Prepared by
the Omaha City Planning Department

STANDARDS FOR URBAN LANDSCAPING

for the City of Omaha, Nebraska

C3-86-141

ORDINANCE NO. 31126

AN ORDINANCE to adopt the Standards for Urban Landscaping and to provide the effective date hereof.

WHEREAS, after Public Hearing, the Planning Board of the City of Omaha did, on August 13, 1986, recommend adoption of the Standards for Urban Landscaping as part of Chapter 55 of the Omaha Municipal Code, entitled "Zoning".

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF OMAHA:

Section 1. That the Standards for Urban Landscaping attached hereto and made a part hereof by reference, is hereby adopted as the Standards for Urban Landscaping and a part of Chapter 55 of the Omaha Municipal Code.

Section 2. The Standards for Urban Landscaping may be supplemented, changed and amended after appropriate action by the Planning Board and adopted by the City Council as provided by law.

Section 3. That this Ordinance shall be effective concurrent with Ordinance No. 30918, adopting the new Chapter 55.

INTRODUCED BY COUNCILMEMBER

Steve H. Jomaseko

APPROVED BY:

Michael Boyle 11/26/86

MAYOR OF THE CITY OF OMAHA DATE

PASSED NOV 25 1986 6-0

ATTEST:

DEPUTY Krista Brown

CITY CLERK OF THE CITY OF OMAHA

APPROVED AS TO FORM:

Allen P. Brown

asst. CITY ATTORNEY

L

STANDARDS FOR URBAN LANDSCAPING

for the City of Omaha, Nebraska

City of Omaha, Nebraska
Bernie Simon, Mayor

Report No. 238
Prepared by
the Omaha City Planning Department
Martin H. Shukert, AICP, Director
February 1987
Reprinted April 1990

Acknowledgments

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Report No. 238

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Introduction

In the past, City ordinances have contained very generalized landscaping and open space requirements. These regulations, oriented mainly toward the establishment of bufferyards and parking lots, were open-ended and subjective in nature. This resulted in inconsistent requirements for quantity of materials and open space. Emphasis varied as boards and councils changed.

The Standards for Urban Landscaping were developed to support new Zoning Ordinance regulations which are more specific in regard to landscaping and permeable area requirements. The establishment of more specific requirements carries with it the need for a uniform set of standards. By presenting these requirements and guidelines in a consistent manner, we can help to minimize subjectivity, retain design flexibility, and expedite the review process. This also provides a consistent way for staff and boards to regulate development.

It is intended that the establishment of this Zoning Ordinance and supplementary Standards will encourage the ethic that landscaping, open space and landscape preservation are integral parts of the development process. This goal is primary to the continuing improvement of the quality of life in Omaha.

I. SUBMITTALS

APPLICATIONS

Landscaping is currently required by the City for the following requests:

P-1 Parking lot permits and plans
All rezoning requests
Outdoor auto displays
Planned Unit Developments (P.U.D.s)
Special permits

The new Zoning Ordinance, approved by the City Council on November 25, 1986, also will require landscaping plans for new development in most zoning districts. In addition, most requests for a more intensive land use will require landscaping and screening plans.

PLANS

When landscaping is required, a plan must be submitted to the Planning Department as part of the application. An applicant should submit three legible copies of the plan at the time of application. In order to speed the review process, some basic guidelines should be followed regarding the submitted plan.

Submittal Guidelines

Plans should be drawn by a professional experienced in preparing landscaping plans. We recommend retaining the services of a registered landscape architect. A wide range of information is required for the Planning Department staff to provide a full review.

- All items related to the project should be indicated graphically and labelled clearly. This includes: property lines, easements and other pertinent boundary lines; utilities and utility easements; adjacent and intersecting streets (including street names); proposed and existing structures, walks, drives, parking areas, and any other man-made structures, such as fences and retaining walls.
- An arrow indicating north orientation for the site, as well as an indication of the scale at which the plan is drawn. Most often landscaping plans are drawn at 1 inch = 10 feet or 1 inch = 20 feet. Larger sites are acceptable with 1 inch = 50 feet or 1 inch = 100 feet.
- When necessary, existing and proposed contours should be provided. Proposed contours should be drawn with a solid line, existing contours drawn with a dashed line. A one or two foot contour interval is recommended; however, in some cases a five foot interval will suffice. We recommend that you retain the services of a certified surveyor or civil engineer to survey the site.
- Indicate proposed plantings by location, scientific name, common name, quantity, planting size, and planting method. A plant list should be provided listing this information and keyed to plant locations on the plan. It is advisable to locate and identify existing plant materials and indicate whether or not they are to be removed. The new Zoning Ordinance for the city provides bonuses for preserving certain existing trees. If you are seeking such a bonus under these provisions, the plants to be preserved should be indicated on the plan by botanical name and variety, common name, size and location. Each plant to be preserved should be clearly indicated as such.

Note: Other information that might be required: drainage patterns, unique natural or manmade features, and planting and construction details.

II. STANDARDS

DESIGN STANDARDS AND GUIDELINES

Certain design guidelines, including requirements stated in the Zoning Ordinance, are basic to the success of a landscaping design. The physical requirements of each plant also have a direct bearing on the outcome of a design. The following guidelines will aid in the creation of a successful landscaping project.

Zoning Ordinance Requirements

The landscaping requirements and provisions, as outlined in Articles Thirteen and Fourteen of the City of Omaha's Zoning Ordinance, apply to most development projects.

- Plantings should be designed and installed so they do not interfere with the visibility or safe use of any bicycle, pedestrian or vehicular trafficway or intersection.
- An average of one tree must be planted per 500 square feet of required landscaped area.
- Plants that will directly interfere with underground or above-ground utilities, easements, drainage systems, or rights-of-way, either City or privately owned, will not be approved.
- Interior landscaping in parking lots must equal a minimum of 5% of the total paved area.
- Screening when required, must attain the minimum required height (usually 6 feet) within three years of installation. Parking lot perimeter screening must attain a height of 4 feet within one year.
- Other requirements may apply to specific sites and zoning districts. Please refer to the relevant sections of the City's Zoning Ordinance.

General Requirements

There are a few rules basic to every project, and of primary importance in the administrative approval process.

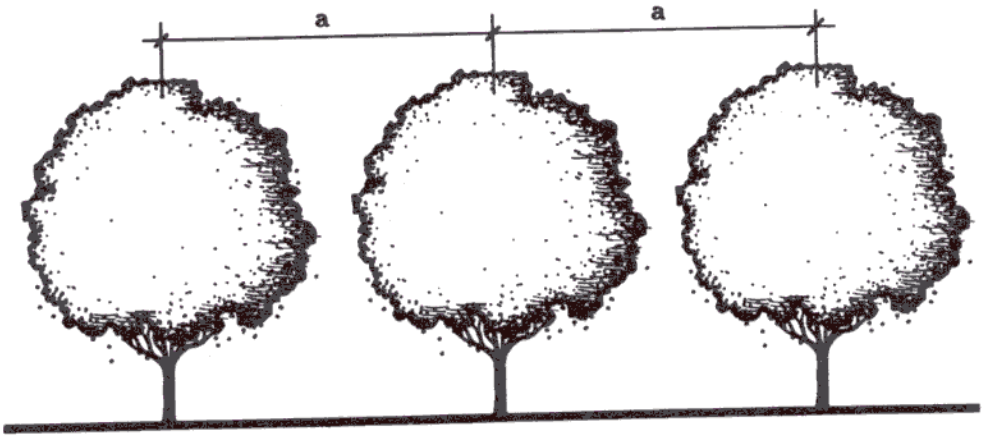
- Plant materials should be chosen from the lists contained herein, or should be approved by the Planning Department.
- All new plant materials should conform to "American Standard for Nursery Stock," as sponsored by the American Association of Nurserymen, Inc.
- "Landscaping" consists of approved trees, shrubs, ground covers, vines, grasses, or any other plant. Up to 35% of the required landscaped area may be brick, stone, or aggregate. Grass unit pavers, installed such that the appearance is primarily that of plant material, may also be considered landscaping.
- Planting should take place when conditions are suitable for the survival of the plant material.
- Every effort should be made to provide each new or preserved plant and its root system with a suitable environment for growth. This includes continued maintenance, proper drainage, and suitable unrestricted growth area.

Plant Arrangement and Screening Guidelines

Four factors have a direct impact on the physical survival of a design: the spacing of plants from one another and from manmade site elements; the growth area provided to the entire plant; the sizes of plants when installed; and the density and arrangement (relative screening) of buffers. Each of these factors are directly related to the others.

- Trees and shrubs should be spaced a distance of one-half to two-thirds the mature (assumed) crown spread from each other, or from buildings or walls. See Figure 1 for a further explanation of plant spacing.

  Above grade, all parts of a plant should be allowed to grow unrestricted. Most plants can tolerate being planted close to buildings, walls, fences or each other—about one-half to two-



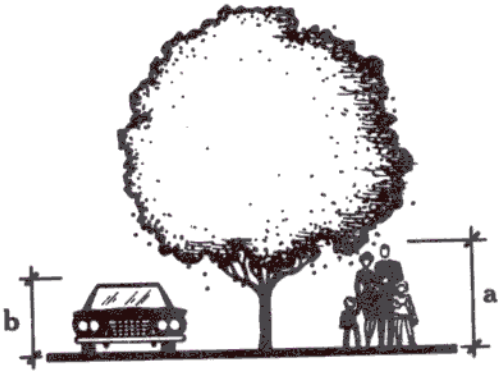
Distance "a" is equal to 1/2 to 2/3 of the mature crown spread, from center to center. With two different species (different form), average out the crown spread.

Fig. 1. Plant Spacing

thirds of their assumed mature spread. Vertical elements such as sign posts or lights are not so much a problem for the plant, but more of visibility of the sign or light. Trees that might eventually grow into power lines should not be planted.

Clearance and visibility requirements are pertinent to public safety and, therefore, are primary to a design. Branching clearance usually must be "forced" through pruning or planting trees closer together at the nursery (this causes the formation of higher branching). Some trees, however, do have naturally higher branching. Figure 2 illustrates branching clearances for different situations.

The table and illustration in Figure 3 give distances and locations of restricted planting areas—areas where only plants that achieve a mature height of 30 inches are allowed. Large trees, with branching clearance of 10 feet or more, are allowed in certain cases.



Required clearances

a 8′ - minimum, general
b 12′ - residential areas
15′ - major streets

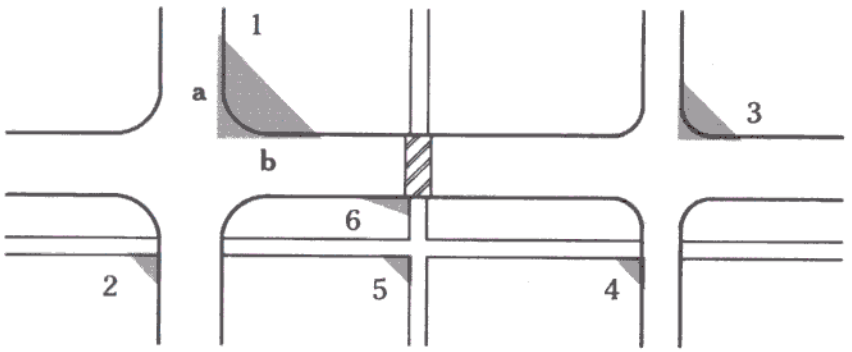
Fig. 2. Branching Clearance

- Plants should be installed in accordance with the "planting size" given in the plant list that accompanies these standards.

Sizes of trees (except coniferous) are stated in caliper (diameter), by inches, taken 6 inches up from ground level. A tree over 4 inches in diameter will be measured 12 inches from ground level. Conifers are sized by height. Shrubs are sized by height, ranging from 12 inches to 4 feet. Ground cover plants and vines are usually sized by the containers they are sold in, such as 2-1/2 inch pots, gallon containers, or sold in flats, with 24 plants to each flat.

Refer to the plant lists starting on page 16 for mature sizes of plants. Note: Plants under urban stress usually attain only 60% to 80% of their mature size. This is *not* reflected in the sizes given on the plant list.

The table in Appendix A will aid in determining spacings for shrubs and ground covers. These numbers may need to be adjusted to accommodate screening requirements. Screening, when required, takes precedence over other aspects of the design. Required screening (regarding height and opacity) must be achieved within three years of planting (one year for parking lot screening).



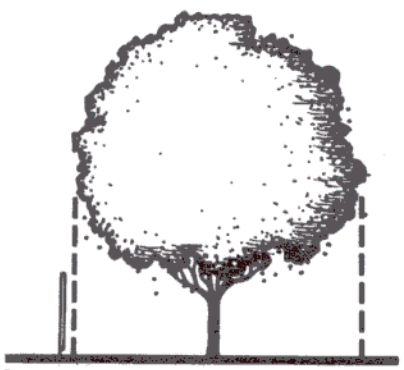
	a	b
1. street-street	30′ (<45 mph), 45′(>45 mph)	30′ (<45 mph), 45′ (>45 mph)
2. street-sidewalk	5′	5′
3. street-alley, drive	15′	15′
4. alley-sidewalk	5′	5′
5. bike path-sidewalk*	10′	10′
6. bike path-street*	10′	15′ (<45 mph), 25′(>45 mph)

*These situations may require additional safety measures such as signs or pavement warnings.

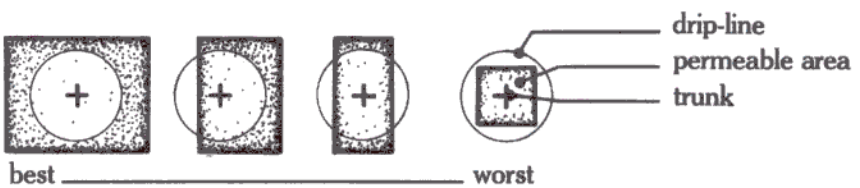
Fig. 3 Restricted Planting Areas

- Two things become important with regard to the amount of growth area given to plants. First are those aspects that relate directly to plant physiology, such as permeable surface area, root-growth area, and allowed vertical and horizontal space above grade. Second are those aspects that relate to public safety and convenience, such as clearance for safe passage and visibility.

  Permeable surface area around a plant is pertinent to its survivability. The fibrous surface roots aid in needed gas and nutrient exchange. As a general rule, permeable surface area should extend out to and possibly past the dripline of the plant (See Figure 4).



Locate fence just outside drip line.



The more permeable surface outside the dripline, the better off the plant.

Fig. 4. Permeable Surface/Area of Protection

Root growth area, consisting of a suitable growing medium and appropriate drainage, should be provided based on the type of root system the plant has (i.e. if the plant usually forms a taproot, a deeper root growth area will be needed). The recommended general root growth area is noted in the tree lists starting on page 16. Some shrubs can tolerate as shallow as one to two foot depth.

- Plants of different heights, shapes, and density will provide different degrees of screening. Figure 5 illustrates how various arrangements can serve to screen and buffer in various ways. The three main types of screening are bufferyard, parking lot interior, and street or right-of-way screening.

Bufferyard screens are the most common type required. The "yard" is usually the landscaped area between two potentially incompatible uses. Most often an opaque screen is required, as in the use of a dense hedge or a fence. In general, screening is related to sight lines; however, it can be used occasionally to buffer noise and reflected heat. Lower level filter-type plantings serve as suitable buffers to parking lots. Small trees—in combination with low level shrubs, or larger trees, including conifers—serve this purpose well. Grade changes such as berms or retaining walls also aid in buffering.

Interior landscaping of parking lots is required not only to reduce reflected heat from pavement, but also to buffer reflected heat from buildings. Any reduction in reflected heat and glare, in addition to aesthetic improvements, makes parking lots more tolerable. Each unenclosed parking lot should provide an interior landscaped area equal to no less than 5% of the total paved area of the lot.

Street planting, through rarely opaque, provides filtered screening between pedestrians and traffic. Street planting is usually done with larger deciduous trees, also providing upper-level screening of taller buildings. Tall trees in most situations will provide this type of screening.

Note: Solid, opaque screening is only recommended in cases involving severe land use conflicts. Usually a broken or filtered screen is a more appropriate solution.

