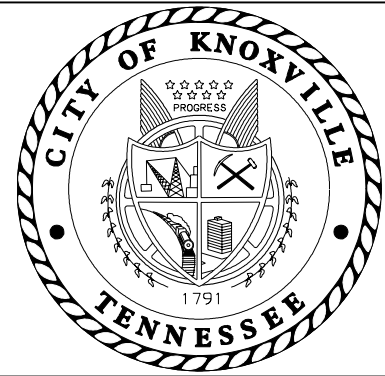
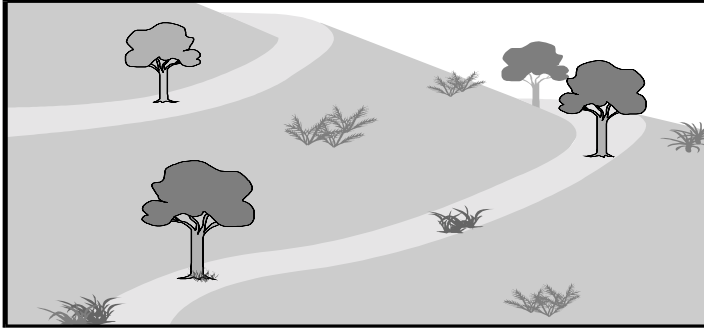


ACTIVITY: Trees, Shrubs and Vines

ES – 10



Targeted Constituents

● Significant Benefit		▸ Partial Benefit		○ Low or Unknown Benefit	
● Sediment	○ Heavy Metals	○ Floatable Materials	○ Oxygen Demanding Substances		
▸ Nutrients	○ Toxic Materials	○ Oil & Grease	○ Bacteria & Viruses	○ Construction Wastes	

Description

Planting trees, shrubs, vines and other ground covers will provide long-term stabilization of soil. The primary functions of permanent vegetation is to improve aesthetics, reduce erosion by slowing runoff velocities, enhance infiltration and transpiration, trap sediment and other particulates, protect soil from raindrop impact, and provide habitat for wildlife. This management practice is likely to create a significant reduction in sediment.

Suitable Applications

- Appropriate for site stabilization both during construction and after construction
- Open areas and slopes, such as parks or playgrounds
- Landscaping corridors and buffer areas
- Near buildings and structures, to provide shade and aesthetics

Approach

See AM-03, Preservation of Existing Vegetation, in order to plan removal of existing vegetation during construction projects. Existing vegetation should be preserved whenever possible, particularly native species which are aesthetically pleasing and provide wildlife habitats. In addition, Table AM-03-1 contains a brief description of tree location requirements for obtaining a grading permit, building permit, preliminary plan review or construction within right-of-way.

Prior to the planting of trees, consult Table AM-03-1 which contains the Knoxville Tree Protection Ordinance. The following list includes some of the major points in the ordinance:

- Section 14-28 - Definition of a tree
- Section 14-29 - Applies to every property except for single-family dwelling units
- Section 14-34 - Maximum limit on the destruction or removal of trees
- Section 14-35 - Protection of trees in historical areas or if botanically important
- Section 14-36 - Minimum rate of tree planting
- Section 14-37 - Maintain and replace planted trees up to 18 months later

Table ES-10-1 contains the suggested list of tree species for planting within the city, as recommended by the Knoxville Tree Board. This list contains the most common types of trees planted in this area; other trees may be approved by the city horticulturist.

Selecting the right type of vegetation to be planted depends on many factors such as sunlight or shade, water requirements, allowable room, soil pH, amount of soil available, tolerance to automobile emissions or street deicing salts, fertilizer and other maintenance requirements, preference for deciduous or evergreen trees, and aesthetic considerations. For instance, some trees may grow considerably and create problems for overhead utilities or underground pipes.

Trees in particular are essential for improving the urban environment. They provide shade and protection from the elements for humans and for wildlife. Trees greatly improve ground temperatures, air temperatures, the movement of air, humidity, and the transmission of urban noise.

This BMP contains general guidance for selecting and for planting the various types of vegetation. Extensive guidance is available from the UT Agricultural Extension Office on the 5th floor of the City County Building (and from the website located at <http://www.utextension.utk.edu/knox/>). There are many publications available in paper copy and at the website for topics such as native trees, urban trees, small trees, trees for poorly drained soils, fruit trees, etc.

