807 LANDSCAPING ESTABLISHMENT

807-1 Description

Landscaping establishment is all work necessary to care for the plants, including operation of the irrigation system.

The specifications state "all other contract work" must be completed before the establishment period will begin. There may be occasion when establishment may begin before all other work is completed. If such items of work as placing delineators, minor paving or other work that would not be likely to encroach on landscaped areas are being done, the establishment period could begin.

The completion of planting in any given area may precede the start of landscaping establishment by considerable time. When landscaping establishment is started, the area should be inspected to make sure that all plants are in place and healthy.

807-3 Construction Requirements

Although planting stock has been properly selected, delivered to the planting site in a vigorous, thrifty condition, and planted in accordance with good horticultural practices, survival and normal growth depend, to a large degree, upon appropriate care during the establishment period.

Ideally, the establishment period should encompass the time required by the planting to become acclimated to the growing conditions at the planting site. The Project Specifications should clearly indicate the length of the establishment period, which may vary from one area of the state to another, depending on the local conditions, climate, and the type of plant materials utilized.

A well-rounded program of horticultural practices used during the establishment period may include watering, adjusting emitter locations, fertilizing, pruning, insect, disease, and weed control, and replacement of unsatisfactory plants in accordance with the Specifications.

The following inspection guidelines include critical items that should be observed and documented every 30 days during establishment:

- Plants must be kept in proper position as appropriate for the species. Plants may require repositioning as a result of settlement, wind action, vandalism, etc. Care should be exercised in straightening to minimize disturbance to the root mass and should include replacing topsoil as required.
- Stakes should be firmly embedded; redriving may be necessary. Stakes should not be allowed to rub the tree.
- Guy wires must be adjusted to allow some movement. Adjustments may be necessary to keep the tree straight (not too tight) to prevent a large amount of swaying and prevent damage by rubbing.
- Protective wrapping on trunks or stems should be secure.
- Vehicular, fire, or damage due to vandalism should be noted and corrective action taken.
- Note damage caused by animals (i.e., deer, rodents) and seek advice from Natural Resources Section on control measures. Damaged material should be replaced as necessary.
- Report infestations of insects and disease to the horticulturist or other appropriate professional for recommendations on corrective action.
- Inspect for broken branches or sucker growth and have them removed by pruning.
- Where discoloration or foliage occurs, especially in evergreen material, advice on corrective measures

should be sought.

- Dead and severely damaged plants should be removed immediately and replaced within 21 calendar days.
- Inspect for settlement of soil or soil mix and replace to required grade, repositioning the plant if necessary.
- Inspect berms and water basins (constructed for the purpose of retaining water) to ensure that they are functioning properly. Repair and rebuild as necessary.
- See that project areas are weeded, mowed, or sprayed as specified. Use the Herbicide and Pesticide Application Log to record application details and reference in the Inspector's Daily Diary.
- If planting projects require the use of fertilizers, specifications should be followed.
- Qualified personnel, utilizing the best horticultural practices and tools, should perform pruning at the appropriate time.
- A pre-final inspection should occur approximately one month prior to the end of the landscaping establishment period. The Contractor should correct any deficiencies within 10 days.

A Final inspection at the end of the landscaping establishment period will be made to determine if all plants are growing in a healthy manner. There should be no problems at this time if the plants were well maintained during the course of the establishment period. The Resident Engineer or a representative, a Landscape Architect, a maintenance person, the Inspector and Contractor should attend this final walk through.

807-3.03 Irrigation System Establishment

The irrigation system establishment testing that is done within one week prior to the landscaping establishment inspection involves walking the project and checking the pressure regulating valves with a pressure gauge. The pressure gauge at the backflow prevention unit should be read and recorded with the other readings. Changes in pressure should be investigated. The backflow unit should be tested as required by a qualified representative. Inspect filters and flush end caps, if necessary. The establishment period for the irrigation system coincides with the landscaping establishment.

The monthly inspections of the landscaping establishment and the irrigation system establishment are done simultaneously. During the regular monthly inspections, be aware of eroded areas or unusual wet spots. Check the wetting pattern around each plant. Current practice is to install distribution tube ends at the designated location shown on the plans during Phase 1, but capped (tied) off. During the landscaping establishment period, these distribution tubes are untied and put into use. After the weeding crew is through, expect numerous cuts, cracks and dislodged emitter hoses.

