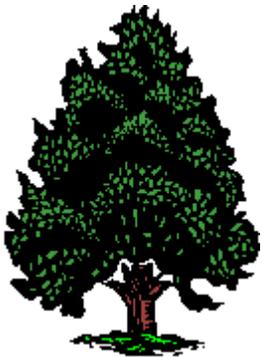




TREE CITY USA



Tree and Landscape Standards

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Dated: August 24, 2006



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PART I: GENERAL

- A. Policy Regarding Trees.** It is the policy of the Town to encourage new tree planting on public and private property, to line its streets with trees, to plant trees in parks, to minimize tree hazards, to maintain trees in a healthy condition, and to conduct a consistent, professional, effective and efficient community forestry program.
- B. Relationship with other Town Planning Documents.** These standards are intended to be fair and consistent with current industry standards, and to supplement and complement the Parks and Recreation Master Plan, Planning Procedures Manual, corridor plans and other pertinent planning documents.
- C. General Specifications.** A permit is required for planting, pruning or removal of trees in public places. It shall be unlawful for any person to plant, remove, or cause to be planted, removed or destroyed, any tree, shrub or hedge in, over or upon the public right-of-way of any street, alley, sidewalk or other public place within the Town without having first obtained a written permit from the Town. An approved landscape plan by the Planning Department shall be considered a permit (*Windsor Municipal Code Sec. 7-63*). The Town Forester shall issue permits. A fee may be assessed with this permit.
- D. Definitions.**
1. *Arborist* - a tree care professional who possesses the technical competence through experience and related training to provide for or supervise the management of trees and other woody plants in the residential, commercial, and public landscape.
 2. *Branch* - a secondary shoot or stem arising from a main trunk or leader of a tree or woody plant.
 3. *Branch Collar* - trunk tissue that forms around the branch base between the main stem and the branch or a branch and a lateral.
 4. *Branch Bark Ridge* - raised area of bark in the branch union that marks where the branch wood and trunk wood meet.
 5. *Buffer Yard* - a landscaped area between incompatible uses.
 6. *Crown* - the leaves and branches of a tree or shrub; the upper portion of a tree from the lowest branch on the trunk to the top.
 7. *Crown Cleaning* - the removal of dead, dying, diseased, crowded, weakly attached, low-vigor branches, and water sprouts from a tree's crown.
 8. *Crown Raising* - the removal of the lower branches of a tree in order to provide clearance.

9. *Crown Reduction* - the reduction of the top, sides, or individual limbs by the removal of the leader or longest portion of a limb to a lateral no less than one-third of the total diameter of the original limb and removing no more than one-quarter of the leaf surface.
10. *Crown Thinning* - the selective removal of branches to increase light penetration and air movement, and to reduce weight.
11. *Cut* - the exposed wood area resulting from the removal of a branch or portion thereof.
12. *Decay* - degradation of woody tissue caused by biological organisms.
13. *Deciduous Tree* - a tree that loses its leaves each autumn.
14. *Easement* - a dedication of land for a specified use such as providing access for maintenance of utilities (*Windsor Municipal Code Sec. 17-11(4)*).
15. *Evergreen Tree* - a large tree that retains its leaves (or 'needles') for more than one growing season.
16. *Ground Cover* - vegetation with the purpose of soil stabilization such as vines, turf, low growing shrubs, and perennials.
17. *Parking Lot Interior* – area within the perimeter of a parking lot.
18. *ISA* – International Society of Arboriculture. Instrumental in setting standards for the tree care industry.
19. *Landscape* - to cover, adorn, or improve property with living plants (such as trees, shrubs, vines, grass or flowers) and/or loose natural materials with limited use (such as rock, wood chips, or shavings). "Landscape" does not include improving property with artificial trees, shrubs, turf or other artificial plants.
20. *Lateral* - a branch or twig growing from a parent branch or stem.
21. *Leader* - a dominant upright stem, usually the main trunk. There can be several leaders in one tree.
22. *Limb* - same as branch, but larger and more prominent.
23. *Lot* - a parcel of land intended for transfer of ownership or building development having its full frontage on a public street (*Windsor Municipal Code Sec. 17-11(5)*).
24. *Open Spaces* - natural areas with public access that provide for passive recreation. Open space is usually maintained with native vegetation.

25. *Ornamental Tree* - a small tree, usually less than thirty (30) feet at maturity. Often planted for ornamental characteristics such as spring flowers or attractive bark.
26. *Opacity* - the quality or state of a body that makes it impervious to the rays of light.
27. *Parking Lot* – a paved area dedicated for the purpose of parking vehicles and space required to maneuver vehicles in and out of parking stalls.
28. *Parking Lot Perimeter* – land/area directly adjacent to the parking lot.
29. *Planting Bed* - area that is prepared for the installation of plant materials. Edging shall be used to separate all plant beds from turf and other non-paved areas. Mulch and weed barrier fabric shall be used to protect bed from weeds, and conserve moisture. All shrubs and groundcovers shall be located within plant beds. The installation of individual shrub species in turf areas is prohibited.
30. *Pruning* – selective removal of tree and shrub branches and limbs.
31. *Public Right-of-Way* - the width between property lines of a street (*Windsor Municipal Code Sec. 17-11(8)*).
32. *Shade Tree* - a large deciduous tree with a mature height of at least thirty (30) feet.
33. *Shrub* - a woody plant usually less than fifteen (15) feet in height, often formed by a number of vertical or semi-upright branches arising close to the ground.
34. *Street* - a thoroughfare for vehicular traffic (*Windsor Municipal Code Sec. 17-2-10*).
35. *Street Tree* – trees that exist or are planted in the street row or along street frontage.
36. *Stub* - an undesirable short length of a branch remaining after a break or incorrect pruning cut is made.
37. *Topping* - cutting a currently growing, larger branch, limb, or leader back to a stub or lateral branch not sufficiently large enough to assume the terminal role.
38. *Town Forester* - person responsible for the interpretation and implementation of these standards as approved by the Town Board. Also responsible for planting, maintenance, and removal of trees and shrubs in parks and public rights-of-way.
39. *Trunk Flair* – the area where the trunk widens and the roots spread at the base of the tree.

40. *Xeriscape* - a landscape designed for reduced water use. Such a landscape can include plants that have adapted so that they transpire less than others or species that can survive periods of drought.

PART II: DEVELOPMENT LANDSCAPE STANDARDS AND SPECIFICATIONS

- A. Purpose.** Development brings about changes to the natural topography of a site, disturbs or removes existing vegetation, and typically brings expanses of impervious surfaces that can have a negative impact on the natural environment of an area by increasing air temperatures and accelerating runoff and erosion. The purpose of these standards and specifications is to define the requirements of the Town, which have been established in order to promote the health, safety and welfare of the Town's inhabitants by creating a community that has strong aesthetic features in all aspects of its developments. The Town recognizes that landscaping can be used to improve air quality, reduce dust, act as a noise buffer, promote energy and wildlife conservation, visually facilitate traffic flow, promote water conservation through the use of low water adaptive vegetation, and mitigate the impact of otherwise incompatible uses. Stringent landscape standards ensure that the entire community benefits from an enhanced visual experience, higher property values, the protection of existing natural areas, and an improved quality of life.
- B. Landscape Plan Required.** New development requires a site plan as defined by the *Windsor Municipal Code*, and developer shall submit a landscape and tree protection plan that:
1. reinforces and extends any existing patterns of outdoor spaces and vegetation where practical;
 2. meets the standards of any existing corridor plan;
 3. supports functional purposes such as spatial definition, visual screening, creation of privacy, management of microclimate or drainage;
 4. enhances the appearance of the development and neighborhood;
 5. protects desirable trees, natural systems and habitat;
 6. enhances the pedestrian environment;
 7. identifies all landscape areas;
 8. provides an approved irrigation plan;
 9. identifies all landscaping elements within each landscape area; and
 10. meets or exceeds the standards and specifications of this document and subsequent amendments thereto.

C. Submittal Requirements for Landscape Plans.

1. A preliminary landscape plan is required as part of the preliminary site plan and will be reviewed by the Town Forester.
2. A final landscape plan, approved by the Town Forester, must be submitted with the final site plan.

D. General Landscape Standards. All final site plans [as outlined in the *Windsor Municipal Code Sec. 17-7-50(b)(1)(a)*] shall include landscape plans that meet the following minimum standards:

1. *Landscape Area Treatment.* Landscape areas shall include all areas on the site that are not covered by buildings, structures, paving or impervious surfaces. Landscape areas shall consist only of landscaping. The selection and location of turf, ground cover (including shrubs, grasses, perennials, flowerbeds, and slope retention), pedestrian paving and other landscaping elements shall be used to prevent erosion and meet the functional and visual purposes such as defining spaces, accommodating and directing circulation patterns, managing visibility, attracting attention to building entrances and other focal points, and visually integrating buildings with the landscape area and with each other.
2. *Landscaping of Recreation and Open Space Districts.* A landscape plan shall be developed for all lands designated as recreation or open space districts. Lands designated as open space shall be maintained in a native landscape. Landscaping for shade, screening and other uses may be permitted in open space areas.
3. *Landscaping of Parks.* A landscape plan shall be developed for all lands designated as a public park as defined in the *Parks and Recreation Master Plan*. At a minimum, trees shall be planted at forty (40) feet spacing along the mini-park boundaries. Landscape plans shall be based upon expected amenities and facilities, such as playground equipment, picnic tables, game courts, playing fields, and swimming pools. All additional planting, irrigation and maintenance standards provided herein shall be followed.
4. *Entryways.* Primary entryways for new development, or redevelopment where appropriate, shall be landscaped within a setback of at least fifty (50) feet from the right-of-way line. The entry way will be landscaped at a ratio of at least one (1) tree and three (3) shrubs for every 1,500 square feet.
5. *Buffering between Incompatible New Uses and Activities.* In addition to the required landscape, and in certain situations where Town Staff deems the arrangement of uses or the design of buildings does not adequately mitigate conflicts reasonably anticipated to exist between incompatible

uses or building designs, one (1) or more of the following landscape buffering techniques shall be used to mitigate the conflicts:

