

# Village of Ashwaubenon

## Arboricultural Specifications Manual



Adopted by:  
Tree Board, March 24, 2005  
Park Board, April 19, 2005

Revised:  
October 8, 2009

## Introduction

Authority: Pursuant to authority granted under Section 8.07 of the Village of Ashwaubenon Municipal Code and the review and assistance of the Tree and Park Boards, the following serves as the Arboricultural Specifications and Standards of Practice for the Village of Ashwaubenon, Wisconsin, hereinafter referred to as the **Arboricultural Specifications Manual**.

Policy: The policy of the Village of Ashwaubenon is to regulate the planting, transplanting, maintenance, removal and protection of public trees and shrubs in the Village in order to alleviate hazardous conditions which may result in injury to persons using the streets, sidewalks or other public property within the Village. It is also policy to promote and enhance the beauty and general welfare of the Village by protecting trees and shrubs from undesirable treatments, maintenance practices, planting and removal.

Function: The general responsibility of the Parks, Recreation, and Forestry Department is to maintain trees and shrubs located on all public properties, including, but not limited to, terraces, medians, parks, and other public facilities and spaces. This involves all phases of arboricultural work from planting through removal. These specifications are to serve as a standard for the planting and maintenance of all public trees and will apply whether work is performed by Village employees, contractors or private individuals. In abiding by and enforcing these specifications, the Parks, Recreation and Forestry Department makes every effort to maintain a safe and aesthetically pleasing community. Exceptions to these specifications must be approved by the Village Forester. The Arboricultural Specifications Manual shall be adhered to at all times, but may be amended at any time that experience, new research, or laws indicate that improved methods or circumstances make it advisable, and only then with the advise and assistance of the Ashwaubenon Tree Board.



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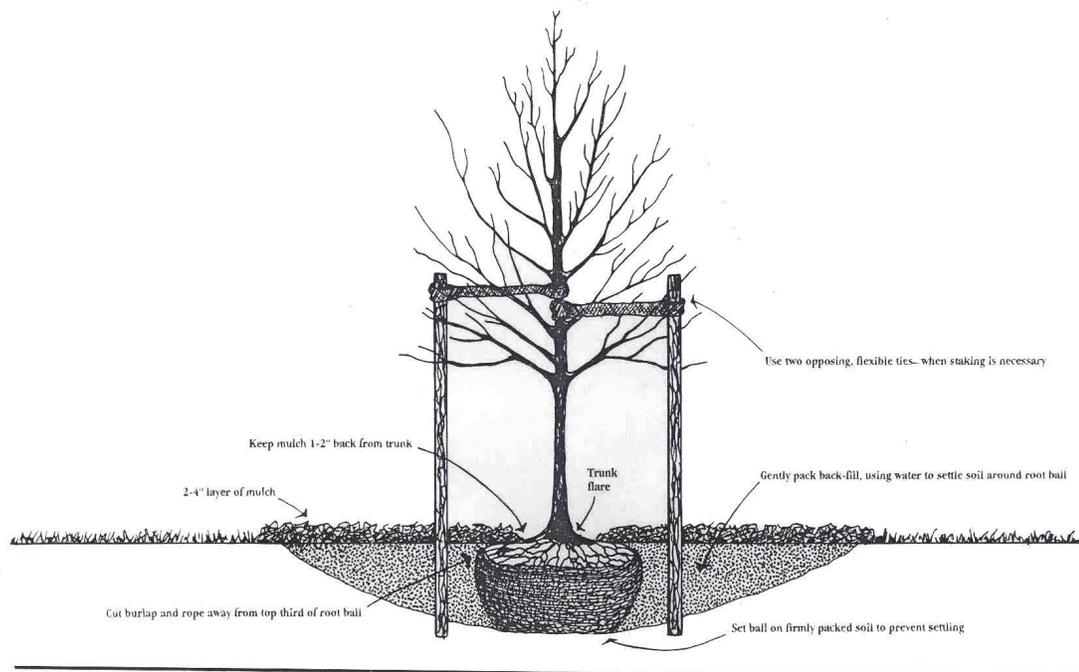
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## Tree Planting Standards

**Size:** All trees planted along the terraces and within public spaces must be of sufficient size to absorb the abuse and conditions common to trees planted in urban areas. The minimum allowable size for shade trees is 1 ¾" caliper and 1 ½" caliper for ornamental trees, however larger sizes may be required to ensure survival for specific situations. Tree caliper shall be measured six inches above the ground to the nearest ¼".