There are also many different species of vines and ground covers from which to choose, but care must be taken in their selection. It is essential to select planting materials suited to both the intended use and specific site characteristics. Additional information can be obtained from local nurserymen, landscape architects, and the UT Agricultural Extension Office.

For construction projects, planting should be performed as soon as final grading is completed, unless there is a specific planting time recommended for a particular plant. In areas where no activity is performed, vegetation may be maintained or established along landscaped corridors and buffer zones to act as filter strips.

Permanent planting during the construction stage of projects will require careful coordination between the local agency inspectors, project managers, construction managers, and landscape contractor. Protocols for site access and construction staging are the responsibility of the site owner or his designated site manager.

Trees and Shrubs

Selection: Trees and shrubs, when properly selected, are low-maintenance plantings that stabilize adjacent soils, moderate the adjacent air and ground temperatures, filter air pollutants, and serve as a barrier to wind. Some desirable characteristics to consider in selecting species for trees and shrubs include vigor, potential size and shape, tolerance to man-made environment, adaptability, climate, wildlife habitat, etc. Sites for new plantings should be evaluated for prior land use, potential for soil contamination, adverse soil conditions such as poor drainage or acidity, exposure to wind, temperature extremes, location of utilities or pavement, and proximity to traffic,

Transplanting: In general, autumn is the preferred time for transplanting small trees. Evergreen trees can also be transplanted in spring. Seedlings (although not usually specified for an urban setting) can generally be planted in the early spring or early autumn to take advantage of moderate temperatures. Proper transplanting for a tree or shrub includes the conservation of as much of the root system as possible. Soil

adhering to the roots should be damp when the tree is dug, and kept moist until replanting. The soil ball should be 12 inches in diameter for each inch of diameter of the trunk. Most transplanted trees and shrubs will need artificial support to prevent excessive swaying. Soil around the tree should be thoroughly watered after the tree is set in place, and then watered deeply once a week during summer and dry periods. Mulching at the base of a tree or shrub is helpful in preventing roots from drying out.

Vines and Ground Covers

Selection: Vines and ground covers can quickly spread and stabilize a slope, preventing erosion from occurring. Vine and ground covers come in many types, colors, and growth habits. Some vines and ground covers are suitable only as part of a small well-maintained landscape area, while others can stabilize large areas with little maintenance. Flowers do not provide erosion control but may be planted to add color and beauty. Vines and ground covers provide food and habitat for many types of wildlife.

Site Preparation: Ground covers are plants that naturally grow very close together, which may create competition for space, nutrients and water. Soil for ground covers should be well prepared. The entire area should be spaded, disked, or rototilled to a depth of 6 inches. Approximately 2 to 3 inches of organic material, such as good topsoil or peat, should be spread over the entire area.

General Planting Guidelines

The following general steps will help ensure good plant growth:

1. Position the plantings to follow the contours of the land, taking into account drainage patterns and the potential for heavy winds.
2. Dig the holes approximately 1/3 larger than the plant root ball.
3. Use good topsoil or soil mixture with a lot of organic matter. Fill hole approximately 1/4 full and gently shake plants to settle soil among roots.
4. Leave a saucer-shaped depression around the plant to hold water. Use mulch to protect the soil from erosion and to retain soil moisture.
5. Water thoroughly and regularly. Stake and support trees or other vegetation as necessary until root systems are capable of firmly infiltrating the subgrade.

Figures ES-10-1 and ES-10-2 show a typical details for planting a shrub or vine and also for planting a tree (balled-and-burlapped). Plants grown in containers are handled in a similar manner. Acclimate plants to outdoor conditions prior to transplanting.

The importance of properly supporting and staking a tree or shrub cannot be overemphasized. Although some trees may take root after a few months, other trees may need to be supported for a couple years. Therefore use proper materials and methods that will both remain functional and look attractive.

Maintenance

- Water trees regularly once a week, particularly during summer months or dry periods. Young trees should receive an inch of water each week for the first two years after planting. Fertilizing may be required for some types of trees and shrubs, in late autumn or early spring. Mulch applied to the base of a tree will help to reduce weeds and retain soil moisture.

