

Appendix Q

AGRICULTURE, FOOD, AND NATURAL RESOURCES (AFNR) YOUTH APPRENTICESHIP

PLANT PATHWAY LANDSCAPING UNIT UNIT 9

Unit 9: Plant Pathway Landscaping

Competency

1. Assist to evaluate landscaping site

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- while assisting a worksite professional

Performance Standard Criteria

Performance will be successful when the learner:

- Reviews list of client requirements, proposed landscape use, and desires
- Reviews site and land use restrictions
- Evaluates current landscaping site for topography, growing light, water sources, and air flow
- **Measures landscaping site**
- **Tests soil**
- Discusses budget requirements with worksite professional
- **Assists to create the landscape design**
- Assists worksite professional to develop landscaping estimate
- Documents recommendations and plan
- Submits proposal for client review

Learning Objectives

- Explain the impact of landscaping in the U.S. economy
- Define land capability and describe ways to improve it
- Identify factors that determine land capability
- Explain the land capability classification system
- Explain how to evaluate topography, air flow and water sources
- List common land use restrictions that impact landscapers
- Explain how to put together an estimate
- Define variable, fixed and incidental costs as they relate to landscaping budgets
- Describe how to estimate landscape maintenance costs
- Differentiate between an estimate and a bid
- Describe landscape specifications
- Describe key components of a landscaping project bid
- Describe how to calculate labor standards and other labor costs

Comments:

Unit 9: Plant Pathway Landscaping

Competency

2. Measure and prepare landscaping site

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- ***Prepares planting spaces***
- Evaluates site for easements, setbacks, etc, if applicable
- Ensures utility companies have pre-marked locations of buried utility lines
- Obtains plat map or site survey of property
- Measures lot perimeter and verify other measured distances on plat are correct
- Measures from front corners of structures to front and side property lines
- Measures exterior walls and angles of existing structures on site
- Measures from back corner of structures to back and side property lines
- Measures existing elements such as sidewalks, driveways, and any greenery to be kept such as trees, shrubs, etc.
- Records measurements

Learning Objectives

- List tools commonly used for measuring in landscaping
- Describe how to use the measuring tools
- Explain how to calculate square footage of sod, soil, mulch, lawn, patios, driveways, walkways, linear footage of bed edging, and plant count
- Explain how Survey and GPS technology is incorporated into measuring land
- Explain the importance of spatial mapping
- Discuss the concept and principles of spatial mapping
- Describe equipment used for spatial mapping
- List techniques used to spatially map
- Explain the application of GIS/GPS systems with map development output

Comments:

Unit 9: Plant Pathway Landscaping

Competency

3. Test soil

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Collects samples of soil/media and/or plant tissue
- Assists worksite professional to test or send sample for soil testing
- Interprets test results of soil/media and/or plant tissue with worksite professional
- Notes deficiencies of nitrogen, phosphorus, potassium, pH, etc.
- Determines mix of fertilizers needed based on soil report with worksite professional
- **Prepares soils/media**
- **Mixes fertilizers and additives. NOTE:** Only certified professionals can prepare, load, apply, and handle pesticide(s).

Learning Objectives

- Determine the environmental factors that influence and optimize plant growth
- Describe nutrient application methods and appropriate practices
- Explain a soil profile
- Explain how soils within a profile change over time
- Explain the role of organic matter, soil depth, surface slope, soil organisms, and nutrient balance in soil productivity

Comments:

Unit 9: Plant Pathway Landscaping

Competency

4. Assist to create design

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- while assisting a worksite professional

Performance Standard Criteria

Performance will be successful when the learner:

- Obtains plat map or site survey of property
- If a plat map is not available, hand graphs or uses computer software to map site
- Chooses an appropriate map scale
- Plots measurements taken at site on scale map
- Creates landscape design based on customer requirements and site evaluation
- Utilizes design elements of line, form, texture, and color to express visual effect
- Determines plants, beds, trees, hardscaping, materials, soil, equipment and power requirements for project
- Determines a planting plan for seasonal displays of foliages, plants, and flowers
- Documents design elements and decisions made for landscaping
- Develops landscaping plan based on design
- Assists to present design to client using PowerPoint, 3D modeling, Pictures, Color Rendering, etc.

