

AIS ATTACHMENT - REDLINED SECTION
5.10.1 Landscaping and Tree Protection
Amendments



ARTICLE 5

General Development and Site Design

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ARTICLE 5

General Development and Site Design

DIVISION 5.10 LANDSCAPING AND TREE PROTECTION

5.10.1 LANDSCAPING AND TREE PROTECTION

- (A) **Applicability.** This Section shall apply ~~applies~~ to all developments ~~that include landscaping, new or existing trees, or both landscaping and new or existing trees~~ (except for development on existing lots for single- ~~and two-~~unit detached dwellings ~~and accessory dwelling units~~) within the designated "limits of development" ("LOD") and natural habitat buffer zones established according to Section 5.6.1 (Natural Habitats and Features).
- (B) **Purpose.** The intent of this Section is to require preparation of ~~a landscape, and tree protection, and irrigation plan-plans~~ (hereinafter "landscape plan") that ~~ensure-demonstrates a comprehensive approach to landscaping that incorporates City plans for the appearance and function of the neighborhood or district, the development, buildings, and the pedestrian environment, while creating or maintaining a diverse significant canopy cover and using water efficiently,~~ ~~is created, diversified and maintained so that all associated social and environmental benefits are maximized to the extent reasonably feasible. These benefits include reduced erosion and stormwater runoff, improved water conservation, air pollution mitigation, reduced glare and heat build-up, increased aesthetics, and improved continuity within and between developments. Trees planted in appropriate spaces also provide screening and may mitigate potential conflicts between activity areas and other site elements while enhancing outdoor spaces, all of which add to a more resilient urban forest.~~
- (C) **General Standard.** All developments ~~to which this Section applies~~ shall ~~must~~ submit a landscape and tree protection plan, and, if receiving water service from the City, an irrigation plan, that ~~incorporates City plans for the appearance and function of the development while creating or maintaining a diverse significant canopy cover and using water efficiently and that promotes reductions in outdoor water use by selecting low water plant materials, improving soil, and exploring non-potable irrigation sources. All landscaping, tree protection and planting, and irrigation must be installed according to approved landscape plans. For the Director or Director's designated staff focused in the applicable area of forestry, landscape, or irrigation to approve a landscape plan it must comply with the standards throughout this Section and must:~~ (1) ~~reinforces and extends any existing patterns of outdoor spaces and vegetation where practicable,~~ (2) ~~supports functional purposes such as spatial definition, visual screening, creation of privacy, management of microclimate or drainage,~~ (3) ~~enhances the appearance of the development and neighborhood,~~ (4) ~~protects significant trees, natural systems and habitat,~~ (5) ~~enhances the pedestrian environment,~~ (6) ~~identifies all landscape areas,~~ (7) ~~identifies all landscaping elements within each landscape area, and~~ (8) ~~meets or exceeds the standards of this Section.~~
- (1) ~~Protect existing trees and natural features;~~
 - (2) ~~Provide a diverse and resilient tree canopy cover;~~
 - (3) ~~Reinforce and extend existing patterns of outdoor spaces and vegetation;~~
 - (4) ~~Enhance the pedestrian environment of the development and neighborhood;~~

- (5) Create visual interest year-round, complementing the architecture of a development and attracting attention to building entrances and other focal points;
- (6) Reinforce spatial definition of outdoor spaces and circulation patterns;
- (7) Screen areas of low visual interest or visually intrusive site elements;
- (8) Lend privacy where appropriate;
- (9) Promote compatibility and buffering between and among dissimilar land uses; and
- (10) Ensure long term health of landscaping through best practices for maintenance and irrigation.

[NOTE: This heading for Subsection (D) was previously Subsection (E).]

(D) **Landscape Standards Planning and Design.** All development applications shall include Any landscape plans that required must meet at least the following minimum standards: in this Subsection.

[NOTE: This Subsection (D)(1) was previously Subsection (D).]

(1) Tree Planting Standards.

(a) **Purposes.** These standards are meant to All developments shall establish groves and belts of trees along all city streets, in and around parking lots, and in all landscape areas that are located within fifty (50) feet of any building or structure in order to establish at least a partial urban tree canopy in available and appropriate spaces. Urban tree canopies are used to define and connect spaces and corridors or other features along the street. All the following elements contribute to this. Useful urban tree canopy benefits include:

- (I) Beautification;
- (II) Reducing erosion and stormwater runoff;
- (III) Mitigating air pollution;
- (IV) Reducing glare and heat build-up;
- (V) Aiding water conservation in irrigated landscaping;
- (VI) Creating continuity within and between individual developments; ~~The groves and belts may also be combined or interspersed~~
- (VII) ~~w~~With other landscape areas in remaining portions of elements, screening and mitigating potential conflicts between activity areas and other site elements; ~~the development to~~
- (VIII) ~~accommodate~~Accommodating views and functions such as active recreation and storm drainage; ~~- and~~
- (IX) Defining and enhancing outdoor spaces.

(b) **Minimum Plantings/Description Tree Stocking Requirements.** All developments must establish groupings of trees along all city streets, in and around parking lots, and in landscape areas shown in the landscape plan. These tree standards stocking requirements outline the required at least a minimum tree canopy and are in addition to requirements for preserving existing trees, parking lot landscape requirements and required tree mitigation. These stocking requirements but are not intended to limit additional tree plantings in any remaining portions of the development. Groves and belts of trees shall be ~~r~~Required as follows tree stocking comprises:

- (I) ~~p~~Parking lot landscaping in accordance with the parking lot landscaping standards as set forth in this Section and in Section 5.9.1, Access, Circulation and Parking;

- (II) ~~s~~Street tree planting in accordance with the *Larimer County Urban Area Street Standards* ~~or other~~ and the street tree planting as defined in ~~s~~Subsection (2)(b) or (e) (D)(1)(e) below;
- (III) "full ~~t~~Tree stocking" shall be required ~~planting~~ in all landscape areas within ~~fifty (50)~~sixty-five (65) feet of any building or structure as further described below. Landscape areas shall be provided in adequate numbers, locations and dimensions to allow full tree stocking to occur along all ~~areas of~~ 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 nonpaved ground area; ~~except that any~~
- (IV) ~~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)~~ten (10) 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. ~~Any tree planting cutouts in walkways must be at least thirty-two (32) square feet, except in the Downtown District where tree cutouts shall mimic or exceed existing design or character to adjacent Street Frontage Types as provided in Section 2.4.1;~~
- (V) Full tree stocking ~~under this Subsection (D)(1)(b)~~ shall mean formal or informal groupings of trees planted according to the following spacing dimensions ~~depending on species and desired degree of shading of the ground plane:~~

Table 5.10.1-(1) – Spacing

<i>Tree Type</i>	<i>Minimum/Maximum Spacing</i>
Canopy shade trees	30'—40' spacing
Coniferous evergreens	20'—40' spacing
Ornamental trees	20'—40' spacing

- (VI) Exact ~~tree~~ locations and spacings may be adjusted at the option of the applicant to support patterns of use, views and circulation as long as the minimum tree ~~planting stocking~~ requirement ~~under this Subsection (D)(1)(b) and the minimum species diversity requirement under Subsection (D)(1)(c) is~~are met; ~~and~~
- (VII) Canopy shade trees shall ~~must~~ constitute at least ~~fifty (50)~~ percent (50%) of all tree plantings. Trees required in ~~subparagraphs~~Subsections (a) or (b) (D)(1)(b)(I) or (II) above may be used to contribute to this standard. ~~If additional trees beyond the minimum tree stocking and mitigation requirements under this Section are planted, the additional trees must meet the minimum species diversity requirement but are not subject to the fifty percent (50%) canopy shade requirement.~~

[NOTE: This Subsection(D)(1)(c) was previously (D)(3).]