- (A) Separation and screening with plant material - planting dense groups of trees and shrubs. Evergreen plant material shall not be elevated if opacity will be lost.
 - (B) Integration with plantings - incorporating trees, vines, planters or other plantings into the architectural theme of buildings and their outdoor spaces to subdue differences in architecture, bulk and avoid harsh edges.
 - (C) Establishing privacy - establishing vertical landscape elements to screen views into or between windows and defined outdoor spaces where privacy is important, such as where larger buildings are proposed next to the side or rear yards of smaller buildings.
 - (D) Visual integration of fences or walls - providing plant material in conjunction with a screen panel, arbor, garden wall, privacy fence or security fence to avoid the visual effect created by unattractive screening or security fences.
 - (E) Landform shaping - utilizing berming or other grade changes to alter views, subdue sound, change the sense of proximity and channel pedestrian movement.
6. Turf Grass. High-use areas shall be planted with irrigated turf grass. Non-irrigated short-grass, prairie grasses, or other adapted grasses that have been certified as xeriscape landscaping may be established in areas of lower traffic with the goal of conserving water by avoiding unnecessary and excessive use of turf with higher water needs. Trees to be planted in turf areas will be planted with an organic mulch ring that has a radius of at least eighteen (18) inches.
7. Planting Beds. Shrub and ground cover planting beds shall be separated from turf grass with edging and shall have open surface areas covered with mulch.
8. Non-Vegetative Ground Covers. Organic mulches (i.e.: bark or wood chips, wood grindings) to a minimum depth of three (3) inches are used wherever possible. Inorganic mulches (i.e.: gravel) retain and reflect heat, compact the soil, and are generally discouraged except for functional purposes such as parking. In no case shall non-vegetative groundcover be installed without permeable weed barrier. Black plastic or impermeable weed barriers shall not be used.
9. Slopes. Retaining walls or other acceptable devices integrated with plantings shall be used to stabilize slopes that are steeper than 3:1. If soil tests performed on the subject soils indicate steeper slopes are stable

without the above required protection, the maximum slope allowed without the above required protection may be increased to the maximum stated in the soils report or 2:1, whichever is less steep.

10. Foundation plantings. Exposed sections of building walls that are in high-use or high-visibility areas of the building exterior shall have planting beds at least five (5) feet wide placed directly along at least fifty (50) percent of such walls.
11. Agricultural Use. If outdoor space is maintained in active agricultural use, the landscape surfaces and ground cover standards above shall not apply.
12. Water Conservation. All landscaping plans shall be designed to incorporate water conservation materials and techniques through application of xeriscape landscaping principles. Xeriscape landscaping principles do not include or allow artificial turf or plants, mulched (including gravel) beds or areas without landscape plant material, such as pavement, walkways, plazas, parking lots, or bare ground. Weed covered or infested surfaces or landscaping does not comply with these standards. Xeriscape is encouraged wherever possible and includes the following concepts:
 - (A) Grouping of plants with similar water requirements together on the same irrigation zones.
 - (B) Limiting high-irrigation turf and plantings to appropriate high-use areas with high visibility and functional needs.
 - (C) Use of low-water demanding plants and turf where practical.
 - (D) Incorporation of soil amendments and use of organic mulches.
 - (E) Provision of regular and attentive maintenance to ensure irrigation systems are functioning properly, and incorporations of water thrifty irrigation systems and devices.
 - (F) See Appendix E, the Town of Windsor's recommended xeric plant list to incorporate trees and shrubs with lower water needs.
13. Parking Lot Perimeter Landscaping. Parking lot perimeter landscaping shall meet the following minimum standards:
 - (A) Trees shall be provided at a ratio of one (1) tree per forty (40) lineal feet along a public street or side lot line. Trees may be spaced irregularly in informal groupings or be uniformly spaced, as consistent with larger overall planting patterns and organization. Perimeter landscaping along a street may be located in and should be integrated with the streetscape in the street right-of-way.

(B) Parking lots shall be screened from adjacent uses and from the street. Screening from residential uses shall consist of a fence or wall six (6) feet in height in combination with plant material and of sufficient opacity to block at least seventy-five (75) percent of light from vehicle headlights. Screening from the street and all non-residential uses shall consist of a wall, fence, planter, earthen berm, plant material or a combination of such elements, each of which shall have a minimum height of thirty (30) inches. Such screening shall extend a minimum of seventy (70) percent of the length of the street frontage of the parking lot and also seventy (70) percent of the length of any boundary of the parking lot that abuts any non-residential use. Openings in the required screening shall be permitted for such features as access ways or drainage ways. Where screening from the street is required, plans submitted for review shall include a graphic depiction of the parking lot screening as seen from the street. Plant material used for the required screening shall achieve required opacity in its winter seasonal condition within three (3) years following planting. Evergreen plant material shall not be elevated if opacity will be lost. If opacity is lost when plants are elevated, property owner will be responsible for replacement.

14. Parking Lot Interior Landscaping. There is no requirement for parking lots with less than or equal to fifteen (15) parking spaces. At least six (6) percent of the interior space of any parking lot with between 16 and 99 spaces and ten (10) percent of the interior space of any parking lot with 100 spaces or more shall be devoted to landscaping. All parking lot islands, connecting walkways through parking lots and driveways through or to parking lots shall be landscaped according to the following standards. No point within the parking lot shall be more than seventy-five (75) feet from a landscaped area, and landscaped areas will exist at least every fifteen (15) parking spaces.

(A) Visibility. To avoid landscape material blocking driver sight distance at driveway-street intersections, no plant material greater than twenty-four (24) inches in height shall be located within fifteen (15) feet of a curb cut.

(B) Maximized Area of Shading. Landscape islands shall be evenly distributed to the maximum extent feasible. At a minimum, trees shall be planted at a ratio of at least one (1) shade tree per one hundred fifty (150) square feet of internal landscaped area with a landscaped surface of turf, ground cover perennials, or mulched shrub plantings.

(C) Landscaped Islands. In addition to any pedestrian refuge areas, each landscaped island shall be greater than eight (8) feet in length in its smallest dimension, include at least eighty (80) square feet of

ground area per tree to allow for root aeration, and have raised concrete curbs. A minimum of one (1) shade tree per eighty (80) square feet shall be planted.

(D) Walkways and Driveways. Connecting walkways through parking lots shall have one (1) shade tree per forty (40) lineal feet which shall be planted in landscape areas within five (5) feet of such walkway. Driveways through or to parking lots shall have one (1) shade tree per forty (40) lineal feet of and along each side and shall be planted in landscaped areas within five (5) feet of such driveway.

15. Railroad Tracks. Existing railroad tracks adjacent to new residential development shall be screened. Screening shall consist of a fence or wall six (6) feet in height in combination with plant material. Screening from the street, all incompatible uses and activities, and all non-residential uses shall consist of a wall, fence, planter, earthen berm, plant material or a combination of such elements, each of which shall have a minimum height of thirty (30) inches.

16. Detention Ponds. All detention ponds shall be landscaped with irrigated turf grass, native grasses, or drought hardy approved vegetation. Trees shall be planted at a minimum of forty (40) feet spacing along the perimeter of a detention pond. All additional planting, irrigation, and maintenance standards provided herein shall be followed.

17. Irrigation Ditches. All irrigation ditches shall be landscaped with irrigated turf grass or native vegetation from the outer edge of the ditch to the top of the bank. Trees shall be planted at a minimum of forty (40) feet spacing along irrigation ditches. All additional planting, irrigation and maintenance standards provided herein shall be followed.

E. Landscaping in Residential Districts. Single-Family Residential SF-1, Single-Family Attached Residential SF-2, Estate Residential E-1, Estate Residential E-2, Multifamily Residential MF-1, and High-Density Multifamily Residential MF-2 Districts shall, at a minimum, be landscaped as follows:

1. Street trees shall be planted in the public right-of-way as established in the Tree Planting Standards section of this document (Part II, Section H). A minimum of one (1) street tree per lot/parcel shall be planted by the individual property owner or the developer as defined in the development agreement.
2. Multifamily Residential Districts shall adhere to all parking lot standards provided in this document as well as other applicable Town regulations.

F. Landscaping in Commercial Districts. Neighborhood Commercial (NC), Central Business (CB), and General Commercial - Planned Unit Development (GC-PUD) Districts should, at a minimum, be landscaped as follows:

1. All commercial development within an established corridor plan shall follow the landscaping standards in the corridor plan and/or these *Tree and Landscape Standards*, whichever is more stringent. Commercial development outside an established corridor plan shall follow the guidelines provided in these *Tree and Landscape Standards*.
2. Twenty (20) percent or more of the lot/parcel shall be landscaped. Landscaped public right-of-way may be included in this calculation.
3. Landscape shall consist of at least one (1) tree and five (5) shrubs for every 750 square feet of landscaped area. One (1) tree may be substituted for five (5) shrubs with approval of the Town Forester.
4. Street trees shall be planted in the public right-of-way as established in the Tree Planting Standards section of this document (Part II, Section H). A minimum of one (1) street tree per lot/parcel shall be planted by the individual property owners or the developer as defined in the development agreement.
5. Buffer yard landscaping shall be provided as follows:
 - (A) At least fifteen (15) feet wide adjacent to a non-arterial street right-of-way. Large non-residential buildings (25,000 square feet or greater) shall provide a buffer yard at least twenty-five (25) feet wide.
 - (B) At least twenty-five (25) feet wide adjacent to an arterial street right-of-way.
 - (C) At least fifteen (15) feet wide adjacent to residential uses. Large non-residential buildings (25,000 square feet or greater) shall provide a buffer yard at least twenty-five (25) feet wide. Non-residential buildings with service areas oriented toward residential uses will provide a buffer yard of at least fifty (50) feet.
 - (D) Buffer yards shall be landscaped at a ratio of at least one (1) tree and five (5) shrubs for every 500 square feet, except that buffer yards adjacent to residential uses shall be landscaped at a ratio of at least one (1) tree and five (5) shrubs for every 250 square feet.
 - (E) Buffer yards may be interrupted for emergency, public utility, or other necessary access.
 - (F) Buffer yards between incompatible uses shall be designed according to the standards set forth in Section 8.
 - (G) Parking lots shall be landscaped according to the standards set forth in Sections 16 and 17.

