

Comments from John Parry as of January 22, 2015, “track changes” author “USDA Forest Service”

TOWN OF DURHAM, NEW HAMPSHIRE



Part 3. Development Standards

****DRAFT****

SITE PLAN REGULATIONS

September 17, 2014

Adopted by the Durham Planning Board: *DATE

Most Recently Amended:

PART III. DEVELOPMENT STANDARDS

- Article 1 General Standards
- Article 2 Architectural Design Standards (The standards are contained in the Appendix)
- Article 3 Construction Practices Standards
- Article 4 Cultural Resources Standards
- Article 5 Landscaping and Screening Standards
- Article 6 Lighting Standards
- Article 7 Miscellaneous Design Standards
 - Building Configuration
 - Erosion and Sedimentation Control
 - Fences and Walls
 - Flood Zones
 - Recreation and Open Space
 - Signage
- Article 8 Natural Resources Standards
- Article 9 Operational Issues Standards
 - Hours of Operation
 - Maintenance of the Site
 - Snow Storage and Removal
 - Solid Waste
 - Flammable and Combustible Liquids
 - Street Addressing
- Article 10 Parking and Circulation Standards
- Article 11 Pedestrian, Bicycle, and Transit Facility Standards
- Article 12 Personal Wireless Service Facilities
- Article 13 Public Health and Safety Standards
- Article 14 Standards for Particular Uses/Activities
 - Contractor's Storage Yards
 - Recreational Playing Fields, Outdoor
- Article 15 Stormwater Management Standards
- Article 16 Traffic and Access Management Standards
- Article 17 Utilities Standards

Article 5 Landscaping and Screening Standards

Section 5.1	Purpose
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Section 5.1 Purpose

The purpose of landscaping and screening standards is to:

1. help integrate the built environment with the natural environment;
2. enhance the quality and appearance of development;
3. preserve open space and natural habitats;
4. control excessive stormwater runoff;
5. prevent soil erosion and pollution of water bodies;
6. reduce noise, wind, glare and dust;
7. provide shade and windbreaks to increase energy conservation in buildings to reduce reflected heat;
8. establish an attractive streetscape adjacent to roadways;
9. screen vehicular headlights in parking areas;
10. promote public safety by guiding vehicles and pedestrians within a site;
11. provide areas for snow storage;
12. enhance privacy;
13. enhance the health and survivability of selected landscaping materials

14. protect the value of surrounding property; and
15. protect and enhance the natural beauty, environment, and green space within the Town of Durham.
16. Increase property values

Section 5.2 General Objectives

Landscaping shall be provided that:

1. Defines areas for pedestrian and vehicular circulation;
2. Breaks up the mass of buildings and impervious areas;
3. Incorporates existing native vegetation and other natural features into the site design;
4. Manages and controls stormwater at its source to minimize off-site impacts;
5. Conserves water and reduces outside water use on the site;
6. Provides buffers between incompatible land uses or sites;
7. Softens the visual impact of architectural and structural materials;
8. Minimizes the introduction of pollutants to the environment.

Section 5.3 General Requirements

- 5.3.1 Areas not occupied by buildings or other structures, parking, loading, access ways or natural vegetation or other natural features shall be left in their natural vegetated state where desirable or landscaped to provide visual relief from expanses of paving and buildings while providing benefits such as shade and stormwater management benefits.
- 5.3.2 At a minimum, all yards, setbacks, and areas of open space as required by the Zoning Ordinance shall retain existing natural features or be landscaped as required herein.
- 5.3.3 Landscaped areas shall consist of a combination of grass, flowers, vines, groundcovers, shrubs, and/or trees, as appropriate. All planting areas shall be landscaped with a combination of climate tolerant plant material and protective groundcover and bark mulch. No area shall be left to remain as bare soil.
- 5.3.4 Sites shall be designed to retain and enhance the existing natural features as reasonably determined by the Planning Board.
- 5.3.5 Existing invasive plant species on the subject property shall be removed and destroyed. The Planning Board may reduce or disregard this requirement, where

appropriate, based upon the location and area of invasive species relative to the area to be developed. Applicants shall refer to the current *Prohibited Invasive Plant Species List* maintained by the NH Department of Agriculture.

