



### **Topsoil in Boulevards**

Quality topsoil material will be provided for use as a medium to aid in tree transplant recovery, tree establishment and to sustain long-term healthy plant growth.

The topsoil (Boulevard Topsoil Borrow) shall have the following designation regarding quality and components:

The topsoil borrow will contain three blended components consisting of loam soil, sand, and compost for use as structural soil for plant establishment in streetscape boulevards. The components consist of the following by volume:

- . (1) One-third loam topsoil meeting the requirements of the USDA Soil Texture Triangle or Loam Topsoil Borrow;
- . (2) One-third sand in accordance with 3149.2. K “Sand Cover;” and
- . (3) One-third compost in accordance with 3890, “Grade 2 Compost.”
- .

### **Topsoil Installation**

The topsoil shall be blended with existing soils in the following manner:

- Remove any debris left over from the concrete forming of the boulevard areas, as well as any other construction-related debris and any large stones over 2” diameter prior to topsoil application
- Apply 3 inches of the topsoil in the boulevard planting area and till in with existing debris-free soils.
- Apply another 3 inches of topsoil in the same area and till in again.
- Apply the final 2-3 inches of topsoil and till it in.
- The rest of the bed is to be prepared according to the MNDOT Spec 2574.3

### **Soil Amendments**

In order to encourage soil microbial activity, which is crucial for plant health and critical for new tree establishment in new barren soils, application of a product with a consistent



carbon to nitrogen ratio that encourages a healthy soil environment will result in fast establishment and production of significant growth. Application of the soil amendment is to be done at planting.

#### Directions:

- Clear plants (turf, annuals etc.) away from planting area in a 3-5 foot radius ring.
- Loosen soil.
- Plant tree as per planting instruction section.
- Add material over the top of planting area at labeled rate (which is 1.5 bags per tree).
- Spread evenly throughout the 3-5 foot radius planting area.
- Cover planting area with mulch, as described in the planting instructions.
- Irrigate treatment area to activate product.
- Do not place watering bags, weed barriers or other impervious barriers on top of the application area (since the product initiates microbial activity, soil and air gas exchange must not be restricted)

#### Plant Stock

Project plants will be of the following root-containment systems (listed in order of priority):

1. Bare root. Trees are to be between 1.25" and 2" caliper
2. Container grown (air-root-pruned container). Trees are to be in 15, 20 or 25 gallon containers
3. Container grown (standard container). Trees are to be in 15, 20 or 25 gallon containers.
4. Balled and Burlapped. Evergreen trees are to be 6' to 8' in height

Project plants must meet MNDOT specifications for quality, as far as the volume, density, condition, etc...

#### Plant Installation

Other than responsibilities outlined in the contract between the city and the county, plants shall be installed according to the Contract Documents including the plan, Special Provisions, Standard Planting Details, MnDOT's Specifications for Construction.



## Drainage

The Contractor shall be responsible for ensuring adequate drainage in the planting hole and bed areas. When the Contractor has reason to suspect a drainage problem, they shall perform a percolation test by filling a 16 inch deep planting hole with water and measuring the time it takes for the water to drain from the hole. Adequate drainage will be considered equal to or greater than a percolation rate of 1/2 inch per hour. In the case of inadequate drainage, the Contractor shall be responsible for requesting approval from the Engineer to either relocate, delete affected planting locations, or to proceed with Extra Work by using one or a combination of the Planting Details for Poorly Drained Soils as shown in the plan.

## Stem Girdling Roots

Container grown and balled & burlapped plant stock with more than 4 inches of soil depth above the root flare shall be rejected. Excess soil above the root flare can in time result in stem encircling roots, which can then lead to stem girdling roots. Plant stock may be accepted provided the excess soil is less than 4 inches and can be removed without damaging the root system of the plant.

## Balled and Burlapped Stock

As described in the planting detail, the Contractor must:

- \* Remove the top 1/3 or the top two horizontal rings of the wire basket.
- \* Remove the burlap and nails to expose the top 1/3 of the soil ball.
- \* Remove all rope/twine and dispose of off site.
- \* Cut vertical slits at 6 inch intervals into treated burlap.

Reject broken soil balls. Staking and guying plants with broken soils balls are not acceptable.

It may be determined that staking and guying is necessary for support of the tree. This will be done in accordance with 2571.3I.1 and the Standard Planting Details. Rope or twine will not be retied to the remaining wire basket for support.

## Container Stock

Container grown material is a plant that has grown in a container for at least 1 year (through the winter).



Reject “potted” material. Potted material is bare root stock placed in a container in the current growing season. “Potted” material roots will not hold soil intact and in the shape of the container when removed from container.

Install containerized plants immediately after removing from the container and as described in the planting detail.

Score or prune the outside of the soil ball to redirect circling roots at 6 inch intervals.

