

# Nebraska Statewide Arboretum & Nebraska Forest Service

## SPECIFICATIONS FOR PARTNERSHIP PROJECTS

### Bidding ♦ Design ♦ Tree Removal ♦ Purchasing ♦ Planting ♦ Initial Care

The Nebraska Statewide Arboretum, Inc. and Nebraska Forest Service (hereafter referred to as NSA/NFS) have developed the following specifications and guidelines in order to help grant funded and other partnership projects achieve success and establish healthy landscapes.

#### I. BIDDING OF PROJECTS

- All projects are expected to comply with local bidding ordinances and requirements (ordinances or requirements of the governmental unit or sponsoring authority that is responsible for the project). However, it is not the intent of the NSA/NFS that the lowest bid be automatically accepted, but rather that the lowest **responsible** bid is accepted. Bids shall be carefully evaluated considering nursery standards, project specifications and plant material requirements. If it is a requirement of the local governmental unit or sponsoring authority to accept the lowest bid only, then NSA/NFS shall be allowed to review all bids to determine that the lowest bid is indeed responsible and acceptable. If such a bid is not acceptable, the bidding process will be redone.
- If there are no local bidding ordinances or requirements governing the project, then the NSA/NFS bidding specifications shall govern the bidding process.
- Projects with a projected total cost of over \$10,000.00 shall show evidence of contacting more than one contractor to compare costs of materials and services. The NSA/NFS may waive this requirement upon written request by the project coordinator, citing reasons for a waiver request.
- Bids shall contain itemized plant material information including species, size (trees by trunk caliper), quantity and cost. Plant installation, plant delivery, mulch, or any other materials or labor shall be itemized and listed separately from plant material cost.
- Nurseries shall be licensed by the Nebraska Department of Agriculture. It is suggested that all plant material be guaranteed for at least one year from the planting date. No plant substitutions shall be allowed without the permission and approval of NSA/NFS. It is allowable for plant material to be obtained from more than one plant contractor.
- The grant coordinator reserves the right to refuse plant material that does not meet the specifications in this document or looks to be of poor quality.
- The *NSA/NFS Specifications for Partnership Projects* (this document) shall be included in all bid documents and all contractors shall comply with it.

#### II. PROJECT DESIGN AND IMPLEMENTATION

**Note:** *Project implementation should not begin until written notification of design approval is received.*

Developing good landscape design plans is very important to the success of partnership projects. All projects are required to be implemented from NSA/NFS approved design plans. In general, design plans should emphasize sustainable landscape practices including wise species selection and placement that help reduce the need for costly inputs of supplemental water, fertilizers, pesticides and difficult maintenance practices. NSA/NFS will review design plans and offer suggestions for changes if needed. Design plans must be legible and drawn at an appropriate and accurate scale and should include:

- a scale and north arrow
- major existing site features (including structures and roadways)
- existing trees and important landscape plants
- proposed new plantings with plant names clearly identified and hardscape improvements (if any)

Design service fees are typically an allowable use of grant funds. To be eligible for reimbursement, such fees must be paid to professional landscape designers or landscape architects. If needed, please contact the NSA, Inc. office for a list of design professionals in your area. Also, NSA, Inc. has design professionals on staff that can provide creative design solutions if so desired.

## Plant Species Diversity

In an effort to increase visual and genetic diversity in the landscape, the NSA/NFS encourages the use of a greater variety of plants. The *Plant Diversity Initiative* document was developed as a guide to provide information about sustainable design and diverse plant species selection. It contains a short list of plants that are problematic or overused in some Nebraska landscapes. Some of the plants listed should not be used; others may have limited use. Please refer to that document for specific information.

## III. TREE REMOVAL

Tree removals (when approved as a part of the project) shall be done either by qualified employees of the local government or by qualified (Nebraska Arborist Association or International Society of Arboriculture certified) commercial arborists. Commercial arborists shall provide proof of current liability insurance including workers compensation. Commercial arborists shall also meet all requirements provided for by local ordinance.

## IV. PLANTING PRACTICES

Landscape planting is most successful when good stock and proper planting methods are used. The following are specifications and guidelines required by the NSA/NFS for purchasing and planting the most common types of landscape plant material (trees, shrubs and herbaceous plants).

