

COMPREHENSIVE DEVELOPMENT

120 Attachment 1

Town of Chesapeake City

Appendix A: Guide for Landscaping [Added 1-28-2019 by Ord. No. 1.14.2019.A]

A-1: Guide for Protecting Existing Trees

Article 6.2 provides for the retention and protection of large trees when land is developed. To better ensure the survival of existing trees, the developer should heed the following guidelines (in addition to the mandatory requirements of Article 6.2):

- (1) Protect trees with fencing and armoring during the entire construction period. The fence should enclose an area 10 feet square with the tree at the center.
- (2) Avoid compaction of the soil around existing trees due to heavy equipment. Do not pile dirt or other materials beneath the crown of the tree.
- (3) Keep fires or other sources of extreme heat well clear of existing trees.
- (4) Repair damaged roots and branches immediately. Exposed roots should be covered with topsoil. Severed limbs and roots should be sealed. Wherever roots are destroyed a proportional amount of branches must be pruned so the tree does not transpire more water than it takes in. Injured trees must be thoroughly watered during the ensuing growing year.
- (5) Prune all existing trees that will be surrounded by paving to prevent dehydration.

A-2: Standards for Street and Parking Lot Trees

Trees planted in compliance with the requirements of § 120-6.2.5 shall have most or all of the following qualities:

- (1) Hardiness.
 - (a) Resistance to extreme temperatures.
 - (b) Resistance to drought.
 - (c) Resistance to salt damage.
 - (d) Resistance to air pollution.
 - (e) Ability to survive physical damage from human activity.
- (2) Life cycle.

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- (a) Moderate to rapid rate of growth.
- (b) Long life.
- (3) Foliage and branching.
 - (a) Tendency to branch high above the ground.
 - (b) Wide spreading habit.
 - (c) Relatively dense foliage for maximum shading.
- (4) Maintenance.
 - (a) Resistance to pests.
 - (b) Resistance to plant diseases.
 - (c) Little or no pruning requirements.
 - (d) No significant litter problems.

A-3: Formula for Calculating 20% Shading of Vehicle Accommodation Areas

The following is an elementary formula for determining the number of shade trees required in and around paved parking lots in order to presumptively satisfy the shading requirements of Article 6.2.

- (1) Including parking spaces, driveways, loading areas, sidewalks, and other circulation areas and not including building area or any area which will remain completely undeveloped, calculate square footage of the vehicle accommodation area: sq. ft
- (2) Multiply X .20
- (3) Area to be shaded = sq. ft
Add:
- (4) Area shaded by existing trees to be retained in and around the vehicle accommodation area:* sq. ft.
- (5) Area shaded by required screening trees, if any:* sq. ft.
- (6) Area shaded by required street trees, if any: * sq. ft.
- (7) Subtotal=

[If line (7) is greater than line (3), then the shading requirement has been met. If not, go to line (8).]

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- (8) Enter the difference between line (7) and line (3): sq. ft.
- (9) Divide line (8): /707
- (10) Total number of shade trees required within the vehicle accommodation area. trees

*Existing trees retained in compliance with Article 6.2 will be credited according to their actual crown radius. Shaded area may be calculated as follows:

$$3.14 \times (\text{crown radius})^2 = \text{shaded area.}$$

Trees planted within the vehicle accommodation area are credited with shading 707 square feet (based on a crown radius of 15 feet). New or existing trees on the perimeter of the parking lot are credited for having only half a crown over the vehicle accommodation area (e.g., new perimeter trees will be credited for shading 354 square feet, based on 1/2 a crown radius of 15 feet). Generally, all trees planted in compliance with the screening requirements and the street tree requirements of Article 6.2 will be considered perimeter trees. When smaller trees such as dogwoods are planted the credited shading area will be adjusted downward to 314 square feet for interior trees and 157 square feet for perimeter trees (based on a crown radius of 10 feet).