- (c) **Minimum Tree Species Diversity.** To prevent uniform insect or disease susceptibility and eventual uniform senescence ~~on a development site~~ within a landscape planned area or in the adjacent area or the district, species diversity is required, and extensive monocultures are

prohibited. No more than three (3) consecutive trees of the same cultivar or variety may be planted in a row, including corners and groupings. The following minimum requirements shall apply to any development landscape plan.

Table 5.10.1-(2) – Species Diversity Table

<i>Number of trees on site</i>	<i>Maximum percentage of any one species</i>
10—19	50% 40%
20—39	33% 30%
40—59	25% 20%
60 or more	15% 10%

[NOTE: This Subsection (D)(1)(d) was previously (D)(4).]

(d) **Tree Species and Minimum Sizes.** The City Forester shall provide a recommended list of trees, which shall be that are acceptable to satisfy the requirements for landscape plans, including approved canopy shade trees that may be used as street trees.

(I) **Minimum Size.** The following minimum sizes shall be required (except as provided in subparagraph (5) Subsection (D)(1)(d)(II) below):

Table 5.10.1-(3) – Minimum Size Table

<i>Type</i>	<i>Minimum Size</i>
Canopy Shade Tree	2.0" caliper balled and burlapped or equivalent
Evergreen Tree	6.0' 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 or 1 gallon may be permitted if planting within the Critical Root Zone of existing trees

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.

(II) **Reduced Minimum Sizes for Affordable Housing Projects.** In any affordable housing project, the following minimum sizes shall be required:

Table 5.10.1-(4) – Affordable Housing Minimum Tree Size Table

<i>Type</i>	<i>Minimum Size</i>
Canopy Shade Tree	1.0" caliper container or equivalent
Evergreen Tree	4.0' height container or equivalent
Ornamental Tree	1.0" caliper container or equivalent
Shrubs	1 gallon
Canopy Shade Tree as a street tree on a Local or Collector street only	1.25" caliper container or equivalent

[NOTE: This Subsection (D)(1)(e) was previously D(2).]

(e) **Street Trees.** Planting of street trees shall occur in the adjoining street right-of-way, after first obtaining a street tree permit (free of charge) from the Forestry Division as stated in Fort Collins Municipal Code Article 3, Section 27-31. Except as described in subparagraph Subsection (D)(1)(e)(bII) below, the street tree plantings in connection with the development by one (1) or more of the methods shall occur as described in subparagraphs Subsections (D)(1)(e)(aI) through (dV) below:

(I) Wherever the sidewalk is separated from the street by a parkway, canopy shade trees shall be planted at thirty-foot to forty-foot spacing (averaged along the entire front and sides of the block face) in the center of all such parkway areas. If two (2) or more consecutive residential lots along a street each measure between forty (40) and sixty (60) feet in street frontage width, one (1) tree per lot may be substituted for the thirty-foot to forty-foot spacing requirement. Such street trees shall be placed at least eight (8) four (4) feet away from the edges of driveways and alleys, and forty (40) feet away from any streetlight and to the extent reasonably feasible, be positioned at evenly spaced intervals and separated from streetlights and utilities lines as required in Subsection (D)(1)(f) below.

(II) Wherever the sidewalk is attached to the street in a non-standard way or in a manner that fails to comply with the Larimer County Urban Area Street Standards, canopy shade trees shall be established in an area ranging from three (3) to seven (7) feet behind the sidewalk at the spacing intervals as required in Subsection (a) (D)(1)(e)(I) above. Wherever the sidewalk is attached to the street and is ten (10) feet or more in width, or extends from the curb to the property line, canopy shade trees shall be established in planting cutout areas of at least sixteen (16) thirty-two (32) square feet at thirty-foot to forty-foot spacing, except in the Downtown District where tree cutouts shall mimic or exceed existing design or character to adjacent Street Frontage Types as provided in Section 2.4.1.

(III) Ornamental trees shall be planted in substitution for the required canopy shade trees required in subsection (D)(2)(a) and (b) above where overhead lines, and fixtures, and underground utilities may prevent normal growth and maturity. Ornamental trees shall be placed at least fifteen (15) feet away from any streetlight as required in Subsection (D)(1)(f) below.

(IV) Wherever existing ash trees (Fraxinus species) are in the adjoining street right-of-way, the applicant shall must coordinate and obtain an onsite analysis with the City Forester to determine replacement canopy shade trees either through shadow planting or other emerald ash borer mitigation methods. The City Forester is available also to recommend shadow planting or emerald ash borer mitigation methods for existing ash trees on private property.

(V) In any multi-phase development plan, all street trees per phase must be planted at once rather than on a lot by lot over time to the maximum extent feasible; and such planting may only occur after the irrigation is functioning and right-of-way turfgrass, if present, is established. The City Forester, through conversations with

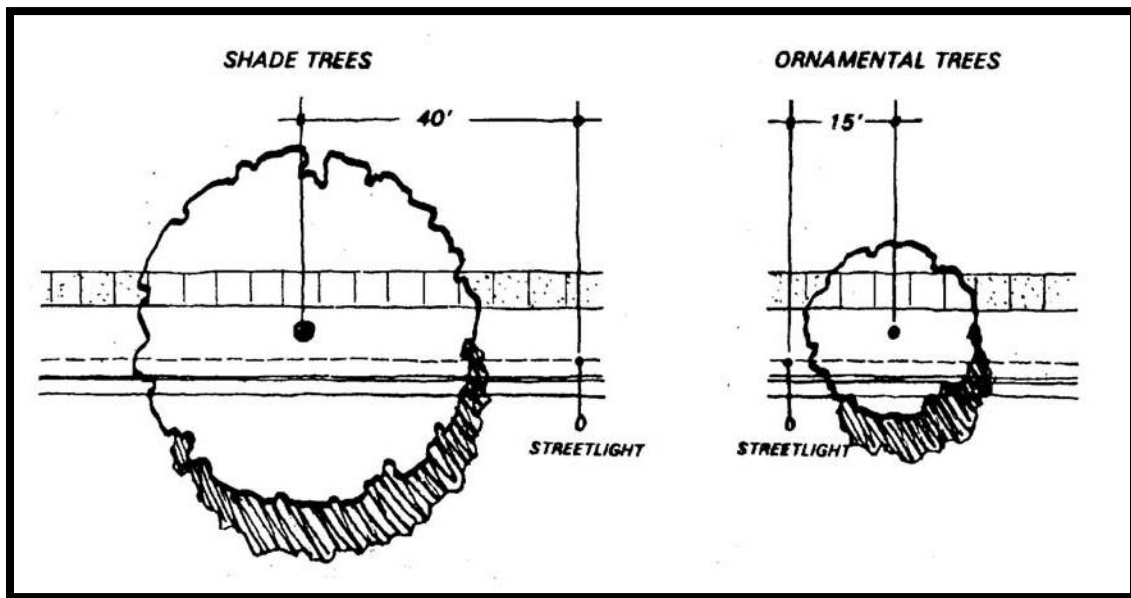
the landscape contractor and applicant, makes the final decision as to what timing is feasible. Street trees must only be planted during shoulder seasons, March through June, and September through November, to avoid the hottest and coldest periods of the year.

[NOTE This Subsection (D)(1)(f) was previously Subsection (K).]

(f) **Utilities and Traffic.** Landscape, utility and traffic plans shall be coordinated. The following list sets forth minimum dimension requirements for the most common tree/utility and traffic control device separations are shown below. Exceptions to these requirements may occur, as approved by the Director, where utilities or traffic control devices are not located in their standard designated locations, as approved by the Director. Tree/utility and traffic control device separations shall not be used as a means of avoiding the planting of required street trees. Required separations are:

- (I) Forty (40) feet between shade trees and streetlights. Fifteen (15) feet between ornamental trees and streetlights. (See Figure 35.10.1-(1).)