**Note: All projects and associated contractors shall comply with these specifications, which are considered to be a part of the agreement between NSA/NFS and all partnership program projects. NSA reserves the right to request a refund of any grant funds spent on inferior plant material or any plants improperly planted.**

### A. Plant Stock Specifications:

Trees and all associated plant material purchased and installed as a part of any funded project must be of high quality and purchased from nurseries licensed to do business in Nebraska.

1. **All plant material must have high-quality root systems!** Such root systems should be fibrous (containing numerous small feeder roots) and be free from significant root circling and girdling.
2. Preference will be given to bare-root trees and trees grown in root control containers that prevent stem girdling roots, excessive circling and pot-bound conditions. Such containers include fabric bags as well as plastic containers designed specifically for optimal root development (i.e. RPM containers, Rootmaker™ pots, Readyroot™ containers, slit pots, etc.).
3. Trees grown in traditional, smooth-sided plastic containers are strongly discouraged. However, trees placed in a container (containerized) for a short period of time (typically less than 6 months) for aid in sale and handling are allowed as long as the root systems remain viable.
4. Balled and burlapped (B&B) and spade-dug trees are allowed if high quality can be assured and costs are reasonable. For B&B stock, at least 18" of soil ball is required for each 1" caliper of trunk. All baskets and burlap must be removed completely prior to planting or removed to a depth of at least 12" in the hole after planting. For spade dug trees, at least 24" of spade width is required for each 1" of trunk caliper.

### B. Plant Quality Standards

Minimum quality specifications for all nursery grown plants shall be the specifications contained in *American Standard for Nursery Stock*, specifically ANSI Z60.1, as adopted by the American Association of Nurserymen. A web copy of ANSI Z60.1 can be found at the website noted at the end of this specs document under heading "Resources". All plants shall be free of diseases, noxious weeds and damaging insects. All plants shall be subject to the laws and regulations of the State of Nebraska and shall be identified by plant names approved by NSA/NFS. Projects are strongly encouraged to investigate the source of nursery stock. Stock grown in Nebraska may be best adapted to Nebraska sites. Species selected for planting shall be adaptable to Nebraska, and the NSA/NFS reserves the right to approve species selections and sizes. The NSA/NFS highly recommends that trees originate from nurseries in the north central part of the United States as indicated by Figure 1.

All plants shall be packed and shipped from the supplier in a manner that protects the plant against drying, freezing, breaking or other injury. Bare-root plants shall be packed in



moist packing material and bundled to ensure against heat or mold damage. Plants shall be protected against the elements while in transit and shall be thoroughly inspected before acceptance. The project coordinator or individual(s) responsible for ordering plant material shall contact the nursery supplying the order to ensure compliance with these standards.

### C. Plant Size Specifications

All plants installed in projects shall follow required specifications as detailed in the *American Standard for Nursery Stock* ANSI Z60.1, including height, caliper and volume measurements as applicable. A web copy of ANSI Z60.1 can be found at the website noted at the end of this specs document under heading "Resources". Plant materials not meeting these specifications shall be rejected prior to installation.

In general, smaller caliper trees will establish in the landscape more quickly. Smaller plants will often catch up to and exceed the size of larger plants that were planted at the same time. Plant sizes at the time of planting shall conform to the following size ranges. These ranges apply to all plants whether bare-root, containerized, balled and burlapped or spade dug. NOTE: Any plant larger than the size range listed will require prior approval.

- ◆ **Deciduous Trees:** ½" to 1 1/2" trunk caliper (measured at 12 inches above the ground). **Evergreen Trees:** 3 to 6 feet tall. Trees shall be well branched. **Spade Dug Trees:** Pre-approval is required for use of spade dug trees. If approved, the minimum spade size shall be 24" for each one inch trunk caliper (measured at 12 inches above ground).
- ◆ **Shrubs:** 12" to 24" inch height and/or width, depending on natural growth habit.
- ◆ **Herbaceous Perennials and Grasses:** Plant size shall vary depending on species, but plants shall be well-rooted and of an appropriate size to establish successfully in the landscape.