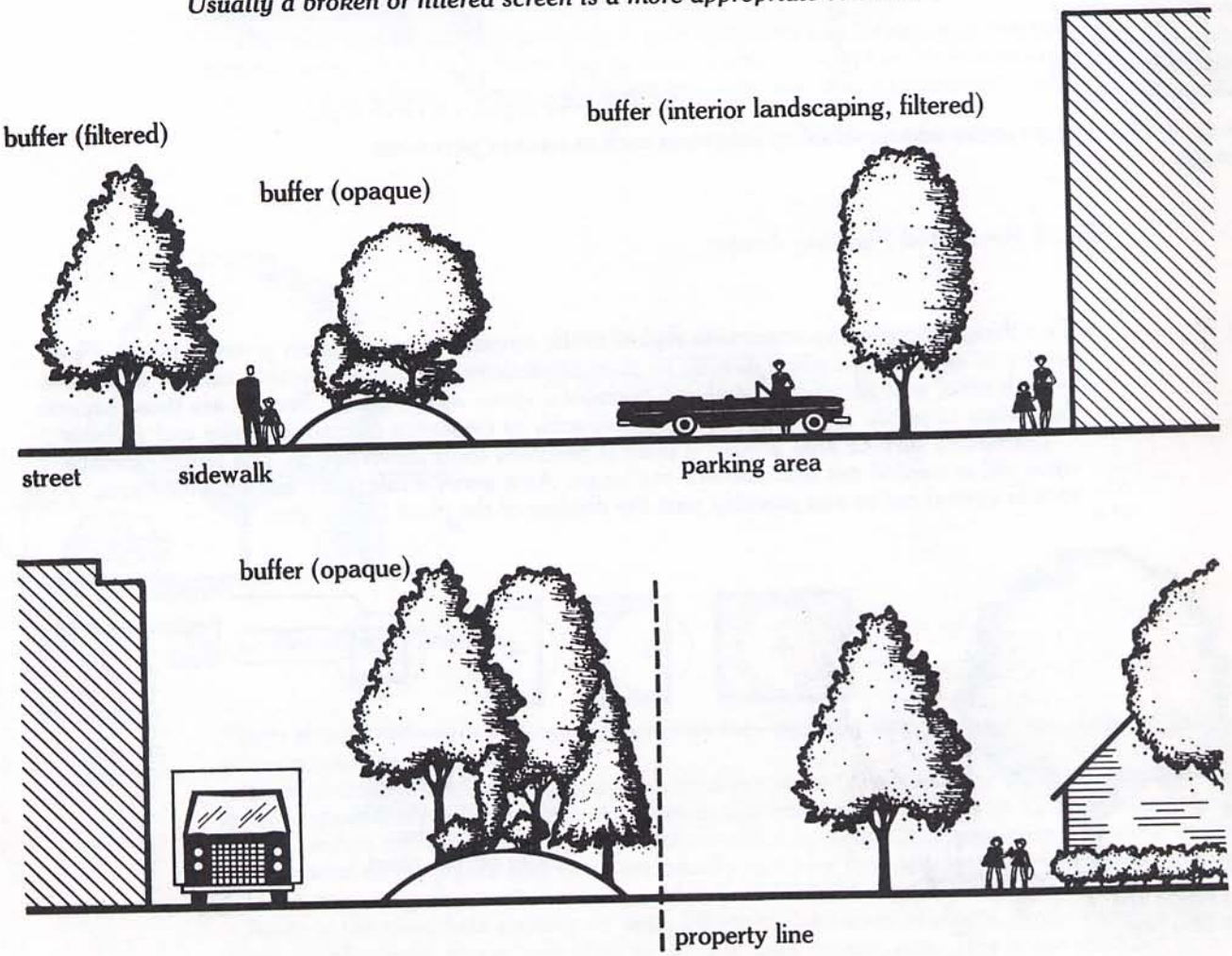


Fig. 5. Screen/Buffer Arrangements

Maintenance Guidelines

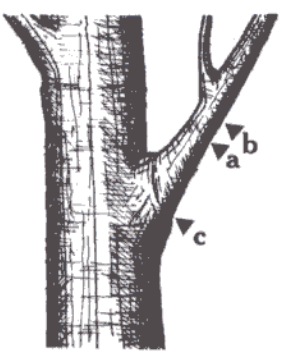
All plant materials require maintenance of some kind, whether it be spraying with insecticide twice a month, or watering once a week. Regular pruning of dead or diseased branches, and applications of fertilizers or soil modifiers, are some of the other maintenance concerns that may be necessary. Standards established in this document are meaningless without good maintenance.

- Each plant requires different types and frequency of health care. Plants in stressful situations may require more care and more frequent inspections.
- As long as the plant is installed according to an approved or recommended procedure (see Appendix B), a minimum amount of maintenance should be performed.
- A few maintenance items can be performed initially to help give the plant a good, strong start after transplanting.

  On trees and shrubs, about one-third of the crown mass should be pruned out at the time of planting. This will give the roots a chance to strengthen themselves. Prune out major branches by cutting as close to the branch collar as possible. Figure 6 illustrates the correct procedure for pruning.

  Always use clean sharp tools, and make all cuts at an angle (or vertical) to the ground plane, so they will not hold water. Remove all broken, dead, diseased, and overlapping branches, but remember to try to retain the "natural" shape of the plant. Never remove the central leader of a tree. Wrap tree trunks in tree crepe to protect against wind and sunburn. Water and fertilize all newly installed plants according to the directions of the nursery, or what is required by the City. Occasionally, protection is required for newly installed plants in the form of barrier fences, staking for support, or warning signs. These items are specific to each individual project.

  Following the installation details included in this report or other approved installation procedures will help assure a minimum of transplant shock.



a. notch to prevent stripping of bark

b. second cut, majority of branch

c. third cut, away from bark ridge, at collar

Fig. 6. Pruning

Preservation Guidelines

Existing trees and shrubs as well as other plantings are often a valuable asset to any project. They add variety and maturity to a landscaping project, in addition to providing a bonus toward City landscaping requirements. (See Sec. 55-718(d), of the City of Omaha Zoning Ordinance for an explanation of Bonus Provisions.)

Any unnecessary damage to an existing plant marked for preservation could be cause for rejection or replacement of the plant. Plants to be preserved should be noted on the plan, along with the procedure to be used for protecting these plants during construction. It is advisable to retain the services of an experienced plantsman, such as a landscape architect, arborist, or nurseryman, to determine the health and life expectancy of an existing plant.

- The primary area of protection, aside from the actual plant itself, is generally that ground area inside the drip line of the plant. This area, however, depends somewhat on the root system type (shallow, deep laterals, tap). A fence or barrier, located as indicated in Figure 4 on page 9 will discourage people from using this area as storage for construction materials. This area should also be protected from vehicles, dumping and grading. (A grade change, fill or cut, of as little as 6 inches, within the drip line, could kill the plant).

Grading Guidelines

Two types of grading are often used to supplement the visual and physical aspects of a landscaped area. The first, referred to as berms, add interest and variety. The second, terracing, is used in most cases to improve the appearance and maintenance requirements of a steep slope.

- Slope ratios of berms and other sloped areas should not exceed 1 foot vertically for every 3 feet horizontally (3:1), for purposes of maintenance. Occasionally, slopes of 2:1 may be appropriate, if planted correctly. See Figure 7 for an example of a berm and appropriate plantings.
- Terracing is a suitable alternative for an area where a berm will not work. See Figure 7 for an illustration of a terracing solution. Terracing will also provide a maintainable surface that may have been too steep had a berm or slope been incorporated.

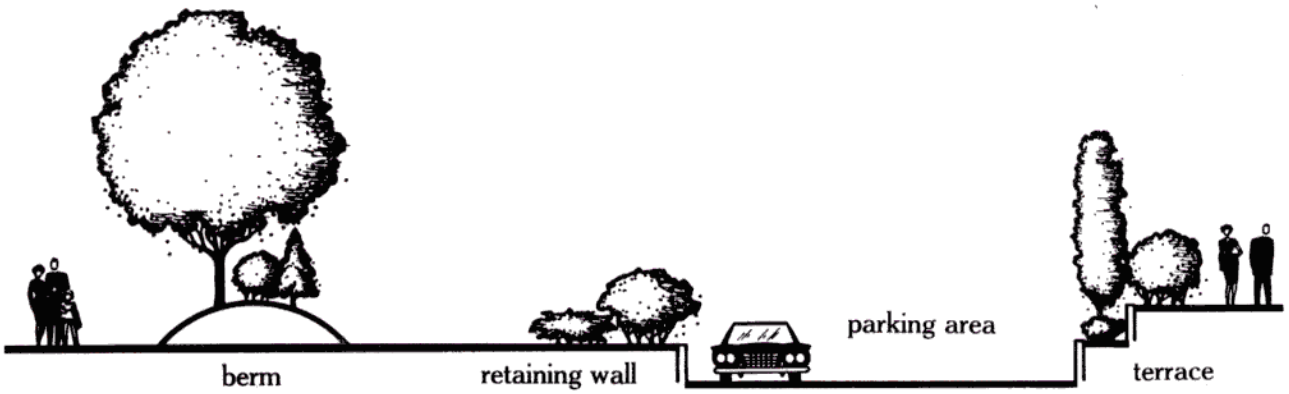


Fig. 7. Grading Buffers

RECOMMENDED PLANTS

The plant lists offered here provide a wide choice of trees, shrubs, and ground cover plants and vines, suitable to this climate. Most of the listed plants will require very little maintenance. Only a few can be considered rare or hard to find. If a plant is not in stock at a local nursery, the nursery can usually order it from a wholesaler or another retail nursery.

The information is general and based on data provided by a variety of sources, including local examples. Numerous lists are available through local libraries or university and county extension services, for example, and the reader may encounter discrepancies when using more than one list. In reality, each individual specimen will perform differently, depending on a variety of factors. The information in this list (and in other published plant lists) does not, however, guarantee survival of any plant.

The lists contain two types of plant information:

a. Physical Characteristics - provided as an aid to design and survival of the plantings.
b. Plant Use Factors - providing information on appropriate uses of the plant, recommended and required sizes and spacings, and tolerances to urban environmental hazards.

Note: Additions, deletions, and various changes in data will take place based on new information and actual plant performance in the field. Where the information for a certain category is not provided, the plan can be considered experimental in that category (not yet proven one way or another), or that the information was unavailable at the time.

Trees

The list provided here offers a variety of trees suitable to different situations. A list of regionally hardy trees would actually be longer. However, we have limited the number of those requiring a medium to high level of maintenance, or that may be difficult to find commercially. The following information is provided in the tree list.

Physical Characteristics

This information is based on averages. Size, form, and habit will vary depending on site specifics such as climate and maintenance, and on nursery and delivery treatment and care.

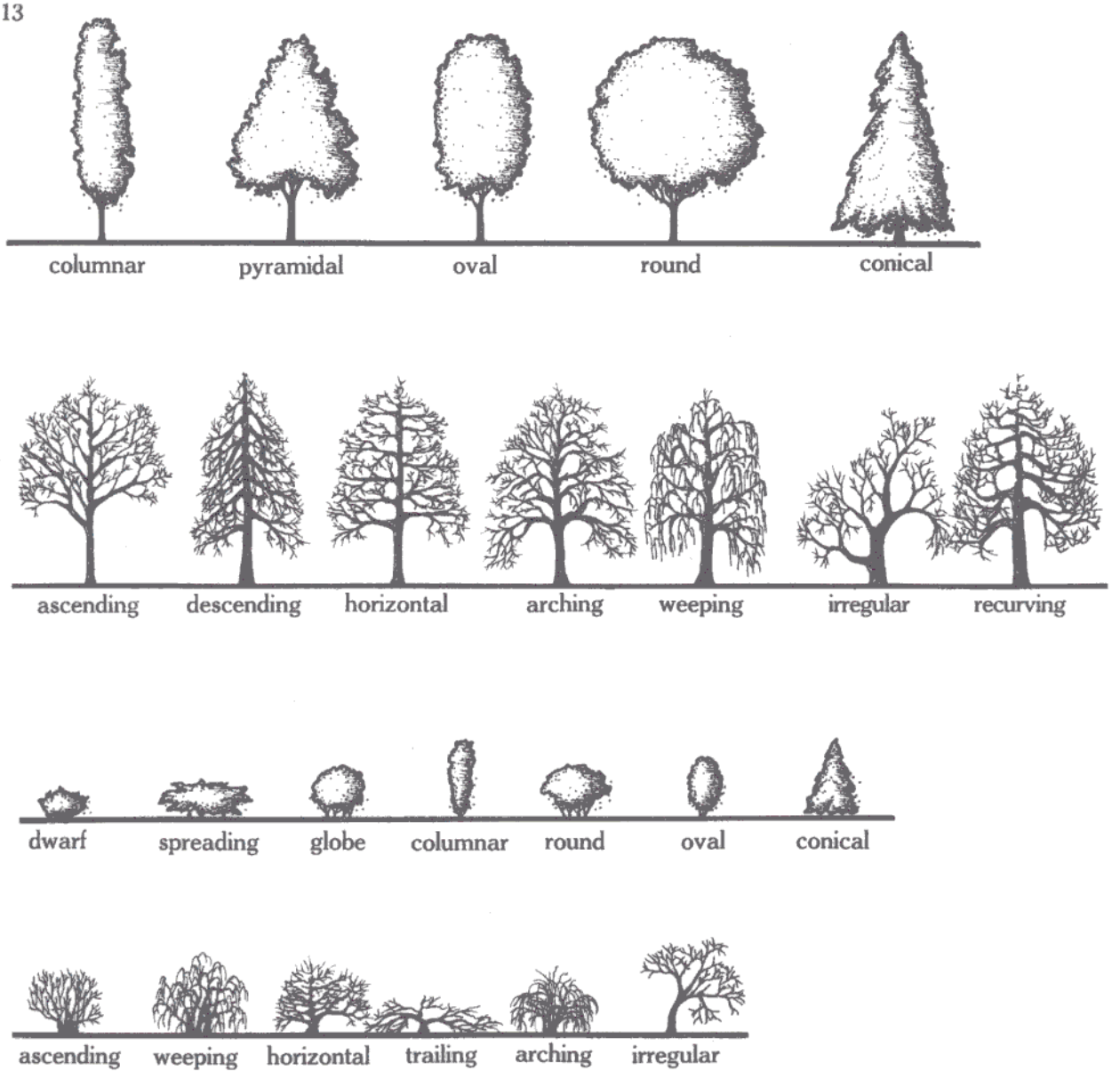


Fig. 8. Form and Habit for Trees and Shrubs

Generally, the harsher the conditions, the more variable the plant performance.

Height, Spread, Form and Habit - Height and spread are given in feet. Form and habit are based on the average shape and branching pattern of mature specimens. Figure 8 illustrates the possible forms and habits of trees and shrubs. Where more than one form type or habit type is provided, this indicates a change from one to the other as the plant matures. For example, Scotch Pine is listed as "conical-oval/horizontal". This indicates that the form changes from conical to oval as the plant matures.

Sun and Shade - This category gives information on sun and or shade tolerance or suitability for each plant. This is indicated by the following symbols:

○ - best in full sun.

◒ - best in part sun, part shade.

● - best in full or predominantly shaded areas.

Root Zone - This category is provided to help determine ease of transplanting (trees with taproots are more difficult to transplant), area of protection (depth and diameter) for existing trees to be preserved, and general area of root growth. This will be indicated by:

S - shallow roots, fibrous surface roots, often extending out beyond the drip line.

D - deep, coarse, lateral roots, often accompanied by a minor taproot.

T - major taproot, transplant only when young.

Trees with deep lateral roots and taproots are usually more tolerant of drought and soil compaction. Existing trees to be preserved must be protected, based on their root system type. Protection of surface area around preserved trees should be calculated as follows:

Shallowroots - 1 1/2 times the existing crown diameter.

Deep lateral roots - 1 foot beyond the drip line.

Taproot - 75% of the crown diameter.

Where existing trees have grown in restricted areas, these calculations should be adjusted.

Depth of suitable unrestricted root growth area to be provided for new tree plantings will vary. Shallow root systems can survive with a minimum depth of 4 feet; deep lateral systems with about 8 feet; and taproot systems about 15 feet.

Plant Use Factors

This information is provided to aid in determining uses for different types of plants. This is also where recommended and required plant sizes and spacings can be found.

Buffering Density - This category is based on seasonal opacity of the plant. The following classifications were used:

E - excellent; *evergreen plants only,* year-round opacity.

G - good; deciduous, dense leaf and branching habit, long leaf season.

F - fair; deciduous, open branching and leaf, early leaf drop.

P - poor; deciduous, open, irregular habit, early leaf drop.

Urban Business District (UBD) Suitable - This refers to suitability to the typical environmental impacts and situations encountered in urban business districts. To be considered suitable, a tree should exhibit most of the following qualities:

a. Some tolerance to snow-melting salts.
b. Tolerant of drought and reflected heat.
c. Tolerant of air pollution created by autos.
d. "Low" maintenance level classification.
e. Naturally (or induced) high branching habit, or tolerant of pruning to provide this.
f. Does not drop excess "litter," e.g. large leaf, fruit, seed.

This information is based solely on local performance. Information provided in the "Urban Tolerance" category (page 15) is based on current data gained from plant physiology studies, and observations of plant performance in similar situations in other cities. The reader may note some discrepancies between these two categories.

Recommended Planting Size - This information is given as height (feet) for coniferous trees, and caliper (inches) for deciduous trees. Caliper is the trunk diameter measured 6 inches up from ground level (trees up to and including 4 inches cal.) and 12 inches up from ground level (over 4 inches cal.).

Two sub-categories are provided here—minimum, and bonus. Minimum planting size is that size at which the plant is considered acceptable to meet the planting requirements of the Zoning Ordinance. Bonus size is that which is required to meet the Bonus Provisions of Section 55-718(d) of the City Zoning Ordinance. This is also the minimum required size of an applicable "preserved" tree. Figure 9 illustrates size determination.

Recommended Spacing - This category is also divided into two subsets; screen spacing and street spacing. Screen spacing should not be confused with required screening—as defined in Section 55-717(b) of the City Zoning Ordinance. (Required screening is generally more applicable to shrubs, and therefore is included on the Shrub list). Recommended spacing for tree screening is simply that spacing at which the trees will grow together sufficiently to provide some screening.

Spacing is determined, generally, as one-half the mature spread for screening, and two-thirds the mature spread for street tree plantings. These may occasionally need adjustment on a site-specific basis. They are to be considered recommendations; other arrangements (random, less formal, for example), should "average out" to the above calculation. Where more than one species is used, resulting in different-sized trees, spacing should be calculated the same way, using the average mature spread of the two adjacent trees.