Figure 35.10.1-(1) – Tree/Streetlight Separations



- (II) Twenty (20) feet between shade and/or ornamental trees and traffic control signs and devices.
- (III) Ten (10) feet between trees and water or sewer mains.
- (IV) Six (6) feet between trees and water or sewer service lines.
- (V) Four (4) feet between trees and gas lines.

- (VI) Street trees on local streets planted within the eight-foot-wide standard abutting utility easement may conflict with utilities. Additional conduit may be required to protect underground electric lines.

[NOTE: This Subsection (D)(2) was previously (E)(2).]

(2) **Landscape Area Treatment.** Landscape areas shall include all areas on the site, including entryways, that are not covered by buildings, structures, paving, or impervious surface, or other outdoor areas including play areas, plaza spaces, patios, and the like. Landscape areas shall consist only of landscaping, which includes any combination of living plants, and may include built features such as fences, benches, works of art, reflective pools, fountains, or the like. Landscaping shall also include irrigation systems, mulches, topsoil, soil preparation, revegetation, and the preservation, protection, and replacement of existing trees. The selection and location of turf, ground cover (including shrubs, grasses, perennials, flowerbeds and slope retention), and 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.

(a) **Coverage.** Not counting trees, more than 50% of a landscape area must be covered with living plants at maturity. The Director may approve an exception to this requirement if a determination is made that an area is too small for living landscape material and for irrigation to be reasonably feasible.

(b) **Grouping and Placement.** A landscape plan must group landscape materials based upon hydrozone and irrigated accordingly (as described under Subsection(D)(3) of this Section and based on light (e.g. full sun, shade, partial sun) requirements.

(c) **Irrigated Turf grass.** Irrigated turf grass areas may only be planted according to planned use. Any landscape plan that includes irrigated turf grass must indicate the intended use of all turf grass areas.

- (I) Irrigated turf grass with a high water requirement may only be planted according to planned use, only in areas or spaces used for recreation or for civic or community purposes. Such purposes may include playgrounds, sports fields or other athletics programming, picnic grounds, amphitheaters, portions of parks, and playing areas of golf courses. Such purposes do not include, and irrigated turfgrass with a high water requirement must not be planted in, parking lots or medians. Irrigated turf grass with a high water requirement may only be planted for recreation, civic or community purposes and is limited to High-use areas shall be planted with irrigated turf grass of heavy foot traffic. Irrigated turf grass with a high water requirement refers to high- or moderate-hydrozone sod forming grasses including species such as *Poa pratensis* (Kentucky bluegrass), and turf-type tall fescue (*Festuca arundinacea*) and their varieties and cultivars. See the hydrozone table (Table 5.10.1-(5)) at Subsection (D)(3) of this Section for descriptions of hydrozones. Nonirrigated shortgrass prairie grasses or other adapted grasses that have been certified as Xeriscape landscaping may be established in remote, low-use, low-visibility areas.

(II) Irrigated turf grass shall not be installed in contiguous areas smaller than seventy-five (75) square feet to avoid water waste that occurs through overspray on small areas.

(III) Irrigated turf grass species with a low water requirement may be located on a site as appropriate for the species and planned activity. Well-maintained irrigated turf grass with a low or very-low water requirement according to hydrozones in Table 5.10.1-(5) at Subsection (D)(3) of this Section or the *City of Fort Collins Plant List* and that also does not meet the definition of "turf" set forth in C.R.S. 37-60-135(2)(i) and well-maintained regionally adapted or native grass species are not subject to the irrigated turf grass limits in Subsection (D)(2)(c)(I) of this Section.

(d) **Artificial Turf and Plants.** No artificial turf or artificial plants may be included in any landscape plan or installed. The Director may approve an exception to allow artificial turf to be installed on an athletic field of play if the installation is not prohibited under C.R.S. 37-99-103 and if the Director determines the use is appropriate, the use does not add pollutants that could cause environmental impairment, and alternatives are not reasonable. Any exception to allow artificial turf must be noted in the landscape plan.

(e) **Ecologically Sensitive Areas.** Non-native plants must not be planted near ecologically sensitive areas, such as natural habitat buffer zones (NHBZs) and natural areas, if the species or variety is deemed by the Director to be likely to spread into that sensitive area.

(f) **Mulched Planting Beds.**

(I) Shrub and ground cover planting beds shall be separated from irrigated turf grass with a high water requirement by with edging or other physical divider or a commitment on the landscape plan to maintain a shovel-cut edge to define the space that is being maintained. and

(II) Shrub and ground cover planting beds shall have the majority of exposed soil areas covered with mulch.

(III) Mulch must be organic or inorganic mulch. To the extent that any inorganic mulch is used, the total coverage area of inorganic mulch must not exceed fifty percent (50%) of the total landscape areas. Mulching around trees is excluded from this fifty percent (50%) calculation.

(IV) Synthetic-based inorganic mulches, including plastic- or rubber-based mulches are not permitted.

(g) **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) seven (7) feet wide placed directly along at least fifty (50) percent of such walls, except:

(I) where pedestrian paving abuts a commercial building with trees and/or other landscaping in cutouts or planting beds along the outer portion of the pedestrian space away from the building;

- (II) Where exceptional situations unique to the development hinder the applicant's ability to comply with fire code or building code requirements while also adhering to a strict application of this standard.

[NOTE: This Subsection (D)(2)(h) was previously (E)(1).]

(h) **Buffering Between Incompatible Uses and Activities.** In situations where the Director determines that the arrangement of uses or design of buildings does not adequately mitigate conflicts reasonably anticipated to exist between dissimilar uses, site elements or building designs, one (1) or more of the following landscape buffering techniques shall be used to mitigate the conflicts:

- (I) Separation and screening with plant material: planting dense stands of evergreen trees, canopy shade trees, ornamental trees or shrubs;
- (II) 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 and bulk and avoid harsh edges;
- (III) 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 side or rear yards of smaller buildings;
- (IV) 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; and/or
- (V) Landform shaping: utilizing berming or other grade changes to alter views, subdue sound, change the sense of proximity and channel pedestrian movement.

(i) **Street Parkways, Rights-of-Way, Transportation Corridors.** All adjoining street parkways, street rights-of-way, and transportation corridors shall be landscaped in connection with the development in accordance with the *Larimer County Urban Area Street Standards* and in accordance with state law, including C.R.S. 37-99-103.

(j) **Slopes.** Retaining walls, slope revetment or other acceptable devices integrated with plantings shall be used to stabilize slopes that are steeper than 3:1. If structural soil tests performed on the subject soils indicate steeper slopes are stable without the above required protection, then 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.

[NOTE: This Subsection (D)(2)(k) was previously Subsection (L).]

(k) **Visual Clearance or Sight Distance Triangle.** Except as provided in Subparagraphs (1) and (2) Subsections (D)(2)(k)(I) and (II) below, a visual clearance triangle, free of any structures or landscape elements over twenty-four (24) inches in height, shall be maintained at street intersections and driveways in conformance with the standards contained in the *Larimer County Urban Area Street Standards*.

- (I) Fences shall not exceed forty-two (42) inches in height and shall be of an open design.
- (II) Deciduous trees may be permitted to encroach into the clearance triangle provided that the lowest branch of any such tree shall be at least six (6) feet from grade.

(I) Exceptions.

- (I) Agricultural Use. If outdoor space is maintained in active agricultural use, the landscape surfaces and ground cover standards above shall not apply.
- (II) Streetscapes attached to a property are subject to *Larimer County Urban Area Street Standards* and are not considered as part of the total landscape area of a property for computing percentages under the standards in this Subsection.
- (III) All streetscapes intended to be turned over to the Parks Department after development must conform to Parks Department standards. Landscaping plans must also be reviewed and approved by the Parks Department before approval, regardless of the water district.