Learning Objectives

- List and define terms associated with landscape design
- Identify design elements
- Discuss applications of art in horticulture and landscaping
- Discuss principles of design that form the basis for visual impression
- Explain how to render a design to scale
- Define the categories of landscape plants
- Distinguish between an annual and a perennial
- Explain how to use annuals and perennials in the landscape
- Describe how to design a flower garden
- List common hardscaping materials used in landscaping
- List common software applications and how they are used to develop landscaping designs

Comments:

Unit 9: Plant Pathway Landscaping

Competency

5. Prepare supplies and equipment

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Obtains landscaping plan list of materials, supplies and equipment needed at site
- Locates required supplies and equipment
- Restocks carts/vehicles with necessary supplies
- Uses protective gloves and clothing as required
- Handles cleaning solutions and chemicals safely as indicated on MSDS. **NOTE:** Only certified professionals can prepare, load, apply, and handle pesticide(s).
- Returns or disposes used supplies to storage or for disposal as required
- Verifies tools and equipment to be used are clean, in working order, and current for preventive maintenance, calibration and repair
- Obtains and loads plant materials needed according to landscaping plan
- Loads all required materials, supplies, and equipment for transport to landscaping site
- Documents stocking, use, and return/disposal of supplies, materials and equipment

Learning Objectives

- Outline compliance requirements of safety and health standards in landscaping
- Describe the layout of the common landscaping facility maintenance area
- List and describe the uses of the various cleaning and chemical solutions used in the landscaping industry
- Explain how to store and dispose of pesticides

Comments:

Unit 9: Plant Pathway Landscaping

Competency

6. Remove waste materials and hardscaping

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Obtains and follows landscaping plan for removal of waste materials or plants to be removed
- Digs up and removes plants to be discarded from site
- Prunes or trims plant material to be kept around landscaping spaces to allow for appropriate lighting and air circulation
- Removes sticks, stones, and other trash
- Removes old plant debris that may harbor insects and diseases
- Levels site
- Cleans equipment used

Learning Objectives

- Explain the purpose of compost
- Describe the benefits of composting
- Describe how waste plant material is used for compost
- Describe the process for starting and maintaining compost
- Discuss the environmental implications of composting versus discarding plant material

Comments:

Unit 9: Plant Pathway Landscaping

Competency

7. Install construction materials and hardscaping

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Obtains and follows landscaping plan for constructing and placing hardscaping materials
- Ensures utility companies have pre-marked locations of buried utility lines
- Reviews the procedure required for the hardscape project
- Wears the appropriate Personal Protective Equipment (PPE)
- Marks the excavation area
- Excavates the site
- Installs a PVC sleeve or pipe if there may be a future need to run a utility line across the hardscaping
- Digs clean, 90-degree edges around the excavation
- Prepares and compacts the base
- Screeds the bedding sand
- Lays the stone, concrete, hardscape material as required
- Prepares the edge restraints
- Compacts the hardscaped surface if required
- Builds or adds on the structural elements required
- Cleans equipment used

Learning Objectives

- Define hardscaping
- List common types of hardscaping projects
- List common equipment used in hardscaping projects
- Explain the importance of soil compacting in hardscaping projects
- Describe the process for preparing a common hardscape base
- Describe the process for preparing bedding sand

WALKS & DRIVEWAYS

- Compare and contrast preparing and installing asphalt versus concrete driveways
- Compare the types of materials used in paving
- Describe the common steps for cutting and installing pavers and edging
- Explain common steps and warnings for working with concrete
- Explain how to select patio materials
- Describe how to install a walkway or patio

DECKS

- Discuss proper deck installation procedures

FENCES & WALLS

- Explain the reasons for installing a fence or wall
- Identify the different parts of a fence
- Discuss how to properly install a fence
- Describe the different materials used to build a retaining wall
- Explain how to install a retaining wall

LIGHTING

- Identify the major lighting techniques available for the garden
- Explain the difference between high and low voltage
- Describe the proper installation of low-voltage lighting systems
- Identify the major lighting techniques available for the garden
- Explain the difference between high and low voltage
- Describe the proper installation of low-voltage lighting systems

WATER FEATURES

- Identify the different materials needed to create a water feature
- Describe the proper technique for creating a small pond
- Explain how to construct a waterfall feature

Comments:

Unit 9: Plant Pathway Landscaping

Competency

8. Plant landscaping materials

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Obtains and follows landscaping plan for planting
- Ensures utility companies have pre-marked locations of buried utility lines
- Verifies or **installs watering** sources
- Tills or turns the soil
- Wears any required Personal Protective Equipment (PPE)
- **Plants seeds, seedlings, or cuttings** as indicated on landscaping plan at appropriate depths and spacing
- **Applies fertilizers** according to requirements. **NOTE:** Only certified professionals can prepare, load, apply, and handle pesticide(s).
- Documents time, location and types of plants planted
- Cleans equipment used
- Returns or disposes unused plant material, seeds, fertilizers as required

