

LANDSCAPE MAINTENANCE

GROUNDCOVERS: IMPLEMENTATION AND MAINTENANCE REGIMES

1. TURF

Application: Majority of parkland areas, where use indicates need for clipped grass

- Overseed lawn areas with a grass mix of 95% fescue and 5% bluegrass.
- Mow a minimum of once a week in spring, to a height of 2" to 2½" high. Mowing should be frequent enough so that no more than ⅓ of grass blade is removed at each mowing. The top growth supports the roots; the shorter the grass is cut, the less the roots will grow. Short cutting also dries out the soil and encourages weeds to germinate.
- Mow once every two weeks in summer.
- Mow on a ten-day cycle in fall, when growth is stimulated by cooler nights and increased moisture.
- Do not remove grass clippings after mowing.
- Keep mower blades sharp to prevent ragged cuts on grass leaves, which cause a brownish appearance and increase the chance for disease to enter a leaf.

2. FESCUE

Application: Road shoulders, medians, under selected tree masses, in selected parkland areas. Proposals will change approximately 15% of turf areas to fescues.

- Scarify and loosen the surface of the ground. Fill in low and compacted areas with sandy loam. Add 2" of compost and blend into soil. Add 60 pounds/1,000sf of lime. Use a slice seeder to sow hardy red fescue between the middle of August and the middle of September. This fescue grows to 5" high.

- In the second year, overseed in April to thicken turf. Apply 10-10-10 fertilizer when grass is overseeded.
- Mow between the end of May and the first week in June. Mow a second time between the end of September and the middle of October.
- If there are considerable weeds, undertake additional spot mowing to remove them. Fescue will thicken up and out-compete weeds. Where weeds persist, remove them by mechanical means.
- Slice-seed more fescue every few years as required in areas that see wear from site use.

3. TALL/ORNAMENTAL GRASSES

Application: Ornamental planting in selected areas of rotaries/intersections as transition/gateway parkway zones

- Prepare area by removing existing ground-covering vegetation.
- In April, add lime at 50 pounds/1,000sf. If the area is subject to salt, add 50 pounds/1,000sf gypsum. Add 0-20-0 superphosphate at 35 pounds/1,000sf. Add 2"-4" of compost. Add sandy loam as necessary to meet adequate grade. Add 10 pounds/1,000sf of 10-10-10 fertilizer. Incorporate all materials.
- In April, plant grasses. Mulch planting in with twice-ground bark mulch, not more than 1½" deep.
- In July, remove weeds by mechanical means.
- During first year, water once a week in any week during which there has not been 1" of rain.
- Cut the following April to within 6" of ground surface. Remove cuttings.
- Apply slow-release fertilizer once a year.
- In July, mechanically remove weeds as required, until grass planting becomes established.
- During ensuing years, water as required when natural rainfall is less than half the normal amount for three weeks of any month.

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4. WILDFLOWER MEADOW**Application: in selected parkland areas/ transition spaces**

- Meadow mix to be composed of 60%-70% grasses, and 30%-40% wildflowers.
- Meadows require a minimum area of 100' x 250'.
- Character of meadow to include specimen trees for shade, drifts of shrubs at edges to extend season of bloom and interest. Meadow to be distinct from, and provide transitional development between, turf/lawn and ornamental garden.
- Meadow will not be in full color all of the time.
- If the area is presently composed of thin grass cover:
 - > Add 50 pounds/1,000sf lime, 30 pounds/1,000sf superphosphate (0-20-0), 15 pounds/1,000sf 10-10-10 fertilizer.
 - > Aerate with a coring aerator.
 - > Slice-seed mix into area.
- If the area is presently composed of herbaceous growth, Rototill initially, then follow above regime.
- Mow once a year after the growing season ends and the seeds have set. Leave clippings.
- Second year in April, slice-seed same mix at half the first-year rate.
- Seasonal color, annual/perennial mix:
 - > fall, purple and gold: goldenrod, New England aster, Queen Anne's lace
 - > summer, yellow and white: yarrow, rudbeckia, milkweed, black-eyed Susan

5. HIGH-USE AREAS**Athletic fields, Hatch Shell, turf area across from Harvard houses**

Certain areas of the Basin are subject to intensive use and require correspondingly greater maintenance attention: athletic fields, the Hatch Shell, and the parkland across from the Harvard houses. This maintenance regime should be followed for each of these areas. Specific additional recommendations for the Hatch Shell and Harvard house areas follow.