### D. Planting Seasons

Spring and fall are the best times to plant most landscape plants in Nebraska. Planting can occur into winter if the ground is workable and plants are properly protected. **Planting should not occur and will not be approved without permission for any time during July and August.** Weather conditions can vary greatly from day-to-day and from year-to-year across Nebraska. Consequently those coordinating planting projects shall be cognizant of recent weather patterns and be prepared to take the steps necessary to ensure successful transplanting. It is especially important that irrigation be available if the post-planting period is dry. Dry periods are common throughout the growing season in Nebraska, especially during mid to late summer. Planting during extremely wet periods can also be problematic if the planting area cannot be prepared properly, or if water stands around the root zone of transplanted plants for extended periods of time.

### E. Landscape Planting Practices

**Pavement Cut-out Plantings:** Trees planted in pavement cut-outs in downtowns, parking lots and medians are exposed to harsh and stressful growing conditions. They are subject to construction soils, compaction, temperature extremes, decreased horizontal root space and decreased gas exchange and moisture to roots. It has been the experience of the NSA/NFS that these plantings have greatly reduced life spans. Any plantings in sites such as those mentioned will require approval. Approval will be based on recommendations for minimum open soil space and will require the use of species that have been shown to be more tolerant of these areas. An engineering plan may be required before approval of any planting in these areas. Planting strips are less stressful than individual cut-outs because they create a larger open space. At least 3 feet of good soil should be added to planting areas after construction and before planting.

**Preparing the Planting Site:** Before any planting begins confirm that the soil is suitable for growing the selected plants. For questionable soils, a soil test would be helpful. If the soil is heavy clay or very compacted, the soil should also be tested to ensure that there is adequate drainage. If drainage is poor and the area seasonally wet, wet-tolerant species such as maple, sycamore, bald cypress and swamp white oak should be considered.

For most soils, amendments to the planting area are not necessary. New construction sites shall have at least 8 inches of top soil present or applied after construction. If soils are heavy clay or very compacted, consider replacing the soil with a good loam soil and/or incorporating composted organic materials to a depth of several inches.

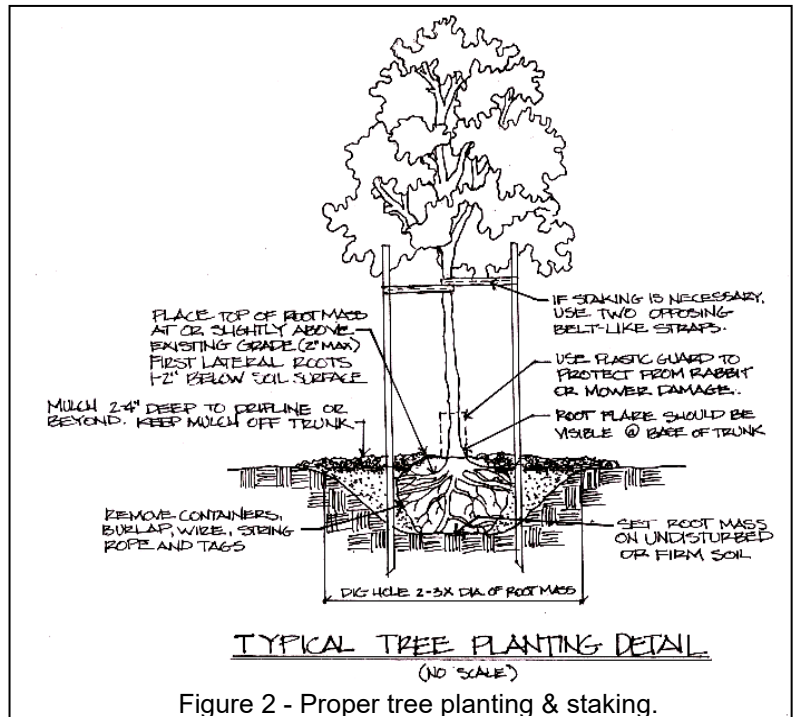
**Tree and Shrub Planting:** Protect landscape plants when transplanting them by holding and lifting them by the container, basket or ball, not by the trunk. Keep the roots moist but not saturated. If you are not able to plant your tree or shrub immediately after purchase, place them in a cool, shaded area.

**Note:** Locate all underground utilities before digging.

Planting depth is of critical importance in the long term health and vigor of a tree. All trees shall be planted at a depth such that the uppermost structural roots are located within the top two inches of the soil surface (see figure 2 – proper tree planting). The root flare (or trunk flare) is the area between the vertical transition of the tree stem and the structural roots, and should be visible above grade upon planting. While root flare is somewhat difficult to detect in some young trees, the objective is to ensure that the uppermost two or more structural roots of the young tree are located near the soil surface. More on the topic of tree planting depth can be found under “Resources”.