Learning Objectives

- Outline proper planting techniques
- Describe the methods of planting annuals, perennials, and groundcovers
- Examine the developmental stages of common landscaping plants
- Describe factors affect each developmental stage
- Determine the nutrient and climatic requirements of common landscaping plants
- Analyze the three phases of perennial grass growth
- Describe the process for transplanting small trees
- Identify major parts of turfgrass plants
- Explain how turfgrasses are selected based on climate
- Identify characteristics of grass plants used for turfgrass purposes
- Analyze the influence of woody plant biology on maintenance practices
- Explain recommended watering practices for woody landscape plants
- Explain guidelines for fertilizing woody landscape plants
- Describe how to select and apply mulches to the landscape

Comments:

Unit 9: Plant Pathway Landscaping

Competency

9. Maintain landscaped spaces

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Obtains and follows landscaping plan for landscaped space maintenance agreements
- Trims, tips, and weeds flower spaces
- Mows, mulches, aerates, weeds, grubs, and removes thatch from lawns
- Trims and edges around beds, walks, and walls
- Prunes and trims trees, shrubs, and hedges, using shears, or pruners
- Rakes, mulches, and composts leaves
- Waters lawns, trees, and plants, using portable sprinkler systems, hoses, or watering cans
- Uses **irrigation methods** to adjust the amount of water consumption and to prevent waste
- **Mixes and applies fertilizers and additives** onto grass, shrubs, and trees, using hand or automatic sprayers or spreaders. **NOTE:** Only certified professionals can prepare, load, apply, and handle pesticide(s).
- Shovels snow from walks, driveways, and parking lots, and spread salt in those areas
- Gathers and removes litter
- Maintains and repairs hardscaping such as fences, planters, fountains, and benches
- Monitors landscaping regularly for weeds, insects, and plant diseases
- **Operates** powered **equipment** such as mowers, tractors, snow blowers, electric clippers, and sod cutters **safely** and correctly
- Uses hand tools such as shovels, rakes, pruning saws, saws, hedge and brush trimmers, and axes safely and correctly
- Documents maintenance and monitoring as required

Learning Objectives

- Explain how building appearance and grounds maintenance affect overall experience and attitude toward a company or business
- Explain the proper use and techniques for lawn mowing, planting, weeding, pruning, and watering
- Describe equipment and any special solutions used for lawn mowing, planting, weeding, pruning, and watering
- Compare and contrast different fertilizer treatments for effectiveness, safety, and environmental impact
- Describe common plant diseases and insect infestations and what they look like
- Describe fertilization practices for turfgrass
- Explain proper mowing procedures

- Discuss water practices for turfgrass
- Describe other maintenance practices for turfgrass
- Identify turfgrass weeds and describe methods for managing weeds
- Discuss turfgrass diseases and management practices
- Identify turfgrass pests and pest management practices
- Discuss turfgrass management for golf courses
- Explain turfgrass management for athletic fields
- Describe the turfgrasses used for golf courses and athletic fields
- Explain why woody landscape plants are pruned
- Describe how to prune trees properly
- Describe various pruning techniques used with shrubs
- Explain how to rake and collect leaves to avoid back injuries
- Describe seasonal landscaping maintenance needs
- Describe how pests are controlled in landscaped areas
- Describe how to shovel snow by hand to avoid back injury
- Explain the use of salt and sand to prevent falls and slips
- Describe the effective temperature ranges of salt and sand to remove snow and ice from walkways
- Explain how chips, holes, and cracks are maintained at a facility in order to prevent slips and falls

Comments:

Unit 9: Plant Pathway Landscaping

Competency

10. Operate landscaping machinery safely

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Operates only equipment that he/she is trained on
- Verifies tool/equipment is available for use and in working order
- Verifies tool/equipment is current for preventative maintenance and/or calibration
- Verifies safety equipment and any Personal Protective Equipment (PPE) needed for tool/equipment use
- Inspects tool/equipment and work area for safety considerations
- Sets up and prepares tool/equipment for safe operation including lubrication and fluid level checks
- Wears the required Personal Protective Equipment (PPE) at all times as required for the operation of the tool/equipment
- Operates tool/equipment safely with guarding devices if applicable in the manner required for the job task
- Monitors tool/equipment for safe operation while operating
- Follows procedures for clean up and shut down after use
- Investigates and promptly reports abnormal tool/equipment conditions
- Shuts down and labels any tool/equipment that is not operating as expected, if applicable
- Stores tools