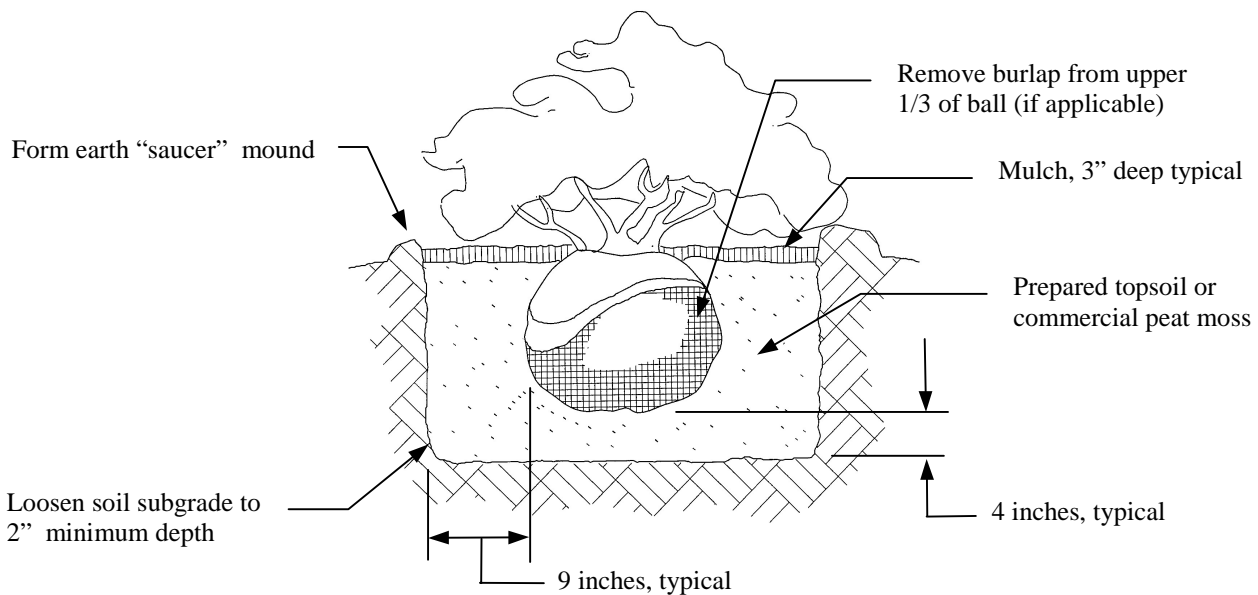
- Proper pruning, watering, and application of fertilizer is necessary to maintain healthy and vigorous shrubs. A heavy layer of mulch applied around the shrubs reduces weeds and increases the retention of soil moisture.
- Vines and ground covers will require pruning and watering during the summer months. Vines and ground covers may not provide sufficient erosion control during winter months.
- Trees and shrubs with thin bark may require additional protection from insects and small animals. Spraying may be necessary for some types of trees and shrubs. Repair wounds and abrasions by either tree paint or by removing limbs. Consult an arborist or horticulturist as necessary for the care of trees or shrubs.

Limitations

- If the site is susceptible to erosion, additional control measures may be necessary during the establishment of vegetation. Caution should be exercised in selecting non-native vegetation because of potential impacts to native vegetation on adjacent lands. Non-native species may quickly spread and compete with originally undisturbed vegetation.
- Overapplication of fertilizers, herbicides and pesticides may create stormwater pollution. Follow the guidelines in AM-13 (Pesticides, Herbicides, and Fertilizer Use) to prevent misuse of these materials. Follow package instructions carefully.
- Construction activities are likely to injure or kill trees unless adequate protective measures are taken. Direct contact by equipment is the most obvious problem, but damage is also caused by root stress from filling, excavation, or compacting soil near trees. Follow guidelines in AM-03, Preservation of Existing Vegetation.