Sprinkler irrigation systems most often fail when mowers hit the raised head. The damage is usually so severe that replacement is required. Check all heads for water delivery, spray arc, and droplet size. Deviations from their normal performance will require servicing of the sprinkler head. Has the head been driven over? Is it sunk into the ground? Check the flow path through the nozzle. Is it obstructed? Check the pressure. Is it operating at the correct pounds per square inch? Look for bent or broken parts. Repair or replace as necessary. Is the watering pattern hitting road surfaces or walks? Make the proper adjustments.

The Contractor is also required to conduct a training and orientation session for State personnel covering the operation, adjustment, and maintenance of the irrigation system. The Resident Engineer shall arrange to have the maintenance, or local government personnel who will be involved with the irrigation system attend this orientation session. The as-built plans shall be available so they can be reviewed and all features explained. One copy of the as-built plans shall be made available to the maintenance personnel when completed, along with parts lists and service manuals for all equipment.

GLOSSARY OF LANDSCAPE TERMINOLOGY

Acid/Alkaline Soil
pH is a measure of hydrogen ions in the soil. Various plants respond differently to pH variations. The pH scale ranges from 0-14. pH of 7 means a neutral soil. pH below 7 is acidic soil. pH above 7 is alkaline soil or basic soil. Generally, plants are selected for a particular area without a need to change pH of soil. When a pH change is desired, a soil test is taken, analyzed and the pH is changed appropriately upon recommendations from a landscape architect, soil scientist, landscape specialist or horticulturist.

Balled and Burlaped (B&B)
Plants are prepared for transplanting by digging them so that the soils immediately around the roots remain undisturbed. The ball of earth and root is then bound in burlap or similar mesh fabrics. An acceptable B&B root ball should contain 90 percent (visual estimate of volume) of the earth material held together with root system when removed from the burlap.

Bare Root (BR)
Most deciduous plants are dug when dormant. The roots are cleared, pruned and usually stored in moist material. Deciduous bare root plant materials must be pruned or thinned to about 1/3 of its limb area to balance the loss of root area (due to digging and root pruning). The shock of transplanting can be compensated by thinning, not just tip removal, using care not to change configuration of the plant. Roots must remain moist and not allowed to dry out.

Botanical Name
The botanical name is the plant name, written in Latin, that is used universally. The common name is the name used in a local area, and is not necessarily the same name used in other areas. The correct botanical name is usually found in "Standardized Plant Names", available from the District Landscape Specialist. The botanical name usually consists of two names, genus and species, but may include additional names.

GENUS	1st word
SPECIES	2nd word
VARIETY	3rd word (if appropriate)
FORM	4th word (if appropriate)

Example - Juniperus chinensis “Pfitrzerana Glauca”

Branch
An offshoot from a trunk or main stem. It could be also called a bough or a portion of a main stem.

Caliper
The diameter of the trunk of a deciduous tree is measured 6 inches (150 mm) above ground level, up to 4 inches (100 mm) caliper size. If greater caliper than 4 inches (100 mm), it is measured at 12 inches (300 mm) above ground level.

Cambium Layer
The layer of actively dividing cells between the outer bark and the inner wood of woody plants.

Candle
The new growth at the terminal end of a twig on coniferous evergreens.

Cane
A primary stem which starts from the base of a shrub or at a point not higher than 1/4 the height of the plant. A cane generally only refers to growth on particular plant material, such as roses, etc.

Conifer
Conifers are plants that bear seeds in a cone, usually evergreen, with needles or scales in lieu of broad leaves. Examples of conifers include pine, spruce, fir, and giant arborvitae.

Container Grown
Plants grown and delivered to the job site in cans or other containers. The containers are manufactured in nominal sizes with a capacity of about 3/4 stated size (i.e., gallon containers have about 3 quart capacity). Container grown plant material can be planted anytime of the year and should not be allowed to dry out while in the container. Usually, plants grown in containers are in a very free draining soil mixture made up of nutrient free components. Container grown plants have a tendency to dry out and decline in vigor when not under the care of the nurseryman. Container grown material should have a firm root ball that will hold 90% (visual estimate of volume) of the ball material when removed from the container. Good container grown materials will hold virtually all of the soil in the root zone when a good growing medium is used. Some root growth should be visible in the outer edges of the ball. Excessive roots at the bottom of the ball indicate lack of proper root pruning at the time of canning. Excessive roots at the side or bottom of the container could indicate a root bound condition.

Deciduous
Plants that shed all their leaves at the end of the growing season and remain leafless during the winter or dormant period.