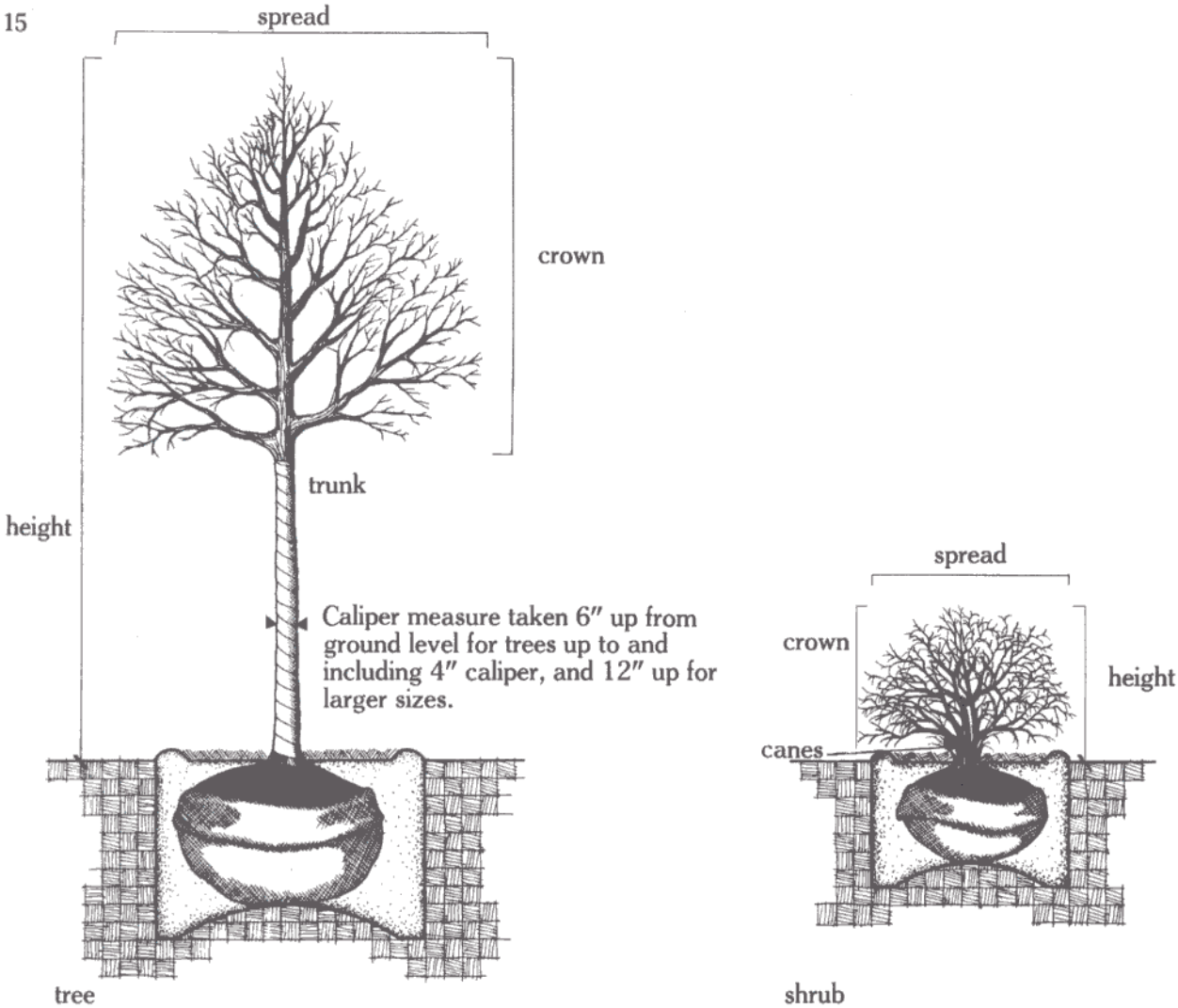


Fig. 9. Size Determination for Trees and Shrubs

Maintenance Level - This is evaluated on the basis of susceptibility or tolerance of diseases and pests, and moisture, fertilizer and soil requirements. The following classifications were used:

H - high level maintenance, susceptible to a variety of diseases and/or pests, involving extensive or consistent maintenance. Not allowed where this will not be provided.

M - medium level maintenance, susceptible to some disease and/or pests, involving seasonal treatment. Not allowed where this will not be provided.

L - low level maintenance, generally free of problems, requiring only average watering, pruning and fertilizer.

Urban Tolerance - This information is provided on the basis of tolerance (T) or sensitivity (S) to any of the following:

a. Salt - in reference to salts used to melt ice and snow.

b. Drought/heat - reflected heat from pavement, buildings and windows can scald bark, dry out leaves, and cause the plant to lose valuable water. Hot summer winds or exhaust from vents can cause similar problems.

c. Soil compaction - soils under pavement and buildings are more compacted and therefore have less available air and water space. Soils are also compacted, for example, by construction vehicles and storage of construction materials.

d. Night lighting - street lights, parking lot lights and lit signs all produce enough light to impede the growth of some plants (plant growth takes place mainly during dark hours). This information should be used with caution, as research into this area is new and inconclusive.

e. Air pollution - major concerns are those pollutants produced by auto exhaust, and particulates such as dust and soot, which can clog leaf stoma (pores).

Trees — Evergreen

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	Root Zone	PLANT USE FACTORS: Buffering Density	UBD Suitable	Rec. Planting Size: Minimum	Bonus	Rec. Spacings: Screen	Street	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Abies concolor White Fir	50′	30′	conical horizontal	◒	S	E	No	4′	8′	15′	NA	Low	S	S	S		S	
Juniperus chinensis Chinese Juniper	20′	8′	columnar horizontal	○	S	E		5′	8′	4′	NA	Low	T	T			T	Do not plant near hawthorns or crabapples. May require spraying, some varieties are available that are resistant to cedar apple rust.
J. chinensis 'Ames' Ames Juniper	15′	5′	columnar horizontal	○	S	E		4′	8′	2½′	NA	Low	T	T			T	Steel blue foliage, starts growth very slowly. Not resistant to cedar apple rust.
J. chinensis columnaris Blue Columnar Chinese Juniper	20′	6′	columnar horizontal	○	S	E		5′	8′	3′	NA	Low	T	T			T	Silver green, very columnar. Not resistant to cedar apple rust.
J. chinensis 'Keteleeri' Keteleer Chinese Juniper	15′	6′	conical horizonal	○	S	E		4′	8′	3′	NA	Low	T	T			T	Generous fruit. Not resistant to cedar apple rust.
J. chinensis varieties																		Numerous other varieties (many mis-named) are available commercially. Some are reportedly resistant to cedar apple rust.
Juniperus scopulorum Rocky Mountain Juniper	30′	10′	conical horizontal	○	S	E		3′	6′	5′	NA	Low	T	T			T	This species and its varieties seem to tolerate drought better than Eastern Red Cedar. Some varieties are reputed to be resistant to cedar apple rust.

Trees — Evergreen

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS					PLANT USE FACTORS												Notes
								Rec. Planting Size		Rec. Spacings			Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Root Zone	Buffering Density	UBD Suitable	Minimum	Bonus	Screen	Street	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
J. scopulorum 'Blue Heaven' Blue Heaven Juniper	15′	5′	conical horizontal	○	S	E		3′	6′	2½′	NA	Low	T	T			T	Excellent fruits.
J. scopulorum 'Cologreen' Cologreen Juniper	15′	5′	conical	○	S	E		3′	6′	2½′	NA	Low	T	T			T	Light green foliage.
J. scopulorum varieties																		Numerous other varieties availabl Many reputed to be resistant to cedar apple rust.
Juniperus virginiana Eastern Red Cedar	40′	15′	conical horizontal	○	T	E		3′	6′	8′	NA	Med	T	T	S		T	Numerous varieties available. However none listed as resistant to cedar apple rust.
J. virginiana 'Burkii' Burk Red Cedar	20′	6′	conical horizontal	○	T	E		3′	6′	3′	NA	Med	T	T	S		T	Steel blue foliage.
J. virginiana 'Canaertii' Canaert Red Cedar	20′	10′	conical horizontal	○	T	E		3′	6′	5′	NA	Med	T	T	S		T	Dark green, very compact.
J. virginiana pendula Weeping Red Cedar	20′	10′	conical weeping	○	T	E		3′	6′	5′	NA	Med	T	T	S		T	Pendulous branch tips.

Trees — Evergreen

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS					PLANT USE FACTORS												Notes
								Rec. Planting Size		Rec. Spacings			Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Root Zone	Buffering Density	UBD Suitable	Minimum	Bonus	Screen	Street	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
J. virginiana varieties																		Numerous other varieties available. A slow growing tree but does well in poor soils. May require spraying for a variety of disease problems.
Picea abies Norway Spruce	80′	40′	conical horizontal	◒	D	E		5′	8′	27′	NA	Low		S	S			Prefers moist, well-drained soils.
Picea glauca White Spruce	50′	25′	conical horizontal	◒	D	E		5′	8′	17′	NA	Low		S	S			More tolerant of drought-heat than other spruce. A few varieties are available.
Picea omorika Serbian spruce	60′	25′	conical horizontal	◒	D	E		5′	8′	17′	NA	Low		S	S			Pendulous branches. Tolerant of cold, dry winds. Still requires moist, well-drained soil.
Picea pungens Colorado Spruce	40′	25′	concial horizontal	◒	D	E		5′	8′	17′	NA	Low	T	S	S	T	S	Several varieties are available. All spruces lose lower branches as they mature.
Pinus banksiana Jack Pine	75′	25′	oval horizontal	○	S	G		5′	8′	17′	NA	Low						Extremely hardy, but very loose and open in habit.
Pinus nigra Austrian Pine	60′	50′	pyramidal horizontal	○		E		5′	8′	34′	NA	Low			S		T	Local specimens recently ravaged by fungus. Limit to 10% of evergreen plantings.

Trees — Evergreen

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	Root Zone	PLANT USE FACTORS: Buffering Density	UBD Suitable	Rec. Planting Size: Minimum	Rec. Planting Size: Bonus	Rec. Spacings: Screen	Rec. Spacings: Street	Maintenance Level	Urban Tolerance: Salt	Urban Tolerance: Drought-Heat	Urban Tolerance: Soil Compaction	Urban Tolerance: Night Lighting	Urban Tolerance: Air Pollution	Notes
Pinus resinosa Red Pine	50′	25′	pyramidal-oval horizontal	○		E		5′	8′	17′	NA	Low	S	S			T	Very adaptable to moist soils, but needs protection from hot, dry winds.
Pinus strobus Eastern White Pine	75′	50′	conical-round irregular-horizontal	○	D	E	No	5′	8′	34′	NA	High	S	S	S	T	S	Many disease problems. Plant only where maintainable.
Pinus sylvestris Scotch Pine	60′	50′	conical-oval irregular-horizontal	○		E		5′	8′	34′	NA	Low			S		T	Supposedly susceptible to pine needle disease, but does very well locally. Probably the most tolerant (Pine) of urban impacts.
Pseudotsuga menzeisii Douglas Fir	80′	40′	conical horizontal	◒	D	E		5′	8′	27′	NA	Low	S	S	S		T	Variety 'glauca' is considered best for northern climates.
Taxus cuspidata Japanese Yew	20′	8′	conical ascending	●		E		4′	6′	5′	NA	Med		S	S		T	Very susceptible to cold, dry winds, and drought. Can grow much larger if given ideal conditions.
x Taxus media Intermediate Yew	25′	15′	conical-round ascending	●		E		4′	6′	10′	NA	Med		S	S		T	Same problems as Japanese Yew.
Thuja occidentalis Eastern Arborvitae	50′	20′	columnar ascending	●		E		4′	6′	14′	NA	Med		S	S			Requires somewhat acid soils. Some varieties are available. Susceptible to cold, dry winds and drought.

Trees — Evergreen

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS					PLANT USE FACTORS												Notes
								Rec. Planting Size		Rec. Spacings			Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Root Zone	Buffering Density	UBD Suitable	Minimum	Bonus	Screen	Street	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
Tsuga canadensis Canada Hemlock	70′	40′	conical horizontal	●		G	No	6′	8′	20′	NA	High	S	S	S			Habitat must be protected and moist.

Trees — Deciduous Scientific Name Common Name	PHYSICAL CHARACTERISTICS					PLANT USE FACTORS												
								Rec. Planting Size		Rec. Spacings			Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Root Zone	Buffering Density	UBD Suitable	Minimum	Bonus	Screen	Street	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Acer ginnala Amur Maple	20′	20′	round irregular-ascending	◒	S	G		1¼″	3″	10′	14′	Low			S	S	T	Very hardy and adaptable.
Acer nigrum Black Maple	75′	60′	pyramidal-round ascending	◒	S	G		2″	4″	30′	40′	Med	S	S	S	S	T	Has a few disease problems occasionally.
Acer platanoides Norway Maple	75′	30′	round ascending	◒	S	G		2″	4″	15′	20′	Low		S	S	S	T	Sensitive to reflected heat and hot, dry winds.
A. platanoides 'Summershade' Summershade Maple	60′	35′	round ascending	◒	S	G		2″	4″	18′	24′	Low		S	S	S	T	Grows at a faster rate than most other varieties. More tolerant of heat/drought than other varieties, or the species.
A. platanoides 'Columnare' Columnar Norway Maple	50′	20′	columnar ascending	◒	S	G		2″	4″	10′	14′	Low		S	S	S	T	A good columnar variety. Another is 'Erectum', at only about 10′ wide.
A. platanoides varieties																		Numerous other varieties are available, most are hardier than the species.
Acer rubrum Red Maple	70′	40′	oval ascending	◒	S	G		2″	4″	20′	27′	Med	S	S	S	S	T	Prefers acid soils. Slightly weak-wooded. Several varieties are available, of various shapes (i.e. pyramidal, columnar, etc.).

Trees — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	Root Zone	PLANT USE FACTORS: Buffering Density	UBD Suitable	Rec. Planting Size: Minimum	Bonus	Rec. Spacings: Screen	Street	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Acer saccharinum 'Blair' Blair Soft Maple	100′	75′	oval ascending	◒	S	G		2″	4″	40′	NA	Low	S		S	S	T	A stronger variety of the species, but should only be used in background plantings.
Acer saccharum Sugar Maple	80′	50′	oval ascending	◒	S	G		2″	4″	25′	34′	Med	S	S	S	S	T	Prefers acid soils. Requires more attention when young, as it is susceptible to hot, dry winds. Some varieties are available, some may be hardier than the species.
Acer tataricum Tatarian Maple	25′	15′	round ascending	◒	S	G		1¼″	3″	8′	10′	Low	S		S	S	T	Hard to find commercially. A beautiful, low maintenance tree.
Amelanchier canadensis Shadblow Serviceberry	30′	15′	oval ascending	●	S	F		1¼″	3″	8′	10′	Med	T	S	S			Demands well drained soil. Somewhat susceptible to disease. Can be grown as a large shrub.
Amelanchier grandiflora Apple Serviceberry	25′	20′	oval	●	S	F		1¼″	3″	10′	14′	Med	T	S	S			Larger flowers than A. canadensis.
Amelanchier laevis Allegheny Serviceberry	30′	20′	oval ascending	●	S	F		1¼″	3″	10′	14′	Med	T	S	S			Same as Shadblow, but often shorter.
Betula lenta Sweet Birch	45′	30′	round ascending	◒	D	F		1½″	3″	15′	20′	Med			S	S		Difficult to find commercially, but supposedly more resistant to borers.

Trees — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form Habit	Sun/Shade	Root Zone	PLANT USE FACTORS: Buffering Density	UBD Suitable	Rec. Planting Size: Minimum	Bonus	Rec. Spacings: Screen	Street	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Betula nigra River Birch	60′	40′	oval ascending	○	S	F		2″	4″	20′	27′	Low		T	T	S		Appear resistant to birch borers. Prefers soils that are slightly acid.
Carpinus betulus European Hornbeam	35′	25′	pyramidal horizontal	●	D	G		1½″	3″	13′	17′	Low		S	S	S	S	Several varieties available. Good screen. Vareity 'Columnaris' is popular.
Carya ovata Shagbark Hickory	75′	30′	oval ascending	◒	T	G	No	2″	4″	15′	NA	Low	S		S			Adaptable. Do not plant where fruit will be a hazard.
Catalpa speciosa Northern Catalpa	50′	25′	oval ascending	○	T	G		1½″	3″	13′	NA	Low	S	T	T	S	S	Fast-growing. Drops large leaves, seed pods, flowers.
Celtis occidentalis Common Hackberry	70′	50′	round ascending	◒	D	G		2″	4″	25′	34′	Low	T	T	S			Susceptible to anthracnose (disfiguring, not fatal). C. laevigata (Sugar Hackberry) is supposedly resistant.
Cercis canadensis Eastern Redbud	25′	20′	round irregular	◒	D	G		1¼″	3″	10′	14′	Low	S	T	S		S	Sensitive to herbicides. Protect from cold winter winds. Prefers slightly acid soil.
Cornus alternifolia Pagoda Dogwood	20′	15′	round norizontal	●	S	F		1¼″	3″	8′	10′	Med		S	S			Prefers slightly acid soils. Susceptible to twig blight. Not many local examples.

Trees — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	Root Zone	PLANT USE FACTORS: Buffering Density	UBD Suitable	Rec. Planting Size: Minimum	Bonus	Rec. Spacings: Screen	Street	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Cornus florida Flowering Dogwood	25′	20′	round horizontal	●	D	F		1¼″	3″	10′	14′	Med		S	S	S	T	Requires acid soils.
Cornus mas Cornelian Cherry	20′	15′	round horizontal			F		1¼″	3″	8′	10′	Low						Some varieties are available. Can be grown as large shrub.
Crataegus mollis Downy Hawthorn	35′	35′	round horizontal	○	T	G	No	1½″	3″	18′	24′	Med	S	T	S			Many disease problems. Large fruits similar to crabapple's. Thorns and fruit means not allowed in pedestrian areas.
Crataegus crus-galli Cockspur Thorn	25′	20′	round horizontal	○			No	1¼″	3″	10′	14′	Low						Thornless varieties are occasionally available. Reputed to be slightly more disease resistant.
Crataegus oxycantha English Hawthorn	20′	12′	round horizontal	○		G	No	1¼″	3″	6′	8′	Low	S					One variation, Paul's Scarlet, is common. May have problems in cold winters. Has no fall color.
Crataegus phaenopyrum Washington Hawthorn	20′	15′	round horizontal	○	T	G	No	1¼″	3″	8′	10′	Low	S	T	S			Columnar variety is commonly available. Reputed to be resistant, but not immune to fire blight.
Elaeagnus angustifolia Russian Olive	30′	30′	round irregular	○		F		1½″	3″	15′	20′	Med	T	T	T		T	Seriously threatened by canker disease, otherwise a good tree, very adaptable.