G. Landscaping in Industrial Districts. Heavy Industrial (I-H) and Limited Industrial (I-L) Districts shall be landscaped as follows:

1. All industrial development within an established corridor plan shall follow the landscaping standards in the corridor plan and/or these *Tree and Landscape Standards*, whichever is more stringent. Industrial development outside an established corridor plan shall follow the guidelines provided in these *Tree and Landscape Standards*.
2. Fifteen (15) percent or more of the lot/parcel shall be landscaped which may include any/all of the buffer yard requirements below.
3. Landscape shall consist of at least one (1) tree and five (5) shrubs for every 750 square feet of landscaped area or as deemed appropriate by the Town Forester.
4. Street trees shall be planted in the public right-of-way as established in the Tree Planting Standards section of this document (Part II, Section H). A minimum of one (1) street tree per lot/parcel shall be planted by the individual property owner or the developer as defined in the development agreement.
5. Buffer yard landscaping (including adjacent public rights-of-way) shall be provided as follows:
 - (A) At least fifteen (15) feet wide adjacent to a non-arterial street right-of-way. Large non-residential buildings (25,000 square feet or greater) shall provide a buffer yard at least twenty-five (25) feet wide.
 - (B) At least fifteen (15) feet wide adjacent to an arterial street right-of-way. Large non-residential buildings (25,000 square feet or greater) shall provide a buffer yard at least twenty-five (25) feet wide.
 - (C) At least fifteen (15) feet wide adjacent to residential uses. Large non-residential buildings (25,000 square feet or greater) shall provide a buffer yard at least twenty-five (25) feet wide. Manufacturing facilities, uses with outdoor storage or activities, or non-residential buildings with service areas oriented toward residential uses will provide a buffer yard of at least fifty (50) feet.
 - (D) Buffer yards shall contain berms or a combination of berms and walls/fences as appropriate.
 - (E) Buffer yards shall be landscaped at a ratio of at least one (1) tree and five (5) shrubs for every 500 square feet, except that buffer yards adjacent to residential uses shall be landscaped at a ratio of at least one (1) tree and five (5) shrubs for every 250 square feet.

- (F) Buffer yards may be interrupted for emergency, public utility, or other necessary access.
- (G) Buffer yards between incompatible uses shall be designed according to the standards set forth in Section 8.
- (H) Evergreen trees used as screening in buffer yards may not be pruned to elevate their canopies. If opacity is lost, tree replacement will be necessary.

H. Tree Protection and Replacement. Existing desirable trees within any planning area and within natural buffer zones shall be preserved to the extent reasonably feasible and may help satisfy the landscaping requirements given above. Such trees shall be considered “protected” trees, subject to the exceptions contained below.

1. Streets, buildings, and lot layouts shall be designed to minimize the disturbance to protected existing trees. All required landscape plans shall accurately identify the locations, species, size, and condition of all desirable trees, each labeled showing the applicant’s intent to either remove, transplant or protect.
2. Where it is not feasible to protect and retain desirable existing tree(s) or to transplant them to another on-site location, the applicant shall replace such tree(s) according to the following schedule and requirements. Replacement trees shall be used to satisfy the tree planting requirements of these standards and shall be planted either on the development site or closest available planting site.
3. A desirable tree that is removed shall be replaced with not less than one (1) or not more than six (6) replacement trees sufficient to mitigate the loss of the removed desirable tree. The applicant shall select either the Town Forester or a qualified landscape appraiser to determine the loss based upon an appraisal of the tree to be removed by using the most recent published methods established by the Council of Tree and Landscape Appraisers as a guideline. Replacement trees shall meet the following minimum size requirements:
 - Shade trees – 2” caliper balled and burlap or equivalent
 - Ornamental trees - 1.5” caliper balled and burlap or equivalent
 - Evergreen trees – 6’ height balled and burlap or equivalent
4. Trees that meet one or more of the following removal criteria may be exempt from these requirements:
 - (A) Dead, dying, or naturally fallen trees, or trees found to be a threat to public health, safety, or welfare.

- (B) Trees that are determined by the Town to substantially obstruct clear visibility at driveways or intersections.
 - (C) Tree species that constitute a nuisance to the public such as cotton bearing cottonwood, Russian olive, and female boxelder. Native cotton bearing cottonwood trees and female boxelder trees, when located in a natural area buffer zone, are not considered nuisance tree species.
5. All existing trees that are located on Town rights-of-way adjacent to the development shall be accurately identified by species, size, location, and condition on required landscape plans, and shall be preserved and protected in accordance with the standards herein.
 6. Replacement trees must be on the Town's recommended tree list or approved by the Town Forester.

I. Tree Protection Specifications. The following tree protection specifications shall be followed for all projects with protected existing trees:

1. Within the drip line of any protected existing tree, there shall be no cut or fill greater than a four inch (4") depth unless a qualified arborist or forester has evaluated and approved the disturbance.
2. All protected existing trees shall be pruned according to the most current standards and guidelines developed by the ISA.
3. Prior to and during construction, barriers shall be erected around all protected existing trees with such barriers to be of orange fencing a minimum of four (4) feet in height, secured with metal t-posts, no closer than six (6) feet from the trunk or one-half ($\frac{1}{2}$) of the drip line, whichever is greater. The spacing of stakes shall be ten (10) feet. There shall be no storage or movement of equipment, material, debris, or fill within the fenced tree protection zone.
4. During the construction stage of development, the applicant shall prevent the cleaning of equipment or material or the storage of waste material such as paints, oils, solvents, asphalt, concrete, motor oil or any other material harmful to the life of a tree, within the drip line of any protected tree or group of trees.
5. No damaging attachment, wires, signs, or permits may be fastened to any protected tree.
6. Large property areas containing protected trees and separated from construction or land clearing areas, road rights-of way and utility easements may be "ribboned off" rather than erecting protective fencing around each tree as required above. This may be accomplished by placing metal t-posts a maximum of twenty-five (25) feet apart and tying

ribbon or rope from stake-to-stake along the outside perimeters of such areas being cleared.

7. The installation of utilities, irrigation lines, or any underground fixture requiring excavation deeper than six (6) inches shall be accomplished by boring under the root system of protected existing trees at a minimum depth of twenty-four (24) inches. The auger distance is established from the face of the tree (outer bark) and is scaled from tree diameter at breast height as described in the chart below:

Tree diameter at breast height (in inches)	Auger distance from face of tree (in feet)
0-2	1
3-4	2
5-9	5
10-14	10
15-19	12
Over 19	15

8. Existing healthy and protected trees and shrubs shall be preserved and incorporated into the overall site and landscape design to the maximum extent practical as determined by the Town.

J. Tree Planting Standards

1. Minimum Plantings/Description. These tree standards require at least a minimum tree canopy but are not intended to limit additional tree plantings in any remaining portions of the development. Groves and belts of trees shall be required as follows:
 - (A) Landscape areas shall be provided in adequate numbers, locations, and dimensions in all high use or high visibility sides of any building or structure. Such landscape areas shall extend at least seven (7) feet from any building or structure wall and contain at least fifty-five (55) square feet of non-paved ground area. Planting cutouts in walkways shall contain at least sixteen (16) square feet. Planting cutouts, planters, or other landscape areas for tree planting shall be provided within any walkway that is twelve (12) feet or greater in width adjoining a vehicle use area that is not covered with an overhead fixture or canopy that would prevent growth and maturity.
 - (B) Formal or informal groupings of trees planted according to the following spacing dimensions:

	Minimum/Maximum
Shade trees	30' - 40' spacing
Coniferous evergreens	20' - 30' spacing
Ornamental trees	20' - 30' spacing

- (C) Exact locations and spacings may be adjusted at the option of the applicant to support patterns of use, views, and circulations as long as the minimum tree-planting requirement is met. Shade trees shall constitute at least fifty (50) percent of all tree plantings.
2. Street Trees. Planting of street trees shall occur along all arterials and major collectorals in the adjoining street right-of-way and is highly recommended along minor collectoral and local streets where appropriate in connection with the development by one or more of the methods described below (For street cross-sections see Appendix F).
- (A) Wherever the sidewalk is separated from the street by a parkway, shade trees shall be planted at thirty (30) to forty (40) feet spacing intervals in the center of all such parkway areas. Such street trees shall be placed at least ten (10) feet away from the edges of driveways and alleys, and forty (40) feet away from any street light.
- (B) Wherever the sidewalk is attached to the street, shade trees shall be established in an area ranging from three (3) to seven (7) feet behind the sidewalk at thirty (30) to forty (40) feet spacing.
- (C) Wherever the sidewalk is attached to the street and is ten (10) feet or greater in width, or extends from the curb to the property line, shade trees shall be established in planting cutout areas of at least sixteen (16) square feet at thirty (30) to forty (40) feet spacing.
- (D) Ornamental trees shall be planted in substitution for shade trees where overhead utility lines and fixtures prevent normal growth and maturity of shade trees. Ornamental trees shall be placed at least fifteen (15) feet away from any street light.
- (E) Trees must be centered in the planting strip when the distance between the curb and detached sidewalk is eight (8) feet or less. Shade trees shall not be planted in planting strips less than four (4) feet in width.
- (F) Evergreen trees should not be planted too close to streets or sidewalks, and must be planted outside the area of concern by at least one-half ($\frac{1}{2}$) the diameter of the average mature size of the tree species. Future clear line of sight issues should be considered as well.

(G) Street tree maintenance for the first five (5) years following planting is the responsibility of the developer and/or the property owner. The developer and/or the property owner are responsible for maintaining the trees in a good condition during this five (5) year period. The Town assumes street tree maintenance after the five (5) year period.

