

Landscape Installation Scenario: The Foundation Planting Project

Scenario Title: Phase I: Commercial Building Foundation Planting

Objective: Your team is tasked with installing the landscape for the primary entrance area of a new corporate office building. The site is prepared, and the crew is ready to plant.

Plant Material List:

1. One (1) 2.5-inch caliper 'Autumn Blaze' Maple tree (*Acer freemanii*).
2. Twelve (12) Dwarf Japanese Holly (*Ilex crenata* 'Compacta') shrubs.
3. Eight (8) 'Limelight' Hydrangea (*Hydrangea paniculata* 'Limelight') shrubs.
4. 500 sq. ft. of pre-sodded turf area adjacent to the beds.

Site Conditions:

- Soil test results show average Nitrogen (N) and Potassium (K) but low Phosphorus (P). The soil is a slightly compacted clay loam.
- A newly installed irrigation main line runs adjacent to the planting beds.
- The beds border a maintained turf area that will require a clean visual separation.

Multiple Choice Questions (Select the single best answer)

Fertilization & Soil Amendments

1. Based on the soil test results (low Phosphorus), which nutrient application is most critical *during* the initial planting of the Maple tree and Holly shrubs to promote successful establishment?

- A. A high-Nitrogen (N) fertilizer to boost immediate green growth.
- B. A Phosphorous (P) supplement, often found in 'starter' fertilizers, to encourage strong root development.
- C. A high-Potassium (K) fertilizer for disease resistance.
- D. A calcium carbonate application to raise the soil pH significantly.

2. When applying a slow-release granular fertilizer to the Holly and Hydrangea shrubs, what is the best practice regarding placement?

- A. Bury the fertilizer granules deep in the planting hole beneath the root ball.
- B. Broadcast the fertilizer evenly across the entire landscape bed *after* the mulch is applied.
- C. Incorporate the granules lightly into the soil surface around the dripline of the plants before mulching.
- D. Mix the fertilizer directly into the backfill soil at a 50:50 ratio with native soil.

Irrigation

3. For the newly installed shrubs and tree, the most water-efficient and effective method for consistent, targeted establishment irrigation is:

- A. High-pressure overhead sprinklers run twice daily for 5 minutes.
- B. Low-volume drip emitters placed near the root ball of each plant.
- C. Temporary soaker hoses left running overnight.
- D. Relying solely on rainfall for the first month.

4. During the critical first two weeks after installation, what is the recommended irrigation strategy for the new plants?

- A. Deep soaking (long duration) every 7-10 days to encourage deep roots immediately.
- B. Frequent, short bursts (shallow watering) to keep the top few inches of the soil moist while roots establish.
- C. No watering is needed, as the plants are dormant.
- D. Using a soil moisture meter to ensure the soil is completely dry before watering.

Pruning & Planting Technique

5. Which immediate pruning task is mandatory for the new 2.5-inch caliper 'Autumn Blaze' Maple tree?

- A. Topping the main leader to encourage lateral branching and fullness.
- B. Removing all foliage to reduce water stress.
- C. Removing broken branches, rubbing/crossing limbs, and cutting the trunk clean from any nursery tags or wires.
- D. Cutting all lateral branches back by one-third to balance the roots.

6. The new Dwarf Japanese Holly shrubs appear healthy but slightly leggy from the nursery. What type of pruning should be done immediately after planting to encourage a denser, more uniform appearance?

- A. Severe corrective pruning, removing half the plant's size.
- B. Light 'tip pruning' or 'heading back' of the new growth tips.
- C. Shearing the plant into a tight square hedge shape.
- D. Root pruning the lower third of the root ball.

7. When planting the Maple tree, the critical step to prevent future girdling roots and ensure long-term health is to:

- A. Fertilize heavily with nitrogen immediately after backfilling the hole.
- B. Ensure the trunk flares are visible above the finished soil grade and shave/score any circling roots on the outside of the root ball.
- C. Plant the tree 6 inches deeper than it was in the nursery pot.
- D. Water it exclusively with reclaimed water for the first year.

Edging & General Maintenance

8. The turf area adjacent to the planting beds requires a professional, clean separation. What is the primary functional purpose of installing a durable steel or heavy-gauge plastic edging?

- A. To provide nutrients to the soil.

- B. To serve as a mowing strip for turf equipment, reducing labor.
- C. To prevent turf grass runners (stolons/rhizomes) from invading the planting bed.
- D. To reflect sunlight away from the plant roots.

9. After planting, fertilizing, and installing irrigation, what is the next crucial step to complete the bed, which helps regulate soil temperature, retain moisture, and suppress weeds?

- A. Applying a pre-emergent herbicide only.
- B. Installing a 2-3 inch layer of organic mulch, keeping it away from plant stems.
- C. Tilling the top 6 inches of soil deeply.
- D. Spraying all foliage with an insecticidal soap solution.