Dead trees that pose a high risk to people or property should be removed prior to construction. Existing live trees with severe defects that appear to be at high risk for failure should be inspected by a certified arborist. If confirmed to be an extreme risk they should be removed as soon as practical.

- 5.3.6 Existing topography shall be maintained unless otherwise approved by the Planning Board.
- 5.3.7 Any areas disturbed during construction that will not be occupied by buildings or other structures, parking, loading, access ways, or landscaping materials shall be replaced with a minimum of 6 inches of suitable topsoil and shall be replanted according to the requirements herein.
- 5.3.8 Plant material and landscape maintenance procedures that incorporate water conservation techniques (i.e., xeriscaping) are preferred.
- 5.3.9 All local and state requirements for yards and sight distance shall take precedence for selection and placement of landscaping features, as appropriate.
- 5.3.10 No plantings shall be placed where they may interfere with existing or proposed sewer, water, natural gas lines, or power/utility lines or where they will inappropriately block signs or lighting.
- 5.3.11 The front yard landscaping area may contain any of the following:
- a) Public utility easements and open surface drainage easements that do not occupy more than thirty (30) percent of the required landscaped area. Such areas should be planted with perennials or groundcover in order to not interfere with utility connections;
 - b) Underground utility connections and transformers, provided that they do not encroach more than five (5) feet into the required landscaped area. Such equipment shall be landscaped to soften the visual impact.
- 5.3.12 Applicants shall incorporate Low Impact Development (LID) design practices and technologies in all aspects of the site's landscaping.
- 5.3.13 Zoning Ordinance. Until such time that Article XXII – Landscaping, in the Durham Zoning Ordinance, is removed from the Zoning Ordinance, wherever any provision in these regulations is inconsistent with a provision in the Zoning Ordinance, the stricter provision shall apply.

Comment [UFS1]: (Ideally encourage locating underground utilities in the same trench to reduce disturbance to site)

A landscape plan, developed by a landscape architect or other qualified professional, shall be completed and approved by the planning board prior to installation.

Section 5.4 Plant Selection

The following standards shall apply.

- 5.4.1 Deciduous trees, at the time of planting, shall be fully branched and have a minimum caliper of 2 inches.
- 5.4.2 Evergreen trees, at the time of planting, shall be fully branched and have a minimum height of 5 feet.
- 5.4.3 Shrubs, at the time of planting, shall be fully branched and have a minimum height of 2½ feet.
- 5.4.4 All proposed plantings shall be appropriate for the soils, drainage, hardiness zone, climate and other conditions of the site. Particular attention shall be paid to tolerance to potential road salt and other deicing treatments.
- 5.4.2 Plant materials shall be of specimen quality conforming to the most recent version of the American Standards for Nursery Stock (ANSI) ~~Standard for Nursery Stock~~ and be pest free. Plant materials shall be guaranteed for at least two growing seasons.
- 5.4.3 Unless otherwise approved, trees shall be selected from the recommended approved list of tree species, included in Appendix #???
- 5.4.4 Species on the current Prohibited or Restricted Invasive Plant Species Lists maintained by the NH Department of Agriculture shall not be planted.
- 5.4.5 Species shall not be planted that are a known host for an insect or disease pest of concern for the region.
- 5.4.6 Trees shall be selected for growing habits that are appropriate for the location, and for the intended function (privacy buffer, shade, etc.). Consideration shall be given to rooting space, crown height and canopy spread at maturity in order not to interfere with structures, sidewalks, utility lines (above- and below-ground), signs, lights, and other elements.

Comment [UFS2] : May be limiting. Some shrubs are intended to be shorter or even ground covers. Some shrubs may start out smaller.

Comment [UFS3] : Move to top of Section 5.4?

Comment [UFS4] : If such a list is desirable it Needs to be developed

Section 5.5 Planting Requirements

The following standards shall apply:

- 5.5.1 Planting holes for trees shall be at least two times the width of the root ball and shall be no deeper than the root ball.

Comment [UFS5] : Provide a general reference for tree planting specs such as “ trees and shrubs should be planted using the commonly accepted industry standards, as described in the most recent edition of Tree Planting Best Management Practices – International Society of Arboriculture”. Some of these basic practices include;

5.5.2 Shrubs shall have a planting hole at least three times the width of the root ball and shall not be deeper than the root ball itself.