3. Minimum Species Diversity. To help prevent insect or disease susceptibility and eventual uniform senescence on a development site or in the adjacent area, species diversity is required and extensive monocultures are prohibited. No more than twelve (12) trees shall be used consecutively, and frequent alternation of different species is necessary. Existing trees may be included when determining species diversity. The following minimum requirements shall apply to any development plan.

Number of trees on site	Maximum percentage of any one species
10 – 19	50%
20 – 39	33%
40 – 59	25%
60 or more	15%

4. Tree Species and Minimum Sizes. The Town Forester shall provide a recommended list of trees which shall be acceptable to satisfy the requirements for landscape plans, including approved shade trees that may be used for street trees. The following minimum sizes shall be required:

<u>Type of Tree</u>	<u>Minimum Size</u>
Shade tree	2" caliper balled and burlapped or equivalent
Shade tree as a street tree on a local residential street only.	1.5" caliper container or equivalent
Evergreen tree	6' height balled and burlapped or equivalent
Ornamental tree	1.5" caliper balled and burlapped or equivalent
Shrubs	5 gallon or adequate size consistent with design intent

5. Any tree plantings that are in addition to those that are made as part of the approved landscape plan are exempt from the foregoing size requirements.
6. Unless otherwise specifically authorized by the Town Forester, the following species and types of trees and woody plants shall not be planted or allowed to grow upon public street rights-of-way unless the tree was in existence prior to January 1, 1977.
 - (A) Any of the poplar species (*Populus* spp.), including but not limited to cottonwood, aspen, silver poplar, or Lombardy poplar.
 - (B) Any of the willow species (*Salix* spp.)
 - (C) The box elder tree (*Acer negundo*)
 - (D) The Siberian elm (*Ulmus pumila*)
 - (E) Any weeping or pendulous type tree (i.e. weeping birch)
 - (F) Any tree with a bushy growth habit which cannot be maintained to a single leader or trunk.
 - (G) Any shrub or hedge which by its growth would obstruct, restrict, or conflict with necessary and safe use of the public rights-of-way.
 - (H) Conifers or evergreens which would eventually grow over the sidewalks or street.
 - (I) Any honeylocust (*Gleditsia triacanthos*) that bear either seed pods or thorns.
 - (J) Russian olive (*Eleagnus angustifolia*).
7. Tree plantings made in a sidewalk must have a minimum of sixteen (16) square feet cutout area.
8. No tree planting is to be made closer than ten (10) feet or one-half (1/2) of the mature canopy width from any building or structure.
9. All trees planted in public places, public rights-of-way, or installed as a result of an approved landscape plan, shall be selected according to current American Association of Nurseryman standards. Plants shall have normal, well developed branches and vigorous root systems. They shall be healthy, vigorous plants free from defects, decay, sunscald injuries, bark abrasions, insect pests and all forms of infestations or objectionable disfigurements.

10. The Town Forester may request to inspect any trees or shrubs before, during and after they are planted.
11. All trees shall be planted according to the Town of Windsor's standards and guidelines developed by the International Society of Arboriculture.
12. No plant pits shall be dug or prepared until the Town Forester approves their location.
13. Circular pits with sloping sides shall be excavated for all balled and burlapped and container plants. Trees should be planted so that the trunk flair is approximately two (2) inches above grade. The pits should be at least 2 to 3 times wider and slightly shallower than the depth of the soil ball. All plants should be centered in the pit.
14. For all plants moved with a tree spade, all holes and cavities between the ball and the surrounding soil should be filled. The ball should be thoroughly soaked with water after planting.
15. All evergreen trees in excess of six (6) feet in height and any tree weak in the ball or ground should be guyed securely as approved by the Town Forester.
16. All underground electric or telephone lines, gas lines, water lines or any other improvements, public or private, shall be checked before planting is done.
17. All tree and shrub plantings should be mulched over the root system with four (4) inches of wood chips or other acceptable organic matter.
18. Standards relating to hedges:
 - (A) No hedge planting is permitted in the parkway between the sidewalk and the curb. No solid hedge is permitted in the site triangle at street intersections.
 - (B) Where the combination sidewalk-curb and gutter have been installed, no hedges may be planted closer than five (5) feet from such sidewalk.
 - (C) Where curb and gutter have been installed but no sidewalk exists, no hedge shall be planted closer than nine (9) feet from such curb.
 - (D) No hedge shall be planted closer than five (5) feet from an existing or designated alley.
 - (E) Hedges must be maintained so as to not grow out over and obstruct designated pedestrian or vehicular rights-of-way.

19. Standards relating to shrub plantings:
 - (A) Shrubs are to be grouped in planting beds to maximize aesthetic value with a minimum of five (5) shrubs per bed. No single shrub plantings in turf areas.
20. See Appendix D, *Planting Diagrams*, for planting standards and visual guidelines for planting trees and shrubs.
 - (A) Plant material shall be handled in a manner so as to cause the least amount of damage during the planting process.
 - (B) Balled and burlapped and container plants shall always be handled by the soil ball. Under no circumstances should they be dragged, lifted or pulled by the trunk or foliage in a manner that will loosen the roots in the ball.
 - (C) During transport to the job site, plants should be handled, secured or covered so as to prevent any damage from wind or vibration. Plants should never be thrown or bounced off a truck or loader to the ground.
 - (D) Plant material shall be planted the day it is delivered to the planting site or it shall be watered and covered with mulch or soil or placed in a shady area to prevent dehydration.
 - (E) In cases where trees are likely to have their trunks scarred during the planting operation, the trunks should be protected with non-abrasive wrap or padding.
 - (F) Trees and shrubs should not be dug, balled and burlapped, or moved with a tree spade during the active growing period unless the ball is large enough to ensure a reasonable chance of survival.
 - (G) All twine or rope and plant labels secured around the trunk shall be removed after planting is completed.
 - (H) Trees or shrubs that have their soil balls secured in a wire basket and burlap must have the lower 1/3 of the burlap and basket removed prior to placement in hole. The upper 2/3 of the ball will be used to manipulate the tree into the hole. Once level, soil will be placed at the base to stabilize the tree. The remainder of basket and burlap will be removed including all twine and labels on the trunk and canopy. Complete the backfilling and water settle, filling all sink holes with soil.
 - (I) Evergreen trees with an excessively bushy growth form shall have the boughs tied up with rope or twine during transport and planting to avoid damage to the foliage and branches. After planting, the boughs should be released, and all twine removed.

- (J) Any bark abrasions or broken limbs caused in the planting operation should be treated or corrected immediately.
- (K) Cleanup of any soil, branches, or other debris resulting from any tree or shrub planting shall be promptly completed following planting. The work area shall be kept safe at all times until the cleanup operation is completed. Under no circumstances shall the accumulation of soil, branches, or other debris be allowed in such a manner as to result in a public hazard.
- (L) Excavated pits that will be left open when work is not in progress or pose an immediate and considerable hazard to pedestrian or vehicular traffic shall be adequately barricaded with warning devices.

K. Placement and Interrelationship of Required Landscape Plan Elements. In approving the required landscape plan, the Town Forester shall have the authority to determine the optimum placement and interrelationship of required landscape plan elements such as trees, vegetation, turf, irrigation, screening, buffering, and fencing, based upon the following criteria:

1. Protecting existing trees, natural areas and features.
2. Enhancing visual continuity within and between neighborhoods.
3. Providing tree canopy cover.
4. Creating visual interest year round.
5. Complementing the architecture of a development.
6. Providing screening of areas of low visual interest or visually intrusive site elements.
7. Providing privacy to residents and users.
8. Conserving water.
9. Avoiding reliance on excessive maintenance.
10. Promoting compatibility and buffering between and among dissimilar land uses.
11. Establishing spatial definition.

L. Landscape Materials, Maintenance, and Replacement

1. Topsoil. To the maximum extent feasible, topsoil that is removed during construction activity shall be conserved for later use on areas requiring revegetation and landscaping.
2. Soil amendments. Prior to installation of plant materials, areas that have been compacted or disturbed by construction activity shall be thoroughly loosened. Organic amendments such as compost, peat, or aged manure

shall be thoroughly incorporated at a rate of at least three (3) cubic yards of amendment per 1,000 square feet of landscape area.

3. Plant materials. The selection of plant materials shall be based upon the Town of Windsor's climate and site conditions. A list of allowable and preferred plant species as well as a list of drought tolerant plants shall be available from the Town Forester.
4. Plant quality. All plants shall be A-Grade or No. 1 Grade, free of any defects, of normal health, height, leaf density, and spread appropriate to the species as defined by the American Standard for Nursery Stock.
5. Installation. All landscaping shall be installed according to sound horticultural practices in a manner designed to encourage quick establishment and healthy growth. All landscaping in each phase shall either be installed or the installation shall be secured with a letter of credit, escrow, or performance bond for 110% of the value of the landscaping material prior to the issuance of a certificate of occupancy for any building in such phase.
6. Maintenance. Trees and vegetation, irrigation systems, fences, walls, and other landscape elements shall be considered as elements of the project in the same manner as parking, building materials, and other site details. The applicant, landowner, or successors in interest shall be jointly and severally responsible for the regular maintenance of all landscaping elements in good condition. All landscaping shall be regularly maintained. Provisions for landscape maintenance shall include but not be limited to winter watering, pruning, weeding, tree and debris removal, disease and vector control, raking, re-mulching, mowing, edging and trimming, and the preserving of screens in good condition. Dead, diseased or missing plants must be replaced with the same type as provide in the approved landscape plan. Replacement must occur within the next planting season, not to exceed twelve (12) months.
7. Replacement. Any landscape element that dies, or is otherwise removed, shall be promptly replaced as per the site plan based upon the requirements in these standards. Healthy, mature trees that are removed by the applicant or by anyone acting on behalf of or with the approval of the applicant shall be replaced as required as outlined in these standards.