**Condition:** Unless otherwise specified, all trees shall conform to the American Nursery and Landscape Association's *American Standard for Nursery Stock*, (Z60.1-2004). Each tree chosen for planting shall be a high-quality, healthy tree with evidence of vigorous growth during the previous year. All trees shall have a comparatively straight, single trunk, well developed leaders and crown, and the roots shall not only be characteristic of the species, cultivar or variety, but also exhibit evidence of proper nursery pruning practices. Ornamental trees may be multiple-stemmed if they can be pruned for adequate clearance. At the time of planting, all trees must have a full healthy crown, be free of mechanical injuries and display no other objectionable features that will affect the future form, health, and beauty of the tree.

**Planting Methods:** Proper planting methods (Figure 1) are critical to ensuring a high level of transplanting success by encouraging proper root growth and reducing transplant shock.



**Figure 1 Proper Tree Planting Methods**

A large planting hole 2-3 times the diameter of the root ball shall be used leaving a pedestal of soil in the center of the hole on which to rest the tree. The root/trunk flare should be at or slightly above the finished grade. When using balled and burlapped planting stock, remove the wire, burlap and twine from at least the top one third of the root ball, thus minimizing disturbance to ensure the root ball's integrity. If necessary, use a sharp hand pruner to remove any damaged roots as needed. Whenever possible, backfill the hole with native soil and do not add amendments such as compost, peat moss, or stone to "improve" the soil. Water the tree generously to eliminate large air pockets and firm the soil around the tree's roots.

Location: All street trees shall be planted midway between the curb and sidewalk (or where the sidewalk would be if there is no sidewalk), unless in the opinion of the Village Forester, there is sufficient reason to plant the trees off-center.

To allow for maintenance, minimize infrastructure damage and promote safety, trees shall be planted using the following guidelines. Exceptions to these guidelines may be made by the Village Forester when circumstances warrant and public safety is not threatened.

1. 50' from an approach corner
2. 35' from a non-approach corner
3. 20' from a street light
4. 10' from a driveway, utility pole, or fire hydrant
5. 5' from a gas valve, water valve, or carriage walk
6. 3' from the curb

Vision Triangle: No trees (or shrubs greater than 30" in height) shall be planted in the Vision Triangle as specified in section 14.19(6) of Ashwaubenon Municipal Code. The Vision Triangle is determined by drawing a straight line between two points, each measured 35' back from the projected apex of the curbs. See Appendix A for a diagram of the Vision Triangle Ordinance.

Spacing: Future maintenance problems can be minimized by careful and thoughtful placement of trees. Spacing of trees is a function of local site conditions, the species or cultivar used, and their, mature height, spread and form. A safe minimum spacing between trees is a distance equal to the width of the species at maturity. Good general guidelines are as follows:

1. 25' center-to-center for small trees (Appendix B)
2. 35' center-to-center for medium trees (Appendix C)
3. 40' center-to-center for large trees (Appendix D)

Recommended Street Trees: Appendices B, C and D contain the lists of tree species approved for planting in the Village based upon their mature size. The Tree Board shall review, at least once every three years, the trees listed in these appendices to determine whether any species, cultivars or varieties should be added or removed from the lists.

Only small-growing trees (Appendix B) shall be planted under overhead secondary or primary electrical distribution lines. Trees planted to the side of power lines shall be carefully selected for mature habit to minimize future conflicts.

Undesirable Street Trees: Unacceptable species or their varieties as listed in Appendix E shall not be planted on Village property, except in special locations where, because of characteristics of adaptability or landscape effect, they can be used advantageously. Their lack of suitability is based upon objectionable growth habits, fruiting habits, form, susceptibility to serious diseases, propensity to incur storm damage, and other limitations. The limitations listed for each tree or species are the more serious problems encountered locally.

### **Maintenance of Newly Planted Trees**

General: Newly planted trees, shrubs and other plants require special maintenance for one or two growing seasons following planting. All maintenance practices shall follow approved arboricultural standards.

Watering: Since up to 95% of the tree's roots were cut when the tree was dug in the nursery, regular watering is important to aid in the development of a strong new root system. Trees need the equivalent of about one inch of rain every week. When the soil is dry four inches below the soil surface, it is time to water. Residents are asked to help water the street trees planted in the terrace adjacent to their house during the growing season. Village staff will water all park and green space plantings, but only provide supplemental watering for plantings in residential areas.