A-4: Typical Parking Lot Planting Islands

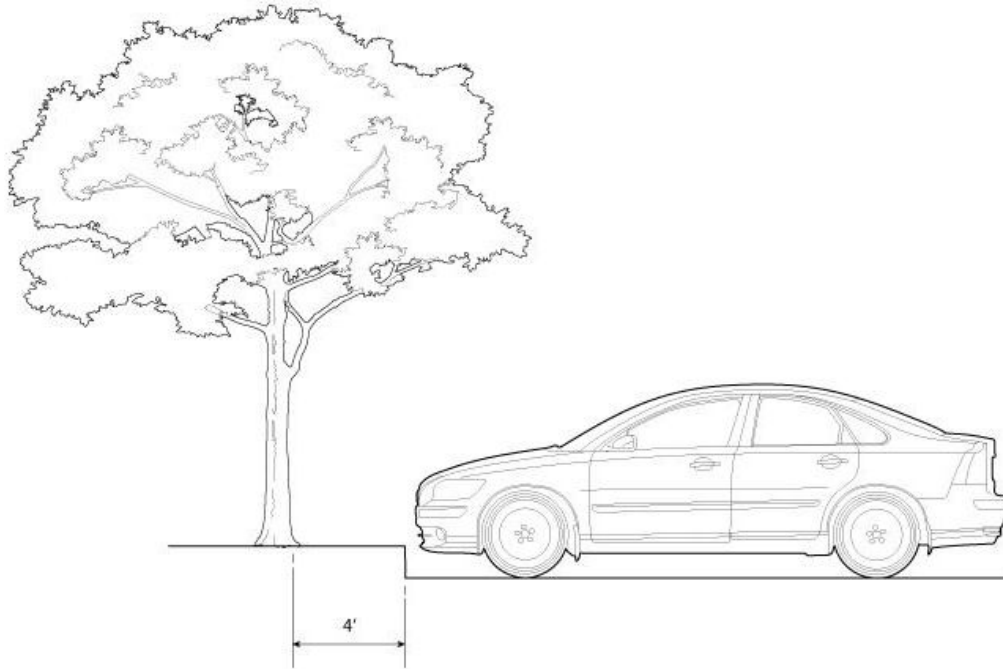


Illustration 1

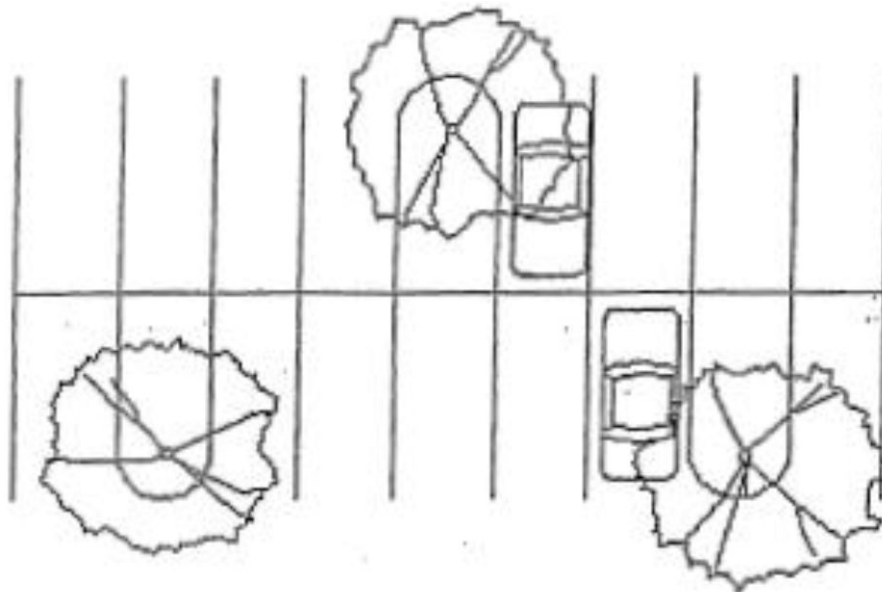


Illustration 2

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A-5: Guide for Planting Trees

The trees recommended in Section A-10 have minimal maintenance requirements. However, all trees must receive a certain degree of care, especially during and immediately after planting. To protect an investment in new trees, the developer should ensure that the following guidelines are followed when planting:

Selection. Select trees well adapted to the microclimates of individual planting sites. A poor tree match dooms the tree from the start no matter how much care is taken in planting.

Planting times. The best times for planting are early spring and early fall. Trees planted in the summer run the risk of dehydration.