M. Irrigation.

1. Provisions shall be made for permanent, automatic irrigation of all plant material, with the following exceptions:
 - (A) Certified xeriscape landscaping which, following three (3) seasons of supplemental watering (temporary irrigation) and sufficient plant establishment, does not require supplemental irrigation for survival.
 - (B) Trees and other plants used to landscape a residential local street adjacent to lots for single-family detached dwellings.

(C) Irrigation of trees planted in rights-of-way of rural roads or detention ponds shall be irrigated for a minimum of five (5) years.

2. An irrigation plan shall be submitted to the Town Forester to ensure adequate water requirements are compatible with the submitted landscape plan.

N. Utilities. Landscape and utility plans shall be coordinated. The following list sets forth minimum dimension requirements for the most common tree/utility separations. Exceptions to these requirements may occur where utilities are not located in their standard designated locations, as approved by the Town of Windsor. Tree/utility separations shall not be used as a means of avoiding the planting of required street trees.

1. Forty (40) feet between street trees and street lights. Fifteen (15) feet between ornamental trees and street lights.
2. Ten (10) feet between trees and water or sewer lines unless a wider separation is required by the Town in consideration of unusually deep utility installations.
3. Four (4) feet between trees and gas, telephone, electric and other underground utilities.
4. Ten (10) feet from a driveway.
5. A minimum clearance of three (3) feet on each side of a fire hose connection must be maintained. No vegetation other than turf or low-growing ground covers may be planted between the fire hose connection and the sidewalk or street.
6. Street trees on local streets planted within utility easements may conflict with utilities. Additional conduit may be required to protect underground electric lines.

O. Visual Clearance or Sight Distance Triangle.

1. At the intersection of streets, roadways or vehicular access points, no tree or plant material with a mature height greater than three (3) feet shall be planted within a sight triangle measuring forty (40) feet along the boundary of each of the intersecting streets, measured from the point of intersecting curb lines or edge of asphalt. For existing landscaping, see *Windsor Municipal Code Sec. 16-10-10*.
2. A site triangle, free of any structures or landscape elements over three (3) feet in height, shall be maintained at street intersections and driveways.
3. Deciduous trees may be permitted to encroach into the clearance triangle provided the lowest branch of any tree shall be at least eight (8) feet above grade.
4. When approaching traffic control signs, standard warning signs, and school signs, the sign shall be visible from the travel lane at a distance of 100 feet.

P. Revegetation. When development construction causes significant disturbance within any tract or outlot, adequate revegetation to return the site to its original condition shall occur.

Q. Tree Pruning and Removal. All tree pruning, removal, and other maintenance practices shall be done in accordance with the most current standards and guidelines developed by the ISA.

R. Alternative Compliance. Upon request by an applicant, the Town Forester may approve an alternative landscape and tree protection plan that may be substituted in whole or in part for a landscape plan meeting the requirements of these standards.

1. Procedure. Alternative landscape plans shall be prepared and submitted in accordance with submittal requirements for landscape plans. Each such plan shall clearly identify and discuss the modifications and alternatives proposed and the ways in which the alternative plan meets the intent of these standards.
2. Review Criteria. To approve an alternative plan, the Town Forester must first find that the proposed alternative plan accomplishes the intent of these standards. In reviewing the proposed alternative plan for purposes of determining whether it accomplishes the intent to these standards, the Town Forester shall take into account whether the alternative preserves and incorporates existing vegetation in excess of minimum standards, protects natural areas and features, maximizes tree canopy cover, enhances neighborhood continuity and connectivity, and demonstrates innovative design and use of plant materials and other landscape elements.

Part III Appendices

Appendix items attached to this document can be adjusted periodically at the staff level and incorporated into this document to conform to advancements in the green industry.

Appendix A: Landscape Plan Checklist

Landscape Plan Checklist

- Landscape Plan on one page
- Land Use table identifies:
 - open space requirements in % and square footage
 - parking lot in square footage
 - interior parking lot landscaped area in square footage (from interior flow line)
 - other hardscapes – sidewalks, driveways to parking lots
- Landscape legend:
 - Identifier – either alpha (more than 3 species) or symbols (3 or less species)
 - Quantities
 - Scientific Names
 - Common Names
 - Size
 - Type – Ball and Burlap (B&B), bare root, containerized
- Scale
- Planting details for:
 - Deciduous
 - Conifers
 - Shrubs
- Planting notes
- Irrigation meter location – separate from building meter
- Irrigation plans
- Utilities shown:
 - Water
 - Gas
 - Electric
 - Easements
 - Sewer
 - Telephone
 - Cable
- Right-of-Way designations

Appendix B: Landscape Plan Protocol

Landscape Plan Protocol

1. Landscape plans shall be submitted at the earliest possible stage in the planning process.
2. Landscape plans are required at the site plan processes stage.
3. Landscape plans will be reviewed according to established standards with any and all deficiencies red-lined in submittal plans.
4. Corrections must be resubmitted until approved.
5. Upon approval, the planning department will be notified that the landscape plan is acceptable.
6. At time of plant installation, physical inspection is required by Town of Windsor Forester.
7. Corrections must be made before continuing to have landscaping accepted.
8. A visual inspection must be made to verify complete installation as per approved plan before a release can be made for the certificate of occupancy.
9. Plant material must be maintained in perpetuity by the property owner as per approved landscape plan.

Appendix C: Planting Notes

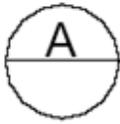
Planting Notes

1. All plant materials shall be in accordance with American Association of Nurserymen specification for number one grade.
2. All turf areas to be irrigated with automatic pop-up irrigation system. All shrub beds and trees to be irrigated with an automatic drip (trickle) irrigation system, or acceptable alternative. The irrigation system is to be adjusted to meet the water requirements of the individual plant material.
3. All trees to be balled and burlapped, root control bag, or containerized.
4. All shrub beds to be mulched with wood mulch (3" average depth) on typhar filter fabric.
5. Edging between grass and shrub beds shall be 1/8" x 4" steel set level with top of sod.
6. Changes in plant species or plant locations from what is listed on the landscape plan will require the approval of the Town Forester prior to installation or replacement. Overall quantity and quality to be consistent with approved plans. In the event of conflict with the quantities included in the plant list, species and quantities shall be provided.
7. Landscaping of the townhome units may be phased on a building by building basis.
8. The Homeowner's Association will be responsible for landscape maintenance including the plantings in public street rights-of-way.
9. Street and ornamental trees shall be planted no closer than forty (40) feet and fifteen (15) feet respectively from street lights. No trees shall be planted within ten (10) feet from water and sewer lines, four (4) feet from gas, telephone and electric utilities, and ten (10) feet from any driveway.
10. Minimum clearance of three (3) feet on each side of fire department connection (FDC). No vegetation other than turf or ground covers planted in front of FDC.
11. The irrigation system shall be reviewed and approved by the Town's Water Department prior to issuance of a building permit. The irrigation system must be installed or secured with a financial instrument deposited with the Town prior to issuance of a certificate of occupancy for the building.

Planting Notes (cont.)

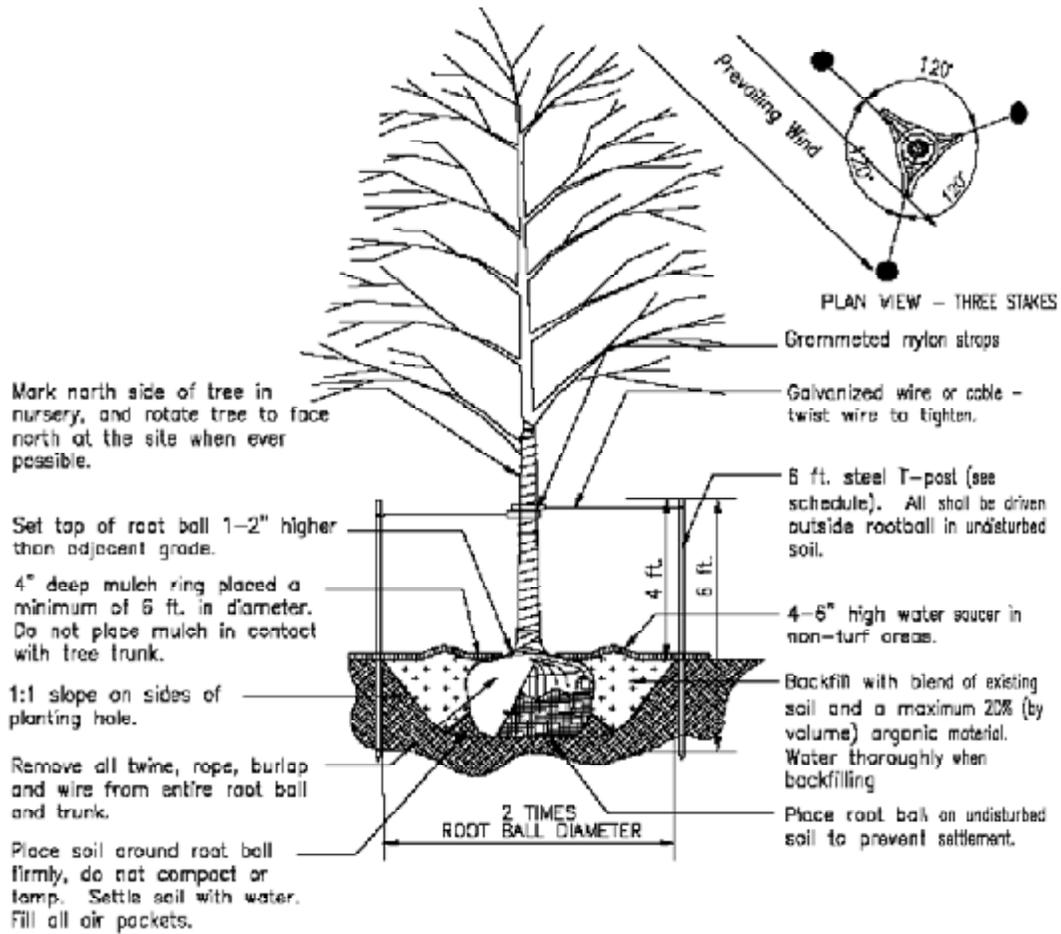
12. Developer shall ensure that the landscape plan is coordinated with the plans done by other consultants so the proposed grading, storm drainage, or other construction does not conflict nor preclude installation and maintenance of landscape elements on this plan.
13. Prior to installation of plant materials, areas that have been compacted shall be thoroughly loosened. Organic amendments such as compost, peat, or aged manure shall be thoroughly incorporated at a rate of at least three (3) cubic yards per 1,000 square feet.
14. Turf grass will be seeded or sodded with drought tolerant blend. Trees to be planted in turf areas will be installed with an organic mulch ring that has a radius of at least eighteen (18) inches.
15. To the maximum extent feasible, topsoil that is removed during construction activity shall be conserved for later use on areas requiring revegetation and landscaping.
16. Foundation shrubs beds to be designed and installed after completion of each building.
17. Contact Town of Windsor Parks and Recreation Department prior to planting in order for Town to verify proper planting.
18. No substantial impediment to visibility between the heights of three (3) feet and eight (8) feet shall be created or maintained at street intersections within a site triangle described as follows: beginning at the point of intersection of the edges of the driving surface, then to forty (40) feet along both intersecting edges and then along a transverse line connecting these points.
19. Second domestic water meter to be shown on landscape plan for irrigation connection or non-potable water source connection.
20. If plants are in need of replacement due to declining health, disease, or death, the plants must be replaced with the original species unless approved by the Town Forester.