If planting balled and burlapped stock, the wire basket shall be cut and basket completely removed before planting. Remove burlap and all twine or similar material. Use care in handling the root ball. Part of the burlap can be left on to facilitate lifting the plant into the hole. After the plant is in the hole, the burlap should be cut away to the bottom of the planting hole, or as deep as possible. Shipping labels, wire, tags, wrapping and staking material shall be removed from the trunk and branches.

For container-grown or containerized plants, examine the roots after removing the pot. Plants shall not be pot bound. Plants with masses of circling roots are not acceptable for planting. Minimally encircled roots shall be straightened out in the planting hole as much as possible. For plants grown in fabric bags, the bag should be cut away and completely removed before planting.



The planting hole should be significantly wider than the root system or root ball and no deeper than the depth of the root system. Score the sides of the hole with shovel, especially in clay soils. Once the plant is in place, use the soil removed from the hole as the back-fill around the roots. When back-filling, water occasionally to remove air pockets. Be careful not to tamp or compact the soil, this can lead to excessive soil compaction and possible root damage. Do not incorporate organic matter, sand or other material into the back-fill since differences in soil-pore sizes are created which can restrict water movement and root growth between the root ball, planting hole and surrounding soil.

**Mulching:** Research has shown that wood chip mulch contributes to the healthy establishment of landscape plants. Mulching conserves moisture, reduces weed competition, insulates roots from heat and cold extremes, helps prevent mower and trimmer damage, and aids in long-term development of good soil structure. Mulching should be considered an ongoing practice that is a part of each year’s maintenance routine. Depending on the type of mulch used and weather conditions, most tree and shrub beds shall need to be re-mulched every two to three years. Later applications should not increase the total mulch depth.

Mulch trees and shrubs with a 2-3 inch deep layer over the root zone. A tree of 1 1/2” caliper should have a mulch ring of 5’ diameter or greater. Evergreens should be mulched to beyond the spread of the lowest branches. Mulch shall not be piled up against tree trunks and shall be kept a few inches from the base of the trunk. Mulch plants in massed groupings when possible. Avoid deep layers of mulch which could result in the tree being planted too deep.

Mulch perennials and grasses with only enough mulch to cover the soil (typically one inch or less). Many perennials and grasses, especially native species, will not tolerate heavy mulching.

Wood chips, shredded or chipped, serve as the best mulches. Be careful with lighter materials such as bark nuggets since they have a tendency to float out of the chip bed during heavy rains. Avoid cypress mulch as it tends to form dense mats and poor growing conditions, and is often harvested from endangered trees. Do not use rock mulches. Rock does not insulate against temperature extremes, and rock absorbs and radiates heat, which can lead to plant desiccation. Do not use black plastic or landscape fabric under the mulch layer. They inhibit proper air and water exchange by the roots.

**Staking and Guying of Trees:** The purpose of most staking and guying is to prevent a newly planted tree from tipping over in the wind. In Nebraska this practice is often necessary. Excessive movement can dislodge the small, fibrous roots in the soil before they are firmly established. However, many trees are lost because guying materials are not removed or are improperly installed.

Staking is especially important on open, windy and exposed sites, and sites with high use by people. Staking and guying materials shall be strong enough to provide support, but flexible enough to allow some movement. Guying materials shall have a broad surface at the point of contact with the tree to prevent damage from rubbing. Commercial tree ties and cloth or canvas webbing or straps that are at least one and one half inch wide are examples of good guying materials. **Do not use garden hose**. All staking and guying shall be monitored and adjusted as needed to prevent tree damage and girdling. **It shall be removed at the end of one year**. Stakes without guying may be left in the place longer in high use areas if needed to prevent damage from humans, mowers and other equipment or vehicles.

**Wraps and Guards:** Tree wraps can be used to protect the tree from damage while it is being transported and planted. Otherwise, trunks should not be wrapped during the growing season. Trunk wrapping may be desirable on some thin-barked trees such as red maple to prevent winter injury. Consult with NFS staff for recommendations.