Trees — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	Root Zone	PLANT USE FACTORS: Buffering Density	UBD Suitable	Rec. Planting Size: Minimum	Rec. Planting Size: Bonus	Rec. Spacings: Screen	Rec. Spacings: Street	Maintenance Level	Urban Tolerance: Salt	Urban Tolerance: Drought-Heat	Urban Tolerance: Soil Compaction	Urban Tolerance: Night Lighting	Urban Tolerance: Air Pollution	Notes
Euonymous atropurpurea Eastern Wahoo	15′	8′	round ascending-arching	◒	S	F		1″	2″	4′	5½′	Low		S	S			Hard to find commercially. Usually grown as a large shrub, may be grown as small tree.
Euonymous europaea European Spindle Tree	15′	8′		◒		G		1″	2″	4′	5½′	Low		S	S			Variety 'Aldenhamensis' is very common. Other cultivars are available. Also may be grown as large shrub.
Fraxinus americana 'Rosehill' Rosehill Ash	70′	50′	oval recurving	◒	S	G		2″	4″	25′	34′	Med	S	S	S	T		Good variety of White Ash. Others are available. Seedless varieties are preferred.
Fraxinus pennsylvanica Red Ash	60′	50′	oval recurving	○	S	G		2″	4″	25′	34′	Med						May be hard to find commercially.
Fraxinus pennsylvanica lanceolata Green Ash	60′	50′	oval recurving	○	S	G		2″	4″	25′	34′	Med						Variety 'Marshall's' very common. Seedless cultivars preferred. Somewhat overplanted locally.
Fraxinus quadrangulata Blue Ash	50′	30′	oval recurving	◒		G		2″	4″	15′	20′	Med						Hard to find commercially.
Ginkgo biloba Ginkgo	60′	35′	pyramidal-oval ascending	○		F		2″	4″	18′	24′	Low		T			T	Use only male trees as females produce foul-smelling fruits. Some columnar varieties are available.

Trees — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	Root Zone	PLANT USE FACTORS: Buffering Density	UBD Suitable	Rec. Planting Size: Minimum	Rec. Planting Size: Bonus	Rec. Spacings: Screen	Rec. Spacings: Street	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Gleditsia tricanthos inermis Thornless Honey Locust	75′	50′	round horizontal	○	D	P		2″	4″	25′	34′	Med	T	T	T			Many varieties available. Only thornless allowed. 'Shademaster' and 'Skyline' are common. Very over-planted locally.
Gymnocladus dioicus Kentucky Coffee Tree	75′	50′	oval horizontal	○	D	F	No	2″	4″	25′	34′	Low						Not for pedestrian areas (large seed pods). Excellent for other areas.
Koelreuteria paniculata Goldenrain Tree	25′	20′	round ascending	○		G		1¼″	3″	10′	14′	Low						Somewhat weak-wooded.
Larix laricina American Larch	60′	30′	pyramidal horizontal	○	S	F		2″	4″	15′	NA	Med	T	S	T			Deciduous conifer. Most drought tolerant of all larches. Somewhat susceptible to canker disease.
Liriodendron tulipifera Tulip Tree	100′	80′	oval ascending	◒	D	G		2″	4″	40′	NA	Med		S	S	S	S	Must have moist, well drained soils. Very large tree.
Maclura pomifera Osage-orange	30′	20′	round recurving	○	S	G		1½″	3″	10′	14′	Low	T	T	S			Some fruitless and thornless varieties are now available.
Magnolia soulangeana Saucer Magnolia	20′	20′	round irregular		S	F		1″	2″	10′	NA	Low						Several cultivars available. Protect from cold, dry winds.

Trees — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS					PLANT USE FACTORS												Notes
								Rec. Planting Size		Rec. Spacings			Urban Tolerance					
	Height	Spread	Form / Habit	Sun/Shade	Root Zone	Buffering Density	UBD Suitable	Minimum	Bonus	Screen	Street	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
Magnolia stellata Star Magnolia	15′	15′	round irregular		S	F		1″	2″	8′	NA	Low						Very slow growing. Protect from cold, dry winds.
Malus Crab Apples																		Generally only disease resistant varieties are recommended. Those with large (over ½″) fruit are not recommended for pedestrian use areas. Hundreds of varieties on market.
Ostrya virginiana American Hophornbeam	35′	25′	pyramidal horizontal	●	S	F		1½″	3″	13′	17′	Low			S			Very drought tolerant, supposedly worth using more than it is.
Phellodendron amurense Amur Cork Tree	40′	45′	oval irregular			G		1½″	3″	23′	NA	Low		T			T	
Phellodendron sachalinense Sakhalin Cork Tree	35′	24′	oval irregular			G		1½″	3″	13′	NA	Low		T				More hardy than Amur Cork Tree, but very hard to find commercially. Should be used more.
x Platanus acerifolia London Planetree	90′	50′	oval horizontal	◒	S	G		2″	4″	25′	34′	Low			T	T	S	Less susceptible to anthracnose than the American Planetree.
Platanus occidentalis American Planetree	100′	50′	oval horizontal	◒	S	G		2″	4″	25′	34′	Low			T	T	S	Also known as Sycamore. Suffers from anthracnose (not fatal).

Trees — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS					PLANT USE FACTORS												Notes
								Rec. Planting Size		Rec. Spacings			Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Root Zone	Buffering Density	UBD Suitable	Minimum	Bonus	Screen	Street	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
Populus deltoides var. Cottonless Cottonwoods	80′	50′	oval ascending	○		G	No	2″	4″	25′	NA	High	T	T	T	S	T	Has some disease problems. Some disease resistant (supposedly) varieties available. Best in background plantings.
Prunus maackii Amur Choke Cherry	30′	20′	oval ascending	○		G	No	1½″	3″	10′	14′	Med						Very hardy, but requires well-drained soil.
Prunus padus commutata Harbinger Bird Cherry	35′	35′	round ascending	○		G	No	1½″	3″	18′	24′	Med						This is one of many varieties of of European Bird Cherry. Very hardy and adaptable.
Prunus sargentii Sargent Cherry	35′	25′	round ascending	○		G	No	1½″	3″	13′	17′	Med	T	T	S			Very hardy and adaptable.
Prunus serotina Black Cherry	65′	30′	oval horizontal-weeping	○		G	No	2″	4″	15′	20′	Low	T	T	S			Not for pedestrian areas as fruit is large and messy.
Prunus virginiana Common Choke Cherry	30′	10′	pyramidal ascending	◒		G	No	1¼″	3″	5′	7′	Low						Suckers freely. Variety 'Shubert' is very common.
Pyrus calleryana 'Bradford' Bradford Pear	35′	25′	pyramidal ascending	○		G		1¼″	3″	13′	17′	Low	T	T			T	

Trees — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form Habit	Sun/Shade	Root Zone	PLANT USE FACTORS: Buffering Density	UBD Suitable	Rec. Planting Size: Minimum	Bonus	Rec. Spacings: Screen	Street	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Quercus borealis Red Oak	80′	60′	round horizontal	◒	D	G		2″	4″	30′	40′	Low	T	S	S	S	T	Acorns may prove to be a hazard in pedestrian use areas.
Quercus bicolor Swamp White Oak	70′	50′	round horizontal	◒		G		2″	4″	25′	34′	Low	T	T	T			Highly recommended in many plant lists, but difficult to locate commercially.
Quercus coccinea Scarlet Oak	60′	50′	round horizontal	○		F		1¼″	3″	25′	34′	Low						Prefers acid soil. Hard to find commercially.
Quercus imbricaria Shingle Oak	60′	35′	round horizontal	◒		G		2″	4″	18′	24′	Low						Hard to find commercially. Supposedly makes an excellent clipped hedge.
Quercus macrocarpa Bur Oak	70′	50′	oval horizontal	○	T	G		2″	4″	25′	34′	Low	T	T	S			Very slow growing. Very sensitive to soil compaction.
Quercus muhlenbergi Chinkapin Oak	65′	45′	round ascending	○	D	G		2″	4″	23′	30′	Low	T	T	S			Very hard to find commercially. Requires acid soil.
Quercus palustris Pin Oak	70′	35′	pyramidal	○	T	F		2″	4″	18′	24′	Med						Prefers acid soil. Suffers badly from chlorosis.

Trees — Deciduous	PHYSICAL CHARACTERISTICS					PLANT USE FACTORS												
								Rec. Planting Size		Rec. Spacings			Urban Tolerance					
Scientific Name Common Name	Height	Spread	Form Habit	Sun/Shade	Root Zone	Buffering Density	UBD Suitable	Minimum	Bonus	Screen	Street	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Quercus robur English Oak	60′	35′	pyramidal ascending			G		2″	4″	18′	24′	Low						Hardiness questionable during cold winters. Does best in acid soils, but reputedly tolerates alkaline soils well.
Salix alba White Willow	60′	50′	round arching	○	S	F	No	2″	4″	25′	NA	High	T	T	T			Prefers wet soils. Weak-wooded and most appropriate as background planting. Susceptible to disease.
Salix alba tristis Golden Weeping Willow	45′	40′	round weeping	○	S	F	No	1½″	3″	20′	NA	High	T	T	T			Sometimes sold as 'Niobe' which is wrong. Susceptible to disease. Should not be planted near sewer systems.
x Salix blanda Wisconsin Weeping Willow	45′	35′	round weeping	○	S	F	No	1½″	3″	18′	NA	High	T	T	T			Susceptible to disease. Does best in moist soil. Should not be planted near sewer systems.
Salix matsudana 'Tortuosa' Corkscrew Willow	30′	25′	oval ascending	○	S	F	No	1¼″	3″	13′	NA	High						Disease susceptible. Does best in moist areas. Also grown as large shrub.
Salix discolor Pussy Willow	20′	15′	oval ascending	○	S	F	No	1¼″	3″	8′	NA	High						More hardy than Goat Willow. Same problems as other willows.
Salix petandra Laurel Willow	35′	30′	round ascending	○	S	F	No	1¼″	3″	15′	NA	High						Susceptible to diseases. Same problems as other willows.

Trees — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	Root Zone	PLANT USE FACTORS: Buffering Density	UBD Suitable	Rec. Planting Size: Minimum	Rec. Planting Size: Bonus	Rec. Spacings: Screen	Rec. Spacings: Street	Maintenance Level	Urban Tolerance: Salt	Urban Tolerance: Drought-Heat	Urban Tolerance: Soil Compaction	Urban Tolerance: Night Lighting	Urban Tolerance: Air Pollution	Notes
Sophora japonica Japanese Pagoda Tree	45′	45′	round horizontal			G		1½″	3″	23′	30′	Low		T				Columnar and weeping varieties are occasionally available.
Sorbus alnifolia Korean Mountain Ash	45′	35′	oval horizontal	○		G	No	1½″	3″	18′	24′	High						Fewer disease problems and hardier than European Mountain Ash.
Syringa reticulata Japanese Tree Lilac	20′	20′	round ascending-horizontal	○		G		1¼″	3″	10′	14′	Low						
Tilia americana American Linden	80′	40′	oval recurving	●		G		2″	4″	20′	NA	Low	S	S	S			Variety 'Dakota' has higher branching than species, and is suitable for street tree use.
Tilia cordata Littleleaf Linden	60′	35′	pyramidal-round horizontal		D	G		2″	4″	18′	24′	Low	S	S	S		T	Several varieties are available, some tolerant of poor soils.
Tilia euchlora Crimean Linden	60′	40′	pyramidal-round horizontal		D	G		2″	4″	20′	27′	Low	S	S	S		T	Variety 'Redmond' is very popular.
Tilia mongolica Mongolian Linden	60′	40′	pyramidal horizontal		D	G		2″	4″	20′	27′	Low	S	S	S		T	Excellent specimen, but may be hard to find commercially.

Trees — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS					PLANT USE FACTORS												Notes
								Rec. Planting Size		Rec. Spacings			Urban Tolerance					
	Height	Spread	Form / Habit	Sun/Shade	Root Zone	Buffering Density	UBD Suitable	Minimum	Bonus	Screen	Street	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
Viburnum prunifolium Blackhaw Viburnum	15′	10′	oval horizontal	O	S	G		3/4″	2″	5′	7′	Low	S		S			May be grown as large shrub.
Viburnum sieboldii Siebold Viburnum	20′	12′	round horizontal			G		1″	3″	6′	8′	Low	S		S			May be grown as large shrub.
Zelkova serrata Japanese Zelkova	75′	70′	round ascending arching			G		2″	4″	35′	47′	Low						

Shrubs

The list provided here offers a variety of shrubs suitable to different situations. A list of regionally hardy shrubs would actually be longer. However, we have limited the number of those requiring a medium to high level of maintenance or those that may be difficult to find commercially.
The following information is provided in the shrub list.

Physical Characteristics

Shrubs perform similarly to trees; the more harsh the environment, the more variable the performance. The reader will note that the Root Zone category has been omitted from the Shrub List. Generally, all shrubs can be considered to have a shallow root system, and have similar restrictions and requirements as trees with this type of root system.

Height, Spread, Form and Habit - See explanation for Tree List.

Sun and Shade - See explanation for Tree List.

Plant Use Factors

These categories vary somewhat from those of the Tree List, generally due to required screening regulations. The category of UBD suitability has been omitted, as shrubs generally require too much maintenance to be suitable for the urban environment. (There are exceptions to this). The urban tolerance information should supply enough data to determine the plant tolerance of urban "impacts".

Buffering Density - See explanation for Tree List.

Recommended Planting Size - This is divided into three sub-categories: standard, required screening for buffer yards, and required screening for parking lot perimeters.

Standard planting size is that at which the plant is generally acceptable, when not used for required screening purposes.

Required buffer yard screening is that planting size required so that the plant will attain a minimum height of six (6) feet within three years of planting.

Required parking lot screening is that size required so that the plant will attain a minimum height of four (4) feet within one year of planting.

Recommended Spacing - This is divided into the same three sub-categories as is Recommended Planting Size.

Standard spacing is generally calculated as two-thirds of the assumed mature spread for all shrubs, except conical evergreens, which are calculated as one-half of the assumed mature spread. The table provided in Appendix A will aid in calculating mass plantings.

The required screening plantings for bufferyards and parking lot perimeters must be spaced so that they provide substantial opaqueness within three years and one year of planting, respectively.

Both recommended size and spacings may be adjusted when used in combination with a berm, grade change, retaining wall or fence.

Maintenance Level - See explanation for Tree List.

Urban Tolerance - See explanation for Tree List.

Shrubs — Evergreen

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS				PLANT USE FACTORS													Notes
						Rec. Planting Size			Rec. Spacings				Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Buffering Density	Minimum	Required Screen (Buffer)	Required Screen (Parking)	Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
Junipers chinensis varieties																		Numerous varieties available. Use only those resistant to cedar apply rust, especially when planting new hawthorns and crabs.
J. chinensis 'Blaawsi' Blaaws Juniper	4′	4′	spreading arching	○	E	18″	NA	36″	3′	NA	2½′	Low	T	T			T	Blue-green foliage.
J. chinensis 'Hetzii' Hetz Juniper	15′	10′	spreading ascending	○	E	18″	18″	24″	6′	2½′	2′	Low	T	T			T	Will grow very large if not pruned.
J. chinensis 'Maneyi' Maney Juniper	6′	15′	spreading ascending	○	E	18″	NA	36″	6′	NA	1½′	Low	T	T			T	Will get larger than indicated unless pruned.
J. chinensis pfitzeriana Pfitzer Juniper	6′	15′	spreading ascending	○	E	18″	NA	24″	6′	NA	4½′	Low	T	T			T	Over-used, but very resistant to cedar apply rust. Some varieties available.
Juniperus communis varieties																		Foliage more prickly than other junipers. Many of these turn brown in winter.
J. communis 'Compressa' Compressa Juniper	2′	1′	columnar ascending	○	NA	12″	NA	NA	8″	NA	NA	Low	T	T			T	Very dwarf-form, very slow growing.

Shrubs — Evergreen

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS				PLANT USE FACTORS													Notes
						Rec. Planting Size			Rec. Spacings				Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Buffering Density	Minimum	Required Screen (Buffer)	Required Screen (Parking)	Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
J. communis 'Depressa' Depressa Juniper	3′	9′	spreading trailing	○	NA	18″	NA	NA	6′	NA	NA	Low	T	T			T	Very slow-growing. Resistant to cedar apple rust.
Juniperus sabina varieties																		Many varieties available, some sensitive to twig blight.
J. sabina Savin Juniper	4′	4′	spreading arching	○	E	18″	NA	42″	3′	NA	2½′	Low	T	T			T	Slow-growing. The varieties listed below are more disease resistant than this.
J. sabina 'Blue Danube' Blue Danube Juniper	3′	9′	spreading ascending	○	NA	18″	NA	NA	6′	NA	NA	Low	T	T			T	
J. sabina tamariscifolia Tamarix Savin Juniper	2′	4′	spreading ascending	○	NA	12″	NA	NA	3′	NA	NA	Low	T	T			T	Very handsome. Makes a good ground cover.
J. sabina 'Von Ehron' Von Ehron Savin Juniper	8′	8′	spreading ascending-arching	○	E	18″	18″	24″	5′	4′	2½′	Low	T	T			T	Faster growth rate than other Savin Junipers. Resistant to fire blight. Dark green foliage
Junipers virginiana 'Globosa' Globe Eastern Red Cedar	10′	10′	Globe horizontal	○	E	18″	18″	24″	6′	4′	2½′	Low	T	T			T	Very dense.