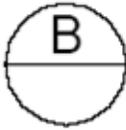
Appendix D: Planting Diagrams



DECIDUOUS TREE - PLANTING

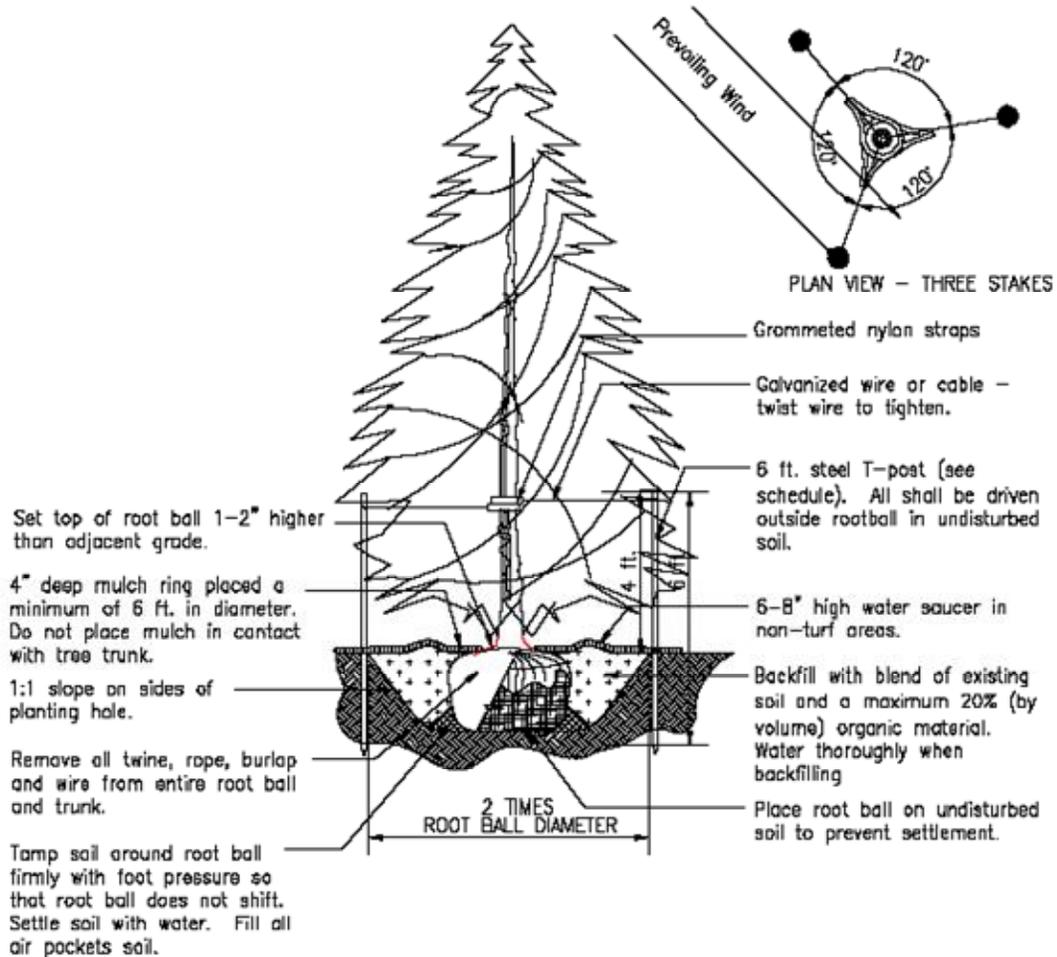
SCALE: NOT TO SCALE





EVERGREEN TREE - PLANTING DETAIL

SCALE: NOT TO SCALE



Pruning Notes:

Do not heavily prune the tree at planting. Prune only crossover limbs, co-dominant leaders and broken branches. Some interior twigs and lateral branches may be pruned. However, do not remove the terminal buds of buds of branches that extend to the edge of the crown.

Staking Notes:

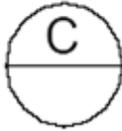
Stake trees per following schedule, then remove at end of first growing season. follows:

1- $\frac{1}{2}$ " Caliper size - Min. 1 stake on side of prevailing wind (generally N.W. side).

1- $\frac{1}{2}$ " - 3" Caliper size - Min. 2 stakes - one on N.W. side, one on S.W. side.

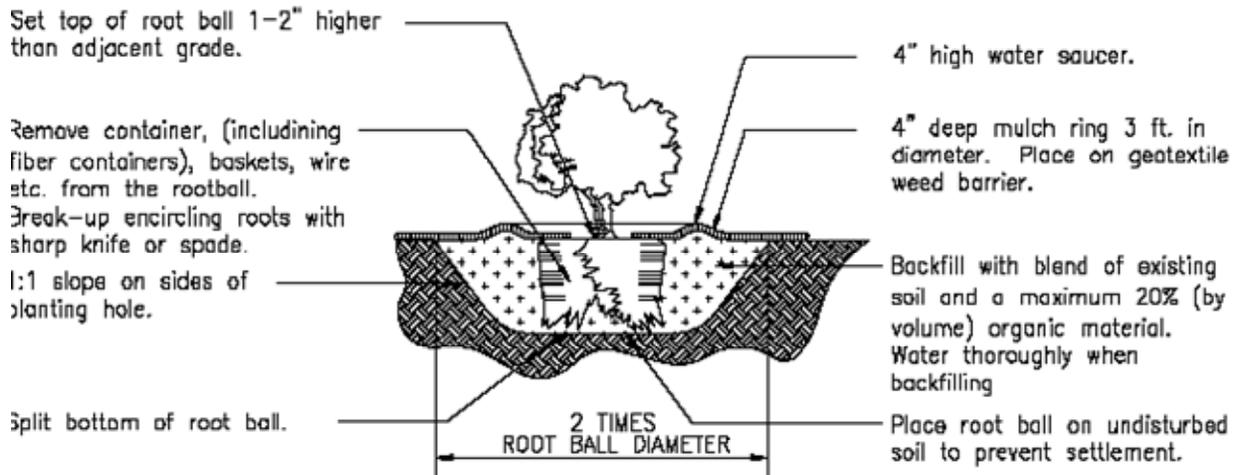
3" caliper size and larger - 3 stakes per diagram

Wire or cable shall be min. 12 gauge, Tighten wire or cable only enough to keep from slipping. Allow for some trunk movement. Nylon straps shall be long enough to accommodate 1- $\frac{1}{2}$ " of growth and buffer all branches from wire.



SHRUBS - PLANTING DETAIL

SCALE: NOT TO SCALE



Placement Notes:

Set Shrub plumb. Space plants, and place for best effect.

Pruning Notes:

Do not heavily prune the shrub at planting. Prune only dead or broken branches. If form is compromised by pruning, replace shrub.

Appendix E: Plant Lists

Trees for Windsor, Colorado

By no means does this list include every tree that could grow in Windsor, Colorado. It is, however, an attempt to list the most commonly available trees and their characteristics. There is no perfect tree. Great care should be given to select the right tree for the right place. More detailed information on all trees can be obtained from your local nursery professional. If you are interested in planting a tree not on this list, please contact the Windsor Town Forester or the Windsor Tree Board. A list of drought tolerant species follows the Recommended Tree List.

Town of Windsor Recommended Tree List

Deciduous Shade Trees (typically over 40' in mature height)

Common Name	Latin Name	Typical Mature Width/Height /Rate	Characteristics
American Linden	<i>Tilia americana</i>	30-40'/60on up'/moderate	Recommend the Redmond variety, very dense perfect canopy. Fragrant yellow summer flowers.
Black Ash	<i>Fraxinus nigra</i>	40-50'/20-25'/moderate	Great alternative to the over used green ash in our area. Available in seedless cultivars. Bright yellow fall color.
Black Walnut	<i>Juglans nigra</i>	50-75'/50-75'/slow	Does produce a nut. Does not like heavy pruning. Great tree for squirrels and birds.
Catalpa	<i>Catalpa speciosa</i>	20-40'/40-60'/moderate	Great spring white blooms turn to long pod, very large heart shaped leaf.
Common Horsechestnut	<i>Aesculus hippocastanum</i>	40-70'/50-75'/moderate	Large spiny fruit capsule. Best for large open areas. Fair tree for our area.
European Larch	<i>Larix decidua</i>	25-30'	Deciduous evergreen, wonderful tree. Underused in our area.
Ginkgo	<i>Ginkgo biloba</i>	30-40'/50-70'/slow	This tree has a very unique leaf shape. One of the oldest growing trees (around for the past 150 million years). Female fruit has a rank smell, always pick male trees.