Mulching: A layer of mulch around the newly planted tree is beneficial. It helps reduce competition from grass and weeds, retains soil moisture, improves soil fertility and structure and protects the trunk from damage caused by mowers and string trimmers. A 3-4" layer of mulch shall be placed at an even depth around the tree. Mulch shall be pulled away from the trunk so as not to be touching the trunk as this promotes fungal diseases and encourages rodents to girdle the bark at the base of the tree. Shredded bark or woods chips are recommended materials, but be sure the material is seasoned or composted before using. The use of stone or other inorganic material is discouraged and generally not recommended.

Pruning: No pruning should occur at the time of planting except to remove dead or broken branches. Unnecessary pruning at this time may reduce the amount of stored energy the plant holds and may stress the tree. A pruning schedule may be started two years after planting.

Fertilization: Adequate quantities of the essential nutrient elements should be available after new root growth starts. Provision of good drainage and adequate soil moisture are far more important following planting than fertilization. Apply fertilizer sparingly and only to correct a specific deficiency. Since excessive fertilization can

“burn” roots and stimulate crown growth faster than the roots can supply water, it is best to wait until the third year after planting to begin applications.

Staking: If it is necessary to stake a tree after planting use only broad, soft strapping and leave some play for the tree to sway in the wind. Do not use wire surrounded by a garden hose as this may cause serious damage to the trunk. All staking material should be removed within two years unless deemed necessary for continued stability.

Wrapping: Studies have found that trunk wrap often does more harm than good. However, wrap may be seasonally used to protect young trees from sunscald or cracking, but should be removed every spring to prevent long-term damage.

## **Planting Policies**

Reconstructed and Widened Streets: When trees are removed in preparation for reconstruction or widening of any established street, new trees will be planted provided there is adequate space in the terrace to support tree growth. The expense of this planting shall be borne by the Village and incorporated into the project. The location and species of these trees shall be determined by the Village Forester with assistance from the Village Engineer.

Neighborhood Street Tree Planting Program: The Village of Ashwaubenon has a tree planting program for residents who wish to have trees planted in the terrace area adjacent to their property. The planting program, typically offered in the fall, is a cost sharing partnership between the Village and its residents to promote the benefits of tree-lined streets. The resident pays for the initial cost of the tree, while planting, maintenance, and replacements are the Village’s responsibility. Residents are accommodated on a first come, first served basis.

Resident Plantings: Residents or property owners who wish to plant trees in the Village right of way should submit a free “Street Tree Planting” application to the Village Forester prior to beginning work. Species should be chosen from the recommended tree planting lists contained in Appendices B, C, and D. The Village Forester will review all applications with emphasis on planting the “right tree in the right place”.

New Subdivisions: Section 18.06(2) of Ashwaubenon Municipal Code provides funding for street tree planting in subdivisions developed after October 2003. A linear curb fee is collected and placed in an escrow account for public improvements similar to the special assessments made for sewer, water, curb, gutter, and storm water management. After occupancy permits have been issued for approximately 75% of the houses on a street, trees shall be selected and planted in the terrace by the Village. The current assessment rate shall periodically be re-evaluated by staff to ensure the amount being collected is adequate to cover all associated project costs.

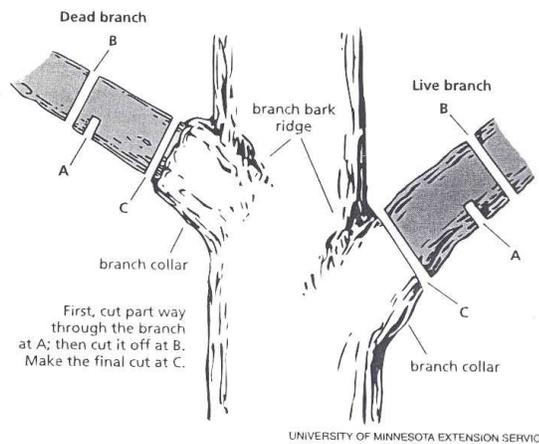
Unimproved Streets: Trees shall not be planted in the terrace on unimproved streets or where no curb and gutter exists without approval from the Village Forester and Village Engineer.

## Pruning Standards

General: All pruning shall follow the American National Standards Institute's *Standard Practices for Tree Care Operations-Pruning (ANSI A 300 (Part 1))* for the purpose of crown cleaning, crown thinning, crown raising, and structure development. Pruning shall improve the appearance of the trees and maintain the crown shape and symmetry typical of the species at its given size and age. Permission from the Village Forester is required before any pruning is done on Village owned and maintained trees.