[NOTE: All of this Subsection below was distributed among the other Subsections within this Section.]

~~**Water Conservation.** Landscape plans shall be designed to incorporate water efficient techniques.~~

~~(m) Landscape designs shall be designed according to the xeriscape landscaping principles described as follows:—~~

- ~~(I) Plan and design. Plan for how people will use and interact with the landscape. Group landscape materials accordingly based upon hydrozone.—~~
- ~~(II) Landscape arrangement. Provide a cohesive arrangement of turf, plants, mulch, boulders and other landscape elements that support the criteria in Section 5: 10.1(H). Landscape elements shall be arranged to provide appropriate plant spacing and grouping and to avoid a disproportionate and excessive use of mulch areas.—~~
- ~~(III) Appropriate use of turf. Limit high water use turf to high traffic areas where turf is functional and utilized.—~~
- ~~(IV) Appropriate plant selection. Selected plants shall be well adapted to the Fort Collins climate and site conditions. Plants shall be grouped according to water and light requirements.—~~
- ~~(V) Efficient irrigation. Design, operate and maintain an efficient irrigation system. Select equipment appropriate to the hydrozone. Water deeply and infrequently to develop greater drought tolerance.—~~

- ~~(VI) Soil preparation. Incorporate soil amendments appropriate to the soil and the plant material. Soil preparation must be in accordance with City of Fort Collins Municipal Code 3..2.1.—~~
- ~~(VII) Mulch. Maintain a minimum depth of three inches of mulch in planting beds to conserve soil moisture and control weeds, with careful placement and adjustment of depth near plant stems as needed to allow unimpeded plant establishment and vigorous growth.—~~
- ~~(VIII) Maintenance. Provide regular maintenance including but not limited to weeding, pruning, mowing to an appropriate height, deadheading, replacement of dead plant material, and replenishment of mulch surfaces.—~~
- ~~(IX) Xeriscape principles do not include or allow artificial turf or plants; paving of areas not used for walkways, patios or parking; excessive bare ground or mulch; weed infestations; or any landscaping that does not comply with the standards of this section.—~~

[NOTE: This Subsection (D)(3) was previously (E)(3)(b).]

- (3) **Water Budget and Hydrozones.** Landscape plans shall include **must also contain estimated water use, including:**
 - (a) **Maximum Not to Exceed.** A water budget chart that shows the total annual water use, which shall **Total annual water use once landscaping is established must** not exceed an average of **fifteen (15) eleven (11)** gallons/square foot/year for each water tap.
 - (b) **Hydrozones.** A hydrozone plan view diagram that identifies each hydrozone category assigned per planted area and that sums the total area of each category per hydrozone. The hydrozone plan view diagram shall provide an accurate and clear visual identification of all hydrozones using easily distinguished symbols, labeling, hatch patterns, and relationships of hydrozone plan elements.

Accurate and clear identification of all applicable hydrozones are defined in Section 7.2.2 and according to using the following categories:

Table 5.10.1-(5) – Hydrozones

HYDROZONE	WATER CONSUMPTION PER YEAR
High Hydrozone	18 gallons/square feet/year
Moderate Hydrozone	14 gallons/square feet/year
Low Hydrozone	8 gallons/square feet/year
Very Low Hydrozone	3 gallons/square feet/year

[NOTE: This Subsection (D)(4) was previously (E)(4).]

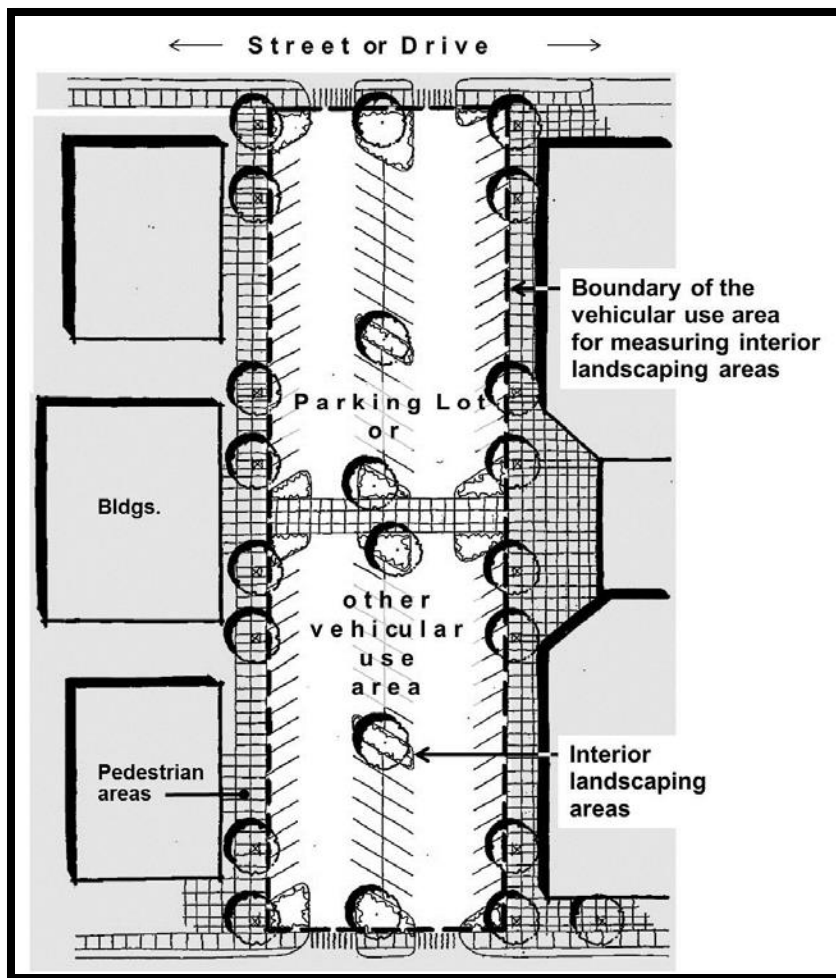
- (4) **Parking Lot Perimeter Landscaping.** Parking lot perimeter landscaping (in the minimum setback areas required by Section 5.9.1(J)(Access, Circulation and Parking) and irrigation shall meet the following minimum standards **in addition to the other requirements in this Section:**

- (a) Trees shall be provided at a ratio of one (1) tree per twenty-five (25) lineal feet along a public street and one (1) tree per forty (40) lineal feet along a side lot line parking setback area. 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) Screening. Parking lots with six (6) or more spaces shall be screened from abutting 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 (75%) of light from vehicle headlights for the entire length of the parking lot. Screening from the street and all nonresidential 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 (70%) of the length of the street frontage of the parking lot and also seventy (70) percent (70%) of the length of any boundary of the parking lot that abuts any nonresidential 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 of construction of the vehicular use area to be screened.

[NOTE: This Subsection (D)(5) was previously (E)(5).]

- (5) **Parking Lot Interior Landscaping.** Six (6) percent (6%) of the interior space of all parking lots with less than one hundred (100) spaces, and ten (10) percent (10%) of the interior space of all parking lots with one hundred (100) spaces or more shall be landscape areas. (See Figure ~~±5.10.1-~~(2)). All parking lot islands, connecting walkways through parking lots and driveways through or to parking lots shall be landscaped and irrigated according to the following standards in addition to the other requirements in this Section:
 - (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. This requirement does not apply to trees, for which visibility requirements are provided in Subsection (D)(2)(k)(II) of this Section.
 - (b) **Maximized Area of Shading.** Landscaped 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) canopy 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 live plants with mulch, as appropriate.
 - (c) **Landscaped Islands.** In addition to any pedestrian refuge areas, each landscaped island shall include one (1) or more canopy shade trees, be of length greater than eight (8) feet 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.