Evergreen
Plants that maintain green foliage throughout the year. Some leaves may be shed, however, the terminal foliage will remain on the plant.

Fertilizer
Any natural or artificial material added to the soil or directly to the leaves to supply one or more of the plant nutrients. Generally, a complete fertilizer refers to a fertilizer that contains Nitrogen, Phosphorous, and Potassium (NPK). Indications on a container are usually numerical 10-8-6 or 20-10-5, etc. These numbers indicate the percentage of actual nutrient element available i.e., 10% Nitrogen, 8% Phosphorous and 6% Potassium (10-8-6). Other minor nutrients are sometimes added to NP&K such as Magnesium, Manganese, Boron, Iron, Zinc, Calcium, Sulfur, etc. The nitrogen in a fertilizer can be readily available or slow release (controlled availability) depending upon how water soluble it is. The slow release nitrogen (high percentage of water insoluble nitrogen) will allow the nitrogen to be available to plants over a long period of time. The readily available 100% water soluble fertilizer can leach away with heavy rains or damage the plant by the high concentrations of nutrient. Additional nitrogen and other elements are often necessary for plant growth when mulches are used. The decaying activity of the mulch ties up the plant nutrients and is thus unavailable for plant growth.

Form
A plant subdivision of botanical variety, usually the fourth word in the botanical name. It distinguishes some minor characteristic such as "dwarf", "columnar", or "white flower".

Friable
A granular soil, easily crumbled by cultivation.

Genus
A plant family is divided into groups of one or more related plants called genera (plural of genus). The first word in a plant's botanical name is the name of the genus to which the plant belongs; for example, Pinus contorta, Pinus ponderosa, and Pinus densiflora.

Granite Mulch:
Larger sized hard grained granite. Able to hold larger gradation and less weathered than decomposed granite. For use on roadway slopes for decorating plating material, where decomposed granite would erode off the slopes.

Hardy (Hardiness)
Hardiness usually refers to a plants tolerance to cold temperatures, however, it could be tolerance to heat, drought, abundance of moisture, etc. as is relates to survival.

Heeling In
A method of temporary storage by covering plant roots with sawdust, mulch or a mixture of other materials capable of good moisture retention, to keep the roots from drying out.

Herbicide A herbicide is a pesticide chemically formulated to control or destroy weeds. Herbicides are broken down into main groups:

- Post-Emergence Herbicide is a plant killing material that acts on the active growing surface of a plant after the plant has emerged from the soil. It is usually most effective during the rapid growth of the plant.
- Pre-Emergence Herbicide is a plant killing herbicide that acts on the seeds, bulbs, tubers, stolens, etc., as they sprout (before-emergence).

Humus
Decomposed or partly decomposed organic matter in the soil. Humus is generally found on the upper surfaces of the soil. Humus frequently imparts a dark color to the soil. It is beneficial because of its nutrient and moisture storage capacity.

Horticultural Variety (Cultivar)
A plant "variety" or "cultivar" originating as a result of controlled fertilization, selective breeding of progeny, or hybridization. Such plants are given a "variety" name which is added to the rest of the plant name and usually set off by single quotation marks or all capitals i.e., Gleditsia triacanthos inermis 'MORAINE'.

Inoculated Seed
Seeds of the legume family (i.e., clover) that have been treated with nitrogen-fixing bacteria to enable them to make use of nitrogen from the soil atmosphere.

Leader
The main stem or trunk that forms the apex of a tree. If the leader is missing, another leader will try to establish itself. Often several leaders take off and a multi-set tree results from the point.

Liners
Liners are small plants such as seedlings, plants from cuttings; unfinished nursery stock or whips usually under 3 feet (1 meter) in height. These plants are usually lined out in nursery rows or planted using reforestation methods.

Mulch
Mulch is any loose material placed over soil, usually to retain moisture, reduce or prevent weed growth, insulate soil or improve the general appearance of the plant bed. Additional fertilizer is usually necessary in order to offset the loss of plant nutrients used by the microorganisms that break down the mulch.

Perlite
Lightweight, granular material made out of an expanded volcanic material and used in a growing medium or soil amendment. This material allows for a more aerated growing medium, with good drainage.

Pesticide
A pesticide is any substance or mixture or substances intended to control insects, rodents, fungi, weeds or other forms of plants or animal life that are considered to be pests.

Pinching Back (Heading Back)
Pinching back or heading back is a process of pruning a branch back to a bud or side branch. This process encourages the plant to branch out, resulting in a bushier plant.