Plant material shall be watered and mulched with 2” – 4” of bark mulch at time of planting.

Plant material shall be installed during appropriate planting seasons unless otherwise approved (March – Mid June or Mid September – December).

5.5.3 Trees planted in dense urban development within sidewalks, parking lots, pavement or other hard scape require special design techniques to insure they will be healthy. Adequate drainage, irrigation, rooting space, soil volume and protection from human activity must all be considered. Planning for these Tree spaces or “boxes” should be included in the conceptual design phase so that adequate space is allocated, and it is incorporated into the infrastructure. This is especially true when there is a desire to establish trees that will have a medium to large mature size (over 30 feet in height). Where appropriate, existing standards for infrastructure design (such as the Architectural Design Standards for Tree Planting in Urban Areas”) shall be consulted and appropriate specifications determined by the Planning Board.

When appropriate for trees placed within sidewalks, tree grates, pavers or other appropriate devices, shall be used to prevent excessive soil compaction and to add interest to the pavement. Tree grates shall be fabricated of a strong, durable material, installed flush with grade, and provide an expandable center opening to allow for continued tree growth.

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5.5.4 Where appropriate, tree guards shall be installed to protect the base of the tree from street activity.

5.5.5 Tree wells over 6 inches deep or other landscape features that have the potential to present a tripping/falling hazard to the public shall have grates, fences or other protective measures installed.

Section 5.6 Landscaped Areas, in General

5.6.1 Side slopes for all landscaped areas shall not exceed thirty-three and one third (33-1/3) percent (3:1 slope) and shall be appropriately stabilized with vegetation.

5.6.2 Within parking areas, landscaped islands shall be provided between adjacent rows of parking and between groups of parking spaces in such as way as to break up large contiguously paved areas and thus provide shade and interest for pedestrians.

Comment [UFS6]: Include a ratio here? Such as 1 planting island per 20 parking spaces.

5.6.3 Landscaped areas shall be a minimum of 6 feet wide or as determined appropriate by the Planning Board in order to provide adequate room for vegetative root growth and to not interfere with access to vehicles, lines of sight, and pedestrian

travel. For trees with a mature height of under 30 feet, a minimum width of 4 feet is adequate.

Comment [UFS7]:

- 5.6.4 Landscaped areas shall consist of a combination of large and small trees, shrubs, perennial and/or annual flowers, and/or groundcover, as appropriate.
- 5.6.5 Landscaped areas shall be designed with a variety of plant species that provide seasonal variety and biodiversity.
- 5.6.6 Landscaping along roads, around building entrances, near parking spaces, and along pedestrian and bicycle ways shall not interfere or block lines of sight, restrict travel, or present a hazard to personal property.
- 5.6.7 Any landscaping located within the safe site distance of a driveway entryway, as defined by AASHTO standards, shall be no more than 3 feet at mature height.
- 5.6.8 Low Impact Development (LID) techniques such as raingardens, bioretention systems, tree box filters, and similar stormwater management landscaping techniques shall be incorporated into landscaped areas and may replace required landscaping components as approved by the Planning Board.

Section 5.7 Landscaping Along Public Rights of Way

- 5.7.1. Where feasible or as required by the Planning Board, street trees may be planted along public rights-of-way with the goal of providing a tree-lined street.
- 5.7.2. Trees shall be spaced at a minimum of 1 tree per 30 lineal feet (50 feet for trees with a large mature height) or as specified by the Planning Board to accommodate the mature crown spread of the tree. In most cases, deciduous trees – larger shade trees where space permits or smaller ornamental/fruit trees where space does not permit – should be used. Trees shall not interfere with buildings, overhead utilities, pedestrian travel, signs, lights, or access to on-street parking spaces.
- 5.7.3. Landscaping strip. Along Route 4, Route 108, Route 155A/Mast Road, and the Old Concord Turnpike, but not including any property located in the five core commercial zoning districts (C, CB, CC, CH, and PO), there shall be established a front landscaping strip 25 feet wide, extending onto the property from the front right of way/property line. In addition to the trees specified immediately above, the landscaping strip shall be laid out with an appropriate combination of those trees, shrubs, hedges, planted berms, fences, brick or stone walls, and other landscaping elements, as determined by the Planning Board.