Tree trunk damage from rodents, deer, mowers and weed trimmers can be prevented by using plastic trunk guards. Guards should be monitored regularly and removed before rubbing or girdling problems occur. It is preferable to use guards that allow for air movement. A variety of wire mesh/netting cages can be used to protect shrubs from rabbits in winter.

**Watering:** All plants should be thoroughly watered at the time of planting. This shall be done by the nursery contracted to do the installation. Supplemental watering is often needed for 1-2 years or more after planting. The amount of watering required will vary with the type of plant, type of soil, time of year and weather conditions. Avoid over-watering, especially in poorly drained soils.

Newly planted trees and shrubs should receive the equivalent of one inch of rainfall per week during the growing season. It is best to water trees thoroughly and slowly with enough water to fully moisten the root ball. In general, container and B&B plantings require more water at application than do bare root plantings. If rainfall is adequate during the growing season (1 inch per week) supplemental water is not required.

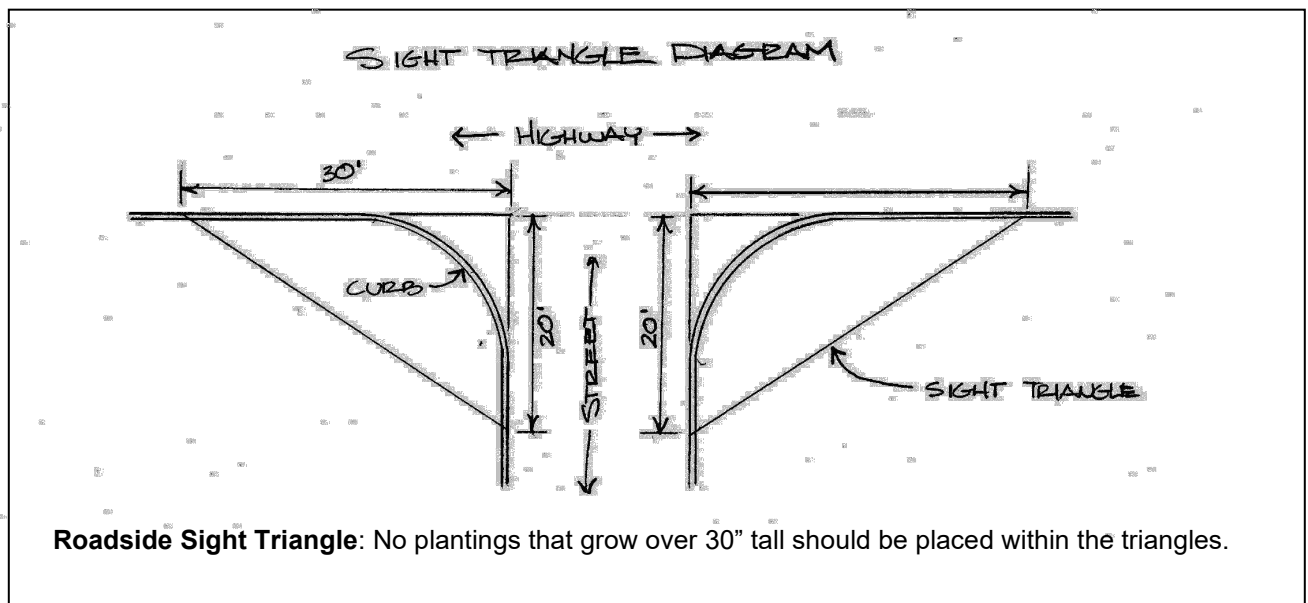
Perennials of small size or grown in porous media may dry out more quickly than trees and shrubs, and thus require closer monitoring. This is especially important during the first several weeks after planting when watering more frequently may be required. Native perennials and grasses typically require less moisture to become established and thereafter.

**Fertilizing:** Most top soils contain sufficient levels of available nutrients to supply the requirements of newly planted landscape plants, thus fertilization is not needed. Planting species that are tolerant of existing soil conditions will provide the greatest success. In situations where construction has altered the soil, the addition of good top soil and organic material such as compost may be necessary. Future determination of additional nutrient needs shall be made based upon the condition and vitality of the plants and analysis of soil samples. The addition of compost to perennial beds, rather than fertilizer, is also best.