Pruning Cuts: All final cuts shall be "collar cuts" made sufficiently close to the trunk or parent limb, without cutting into the branch collar or leaving a protruding stub, so that closure can readily begin under normal conditions. The face of the "collar cut" or wound area shall be circular in form. "Flush" cuts to the main stem behind the branch collar and that leave oval exposed wounds shall not be made. Cuts shall be clean and made such that all wound sides are even edged and do not leave "dog ear" ridges on one side or another.

All limbs removed shall be cut in such a manner so as to prevent any ripping or tearing of the wood or bark on the parent or remaining stem. Large limbs shall be cut using the three-cut pruning method as shown in Figure 2. Limbs shall be brought to the ground as to prevent any damage to property, publicly or privately owned.



**Figure 2 Proper Pruning Technique – 3 Cut Method**

Crown Cleaning: Crown cleaning should remove all dead, dying, diseased, crowded, weakly attached and low-vigor branches. Interior crowding and crossed or rubbing branches should be pruned where practical so as not to leave large holes in the general form of the tree. Trunk suckers and water sprouts, especially where they are

present below the bottom 1/2 of the tree, should also be removed as part of crown cleaning. Suckers and sprouts that add to the shape of the tree above 14 feet may remain in mature trees that may not have an optimum crown or shape.

Crown Thinning: Crown thinning should selectively remove and/or prune branches back to large laterals to increase light penetration and air movement through the crown. After crown thinning, trees and branches shall have foliage and mechanical stress evenly distributed along a branch and throughout the crown. Not more than one-fourth of foliage on mature trees shall be removed.

Crown Raising: Crown raising should remove lower branches where practical (dependent on tree size) to obtain an eventual full foliage height clearance of 14 feet on the street side of the tree. Work shall maintain the crown shape and symmetry typical of the species being pruned, and should balance the tree evenly. Raising should also allow an eventual clearance over the pedestrian walk (or resident side of tree) of 10 feet. Pruning may include heading cuts on lower limbs or thinning cuts to lighten lower branch loads to achieve clearance if complete branch removal from the tree trunk is not practical.

Clearance Pruning: Clearance of houses and buildings should be such that branches are a minimum of 15 feet from rooftops. Trees and other vegetation shall be pruned to maintain a clear line of sight when approaching all traffic control devices and intersections.

Tools: Proper tools such as hand pruners, pole saws, hand saws, and chain saws shall be used for each cut. The cutting edges of each tool shall be positioned to obtain a proper pruning cut so it will not cut, rip, or harm adjacent bark areas. At no time shall any person working in trees for pruning purposes, wear spurs or any other footwear, which, in the opinion of the Village Forester, injure the tree being pruned.

Site Appearance and Clean-Up: Pruned limbs and branches temporarily placed in the terrace area shall be placed in such a manner as to eliminate any obstruction to motor vehicles and pedestrians. Site cleanup shall include removal of small twigs, chips, leaves and limbs from the street, curb, terrace, sidewalk, private lawns and driveways with the appropriate tools for the job. The site shall be returned to the same state it existed in prior to the pruning work. Under no circumstances shall any materials be allowed to lie on the terrace overnight.

Topping: It is an unacceptable practice to top any public tree in the Village and it is not recommended for any private tree. Topping is the indiscriminate cutting back of tree branches to stubs or lateral branches that are not large enough to assume the terminal role of growth. Property owners often feel that their trees have become too large for their property and feel the need to reduce the tree's height. Topping, however, is not a viable method of height reduction and will make a tree more hazardous in the long term by encouraging excessive growth and extensive decay.

Pruning of Oaks: In an effort to minimize the spread of oak wilt (*Ceratocystis fagacearum*), the Village of Ashwaubenon has adopted a policy which prohibits the pruning or wounding of oaks (*Quercus* spp.) from April 1<sup>st</sup> to July 1<sup>st</sup>.

Wound Dressings: Under normal circumstances, wound dressings or pruning paints shall not be applied to pruning cuts. Research has shown that they may actually interfere with the protective benefits of tree gums and resins, and prevent wound surfaces from closing as quickly as they might under natural conditions. The exception to using wound dressings is when corrective pruning needs to be done on oaks (*Quercus* spp.) and American elms (*Ulmus americana*) during the growing season. Application of wound dressings is recommended to prevent the introduction of pathogens such as Dutch elm disease (*Ophiostoma ulmi*) and oak wilt which are both transmitted by insects attracted to the sap of fresh wounds.