Section 5.8 Parking Lots

- 5.8.1 The requirements of this subsection, do not apply to parking areas situated to the rear of the main building, or beyond the line running even with the rear wall of

the building. For smaller parking lots/areas, such as those with fewer than 6 vehicle spaces, the Planning Board may adjust these requirements as appropriate.

- 5.8.2 All off-street parking areas shall be screened from the public right-of-way to provide substantial visual screening up to a height of 3-1/2 feet above grade, excluding sight triangles at vehicular entrances and exits. A moderately dense hedge composed predominantly of evergreen shrubs shall be planted which is reasonably expected to provide this screening within one year. Alternatively, a combination of plantings, mounds, berms, walls, and fences may be used to provide this screening. This screening will often in conjunction with the front landscaping strip.
- 5.8.3 Landscaping should be used to delineate vehicular and pedestrian circulation patterns within parking lots and throughout the site.
- 5.8.4 Trees should be distributed throughout the parking lot as evenly as practical, in order to provide optimal canopy coverage and shading.
- 5.8.5 A landscaping peninsula shall be placed at the end of each parking row (such a peninsula is also referred to as an “end cap”), in line with the adjoining parking spaces, measuring at least the same dimensions as the adjoining parking spaces, wherever the row of parking spaces is adjacent to a perpendicular travel way. Each peninsula shall be planted with one shade tree, or one ornamental tree if use of a shade tree is not practical, for lack of space for roots. Where two peninsulas back up to one another, there may be space for only one ornamental tree (rather than a shade tree) near the tip of each peninsula.
- 5.8.6 There shall be no more than four continuous parallel parking rows on the interior of the parking lot (i.e. parking rows along the perimeter of the parking lot are not situated on the interior) without installation of a landscaped median separating those parking rows from any additional parking rows. The landscaped median shall be at least 6 feet wide and shall be parallel to and run the same length as the adjacent parking rows. See the diagram.
- 5.8.7 The landscaped median, referred to in 7), above, when included, shall be planted with evergreen shrubbery and at least one ornamental or shade tree for every 30 linear feet of the median. The landscape median shall be planted with sufficient trees and shrubs in order that, at maturity (defined herein to be 5 years from installation), at least 25% of the area of the median, as looked down upon from above, would be covered by the canopies/crowns of the trees and shrubs.
- 5.8.8 Trees and shrubs used in parking lots should be selected to avoid “messy” species which may drop significant fruit, flowers, sap, and other materials on vehicles. Species selected may need to tolerate hotter drier conditions in expansive pavement areas and tolerate salt spray and drainage.

Comment [UFS8]: I would not limit species to ever green shrubbery. Maybe say and appropriate mix of species as determined by the PB?

- 5.8.9 Foundation Planting Strip. There shall be a minimum 4 foot wide foundation planting strip between the building and any parking lot or driveway situated on the front or side of the building. The foundation bed shall be planted with appropriate landscaping materials, including grass, shrubbery, flowers, and mulch, as determined by the applicant. Use of ornamental trees is encouraged where practical. Where there is a sidewalk alongside the building, the foundation planting strip may be situated on either side of the sidewalk. A continuous foundation planting strip is preferred but it need not be continuous where there are projecting building elements, such as entrances, bays, and utilities.
- 5.8.10 A minimum of five percent (5%) of the total parking and driveway area, in addition to a buffer strip of at least ten-feet in width abutting a public right-of-way, shall be landscaped.
- 5.8.11 Parking lots shall be broken up into smaller parking areas with landscaping features and bioretention systems. The total parking area required shall be broken into sections not to exceed forty (40) spaces unless otherwise approved by the Planning Board.
- 5.8.12 All islands, peninsulas, and medians required in the parking areas shall be more or less evenly distributed throughout such parking areas. The distribution and location of landscaped areas may be adjusted to accommodate existing trees or other natural features so long as the total area requirement for landscaped islands, peninsulas, and medians for the respective parking area is satisfied. All landscaped islands, peninsulas, and medians shall be a minimum of six feet in width and shall be separated from the parking area by adequate curbing or tire stops. The design and use of islands for bioretention systems shall meet Low Impact Development (LID) best management practices. Some islands shall be used to provide pedestrian walkways.
- 5.8.13 There shall be a six-foot-high solid **screen** composed of evergreens or fencing when bordering or adjacent to a residential zone.
- 5.8.14 Corner clearance, as defined in Section 175-7 of the Durham zoning ordinance, shall be observed regarding all landscaping or screens.