Shrubs — Evergreen

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS				PLANT USE FACTORS													Notes
						Rec. Planting Size			Rec. Spacings				Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Buffering Density	Minimum	Required Screen (Buffer)	Required Screen (Parking)	Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
J. virginiana 'Tripartita' Fountain Red Cedar	5′	8′	spreading arching	○	E	18″	NA	24″	5′	NA	4′	Low	T				T	Dark green, very tolerant of pruning.
Picea abies varieties																		A few varieties are available. All are slow growing, and prefer moist, well-drained, slightly acid soil.
P. abies 'Nidiformis' Nidiformis Norway Spruce	4′	6′	oval-spreading ascending	◒	E	18″	NA	42″	4′	NA	4′	Low		S				
Picea glauca 'Conica' Dwarf White Spruce	10′	8′	conical horizontal	◒	E	18″	4½′	42″	5′	2½′	2′	Med						Very slow-growing.
Pinus mugho mughus Dwarf Mugho Pine	15′	15′	globe-spreading ascending	○	E	18″	4½′	42″	6′	4′	2½′	Med						Susceptible to some needle diseases. Actual mature size unpredictable. Slow-growing.
Pinus nigra 'Hornibrookiana' Hornibrook Austrian Pine	3′	6′	oval-spreading horizontal	○	NA	18″	NA	NA	4′	NA	NA	Med						Slow growth rate.
P. nigra 'Pygmaea' Pygmy Austrian Pine	8′	6′	conical horizontal	○	E	18″	4½′	42″	4′	2½′	2′	Med						Slow growth rate.

Shrubs — Evergreen

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS				PLANT USE FACTORS													Notes
						Rec. Planting Size			Rec. Spacings				Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Buffering Density	Minimum	Required Screen (Buffer)	Required Screen (Parking)	Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
Pinus pumila Japanese Stone Pine	5′	8′	spreading ascending	○	E	18″	NA	42″	5′	NA	4′	Med						
Pinus strobus varieties																		A few varieties available. Very slow growth.
P. strobus 'Nana' Dwarf White Pine	4′	4′	oval-conical horizontal	○	E	18″	NA	42″	2½′	NA	2½′	Low						
Pinus sylvestris 'Watereri' Waterer Scotch Pine	9′	8′	conical horizontal	○	E	18″	4½′	42″	5′	3½′	3½′	Low						
Taxus canadensis Canada Yew	8′	9′	oval-spreading ascending	●	E	18″	4½′	42″	6′	4½′	3½′	Med	S	S	S			Requires moist, well-drained soil, and protection from winter sun and wind. Slow-growing.
Taxus cuspidata varieties																		Many available. All should be protected from winter sun and wind.
T. cuspidata expansa Spreading Japanese Yew	5′	8′	spreading ascending	●	E	18″	NA	42″	5′	NA	3½″	Low	S	S	S			Slow growth rate.

Shrubs — Evergreen

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS				PLANT USE FACTORS													Notes
						Rec. Planting Size			Rec. Spacings				Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Buffering Density	Minimum	Required Screen (Buffer)	Required Screen (Parking)	Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
T. cuspidata nana Dwarf Japanese Yew	4′	8′	spreading ascending	●	E	18″	NA	42″	5′	NA	5′	Low	S	S				Slow growth rate.
Taxus x media varieties																		Many available.
T. x media 'Hicksii' Hicks Anglojap Yew	12′	8′	oval ascending	●	E	18″	4½′	42″	5′	2½′	2′		S	S				Slightly faster growth rate than other yews.
T. x media 'Taunton' Taunton Yew	3′	6′	spreading ascending	●	NA	18″	NA	NA	4′	NA	NA	Low	S	S				Some resistance to winter wind and sun. Highly recommended.

Shrubs — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Acer ginnala Amur Maple	20′	20′	round-spreading ascending	◒	G	18″	36″	36″	6′	4′	2½′	Low			S	S	T	Generally grown as a small tree, but may be trained as a large shrub. Recommended.
A. ginnala 'Durand Dward' Dwarf Amur Maple	6′	12′	oval ascending	◒	G	18″	NA	36″	4′	NA	5½′	Low			S	S	T	May be grown as a small tree.
Acanthopanax sieboldianus Five-leaved Aralia	8′	5′	round ascending	●	G	18″	36″	36″	3½′	2½′	1½′	Low	T	T			T	Very adaptable to city conditions, yet thorny; not for pedestrian areas or playgrounds.
Alnus rugosa Speckled Alder	15′	12′	round ascending	●	G	18″	36″	36″	6′	2½′	2′	Med						Best used in wet areas.
Amorpha canescense Leadplant	3′	3′	round ascending		NA	18″	NA	NA	2′	NA	NA	Low		T				Very tolerant of dry conditions. Blue flowers, silvery foliage.
Amorpha nana Fragrant False Indigo	2′	2′	round ascending		NA	18″	NA	NA	1½′	NA	NA	Low		T				
Aralia hispida Bristly Sarsaparilla	3′	3′	round ascending		NA	18″	NA	NA	2′	NA	NA	Low		T				Very sharp spines at base; not for use around pedestrian areas or playgrounds.

Shrubs – Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS				PLANT USE FACTORS													Notes
						Rec. Planting Size			Rec. Spacings				Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Buffering Density	Minimum	Required Screen (Buffer)	Required Screen (Parking)	Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
Berberis koreana Korean Barberry	5′	4′	oval ascending		G	18″	NA	36″	2½′	NA	2′	Low						Dense, thorny, not for pedestrian areas or playgrounds.
Berberis x mentorensis Mentor Barberry	5′	5′	oval ascending		G	18″	NA	36″	3½′	NA	2½′	Low						Makes an excellent hedge. Recommended.
Berberis thunbergii varieties																		Many available, some thornless.
B. thunbergii Japanese Barberry	5′	4′	oval ascending	●	G	18″	NA	36″	2½′	NA	2′	Low						Red fruit and good orange fall color.
B. thunbergii 'aurea' Golden Barberry	5′	5′	oval	●	G	18″	NA	36″	3½′	NA	2½′	Low						Bright yellow foliage.
B. thunbergii 'Crimson Pygmy' Crimson Pygmy Barberry	3′	5′	oval ascending-spreading	●	NA	12″	NA	NA	2′	NA	NA	Low						Somewhat overused, but a handsome plant.
B. thunbergii 'erecta' Truehedge Barberry	4′	3′	columnar ascending	●	G	18″	NA	36″	2′	NA	1½′	Low						Makes a good hedge. Often called Columnberry by nurseries.

Shrubs — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Buxus microphylla 'koreana' Korean Boxwood	3′	3′	round ascending	●	NA	12″	NA	NA	2′	NA	NA	Low						Should be protected from winter sun and wind. Some varieties available.
Caragana arborescens varieties																		Numerous available.
C. arborescens Siberian Peashrub	20′	15′	oval ascending	○	G	18″	18″	24″	6′	3′	2′	Low						Very hardy and tolerant of pruning.
C. arborescens 'Tidy' Tidy Peashrub	15′	10′	oval ascending	○	G	18″	18″	24″	6′	3′	2′	Low						Much neater appearance than the species. Recommended.
C. arborescens 'Pendula' Weeping Peashrub	10′	5′	oval ascending-weeping	○	G	18″	18″	24″	3½′	2′	2′	Low						Interesting weeping habit. Recommended.
Caragana frutex Russian Peashrub	8′	6′	oval ascending	○	G	18″	18″	24″	4′	2½′	2′	Low						Suckers, but very hardy.
C. frutex 'Globe' Globe Russian Peashrub	3′	3′	globe ascending	○	NA	18″	NA	NA	2′	NA	NA	Low						Does not sucker like the parent. Makes a good hedge requiring very little pruning. Highly recommended.

Shrubs – Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS				PLANT USE FACTORS													Notes
						Rec. Planting Size			Rec. Spacings				Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Buffering Density	Minimum	Required Screen (Buffer)	Required Screen (Parking)	Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
Caragana microphylla Littleleaf Peashrub	8′	5′	oval ascending	○	G	18″	18″	24″	3½′	2½′	2′	Low						Very fine-textured, may be hard to find commercially. Recommended.
Chaenomeles japonica Japanese Quince	3′	3′	oval ascending-arching	○	NA	18″	NA	NA	2′	NA	NA	Low						Thorny, traps a lot of litter. Rather unkempt looking at times.
Chaenomeles speciosa Flowering Quince	6′	6′	oval ascending-arching	○	F	18″	NA	36″	4′	NA	2½′	Med						
Cornus alba varieties																		Numerous varieties are available.
C. alba 'Siberica' Siberian Dogwood	8′	6′	oval ascending	●	G	18″	18″	24″	4′	2½′	2′	Low						Does not spread as readily as Red Osier Dogwood.
Cornus amomum Silky Dogwood	8′	8′	oval ascending	●	G	18″	18″	24″	5½′	4′	2½′	Low						Porcelain-blue fruit, yellow flowers. Recommended, but may be hard to find.
Cornus mas Cornelian-cherry	20′	15′	round horizontal	●	G	18″	4½′	42″	6′	2½′	2′	Low						Can be grown as a small tree. May show some die-back during severe winters.

Shrubs — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Cornus racemosa Gray Dogwood	8′	5′	oval ascending	○	G	18″	36″	36″	3½′	2½′	2′	Low						May get larger than indicated if not pruned. Suckers. Nice winter twig and branch color.
Cornus sericea varieties																		Many available some very 'loud' in twig and leaf color.
C. sericea Red Osier Dogwood	6′	6′	round ascending arching	●	G	18″	NA	36″	4′	NA	2′	Low						Bright red twigs. Formerly named C. stolonifera. Good in wet areas. Recommended.
C. sericea 'Flaviramea' Yellowtwig Dogwood	8′	5′	round ascending arching	●	G	18″	36″	36″	3½″	2½″	2′	Low						Bright yellow twigs. Does well in wet areas.
C. sericea 'Kelseyi' Kelsey Dwarf Redtwig Dogwood	2′	3′	dwarf- round ascending	●	NA	12″	NA	NA	2′	NA	NA	Low						May suffer during a severe winter.
Cotinus coggygria Smoketree	15′	12′	round ascending	○	G	18″	4½′	42″	6′	3½′	2½′	Med						Variety 'Royal Purple' is hardiest. Others available. Prefers slightly acid soils.
Cotoneaster species																		Others available than those listed here. Many are incorrectly named at nurseries.

Shrubs – Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Cotoneaster apiculata Cranberry Cotoneaster	3′	3′	round spreading arching	◒	NA	18″	NA	NA	2′	NA	NA	Low						Similar to well-known Rock Spray, but hardier. Recommended. Makes a good bank cover.
Cotoneaster divaricata Spreading Cotoneaster	6′	5′	round spreading arching	◒	E	18″	NA	36″	3½′	NA	2½′	Med						Intense red fall color and fruit.
Cotoneaster horizontalis Rock Spray	3′	3′	round spreading arching	◒	NA	18″	NA	NA	2′	NA	NA	Med						Makes a good bank cover.
Cotoneaster lucida Hedge Cotoneaster	8′	6′	columnar oval ascending	◒	G	18″	36″	36″	4′	2½′	2′	Low						Very suitable as a clipped hedge. Often confused with C. acutifolia (Peking Cotoneaster) at nurseries.
Deutzia x lemoinei Lemoine Deutzia	4′	4′	round ascending		G	18″	NA	36″	2½′	NA	2½′	Med						Profuse flowers.
Dirca palustris Leatherwood	5′	5′	round oval ascending		G	18″	NA	36″	3½′	NA	2½′	Low						Shade tolerant. Good plant for wet areas. Very hardy and adaptable.
Diervilla lonicera Bush Honeysuckle	3′	3′	round ascending		NA	18″	NA	NA	2′	NA	NA	Low						Suckers freely. Makes a good bank cover.

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Elaeagnus umbellatus Autumn Elaeagnus	12′	12′	spreading ascending		G	18″	18″	24″	6′	4′	2½′	Low						Also known as Autumn Olive. Used a lot, but hardiness may be questionable during severe winters.
Euonymous alatus Winged Euonymous	12′	15′	spreading horizontal	○	G	18″	18″	24″	6′	4½′	3½′	Med		T				Also known as Burning bush. Bright red fall color. May have problems with scale.
E. alatus 'Compactus' Dwarf Winged Euonymous	6′	5′	round horizontal	○	G	18″	NA	24″	3½′	NA	2½′	Med		T				Makes an excellent hedge, pruned or not. Also susceptible to scale.
Euonymous bungeanus semipersistens Midsummer Euonymous	15′	10′	oval ascending	◒	G	18″	18″	24″	6′	3½′	2½′	Med						Very fast growing; recommended but may be hard to find.
Euonymous atropurpurea Eastern Wahoo	15′	8′	round ascending	◒	G	18″	36″	36″	5½′	2½′	2′	Med						Very nice small tree or large shrub. Yellow fall color. Recommended.
Euonymous europaea European Euonymous	15′	8′	round ascending	◒	G	18″	36″	36″	5½′	2½′	2′	Med						Variety 'Aldenhamensis' is popular. Can be used as a small tree.
Euonymous fortunei Wintercreeper	4′	4′	spreading ascending trailing	●	NA	12″	NA	NA	2½′	NA	NA	Med						All varieties will become vigorous climbing vines if given something to climb upon. Makes an excellent groundcover.

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Forsythia x intermedia varieties																		Numerous varieties available.
F. x intermedia 'Karl Sax' Karl Sax Forsythia	8′	10′	spreading ascending-arching	○	F	18″	36″	36″	6′	4½′	3½′	Low						More flower bud hardy than others.
F. x intermedia 'Spring Glory' Spring Glory Forsythia	8′	10′	spreading ascending arching	○	F	18″	36″	36″	6′	4½′	3½′	Low						Showy light yellow flowers. Marginal flower bud hardiness.
Forsythia x ovata Early Forsythia	8′	6′	spreading ascending-arching	○	F	18″	36″	36″	4′	3½′	2′	Low						Hardier than most of the F. x intermedia.
Forsythia suspensa Weeping Forsythia	6′	5′	round arching	○	F	18″	NA	36″	3½′	NA	2′	Low						Gracefully arching in habit; much neater appearance than other forsythias.
Hammamalis vernalis Vernal Witchhazel	10′	8′	round ascending	●	F	18″	36″	36″	5½′	2½′	2′	Low						
Hammamalis virginiana Common Witchhazel	12′	8′	round ascending	●	F	18″	36″	36″	5½′	2½′	2′	Low						May be grown as a small tree.

Shrubs — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Hibiscus syriacus Rose-of-Sharon	10′	5′	oval ascending		F	18″	36″	36″	3½′	2½′	2′	Med						Also called Shrub Althea. Protect from winter winds, plant in well-drained soil. Some varieties are available.
Hippophae rhamnoides Sea-Buckthorn	15′	10′	oval ascending		G	18″	4½′	42″	6′	2½′	2′	Med	T					Thorny; not for pedestrian areas or playgrounds. Bright orange fruit. Resembles Russian Olive.
Hydrangea arborescens Hills-of-Snow	4′	4′	round ascending		F	12″	NA	NA	2½′	NA	NA	Low						Often dies back in winter. Many varieties available. Prunes well.
Hypericum kalmionum Kalm St. Johnswort	2′	3′	dward round ascending		NA	12″	NA	NA	2′	NA	NA	Low		T				Can be used as a ground cover.
Hypericum prolificum Shrubby St. Johnswort	3′	3′	round ascending	●	NA	12″	NA	NA	2′	NA	NA	Low		T				Blooms for several weeks. Very tolerant of dryness.
Ilex verticulata Winterberry	6′	8′	oval ascending	●	G	18″	NA	42″	5½′	NA	3½′	Med		S				Requires acid soil. Some varieties available.
Kerria japonica Japanese Kerria	3′	3′	oval arching		NA	18″	NA	NA	2′	NA	NA	Low						Produces flowers throughout the summer.

Shrubs — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Kolkwitzia amabilis Beaty-bush	10′	6′	oval ascending-arching		G	18″	18″	24″	4′	2½′	2′	Low		T				Low maintenance plant. Profuse flowers late in May to June.
Ligustrum amurense Amur Privet	12′	6′	oval-columnar ascending	◒	G	18″	18″	24″	4′	2′	1½′	Low					T	Most hardy of the privets. Recommended.
Ligustrum x ibolium Ibolium Privet	12′	6′	oval-columnar ascending	◒	G	18″	18″	24″	4′	2′	1½′	Low					T	More handsome than Amur Privet, but hard to find. Recommended.
Ligustrum obtusifolium varieties																		Available, somewhat overused.
L. obtusifolium Border Privet	8′	8′	round ascending	◒	G	18″	18″	24″	5½′	4′	2½′	Low					T	
L. obtusifolium regelianum Regels Border Privet	6′	6′	round horizontal	○	G	18″	18″	24″	4′	2′	1½′	Low					T	Overused. Not as hardy as others.
Linder benzoin Spicebush	6′	6′	round ascending		G	18″	NA	42″	4′	NA	2½′	Low		S				May require some winter protection. Fragrant flowers and leaves.

Shrubs — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Lonicera x bella albida White Bell Honeysuckle	12′	10′	oval ascending	◒	G	18″	18″	24″	6′	2½′	2′	Low						Many varieties available with different flower colors.
Lonicera fragrantissima Winter Honeysuckle	6′	6′	oval spreading irregular	◒	G	18″	NA	24″	4′	NA	2½′	Low						Lemon-scented flowers. Tolerant of pruning. Recommended.
Lonicera maackii Amur Honeysuckle	18″	18″	oval-spreading arching-ascending	◒	G	18″	18″	24″	6′	4′	2½′	Low						Variety podocarpa is popular.
Lonicera morrowii Morrow Honeysuckle	8′	8′	Round-spreading ascending	◒	G	18″	18″	24″	5½′	4′	2½′	Low						Dense, mound-like shrub.
Lonicera tatarica varieties																		Many varieties. Check on aphid resistance.
L. tatarica Tatarian Honeysuckle	10′	8′	oval ascending	◒	G	18″	18″	24″	5½′	3½′	2′	Med						Very durable, low-maintenance shrub, except for aphid problems.
Lonicera x xylosteum 'Claveyi' Claveys Dwarf Honeysuckle	3′	5′	dwarf-oval ascending	◒	NA	18″	NA	NA	3½′	NA	NA	Low						Resistant to aphids. Some varieties.