### **Tree Removal Policy**

General: There are many factors that contribute to transforming a tree from an asset to a liability. They include: disease, decay, and mechanical damage which can cause a tree to be structurally unsound, and therefore unsafe. It is the policy of the Village to base tree removals on safety related criteria and liability. As specified in the Village of Ashwaubenon ordinances, the only person who may authorize the planting or removal of a Village tree is the Village Forester or his/her designated agent.

Acceptable Reasons For Public Tree Removal: A tree may be removed when the Village Forester concludes that any of the following conditions exist:

1. Any dead or dying tree;
2. Any otherwise healthy tree, which harbors insects or diseases, which could reasonably be expected to seriously injure or harm any other tree;
3. Any tree which, by reason of location or condition, constitutes an imminent danger to the health, safety or welfare of the general public. In the category of dangerous or hazardous trees are those with observable, critical structural defects that could cause the tree to fail during periods of stress, i.e. wind or ice storms. Included are extensive rot or cavity formations, weak forks or crotches, and/or other characteristics that would impose an immediate liability to the Village;

Unacceptable Reasons For Public Tree Removal: NOT included in the definition of a tree as a public nuisance or immediate hazard are the following:

1. Species of trees currently classified as undesirable and thereby prohibited from being planted on Village owned property, as listed in the Undesirable Species List of this Arboricultural Specification Manual (Appendix E), with the following exceptions:
  - a. Any individual tree listed in the prohibited species table that is declared a public nuisance by the Village Forester, that meets the specification for removal as previously identified;

- b. Any individual or species of tree listed in the prohibited species table that is designated by the Village Forester as being part of a scheduled village-wide, replacement program designed to upgrade the Village's tree population;
2. Individual trees, regardless of species or kind, that pose either an imminent or potential hazard for which corrective actions can be taken;
3. Trees that constitute an inconvenience to the public by virtue of leaf, twig or fruit drop; that act as sources of allergies; that cause root blockage in sanitary or storm sewers; that inhibit or prevent the growing of turf beneath the canopy of the tree due to shading; that are subject to disease or insect problems, which cause only minor harm to trees;
4. Trees that constitute an inconvenience to the public by virtue of their location, except those public trees that pose serious obstruction problems in terms of egress or access to private property or new construction projects. The removal of a public tree for purposes of accommodating private facilities will not be sanctioned unless the following conditions have been satisfied:
  - a. There are no other reasonable design alternatives;
  - b. The value of the tree(s) in question has been determined by the Village Forester in accordance with the latest revision of "*Guide for Plant Appraisal*" as published by the International Society of Arboriculture;
  - c. The Village must be compensated for the loss of the tree(s) by the property owner before removal is authorized by the Village.

Unauthorized Removals: If a tree is removed without prior written authorization from the Village Forester (or other authorized Village representative), the Village will need to be compensated for the tree's loss. The party removing the tree will be subject to a citation under section 25.04 of Ashwaubenon Municipal Code which may include restitution of the tree's value using the latest revision of "*Guide for Plant Appraisal*" as published by the International Society of Arboriculture. Upon payment of the citation, the Village Forester may replace the street tree(s) at their discretion if the site is appropriate for replanting. All costs associated with the planting will be borne by the Village.

### **Miscellaneous Maintenance Practices**

Stump Removal: The stumps of all removed trees shall be ground to a depth of at least eight inches (8") below the surrounding ground level. The excess stump chips shall be removed, the hole filled with clean topsoil, and the site graded and seeded. Watering of newly established grass will then be the responsibility of the adjacent property owner. All costs associated with stump removal shall be borne by whomever bears the cost of tree removal.

Fertilization: The Village does not, in general, fertilize terrace trees. A resident who wishes to fertilize the terrace tree(s) adjacent to their property shall request written permission from the Village. The Village Forester has the authority to approve or deny a fertilization request. All fertilization shall adhere to the American National Standards

Institute's *Standard Practices for Tree Care Operations – Fertilization (ANSI A 300 (Part 2))*.

The Village does periodically perform fertilization applications to improve the health and vigor of trees exhibiting the symptoms of chlorosis (yellowing leaves) due to high soil pH. Alkaline soils are typical to Northeastern Wisconsin and species of trees such as red maple, white oak, pin oak, and river birch are unable to tolerate this high pH. Treatments should include the mulching of an area under the dripline of the tree with woodchips and an annual application of 5 to 10 pounds of granular sulfur per 100 square feet of treated area. This technique will lower the pH of the soil over a period of several years to levels that will benefit the tree. However, please note this treatment is not 100% effective and results will vary do to the buffering capacity of the existing soils.