Figure ~~±5.10.1-~~(2) – Interior Landscaping for Vehicular Use Areas:



- (d) **Walkways and Driveways.** Connecting walkways through parking lots, as required in subsection 5.9.1(C)(5)(a) (Walkways), shall have one (1) canopy shade tree per forty (40) lineal feet of such walkway planted in landscape areas within five (5) feet of such walkway. Driveways through or to parking lots shall have one (1) canopy shade tree per forty (40) lineal feet of and along each side of such driveway, in landscape areas within five (5) feet of such driveway.
- (e) **Parking bays** shall extend no more than fifteen (15) parking spaces without an intervening tree, landscape island or landscape peninsula.
- (f) **Engineering.** Detailed specifications concerning parking lot surfacing material and parking lot drainage detention are available from the City Engineer.
- (6) **Screening.** Landscape and building elements shall be used to screen areas of low visual interest or visually intrusive site elements (such as trash collection, open storage, service areas, loading docks and blank walls) from off-site view. Such screening shall be established on all sides of such elements except where an opening is required for access. If access is possible only on a side that is visible from a public street, a removable or operable screen shall be required. The screen shall be designed and established so that the area or element being screened is no more than twenty (20) percent (20%) visible through the screen.

Screening Materials. Required screening shall be provided in the form of new or existing plantings, walls, fences, screen panels, topographic changes, buildings, horizontal separation or a combination of these techniques.

- (7) **Landscaping of Vehicle Display Lots.** Vehicle display lots for vehicle sales and leasing (as those terms are defined in Article 7) that abut an arterial or collector street shall feature landscaped islands along the street at an interval not to exceed every fifteen (15) vehicles or one hundred thirty-five (135) feet, whichever is less. Each landscaped island shall comply with the requirements of 5.10.1(E)(5)(c).

[NOTE: This Subsection (E) was previously Subsection (I).]

(E) Landscape Materials, Maintenance and Replacement.

- (1) **Topsoil/Soil Preparation.** To the maximum extent feasible, topsoil that is removed during construction activity shall be conserved for later use on areas requiring revegetation and landscaping. Organic soil amendments shall also be incorporated as appropriate to the existing soil and the proposed plant material and in accordance with the requirements of Section 5.5.5 Subsection (K) of this Section.
- (2) **Plant Materials.** Plant material shall be selected from the *City of Fort Collins Plant List* created and maintained by Fort Collins Utilities Customer Connections Department and adopted by the Director. The *Plant List* contains plants determined by local resources to be appropriate for local conditions. The Director may approve plants not included on the list upon a determination that such plants are well suited for the local climate.
 - (a) No invasive plant species may be included in a landscape plan or installed in a development.
 - (b) A landscape plan proposing a plants that is not included on the *Plant List* may be approved by applicable decision-making staff if the applicant verifies on the landscape plan that the plant is well adapted to the Fort Collins local climate and site conditions and is not a noxious weed according to Colorado Department of Agriculture or a weed under City Code Section 20-41.
- (3) **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 latest version of the *American Association of Nurserymen standards Standard for Nursery Stock*.

[NOTE: The previous Subsection (E)(4) that existed here was moved into its own Subsection (I).]

- (4) **Maintenance.** Trees and vegetation, irrigation systems, fences, walls and other landscape elements shall be considered as elements and infrastructure of the project development 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. Required maintenance includes, but is not limited to, the following:

(a) Perform regular elimination of weeds, pruning, mowing to an appropriate height, deadheading, replacement of dead plant material, and replenishment of mulch surfaces.

(b) Maintain All landscaping shall be maintained free from disease, pests, weeds, and litter, and all landscape structures such as fences and walls shall be repaired and replaced periodically to maintain a structurally sound condition.

(c) Use best practices for integrated pest management to protect pollinators and other living organisms, as well as best practices for prioritizing water quality, that improve the health of landscapes and soils.

(d) Preserve and protect trees and the critical root zone (CRZ) designated for preservation. Preserving and protection includes but is not limited to avoiding damage to the tree and CRZ. Damaging actions include but are not limited to backing into a tree, excavating or trenching in the CRZ, storing heavy equipment on the CRZ, and overpruning.

(I) Damage to a tree or CRZ that interferes with the long-term health of the tree requires mitigation according to the Tree Mitigation Requirements under Subsection (G) of this Section.

(II) Naturally fallen trees or trees found to be a threat to public health, safety or welfare are exempt.

(5) **Replacement.** Any landscape element that dies, or is otherwise removed, shall be promptly replaced based on the requirements of this Section.

(6) **Mitigation.** 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 per Subsection (F) with not less than one (1) or more than six (6) replacement trees sufficient to mitigate the loss of value of the removed tree existing canopy. The applicant shall select either the City Forester or a qualified landscape appraiser to determine such loss based upon a fair market value appraisal of the removed tree, using the most recent published methods established by the Council of Tree and Landscape Appraisers. Larger than minimum sizes (as set forth in subsection (D)(4) above) shall be required for such replacement trees resources listed in Subsection (F) of this Section.

[NOTE: This Subsection (E)(7) was previously Subsection (M).]

(7) **Revegetation.** When the development causes any disturbance within any natural area buffer zone, revegetation shall occur as required in paragraph Subsection 5.6.1(E)(2) (Development Activities Within the Buffer Zone) and subsection 5.10.1(F) (Tree Preservation and Mitigation).

(8) **Restricted Tree Species.** City Forestry Division shall provide a list of specified tree species that shall not neither be planted within the limits of development and LOD, nor in the adjoining street right-of-way. For example, no ash trees (Fraxinus species) shall be planted due to the anticipated impacts of the emerald ash borer.

(9) **Prohibited Tree sSpecies.** For prohibited species reference to Chapter 27, Article II, Division 1, Sec. 27-18 of the Fort Collins Municipal Code.

(10) **Mulch.** In addition to the requirements under Subsection (D)(2)(f) of this Section, the following standards apply:

- (a) **Mulch for Trees.** All trees must have organic mulch placed and replenished as needed at a depth of two (2) to four (4) inches for a minimum of a three (3) foot radius mulch ring or under a tree grate. This includes trees planted in rock cobble planting beds.
- (b) **Mulch for Other Landscaping.** Mulch must be placed and replenished as needed to maintain complete coverage of the soil surface with a minimum depth of ~~three~~ two (2) to four (4) inches of mulch. Mulch shall be maintained at these minimum depths in planting beds to conserve soil moisture and control weeds, with careful placement and adjustment of depth near plant stems as needed to allow unimpeded plant establishment and vigorous growth.

[NOTE: This Subsection (F) has remained Subsection (F).]

(F) **Tree Preservation and Mitigation.** Existing significant trees (six (6) inches and greater in diameter) within the LOD and within natural habitat buffer zones NHBZs shall **must** be recorded in a tree inventory and preserved to the extent reasonably feasible and may help satisfy the landscaping requirements of this Section as set forth above. Such trees shall be considered "protected" trees within the meaning of this Section, subject to the exceptions contained in ~~s~~Subsection (F)(2) below. Streets, buildings and lot layouts shall be designed to minimize the disturbance to significant existing trees. All required landscape plans, demolition plans, grading plans, building plans, engineering plans, and utility plans shall accurately identify the locations, species, size and condition of all significant trees, each labeled showing the applicant's intent to either remove, transplant or protect.

Where the City determines it is not feasible to protect and retain significant existing tree(s) or to transplant them to another on-site location, the applicant shall replace such tree(s) according to the following requirements and shall satisfy the tree planting standards of this Section **Subsection**.