References

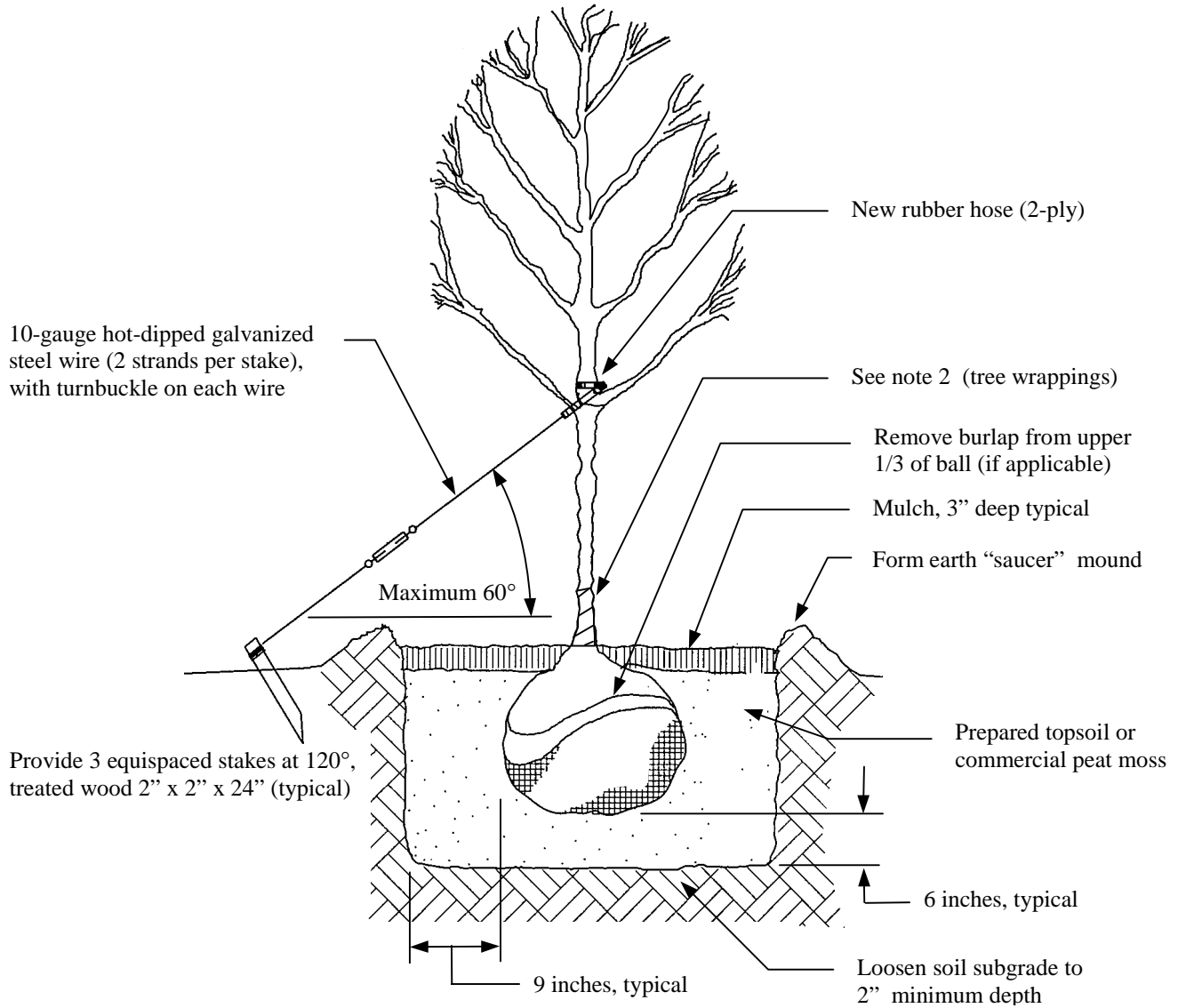
8, 30, 33, 34, 35, 43, 63, 114, 125, 135, 136, 141, 144
 (see BMP Manual Chapter 10 for list)



**Figure ES-10-1
 Typical Planting Detail – Shrub or Vine**

Notes:

1. Balled-and-burlapped (B&B) stock from nurseries shall meet the standards of ANSI Z60.1, American Standard for Nursery Stock.
2. Young deciduous trees may be wrapped from the base of the tree to the height of the lowest branches. Wrap shall consist of 4-inch wide rolls of bituminous impregnated tape which is specially manufactured to resist insects.
3. Alternative materials for staking trees include common garden hose, sliced open and fitted around trunk, and galvanized wire, 12-gauge or thicker.



**Figure ES-10-2
Typical Planting Detail – Tree**