Cabling and Bracing: Tree support systems are used to provide supplemental support to leaders, individual branches, and /or entire trees by limiting their movement. When a tree has a structural defect or condition that poses a high risk of failure, a supplemental support system can often reduce the risk. However, not all potential hazards can be mitigated by their installation. It is essential that each tree be carefully examined for risk of failure by a qualified arborist to ensure that the system will achieve its objective of providing added support, without increasing the risk of tree failure.

As a general rule, cables should be located above the crotch at a point approximately two-thirds (2/3) of the distance between the crotch and tops of the branch ends. Rust-resistant cables, thimbles and lags should be used and thimbles must be used in the eye splice in each end of the cable. Under no circumstances shall cable be wrapped around a branch. All cabling and bracing practices shall follow the American National Standards Institute's *Standard Practices for Tree Care Operations – Support Systems, Cabling, Bracing, and Guying (ANSI A300 (Part 3)-2000)* and the International Society of Arboriculture's companion publication *Best Management Practices – Tree Support Systems: Cabling, Bracing, and Guying* (2001).

Spraying: The Village, in general, limits the use of pesticides on its public trees. Applications may be done for the control of specific diseases or insects with the proper timing and materials to obtain the desired level of control. Suitable precautions shall be taken to protect and warn the public that spraying is being done. All application practices shall conform to the appropriate State and Federal regulations.

A resident who wishes to apply pesticides to the terrace tree(s) adjacent to their property shall request written permission from the Village. The Village Forester has the authority to approve or deny a pesticide application request. Residents applying for permission to apply pesticides must submit the following information: type of pesticide, timing (weeks(s) to be applied), quantity to be used, application method, and reason for pesticide use. If the application is done by a commercial contractor or is a restricted use pesticide (RUP), proof of a valid Wisconsin Department of Agriculture Trade and Consumer Protection Commercial Applicator License Number is also needed.

## **Digger's Hotline and Local Utilities**

Digger's Hotline (800-242-8511) and all appropriate local utility companies must be notified prior to any underground excavation, including but not limited to: tree planting, stump removal and root repair. Three business days are customarily required as sufficient notice for the processing of locates. Proper marking of excavation sites prior to calling ensures that no resident, employee or utility are at risk from damage to unmarked utilities. Work within 18" of any underground utility requires hand digging to expose the facility and prevent unnecessary damage to utilities. Private utilities (i.e. irrigation, pet fences, private lighting etc.) located within the public right-of-way shall be marked by the adjacent property owner at their expense. The Village cannot assume responsibility for any damage as a result of unmarked private utilities in the right of way as they are prohibited in section 8.04(1) of Village of Ashwaubenon Code.