To the extent reasonably feasible, replacement **mitigation** trees shall be planted on the development site or, if not reasonably feasible, in the closest available and suitable planting site on public or private property. The closest available and suitable planting site shall be selected within one-half (1/2) mile (2,640 feet) of the development site, subject to the following exceptions. If suitable planting sites for all of the replacement trees are not available within one-half (1/2) mile (2,640 feet) of the development, then the City Forester shall determine the most suitable planting location within the City's boundaries as close to the development site as feasible. If locations for planting replacement trees cannot be located within one-half (1/2) mile of the development site, the applicant may, instead of planting such replacement trees, submit a payment in lieu to the City of Fort Collins Forestry Division to be used to plant replacement trees to plant replacement trees as close to the development site as possible. The **fair market value** payment in lieu mitigation fee per tree is determined by the City Forester **using the current editions of the Council of Tree and Landscape Appraisers' Guide for Plant Appraisal**, the industry's international standard and best practice and may be adjusted annually based on market rates. Payment must be submitted ~~prior to the~~ **before a** Development Construction Permit ~~issuance~~ or other required permits **or pre-construction approval is issued, as applicable.**

(1) **Mitigation Trees.** A significant tree that is removed shall be replaced with not less than one (1) ~~or~~ **nor** more than six (6) replacement trees sufficient to mitigate the loss of contribution and value of the removed significant tree(s). The applicant shall coordinate with the City Forester to determine

such loss based upon an onsite tree assessment, including, but not limited to, shade, canopy, condition, size, aesthetic, environmental and ecological value of the tree(s) to be removed. Replacement Mitigation trees shall meet the following minimum size requirements unless otherwise determined by the City Forester:

- (a) Canopy Shade Trees: 2.0" caliper balled and burlap or equivalent.
- (b) Ornamental Trees: 2.0" caliper balled and burlap or equivalent.
- (c) Evergreen Trees: 8' height balled and burlap or equivalent.

(2) **Exemptions.** Trees that meet one (1) or more of the following removal criteria shall be exempt from the requirements of this subsection unless they meet mitigation requirements in Section 5.6.1(E)(1) of this Code:

- (a) ~~d~~Dead, dying or naturally fallen trees, or trees found to be a threat to public health, safety or welfare;
- (b) ~~t~~Trees that are determined by the City to substantially obstruct clear visibility at driveways and intersections;
- (c) Siberian elm less than eleven (11) inches diameter-at-breast-height (DBH) and Russian-olive or ash (*Fraxinus* species) less than eight (8) inches DBH;
- (d) Russian-olive, Siberian elm, and ash (all *Fraxinus* species) of wild or volunteer origin, such as those that have sprouted from seed along fence lines, near structures or in other unsuitable locations.

(3) **Depiction of Street Trees.** All existing street trees that are located on City rights-of-way abutting 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 of subsection (G).

[NOTE: This Subsection (G) has remained Subsection (G).]

(G) **Tree Protection Specifications.** The following tree protection specifications shall be followed for all projects with protected existing trees. Tree protection methods shall be delineated on the demolition plans and development plans.

- (1) **No Disturbance.** Within the drip line of any protected existing tree, there shall be no cut or fill over a four-inch depth unless a qualified arborist or forester has evaluated and approved the disturbance.
- (2) **Pruning.** All protected existing trees shall be pruned to the City of Fort Collins Forestry Division standards.
- (3) **Protective Barriers.** Prior to and during construction, barriers shall be erected around all protected existing trees with such barriers to be of orange construction or chain link 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 (½) of the drip line, whichever is greater. Concrete blankets, or equivalent padding material, wrapped around the tree trunk(s) is recommended and adequate for added protection during construction. There shall be no storage or movement of equipment, material, debris or fill within the fenced tree protection zone. ~~A tree protection plan must be submitted to and approved by the City Forester prior to any development occurring on the development site.~~

- (4) **Chemicals and Harmful Materials.** During the construction stage of development, the applicant shall prevent the cleaning of equipment or material or the storage and disposal 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 Attachments.** No damaging attachment, wires, signs, or permits may be fastened to any protected tree.
- (6) **Ribboning Off.** 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 in subsection (G)(3) above. This may be accomplished by placing metal t-post stakes a maximum of fifty (50) feet apart and tying ribbon or rope from stake-to-stake along the outside perimeters of such areas being cleared.
- (7) **Soil Disturbances.** Soil disturbances in proximity to trees must comply with the distances in Table 5.10.1-(6) below, Tree Diameter to Soil Disturbance Distance. Soil disturbances include, but are not limited to, soil loosening or amending, augering or boring, tunnelling, irrigation installation, or excavation within the critical root zone (CRZ). Soil loosening and amending shall be pursuant to City Code Section 12-132.
- (8) **Underground Facilities Installations.** 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 and not directly under the trunks of trees. The auger distance is established from the face of the tree (outer bark) and is scaled from tree diameter at breast height (DBH) as described in the chart below. Low pressure hydro excavation, air spading or hand digging are additional tools/practices that will help reduce impact to the tree(s) root system when excavating at depths of twenty-four (24) inches or less. Refer to the Critical Root Zone (CRZ) diagram, Figure 2.5.10.1-(3), for root protection guidelines. The CRZ shall be incorporated into and shown on development plans for all existing trees to be preserved.

Table 5.10.1-(6) – Tree Diameter to Soil Disturbance Distance Auger Distance Table:

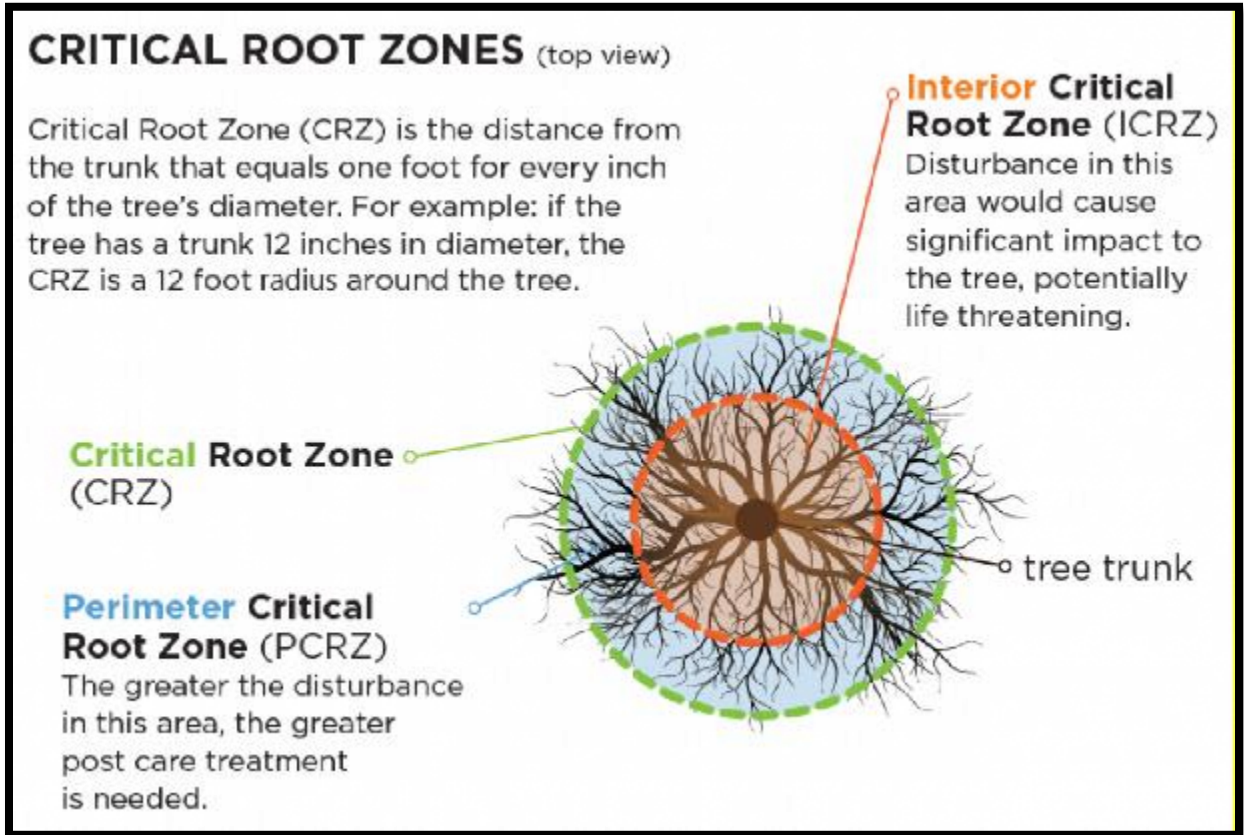
Tree Diameter at Breast Height (Inches)	0" to 9"	10" to 14"	15" to 19"	Over 19"
Soil Disturbance Distance from Face of Tree* (Feet)	5 feet	10 feet	12 feet	15 feet

*The soil disturbance distance shall be measured from the edge of disturbance to the face of the tree.