Paper fiber pots need not be removed but must be vertically slit at 6 inch intervals to allow faster degradation of the pot. The top of the pot must be removed to a depth of 1 inch below the soil line.

#### Bare Root Stock

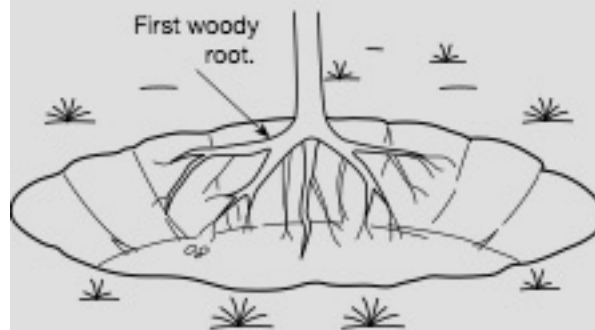
Soak plant roots for 1-24 hours prior to planting. The Contractor must install bare root stock as described in the Standard Planting Details. The root must be spread in a natural position and at the proper depth before back filing around the roots. Planting hole should be wide enough to fit the natural root spread. Do not prune roots to fit the hole.

#### **Planting Technique**

Plantings will be done in accordance with techniques described in the following MNDNR 2014 & 2015 ‘How To Plant A Tree’ publications. See excerpts below:

# HERITAGE SHADE TREE CONSULTANTS

- 1** Keep roots moist at all times.  
Dry roots die.
- 2** Dig a hole twice as wide as and slightly deeper than root length.
- 3** Place roots in hole so top of first woody root is within 1" of soil surface.



- 4** Distribute roots evenly, making sure roots are straight and not doubled over or "J" rooted.



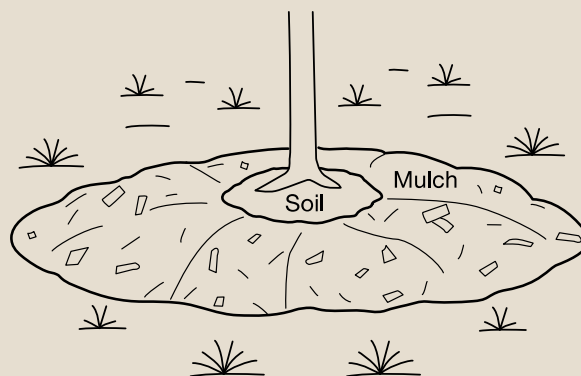
Don't create a "J" root.

**5** Keeping tree straight, backfill hole up to top of first woody root.

**6** Heel in soil with foot over entire backfill area to remove air pockets in the soil.

**7** Water entire backfill area.

**8** Layer 2"–4" of mulch over backfilled area, keeping mulch away from trunk.



Don't create a  
mulch volcano.

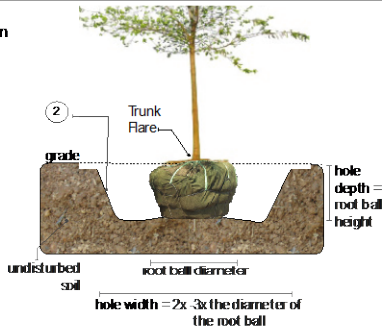
## Planting Balled and Burlap and Containerized Trees

### 1) Digging the Planting Hole

**TOOLS**

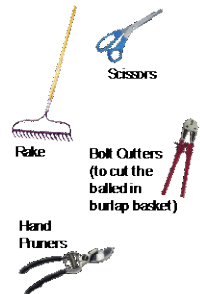


- 1 Call Gopher State One-Call at 1-800-252-1166 before digging. Dig planting hole no deeper than the root ball height. Excavate hole 2-3 times the diameter of the root ball.
- 2 Roughen the sides of the planting hole.
- 3 Before placing the tree in the planting hole, prune dead or broken branches. Remove any tree wrap, tape, string, and tags from tree trunk and branches.
- 4 Gently lower the tree into the hole by holding onto the root ball so that the first woody root is at the original grade.

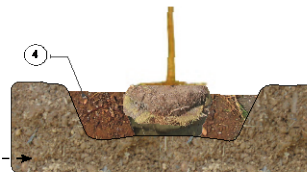
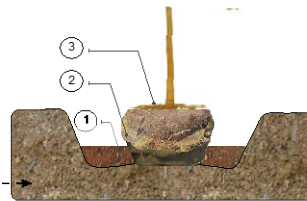


### 2) Planting the Tree

**TOOLS**



- 1 Backfill 1/3 of the planting hole with original soil to stabilize root ball and keep tree upright.
- 2 Cut and remove top 2/3 of the wire basket.
- 3 Cut and remove top 2/3 of the burlap from the root ball.
- 4 Completely backfill the hole with original soil.