Drainage. Prior to planting, test soil drainage. If water does not drain out of a sample planting hole within a few hours, consider installing drainage in the bottom of the hole to drain away excess water. Also consider raising or berming the planting site or adding several inches of good quality topsoil in the planting hole and the surrounding area, but do not simply amend the soil in the planting hole - water movement will be detrimentally altered. If none of the above is possible, select a more water tolerant tree species (red maple, sycamore, bald cypress, willow oak river birch, etc., avoid trees like dogwoods that don't like "wet feet").

The planting hole. The planting hole that is dug should be wide and shallow. A flat, pancake-shaped hole that approximates the shallow, horizontal root growth that the tree will produce is recommended. In average soil, dig the hole only as deep as the root ball, and in heavy clay soil to enhance drainage, dig the hole an inch or two inches shallow. Loose soil should not be put beneath the root ball in order to avoid having the tree end up planted too deep as the soil beneath it settles or compacts. The exposed top of the ball can be covered with mulch. Whenever possible, hole walls should gradually taper up to grade, rather than being straight, to more closely approximate where root growth will occur.

Soil additives. Adding water-absorbing polymers (hydrogels, super slurpers, etc.) to the backfill soil has not proven beneficial in the majority of the landscape research that has been conducted with regard to tree planting. The same is true to adding organic amendments (peatmoss, compost, etc.). In general, the only substitute for backfilling with the existing soil, unamended, is backfilling with better quality topsoil.

Planting near sidewalks, driveways, and other areas. Plant all trees at least four feet from the end of head in parking spaces to prevent damage from car overhangs. When planting near sidewalks, driveways and other areas where tree root surfacing can cause damage or be a maintenance problem, consider installing one of the physical root redirecting barriers being marketed, or try the herbicide treated landscape fabric now available for this purpose (BioBarrier®). No long-term research has yet been published on the use of these tree redirecting materials, so their long-term effect on trees is not yet known.

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Balled and burlapped trees. When planting balled and burlapped trees, closely inspect the material used to wrap the root ball. Many synthetic materials (nylons, etc.) are being used as well as burlaps treated to retard their degradation. When in doubt as to whether or not these materials will degrade underground do not leave them intact. Remove the pinning nails or lacing and roll back the top several inches. Make vertical slits in several places around the ball. You do not want a wrapping material that won't degrade to restrict root growth.

Wire baskets. Research has shown that the wire baskets used to protect root balls, whether galvanized or not, are degrading only very slowly underground due to low oxygen. No long-term root girding or damage has been found, however, so it does not appear that the baskets need to be removed. If the top loops of the wire basket will be at ground level or slightly above, it will be advisable to remove this section to keep equipment from hanging up in the loops.

Ropes. Be sure to remove all ropes, whether jute or nylon, that have been tied around the trunk. Again, degradation is slow or nonexistent, resulting in trunks being girdled.

Containers. Be sure to remove all plastic containers from the root balls of container-grown or containerized trees. If trees have been grown or potted into fiber pots, break away the top several inches of the fiber pot. Many fiber pots are being coated with extra materials to extend their shelf life, but this can slow degradation below ground and retard root extension.

Root care in container plants. When a container is removed, if roots are found circling around the outside of the root ball, cut them in a few places to remove the possibility of the curling root eventually girdling the trunk. Select trees grown in pots with vertical ribs rather than ones with straight walls or horizontal ribs as the vertical ribs help reduce root circling.

Fertilizer. Fertilizer can be added to the backfill if it is a slow-release form - Osmocote®, Woodace® briquettes, tree spikes, etc. The caution in the past against adding fertilizers at planting time was a result of not having slow-release fertilizers available - agronomic fertilizers that were and still can be used in landscaping have the potential to burn and should not be added.

Watering. Good follow-up watering is important to help establish a tree's root system. Several water reservoir devices are available, but may be too expensive or cumbersome to justify using.

Mulching. Trees should be mulched, but not over mulched, when planted. Two inches to three inches of organic mulches, such as shredded or chunk pine bark, or inorganic mulches, such as volcanic rock, is adequate. Keep mulches from touching the trunks of trees. With organic mulches, excessive mulch piled against tree trunks can hold too much moisture against the bark and lead to disease problems. It also may become a habitat for rodents that will feed on the bark. With inorganic mulches, if the tree is in a windy location and the trunk moves considerably, the bark may become abraded by the inorganic mulch.

