

## Chapter 6 – Planting Bed Management



Landscape planting beds are often the focal point of a park, streetscape or City building. They provide color, texture, space definition, fragrance, wildlife habitat and other benefits enjoyed by park users. In the Pacific Northwest, climatic conditions favor growing a wide variety of ornamental landscape plants and a rich palette of Northwest native plants. These environmental conditions have allowed planners, designers and maintenance staff to create a landscape plant collection of real beauty. Careful management of these assets is required to continue the heritage and maintain the value of this substantial plant collection. The best management practices described in this chapter are applicable to parks, city buildings and streetscapes that have planting areas as a design function.

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### 6.2 Definitions

**Biological Control** – The use of biological agents, such as insects, to control weeds.

**Chemical Control** – The use of herbicides, both pre-and post-emergent.

**Disease Control** – The maintenance of healthy plants accomplished by good cultural practices.

**Edging** – The control by manual or chemical means of plant growth, both to lawn area surrounding the bed and plant material in the beds.

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**Fertilizing** – The use of organic or inorganic materials to adjust fertility levels in the soil.

**Formal Beds** – Planting beds that may include ornamentals, annuals and perennials as part of a landscape design.

**Informal Beds** – Planting beds that may include native plantings without a formalized landscape design.

**Insect Control** – The suppression or eradication of harmful insects in the landscape.

**Irrigation** – The supply of water to plantings, either through automatic irrigation systems or manual systems.

**Manual or Mechanical Control** – The use of hand and power tools to remove unwanted vegetation.

**Planting Beds** – Planting beds are non-turf, planted areas that include woody plant material such as shrubs, trees and ground covers. Planting beds also include floral color displays containing herbaceous plants such as perennials, annuals and bulbs.

**Weed Control** – The control of undesirable plant species.

### 6.3 Background

Level of visibility and site use dictate maintenance standards for planting beds. Even within the same park, maintenance techniques can differ for formal plantings and high-traffic areas as opposed to remote areas that may remain informal and natural. For that reason, planting bed BMP's are tailored to the specific requirements of plant material and site goals. At a formal site, the desired result may be to promote prolonged bloom in floral displays.

Planting beds can be divided into four categories according to level of visibility and usage:

1. **Floral Beds** are very visible and have a high standard of maintenance which includes weekly grooming, weeding and regular site visits.
2. **General Landscape Bed Areas** have moderate visibility and standards of maintenance which include monthly weeding and seasonal pruning.

3. **High-Visibility/Public Facility Landscapes** have the highest visibility and the highest standard of maintenance.
4. **Newly-established Landscapes** will have a very high standard of maintenance through the plant establishment period (1-5 years).

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## Existing Site/Environmental Conditions

Site microclimate considerations are taken into account when planning a new planting or renovating an existing one. The following factors must be weighed:

- **Current Landscape Condition:** The condition of current plant material is a good indicator of existing cultural conditions. Compaction, low nutrients, and types of pest populations determine renovation and plant selection options. This is particularly true of soil-borne pathogens such as Phytophthora root rot. Selecting resistant plant materials is a must. It is also recommended to select plants that do not require fertilizers or highly specialized care.
- **Soil Type and Condition:** Soil may require amendment to improve drainage or water-holding capacity. Heavy clay or very sandy soils may be improved if desired, but appropriate plant selection is vital to the success of the planting.
- **Drainage:** Irrigation and drainage conditions must be assessed and any improvements included in the design process. Run-off should be eliminated as much as possible. If a site is a steep slope, COB standards must be met. (see *COB Critical Areas Ordinances*)
- **Cultural Conditions:** Cultural conditions such as exposure to sunlight and reflected light, heat, wind and rainfall apply to plant selection and irrigation installation.
- **Safety:** Safety issues include falling branches, plant growth that blocks pathways, visibility through shrub beds and rerouting pedestrian traffic to sidewalks.
- **Flowers:** In floral displays, the maintenance budget for the display must be taken into consideration when selecting plant material. Some annuals and perennials require more grooming than time constraints allow and should only be used where they will receive adequate care.
- **Species Diversity:** Species diversity offers a longer season of

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interest. Monocultures can be more susceptible to total failure in case of insect or disease problems.