## V. Roadside Planting Considerations:

Permission from the proper authority is required before any plant material can be placed on a highway or street right-of-way. The Nebraska Department of Roads recommends that the following general rules be considered when planting along roadways.

1. A lateral obstacle clearance, or clear zone, exists along all roadways. No woody plants or fixed objects can be located in this zone. The clear zone varies depending on the road design and speed limit. Setbacks for some common situations are:
  - Highway in town with curb, speed limit 40 mph or below - all woody plants shall be at least 6 feet from back of curb.
  - Highways in town without curb; speed limit of 40 mph or below - all woody plants shall be at least 10 feet from edge of driving lane.
  - Rural highways without curb; any speed limit - all woody plants shall be at least 30 feet from edge of driving lanes.
2. All tree and shrub planting shall allow 10 feet on either side of fire hydrants.
3. Allow 15 feet from trunk of shade trees to light poles (10 feet for ornamentals).
4. Trees shall be located at least 20 feet on either side of any overhead utility line unless their natural habit shall keep them under the line.
5. Shade trees shall be at least 5 feet and ornamentals 10 feet from either side of drives.
6. Shade trees shall be pruned up to at least 8 feet over sidewalks, more over roadways.
7. Trees with an appropriate habit shall be selected to reduce branching in driving and walking areas.
8. Locate all above and below ground utilities before planting. Stay away from buried utility lines. When planting where storm sewers are located, verify that there is enough depth above the sewer to allow successful planting over them.
9. Plants shall not interfere with the visibility of any signs.
10. Shrubs and herbaceous perennials shall be less than 30 inches tall in medians.
11. Sight triangles, in which nothing over 30 inches tall can be planted, exist at all roadway intersections (including major driveways - see diagram below). The area of the site triangle varies depending on the adjacent highway speed. The diagram below shows a street intersecting a 30 mph highway. Shade trees can be planted with the trunks at the outside edge of the triangle. Ornamental trees shall be planted so no branching extends into the site triangle. Other plant material can be planted in this area but shall be less than 30 inches tall. In general, trees at most street/roadway intersections are to be located 25-30 feet from the adjacent street/roadway edge (contact your local, county or state governmental agency for specific guidelines).



## **V. RESOURCES:**

It is highly recommended that professional help be used for all planting and maintenance projects. Technical assistance can be obtained from several sources including:

- Nebraska Forest Service - (402) 472-2971 or [eberg2@unl.edu](mailto:eberg2@unl.edu); [kweyers2@unl.edu](mailto:kweyers2@unl.edu); or [choyt2@unl.edu](mailto:choyt2@unl.edu).
- UNL Extension Offices and Research Centers
- Local Natural Resources District Office

Sources of publications and information:

- Nebraska Forest Service: <http://www.nfs.unl.edu>
- Nebraska Statewide Arboretum: <http://arboretum.unl.edu>
- University of Nebraska Extension: <http://www.unl.extension.edu>
- International Society of Arboriculture, Box 3129, Champaign, IL 61826-3129 at <http://www.isa-arbor.com>
- TreeLink website <http://www.treelink.org/>
- American Standard for Nursery Stock* ANSI Z60.1  
<http://www.anla.org/docs/About%20ANLA/Industry%20Resources/ANLAStandard2004.pdf>

Private-sector professionals: Arborists, landscape architects and others in the nursery industry are good information sources. The Nebraska Nursery and Landscape Association and the Nebraska Arborists Association maintain lists of their members in Nebraska. These lists may be obtained free of charge by contacting their respective offices:

Nebraska Nursery and Landscape Assoc.  
4200 Witherbee Blvd.  
Lincoln, NE 68510  
402-450-7192  
<http://www.nnla.org>

Nebraska Arborists Association  
Box 81414  
Lincoln, NE 68501  
402-476-3852  
<http://nearborists.org>

State law requires that all distributors of nursery stock in the state of Nebraska be licensed by the Nebraska Department of Agriculture. This includes tree spade operators. The department maintains a list of all currently licensed nursery growers and dealers (including tree spade operators). This list may be obtained by writing or calling the department.

Nebraska Department of Agriculture Bureau of Plant Industry  
Box 94756  
Lincoln, NE 68509  
402-471-2394

## **COOPERATING AGENCIES OF PARTNERSHIP PROGRAMS:**