Deciduous Shade Trees (typically over 40' in mature height), cont.

Common Name	Latin Name	Typical Mature Width/Height /Rate	Characteristics
Green Ash, Marshall Ash, Patmore Ash, Summit Ash.	<i>Fraxinus pennsylvanica</i>	25-35'/50-60'/moderate	Tends to be over planted. Some pest problems may be present. Very reliable shade trees. Yellow fall color.
Hackberry	<i>Celtis occidentalis</i>	40-60'/40-60'/moderate	A very drought hardy plant - excellent for street-scaping. Leaf tends to get nipple gall, not damaging to the plant and good for wildlife.
Japanese Pagoda Tree	<i>Sophora japonica</i>	50-75'/50-75'/slow	Characteristic persisting pod type fruit, excellent specimen tree.
Kentucky Coffee Tree	<i>Gymnocladus dioica</i>	40-50'/60-75'/moderately slow	Tolerates dry urban conditions and branch structure and bark give great winter interest. Only females produce fruit.
Large Leaf Elm varieties	<i>Ulmus americana</i>	30-40'/60-70'/moderately fast	Pick a variety resistant to Dutch Elm Disease. This tree has one of the best shapes for street ways.
Littleleaf Linden	<i>Tilia cordata</i>	30-40'/60-70'/moderate	Very conical in shape. Usually requires less pruning than most other deciduous varieties.
London Plane Tree or Sycamore	<i>Platanus occidentalis</i>	60-75'/60-75'/moderate	Very characteristic white and green scaling bark.
Norway Maple	<i>Acer platanoides</i>	30-40'/40-50'/moderately slow	Maples are known best for their excellent fall color. Can be sensitive to drought conditions. Fair tree for our area.
Oak trees, Bur Oak, English Oak	<i>Quercus species</i>	40-60'/40-60'/slow	This is a very hardy species in this area. Tends to grow slower which helps to add strength. Watch for chlorotic species, ie. Red Oak, Swamp White Oak.
Ohio Buckeye	<i>Aesculus glabra</i>	20-40'/20-40'/moderate	Best for large open areas due to fruit mess. Not a good street tree.
Thornless Honeylocust	<i>Gleditsia triacanthos inermis</i>	30-70'/30-70'/moderately fast	Tends to be over planted. Many insect problems existing. This is drought tolerant however.

Ornamental Trees (typically under 40' in mature height)

Common Name	Latin Name	Typical Mature Width/Height /Rate	Characteristics
Amur Cork Tree	Phellodendron amurense	30-45'/30-40'/moderate	Characteristic gray furrowed bark that has a cork feel to it. Generally free of pests.
Crabapple	Malus species	20-35'/ 20-25'/moderate	Most commonly known for their spring blossoms that range from white-pink-red-purple. Get a cultivar that has persisting fruit. Always pick a fire blight resistant variety.
Eastern Red Bud	Cercis canadensis	20-30'/20-30'/moderate	Excellent spring flowers. Prefers more of a protected site. Will die back in colder seasons.
Ornamental Pear	Pyrus species	20-30'/ 30-40'/moderate	Great for the spring flower color and often vibrant fall colors. Important to pick a fire blight resistant variety. Watch for co-dominant leaders.
Goldenrain Tree	Koelreuteria paniculata	30-40'/ 30-35' /moderate	Characteristic lantern shaped fruit capsules and orange-yellow fall color. Great species tree. Drought tolerant.
Hawthorn	Crataegus species	20-30'/ 20-30'/moderate to slow	Generally great fall color. Unique characteristic bark. Use a thornless variety in high traffic areas.
Japanese Tree Lilac	Syringa reticulata	15-20'/20-30'/moderate	Creamy white flowers early to mid June. Classic lilac fragrance.
Plum and Cherry	Prunus species	20-25'/ 20-30'/moderate	Often suckers, but great wildlife habitat.
Serviceberry	Amelanchier species	5-15'/5-15'/medium	Fragrant white flowers. Species range from small shrubs to small trees. Good bird tree.

Evergreen Trees

All evergreen trees listed below should be planted a minimum of 15' from streets, sidewalks, and permanent structures.

Small Evergreen Trees (under 30 feet at maturity)

Common Name	Latin Name	Typical Mature Spread/ Height/ Rate	Characteristics
Bristlecone Pine	<i>Pinus aristata</i>	10'/15-20'/slow	Very long living and drought hardy. Classic bottlebrush shaped branches and white resin pitch on needles.
Pinyon Pine	<i>Pinus edulis</i>	20-25'/20-30'/slow	Shorter tree with edible nuts. Mature branch spread. Tolerates drought.
Eastern Arborvitae	<i>Thuja occidentalis</i>	10-15'/40-60'/slow	Works great as a screening hedge. Fair performance in exposed sites.
Junipers (upright varieties)	<i>Juniperus</i> species	10-15'/10-20'/moderate	Dense growth form. Good wildlife habitat. Drought tolerant.

Large Evergreen Trees (over 30 feet at maturity)

Austrian Pine	<i>Pinus nigra</i>	20-30'/30-60'/moderate	Becomes drought tolerant once established.
Blue Spruce or Colorado Spruce	<i>Picea pungens</i>	20-30'/30-60'/moderate	Available in green and blue. Also likes moist well drained soils.
Scotch Pine	<i>Pinus sylvestris</i>	25-35'/60-70'/moderately fast	Generally a more open-airy form. Unique copper colored bark is attractive.
White Fir	<i>Abies concolor</i>	20-30'/30-60'/moderate	This tree likes moist well-drained soils, similar to blue spruce.

Drought Tolerant Plant Species

The following is a list of plants that are very adaptable to dry conditions, and need to be considered when concerned about future water resources. All plants need supplemental water to help with their initial establishment, but these trees and shrubs will adapt and tolerate very dry conditions.

Ornamental Trees (Less than 30 ft)

Acer grandidentatum: Bigtooth Maple
Crataegus ambigua: Russian Hawthorn
Crataegus crusgalli: Cockspur Hawthorn
Forestiera neomexicana: New Mexican Privet
Prunus americana: American Plum
Ptelea trifoliata: Wafer Ash
Koelreuteria paniculata: Golden Rain Tree
Quercus gambelii: Gambel Oak

Shade Trees (Greater than 30 ft)

Catalpa speciosa: Western Catalpa
Celtis occidentalis: Hackberry
Fraxinus pennsylvanica: Green Ash
Gleditsia triacanthos inermis: Thornless Honeylocust
Gymnocladus dioica: Kentucky Coffeetree
Quercus macrocarpa: Bur Oak
Quercus muehlenbergii: Chinkapin Oak
Quercus robur: English Oak
Sophora japonica: Japanese Pagoda Tree

Evergreen Trees

Juniperus monosperma: Oneseed Juniper
Juniperus scopulorum: Rocky Mountain Juniper
Pinus aristata: Bristlecone Pine
Pinus edulis: Pinyon Pine
Pinus flexilis: Limber Pine
Pinus ponderosa: Ponderosa Pine
Pinus nigra: Austrian Pine

Shrubs

Amorpha canescens: Leadplant
Artemisia spp.: Sage Species
Atriplex canescens: Saltbrush
Caragana spp.: Peashrub Species
Ceratoides lanata: Winterfat
Cercocarpus spp.: Mountain Mahogany Species
Chamaebatiaria millefolium: Fernbush
Chrysothamnus spp.: Rabbitbrush Species
Cotoneaster spp.: Cotoneaster Species
Cowania mexicana: Cliff Rose
Fallugia paradoxa: Apache Plume
Fendlera rupicola: Cliff Fendlerbush
Forestiera neomexicana: New Mexican Privet
Hippophae rhamnoides: Sea Buckthorn
Holodiscus discolor: Creambush
Holodiscus dumosus: Rock Spirea
Jamesia americana: Waxflower
Juniperus species: Spreading Juniper Species
Physocarpus monogynus: Mountain Ninebark
Prunus tomentosa: Nanking Cherry
Prunus besseyi 'Pawnee Buttes': Pawnee Buttes Sandcherry
Ramnus smithii: Smith's Buckthorn
Rhus spp.: Sumac Species
Ribes spp.: Currant Species
Rosa woodsii: Woods Rose
Rubus deliciosus: Thimbleberry
Shepherdia argentea: Silver Buffaloberry