Shrubs — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Malus sargentii Sargent Crabapple	8′	18′	oval-spreading horizontal	○	G	18″	18″	24″	12′	6′	5½′	Low						Variety 'tina is disease resistant, but smaller.
Myrica pensylvanica Bayberry	9′	6′	round ascending	●	F	18″	36″	36″	4′	2½′	2′	Low	T	T				Fragrant berries and leaves. Recommended.
Philadelphus varieties																		Numerous.
Philadelphus x lemoinei var. Lemoine Mock-Oranges																		Many available between 4′ - 8′ in height. Very fragrant.
Philadelphus coronarius Sweet Mock-Orange	10′	6′	round- ascending arching	◒	G	18″	18″	24″	4′	2½′	2′	Low		T				Dwarf form available. Very low-maintenance.
Philadelphus 'Frosty Morn' Frosty Morn Mock-Orange	4′	4′	round ascending arching	○	G	18″	NA	24″	2½′	NA	2½′	Low		T				Probably the hardiest of all the Mock-Oranges.
Physocarpus opulifolius Eastern Ninebark	8′	8′	round ascending- arching		G	18″	18″	24″	5½′	4′	2½′	Low		T				Resembles spiraea somewhat. Very few problems. Recommended.

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Potentilla fruiticosa var.																		Numerous. Most with yellow-white flowers. All are often rather unkempt at times.
P. fruiticosa Shrubby Cinquefoil	3′	3′	spreading irregular-ascending	●	NA	18″	NA	NA	2′	NA	NA	Low		T				Varieties are usually more tidy.
P. fruiticosa 'Grandiflora'	5′	4′	spreading irregular-ascending	●	P	18″	NA	24″	2½′	NA	2′	Low		T				Largest of the potentillas.
P. fruiticosa 'Mandshuria'	1½′	3′	spreading irregular-ascending	●	NA	12″	NA	NA	2′	NA	NA	Low						Very handsome, but prefers moist situation. Not as drought tolerant.
Prunus varieties				○														Numerous. Often incorrectly named, make sure you know what you're getting.
Prunus besseyi Western Sand Cherry	7′	7′	round ascending	○	G	18″	18″	24″	4½′	4′	2½′	Low						
Prunus x cistena Purpleleaf Sand Cherry	6′	6′	oval ascending	○	G	18″	NA	24″	4′	NA	2½′	Low						Overused.

Shrubs – Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Prunus glandulosa Dwarf Flowering Almond	4′	4′	spreading ascending	○	F	18″	NA	24″	2½′	NA	2½′	Low						Some varieties available, usually more handsome.
Prunus japonica Nakai Chinese Bush Cherry	4′	4′	round ascending	○	F	18″	NA	24″	2½′	NA	2½′	Low						Very cold-hardy. Recommended.
Prunus maritima Beach Plum	6′	6′	round ascending-horizontal	○	G	18″	NA	24″	4′	NA	2½′	Low	T					Very fragrant flowers and tasty fruit.
Prunus x pumila Hansen's Bush Cherry	3′	3′	round ascending	○	NA	18″	NA	NA	2′	NA	NA	Low						Vigorous, hardy. Recommended.
Prunus tomentosa Manchu Cherry	8′	8′	spreading-round ascending-horizontal	○	F	18″	18″	24″	5½′	4′	2½′	Low						Also known as Naaking Cherry. Becomes openly picturesque with age. Recommended.
Prunus triloba Flowering Almond	10′	8′	oval ascending	○	G	18″	18″	24″	5½′	2½′	2′	Med						
Rhamnus frangula 'Columnaris' Columnar Alder Buckthorn	15′	5′	columnar ascending	●	G	18″	18″	24″	2½′	2½′	2′	Med						Grows very fast, is very popular. Not as handsome as popularity suggests.

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Rhododendron carolinianum varieties P.V.M. Rhododendrons				●														Numerous available. Requires acid soil, winter protection. High-maintenance plant. All about 4′ x 4′.
Rhododendron x 'Northern Lights' varieties				●														Same as above, but slightly more cold-hardy.
Rhodotypos scandens Black Jetbead	5′	5′	round ascending	○	G	18″	NA	24″	3½′	NA	2½′	Low		T			T	Shade tolerant. Recommended.
Rhus aromatica Fragrant Sumac	4′	3′	oval ascending	○	G	18″	NA	24″	2′	NA	2′	Low		T			T	May grow to 6′ or 8′ under ideal conditions. Recommended, but should be restrained.
Rhus copallina Shining Sumac	10′	8′	oval spreading irregular	○	P	18″	NA	NA	5½′	NA	NA	Low		T			T	Very handsome as single specimen. Hard to find, recommended.
Rhus glabra Smooth Sumac	10′	5′	oval spreading irregular	○	F	18″	NA	NA	3½′	NA	NA	Low		T			T	Irregular form makes all these unsuitable for screening, unless used with lower plants.
Rhus typhina Staghorn Sumac	20′	20′	oval spreading irregular	○	P	18″	NA	NA	6′	NA	NA	Low		T			T	All sumacs sucker, this and smooth sumac especially. Needs restraint.

Shrubs — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS				PLANT USE FACTORS													Notes
						Rec. Planting Size			Rec. Spacings				Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Buffering Density	Minimum	Required Screen (Buffer)	Required Screen (Parking)	Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
Ribes alpinum Alpine Currant	5′	8′	spreading oval arching		G	18″	NA	24″	5½′	NA	4′	Low						Alternate host to White Pine blister rust. Don't plant near 5-needle Pines. Otherwise recommended.
Ribes odoratum Clove Currant	6′	5′	spreading oval arching		G	18″	NA	24″	3½′	NA	2′	Low						Alternate host to White Pine blister rust. Don't plant near 5-needle Pines. Otherwise recommended.
Rosa varieties																		All roses listed here are bush form, mostly native, thorny and require less maintenance than the popular hybrid roses most people plant.
Rosa blanda Meadow Rose	4′	3′	round spreading ascending	○	G	18″	NA	24″	2′	NA	2′	Low						Hard to find, but very hardy and adaptable. Recommended.
Rosa centifolia Cabbage Rose	5′	5′	round spreading ascending	○	G	28″	NA	24″	3½′	NA	2½′	Low						Variety 'Mucosa' (Moss Rose) is popular. Recommended.
Rosa hugonsis Father Hugo Rose	6′	6′	round spreading ascending	○	G	18″	NA	24″	4′	NA	2½′	Low						Very reliable, common in older gardens.
Rosa roxburghii Roxburgh Rose	6′	6′	round spreading ascending	○	G	18″	NA	24″	4′	NA	2½′	Low						Hard to find, but highly recommended. Very handsome.

Shrubs — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Rosa rugosa Rugosa Rose	5′	5′	round spreading ascending	○	G	18″	NA	24″	3½′	NA	2½′	Low						Many varieties available.
Rosa spinosissima Scotch Rose	3′	3′	round spreading ascending	○	G	18″	NA	NA	2′	NA	NA	Low						Suckers, forms thickets. Recommended where this is suitable.
Rosa virginiana Virginia Rose	4′	4′	round spreading ascending	○	G	18″	NA	24″	2½′	NA	2½′	Low						Native, vigorous suckers, recommended, but needs restraint.
Salix lucida Shining Willow	20′	10′	oval ascending		F	18″	18″	24″	6′	3½′	3′	Med						Vigorous. Does well in wet areas.
Salix purpurea Red Osier	8′	8′	round ascending		G	18″	18″	24″	5½′	4′	2½′	Med						Dwarf form (4′ x 4′) makes a good hedge. Fast growth.
Sambucus canadensis American Elder	8′	6′	oval ascending		F	18″	18″	24″	4′	2½′	2′	Med						Coarse-textured. Fast growth rate. Suckers, good in wet areas.
Sheperdia canadensis Russet Buffaloberry	7′	6′	oval round irregular		P	18″	36″	36″	4′	3½′	2′	Med		T				Tolerates dry, alkaline soils; very open and straggly growth.

Shrubs – Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS				PLANT USE FACTORS													Notes
						Rec. Planting Size			Rec. Spacings				Urban Tolerance					
	Height	Spread	Form Habit	Sun/Shade	Buffering Density	Minimum	Required Screen (Buffer)	Required Screen (Parking)	Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	
Sorbaria sorbifolia Ural False Spiraea	5′	5′	round ascending arching		F	18″	NA	24″	3½′	NA	2½′	Low						Shade tolerant. Suckers vigorously. Makes a good bank cover.
Spiraea species varieties																		Numerous.
Spiraea albiflora Japanese White Spiraea	2′	3′	oval spreading ascending	◒	NA	12″	NA	NA	2′	NA	NA	Low						Very adaptable. Recommended.
Spiraea x bumalda varieties																		Numerous available.
S. x bumalda 'Anthony Waterer' Anthony Waterer Spiraea	2′	4′	oval spreading ascending	◒	NA	12″	NA	NA	2½′	NA	NA	Low						Very adaptable. Spreads vigorously, must be restrained.
Spiraea japonica alpina Alpine Japanese White Spiraea	1′	2′	dwarf spreading ascending	◒	NA	12″	NA	NA	1½′	NA	NA	Low						Makes a good ground cover.
Spiraea x margaritae Margarita Spiraea	4′	4′	round spreading arching	◒	G	18″	NA	24″	2½′	NA	2½′	Low						Highly recommended.

Shrubs — Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Spiraea nipponica rotundifolia Big Nippon Spiraea	6′	5′	round spreading ascending	◒	G	18″	NA	24″	3½′	NA	2′	Low						Ascending habit different from most spiraeas.
Spiraea prunifolia Bridalwreath Spiraea	6′	6′	round arching	◒	G	18″	18″	24″	4′	4′	2½′	Low						One of few spiraeas with good fall color (orange).
Spiraea triloba Treelobe Spiraea	5′	4′	spreading arching	◒	G	18″	NA	24″	2½′	NA	2′	Low						Very nice, but not well-known. Recommended.
Spiraea x vanhouttei Vanhoutte Spiraea	8′	8′	round spreading arching	◒	G	18″	18″	24″	5½′	4′	2½′	Low						Very popular, and justifiably so; very handsome. Recommended.
Staphylea trifolia American Bladdernut	12′	8′	oval ascending		G	18″	18″	24″	5½′	2½′	2′	Low						Hard to find, but highly recommended. Cultivated since 1640.
Symphoricarpos albus laevigatus Snowberry	3′	3′	round arching ascending	◒	NA	18″	NA	NA	2′	NA	NA	Low		T			T	Spreads by suckers. Excellent as a bank cover. Shade tolerant.
Symphoricarpos x chenaultii Chenault Coralberry	2′	3′	round spreading ascending arching	◒	NA	12″	NA	NA	2′	NA	NA	Low		T			T	Good bank/ground cover. Suckers as do other symphoricarpos. Variety 'Hancock' makes a nice ground cover.

Shrubs — Deciduous	PHYSICAL CHARACTERISTICS				PLANT USE FACTORS													
						Rec. Planting Size			Rec. Spacings				Urban Tolerance					
Scientific Name Common Name	Height	Spread	Form Habit	Sun/Shade	Buffering Density	Minimum	Required Screen (Buffer)	Required Screen (Parking)	Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Symphoricarpos orbiculatus Indian Current	3′	3′	round spreading arching ascending	◒	NA	18″	NA	NA	2′	NA	NA	Low		T			T	Suckers, same as others. All are highly recommended.
Syringa varieties																		All are susceptible to scale, and may require spraying. Numerous available.
Syringa x chinensis Chinese Lilac	10′	8′	oval ascending	○	G	18″	36″	36″	5½′	3½′	2½′	Med		T				Does not sucker like most other lilacs. Highly recommended.
Syringa oblata dilatata Korean Early Lilac	12′	8′	oval ascending	○	G	18″	36″	36″	5½′	2½′	2′	Med		T				Hard to find. Can be pruned as a small tree. Noted for early flowers.
Syringa x persica Persian Lilac	8′	6′	oval ascending arching	○	G	18″	36″	36″	4′	3½′	2½′	Med		T				Very handsome, highly recommended.
Syringa villosa Late Lilac	9′	7′	oval round ascending	○	G	18″	36″	36″	4½′	2½′	2′	Med		T				Noted for late flowers and dense habit.
Syringa vulgaris Common Lilac	20′	15′	oval ascending arching	○	G	18″	36″	36″	6′	4½′	2½′	Med		T				Numerous varieties available. Suckers, and must be thinned to look good.

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Tamarix petandra Five-Stamen Tamarix	15′	8′			F	18″	36″	36″	5½′	2½′	2′	Med	T					Prune back to keep nice. Fine texture, very tolerant of salt.
Viburnum species varieties																		Many available. All are at least a little shade tolerant. Larger ones can be pruned as small trees.
Viburnum x carlcephalum Fragrant Snowball	4′	4′	round ascending	◒	G	18″	NA	36″	2½′	NA	2½′	Low						Fragrant flowers.
Viburnum cassinoides Witherrod	6′	5′	oval ascending	●	G	18″	NA	36″	3½′	NA	2½′	Low						Hard to find, but highly recommended.
Viburnum dentatum Arrowwood	6′	6′	round ascending	●	G	18″	18″	24″	4′	4′	2½′	Low						Very fast growing.
Viburnum x juddii Judd Viburnum	4′	4′	round ascending	◒	G	18″	NA	36″	2½′	NA	2½′	Low						Cold tolerant. Could get larger than indicated.
Viburnum lantana Wayfaring Tree	15′	10′	oval ascending	◒	G	18″	36″	36″	6′	2½′	2′	Low		T				Variety 'Rogosum' has nice foliage. Drought tolerant. Recommended.

Shrubs – Deciduous

Scientific Name / Common Name	PHYSICAL CHARACTERISTICS: Height	Spread	Form / Habit	Sun/Shade	PLANT USE FACTORS: Buffering Density	Rec. Planting Size: Minimum	Required Screen (Buffer)	Required Screen (Parking)	Rec. Spacings: Standard	Required Screen (Buffer)	Required Screen (Parking)	Maintenance Level	Urban Tolerance: Salt	Drought-Heat	Soil Compaction	Night Lighting	Air Pollution	Notes
Viburnum lentago Nannyberry	20′	10′	oval arching-ascending	●	G	18″	36″	36″	6′	3½′	3′	Low						Popular. Often grown as a small tree. Recommended.
Viburnum plicatum Japanese Snowball	8′	8′	round ascending-horizontal	◒	G	18″	36″	36″	5½′	3′	2½′	Low						Varieties tomentosum and 'Mariessii' are outstanding. Others available. Recommended.
Viburnum prunifolium Black Haw	12′	8′	oval ascending-horizontal	●	G	18″	36″	36″	5½′	3½′	2½′	Low						Slow-growing, similar in habit to Hawthorns.
Viburnum sieboldii Siebold Viburnum	20′	12′	oval ascending-horizontal	●	G	18″	36″	36″	6′	2½′	2′	Low						Highly recommended. Interesting habit, good fall color, profuse flowers.
Viburnum trilobum American Cranberry Bush	10′	8′		◒	G	18″	36″	36″	5′	3′	2½′	Low						Hardier than European counterpart (V. opulus). Fruit is tasty; dwarf form available. Recommended.
Weigela florida Old-Fashioned Weigela	6′	5′	oval spreading ascending		G	18″	36″	36″	3½′	3½′	2½′	Med						Many varieties available, recommend 'Mandshuria'. All need regular pruning.
Yucca filamentosa Adams-needle	6′	3′	spreading ascending	○	NA	12″	NA	NA	2′	NA	NA	Low		T				Very conspicuous. Actual foliage only 3′ tall with another 3′ of flower stalk in center.

Ground Covers

Plants referred to as ground covers are often more suitable than turfgrass for controlling erosion. Although turfgrass holds soil better, there are often situations where the maintenance they require cannot be provided. Ground covers do not require mowing, and often are more tolerant of adverse conditions than turfgrasses.

The list provided here offers a variety of ground covers suitable to different situations. A list of regionally hardy ground covers would actually be longer; we have omitted those requiring a medium to high level of maintenance, acid soil, or those that may be difficult to find commercially. The following information is provided in the Ground Cover List.

Physical Characteristics/Plant Use Factors

The information on physical characteristics is based on averages. As with trees and shrubs, growth rate and form will vary depending on site specifics and level of care. However, the information is applicable to most circumstances.

Information is also provided on the various situations in which ground covers might best be used.

Growth rate - A fast growth rate is usually desired when using a ground cover. Those with medium or slow growth rates often require installing more plants closer together in order to obtain the desired erosion control.

Many fast-growing ground covers are also vigorous, and may grow out of control unless restrained with edging or pavement. Those plants on the list that should be restrained are so indicated (R).

Form - Ground covers attain a variety of forms, as listed below.

a. carpet - low, dense mat, small leaf or needles (juniper).
b. thicket - tangled, arching habit, often finely textured.
c. individuals - individual plants stand out.
d. vine - a vine actually grown on the ground, main stems are horizontal trailers, branchlets are upright.
e. suckers - develops extensive underground rooting that sends up shoots.

Use - Three situations are often encountered where ground covers might best be used.

a. flat ground
b. banks
c. edging

Sun and Shade - Sun and shade tolerance will also be included in this category, and are indicated in the following way:

○ - best in full sun.

◒ - best in part sun, part shade.

● - best in full shade.

Erosion Control - Some ground covers die to the ground every fall and come back every spring. Obviously these are not as suitable for controlling erosion. These plants are considered "herbaceous" and are indicated with an (h).