## **References**

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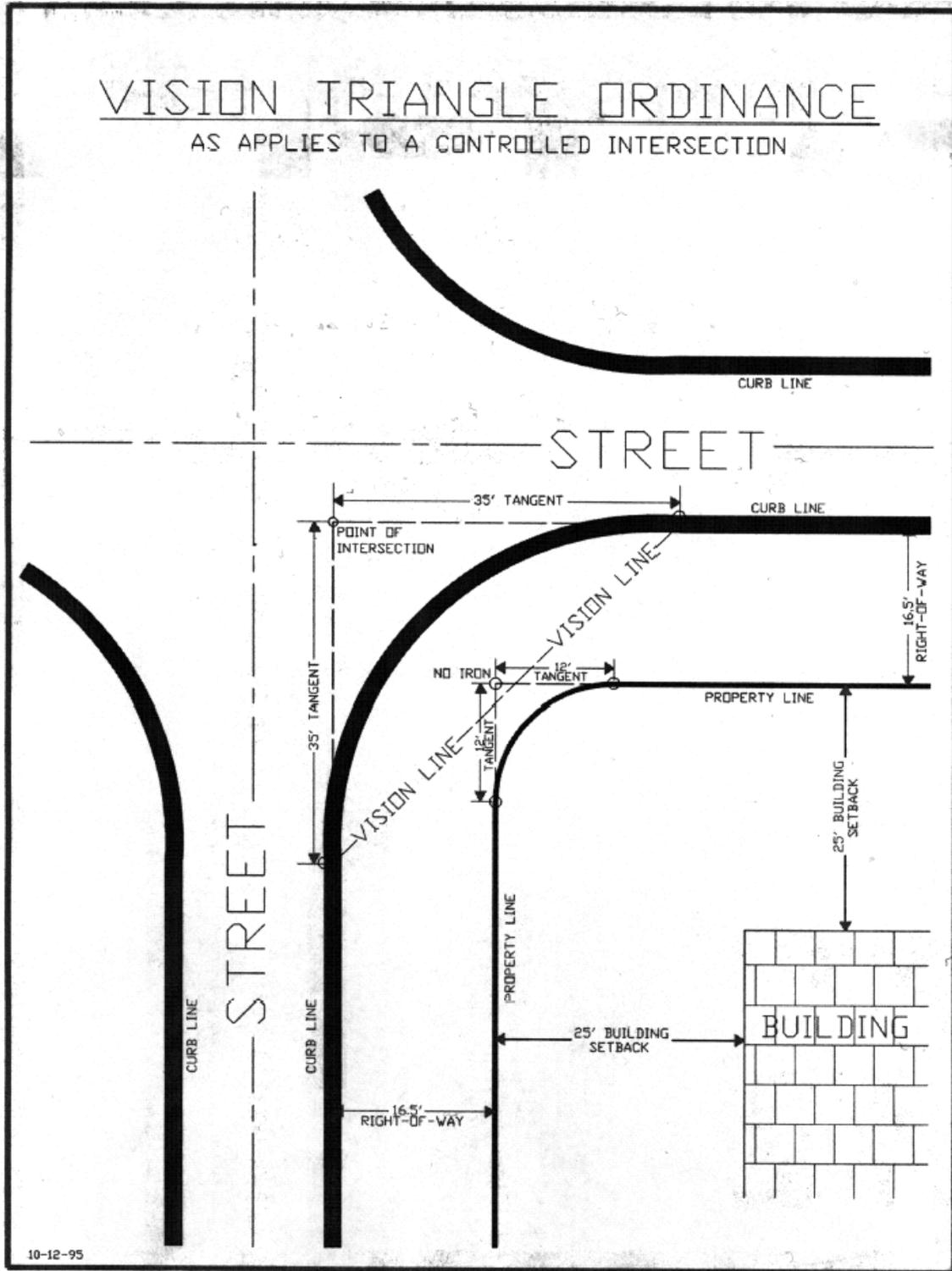
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APPENDIX A – VISION TRIANGLE DIAGRAM



**APPENDIX B - SMALL TREE PLANTING LIST**

(up to 30' in height)

SPACING: 25' minimum

TERRACE WIDTH: 5' Minimum

<u>Scientific Name</u>	<u>Common Name</u>	<u>Cultivars</u>
<i>Acer ginnala</i>	Amur Maple (Tree Form)	
<i>Acer tataricum</i>	Tatarian Maple	
<i>Amelanchier canadensis</i>	Serviceberry (Tree Form)	'Autumn Brilliance'
<i>Crataegus crusgalli</i> var. <i>inermis</i>	Thornless Hawthorne	'Cockspur'
<i>Maackia amurensis</i>	Amur maackia	'Starburst'
<i>Malus</i> spp.	Flowering Crabapple	'Golden Raindrops' 'Indian Summer' 'Madonna' 'Pink Spires' 'Prairifire' 'Profussion' 'Red Barron' 'Red Jewel' 'Sentinel' 'Snowdrift' 'Spring Snow'
	(Others cultivars/varieties upon approval)	
<i>Syringa pekinensis</i>	Pekin Tree Lilac	'China Snow'
<i>Syringa reticulata</i>	Japanese Tree Lilac	'Ivory Silk'

## APPENDIX C - MEDIUM TREES PLANTING LIST

(30 to 45' in height)

SPACING: 35' minimum

TERRACE WIDTH: 6' minimum

<u>Scientific Name</u>	<u>Common Name</u>	<u>Cultivars</u>
<i>Acer plantanoides</i>	Columnar Norway Maple	'Columnare'
<i>Acer truncatum x platanoides</i>	Shantung Maple	'Pacific Sunset' 'Norwegian Sunset'
<i>Cercidiphyllum japonicum</i>	Katasuratree	
<i>Corylus colurna</i>	Turkish Filbert	
<i>Ostrya virginiana</i>	American Hophornbeam or Ironwood	
<i>Phellodendron amurense</i>	Amur Corktree	'Macho' 'Shademaster'
<i>Pyrus calleryana</i>	Callery Pear	'Autumn Blaze' 'Select' or 'Chanticleer'
<i>Sorbus alnifolia</i>	Korean Mountain Ash	

**APPENDIX D - LARGE TREE PLANTING LIST**

(over 50' in height)