### 6.4 Best Management Practices

#### Site Preparation

Preparing the site is important to the long-term success of a landscape. Making the necessary cultural improvements before planting saves time and money. The following are BMPs for site preparation:

- **Existing Weeds:** To prepare a site for landscaping or renovation, existing weeds and undesirable plant materials should be removed as thoroughly as possible. Weed populations (especially difficult-to-control weeds such as horsetail, morning glory and quack grass) affect planting plans. In a primary bed location, they should be eradicated before installation of new landscapes. If mechanical eradication is not practical, an appropriate chemical control will be used.
- **Overgrown Plants:** Plant material that is too large, or has an expected mature size that is too large for the space, should be replaced with appropriately sized species.
- **Diseased Plants:** Disease and insect-resistant material should be selected and used where the culture will promote healthy growth. In an existing planting to be renovated, diseased plants shall be removed and replaced with healthy specimens or treated by appropriate means.
- **Soil:** Soil amendments as required should be added to and incorporated into an entire planting area. Avoid tilling saturated soils, which can damage tilth.
- **Water:** Irrigation and drainage systems should be installed as needed.
- **Landscape Features:** Install retaining walls, pathways and hardscape features prior to plant installation to avoid subsequent damage.
- **Rocks and Debris:** Excessive rocks and debris must be removed. Rake area to establish finish grade.
- **Fertilizers:** A soil test indicates fertility levels in the soil. Fertilizer, if required, should be applied to the site and incorporated into the soil. Amendments that include un-composted woody material may require nitrogen.

- **Annuals:** Annual flowerbeds must be spaded or tilled at planting time. Amendments such as compost, sand, or Perlite can be added to adjust drainage. In containers, the addition of hydrating gel can enable the use of plant material that might not otherwise be appropriate to water requirements.

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## Planting

The following guidelines for proper installation of plant material ensure good establishment and healthy growth.

- **Fertilizer:** If fertilizer is to be used, it is best to wait until plants are established before adding chemical fertilizers to the soil in order to promote long root growth.
- **Depth:** Plants must be placed at proper depth, taking into consideration room needed for mulching.
- **Spacing:** Proper spacing with consideration of mature size and spread of plants ensures good establishment. Good air circulation and availability of sunlight, water and nutrients will promote growth and avoid development of disease. Ground covers and floral plantings should be close enough to provide adequate coverage to compete with weeds, and provide effective display, without being too crowded at maturity.
- **Water:** Water new plantings to settle soil and reduce transplant shock. Ensure adequate moisture levels during the growing season.
- **Mulch:** Mulch at planting time for maximum efficiency. Rake soil smooth to prevent puddling and then apply mulch. Avoid smothering small plants. A fine mulch is preferred as it becomes the next season's planting soil.

## Edging

Edging controls by either manual or chemical means the plant growth both in the lawn surrounding a bed and plant material in the beds. The main purpose is to maintain a neat edge to the planted area. Proper edging also controls weeds in the bed edge.

- **Informal Plantings** can be maintained mechanically or chemically to control turf and weed encroachment onto mulched areas.
- **Formal Plantings** can be maintained by hand tools, mechanical means or chemically.

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### Irrigation

- Site conditions such as soil type and slope, exposure and moisture requirements of plants dictate both frequency and duration of application.
- Weather conditions, such as temperature and rainfall, require monitoring and response. Generally, most plants require at least 1 inch of water per week. Drought tolerant plants, once established, may need less. Floral plantings, particularly in containers, require considerably more.
- Infrequent deep watering is preferable. Avoid creating runoff.
- Shrubs, groundcovers and flowers planted in the root zones of large trees need more water to balance the competition from the tree roots.
- Consider pedestrian access, park usage and available personnel when establishing irrigation schedules.
- Avoid disease damage by keeping water off leaves.
- Be sure to begin watering early enough in the spring to prevent plant stress and hydrophobic soil conditions. Continue irrigating until consistent fall rains begin.
- Visually test and monitor the system weekly.

### Mulching

Mulching serves to conserve moisture, retain soil, suppress weed growth, moderate soil temperature, reduce compaction and supply nutrients for plants and soil microbes. It is also aesthetically pleasing making it desirable for high visibility locations.

- **Materials:** Materials include bark products, compost, wood chips, and other commercial organic products.
- **Depth of Application:** This varies according to type of plant material, but averages 2 to 3 inches. Keep mulch materials away from contact with trunk or crown of plants to avoid stem rot.
- **Edge of Beds:** Recess edge of beds to avoid drift of mulch materials onto turf or pavement, where necessary.
- **Flower Bed:** Flowerbeds should be mulched with a fine material such as compost, taking care not to smother plant crowns. Generally, mulch in an annual planting is 1 inch deep although a deeper layer of mulch, if possible, will provide better weed suppression.
- **Woodchips:** Un-composted woodchips can deplete soil nitrogen as they decompose. Use of woodchips may require

application of a nitrogen-rich fertilizer.

- **Fallen leaves:** The use of fallen leaves as mulch may be appropriate in some areas. Avoid using diseased or insect-infested material. It is important to avoid smothering the roots of the desirable plants with too thick a layer. A 2-inch layer is considered best. Compost from plants that are known to be diseased must not be used for mulching purposes.

