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## GENERAL INFORMATION

### 1.1 CONCEPT

The definition of a street tree shall mean any tree whose trunk is located fifty (50) percent or more within the land lying between property lines on either side of all public streets, boulevards and alleys including public easements. The principal considerations in design of the placement of street trees are their relation to horizontal and vertical clear zones. No street tree should be placed in the horizontal clear zone or triangular sight distance as described in Chapter 5. The vertical clearance for mature trees should be 14 feet above the street grade and 8 feet above sidewalks. Special considerations must be given to clearances to overhead utility lines, driveways, traffic signs and underground utilities. If at all possible, street trees should not be placed over buried utilities (public or private).

### 1.2 CONDITIONS

1. The design for street trees shall be in conformance with the following:

- A. Urban Design Standards Manual.
- B. Recognized design books for street trees.
- C. In case of a conflict between the above design standards, the Jurisdictional Engineer should be contacted for clarification.

2. Construction Standards

Construction Standards shall be the most recent revision of the Urban Standard Specifications for Public Improvements together with the latest addenda.

3. Project Submittals

If street trees are allowed by the Jurisdiction and if project submittals are required, a street tree planting layout showing the quantity, species/cultivar and location of all trees must be submitted for review. This plan is to be approved by the Jurisdiction prior to the tree planting and a permit issued if the proposed trees are within the street tree zone.

4. Ownership

If the tree is located in the street right-of-way or publicly owned property, Section 364.12 of the Iowa Code requires the Jurisdiction to remove deadwood or diseased trees. Some Jurisdictions do enter into agreements with developers to have them remove unwanted trees within street right-of-ways. If the street tree(s) are located outside of public property or right-of-way, the responsibility and ownership is that of the landowner.

**1.2 CONDITIONS (Continued)**5. Performance Bonds

Performance bonds may be required to be posted, but no maintenance bond generally is required. Check with the Jurisdiction for their requirements. No bond will be released without the Jurisdiction's approval.

## STREET TREE DESIGN

### 2.1 AREA REQUIREMENT PER TREE

The trunk of street trees are to be no closer than 2.5 feet from impervious surface material.

### 2.2 SPACING

For planning purposes, the ideal spacing should be 50 feet apart or no closer than the distance of their full spread from the next tree in the parking. Spacing as close as 30 feet may be permitted by the Jurisdiction for species/cultivars or ornamental trees that have appropriate mature branch spreads.

### 2.3 LOCATION WITHIN PUBLIC RIGHT-OF-WAY

The following criteria is for the location of street trees that are located in the street right-of-way. Jurisdictions may require additional street right-of-way to provide clearances to underground or overhead utilities. The criteria does not include street trees located within medians. Special designs that meet the required clear zone must be used when locating trees within medians.

1. Minimum distance of 5 linear feet from water service stop boxes.
2. Minimum distance of 4 linear feet from curb or alley right-of-way line.
3. Minimum distance of 10 linear feet from hydrants, poles, transformers, telephone junction boxes, manholes, and driveway approaches.
4. Minimum distance of 25 linear feet from street lights.
5. In central business districts where traffic speeds are low, a minimum distance of 3 feet from the back of curb should be used for street trees if a minimum distance of 8 feet exists for right-of-way from back of curb.
6. No trees should be in the horizontal clear zone or triangular sight distance area. (See Chapter 5).
7. No tree shall be planted in any public right-of-way less than twelve (12) feet in width.

### 2.4 TREE SIZE

Street trees shall be a minimum of 1" diameter for ornamental and 1 ¼" diameter for shade trees or as specified and measured at 8 inches above the grade after planting unless smaller trees are allowed.

1. All underground utilities or any other improvements, either private or public, shall be located before planting is done. One Call Service shall be utilized to locate underground utilities. The One Call service phone number is 1-800-292-8989.

**2.5 SELECTION OF TREES**

The species of trees listed are recommended for street tree use. Note: Where it is not recommended that any trees be planted under overhead utility lines some Jurisdictions may allow plantings of low growing trees. The asterisk represents trees permitted under utility lines. Other species can be used with approval of the Jurisdiction. Certain species listed may not be allowed by all Jurisdictions.