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Landscape fabrics for weed control. The use of black plastic beneath mulch around trees is not recommended because air and water exchange are blocked. For added weed control try one of the landscape fabrics that has proven more weed root penetration resistant (Dalen Weed-X®, De Witt Pro 5®, weed barrier, etc.) but do not pile too much mulch (not over two inches) atop the fabric or weeds will simply grow in the mulch layer.

Tree staking. Do not automatically stake all trees, especially small ones. If a tree is in a windy location, or has a crown, stake for a maximum of one year. Try to stake so that the tree has a slight amount of flex rather than being held rigidly in place. Use guying or attaching material that will not damage the bark. If the stakes are to be left in place longer than one year to serve as a barrier against equipment, be sure to remove the guying to prevent trunk girdling. A variety of protective devices are available for trunk protection if that is an important consideration.

Tree wraps. The use of tree wraps and other protection materials that are applied directly to the trunk is currently under investigation. If a material is applied (paper, fabric, burlap, strips, etc.), remove it after one year. If materials are wrapped onto the trunk, wrap from the base of the tree upward so that water is shed off the wrap, not funneled under it.

Tags and labels. Remove tags and labels from the trees to prevent them from girdling the trunk.

Post-planting care. Conscientious post-planting care, especially watering, structural pruning and fertilizing, is a must for street and parking lot trees.

Pruning. Proper site planning should remove all need for pruning. Evergreens in particular should not be limbed up as it counteracts their natural aerodynamic design and decreases the aesthetics of the area. Limbing trees up to be able to mow beneath evergreens is not a professional practice. Landscape designs are prepared with the intent that evergreens are left untouched. Deciduous trees should be monitored and properly limbed up to avoid damage to people and vehicles.

Landscape plants and winter salt. The easiest way to prevent salt damage is to avoid it. Whenever possible, use coarse sand instead of salt to provide traction and make sidewalks and driveways less slick. If you must use salt, use it judiciously, and erect barriers with plastic fencing, burlap, or snow fencing to protect sensitive plants and minimize their contact with salt spray.

Deicing Alternatives

Coarse sand

Calcium chloride calcium (CaCl₂)

Magnesium acetate (CMA)

Magnesium chloride (MgCl₂)

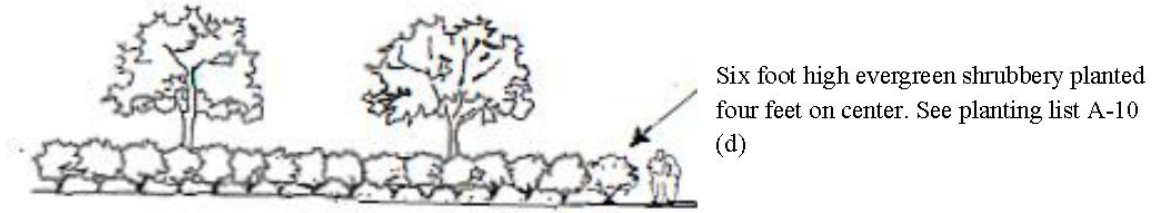
Potassium chloride (KCl)

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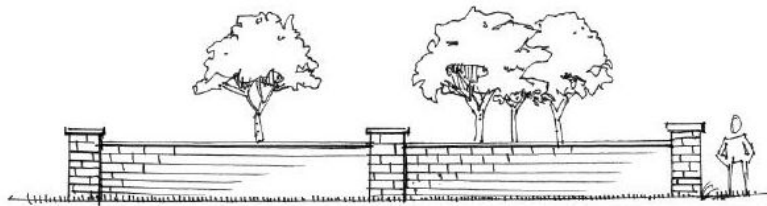
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A-6: Typical Opaque Screens

Small trees planted 30 feet on Center. See planting list A-10.



Large trees planted 40 feet on center. See planting list A-10 (c).