SPACING: 40' minimum

TERRACE WIDTH: 8' minimum

<u>Scientific Name</u>	<u>Common Name</u>	<u>Cultivars</u>
<i>Acer x freemanii</i>	Freeman Maple	'Autumn Blaze' 'Celebration' 'Marmo' 'Sienna Glen'
<i>Acer miyabei</i>	Miyabe Maple	'State Street'
<i>Acer platanoides</i> (limited use of this species is encouraged due to over planting)	Norway Maple	'Cleveland' 'Deborah' 'Emerald Lustre' 'Emerald Queen' 'Fairview' 'Royal Red' 'Superform'
<i>Acer saccharum</i>	Sugar Maple	'Green Mountain' 'Legacy'
<i>Aesculus hippocastanum</i>	Horsechestnut	'Bohmannii'
<i>Celtis occidentalis</i>	Common Hackberry	'Prairie Pride' 'Windy City'
<i>Eucommia ulmoides</i>	Hardy Rubber Tree	
<i>Ginkgo biloba</i> (Male)	Ginkgo or Maidenhair Tree	'Autumn Gold' 'Magyar' 'Princeton Sentry'
<i>Gleditsia tricanthos</i>	Honeylocust	'Imperial' 'Shademaster' 'Skyline' 'Sunburst'

<i>Gymnocladus dioicus</i>	Kentucky Coffee Tree	'Espresso' 'Prairie Titan'
<i>Quercus bicolor</i>	Swamp White Oak	
<i>Quercus ellipsoidalis</i>	Northern Pin Oak	
<i>Quercus macrocarpa</i>	Bur Oak	
<i>Quercus robur</i>	English Oak	'Skymaster' 'Skyrocket'
<i>Quercus rubra</i>	Red Oak	
<i>Quercus x schuetti</i>	Hybrid Swamp x Bur Oak	
<i>Tilia americana</i>	American Linden	'American Sentry' 'Redmond'
<i>Tilia cordata</i>	Littleleaf Linden	'Chancellor' 'Glenleven' 'Greenspire' 'Prestige' 'Sterling'
<i>Tilia tomentosa</i>	Silver Linden	
<i>Tilia x euchlora</i>	Crimean Linden	
<i>Ulmus</i> spp.	Elm Hybrids	'Accolade' 'Frontier' 'Homestead' 'New Horizon' 'Regal' 'Pioneer' 'Prospector'

## APPENDIX E - UNDESIRABLE SPECIES

<u>Scientific Name</u>	<u>Common Name</u>	<u>Problem(s) or Limitation(s)</u>
<i>Abies</i> spp.	Fir	Form – visibility hazard
<i>Acer negundo</i>	Boxelder	Weak wooded, female attracts the Boxelder bug.
<i>Acer rubrum</i>	Red Maple	Manganese/Iron chlorosis
<i>Acer saccharinum</i>	Silver Maple	Weak wooded, susceptible to storm damage, aggressive root system
<i>Betula</i> spp.	Birch	Environmental stress, borers
<i>Betula nigra</i>	River Birch	Iron chlorosis
<i>Carya</i> spp.	Hickory	Littering fruit
<i>Catalpa</i> spp.	Catalpa	Littering fruit
<i>Fagus</i> spp.	Beech	Littering fruit
<i>Fraxinus</i> spp.	Ash	Emerald Ash Borer
<i>Ginkgo biloba</i> (Female)	Ginkgo or Maidenhair Tree	Malodorous fruit
<i>Juglans</i> spp.	Walnut	Littering fruit
<i>Malus</i> spp.	Common Apple	Littering fruit
<i>Morus</i> spp.	Mulberry	Littering fruit
<i>Picea</i> spp.	Spruce	Form – visibility hazard
<i>Pinus</i> spp.	Pine	Form – visibility hazard
<i>Populus</i> spp.	Poplar, Cottonwood	Roots block sewers, weak wooded, cotton type seeds
<i>Prunus</i> spp.	Cherry or Plum	Littering fruit, disease prone
<i>Pyrus communis</i>	Common Pear	Littering fruit
<i>Quercus palustris</i>	Pin Oak	Iron chlorosis
<i>Robina</i> spp.	Black Locust	Shallow rooted, borers
<i>Salix</i> spp.	Willow	Shallow rooted, weak-wooded
<i>Sorbus americana</i>	Mountain Ash	Messy fruit, sunscald problems, insect borers

*Thuja* spp.

Arborvitae

Weak-wooded, storm damage

Form – visibility hazard

*Ulmus pumila*

Siberian Elm

Weak wooded