<i>Tree Diameter at Breast Height (inches)</i>	<i>Auger Distance From Face of Tree (feet)</i>
0-2	1
3-4	2

5-9-	5-
10-14-	10-
15-19-	12-
Over 19-	15-

Figure 25.10.1-(3) - Critical Root Zone Diagram.



(9) Watering During Development. All existing trees within the plan must be watered using irrigation or hauled water sources throughout the duration of the development process and all development activities to sustain and improve tree health and survivability, under the following schedule: watered weekly at a minimum of forty (40) gallons per week March through October, and monthly at a minimum of forty (40) gallons per month November through April when temperatures are above forty degrees (40°).

(8) Placement and Interrelationship of Required Landscape Plan Elements. In approving the required landscape plan, the decision maker 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 on the following criteria:—

- a. protecting existing trees, natural areas and features;—
- b. enhancing visual continuity within and between neighborhoods;—

- ~~g.~~ providing tree canopy cover;
- ~~d.~~ creating visual interest year round;
- ~~e.~~ complementing the architecture of a development;
- ~~f.~~ providing screening of areas of low visual interest or visually intrusive site elements;

~~g.~~ establishing an urban context within mixed-use developments;

~~h.~~ providing privacy to residents and users;

~~i.~~ conserving water;

~~j.~~ avoiding reliance on excessive maintenance;

~~k.~~ promoting compatibility and buffering between and among dissimilar land uses; and

~~l.~~ establishing spatial definition.

[NOTE: This Subsection (H) was previously Subsection (J).]

(H) **Irrigation.** Irrigation systems must be designed, operated, and maintained to prioritize water conservation and water efficiency. Systems should be designed to water deeply and infrequently to develop greater drought tolerance.

(1) **Automatic Irrigation.** Provision shall be made for permanent, automatic irrigation of all plant material, with the following exceptions:

(a) Plantings that do not require any irrigation beyond establishment. For such plantings, any new or existing automatic irrigation should not be routed to these plantings and should be established by tank watering or otherwise as noted on the landscape plan. Trees are not considered "plantings that do not require any irrigation beyond establishment."

(b) Natural areas or other areas within a development where natural features onsite obviate the need for irrigation.

(c) Trees and other plants used to landscape a residential local street parkway abutting lots for detached single-unit dwellings, where manual watering is intended.

(d) Mitigation trees planted off-site where it may not be feasible to install dedicated irrigation for that singular purpose.

(e) Landscaping adjacent to certain street frontage types, such as Storefront and Mixed Use, or within special taxing districts such that landscaping and irrigation may be the responsibility of an entity other than the individual property owner.

(2) **Irrigation Plan Specifications.** For any development provided water within the City, a final irrigation plan as part of the landscape plan shall **must** be submitted to and approved by the Director, and by the Parks Department if a streetscape to be turned over to the City is involved, ~~prior to the issuance of the~~ before a building permit is issued, or if no building permit is required, then ~~prior to~~ before commencement of construction. Any major deviation from an approved irrigation plan, resulting from construction, requires an as-built amendment to the irrigation plan. As determined by the Director, minor redevelopment or change of use projects may not be required to submit an irrigation plan as part of the landscape plan. In such cases, a written statement shall be submitted describing the type of irrigation system proposed. The irrigation plan shall incorporate the City of Fort Collins Irrigation System Standards for Water Conservation set forth below in this Subsection. The irrigation plan must include a water use table organized by irrigation zone for each irrigation tap, corresponding to the hydrozone plan view diagram and aligning with the water budget chart in the landscape plan (Subsection(D)(3) of this Section), and showing the total annual water use. The irrigation plan must also depict on the hydrozone plan view diagram in each watering area by hydrozone, the location/point of irrigation tap connections with the water system, the proposed peak gallons per minute and tap size for each tap, and the layout of irrigation main lines proposed. In addition, as provided below in Subsection (I) of this Section, the irrigation system must be inspected for compliance with the approved irrigation plan before the issuance of a Certificate of Occupancy.

(3) **Irrigation System Standards for Water Conservation.** The City of Fort Collins Irrigation System Standards for Water Conservation are as follows:

(a) Irrigation Methods and Layout.

- (I) The irrigation system shall be designed according to the hydrozones shown on the landscape plan and shall perform as provided in the water budget chart.
- (II) Each zone shall irrigate a landscape with similar site, soil conditions and plant material having similar water needs. To the extent reasonably feasible, areas with significantly different solar exposures shall be zoned separately.
- (III) Trees, including street trees, Turf and non-turf areas shall be irrigated on separate zones. Dedicated non-overhead, surface or subsurface irrigation must be installed for all new trees and existing trees within the plan, except as provided in Subsection (H)(1) above.
- (IV) On steep grades, an irrigation method with a lower precipitation rate shall be used in order to minimize runoff, and, to the extent reasonably feasible, these areas shall be zoned separately.
- (V) No combination of Drip, micro-sprays, sprayheads and or rotors shall not be used together or combined on the same zone.
- (VI) The irrigation method shall be selected to correlate with the plant density. Drip irrigation or bubblers shall be used for sparsely planted trees and shrubs, and rotors, sprayheads and multi-jet rotary nozzles shall be used for turfgrass.

(b) Equipment Selection.

- (I) To reduce leakage of water from the irrigation system, a master shut-off valve shall be installed downstream of the backflow device to shut off water to the system when not operating.
- (II) For irrigation systems that are on a combined-use tap, with a water meter installed upstream to measure total water use, the installation of an irrigation-only submeter ~~should be considered~~ **must be installed**. The purpose of the submeter ~~would be~~ **is** to enable the owner and landscape maintenance contractor to monitor water use for irrigation. The submeter ~~would~~ **is** not be used for billing purposes. The cost of installation and maintenance of a submeter, if used, would be borne by the owner of the property and not by the City. All such submeters would have to be installed in accordance with the specifications established by the City.
- (III) Irrigation controllers shall be "smart" controllers, using climate-based or soil moisture-based technology, selected from the WaterSense labeled irrigation controllers list issued by the United States Environmental Protection Agency from time-to-time and available at the City of Fort Collins Utilities Water Conservation Department. Controllers shall be installed and programmed according to manufacturer's specifications.
 - a. A data input chart for the Smart Controller, including the precipitation rate from the audit, shall be posted at each irrigation controller.
 - b. Within six (6) weeks of the installation of new ~~landscaping~~ **irrigated turf grass sod or seed**, the irrigation system ~~Smart Controller's~~ **schedule** shall be **reduced and set** ~~reset to the~~ **a** normal seasonal watering schedule.
- (IV) An evapotranspiration (ET) sensor or weather monitor shall be installed on each irrigation controller ~~and installed~~ according to manufacturer's specifications in a location to receive accurate weather conditions.
- (V) Sprinklers and nozzles shall meet the following requirements:
 - a. The type of sprinkler and associated nozzles shall be selected to correlate with the size and geometry of the zone being irrigated.
 - b. Sprinklers shall be spaced no closer than seventy-five ~~(75)~~ percent **(75%)** of the maximum radius of throw for the given sprinkler and nozzle. Maximum spacing shall be head-to-head coverage.
 - c. Coverage arcs and radius of throw for turf areas shall be selected and adjusted to water only turf areas and minimize overspray onto vegetated areas, hard surfaces, buildings, fences or other non-landscaped surfaces.
 - d. Sprinklers, bubblers or emitters on a zone shall be of the same manufacturer.