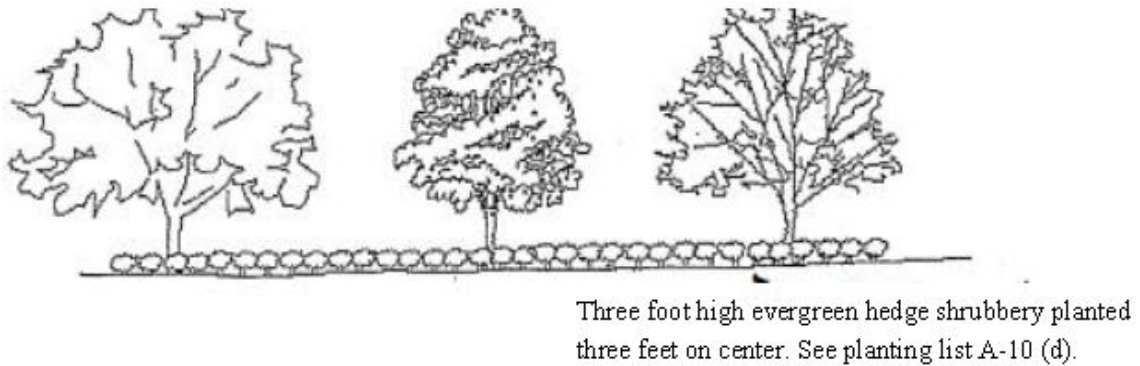
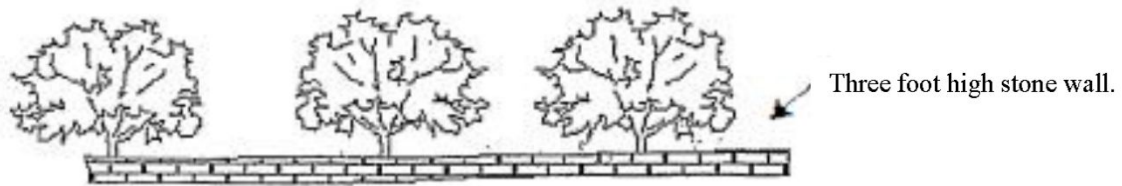
Tall evergreen trees, stagger planted, with branches touching the ground. See planting list A-10 (b).



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A-7: Typical Semi-Opaque Screens

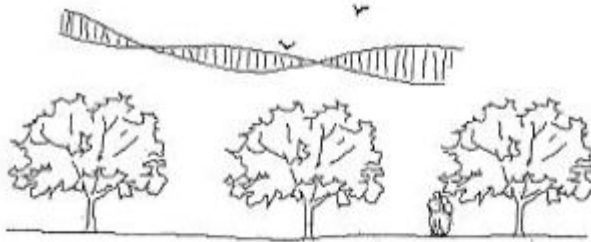
Small trees planted 30 feet on center. See planting list A-10 (a).



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A-8: Typical Broken Screens

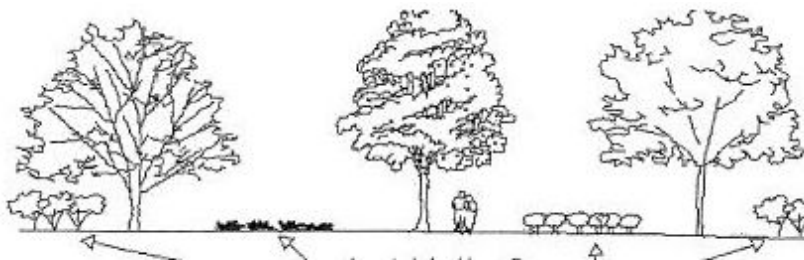
Small trees planted 30 feet on center. See planting list A-10 (a).



Small trees planted 30 feet on center. See planting list A-10 (a).



Small trees planted 30 feet on center. See planting list A-10 (a).



Assorted shrubbery. See planting list A-10 (f).

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A-9: Typical Broken Screens

Shrubs planted for screening purposes should be given a proper culture and sufficient room in which to grow. Many of the guidelines for tree planting listed in Section A-5 also apply to shrubs. However, because specific requirements vary considerably between shrub types, this appendix does not attempt to generalize the needs of all shrubs. For detailed planting information on individual species, refer to:

Manual of Woody Landscape Plants by Michael Dirr

A-10: Lists of Recommended Trees and Shrubs

The following lists indicate native plantings which will meet the screening and shading requirements of § 120-6.2.5 of Chapter 120, Comprehensive Development. The lists are by no means comprehensive and are intended merely to suggest the types of flora which would be appropriate for screening and shading purposes. Plants were selected for inclusion on these lists according to four principal criteria: i) general suitability for the climate and soil conditions of this area, ii) ease of maintenance, iii) tolerance of urban conditions, and iv) availability from area nurseries. When selecting new plantings for a particular site, a developer should first consider the types of plants which are thriving on or near that site.