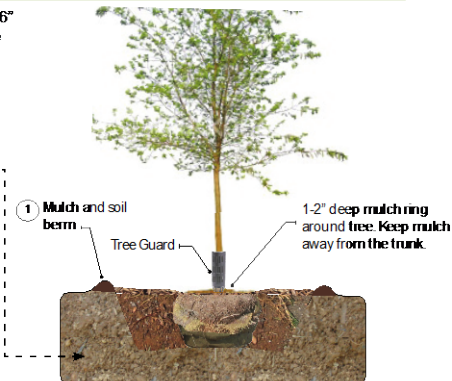
### 3) Mulching and Watering

**TOOLS**



Watering bag - place bag around the tree at the time of planting. One watering bag can hold up to 25 gallons of water, and releases it slowly over time.

- 1 Create a mulch ring around the tree and a 3-6" high soil-and-mulch berm at the edge of the hole. Keep mulch away from the trunk.
- 2 Water the tree thoroughly at planting and 15-25 gallons per week after the planting.



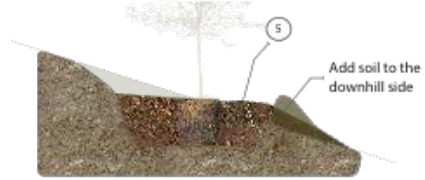
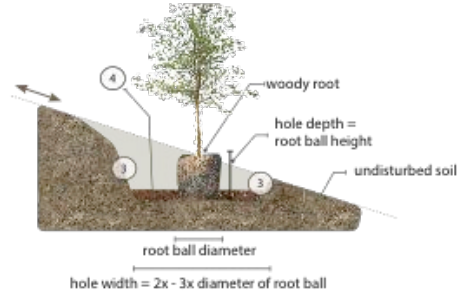
See opposite side for staking tools and directions  
Adapted with permission from Casey Tree, Washington, DC

## Planting and Staking a Containerized Tree

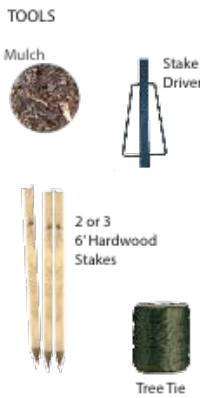
### 1) Planting the Containerized Tree



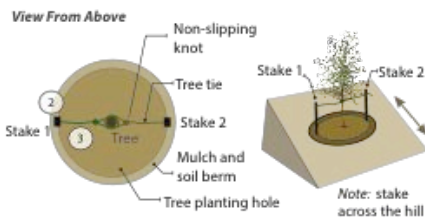
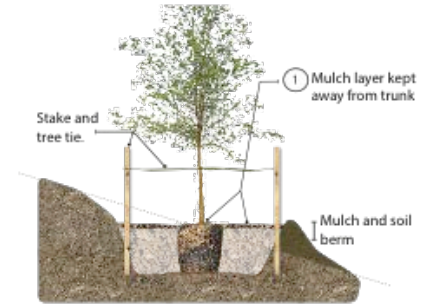
- 1 Contact Gopher State One-Call at 800-252-1166 before digging.
- 2 Dig tree planting hole to depth of root ball so that woody root is level with original grade. Excavate hole 2-3 times the diameter of the root ball.
- 3 Roughen the edges of the hole.
- 4 Carefully remove the tree's root ball from the container, and untangle and prune circling wood roots that are pencil size or larger.
- 5 Gently lower the tree into center of the hole so that the trunk flare is at or slightly above the original grade. Back fill 1/3 of the hole with original soil to stabilize root ball and keep tree upright.
- 6 Completely backfill hole with original soil. Add soil to the downhill side to help level the soil area around the tree.
- 7 Remove any tree wrap, tape, string, and tags from tree trunk and branches.
- 8 Create a mulch ring around the tree and a 3-6" high soil-and-mulch berm at the edge of the hole. Keep mulch away from the trunk.
- 9 Water the tree thoroughly at planting and 15-25 gallons per week after the planting.



### 2) Mulching and Staking the Tree - for trees on flat or sloped ground



- 1 Create a mulch ring around the tree and a 3-6" high soil-and-mulch berm at the edge of the planting hole, particularly on the downhill side. Keep mulch away from the trunk.
- 2 Decide if stakes are necessary to help the tree remain upright. If so, drive stakes two feet deep into the soil at the edge of the hole.
- 3 Secure tree trunk with tree tie using at least a 6" wide loop that fits snugly around the tree trunk - tied with a non-slip knot.
- 4 Remove stakes after one year.



Adapted with permission from Casey Tree. Washington, DC





### **Planting Timing**

Bare Root plants are to be purchased in spring and held at the city of Duluth's gravel bed (bare root trees), until fall planting season. The rest are to be purchased via contract to be delivered to the city for a fall planting.

Planting events will happen in fall of 2016 (how much will depend on how far construction has been completed) and fall of 2017. Planting and establishment is to be performed by city crews.