**TABLE 2.1 - SELECTION OF TREES**

| <u>COMMON NAME</u>                    | <u>GENUS SPECIES</u>                             | <u>MINIMUM SPACING</u> | <u>MATURE HEIGHT (FT)</u> | <u>MATURE SPREAD (FT)</u> |
|---------------------------------------|--|------------------------|---------------------------|---------------------------|
| Freeman Maple                         | Acer X freemanii                                 | 30                     | 50                        | 45                        |
| Norway Maple                          | Acer platanoides                                 | 30                     | 75                        | 30                        |
| Black Maple                           | Acer nigrum                                      | 40                     | 65                        | 60                        |
| Sugar Maple                           | Acer saccharum                                   | 45                     | 80                        | 50                        |
| Greencolumn Maple                     | Acer nigrum 'Greencolumn'                        | 25                     | 50                        | 20                        |
| **European Hornbeam                   | Carpinus betulus                                 | 40                     | 40                        | 30                        |
| Hackberry                             | Celtis occidentalis                              | 40                     | 75                        | 50                        |
| White Ash, (seedless)                 | Fraxinus americana cv. 'Autumn Purple'           | 45                     | 65                        | 50                        |
| Green Ash (seedless)                  | Fraxinus pennsylvanica summit, pat more          | 45                     | 55                        | 50                        |
| Ginkgo (male only)                    | Ginkgo biloba                                    | 50                     | 60                        | 35                        |
| Honeylocust, Thornless                |  |                        |                           |                           |
| Skyline Honeylocust                   | Gleditsia triacanthos i. cv.                     | 30                     | 60                        | 30                        |
| Moraine Honeylocust                   | Gleditsia triacanthos i. cv.                     |                        | 60                        | 40                        |
| Imperial Honeylocust                  | Gleditsia Triacanthos var. inermis 'Imperial'    | 30                     | 25                        | 30                        |
| Shademaster Honeylocust               | Gleditsia Triacanthos var. inermis 'Shademaster' | 40                     | 45                        | 40                        |
| **American Hophornbeam (Ironwood)     | Ostrya virginiana                                | 25                     | 40                        | 20                        |
| Sycamore (huge)                       | Platanus occidentalis                            | 40                     | 100                       | 50                        |
| Callery Pear                          | Pyrus calleryana                                 | 35                     | 60                        | 60                        |
| **Swamp White Oak (High PH sensitive) | Quercus bicolor                                  | 50                     | 75                        | 60                        |
| Northern Red Oak                      | Quercus rubra                                    | 50                     | 75                        | 70                        |
| Burr Oak                              | Quercus macrocappa                               | 40                     | 75                        | 50                        |
| English Oak                           | Quercus robur                                    | 55                     | 75                        | 50                        |
| **Scarlet Oak (High PH sensitive)     | Quercus coccinea                                 | 50                     | 60                        | 50                        |

\*\* Salt Sensitive

**2.5 SELECTION OF TREES (Continued)****TABLE 2.1 - SELECTION OF TREES (Continued)**

| <u>COMMON NAME</u> | <u>GENUS SPECIES</u>         | <u>MINIMUM SPACING</u> | <u>MATURE HEIGHT (FT)</u> | <u>MATURE SPREAD (FT)</u> |
|--------------------|------------------------------|------------------------|---------------------------|---------------------------|
| Linden             |                              |                        |                           |                           |
| **American         | Tilia americana              | 35                     | 70                        | 45                        |
| **Littleleaf       | Tilia cordata                | 30                     | 50                        | 35                        |
| Silver             | Tilia tomentosa              | 50                     | 50                        | 40                        |
| American           | Tilia americana 'Fastigiata' | 30                     | 50                        | 30                        |
| Greenspire         | Tilia cordata 'Greenspire'   | 30                     | 45                        | 30                        |
| Crimean            | Tilia x euchlora             | 35                     | 30                        | 60                        |
| Crabapple          |                              |                        |                           |                           |
| Adams*             | Malus 'Adams'                | 25                     | 20                        | 20                        |
|                    | Malus Adirondack             | 20                     | 18                        | 10                        |
| Pink Spires*       | Malus 'Pink Spires'          | 15                     | 12                        | 10                        |
| Snowdrift*         | Malus 'Snow Drift'           | 20                     | 20                        | 15                        |
| Spring Snow*       | Malus 'Spring Snow'          | 20                     | 20                        | 15                        |
| White Candle*      | Malus 'White Candle'         | 12                     | 18                        | 8                         |