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## Fertilizing

Fertilizing, the use of organic or inorganic compounds, shall be tailored to specific requirements for plantings:

- **Nutrients:** Nutrient requirements differ according to plant type and the desired performance of a plant. Turf grass and other plants grown for their vegetative growth require more nitrogen than plants grown for flower and seed production. Plants grown for flower and seeds require more phosphorus (P) and potassium (K). Too much nitrogen can cause excess growth, which will be more susceptible to insect and disease damage.
- **Application Timing:** Timing application to the biological cycle of the plants is important in maintaining optimum growth. Plants just becoming established may require more P and K in the blend to encourage root development. Also, plants benefit most from fertilizer application at the onset of their new growth in the spring. Applications too close to fall may delay dormancy and promote soft growth, which can suffer winter damage.
- **Micronutrients:** Micronutrients are also important for plant health. It is best to test the soil to determine existing levels of these nutrients because an imbalance can harm plants.
- **Soil pH:** The pH of the soil will determine whether to use an acid or base formulation of fertilizer, as well as the need for lime applications. Always test for pH before applying any fertilizer or lime.
- **Formula:** Select a formulation that is best for the soil type and time of year. Cold weather slows the activity of soil microbes that make nutrients available to the plants. Plants require nitrogen, phosphorous, potassium and other nutrients to optimize growth.
- **Floral Plantings:** Floral plantings can be fertilized at planting time with slow-release fertilizer. Flowers can also be supplemented during growing season with foliar feedings of liquid fertilizer.

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- **Compost:** Compost can be applied as a nutrient source. It must be fully decomposed so that nutrients are made available to plants. Most compost has no more than 3% nitrogen, which is slowly released. Its main benefit is that it encourages beneficial soil microbial growth.

### Pruning

Pruning shall be performed according to current ISA standards and for the following reasons:

- Encouraging and directing new growth and flowering.
- Removing spent blooms and foliage.
- Removing insect, disease and weather damage.
- Maintaining size and shape.
- Maintaining visibility.
- Improving safety.
- Creating pedestrian and mower access.

The following are **BMPs** for pruning:

- **Plant Selection:** Use appropriate plant materials that grow to the correct size for the space. Plant selection reduces the need for excessive pruning.
- **Natural Form:** A natural form is desirable in most park settings.
- **Hedge Pruning:** Hedge pruning requires careful timing for optimum results:
  - First cut should be made as new growth begins to harden off.
  - Last hedging should be made no later than mid-August.
  - Hedges should be wider at bottom than top.
  - Hedge pruning is labor-intensive and is best applied to plants with smaller leaves as they tolerate heavy pruning better.
  - Because the intensity of maintenance required, formally-pruned hedges are not desirable in many park locations.
  - When major pruning is required of prominent plantings and hedges, neighbors/park users may need to be notified in advance of the work to be done.
- **Timing:** The best timing of pruning for most plant material is following flowering. Workload balancing, however, often dictates dormant season pruning.

- **Growth Habit:** Growth habit of specific plant material will determine optimum pruning method.

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## 6.5 Integrated Pest Management

Planting beds are defined as non-turf planted areas that include woody plant material such as shrubs and trees and groundcovers. The category also includes floral color displays containing herbaceous plants such as perennials, annuals and bulbs. The most serious pest management issue in planting beds is weed control. If not controlled, weeds not only make a plant look unkempt, but, more importantly, can out-compete desirable landscape plants resulting in a loss of assets. The following table shows pest tolerance thresholds and IPM principles that shall be employed in selecting maintenance methods for planting beds.

Pest Tolerance Thresholds for Plant Beds			
Area	Weeds	Insects	Disease
<b>General Landscape Beds</b>	Some weeds acceptable. Goal is for bed areas to be generally free of weeds for both asset protection and appearance. Weeds will not be allowed to out-compete desirable landscape plants.	Generally tolerated unless particularly valuable plants are actually threatened.	Occasionally tolerated. Manual and cultural controls preferred. Chemical controls used to save specimens.
<b>Highly-visible/ Public facility landscapes/ Bellevue Botanical Gardens</b>	Generally not acceptable.	Generally tolerated unless they threaten particularly valuable plants. Manual removal of obvious pests is encouraged.	Occasionally tolerated. Manual and cultural controls preferred. Chemical controls used when other means fail.
<b>Floral beds</b>	Generally not acceptable.	Generally tolerated.	Disease problems tolerated. Plants may be replaced when appearance is impacted.
<b>Newly-established landscapes</b>	Weed control is very important to ensure complete establishment of desired plants.	Generally tolerated. Presence of pests may result in host plant being removed and replaced.	Disease problems, if minor, will be tolerated. Presence of disease problems may result in host plant removal and replacement.



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### 6.6 Training

- Training in IPM alternatives for planting bed maintenance will be provided to field staff.
- Staff will receive ongoing training in:
  - Basic horticulture care
  - Growth standards, plant ID
  - Soils
  - Chemical application

