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		Date: 02/07/2020
		Author: Landscape and Grounds Management Department

## PART 1 - INTRODUCTION

### 1.1 PURPOSE

- A. Landscape and Grounds Management (LGM) is committed to provide a clean, well-maintained appearance to all University Properties through appropriately scheduled maintenance activities employing sustainable approaches and practices.
- B. This section describes the requirements of the Site Maintenance Plan which will define the approach to maintenance of proposed designs within the open space of Yale University. The intention of the Site Maintenance Plan is to identify required labor levels for the proposed landscape. The required labor will be estimated by evaluating the tasks by area type. Area types relate to landscape design zones that require specific maintenance annual practices. Proposed designs are required to identify area types in order to determine the specific maintenance levels and types of tasks that will uphold University expectations for landscape character and quality and sustainability objectives.

## PART 2 - GENERAL REQUIREMENTS

### 2.1 UNIVERSITY MAINTENANCE GUIDE


- A. The University expects a well-maintained appearance.
  1. **Beds** – foster full plant cover (preferred over mulch), edged, weed free, and clean.
  2. **Flower pots** – plant with seasonal flowers: spring, summer, and fall.
  3. **Lawn** – maintained at a consistent height (mow weekly)
  4. **Walks**- litter pick daily, clean of debris weekly.
  5. **Driveways and Parking lots** – litter pick bi-weekly and clean of debris monthly.
  6. **Snow/winter precipitation** – remove snow, /apply ice melt for safe pedestrian passage on sidewalks and steps and vehicular passage on roads, and parking lots.
  7. **Trash receptacles** – check regularly for fullness, empty regularly to avoid pests.
  8. **Trees** – prune for tree health, safety and aesthetic quality.

### 2.2 AREA TYPE DEFINITIONS AND TASKS

- A. Area types are components of the designed campus landscape. With reference to “Yale Design Standard 32 01 01 Exterior Improvements Landscape Design” the area types are organized within the Character Defining Features of the site. Listed below is a short description of each area type, maintenance level, typical task list, and typical frequency of tasks compiled by LGM. Other tasks may be required for a specific area to achieve University expectations.

#### Circulation


1. **Walks** – paved surface primarily for pedestrian use incorporated into the landscape.
  - a. Moderate maintenance
  - b. Examples – walkways, stairs, retaining walls

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- c. Example tasks – litter pick, blow, street sweep
- d. Frequency of tasks – weekly litter pick, weekly blow, monthly street sweep
- 2. **Drives and Parking lots** – A built hardscape surface for vehicular use.
  - a. Low maintenance
  - b. Examples – concrete, asphalt paved surface, may include stone curbs, and nearby plantings
  - c. Example tasks – litter pick, blown, street sweep, repaint lines
  - d. Frequency of tasks – monthly litter pick, monthly blow, monthly street sweep, annual line paint

Vegetation – See **“Yale Office of Facilities Preferred Plant List”** for a comprehensive list of preferred species