Comment [UFS9]: I would be a little more flexible on this to allow for species diversity and aesthetic, such as "a screen of appropriate height, density and species composition approved by the PB. 5.9.3 below sounds good.

Section 5.9 Screening

- 5.9.1 Where nonresidential uses and/or off-street parking facilities abut a vacant lot in a residential zone or an existing residential use, the perimeter shall be screened to provide physical and visual separation from the residential zone or use.
- 5.9.2 Screening devices consisting of trees, shrubs, berms, walls, and/or fences shall be installed to a height of 6 feet, or as specified by the Planning Board. A wall or fence shall be placed on the exterior side of any landscaping unless otherwise approved by the Planning Board.

- 5.9.3 Natural screening shall consist of evergreen shrubs and/or trees planted in a line to form a continuous screen and growing to a height of at least 6 feet within 3 years. Additional evergreen shrubs/trees may be planted in a second, staggered line to form a screen together with the first line.
- 5.9.4 All sites shall incorporate screening measures to prevent the headlights of vehicles from shining on adjoining residential areas.
- 5.9.5 All mechanical installations and equipment, solid waste collection equipment, pump stations, outdoor storage, and similar items shall be screened or softened with landscaping that is appropriate for the location.
- 5.9.6 The Planning Board may stipulate additional buffers due to unusual impacts generated, including odor, noise, glare, dirt, dust, vibration, etc.

5.9.6 Where appropriate, natural wooded or vegetated areas existing on property boundaries should be preserved as a visual buffer to adjacent areas. To be an adequate buffer and maintain the area as a viable natural ecosystem, the buffer should be at least 50 feet wide, preferably wider. Larger trees on the edge of this buffer, should have root systems protected from damage.

Comment [UFS10]: Too narrow and a wooded strip is more exposed to sun, wind, invasive invade, etc.

Section 5.10 Protection of Trees and Other Vegetation During Construction

5.10.1. Assess and Map Existing Forested Areas*

Identify general areas on the ground where proposed construction will occur. Make sure that the developer also identifies areas where disturbance will occur, such as travel lanes, storage areas, etc. In those proposed construction and disturbance areas, do a general assessment to identify tree and vegetation types, size, age, and general condition. Note sensitive areas, scenic vistas, wildlife habitat, natural or cultural features, topography, water features, etc. This information should be used in developing a conceptual plan for development, so that important features can be avoided and innovative techniques can be incorporated to avoid damage.

2. Tree Inventory *

Inventory and assess significant trees or stands of trees, such as trees with larger diameter (over 16 “ DBH), desirable species, good aesthetics, good condition, wildlife value, etc. Saving trees in groups is more effective than saving individual trees scattered over a construction site.

a. Flag trees or groups of trees which will be kept and need protection during construction. Identify those trees, and the critical rooting area needed on construction documents.

b. Alternatively, undesirable trees should also be identified, such as declining high risk trees (as identified by a certified arborist), poor species, species intolerant of disturbance, invasives, etc. With PB approval these could be removed prior to construction to avoid conflicts.

c. Make adjustment in the site plan to leave adequate room around the desirable trees. Plan construction of footings, pavement, underground utilities, etc. to avoid critical root areas.

Comment [UFS11]: Could refer to reference “Best Management Practices for Protecting Trees During Construction – International Society of Arboriculture.

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3. Protection Techniques for Trees*

Most of the tree root system is in the top 20 inches of the soil, and can extend out well past the branches of the tree. Construction can damage the root system by severing roots. If too much of the tree root system is removed or damaged by construction, the tree may decline or die, resulting in the loss of benefits, and possibly creating a public hazard with larger trees that could later fail.