- *March-April*
 - > Soil test for pH, P and K requirements. Adjust as needed with an application of lime, phosphate and/or potassium.
 - > Power rake to clear area of winter debris and revitalize turf.
 - > Use a soil similar in composition to the existing soil (preferable sandy loam) to fill low spots and to smooth surface. If low areas are caused by traffic, dig to loosen the compaction before filling with loam.
 - > Core aerate as soon as the soil is sufficiently dry to work to incorporate all material and create air and water passages.
 - > Overseed with a grass seed mix of two parts Triplex rye to one part turf-type tall fescue blend.
- To optimize grass health, maintain turf at 2.5" high. Whatever the finished height, remove no more than 1/3 of the existing grass blade at each mowing. Begin mowing when grass is 1" above the target height.

• *May*

- > Fertilize with a 3-2-3 ratio slow-release fertilizer with one pound actual nitrogen if the condition of the grass requires it.
- > Aerate to lessen compaction. Specific sites could benefit from an application of gypsum at 50 pounds/1,000sf s immediately prior to aeration.
- > Mow as turf growth dictates.

• *June-August*

- > Continue to mow as long as the grass is in active growth.
- > In late August, aerate compacted areas, top-dress low spots, and overseed with a blend of turf-type fescues as per seeding recommendation of the seed company.
- > Water twice weekly, applying 1/2" water for each watering.

• *September-November*

- > Continue mowing as long as the grass is in active growth.
- > Remove leaves as necessary to maintain at least a 95% open turf.
- > Aerate in early October if compaction exists.
- > Fertilize with a 2-1-1 ratio fertilizer with the nitrogen component at least 75% organic. Provide one pound actual nitrogen per 1,000sf at this time.



Turf area across from Harvard houses: soil amendment. Soil samples and measurements of soil depths have not been taken at the turf area across from the Harvard houses. Visual inspection, however, showed poor turf growth and major areas without topsoil. The following soil amendments are recommended, with the assumption that soil improvement will be needed to support adequate turf growth, given the current heavy use of this area.

- Add 4" of compost, 60 pounds/1,000sf of lime, superphosphate at 35 pounds/1,000sf (0-20-0), and 15 pounds/1,000sf of 10-10-10 fertilizer.
- Incorporate materials into existing soil before overseeding.

Hatch Shell: maintenance, use and mitigation of damage caused by use. If the current heavy schedule of Hatch Shell use cannot be altered, it is necessary to dedicate additional funds to maintaining this area, including implementation of the best-practices recommendations made by William Dest, consulting agronomist to The Halvorson Company, in its *Facilities Maintenance Manual* (July 1997) for the MDC.

It is recommended, however, that a less costly, low-technology solution be implemented, along with a reduction in the level of use. Assessment of this area in the context of the entire Charles River Basin and the MDC's maintenance capabilities suggests that the maintenance regime above will be adequate and yet still represent a dedicated and increased effort.

Efforts to maintain this important area must include three elements:

1. dedicated maintenance procedures;
2. limits on use during the high-use months; and
3. payment by users for post-event measures to mitigate damage to the resource.

If it is in healthy condition and receives regular maintenance turf should be tough enough to withstand the intensity of use experienced at the Hatch Shell. Maintenance should include adequate repair after large events, including aeration, overseeding and fertilization.

- *Recommendations for Hatch Shell schedule of use and mitigation of damage*
 - > Schedule events Thursday-Sunday from June through September. (The current schedule is Wednesday-Sunday.)
 - > Reduce use of the site by one-third, using other venues along the Basin and elsewhere throughout the city for events. This will materially improve the opportunities for the grass to recover from damage.
 - > Mow grass on Wednesday prior to the four-day use cycle
 - > After any three consecutive days of heavy use, allow a two-day rest and spot aerate. Seed with Triplex rye and barricade the seeded area.
 - > Utilize the current system of roping off the area when it is not in use, to protect grass from overuse.
 - > On top of the maintenance regime for high-use areas, detailed above, employ

the following regime for Hatch Shell area once a month, with potential to increase frequency based on results of compaction tests and/or prolonged intensive use. Treat turf with lime, gypsum, fertilizer, aeration and overseeding according to the following specifications:

- * Primary areas (receiving the most intensive use):
 - apply 60 pounds/1,000sf of gypsum
 - apply 50 pounds/1,000sf of ground limestone
 - apply 20 pounds/1,000sf of 10-10-10 fertilizer
 - make four passes with an aerator, minimum 3" penetration
 - overseed with grass mix spread at the rate of 6 pounds/1000sf
- * Secondary areas (receiving diffuse use):
 - apply 50 pounds/1000sf of gypsum
 - apply 50 pounds/1000sf of ground limestone
 - apply 10 pounds/1000sf of 10-10-10 fertilizer
 - make two passes with an aerator, minimum 3" penetration
 - overseed with grass mix spread at the rate of 3 pounds/1000sf

For heavily attended events, conduct compaction tests throughout the area before the event, after the event and after mitigation measures to determine the extent of compaction and the effectiveness of mitigation.

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SHRUB IMPLEMENTATION AND MAINTENANCE REGIMES**Deciduous and Evergreen Shrubs**

- Incorporate into planting hole 25% Canadian sphagnum peat moss, ½ lb. 0-20-0, ½ lb. slow-release fertilizer, ½ lb. lime.
- Mulch not more than 3" depth with pine or fir bark.
- Prune annually, immediately after blooming, to remove ⅓ of the above-ground biomass (older stems). Stem removals to occur within 6" of the ground to open up shrub and maintain two-year wood (the blooming wood).
- Fertilize with ½ lb. slow-release fertilizer every second year.
- Prune evergreen shrubs only as needed to remove dead and damaged wood and to maintain the naturalistic form of the shrub.

TREE IMPLEMENTATION AND MAINTENANCE REGIMES**1. Planting and Routine Maintenance**

- For new tree planting:
 - > Prepare hole three times the diameter of the soil ball, and no deeper.
 - > Excavate area 18" and add three parts sandy loam to one part sphagnum peat moss, lime, superphosphate, and slow-release fertilizer.
 - > Stay beyond drip line of any adjacent tree.
 - > Provide a mulch saucer around base of newly planted tree.

- > Do not wrap new plantings. Wrapping raises bark temperatures, causing bark damage and promoting establishment of fungal organisms.
- > Do not stake new plantings, unless special conditions (*i.e.*, high winds or possible vandalism) warrant it.
- Provide aftercare for new plantings for the first three years:
 - > Do not fertilize trees, which artificially stimulates them (unless tree health warrants).
 - > Water once a week the first year; twice a month the second year; once a month the third year.
- Prune parkway trees on four-year cycle.

2. Shoulder Maintenance Support

- Shoulder to be minimum of 6' wide to allow tree planting, and preferably 8–10'.
- In order to allow tree planting, shoulder to have a 6" granite curb and a 12" wide concrete salt splash, which protects the trees from road salts, car damage, and loss of topsoil in rain or flooding.
- Drainage structures to be cleaned regularly to prevent blockage and flooding during storms, which has accelerated topsoil wash-off from shoulder zone.
- Sow fescue grass into shoulders (implementation regime for "2 Fescue," above).
- By existing trees, scarify soil and add compost to support fescue growth.

3. Signature Trees

Maintenance and replacement regime for London planetrees:

- **Inventory**
Because of the significance of the London planetrees near JFK Street along Memorial Drive in Cambridge, a tree-by-tree inventory was conducted. These are "signature" trees within the Basin, and their care, replacement and protection needs to be of the highest priority.
- **Trees classified by size:**
 - > Young specimens (7–15' canopy);
 - > Medium-age specimens (15–35' canopy); and
 - > Large/mature specimens (35–50' canopy)
- **Trees classified by condition:**
 - > *Good*—Trees appear to be in relatively good health. The structure of the tree, including tree canopy, is intact (*Total=61*).
 - > *Fair*—Trees show some evidence of stress, and/or need maintenance. Conditions observed include scarring of tree trunks, feathering growth at the base (indicating circulation system problems, fungal or bacterial disease), and missing or broken branches. (*Total=31*)
 - > *Poor/Dead*—Trees show signs of significant damage, including severe deformity, damaged or missing bark over extensive regions of the trunk, extensive alteration of basic tree structure, including missing branches and dieback of the tree canopy. (*Total=12*)