- 3. **Beds/Pots, Annuals** – annual flowers for visual color. Installed generally 3 times annually; spring, summer, and fall.
  - a. High maintenance
  - b. Examples – violas, lantana, verbena, petunias
  - c. Example tasks – planting, watering, weeding, training, dead heading, watering
  - d. Frequency of tasks – planting in high moisture retention soil mix, replant three times annually, weed weekly, water weekly if in full sun, train/dead head, water bi-weekly
- 4. **Bed, bulbs** – annually planted spring bulbs for early color
  - a. Moderate maintenance – planted in ground cover areas
  - b. Examples – tulip, daffodil, allium, grape hyacinth
  - c. Example tasks – installation, removal or tie down/cutback
  - d. Frequency of tasks – late fall planting at depth of three times bulb height, post bloom removal or tie foliage-down, trim off when yellow
- 5. **Beds, flowers** – a bed with perennial plants (flowering and non-flowering) intermixed.
  - a. Moderate to high maintenance for well-maintained appearance
  - b. Examples – mixed perennials or smaller areas of one type
  - c. Example tasks – weed, prune, shape, train, split
  - d. Frequency of tasks – weed, prune, shape and train monthly, split bi-annually
- 6. **Beds, ground covers** – a bed with the majority of space consisting of 1 variety of low growing, spreading plant material that inhibits weeds
  - a. Low maintenance, may be planted with naturalizing bulbs
  - b. Examples – Baltic ivy, periwinkle, native pachysandra, thyme, tiarella, creeping phlox, wild ginger, barren strawberry, blue-eyed grass
  - c. Example tasks – weed, prune, transplant, edge, pick litter
  - d. Frequency of tasks – inspect monthly and remove weeds if present
  - e. Spring and Fall- transplant, prune, edge and thorough clean up to remove dead and disfigured leaves, litter etc.
- 7. **Beds, perennials** – a bed with the majority of space consisting of one variety of perennial plant material.
  - a. Low to moderate maintenance
  - b. Examples – coneflower, bee balm, coreopsis, decorative grass
  - c. Example tasks – weed, prune, cut back, edge and mulch
  - d. Frequency of tasks – weed monthly, edge and mulch spring, prune, cut back spring and fall
- 8. **Beds, shrubs and hedges** – a bed with the majority of space consisting of woody plant material.

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- a. Low to Moderate maintenance
- b. Examples – yew, holly, viburnum, lilac, cornelian cherry dogwood
- c. Example tasks – weed, annual prune, edg, and mulch
- d. Frequency of tasks – weed monthly, winter prune, spring edge and spring mulch
9. **Climbing vines** – a perennial plant trained to climb a support structure vertically.
  - a. Moderate maintenance
  - b. Examples – Japanese hydrangea, wisteria
  - c. Example tasks – train, prune
  - d. Frequency of tasks – train bi-weekly, prune after flowering & late winter
10. **Lawn** – areas of turfgrass generally maintained under 4”. High frequency of mowing required but can be accomplished quickly by machine.
  - a. Low to moderate maintenance, large areas low, smaller areas moderate.
  - b. Examples – Turf Type fescue, Kentucky blue grass, rye grass
  - c. Example tasks – cut, string trim, blow clippings, aeration, slice seed, and fertilization.
  - d. Frequency of tasks – Mow/string trim/blow weekly, aeration/slice seed spring/fall, IPM bi monthly
11. **Rain Garden or Vegetated bioswale** – floodplain species planting designed to allow rainwater runoff to be retained and to infiltrate into the ground.
  - a. Low to moderate maintenance
  - b. Examples – Shrubs- bayberry, arrowwood, black chokeberry, Grasses and Perennials- blue star, sedge, cardinal flower
  - c. Example tasks – spring IPM application, spring or fall cutting
  - d. Frequency – spring IPM application, spring or fall cutting
12. **Trees** – large shade canopy plant. Priority trees are on a scheduled maintenance program.
  - a. Low maintenance once established; new trees require three years of establishment maintenance at a moderate level
  - b. Examples: Canopy – oak, beech, understory/flowering – Eastern dogwood, shadbush, fringe tree, pagoda dogwood
  - c. Example tasks – prune, shape, dead wood removal
  - d. Frequency of tasks – annual prune, bi-annual shape, dead wood removal as needed
13. **Urban Meadow** – intentionally tall self-regenerating grasses and wildflowers grown for pollinator and bird habitat and to increase biodiversity
  - a. Low maintenance once established, three years of moderate establishment maintenance
  - b. Examples – star-eye grass, black-eyed susan, bee balm, goldenrod, Indian grass
  - c. Example tasks – spring IPM application, 6” cut back, spring or fall mow,
  - d. Frequency of tasks – spring IPM application, June 6” cut back, spring or fall mow
  - e. Retain some unmown areas in order to hold butterfly and praying mantis cocoons until hatched

#### Landscape Structures

14. **Irrigation** – a built system to provide water to the landscape controlled by an automated clock.
  - a. High maintenance
  - b. Examples: Baseline Station 3200, Hunter X core
  - c. Example tasks – spring start up, spring/summer/fall adjustments, repairs, winterization