Soil compaction caused by equipment can also be a serious problem. This is especially true on wet soils. Compacted soils have less open pore space, and hence less space for moisture and oxygen needed to sustain tree health. Even one pass with heavy equipment can cause soil compaction. A general rule of thumb in the protection of open grown trees is to protect a circle called the critical root zone (CRZ) around the tree. The circle radius is equal to 1 foot per 1 inch of trunk diameter for tree species that are tolerant of construction impacts and 1.5 feet per 1 inch of trunk diameter for tree species that are in-tolerant. This is more critical with older trees, than young trees that recover more easily.

Create a tree protection plan to specify how trees will be protected during construction. Techniques should include; refer to “Best Management Practices for Protecting Trees During Construction – International Society of Arboriculture. Some techniques to consider include:

- a. Install highly visible and sturdy fencing to keep equipment off of the critical rooting zone of trees identified to protect. Fencing should be installed around all wooded areas and individual trees where equipment may be present.
- b. Where development must come close to large trees, use other techniques to protect the roots, trunk and branches such as:
 - i. Wrap the trunk in wooden snow fencing or other similar material to protect it from wounding from equipment.
 - ii. Place a heavy layer of wood chips (6”) over the root zone where equipment will pass.
 - Iii Use heavy timbers, vehicle mats, or steel plates over the root zone where equipment will pass.
- c. Establish and identify travel lanes, parking areas, unloading, washout and storage areas to keep vehicles, equipment and chemicals away from tree root zones.
- d. Where grading or excavation will damage roots, severing roots cleanly by hand or with power equipment (concrete saw) causes less tree damage then tearing through the root system with heavy equipment.
- e. Filling and grading should be planned so as not to change the drainage or soil moisture level in the root zone area. In changing grade, do not add more than 4 – 6 inches of fill soil over the critical root zone. This fill will affect the amount of moisture and oxygen reaching the root system.
- f. Prune any low hanging branches that are likely to be broken off by equipment.

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g. Conduct construction during the winter or dormant season, when stress to trees will be less, and there is less soil compaction and disturbance on frozen ground.

h. Mulch and irrigate impacted trees as needed if construction occurs during the growing season.

4) Transplanting and Reforestation*

Where appropriate, the developer should provide an appropriate level of reforestation to replace desirable trees that are damaged or removed. The Town should develop a list of recommended trees for planting in urban/suburban areas. Consider transplanting smaller specimen trees on the site, that may be severely damaged by construction - it may be reasonable to move trees up to 8 inches in diameter with the right methods.

5) Communication

Communicate with all staff, sub-contractors and Town staff about the details of the tree protection plan. Erect signage at key sites and trees protection areas to raise awareness of sub-contractors.

6) Mitigation and Maintenance after Construction*

Where damage has occurred, a qualified professional (Certified Arborist) should be brought in to assess and mitigate the damage. This may include, pruning, watering, mulching, aerating or amending the soil, wound repair, etc.

7) Monitor and Evaluate*

Town staff should monitor tree protection during construction and evaluate tree health after construction. Mitigation, tree care and replacement should be required as needed.

*Note – Steps above should be done by a qualified professional such as a Landscape Architect, Urban Forester, Forester or Certified Arborist

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~~5.10.1 Existing landscaping, trees, and planting materials to be retained shall be protected with a snow fence or other durable method as necessary during construction to avoid damage to root zones as well as above ground vegetation. The fencing shall remain in place until the construction activity in the vicinity of the plant materials is completed.~~

~~5.10.2 Pedestrian, vehicular, and other traffic shall be kept away from trees to avoid soil compaction. Vehicles and equipment may not be parked, and materials may not be stockpiled under the canopy nor in close proximity to trees during construction.~~

Section 5.11 Maintenance and Replacement of Landscaping and Screening

5.11.2 The developer or property owner shall be responsible for the maintenance, repair, and replacement of all required landscaping and screening materials for two years from the date of planting. A written, 2-year tree maintenance plan shall be submitted that includes specifications for watering, mulching, removal of guy wires/stakes (if used), pruning, and tree protection.