Sections A-11 through A-16 contain descriptions of some of the trees and shrubs listed here:

(a) Small Native Trees for Partial Screening <30 feet tall

- (1) *Carpinus caroliniana* - American hornbeam.
- (2) *Magnolia virginiana* - sweetbay magnolia
- (3) *Cercis canadensis* - eastern redbud* salt tolerance
- (4) *Cornus florida* - flowering dogwood
- (5) *Oxydendron arboretum* - sourwood
- (6) *Crataegus phaemopyrum* - Washington hawthorn* salt tolerance
- (7) *Chionanthus virginica* – fringe tree
- (8) *Amelanchier canadensis or laevis* - serviceberry
- (9) *Asimina triloba* - paw paw

(b) Large Native Evergreen Trees for Screening >30 feet tall

- (1) *Magnolia grandiflora* - southern magnolia

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- (2) *Juniperus virginiana* - eastern red cedar
- (3) *Ilex opaca* - American holly
- (4) *Pinus strobus* - white pine

(c) Large Native Shade Trees >30 feet tall

- (1) *Betula nigra* - river birch
- (2) *Acer rubrum* - red maple
- (3) *Nyssa sylvatica* - blackgum
- (4) *Gleditsia triacanthos* – “Shademaster” (thornless) honeylocust
- (5) *Liquidambar styraciflua* (male) - sweet gum
- (6) *Ostrya virginiana* - hophornbeam
- (7) *Platanus occidentalis* - sycamore
- (8) *Tilia americana* - American linden
- (9) *Quercus rubra* - northern red oak
- (10) *Quercus phellos* - willow oak
- (11) *Quercus alba* - white oak
- (12) *Quercus coccinea* - scarlet oak
- (13) *Quercus bicolor* - swamp white oak
- (14) *Quercus palustris* - pin oak
- (15) *Quercus prinus* - chestnut oak
- (16) *Celtis occidentalis* - hackberry
- (17) *Taxodium distichum* - bald cypress

(d) Small Shrubs for Evergreen Screening < five feet

- (1) *Ilex glabra* - “Shamrock” or “Chamzin” inkberry holly
- (2) *Juniperus virginiana* - “Gray Owl 2” red cedar

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(3) *Myrica pensylvanica* - “Morton” bayberry

(4) *Leucothoe axillaris* - coast fetterbush

(e) Large Shrubs for Evergreen Screening > five feet

(1) *Magnolia virginiana* - sweetbay magnolia

(2) *Ilex glabra* - “Densa” or other varieties inkberry holly

(3) *Juniperus virginiana* - “Burkii” or “Emerald Sentinel” eastern red cedar

(4) *Myrica pensylvanica* - bayberry

(5) *Myrica cerifera* - southern wax myrtle

(f) Assorted Shrubs for Broken Screens

(1) *Leucothoe fontanesiana* - drooping leucothoe

(2) *Hamamelis mollis* or *vernalis* - common or vernal witch hazel

(3) *Diervilla sessifolia* - southern bush honeysuckle

(4) *Clethra alnifolia* - sweet pepperbush

(5) *Itea virginica* – Virginia sweetspire

(6) *Rhus* - sumac* salt tolerance

(7) *Ilex verticillate* - “Sprite” female < four feet tall - winterberry holly. Need one male “Jim Dandy” per six females.

(8) *Cornus sericea* and cultivars - red twig dogwood

Note to avoid the following plants: Leyland Cypress, Callery Pear, Crape Myrtle, knockout roses, and arborvitae (though native, requires extensive spraying maintenance for bagworms).

The following tree information is intended as an example of the information available and for research purposes and not necessarily recommended for the project at hand.

A-11: Small Trees for Partial Screening

The following trees are recommended for use in all types of screens. Though smaller than the trees listed in planting lists A-12 and A-13, each of these trees will reach a height of at least 20 feet.

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American hornbeam (*Carpinus carolinia*). Height 20 feet to 30 feet; spread: 15 feet to 20 feet. This native tree has a natural yet refined appearance. It is slow growing, but at maturity it serves as an excellent small shade tree. Its fluted muscular trunk is an interesting feature. In the wild, the American hornbeam is common in moist rich soil, yet, when used in landscape design, it is soil tolerant and does not require an unusual amount of water. It has no pests and no special maintenance problems.