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- d. Frequency of tasks – annual spring start up, monthly adjustments/repairs, annual winterization

#### Furnishings and Small Objects

- 15. **Trash receptacles** – landscape receptacles accessible by pedestrians
  - a. High maintenance
  - b. Examples – Victor Stanley ES-142 dome lid, placed in pairs 1 black 1 dark green or Bigbelly Double Station of 1 Black HC5 and 1 Green SC5 including Lifecycle, software, SC hopper and foot pedals
  - c. Example tasks – emptying bags, cleaning surfaces
  - d. Frequency of tasks – daily emptying of bags, cleaning surfaces bi-annually
- 16. **Waste Stream enclosures** – dumpster and toter locations for commercial waste streams. Ideal enclosures keep dumpsters and totters from pedestrian visibility while allowing direct access by truck to enclosure entrance.
  - a. High maintenance
  - b. Examples – stone or brick wall with gates matching building architecture housing the following waste streams:
    - 1) Recycle – compactors, 2-yard dumpsters, toters (black-trash, green-recycle, brown-compost/food waste, blue-lab recycles, grey-metal)
    - 2) Compost/food waste – toters (brown-compost/food waste)
    - 3) Municipal solid waste – compactors, dumpsters varying sizes
  - c. Example tasks –
    - 1) Recycle – department emptied based on location specific historical data
    - 2) Compost/food waste – department emptied based on location specific historical data
    - 3) Municipal solid waste – vendor emptied based on location specific historical data
    - 4) Trash enclosure – litter picked, pressure washed
  - d. Frequency of tasks – litter picked seasonally, pressure washed as requested

### 2.3 SUSTAINABLE OBJECTIVES AND VEGETATION MANAGEMENT PRACTICES

- A. The Site Maintenance Plan is approached with two processes that are interdependent: Sustainable Objectives and Vegetation Management Practices. Sustainable Objectives focus on Integrated Pest Management while Vegetation Management Practices are the actual tasks to achieve the IPM objectives and University expectations. The goal is to create an ideal living environment for plant material which improves tolerance levels, reduces required inputs, and improves function of the plant.
- B. **Sustainable Objectives** – reduce the inputs of chemicals, labor, nutrients, and water. Inputs are managed through Integrated Pest Management which is a decision-making approach with plant health as the focus. IPM is implemented through selection of appropriate plant material, soil stewardship, cultural practices, irrigation management, establishment, monitoring pest levels and determining acceptable thresholds. The combination of these practices specifically target reduction of chemical use to safeguard human health within the environment.
  - 1. Integrated Pest Management – completed in all area types through active observation and situational awareness. Examples of IPM are:

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- a. Selection of plant material – installation of plant material that will most likely have success in the given environment, “**Yale Office of Facilities Preferred Plantings List**”
- b. Soil stewardship – observation of the soil profile to ensure healthy microbiology, adequate nutrient levels, and management of physical characteristics such as compaction.
- c. Cultural practices – specific tasks that positively impact the health of the plant material without the use of chemical substances.
- d. Irrigation management – observation of soil moisture levels and adjustments to the irrigation system to ensure appropriate levels are maintained.
- e. Establishment – The time required to allow plant material growth to a maturity level where it can fend for itself reducing the required management. This time frame varies plant type to plant type.
  - 1) Example time frames – Lawn 3 months, ground cover 1 year, shrubs 1 year, perennial beds 2 years, trees 2 years, meadows 3 years.
  - 2) Examples tasks – special tasks are required to accomplish the establishment period such as weekly watering for newly planted trees, or additional bed weeding to reduce competition.
  - 3) Customer warranty – LGM is to be provided with a warranty through establishment of the individual area types.
- f. Thresholds – the point when a pest population must be controlled. Usually based on an economic threshold or expectation level of non-managing stakeholders. Generally, thresholds should be set as high as possible to reduce the need for intervention.
- g. Monitoring pest levels – active scouting to locate and identify pest for early detection. Early detection may allow opportunity to take a nontoxic approach.