\*Dwarf species

\*\*Salt Sensitive

**2.6 TREES THAT SHOULD NOT BE PLANTED IN PUBLIC RIGHT OF WAY**

|                 |                       |                           |
|-----------------|-----------------------|---------------------------|
| American Elm    | Box Elder             | Cotton-Bearing Cottonwood |
| Mulberry        | European Mountain Ash | White Poplar              |
| Black Locust    | Catalpa               | Willows                   |
| Russian Olive   | Tree of Heaven        | Austrian Pine             |
| Bolleana Poplar | Weeping Birch         | Lombardy Poplar           |

**2.7 GUIDELINE FOR SELECTION OF NURSERY TREES**

1. There shall be no roots greater than 1/10 in diameter of the trunk circling more than one-third the way around in the top half of the root ball. Roots larger than this may be cut provided they are smaller than one-third the trunk diameter. There shall be no kinked roots greater than 1/5 the trunk diameter. Roots larger than this can be cut provided they are less than one-third the trunk diameter.
2. Trees shall be rooted into the root ball so that soil or media remains intact and trunk and root ball move as one when lifted. The trunk should bend when gently pushed, not pivot at or below soil line.
3. The point where the top-most root in the root ball emerges from the trunk shall be visible at the soil surface.
4. The relationship between caliper, height and root ball size shall meet the ANSI Z60.1 standard.

**2.7 GUIDELINE FOR SELECTION OF NURSERY TREES (Continued)**

5. There should be one dominant leader more-or-less straight to the top of the tree with the largest branches spaced at least 6 inches apart. There can be a double leader in the top 10% of the tree.
6. The tree canopy should be symmetrical, free of large voids, and typical of the species or cultivar. Live crown ratio (distance from bottom of canopy to tree top/tree height) should be at least 60%.
7. Branches should be less than  $2/3$  the trunk diameter, free of bark inclusions, and more-or-less radially distributed around the trunk.
8. Trees greater than 1.5 inches caliper should be able to stand erect without a supporting stake.
9. The trunk and main branches shall be free of wounds (except for properly-made pruning wounds), damaged areas, conks, bleeding, and signs of insects or disease.
10. If any of the above conditions are not met, trees may be rejected.

**2.8 STAKING OF TREES**

Depending on the size of the trees identified to be planted, the jurisdictional engineer shall designate if staking is required. Generally if plant stock is delivered with well developed root balls, and if properly planted, it will not require staking.



**DESIGN REFERENCE MATERIAL****3.1 DESIGN REFERENCE MATERIAL**

- |     |   |               |
|-----|---|---------------|
| 1.  | Guidelines for Selecting Trees  | ISU Extension |
| 2.  | Street Trees for Iowa   | ISU Extension |
| 3.  | Conifer Species for Iowa  | ISU Extension |
| 4.  | Low-Growing Trees for Urban and Rural Iowa  | ISU Extension |
| 5.  | Soils and Trees   | ISU Extension |
| 6.  | Proper Planting of Containerized Trees  | ISU Extension |
| 7.  | Transplanting Trees   | ISU Extension |
| 8.  | Watering Newly Planted Trees  | ISU Extension |
| 9.  | Doing Construction? Don't Hurt the Trees  | ISU Extension |
| 10. | Tree Publications from ISU Extension<br>( <a href="http://www.forestry.iastate.edu/ext/ext.html">http://www.forestry.iastate.edu/ext/ext.html</a> ) | ISU Extension |