10. After installation and initial watering, the team discovers a loose area of plastic edging that is lifting above the turf grade. Why must this be corrected immediately?

- A. The exposed plastic will rot quickly.
- B. The edging will become a tripping hazard, and grass will grow over the top of it, defeating its purpose.
- C. Edging must always be exactly 3 inches above the soil line for aesthetics.
- D. This is not important and can be fixed during the next maintenance cycle.

The Greener-Than-Ever Lawn Care Challenge

Scenario: The Smith Family's Lawn

The Smith family has just moved into a new house with a half-acre lawn, primarily composed of **Kentucky bluegrass** and **perennial ryegrass**. The previous owner neglected the lawn for several years, resulting in several issues:

- **Soil Test Results:** The soil is slightly acidic with a pH of **5.8**. Phosphorus and potassium levels are adequate, but **nitrogen** is very low.
- **Appearance:** The turf is thin, patchy, and a pale yellow-green color.
- **Pest and Disease:** You observe several patches of **dollar spot** fungus and a high number of **dandelions** and broadleaf weeds throughout the lawn.
- **Irrigation:** The property has an existing, but malfunctioning, in-ground sprinkler system.
- **Equipment:** The students will have access to a variety of commercial-grade equipment, including a zero-turn mower, a walk-behind aerator, a rotary spreader, and backpack sprayers.
- **Climate:** The region experiences hot, humid summers and cold winters (a typical cool-season turf region).

Your goal is to develop a comprehensive plan to transform this neglected lawn into a lush, healthy turfgrass stand over the next growing season.

Multiple Choice Questions

1. Fertilization: Soil pH Correction Based on the soil test showing a pH of 5.8, what amendment should be applied to raise the pH to the optimal range for the cool-season grasses?

- A. Urea (46-0-0)
- B. Gypsum
- C. Agricultural Limestone
- D. Ammonium sulfate

2. Fertilization: Nitrogen Timing The lawn requires a significant boost in nitrogen. To promote the strongest root growth and recovery in this cool-season lawn (Kentucky Bluegrass/Perennial Ryegrass), the most crucial time for the *largest* nitrogen application is typically:

- A. Early spring (March/April)
- B. Mid-summer (July)
- C. Late summer/Early fall (September/October)
- D. Late winter (January/February)

3. Equipment: Compaction Relief Before the first fertilizer application, the students determine the soil is heavily compacted. Which piece of equipment would be most effective for alleviating this issue?

- A. Dethatcher (Verticutter)
- B. Core Aerator
- C. Slit Seeder
- D. Rotary Spreader

4. Irrigation: System Repair The sprinkler system has several broken heads, causing water to pool in certain areas and leaving others dry. This uneven water distribution is best described as:

- A. Leaching
- B. Poor Distribution Uniformity (DU)
- C. Runoff
- D. Evapotranspiration (ET)

5. Pest Management: Broadleaf Weeds To control the high volume of actively growing dandelions and other broadleaf weeds, which type of herbicide should the students plan to use?

- A. Pre-emergent herbicide
- B. Non-selective herbicide (like glyphosate)
- C. Post-emergent selective herbicide
- D. Fungicide

6. Pest Management: Disease Control The lawn is currently showing symptoms of dollar spot fungus. What is the most effective cultural practice to help *prevent* the recurrence and spread of this disease, assuming irrigation and mowing are already being managed correctly?

- A. Applying a fast-release nitrogen fertilizer
- B. Increasing the mowing frequency to every day

- C. Removing grass clippings from the affected area
- D. Immediately applying a higher rate of irrigation

7. Mowing: Recommended Height To promote a denser, healthier turf stand that can better outcompete weeds and tolerate stress, the Kentucky bluegrass/perennial ryegrass lawn should be maintained at what typical minimum height during the growing season?

- A. 0.5 inches
- B. 1.0 inches
- C. 2.5 to 3.5 inches
- D. 4.0 to 5.0 inches

8. Irrigation: Optimal Timing To minimize fungal disease development (like dollar spot) and reduce water loss from evaporation, what is the best time of day to run the functioning irrigation system?

- A. Late afternoon (4 PM - 6 PM)
- B. Mid-day (12 PM - 2 PM)
- C. Early morning (4 AM - 8 AM)
- D. Late evening (8 PM - 10 PM)

9. Irrigation: Duration To ensure that the lawn receives enough water, the irrigation application should be:

- A. greater than the water penetration rate.
- B. equal to the water penetration rate.**
- C. less than the water penetration rate.
- D. all of the above.

10. Pest Management: Post-Herbicide Action After applying the post-emergent selective herbicide to control the dandelions, what is the recommended amount of time the students should wait before mowing the lawn to ensure maximum herbicide effectiveness?

- A. Immediately (within the hour)
- B. 3-4 hours
- C. 24-48 hours
- D. One full week