**C. Vegetation Management Practices** – the tasks to achieve the Sustainable Objectives

1. Cultural Practices – specific tasks that positively impact the health of the plant material without the use of chemical substances.
  - a. Examples – aeration, over seeding, pruning for structure
2. Maintenance tasks – specific actions completed by LGM to maintain aesthetics and function of plant material within the design.
  - a. Examples – mowing, trimming, pulling weeds

**2.4 REGIONS**

1. Yale University’s campus is divided into 5 similar yet distinct Regions (Work Units); Central North (Science Hill), Central South (Central), Med School, West Campus, and Athletics.
  - a. Central North (Science Hill) consists of Grove & Ashmun Street North to Divinity School
  - b. Central South (Central) consists of Grove & Ashmun Street South to Crown Street
  - c. Med School consists of South Frontage Road South
  - d. West Campus consists of the campus located at 100 West Campus Drive in Orange CT
  - e. Athletics consists of the Campus located at 81 Central Ave, New Haven
2. Each Region (Work Unit) has different priorities through the course of the year. Prioritization is generally driven by seasonal events, such as Commencement or athletic events, and is scheduled by the LGM Area Supervisor.


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3. Map of Yale University Campus
  - a. <https://map.yale.edu/>

## PART 3 - MINIMUM REQUIREMENTS

### 3.1 SITE MAINTENANCE PLAN

- A. The Site Maintenance Plan is created by combining the Sustainable Objectives and Vegetation Management practices with University expectations. To achieve the area type expectations, tasks must be assigned to each area type. The tasks may then be measured to identify the required labor to maintain the proposed design intent.
- B. The consultant shall meet with the LGM Area Supervisor to discuss specific area maintenance requirements. The LGM Area Supervisor can relay priority time of year/events and any special location nuances that should be considered under the proposed Site Maintenance Plan.
- C. The design team with YoF Planning/Project Management and LGM Area Supervisor shall meet to discuss the anticipated establishment period for all new plantings and include this time frame (ie., typically between 1-3 years establishment) in the Project Manual, Site Maintenance Period Specification. The cost for this is to be carried during estimating and GMP, for determination of funding by the Project for the duration of 18 months, and by University funds for subsequent months.
- D. The Site Maintenance Plan is a required deliverable for all design phases. This document will identify approach/expectations by area type and determine the tasks to be completed; quantified and calculated. Individual action plans shall be created for each specific area type as defined under 3.2 Definitions. The specific design intent should be outlined as defined in 32 01 01 – Yale Landscape Design Standard.
- E. This plan shall be produced by completing 4 documents.
  1. **Basis of Design - Landscape and Civil Systems** – Summary of intent – located within the BOD this summary of the landscape’s design intent is intended to be a field document for LGM Area Supervisors to understand how the landscape should look. This document also serves as a location for the University to identify metrics for University programs.
  2. **Site Maintenance Plan - Site Plan of Area Types** – located within the “L-Series” this drawing is to designate the proposed landscape by area type and account for the gross square footage of each. The measurements by area type will be incorporated into the Site Maintenance Plan Gantt chart for labor estimates.
  3. **Site Maintenance Plan - Planting Schedule** – located within the “L-Series”, include a description for each planting design intent, in addition to information typically listed in planting schedules. The planting schedule is to include a brief description of individual plant design intent and the selection criteria for that location, specifically from a physiological standpoint.
  4. **Site Maintenance Plan - Labor Projection** – located within the BOD the consultant is to insert the area type gross square footage, only, into the Site Maintenance Plan Labor Projection

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spreadsheet. This document will be used by LGM to project the required labor hours to maintain the proposed design.

<b>Date</b>	<b>Description of Change</b>	<b>Pages / Sections Modified</b>	<b>ID</b>
3/25/20	Entire document	-	LGM
11/19/20	Added paragraph 3.1.C.		Univ Planning