A-12: Large Trees for Evergreen Screening

The following trees are ideal for screening large scale areas such as shopping centers and industrial sites. They are also effective in combination with other smaller screening plants. Both are moderate to fast growers. They are not considered to be shade trees.

Southern magnolia (*Magnolia grandiflora*). Height 40 feet to 60 feet; spread: 25 feet+. Magnolias are striking trees which serve well as screens when their branches are allowed to grow to the ground. Generally, this tree does well in city conditions, but it should be planted in quite rich acidic soils and it requires a lot of moisture. Furthermore, magnolias require ample space for growth. If planted in full sunlight, they will grow rapidly. Because it drops large waxy leaves, seed pods, and flowers, the magnolia may present a litter problem.

A-13: Large Trees for Shading

The following trees may be used for screening, but they are recommended especially for shading streets and parking lots. Unless otherwise noted, they will grow rapidly. Each species will attain a mature spread of at least 30 feet.

Honey locust (*Gleditsia triacanthos* “shademaster” or other thornless variety). Height: 50 feet to 75 feet; spread: 25 feet+. Its open, spreading form and feathery leaves may give the honey locust a frail appearance, but it is fact a quite sturdy tree, notable for its resistance to storm damage. It is a native tree which is drought resistant and adaptable to city conditions. Grass and shrubs thrive beneath a honey locust because it casts light shade. This tree is especially useful for its ability to be transplanted at a relatively advanced age. Accordingly, it may be used for immediate effect in a landscape design. The honey locust has its pests and diseases, but it is fairly hardy. Thornless and fruitless varieties such as “moraine” are recommended.

River birch (*Betula nigra*). Height 40 feet to 70 feet; spread: 40 feet to 60 feet. The river birch is a native tree which usually grows along stream banks. In landscape design, it is adaptable to either high or low locations, but still requires a lot of moisture. This tree has an interesting papery bark and a graceful branching habitat. It has no special pest or maintenance problems. Surface roots keep it from being a good tree for restrictive areas like parking lots.

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A-14: Small Shrubs for Evergreen Screening

The following shrubs are recommended for informal (unclipped) hedges or screens. Each species grows to a height of less than six feet; therefore, these shrubs are appropriate for semi-opaque screens.

Inkberry holly (*Ilex glabra* “Shamrock”). Height to three feet to five feet tall by a spread of three feet to four feet wide. An evergreen little-leafed holly that grows as a slow-growing upright holly that is stoloniferous (spreading but not aggressive, easily removed). Easily grown in average, medium to wet soils in full sun to part shade. Adaptable to both light and heavy soils. Tolerates wet soils. Prefers rich, consistently moist, acidic soils in full sun. Good shade tolerance, however. Prune to shape in early spring just before new growth begins. Plants generally need minimal pruning.

A-15: Large Shrubs for Evergreen Screening

The following shrubs are recommended for high hedges or screens. Each species grows to a height of more than six feet; therefore, these shrubs are appropriate for opaque screens.

Emerald Sentinel red cedar (*Juniperus virginiana* “Emerald Sentinel”). Height to 30 feet to 40 feet by eight feet wide. An evergreen, upright, narrow selection of eastern red cedar with bright green foliage. This is a female, fruiting cultivar that is deemed to have superior disease resistance and is considered one of the toughest plants in the nursery trade. Tolerant of most conditions. Suitable substitution for hedgerows where arborvitae may be inappropriate. Eastern red cedars have exhibited slight tolerance to salt.

A-16: Assorted Shrubs for Broken Screens

The following is a sampling of shrubbery that would be appropriate in a broken screen. Because many of these plants are deciduous, they are not suitable for opaque and semi-opaque screens. (Note: Many of the evergreen shrubs described in planting lists A-14 and A-15 are also suitable for broken screens.)

Fringetree (*Chioanthus virginicus*). Height: 10 feet to 30 feet by eight feet to 10 feet wide. The fringetree is known for its profusion of beautiful flowers in spring. It is considered to be one of the most striking Native American shrubs. It is relatively difficult to transplant, but once established it does well in cities as it endures heavy smoke and dust. The only drawback is that its leaves appear rather late in spring.