Ground Covers Scientific Name Common Name	Growth Rate	Form	Use	Sun/Shade	Height	Notes
Aegopodium podogaria Bishop's Goutweed h	F	Carpet	Flat, Banks		1.5′	May become a weed if not restrained. Fast-growing.
Ajuga reptans Carpet Bugle	F	Individuals, Suckers	Flat	◒	4″	Fast-growing. Best in shade. Highly recommended. Best in moist areas.
Akebia quinata Five-leaf Akebia	S	Vine	Flat, Banks		1′	Fast-growing. May strangle other plants. May become a weed if not restrained.
Convalaria majalis Lily-of-the-Valley h	M	Thicket	Flat, Banks, Edging	●	1′	Best in shade. Best in moist areas. Highly recommended.
Coronilla varia Crownvetch	F	Individuals	Flat, Banks		2′	Fast-growing. May become a weed if not restrained.
Cotoneaster apiculata Cranberry Cotoneaster	M	Thicket	Banks, Flat	○	1.5′	Highly recommended. Best in moist areas. Best in sun.
Euonymous fortunei Wintercreeper	S	Thicket, Vine, Suckers	Flat, Banks	●	2′	Best in moist areas. Best in shade.
Euonymous fortunei varieties						
Euonymous obovatus Running Euonymous	M	Thicket, Vine, Suckers	Flat, Banks	●	1′	Best in moist areas. Best in shade.
Euphorbia cyparissias Cypress Euphorbia	S	Carpet	Flat, Thicket		1′	

Ground Covers

Scientific Name Common Name	Growth Rate	Form	Use	Sun/Shade	Height	Notes
Forsythia x intermedia 'Arnold's Dwarf' Arnold's Dwarf Forsythia	M	Thicket, Individuals	Flat, Banks, Edging		2′	Highly recommended. Fast-growing.
Hosta varieties Plantain-lily	F	Individuals,	Edging	●	2′	Best in moist areas. Best in shade.
Juniperus chinensis sargentii Sargent Juniper	M	Carpet	Flat, Banks	○	2′	Best in sun.
Juniperus chinensis varieties						
Juniperus communis 'Depressa' Depressa Juniper	S	Carpet	Flat, Banks	○	3′	Best in sun. Slow-growing.
Juniperus horizontalis admirabilis Prostrate Juniper	F	Carpet	Flat, Banks	○	6″	Best in sun. Fast-growing.
Juniperus horizontalis varieties						
Juniperus procumbens 'Nana' Dwarf Japgarden Juniper	S	Carpet	Flat, Banks	○	1′	Best in sun. Slow-growing.
Juniperus procumbens varieties						
Juniperus sabina 'Blue Danube' Blue Danube Juniper	S	Carpet, Individuals	Flat, Banks	○	3′	Best in sun. Slow-growing. Highly recommended.

Ground Covers Scientific Name Common Name	Growth Rate	Form	Use	Sun/Shade	Height	Notes
Juniperus sabina varieties						
Lonicera dioica Limber Honeysuckle	M	Vine, Thicket	Flat, Banks		2′	Highly recommended.
Lonicera japonica halliana Hall's Japanese Honeysuckle	M	Vine, Thicket	Flat, Banks		2′	May strangle other plants. Fast-growing.
Lycium chinense Chinese Matrimony Vine	F	Vine	Banks, Flat	○	3′	Best in sun.
Lysimachia nummularia Moneywort	F	Carpet	Flat		4′	Fast-growing. Best in moist areas.
Nepeta mussini Mussin's Catnip h	F	Suckers	Flat	○	1′	Best in sun.
Pachysandra terminalis Japanese Spurge h	F	Carpet, Suckers	Flat, Banks	●	1′	Best in shade. Highly recommended. Best in moist areas.
Phlox subulata Moss Phlox	S	Carpet	Flat, Banks, Edging	●	4″	Best in shade.
Polygonum x renoutria Renoutria Fleeceflower h	F	Carpet, Individuals	Flat, Banks		2′	May become a weed if not restrained. Fast-growing.

Scientific Name Common Name	Growth Rate	Form	Use	Sun/Shade	Height	Notes
Potentilla tridentata Wineleaf Potentilla	S	Individuals	Flat, Banks, Edging		1′	Highly recommended. Prefers slightly acid soils.
Sedum acre Goldmoss h	S	Carpet	Flat, Banks, Edging	○	2″	Best in sun. May become a weed if not restrained.
Sedum lydium Lydium Stonecrop h	S	Carpet	Flat, Banks, Edging	○	6″	Best in sun. May become a weed if not restrained.
Spiraea albiflora Japanese White Spiraea		Individuals			1.5′	
Spiraea x bumalda 'Norman' Norman Spiraea		Individuals			1′	
Spiraea japonica alpina Alpine Japanese White Spiraea		Individuals			1′	
Symphoricarpos x chenaultii Hancock Coralberry	F	Thicket,	Flat,	○	2′	Best in sun. May become a weed if not restrained. Fast-growing. Highly recommended.
Vinca minor Creeping Periwinkle	M	Carpet	Flat, Banks		6″	Highly recommended.
Viola varieties Violets	F	Carpet	Flat, Banks, Edging		6″	Highly recommended.

Vines

Vines are plants which will climb when placed near a vertical support. Most will support themselves by means of tendrils, some by adhesive pads (holdfasts), and some simply by twining. See Figure 10 for an illustration of support systems. A few are heavy enough that they need to be tied to trellises or other supports.

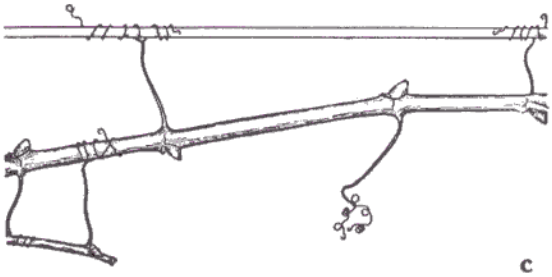
Vines can be used for a variety of situations. On a trellis or fence they provide screening; they can be used to dress up a wall; and they require very little actual ground space. Some can even be used as ground covers.

Physical Characteristics/Plant Use Factors

The vines listed here are arranged by support system, as this is the primary criteria by which they are usually selected. Next to each specimen name are a series of letters and notes that correspond to the following:

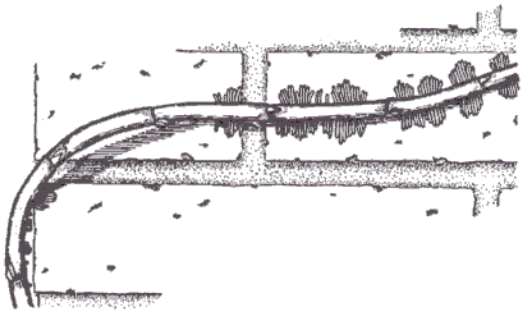
G - may also be used as a ground cover.
Sun, shade, s/s - Best in sun, best in shade, best in half sun, half shade; respectively.
H - hardiness is somewhat questionable during harsh winters.
N - difficult to find commercially.
T - thorns; as with any urban planting, vines with thorns are not allowed where they present a hazard.

a



c

b



b

a. twining
b. root holdfasts
c. tendrils

Sketches by Robert G. Williams
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Fig. 10. Support Systems for Vines

Vines — Tendrils

Scientific Name Common Name	Ground Cover	Sun/ Shade	Hardiness	Avail-ability	Thorns	
Parthenocissus quinquifolia Virginia Creeper	G	S/S	—	—	—	
Parthenocissus quinquifolia engelmanii Engelman Virginia Creeper	G	S/S	—	—	—	
Vines — Root holdfasts						
Campsis radicans Trumpet Vine	—	Sun	—	—	—	
Campsis x tagliabuana 'Madame Galen' Madame Galen Trumpet	—	Sun	—	—	—	
Euonymus fortunei Wintercreeper	G	Shade	—	—	—	
Hedera helix English Ivy	G	Shade	H	—	—	
Hydrangea anomala petiolaris Climbing Hydrangea	—	Shade	—	—	—	
Parthenocissus tricuspidata Japanese Creeper (Boston Ivy)	G	S/S	—	—	—	
Vines — Twining						
Aristolochia macrophylla Dutchman's Pipe	—	S/S	—	—	—	
Celastrus flagelloris Korean Bittersweet	G	S/S	—	—	T	
Celastrus orbiculatus Oriental Bittersweet	G	S/S	—	—	—	
Celastrus scandens American Bittersweet	G	S/S	—	—	—	
Lonicera henryi Henry Honeysuckle	G	Shade	—	N	—	
Lonicera japonica 'Halliana' Halls Honeysuckle	G	Shade	—	—	—	
Lonicera sempervirens Trumpet Honeysuckle	—	Shade	—	N	—	

Sods and Grasses

Sod and seed sold locally is primarily Kentucky Bluegrass. It is often sold pre-mixed with fescue, bentgrass or ryegrass. Zoysia, a dense lawn grass that turns brown after the first frost, is also common in this area.

Grasses are susceptible to the same stress factors as other urban plants. Most, however, are extremely durable once established. All permanent turfgrasses require some mowing and an occasional application of fertilizer. All need regular watering, especially in areas of extensive sun and wind exposure. Although grasses are probably the best ground cover, a grassed slope of greater than 2:1 will not be mowable. Grasses can be established in a variety of ways, such as seeding (broadcast), hydro-mulching, sodding, plugs, or a combination of these.

An alternative to standard turfgrass is the establishment of prairie, or natural grasses. The U.S. Soil Service has information on seed mixes and proper installation and maintenance. Most are actually much lower in maintenance than typical bluegrasses.

Another alternative to standard bluegrass is concrete or stone unit grass pavers. These are available in precast or precut units. Grass grows between these units, providing a very durable surface for occasional vehicular traffic.

Undesirable Plants

Certain aspects of plant physiology may render a plant unsuitable for the urban environment. Generally these factors pertain to public safety and maintenance. The following plant characteristics may be grounds for choosing an alternative.

There are thornless, fruitless varieties of many of these plants available at some nurseries. Often there are varieties, or cultivars, of weak-wooded plants that are stronger than the species. This list is general, and there are often situations where these plants, or their varieties, might be suitable, when they are clearly not in direct conflict with citizens.

Thorns

Plants with thorns are usually not welcome in the urban environment. They not only present a physical hazard to pedestrians, they also tend to trap litter. Occasionally these plants are suitable in high-security situations. Examples of plants with thorns include Common Honeylocust, Buckthorn, Hawthorn, Rose, Quince, Barberry.

Fruit and Seeds

Plants that drop large or messy fruit or seeds are often not suitable, especially in areas of frequent pedestrian or bicycle use. Some plants, such as the female Ginkgo tree have extremely foul-smelling fruits and should be avoided. Other examples of trees with unacceptable fruit and seed include some Crabapple and Cherry, some Oak, Catalpa, Common Honeylocust, Hickory, Walnut, and Osage-Orange.

Weak Wood

Many weak-wooded trees have been planted in urban areas already, as in the case of the Silver Maple. These trees were extensively planted in the early 1900's because they were fast-growing. Most trees that are fast-growing are also weak-wooded or brittle. Other weak-wooded plants include Catalpa, Box-Elder, Tree-of-Heaven, Mulberry, Cottonwood and Willow.

Profuse Suckering

This simply refers to plants that have the tendency to send up prolific shoots from the base. Many of these same trees are also weak-wooded. Suckering plants include Willow, Poplar, Tree-of-Heaven and Mulberry.

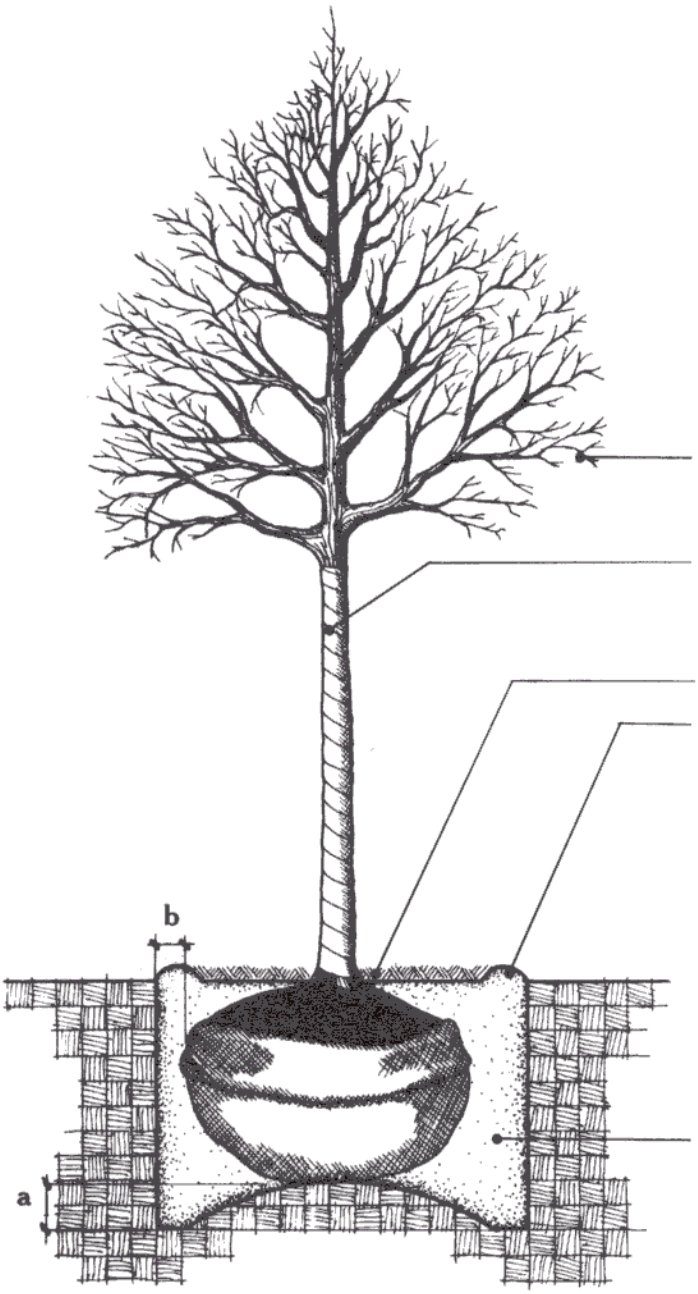
Diseases and Pests

Many plants, especially ornamentals, are susceptible to pests, diseases and fungus. Although these problems can usually be controlled or eradicated, this does require extensive maintenance. The American Elm, susceptible to a variety of diseases and pests, was almost totally eliminated by the Dutch Elm disease. Some Dutch Elm–resistant varieties have been tried in the past, with limited success. Recently, however, a promising variety was developed at the Morton Arboreatum near Chicago, and is being tested in a variety of situations, including Arbor Lodge in Nebraska City. Other plants with disease and pest problems include Crabapple, Cherry, Mulberry, Poplar, Birch.

Appendices

The following section offers some plant installation details and a sample set of landscaping specifications. Their status as examples should be emphasized, as details and written specifications are generally very distinct with each separate project. There are many other acceptable methods of planting and styles of specification writing. The details and specifications will be periodically updated as new information is received.

APPENDIX A - SAMPLE PLANTING DETAILS



Approx. 1/3 of branches should be pruned out after planting (in addition to dead wood). Retain natural shape of tree.

tree crepe

2″ mulch

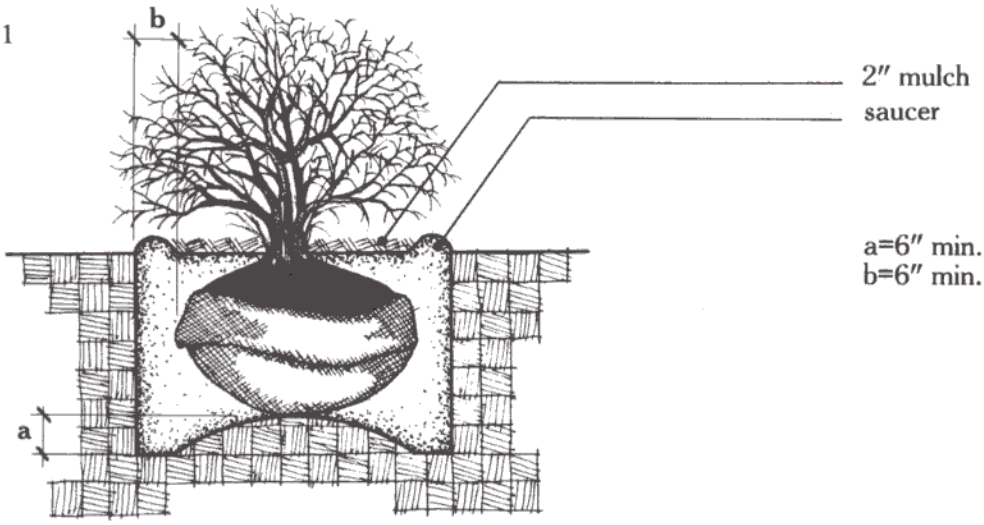
saucer

Fold back burlap 1/3. Remove all wire and synthetic cord.