- e. Sprayheads in turf areas shall have a minimum three-and-one-half-inch pop-up riser height.
- f. Sprayheads on a zone shall have matched precipitation nozzles. Variable Arc Nozzles (VAN) are not acceptable for ninety degree (90°), one hundred eighty degree (180°) and three hundred sixty degree (360°) degree-applications. High-Efficiency Variable Arc Nozzles (HE-VAN) are acceptable only in odd-shaped areas where ninety degree (90°), one hundred eighty degree (180°) and three hundred sixty degree (360°) are not applicable.
- g. Nozzles for rotors shall be selected to achieve an approximate uniform precipitation rate throughout the zone.
- h. All sprayheads and rotors shall be equipped with check valves. Sprayheads shall also have pressure-regulating stems.

(VI) Pressure-compensating emitters shall be used for drip irrigation. For sloped areas, a check valve shall be installed, and the drip line shall be parallel to the slope.

(VII) Remote control valves shall have flow control.

(VIII) A backflow prevention assembly shall be installed in accordance with local codes. All backflow assemblies shall be equipped with adequately sized winterization ports downstream of the backflow assembly.

(IX) Properties with single or combined point of connection flows of two hundred (200) gpm or greater shall have a control system capable of providing real-time flow monitoring and the ability to shut down the system in the event of a high-flow condition.

(c) Sleeving.

(I) Separate sleeves shall be installed beneath paved areas to route each run of irrigation pipe or wiring bundle. The diameter of sleeving shall be twice that of the pipe or wiring bundle.

(II) The sleeving material beneath sidewalks, drives and streets shall be PVC Class 200 pipe with solvent welded joints.

(d) Water Pressure.

(I) The irrigation system designer shall verify the existing available water pressure.

(II) The irrigation system shall be designed such that the point-of-connection design pressure, minus the possible system pressure losses, is greater than or equal to the design sprinkler operating pressure.

- (III) All pop-up spray sprinkler bodies equipped with spray nozzles shall operate at no less than twenty (20) psi and no more than thirty (30) psi.
- (IV) All rotary sprinklers and multi-stream rotary nozzles on pop-up spray bodies shall operate at the manufacturer's specified optimum performance pressure.
- (V) If the operating pressure exceeds the manufacturer's specified maximum operating pressure for any sprinkler body, pressure shall be regulated at the zone valve or sprinkler heads.
- (VI) Booster pumps shall be installed on systems where supply pressure does not meet the manufacturer's minimum recommended operating pressure for efficient water distribution.

(e) Sprinkler Performance Audit.

- (I) A sprinkler performance audit shall be performed by a landscape irrigation auditor who is independent of the installation contractor, and who is certified by the Irrigation Association (a nonprofit industry organization dedicated to promoting efficient irrigation). Sprinkler systems that are designed and installed without irrigated turf grass areas are exempt from this requirement.
- (II) The audit shall include measurement of distribution uniformity. Minimum acceptable distribution uniformities shall be sixty (60) percent (60%) for spray head zones and seventy (70) percent (70%) for rotor zones. Sprinkler heads equipped with multi-stream rotary nozzles are considered rotors.
- (III) Audit results below the minimum acceptable distribution uniformity as set for the sSubsection (H)(3)(e)(II) above require adjustments and/or repairs to the irrigation system. These corrections will be noted on the irrigation as-builts and the test area re-audited until acceptable efficiency/results.
- (IV) The audit shall measure the operating pressure for one (1) sprinkler on each zone to determine whether the zone meets the above pressure requirements.
- (V) A copy of the sprinkler performance audit shall be submitted to and approved by the City before issuance of a certificate of occupancy.

[NOTE: This Subsection (I) was previously Paragraph (I)(4).]

- (I) **Landscape and Irrigation Installation and Escrow.** All landscaping and irrigation 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 one hundred twenty five (125) percent of the value of the landscaping prior to the issuance of a certificate of occupancy for any building in such phase. Except as provided herein, no certificate of occupancy is authorized to be issued for any building on any portion of a property required by this Section to have a landscape plan, unless all landscaping has been installed and maintained according to an approved landscape plan for the property, all

irrigation has been installed and maintained according to an approved irrigation plan for the property, and:

- (1) If such landscaping and irrigation installations have not been completed, a certificate of occupancy may be issued upon the receipt by the City of surety in the form of an acceptable bond, cash deposit, or equivalent conditioned on and guaranteeing the installation of the entire landscaping shown on the approved landscaping plan and the irrigation system shown on the approved irrigation plan or the installation pursuant to an approved phasing plan.
 - (a) The surety must be in the amount of one hundred twenty-five percent (125%) of the estimated cost of the landscaping installation, irrigation installation, or both as applicable, determined by an executed contract to install the landscaping, irrigation, or both, or by adequate appraisals of the cost.
 - (b) Any surety provided pursuant to this requirement shall be released upon an inspection by the City verifying installation is completed or certification issued by a landscape contractor not involved in the installation that the required landscaping program and irrigation system have been completed and maintained in accordance with the landscape plan.
- (2) For a non-potable system intended to be turned over to the Parks Department, the amount of the surety may be reduced after installation is completed, to twenty-five percent (25%) of the actual cost of such system, and the system must be warranted and maintained for five (5) years. If the non-potable system fails, a potable tap shall be supplied at no cost to the City.

[NOTE: This Subsection (J) was previously Subsection (O).]

- (J) **Soil Loosening and Amendments.** For any development project, prior to before installation of any plant materials, including but not limited to grass, seed, flowers, shrubs, or trees, the soil in the area to be planted shall be loosened and amended in a manner consistent with the requirements of City Code Section 12-132(a), regardless of whether a building permit is required for the specific lot, tract or parcel in which the area is located. A certification consistent with the requirements of City Code Section 12-132(b)12-133 shall be required for the area to be planted. A variance to modify the soil loosening standards of Section 12-132(b); the soil amendment standards of Section 12-132(c); or the compliance deadline of Section 12-133(a) may be applied for as This requirement may be temporarily suspended or waived for the reasons and in the manner set forth in City Code Sections 12-132(e) and (d)12-134.

[NOTE: This Subsection (K) was previously Subsection (N).]

- (K) **Alternative Compliance.** Upon request by an applicant, the decision maker may approve an alternative landscape and tree protection plan that may be substituted in whole or in part for a landscape plan meeting the standards of this Section.
 - (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 plan will better accomplish the purposes of this Section than would a plan which that complies with the standards of this Section.
 - (2) Review Criteria. Staff focused in the applicable area of forestry, landscape, or irrigation must provide a recommendation as to whether to approve an alternate plan. To approve an alternative plan with a staff recommendation, the decision maker must find-determine that the proposed alternative plan accomplishes the purposes of this Section equally well or better than would a plan which that complies with the standards of this Section.

~~In reviewing the proposed alternative plan for purposes of determining whether it accomplishes the purposes of this Section as required above, the decision maker shall take into account whether the alternative accomplishes the functions listed in Subsection (C)(1) through (7) and Subsection (H) of this Section and demonstrates innovative design and use of plant materials and other landscape elements.~~