Plant Classification
Plants are universally known by their Latinized botanical name. Generally only two names are used, (Genus and Species). However, varieties or cultivars may break down the species into small subgroups. Pinus mugho 'mugho' is an example of a varietal breakdown of Pinus (genera), mugho (species), mugho (variety).

Puddling
Puddling is a process used to settle the soil with water to eliminate air pockets during the planting process.

Root Ball
Ball of earth encompassing the roots of a plant. Generally, the root ball will have a good portion made up of root networks. A "manufactured root ball" is one where the root system is not adequate to hold the soil in place. Manufactured root balls should not be accepted, since the root system is not developed sufficiently.

Root Bound (Pot Bound)
The condition of a potted or container plant whose roots have become densely matted and most often encircle the outer edges of the container. Generally, this condition is a result of holding the plant in the container for too long a period. Root bound plants should be rejected.

Root Collar (Plant Crown)
Root Collar is the line of junction between the root of the plant and its stem, also known as the plant crown.

Root Pruning
Cutting back and trimming the outer edges of the roots with a sharp tool to encourage a better, more fibrous root system. This is done periodically at the nursery. It should not be done at the project site before planting.

Species
A genus may include one or a great number of species. Each species is a particular kind of plant (i.e., Pinus ponderosa, Pinus contorta, Pinus mugho). The second word in a plant's botanical name designates the species, distinguishing it from other plants in the same genus (plants with the same first name). Species in the same genera share many common features, but differ in one or more characteristics.

Soil Mixture
A mixture of growing medium such as sand, sawdust, perlite, vermiculite, peat, and bark dust which is used to grow plant materials. The soil mixture usually contains two or more items and may be combined with the native topsoil.

Stem
The main upward growing axis of a plant. The main stalk or trunk of a tree, shrub or other plant. The main body of the above ground part of a plant.

Sucker
Any unwanted shoot. A side shoot from the roots of a plant. A side growth arising from an auxiliary bud.

Systemic
A substance (hormone, insecticide, herbicide, etc.) that, when absorbed and translocated makes the plant poisonous to certain pests and diseases. In the case of an herbicide, it can move into the root system and kill the root system.

Thinning
Thinning is the removal of some of the plants in a row or area, or trees in a stand, to open up or avoid crowding of plant or material. Thinning also involves the removal of branches, buds, flowers or fruits for superior results with a single plant.

Tolerant
A plant that is capable of withstanding unfavorable growing conditions (i.e., cold, heat, moisture, drought, etc.).

Tube Container
A tube container is a deep narrow container either single or in blocks used to produce deep root systems or unfinished nursery stock. A deep root system has advantages for establishment of plants where soil moisture is limited.

Vermiculite
A lightweight expanded mica product often used as a rooting medium for plants or as a soil amendment.

Watering In (puddling)
The procedure of watering the backfill and planting hole during the planting procedure. The purpose is to eliminate air pockets and voids around the roots, not to irrigate.

Whip
A young tree that has not started to branch.

LANDSCAPE REFERENCE LIBRARY

It is recommended that each office administering roadside planting, roadside parks, view point development, and Rest Area contracts, obtain and maintain a library of the following books and reference materials before the Contractor commences work.

Required Category

These books should be readily available to all landscape Inspectors and Resident Engineers:

- Any literature referred to in the Special Provisions and Standard Specifications.
- *American Standards for Nursery Stock* - American Association of Nurserymen, Inc.
- *Inspection Guide for Landscape Planting* - AASHTO Subcommittee on Roadside Development.

Recommended Category

Recommended reading and reference material for all personnel involved in landscaping, roadside planting, and rest area projects:

- *A Technical Glossary of Horticultural and Landscape Terminology* - Horticulture Research Institute.
- *Common Weeds of the United States* - United States Department of Agriculture. Dover.
- *Ground Cover Plants* - Donald Wyman.
- *Hortus Second* - Bailey/Hortus Third - Staff of L.H. Bailey Hortorium.
- *Manual on Cultivate Trees and Shrubs* - A. Rehder.
- *Shrubs and Vines for American Gardens* - Donald Wyman.
- *Standardized Plant Names* - American Joint Committee on Horticultural Nomenclature.
- *Sunset Western Garden Book* - Lane Books.
- *Trees for American Gardens* - Donald Wyman.
- *Plants for Dry Climates* - Duffield & Jones.
- *Landscaping for the Southwest Desert* - James D. Claridge.