- 5.11.2 All required plant materials (including mulched beds) shall be tended and maintained in a healthy growing condition reasonably free of weeds, replaced when necessary, and kept free of refuse and debris. All required fences and walls shall be maintained in good repair.
- 5.11.3 The property owner shall remove dead or diseased plant materials immediately once their condition is recognized and replace them with the same type, size, and quantity of plant materials as originally installed, unless alternative plantings are approved by the Durham Tree Warden or Planning Board.
- 10.1.9 A performance bond or letter or credit is required to insure compliance with this section and to cover maintenance for a period of 2 years after the time of planting.

Section 5.12 Irrigation

- 5.12.1 The need for irrigation shall be minimized to the extent possible through use of native drought-tolerant species and the use of landscaping that does not require permanent irrigation systems, such as xeriscaping.
- 5.12.2 When irrigation is necessary to support the establishment and/or maintenance of landscaped areas, smart controllers shall be used to limit irrigation during the day and during rain events.
- 5.12.3 Where appropriate, additional water conservation features including trickle and drip lines, rain barrels, cisterns, or other water harvesting elements shall be used.
- 5.12.4 Applicants are encouraged to use recycled water for irrigation provided the harvesting and circulation systems and water quality meet any applicable Town and State requirements.
- 5.12.5 Irrigation systems shall be installed and operated in accordance with any applicable Town standards.

Section 5.13 Innovative Landscaping Practices

- 5.13.1 Green Roofs. Applicants are encouraged to use roofing materials that have a Solar Reflective Index (SRI) of at least 29 (greater for roofs with a slope of 2:12 or more) or to install vegetated roofs.
- 5.13.2 Solar Orientation. Applicants are encouraged to incorporate landscaping techniques that help reduce energy consumption for heating and cooling of buildings on the site. Trees should be planted to provide shade on buildings and parking lots in the warm seasons and to allow solar heat during the cool seasons.

- 5.13.2 **Stormwater Management.** When planting in urban street or sidewalk areas, incorporate techniques to use landscaping to reduce stormwater, such as stormwater tree boxes, and rain gardens.

Section 5.14 Definitions

Note that there are special definitions sections in several sections in the Site Plan Regulations, specifically: Part I, Article 10 - **Definitions** and Part III, Article 2 – **Architectural Design Standards**, Article 5 – **Landscaping and Screening Standards**, Article 6 – **Lighting Standards**, and Article 16 – **Stormwater Management Standards**.

The following words and terms are oriented specifically toward landscaping. However, these words and terms may be found elsewhere in the Site Plan Regulations, and may appear in more than one place (in which case, the same definition is given in both places). Wherever these words and terms are found, they shall have the meanings given below.

Biodiversity. Contraction of the term “biological diversity,” as defined by the Convention on Biological Diversity, meaning the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Caliper. A measurement of the tree stem diameter used for nursery stock, measured at a point 6 inches above the ground, if the resulting measurement is no more than 4 inches. If that measurement is larger than 4 inches, the desired measurement is made 12 inches above the ground.

Diameter at Breast Height (DBH). A measurement of the tree stem diameter measured at a point 4 ½ feet above ground, generally used for existing trees.

Green roof. Also known as rooftop gardens, green roofs are planted over existing roof structures, and consist of a waterproof, root-safe membrane that is covered by a drainage system, lightweight growing medium, and plants. Green roofs reduce rooftop and building temperatures, filter pollution, lessen pressure on sewer systems, and reduce the heat island effect.

Growing season. The period of time from the last frost date in spring to the first frost date in the fall.

Solar orientation. 1. Orientation of a structure in a way that encourages energy efficiency by creating optimum conditions for the use of passive and active solar strategies. 2. Orientation of a structure for controlled solar gain. 3. The relation of a building and its associated fenestration and interior surfaces to compass direction and, therefore, to the location of the sun. It is usually given in terms of angular degrees away from south, i.e. a wall facing due southeast has an orientation of 45 degrees east of south.

Tree Size. Small: mature height under 30 feet, Medium: mature height 31 – 45 feet, Large: mature height over 45 feet.

Tree, ornamental. Broadleaved deciduous tree, often bearing recognizable fruit, which generally reaches a height of 15 to 30 feet at maturity.

Tree, shade. Broad-leaved deciduous tree which generally reaches a height of at least 30 feet at maturity.

Xeriscaping. The practice of designing landscapes to reduce or eliminate the need for irrigation. Xeriscaped landscapes need little or no water beyond what the natural climate provides.