- > *Missing*—Space where a specimen used to be. (*Total=27*)
- > Total trees, from Longfellow Park east to end of planetrees: 131
- The breakdown of conditions by locations is:
 - > 68% of trees classified as *good* are on “land” side of parkway
 - > 61% of trees classified as *fair* are on river side of parkway
 - > 75% of trees classified as *poor/dead* are on river side of parkway
 - > 63% of trees classified as *missing* are on river side of parkway

Alternatives Considered: During the planning process two alternatives for treatment were considered and discussed extensively but rejected:

1. Removing and replacing all of the trees at one time. This was rejected because of the impact it would have on the visual character of the park and on the public experience.
2. Phasing out tree planting in the shoulders in favor of allées planted on the far side of the paths (that is, planting replacement trees on the river side of the park path and, where space allowed, on the building side of the opposite path). This was rejected because of the lack of consistent space for planting along the entire length of this stretch of parkway, and because the trees would lack the impact of overarching parkway plantings.

Recommendation: This report recommends a third alternative—replacing trees incrementally where specimens are currently missing, and where significant damage and/or rot signals the need to remove a specimen, then following the replacement regime below during the first two years. Thereafter, follow the recommendations of a Massachusetts Certified Arborist, as detailed below under *Annual Assessment*.

• **Year 1 Replacement**

- > Take down all trees classified as dangerous (the 12 specimens classified as poor/dead). Conducting removals during winter months (November through March) does less damage to ground, means less bulk to remove (no leaves), and lowers costs (for work during winter).
- > Grind out stumps and remove grindings, because of pathogens in material.
- > Fill holes with soil and sow fescue in spring.
- > Replant 27 missing specimens, according to the following regime:
 - * **Prepare soil** in holes by excavating a broad, shallow hole and adding good garden loam, 25% sphagnum peat moss and one pound superphosphate 0-20-0.
 - * **Plant new specimens** no bigger than 4" caliper and no deeper than each specimen was planted in nursery. New plantings require one year for each caliper inch to adjust to transplanting and to replace lost root system (95% of the root system is lost during transplanting).

- * Water thoroughly and **mulch** with pine bark 3" deep.
- * Institute a **watering system**, providing 5 gallons for each caliper inch per watering. Water a minimum of once a week the first year; twice a month the second year; once a month the third year; and more frequently if drought conditions or high temperatures indicate the need.

- * **Do not wrap new plantings.** Wrapping raises bark temperature, damaging bark and promoting establishment of fungal organisms.
- * **Do not stake new plantings**, unless special conditions (*i.e.*, high winds or possible vandalism) warrant it.
- * **Prune trees in early spring** as needed to repair damage and retain characteristic form.

• **Year 2 Replacement**

- > **Replace trees removed** during Year 1 (12 specimens) according to the above planting regime.
- > **Prune** all existing trees.
- > *For trees classified as being in good condition only: fertilize in early spring or late fall* with slow-release liquid fertilizer pumped into soil (a one-time application). This commercial process also aerates the soil. Fertilizing a damaged tree can make it more susceptible to anthracnose, since nitrogen feeds the top succulent growth, which is susceptible to the disease.

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- **Annual Assessment:** Engage the services of a Massachusetts Certified Arborist to conduct a yearly assessment of the plantings to monitor new plantings and determine ongoing maintenance and/or replacement needs after the second year. Trees that are in serious decline (trunk rot, dead limbs, etc.), that pose a public hazard, or that are no longer performing adequately should be scheduled for removal and replacement. Conduct assessment in the spring or fall. Fall timing holds the advantage of using early fall coloration as a stress indicator.
- **4. Selective Tree Thinning**
 - Selectively remove trees where necessary to allow greater sun penetration into densely shaded and high-use areas. In some selected areas in the Lower Basin, tree coverage is so dense that grass growth is impeded; trees compete with one another for light, water and nutrients; and the parkland lacks sunny areas for users.
 - Remove trees that are in serious decline (trunk rot, dead limbs, etc.), that pose a public hazard, or that are no longer performing adequately. Determination is to be made by Massachusetts Certified Arborist.