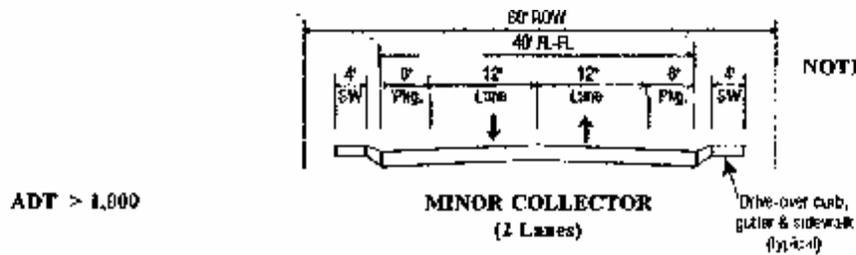
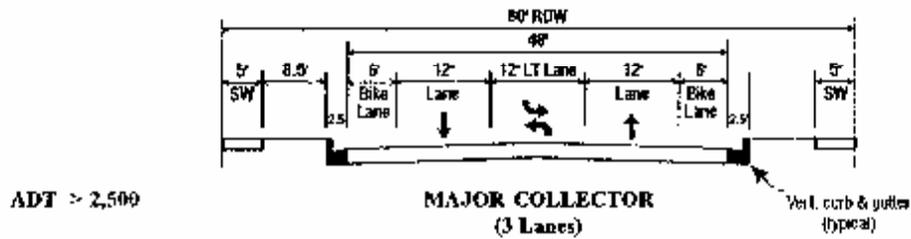
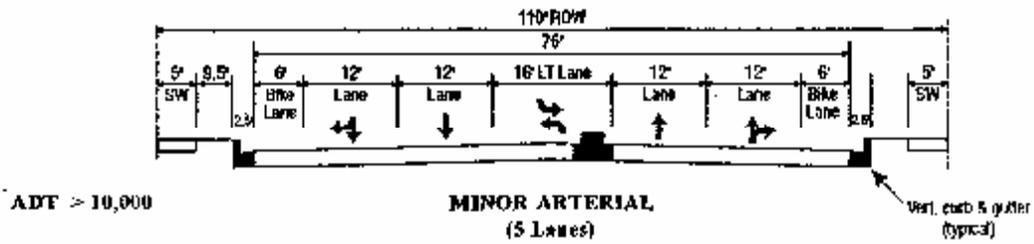
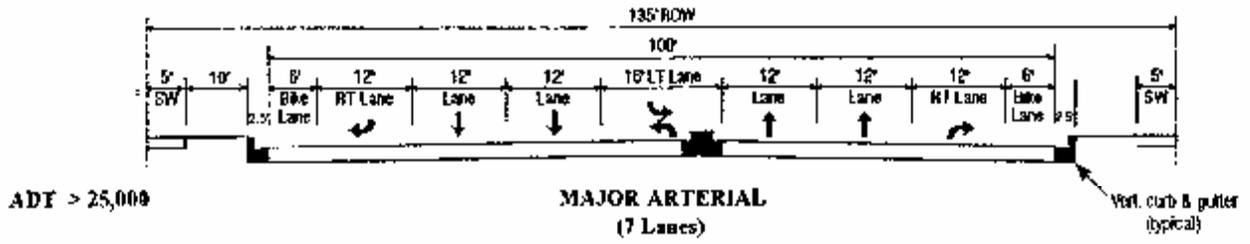
Species Not Recommended

Aspen (<i>Populus tremuloides</i>)	Has many insect and disease problems that are generally not present in Native Mountain areas.
Austree (<i>Salix alba</i> X <i>Matsudana</i>)	Extremely weak wooded, often sold through mail order as a miracle tree that it is not.
Birch (<i>Betula</i> species)	This tree does not do well in Colorado climate as it once did.
Boxelder (<i>Acer negundo</i>)	Female tree attracts Boxelder Bugs that invade houses and can become a nuisance.
Hybrid- cottonwoods (<i>Populus</i> species)	Cotton is a high nuisance on cotton bearing trees, Hybrids tend to be short lived. Cottonwoods also tend to be very weak wooded, good tree for large open spaces.
Hopa Crabapple (<i>Malus</i> species Hopa)	This tree has very high susceptibility to the bacterial disease fire blight. Pick a Crabapple species that has low susceptibility.
Mountain Ash (<i>Sorbus</i> species)	Very susceptible to Fire Blight.
Russian Olive (<i>Eleagnus angustifolia</i>)	Invasive nuisance tree, on Colorado Department of Agriculture's list of noxious weeds.
Siberian Elm (<i>Ulmus pumila</i>)	Extremely weedy and invasive, seeds profusely. Very rapid growth creates extremely weak wood.
Silver Maple (<i>Acer saccharinum</i>)	Very weak wooded tree.
Tamarisk (<i>Tamarix</i> species)	On Colorado Department of Agriculture's noxious weed list, extremely invasive.
Tree of Heaven (<i>Ailanthus altissima</i>)	Very rapid growth creates weak wooded tree, can be very invasive.
Willows (<i>Salix</i> species)	There are many kinds of willows, this is a weak wooded species which can be potentially hazardous placed in the wrong location. Typically after most rain or wind storms twigs or branches will be on the ground.

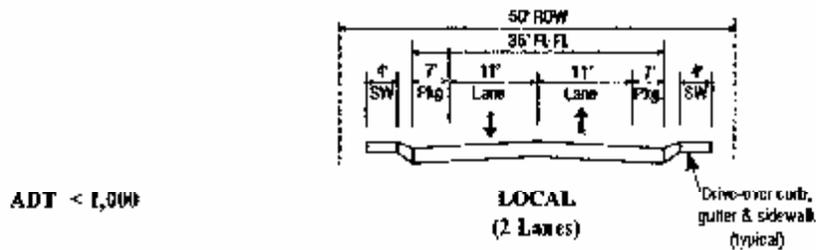
References:

Dirr, Michael A. 1990. *Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses*, fourth edition. Stipes Publishing Company, Champaign, IL. 1007 pp.

Appendix F: Street Classification System



NOTE: House Frontage Not Allowed with Projected ADT > 1,000



**Illustration 11A
Urban Street Cross-Sections**

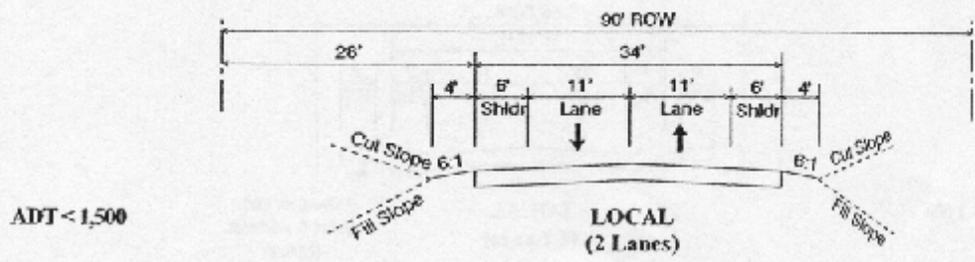
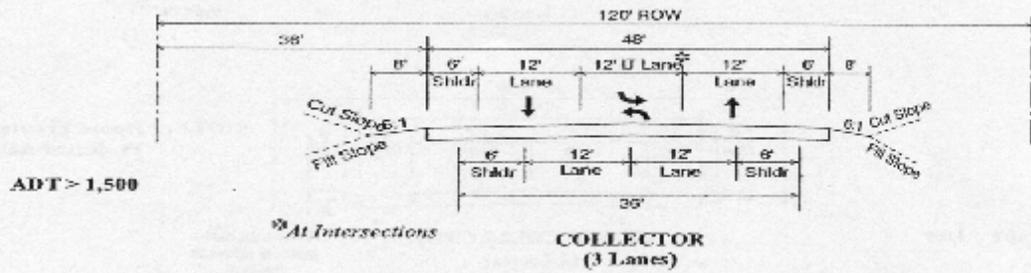
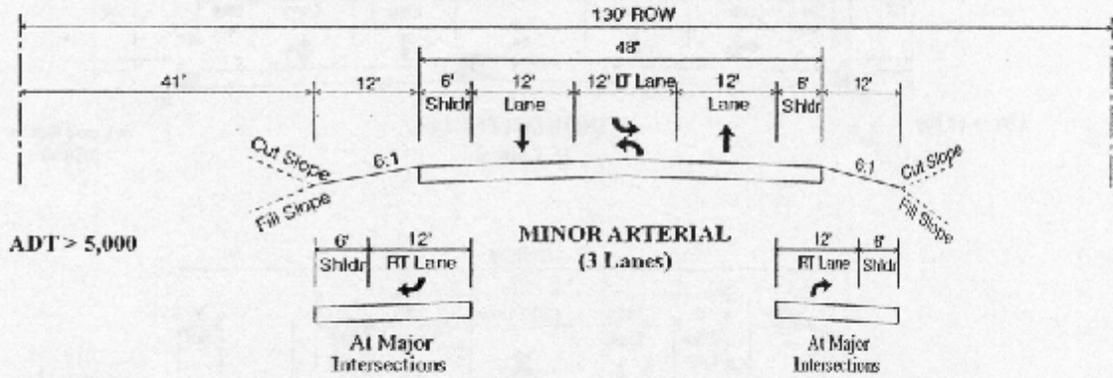
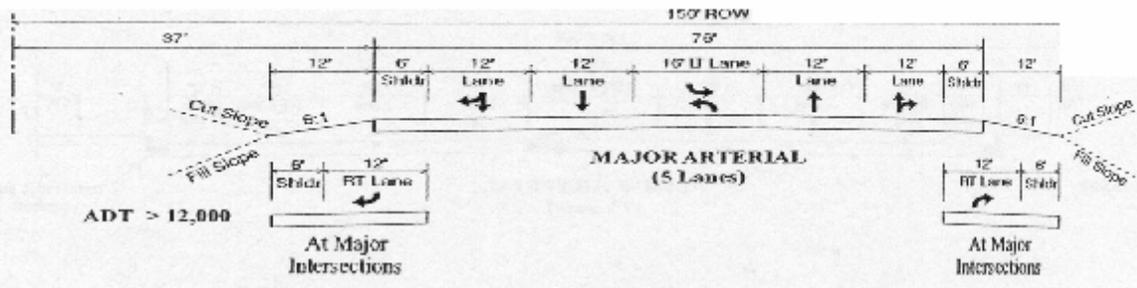


Illustration 11B
Rural Street Cross-Sections



MINIMUM STREET STANDARDS

(Urban Standards)

Type	Right of Way (feet)	Pavement (feet)*	Sidewalk (feet)
Major Arterial (7 lanes)	135	104	5
Minor Arterial (5 lanes)	110	80	5
Major Collector (3 lanes)	80	52	5
Minor Collector (2 lanes)	60	40	4
Local (2 lanes)	50	36	4

*Measured from flow line of gutter to flow line of gutter.

(Rural Standards)

Type	Right of Way (feet)	Pavement (feet)**	Sidewalk (feet)
Major Arterial (at major intersections) (7 lanes)	150	100	N/A
Major Arterial (not at major intersections) (5 lanes)	150	76	N/A
Minor Arterial (at major intersections) (5 lanes)	130	72	N/A
Minor Arterial (not at major intersections) (3 lanes)	130	48	N/A
Collector (at intersections) (3 lanes)	120	48	N/A
Collector (not at intersections) (2 lanes)	120	40	N/A
Local (2 lanes)	90	34	N/A

*Measured from edge of pavement to edge of pavement.
N/A – not applicable