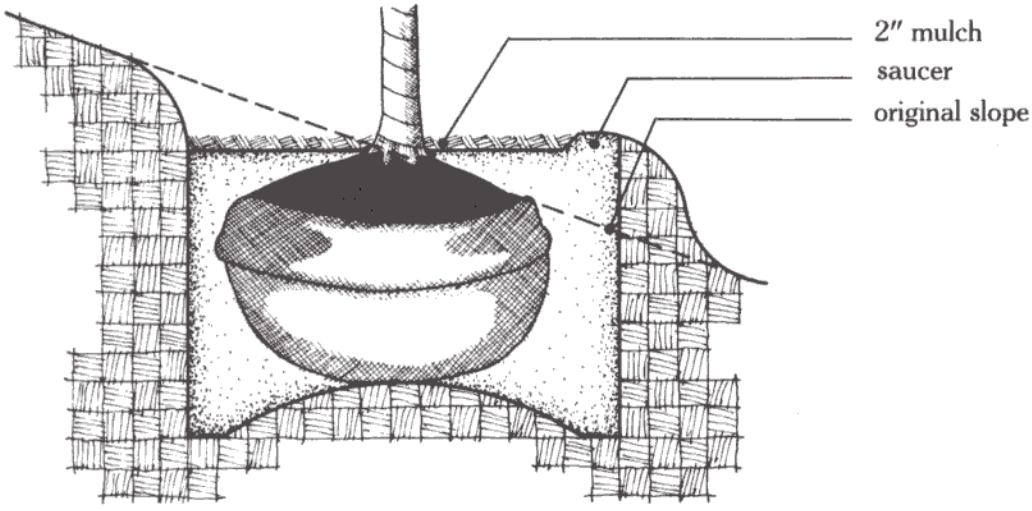
Planting medium - generally, 1 part peat to 4 parts clean topsoil. Alterations may be required according to plant requirements or site conditions.

a=6″
b=1′ (all sides)

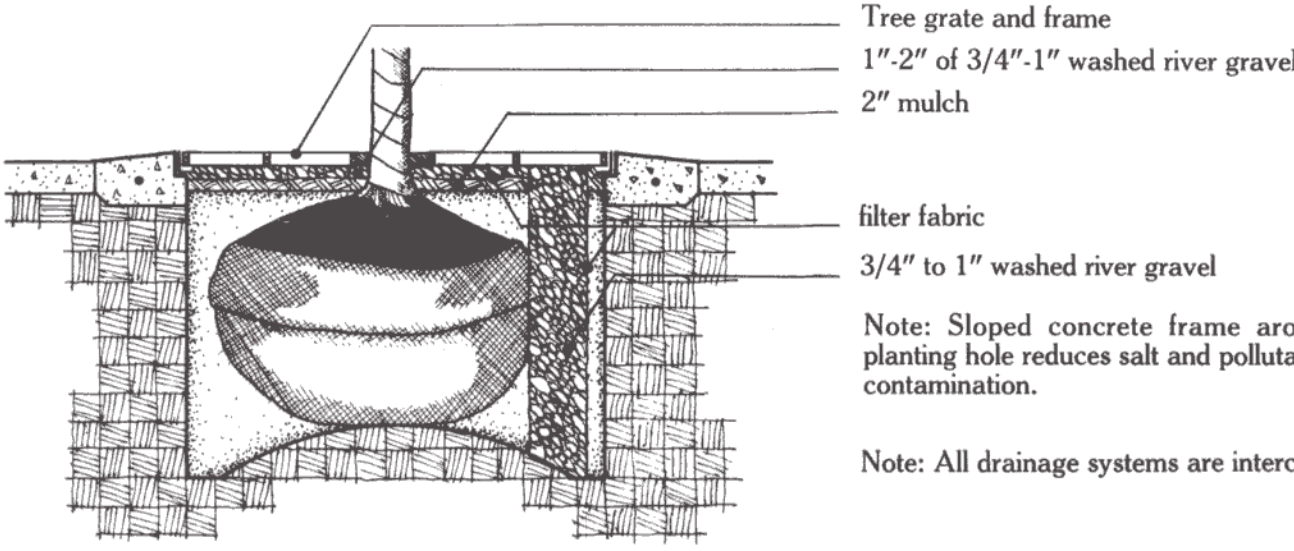
Tree Planting Detail



Shrub in Open Ground



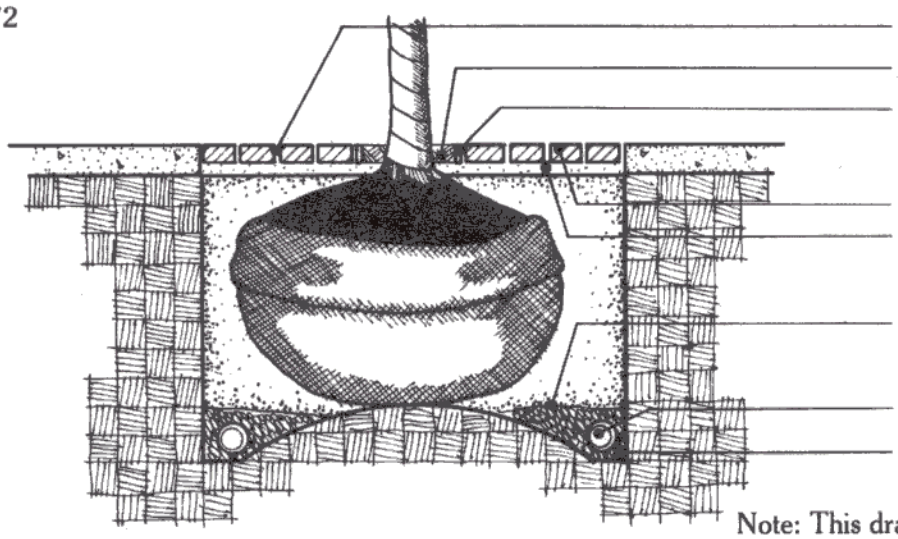
Tree and Shrub on Slope



Note: Sloped concrete frame around planting hole reduces salt and pollutant contamination.

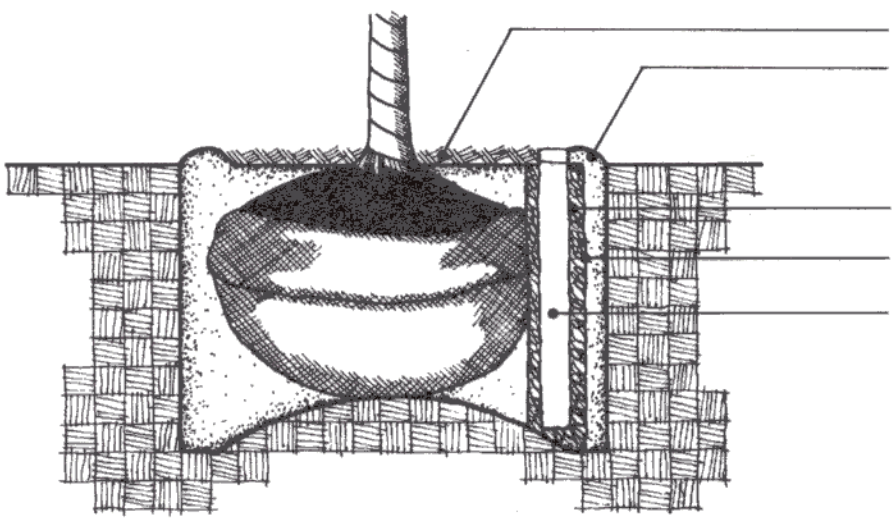
Note: All drainage systems are interchangeable.

Tree in Walk W/Grate

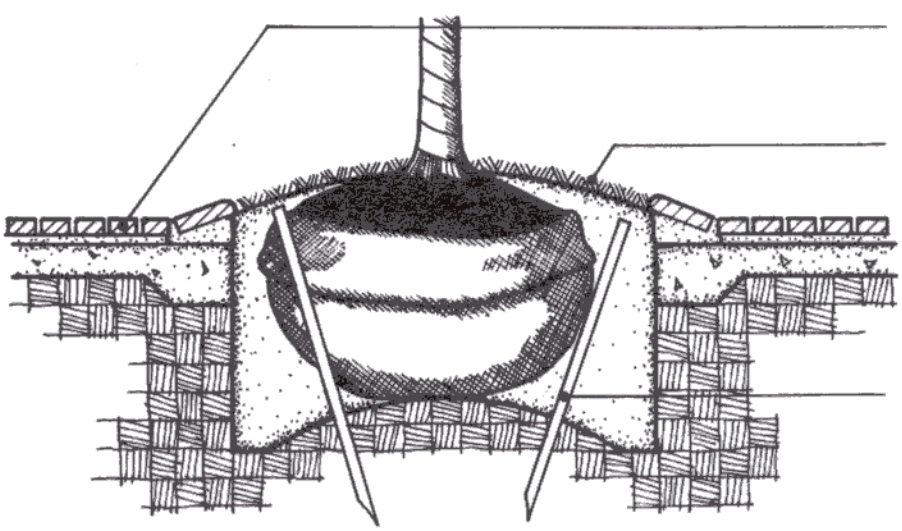


Note: This drainage system is used to carry excess water to storm sewer or other collection system.

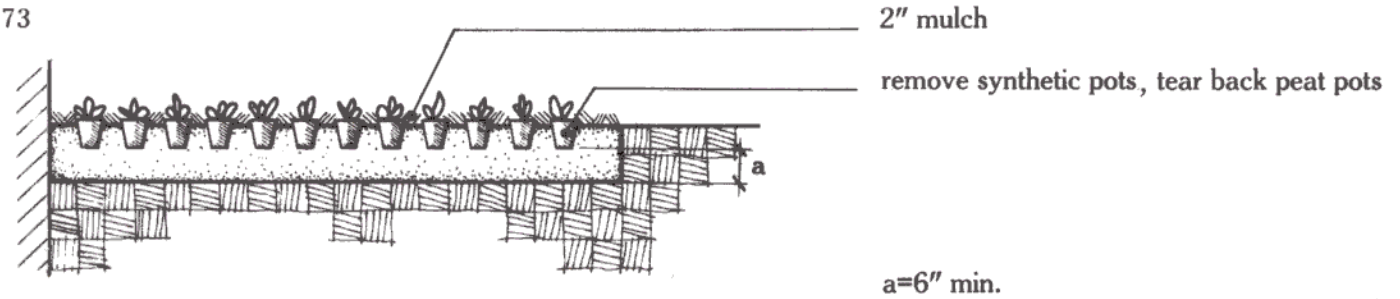
Tree in Walk W/Brick



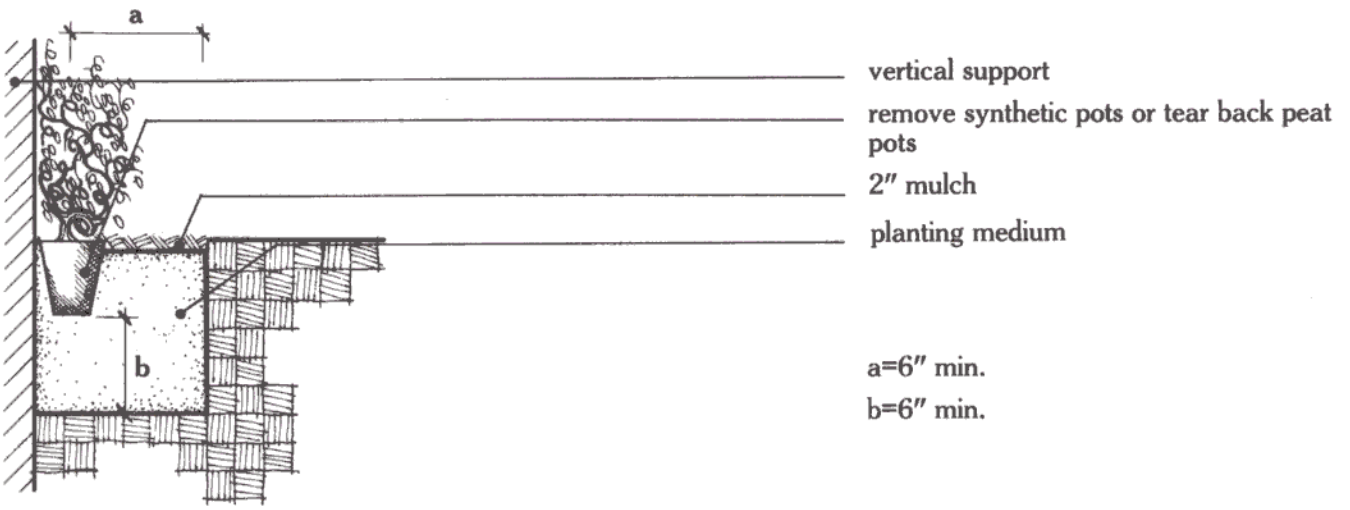
Tree in Open Ground



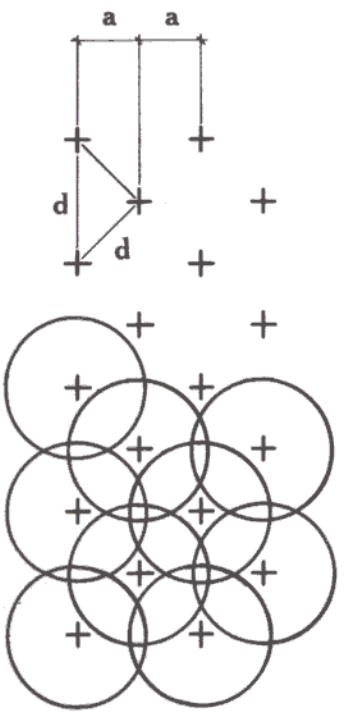
Tree in Sidewalk W/Root Ball Support



Ground Cover Planting



Vine Planting



Shrub and Ground Cover Spacing

d	a	# of Plants	Area Unit
4″	3.46″	10.39	
6″	5.20″	4.62	
8″	6.93″	2.60	per 1 SF
10″	8.66″	1.66	
12″	10.39″	1.15	
15″	12.99″	7.39	
18″	15.59″	5.13	
24″	20.78″	2.89	per 10 SF
30″	25.98″	1.85	
36″	31.18″	1.28	
4′-0	3.46′	7.22	
5′-0	4.33′	4.62	
6′-0	5.20′	3.21	per 100 SF
8′-0	6.93′	1.80	
10′-0	8.66′	1.15	

The illustration and table give planting information for shrub and ground cover massings. These calculations may also be used in figuring the arrangement of a staggered hedgerow.

APPENDIX B - SAMPLE PLANTING SPECIFICATIONS

General

1. "Plant materials" shall mean trees, shrubs, groundcovers, and plants of all descriptions required for the project. Bluegrass seed and sod is excluded from this section.
2. Plant materials shall comply with state and federal laws relating to inspection for disease and insect infestation.
3. The Contractor is responsible for having thoroughly inspected the site prior to submitting a bid.
4. All plant materials shall be sound, healthy specimens, true to name, and typical of their species.
5. The City of Omaha reserves the right to select plant materials at the nursery.
6. All plant materials shall be dug and handled so as to prevent injury to the bark, roots, and branches. Roots shall be packed in such a manner as to insure safe delivery to the site.
7. All plant materials will be subject to inspection by the project engineer, or a representative of the City, for size, quality, health, injury, and color. The City of Omaha, its representative, or the Project Engineer, reserves the right to reject any plant materials at the time of delivery.
8. The Project Engineer, or representative of the City, reserves the right to provide location stakes prior to installation.
9. Substitutions of plant materials is not permitted. If proof is submitted as to the unavailability of a certain species, variety, or size, proposals will be considered for the nearest equivalent size or variety with an equitable adjustment in contract price.
10. Any damage to existing improvements or any other property of the Owner, or any other party, which may be caused by delivery, installation, or maintenance of the plant materials, shall be repaired immediately by the Contractor.

Planting and Delivery

1. All plant materials shall be planted on the day of delivery. If this is not possible, the Contractor shall be responsible for protecting the stock from sun, winds, and drying. Plants shall not remain unplanted on site for more than three days.
2. Planting pits shall be prepared in accordance with the following procedures:
   A. Excavation - The contractor shall be required to excavate for all planting pits to the sizes and shapes shown on the detail drawings. All material excavated from the pits, unless approved by the City, shall be disposed of off the site.

      In the event that rock or other underground obstructions are encountered during the excavation of planting pits, alternative locations may be selected by the City, or its representative. When locations cannot be changed, the obstructions will be removed to a depth of not less than four (4) feet below grade, and no less than six (6) inches below the bottom of a typical root ball when properly installed. The Contractor shall be responsible for the removal of such rock or underground obstruction.

      Where the condition of the bottom of a newly excavated planting pit appears either overly porous or impervious, the Contractor shall be responsible for bringing this condition to the attention of the Project Engineer or the representative of the City.

   B. Shape and size - Where detail drawings are not provided, all planting pits shall have vertical sides and crowned bottoms, unless otherwise specified. All pits shall be one (1) foot wider, and six (6) inches deeper than the size of the root ball to be planted.
3. Plant materials shall be centered in the pit, plumb and straight, and at such a level that, after settlement has occurred, the crown of the root ball will be level with the finished grade.
4. Remove all wire, nylon, or treated rope from the root ball, and fold back top 1/3 of burlap before backfilling.
5. Backfilling of planting pits shall follow these procedures, unless otherwise specified:
   A. Mix - All backfill mix for planting pits shall consist of four (4) parts clean, loamy topsoil, and one (1) part peat. The City reserves the right to alter this mixture according to site conditions.
   B. Settlement - After plants are properly positioned, topsoil mix shall be backfilled in layers of not more than nine (9) inches, and not less than six (6) inches. Each individual layer shall be watered and hand-tamped sufficiently to settle before the next layer is added.
   C. A shallow saucer shall be formed, with a ridge of soil around the base of all trees and large shrubs to faciliate watering.
   D. A two (2) inch to three (3) inch layer of clean bark mulch, wood chips, or other City approved mulch, shall be applied around the base of all plant materials, including ground covers.

Post-planting Maintenance

1. The trunks of all trees and "tree-form" shrubs shall be wrapped spirally from the bottom up to the second whorl of branches with burlap, tree crepe, or other material approved by the City, and shall be securely tied or taped at the top and bottom, and at two (2) foot intervals along the trunk. The wrapping shall be overlapped at least two (2) inches every turn, so that no portion of the trunk is exposed. Wire ties are not acceptable for securing tree wrap.
2. Approximately one-third (1/3) of the wood in the crown shall be removed by thinning and shortening of branches. Pruning shall be done with clean, sharp tools and all cuts shall be made so as to be angled or vertical to the ground plane. All dead and/or broken branches shall be included in this initial pruning. All pruning shall be done in a manner that retains the natural shape and form of the plant. The central leader shall not be pruned unless instructed to do so by the Project Engineer or City representative.
3. The Contractor is responsible for properly maintaining all plant materials up to the time of acceptance by the City, or until a separate maintenance contract is fulfilled. All maintenance procedures shall start immediately after installation. Trees shall be maintained for no less than thirty (30) days from installation. Maintenance shall include, but is not limited to, pruning, watering, weeding, pest and disease prevention and treatment, and resetting and remulching. Maintenance shall also include replacement of damaged or dead plants. Plants shall be replaced with similar size and variety, and in accordance with all specifications contained herein. All removed plant materials shall be disposed of off-site.

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