Learning Objectives

- List the various tools and equipment used at your worksite such as vehicles, cutting and non-cutting hand tools, sawing machines, diagnostic tools, etc.
- Outline applications of each tool and equipment
- Demonstrate the proper usage of a tool or piece of equipment
- Describe and demonstrate the safety requirements for each tool and equipment
- Discuss start up and shut down procedures for each tool/equipment you will operate
- Describe emergency shutdown procedures for the tool/equipment you will operate
- Describe the characteristics of a tool in need of maintenance
- Explain how to recognize and address malfunctions for the tool/equipment you will operate
- Describe how to recognize wear and tear on equipment components
- Describe regulations for the use of tools and equipment at your facility
- Explain Lock Out/Tag Out indications and procedures
- Compare various landscaping tools such as those used for mowing, pruning, shearing, weeding, tilling, etc.

Comments:

Unit 9: Plant Pathway Landscaping

Competency

11. Assist to maintain landscaping facility & equipment

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- while assisting a worksite professional

Performance Standard Criteria

Performance will be successful when the learner:

PREVENTATIVE MAINTENANCE (PM)

- Performs routine preventative maintenance (PM) according to facility schedule
- Communicates scheduled PM to management
- Assures that alternative equipment is available if needed
- Gathers supplies to perform PM
- Ensures that equipment is properly labeled and pulled from use
- Follows appropriate Lock Out/Tag Out procedures prior to performing PM
- Follows all safety requirements and wears appropriate Personal Protective Equipment (PPE) as required
- Assists worksite professional to follow PM schedule to calibrate and maintain equipment, tools and workstations
- Assists worksite professional to re-qualify equipment for operation
- Cleans up area after PM
- Documents preventative actions taken

REPAIR

- Assures that alternative equipment is available if needed
- Consults worksite professionals, maintenance manuals, and equipment history to diagnose possible equipment problems
- Gathers supplies to perform repair
- Ensures that equipment is properly labeled and pulled from use
- Follows appropriate Lock Out/Tag Out procedures prior to performing repair
- Follows all safety requirements and wears appropriate Personal Protective Equipment (PPE) as required
- Assists worksite professional to isolate system and component failure and to repair equipment problems
- Assists worksite professional to identify root cause of problem and develop corrective action plan
- Assists worksite professional to re-qualify equipment for operation
- Cleans up area after repair
- Documents repairs completed
- Evaluates repair work through follow up

Learning Objectives

EQUIPMENT

- Differentiate the types of tractors and transport equipment used in landscaping
- Identify the cutting and digging equipment used in landscaping projects
- Describe the tillage and soil-moving equipment used in landscaping
- Discuss the maintenance of large landscape equipment
- Describe different types of lubricants, their uses, storage, and disposal requirements
- Describe how diagrams schematics, equipment manuals, and equipment specifications to determine the schedule and process for PM
- Describe how diagrams schematics, equipment manuals, and equipment specifications to determine repair
- Describe the most common causes of tool/equipment failure in your facility
- Compare what equipment and equipment material are recyclable and what is not at your facility
- Evaluate methods for equipment maintenance and repair to avoid downtime
- Compare repairing on site to securing a technician from off-site
- List factors to consider in selecting a technician
- List the factors involved with preventive maintenance (time, cost) and emergency repair (downtime, cost)

Comments:

Unit 9: Plant Pathway Landscaping

Competency

12. Sharpen hand tools

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Checks blades regularly as required
- Reviews sharpening procedure and edge bevel angle required for hand tool
- Wears appropriate PPE
- Removes surface rust and dirt
- Sands any splintered tool handles
- Replaces or tightens broken or loose tool handles
- Uses an appropriate file or stone to sharpen nicked or dull tools
- Moves file away from and diagonally across the sharp edge to maintain the factory bevel
- Consults manual for sharpening tools with serrated edges
- For bow saws, uses a triangular file to sharpen both sides of each saw's teeth to the appropriate bevel
- Hones and maintains sharp edges of all cutting tools with a sharpening stone
- Periodically wipes tools with a light oil on metal parts for corrosion protection

Learning Objectives

- Discuss the types of digging and grading hand tools and their uses
- Explain the major types of pruning and cutting hand tools and their uses
- Discuss common shop hand tools used in horticulture
- List common hand tools in landscaping that require sharpening
- Discuss how to determine the correct sharpened bevel angle for a cutting tool
- Explain how serrated edges are sharpened
- Compare sharpening tools such as file and stones
- Discuss when to use which type of sharpening tool
- Demonstrate the process for sharpening tools

Comments: