Landscape Manual

Howard County
Department of Planning & Zoning

January, 2026

HOWARD COUNTY
LANDSCAPE MANUAL

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Chapter 1 Introduction and General Information

1.1 Introduction

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Introduction

I am pleased to present the updated Howard County Landscape Manual, the first comprehensive revision since 2010. Over the past decade, our community has grown and changed, and so have our needs for sustainable, attractive, and resilient landscapes. This updated manual reflects the latest best practices in urban design, environmental stewardship, and community well-being, while remaining clear and usable for residents, developers, and design professionals alike.

The Howard County Landscape Manual is the County's technical manual for preparing development landscape plans. It sets the minimum standards for the amount and type of planting required, identifies suitable landscape materials, and outlines alternative methods to meet these requirements. Prepared by the Department of Planning and Zoning and adopted by the County Council, the manual works hand-in-hand with the Howard County Zoning and Subdivision and Land Development Regulations. Together, these tools help ensure that landscaping on all new developments meets the County's goals for beauty, safety, and environmental performance.

Landscaping now carries even greater significance as we plan for a changing climate. This update aligns with County initiatives—including the Climate Action Policy, the Green Infrastructure Network, and our pollinator program—by recognizing the environmental services that healthy landscapes provide. By integrating these strategies into development, we are building resilience while enhancing the daily experience of residents, visitors, and businesses alike.

I would like to extend my sincere appreciation to all who contributed to this update of the Howard County Landscape Manual. This effort was made possible through the collaboration of multiple County departments, dedicated focus groups, and engaged community members who shared their insights, experiences, and expertise. Their commitment to improving our built environment and shaping a healthier, more vibrant County is reflected throughout this manual. DPZ would also like to recognize and thank our consultant, Site Resources, Inc. for their collaboration and contributions throughout the three phase process from focus groups to research and to drafting the updated manual.

Special thanks to:

- *Howard County Department of Public Works*
- *Howard County Department of Recreation and Parks*
- *Howard County Office of Transportation*
- *Howard County Office of Community Sustainability*
- *Benchmark Engineering, Inc.*
- *Bohler Engineering*
- *Daft McCune Walker, Inc.*
- *Fisher, Collins & Carter, Inc.*
- *Gutschick, Little & Weber, P.A.*
- *Mildenberg Boender & Associations, Inc.*
- *Hord Coplan Macht*
- *KCI Technologies, Inc..*
- *Morris & Ritchie Associates, Inc.*
- *Sill Engineering Group, LLC*
- *St. John Properties, Inc.*
- *CARES Members from (Columbia Village, Harper's Choice*
- *Columbia Association*
- *Columbia Association Weed Warriors*
- *Howard County Bee City*
- *Howard County Master Gardeners*
- *Master Watershed Steward*
- *OMI Green Team*
- *Yards Alive*

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1.2 Version History

First Edition – March 12, 1993

Amendment to First Edition – March 2, 1998

Updates – July 1, 2010

Updated – 2025

Enactment Date & Bill Number

1.3 Applicability

Landscaping requirements are established in the Howard County Subdivision and Land Development Regulations, Zoning Regulations, the Howard County Forest Conservation Manual, and the Howard County Landscape Manual. The basic landscaping requirements are established in Section 16.124 of the Howard County Subdivision and Land Development Regulations.

A landscape plan must accompany all Final Plans or Site Development Plans. Landscape requirements must also be identified schematically in preliminary plan and preliminary equivalent sketch plan submissions.

Refer to **Section 2.5** for exemptions.

1.4 Purpose & Intent

1.4.1 Purpose Statement

The Howard County Landscape Manual is the technical manual used to establish minimum standards of performance for preparing landscape plans, including the amount of landscape plantings required, suitable landscape materials, and alternative means of meeting the regulations. The Landscape Manual and amendments to it are prepared by the Department of Planning and Zoning and adopted by resolution of the County Council.

The Howard County Zoning and Subdivision and Land Development Regulations and the Landscape Manual establish the requirements for landscaping of all new ***developments*** within the County. The purposes of these requirements are to:Protect, preserve and enhance the appearance and value of neighborhoods, and provide a safe environment.

- Protect, preserve and enhance the appearance and value of neighborhoods, and provide a safe environment.
- Buffer potentially incompatible land uses from one another and to screen undesirable views.
- Prevent the unnecessary removal of vegetation during the land ***development*** process.

- Provide ***parking lots*** with landscaped areas that facilitate movement of traffic, break up large areas of impervious surfaces, provide shade, and ***buffer*** or ***screen parking lots*** from adjacent properties and roadways.
- Promote energy conservation through the cooling and wind buffering effects of trees.
- Contribute to the processes of air purification, oxygen regeneration, water absorption, and the reduction of glare and heat.
- Protect the health, safety and welfare of the general public.

Additionally, the Landscape Manual furthers Howard County policies and goals, including those set forth in the Climate Action Plan, the Green Infrastructure Network, and the County's pollinator initiative Howard County Bee City. In addition to aesthetic and functional objectives, landscaping in the built environment serves as a climate adaptation and mitigation strategy by:providing shade

- providing shade
- reducing urban heat island effects
- sequestering carbon
- supporting ***biodiversity***
- improving stormwater management

1.4.2 Using the Landscape Manual

Chapters 2 and 3 of this manual describe the requirements for preparation of landscape plans, the submission of landscape plans as part of the ***development*** process, and the general and specific standards for landscape requirements in Howard County.
Chapter 3 – Landscape Requirements is divided into two sections.

- **Section 3.1** – Intent by Land Use / Development Type describes the intent and guidelines, as related to landscape character and the requirements of this manual, for various land use types. This section should serve as a guide during application of the landscape requirements and may be consulted when proposing alternative methods to meet the landscape requirements.
- **Section 3.2** – Landscape Edges & Site Conditions outlines the standard landscape requirements applicable to various site conditions.

a. Terminology
Throughout the manual, terms that are defined in the landscape manual's glossary and those that can be found in the Zoning and Subdivision and Land Development Regulations are noted by ***bold & italicized text.***

b. General Calculation Standards

Plant material requirements are based on linear feet of property line or other applicable boundary as described for each site condition in **Section 3.2**.

Calculations of required plant quantities shall be rounded up to the next whole number.

c. Elective Landscaping

Proposed landscaping beyond what is required by this manual is encouraged, however it is considered elective or amenity landscaping and should not be part of the approved landscape plan sheets.

Landscape plans shall include the requirements in this manual and landscaping required by other County approval processes including but not limited to conditional use approvals, DAP endorsements, Planning Board approvals. Landscaping beyond what is required by this manual and by other County requirements should not be included in the plans submitted for review and approval.

Additional amenity landscaping proposed may be shown on a separate exhibit that is not part of the approved set. Submitted amenity landscape exhibits are informational only and are not reviewed or approved by the County.

d. References, Links and Resources

Within the manual, hyperlinks (shown as **Section 2.1.2**, for example) are provided to connect directly to referenced sections.

External resources mentioned in the manual will be provided as companion documents on DPZ's Landscape Manual webpage. Keeping links to external resources outside the adopted manual is intended to facilitate updates as websites change, move or dissolve.

Plant Lists are provided as companion documents on DPZ's Landscape Manual webpage.

Citations of code refer to the Howard County Maryland Code of Ordinances Title 16 – Planning, Zoning and Subdivision and Land Development Regulations, Subtitle 1 – Subdivision and Land Development Regulations.

Chapter Two Landscape Plans & Development Process

Chapter 2 Landscape Plans & Development Process

2.1 Qualifications to Prepare Plans

2.1.1 Licensed Landscape Architect

With the exceptions noted in **Section 2.1.2** below, all landscape plans shall be prepared and sealed by a licensed Landscape Architect registered in the State of Maryland. The Landscape Architect shall provide a signed and sealed Professional Statement with the initial submission certifying which sheets they have prepared.

2.1.2 Certified Professional Horticulturist OR Chesapeake Bay Landscape Professional

Landscape plans accompanying the following plan types may be prepared by a Certified Professional Horticulturist or a Chesapeake Bay Landscape Professional (Level 1):

- Minor subdivision
- A resubdivision of a previously approved subdivision that results in four or fewer buildable lots
- Site Development Plan for a single existing residential lot

A Certified Professional Horticulturalist (CPH) must be certified by the Maryland Nursery, Landscape and Greenhouse Association, Inc. and hold a valid certification at the time of each landscape plan submission.

A Chesapeake Bay Landscape Professional (CBLP) must be certified by the Chesapeake Bay Landscape Professional Program and hold a valid Level 1 certification at the time of each landscape plan submission.

2.2 Development Process Overview

As administrator of the subdivision and Site Development Plan review process, the Department of Planning and Zoning is responsible for the review and approval of landscape plans.

The type of plan submission required depends on the zoning, type of development proposed, and number of units created. Subdivision is required for the creation of any new lots. Landscape plans are required as part of the Subdivision and Site Development Plans. A typical standard plan submission may progress through these submission steps:

Environmental Concept Plan → Sketch Plan* → Preliminary Plans → Final Plans → Site Development Plan

Refer to the Department of Planning and Zoning website for current and more detailed ***development*** process information.

2.3 Types of Landscape Plans Required by Plan Submission

2.3.1 Schematic Landscape Plans

Landscape requirements shall be considered in the earliest stages of plan preparation. Landscape requirements must be identified schematically on the preliminary plan or preliminary equivalent sketch plan. The intent of the schematic landscape plan is to ensure landscape requirements are considered early in the design process and are an integral part of the development.

The following must be included on Preliminary Plans or Preliminary Equivalent Sketch Plans:

- Required landscape edges and the type of plantings for each edge should be identified.
- Identify preservation of existing vegetation, proposed plantings, or other alternative solutions. Tabulate in a series of landscape notes and tables. Use appropriate schedules for each site condition proposed on the project and include all applicable schedules on the Landscape Plan.
- Identify whether the developer or builder will be responsible for installation of specific elements of the overall landscape plan.

The landscape information provided on a Preliminary Plan or Preliminary Equivalent Sketch Plan is not unconditionally binding and may be revised during later stages in the planning process to respond to ***development*** plan revisions or to unique site or program elements.
Refer to the Department of Planning and Zoning checklists for each plan type submittal.

2.3.2 Complete Landscape Plan

The Landscape Plan shall be part of a Final Plan or Site Development Plan submission. In general, landscaping requirements that shall be part of each type of plan are as follows:

Final Plan

- Street trees
- Perimeter landscaped edges, if the responsibility of the developer
- Stormwater management areas
- ***Parking lot*** landscaping for single family attached projects
- Soil preparation and maintenance specifications

Site Development Plans

- Perimeter landscaped edges, if the responsibility of the builder
- Parking and loading area perimeter edges

- Parking lot internal planting
- Stormwater management areas
- Internal planting for mobile homes, single family attached units and apartments
- Soil preparation and maintenance specifications

Original Final Plans and original Site Development Plans shall include original Landscape Plans as part of the original plan submissions and shall include required signature blocks.

Use appropriate schedules for each site condition proposed on the project and include all applicable schedules on the Landscape Plan.

The Landscape Plan may be shown on a separate sheet or superimposed on another sheet within the set of original plans. When combined with other sheets, notes should be clear regarding which elements of the sheet are prepared and sealed by the Landscape Architect.

Separate planting plan sheets that include street trees and on-site landscaping must include Department of Public Works and Department of Planning and Zoning signature blocks.

Landscaping that is required for a Final Plan shall be shown on the Road and Storm Drain construction drawings. Planting required for minor subdivisions shall be shown on a supplemental sheet that shall be submitted with the Final Plat.

Refer to the Department of Planning and Zoning checklists for each plan type submittal.

Refer to ***Appendix D*** and ***Appendix E*** for landscape installation and maintenance guidelines.

2.4 Other Design Manuals & New Town Zoning District

2.4.1 Other Design Manuals

Where discrepancies occur between requirements outlined in the Howard County Design Manuals and Guidelines and requirements described in the Landscape Manual, requirements of the Design Manuals and Guidelines prevail. Refer to the Department of Planning and Zoning website for current Manuals and Guidelines.

2.4.2 New Town Guidelines and Additional Review

Property in the New Town Zoning District may be subject to review rights beyond that of Howard County Department of Planning and Zoning. Please refer to the Architectural Review Committee (ARC) Review Map maintained on the ProjectDox Plan Submittal Portal. As part of the plan submittal, projects subject to ARC Review require a letter from Howard Research and Development (HRD), the Village Board Architectural Review Committee (ARC), or other association(s) identified on the Howard Research and Development ARC Review Rights Map stating that the plan has been prepared in accordance with their guidelines.

There are also areas of New Town focused for redevelopment that are subject to additional landscape requirement. The Downtown Columbia Plan identifies a boundary for downtown revitalization redevelopment and increase density. There is the Downtown-wide Design Guidelines that include general landscaping design standards that should be considered throughout the Downtown Columbia area. Six neighborhoods are identified in the Downtown Columbia Plan. As Final Development Plans (FDPs) are approved for the neighborhoods (neighborhoods may fall under multiple FDPs), they are included with additional planning documents including Neighborhood Specific Design Guidelines to complement the conceptual vision for individual areas for redevelopment. The Downtown-wide Design Guidelines and the Neighborhood Design Guidelines can be found in the Community Planning - Community and Master Plans webpage.

New Town Village Centers that are submitted for redevelopment are subject to additional zoning criteria. For Major Village Center Redevelopment as defined in the Zoning Code, approval by the Zoning Board is required. Landscape concepts and design guidelines are included in the Zoning Board case files. Please see Section 125.0 of the Howard County Zoning Regulations for additional information.

Properties not subject to ARC review, Downtown design guidelines, or Major Village Center Redevelopment should meet the requirements outlined in the Landscape Manual.

Surety for New Town planting shall be based on the approved landscape plan.

2.5 Exemptions

A landscape plan must accompany all preliminary, preliminary equivalent sketch, final or Site Development Plans, with the following exemption:

- Resubdivisions and/or ***revision plats*** that create no new lots or parcel divisions

Partial exemptions to the landscape requirements apply to the expansion of existing uses under certain criteria:

- Resubdivisions involving an existing dwelling(s) are required to provide landscaping for only the new buildable lots.

- Expansion of an existing ***parking lot*** or loading area that increases the area or number of spaces by 50% or more shall be required to provide landscaping for the entire ***parking lot*** or loading area in accordance with these regulations. Expansions of less than 50% shall be required to provide landscaping for the additional ***development*** only.
- Expansion to existing ***development*** shall be required to provide landscaping in accordance with this manual as follows:
  - Residential ***development*** that increases the number of built dwelling units shall be required to provide perimeter landscaping for the project area. This requirement shall also apply to redevelopment of existing lots meeting the definition of a recorded subdivision as defined in the Subdivision and Land Development Regulations.
  - A non-residential building that increases the existing floor area by 50% or more shall be required to provide landscaping for the entire site. Expansion of less than 50% shall be required to provide landscaping for the additional ***development*** only.
  - A mixed-use ***development*** that increases the existing building footprint by 50% or more shall be required to provide landscaping for the entire site. Expansion of less than 50% shall be required to provide landscaping for the additional ***development*** only.

2.6 Installation, Surety & Inspections

Plant installation must conform to the current industry standards. Landscape Architects should be familiar with current best practices cited in reputable trade publications such as the "Landscape Specification Guidelines" published by the Landscape Contractors Association MD DC VA, and the American Standard for Nursery Stock published by AmericanHort.

Sample plant installation guidelines and details can also be found in ***Appendix D***. To ensure a thriving landscape, Landscape Architects should provide customized details and specifications based on the unique conditions of each site and proposed plantings.

2.6.1 Posting of Surety & Inspection

Bonding or posting of other surety for required landscaping is mandatory. Surety is placed for total required plantings, not the plantings provided after credit taken for existing individual trees. Existing Forest Conservation easements are credited as a reduction in the linear feet of a perimeter and do not result in added surety.

Surety may be posted as follows:

- Developer's Agreement for road and storm drain improvements (Final Supplemental and Road Drawings) or for the Site Development Plan (SDP).
- When there is no Developers Agreement, landscape surety may be posted with the grading permit agreement.
- In some instances, such as redline revision, when there is no Developers Agreement or Grading Permit, a surety may be required through another process.

If the responsibility for landscape installation is transferred from the developer to another party, the surety information attached to the Developer's Agreement or Grading Permit shall be amended to reflect this change. It is the responsibility of the Developer or applicant that entered the agreement and posted the surety to transfer the responsibility with the appropriate County agency.

Surety for landscaping shall be based on the total number of required plantings (shade trees, small deciduous trees, evergreen trees, and shrubs) or comparable elements shown on the landscape plan. Unit prices to be used for establishing surety requirements are approved by the County Council and are subject to change each year. Refer to the Department of Planning and Zoning website for current Landscape Inspection Fees and Surety amounts.

The Department of Planning and Zoning (DPZ) shall coordinate inspections with the authorized County Landscape Inspector. Upon inspection, DPZ will notify the surety holder of the inspection results. Release of surety will not be granted until:

- All landscaping shown on the approved Final Plan or Site Development Plan has been completed in accordance with the approved landscape plan.
- A copy of the one-year warranty has been provided to DPZ
- The bond holder provides documentation on how the developer(s) has formally transferred longterm responsibility for the required landscaping to the owner, tenant, homeowners association, or other agent responsible for long-term maintenance of the ***development*** per **Section 2.6.2**.

2.6.2 Owners and tenant responsibility after release

The developer is responsible for maintenance of the landscaping during construction and is responsible for obtaining a 1-year warranty for the installed plant materials. The developer is responsible for transferring responsibility for the required landscaping to the owner, tenant, homeowner's association, or other agent responsible for maintenance.

Maintenance responsibilities include, but are not limited to, pruning, fertilizing, watering, mowing, mulching, weeding, and other such activities necessary for the planting to thrive.

Plantings, ***berms*** or other landforms, fences and walls installed as part of the landscape requirements shall be permanently maintained in good condition and, whenever necessary, replaced or repaired.

To ensure public safety, plant material should not be allowed to encroach on rights-of-way and easements and impede motorists' vision of vehicular traffic. See **Section 3.2.3.g** for guidance on planting in sight triangles and maintaining appropriate sight lines.

Review of redline revisions to Site Development Plans (SDP) or final plans (supplemental and/or road plans) will include verification that the site is in conformance with the approved SDP or Final Plan. Redlines will not be approved for modifications or changes in use until the site is brought into compliance with the approved SDP. DPZ may approve a redline revision when the landscaping is not in compliance if the revision clearly indicates the deficiencies and the owner signs a note on the plan certifying the landscaping will be brought into compliance within one year. Inspection fees shall be paid. Failure to restore missing plantings may delay processing by DPZ of building or grading permit applications, or in a notice of violation.

2.7 Other Options to Meet the Regulations

Unique site conditions or a specific set of project design criteria may justify approval by the Department of Planning and Zoning of an alternative proposal that meets the intent of the landscape requirements.

Examples of conditions which justify alternatives include situations where:

- Topography, soil, vegetation or other site conditions that make full compliance impossible or impractical; or when improved environmental quality would result from the alternative.
- Space limitations, unusually shaped lots, and existing conditions on adjacent properties, or redevelopment of sites in older communities.
- Expansion or change of use on an existing site requires a larger buffer or screen than is feasible due to the lack of available space.
- Safety considerations.

The proposal must be equal to or better than standard compliance in terms of quantity, quality, effectiveness, durability, and ability to fulfill the intent of the regulations and the Manual.

2.7.1 Options within Manual

Acceptable alternative methods to meet standard landscape requirements are included in the applicable site condition sections.

Alternative methods proposed in lieu of standard requirements shall be noted on the landscape plan and included in applicable required Schedules (e.g. Schedule A for perimeter landscape edge requirements).

2.7.2 Landscape Architect Proposed Alternative Landscape Plan

Landscape Architects may propose alternative plans that meet the intent of the Subdivision and Land Development Regulations and Landscape Manual Intent as stated within. The landscape architect shall request consideration of an alternative proposal by including a request letter to the Department of Planning and Zoning (DPZ) with the plan submittal. The request must include written justification and plan exhibits illustrating how the alternative better meets the intent of the regulations. Include sufficient written and graphic explanation for evaluation by DPZ. Follow up meetings and discussions with DPZ may be appropriate as DPZ evaluates the request.

Approval of alternate proposals shall be limited to the specific project under consideration and shall not establish precedents for acceptance in other cases.

Alternatives proposed by professionals other than a Landscape Architect will not be considered or evaluated by DPZ.

If approved, include a narrative note on the landscape plans summarizing the request and final approval decision by DPZ.

2.8 Deferring

Projects requesting deferral of the landscape plan to a later plan submittal stage will still be required to meet the full on-site landscape requirements outlined in the Landscape Manual. The granting by the Department of Planning and Zoning of a deferral of landscape requirements to a future plan submittal shall not be construed as justification for altering or eliminating landscape requirements.

When deferring landscape requirements to a future plan stage, the ***development*** team shall consider that any design decisions that do not address the landscape requirements may risk future, additional design modifications to previously approved plans. Additional review cycles may be necessary for the project to meet the regulations and achieve approvable status.

Chapter Three Landscape Requirements

Chapter 3 Landscape Requirements

3.1 Intent by Land Use / Development Type

This section includes the intent and guidelines for each land use type as they relate to landscape character and requirements. These expectations should be referenced when proposing an alternative landscape plan as discussed in **Section 2.7.2** of this manual.

3.1.1 Residential

Residential land use spans a wide range of density levels and required landscaping should be for the specific project and scaled to the density and character of the residential zone and surrounding built and/or natural environment. For example, subdivisions with large lot sizes should establish a more open feel with views when compared to those with higher densities. Smaller lot subdivisions and many single family attached or apartment communities may warrant landscapes designed for a more urban context.

The following are objectives for all residential land uses:

- Preserve existing vegetation, particularly non-invasive healthy trees and shrubs
- Vary the location of trees as necessary to provide the best design for each lot, while meeting the intent of the landscape regulations
- Screen public view of private yard space and provide attractive views from the street, particularly on corner lots
- Shield side and rear yards from visual impacts from streets
- Design ***open space*** as amenity open space for use by neighborhoods and communities, rather than a fragmented mix of leftover green areas

For SFD and SFA developments, landscaping should be provided to help define public and private spaces as well as reduce the visual impact of the streets, sidewalk and driveway pavement. Street trees are an important feature of this intent and placement should be prioritized and coordinated with the individual driveways, utility meters, grinder pumps, and other utilitarian features. Eliminating street trees is discouraged.

In addition to these objectives, refer to the following sections for more guidance based on the project's type of residential land use.

a. Single Family Detached

Low-to-medium density residential areas should include naturalistic landscape edges to create a balance between residential communities and their natural surroundings, while also allowing the opportunity for lawns and gardens surrounding single family detached buildings. Residents may have the option to use trails or sidewalks to access their neighborhood's ***open space***.

b. Single Family Attached

Medium-to-high-density residential areas that may be within or adjacent to mixed-use zones should provide consistent tree plantings along sidewalks and streets to encourage livability among its single-family-attached residents. The narrow street network with wide sidewalks, shallow to medium building setbacks, and substantial tree coverage allows residents to experience a sense of place and safety.

In addition to the objectives listed above:

- Provide inviting landscaped common areas such as entrances to common buildings, walking paths, courtyards, playground and picnic areas

c. Apartments

High-density residential areas located in mixed-use zones should have street trees along sidewalks and plantings along apartment buildings to enhance the overall experience of pedestrians. Additionally, low-to-medium density residential areas may provide apartment buildings with walking paths leading to landscaped ***open space*** areas, such as in playgrounds and courtyards, that encourage residents to create a sense of community amongst neighbors.

In addition to the objectives listed above:

- Provide inviting landscaped common areas such as entrances to apartment buildings, walking paths, courtyards, playground and picnic areas

d. Mobile Homes

Low-density residential within or adjacent to rural areas should provide mobile home ***developments*** with landscape design that allows for both privacy and flexibility to promote a sense of place while allowing occasional removal and replacement of mobile homes.

3.1.2 Open Space & Recreation Open Space

Open space should be designed with intention to provide useable, landscaped, and attractive space that serves as an amenity for the community.

Landscaping of these areas can further this goal by:

- Clearly identifying these areas as common public spaces
- Separating the public space from private or utilitarian spaces such as private patios and refuse collection areas
- Enhancing the visual quality of the neighborhood or ***development***

- Providing a ***buffer*** from active recreation areas/facilities (such as play areas or tennis courts) to residential rear or side yards and adjacent properties
- Providing amenities for office and commercial employees, retail shoppers, residents of high-density, multifamily housing, and the public such as casual dining or eating areas
- Defining the entrances to and specific features of ***open space*** areas with plantings and other landscape elements to create a sense of place
- Providing comfortable areas for active recreation spectators and passive recreation users
- Providing visibility and pedestrian access into ***open space*** areas from streets and ***parking areas*** to encourage use and safety

Stormwater management (SWM) facilities, such as micro-bioretention, should be landscaped, located, and integrated into the site design in such a way as to positively impact the ***development*** beyond the required purpose of managing stormwater. When treated as an integral feature of the practical and aesthetic site design, SWM facilities can become community amenities by supporting passive recreation, bird watching, providing pollinator habitat, etc.

Additionally, landscape plans should encourage future residents to participate in other county initiatives by providing ***open space*** designated for a Homeowners Association (HOA) or similar community groups to use for future plantings. For example, the Bee City Program may provide grants and/or planning assistance to create pollinator gardens in the ***open space***. Notes should be included on the landscape plan encouraging future HOAs or community members to contact the Bee City Coordinator in the Office of Community Sustainability for more information and guidance on current programming. Refer to development plan checklists for required and suggested general notes.

3.1.3 Ground-mount Solar Collectors

The intent of landscape requirements for ground-mounted solar collectors at small and large scales is primarily focused on ***buffering*** views from adjacent roads and properties. Creating native pollinator habitat as a component of solar facilities is highly encouraged.

- Use landscape design in a coordinated manner to buffer/screen ground-mounted solar collectors and associated mechanical equipment from public view
- Locate and screen ground-mounted solar collectors in a manner that cannot be readily seen from the public right-of-way or adjacent properties in residential or office-residential districts
- Screen with a principal or accessory structure, fence, wall, landscape elements, or a combination thereof to enclose or block the view of ground-mounted solar collectors and associated mechanical equipment

- Support climate forward initiatives with the use of native pollinator-friendly plants and groundcovers in lieu of regularly mowed turf grass for the vegetative cover at solar facilities when possible

3.1.4 Commercial

Low-to-medium density commercial uses at the transition between urban and rural areas should use landscape edges to soften transitional uses between zones. Medium-to-high-density commercial ***development***, particularly in urban areas, should provide consistent tree plantings along sidewalks and streets with additional plantings alongside buildings. Landscape should consist of hardy plant species tolerant of soil compaction and minimal space.

Site and landscape design for commercial ***developments*** should address the following objectives:

- Provide landscape to enhance the economic vitality of commercial ***development*** along travel ways, by softening views rather than ***screening***
- Allow views into retail properties to assist wayfinding while softening ***parking lots*** from public space/sidewalks
- Provide tree lines along the main travel routes that connect people from work, school, and shopping to their homes
- Provide formal rows of trees along travel ways to define travel ways, create a green edge, and provide continuity and scale
- Provide landscape areas between commercial properties to allow coordinated planting schemes
- Design landscaping to emphasize shading/cooling for pedestrians and patrons
- Screening of undesirable views such as service, trash and loading areas

3.1.5 Industrial

The intent of landscape requirements for industrial ***developments*** is primarily focused on ***buffering*** incompatible adjacent land uses. Industrial land uses include heavy to light industrial, manufacturing, auto repair and similar, and of all the non-residential land use types, industrial uses are least compatible with residential uses, institutional uses, and public rights-of-way.

Site design shall use a coordinated combination of landscape elements to meet the following objectives:

- Provide a compatible transition or ***buffer*** between residential, commercial, or office uses and more intense industrial uses
- Mitigate the environmental impacts associated with incompatible land uses, for example, ***berms*** and sound walls are encouraged when sound is a concern or potential concern
- Shield residential uses, HOA ***open space*** and public ***open space*** from industrial uses and associated nuisances – both real and perceived – regarding views, light trespass, odors, and noise
- Screening of undesirable views such as service, trash and loading areas

3.1.6 Mixed Use, Institutional and Government Uses

Medium-to-high-density mixed-use, institutional, and government uses within urban areas should provide consistent tree plantings along sidewalks and streets with planting alongside buildings. Landscape should consist of hardy plant species tolerant of soil compaction and minimal space. Additionally, institutional and government uses in lower density areas should use landscaping to provide appropriate transitions between surrounding residential and/or commercial areas. The connections from mixed-use, institutional and government ***developments*** to public ***open space*** can be highlighted by required landscaping and encourage legitimate users.

Consider the following objectives during design:

- Ensure green areas, streets and drive aisles, and the spaces around and between buildings are attractively landscaped
- Promote green infrastructure, species diversity, and tree canopy in these areas
- Establish an enhanced visual relationship between civic, institutional, commercial, mixed-use, and industrial structures and their surrounding environments
- Landscape for passive energy conservation
- Reduce the negative effects of reflection and glare from paving, structures, or direct light from the sun, headlights, streetlights, etc.
- Enhance the aesthetic appearance of civic, institutional, and commercial areas and concentrations of industrial uses to increase economic viability for the surrounding neighborhoods
- Enhance the quality of public spaces and streets, especially in civic, institutional, mixed-use, and commercial ***development***, to be pedestrian-friendly and engaging to the public
- Use Crime Prevention Through Environmental Design (CPTED) principles to increase safety by designing spaces that are more clearly visible and inviting to a wide range of uses, activating spaces and encouraging legitimate uses.

3.1.7 Historic Structures & Areas

Howard County's Historic Preservation Commission has review authority over Historic Properties. When conflicts arise between Landscape Manual requirements and HPC Design Guidelines and/or requirements, those of HPC prevail. Refer to the Historic Preservation Commission resources page found on the DPZ webpage for more information.

For properties of all land use types that are adjacent to historic properties, the historic character of adjacent historic properties should be respected when applying the landscape requirements in this manual. The following objectives should be considered during site and landscape design:

- Preserve the setting and frame significant views of historic properties and unique scenery from the road

- ***Buffer*** and ***screen*** historic structures from new ***development*** to separate incompatible uses visually and physically
- Retain significant landscapes and vegetation associated with historic properties

3.1.8 Scenic Roads

The Howard County Scenic Road regulation intent is to preserve the scenic character of the landscape and the features of the road right-of-way that contribute to the road's character. Because scenic landscapes vary greatly, design solutions for ***development*** will vary and should:

- Minimize tree and vegetation removal, emphasize the protection of healthy and contributing vegetation adjacent to the ***scenic road***, as well as mature trees and hedgerows visible from the road
- Replace invasive and low value shrub and hedgerows with appropriate planting to enhance and improve the scenic quality
- Use vegetation commonly found on the site or in the area for landscaping
- Minimize grading; retain existing slopes along the scenic road frontage
- Maintain visual character and minimize impacts to scenic views. For areas with open views, preserve the foreground meadow, pasture or cropland and place ***development*** in the background as viewed from the road. For areas with forested or wooded views, preserve and enhance ***buffers*** of existing forest or wooded area between the ***scenic road*** and new ***development***.

3.2 Landscape Edges & Site Conditions

This section includes the description of and requirements for a range of landscape edge types and the landscape requirements for various site conditions. Rates and calculations for the requirements are provided within each site condition listed, including any applicable varia tions to required rates based on different land uses or ***development*** type.

These requirements stipulate the quantity of plant materials that shall be provided to meet the requirements of the regulations. Alternative methods to meet the intent are provided – refer to specific site conditions for any applicable alternatives.

Landscape Plans shall include the Schedule(s) applicable to each site condition required for the project site. See ***Appendix B***.

3.2.1 Landscape Edges

Several site conditions outlined in the following subsections require landscape edge plantings. The purpose of the required landscape edge types is to provide varying levels of ***buffering*** and ***screening*** to adjacent uses.

a. Landscape Edge Types

The planting requirements for each landscape edge type call for planting a specific minimum number of shade trees, evergreen trees and/or shrubs.

Table 1 identifies the range of landscape edge treatments, from ***buffer*** to ***screen***. All landscape edge types require planting shade trees. In many categories evergreen trees are also required. Shrub planting is required in Edge Types C, D and E. Designers are encouraged to provide ***plant communities*** and increase ***biodiversity*** where possible using the plant substitutes options provided in Table 2.

Table 1 – Landscape Edge Types

Edge Type	Description	Shade Trees / Linear Feet	Evergreen Trees / Linear Feet	Shrubs / Linear Feet
A	Light Buffer	1:60	0	0
B	Moderate Buffer	1:50	1:40	0
C	Heavy Buffer	1:40	1:20	1:8
D	Screen	1:60	1:15	1:8
E	Parking Adjacent to Roadway (buffer)	1:40	0	1:4

a.1 Plant Type Substitutions

Except as otherwise noted within this manual, the following plant type substitutions may be proposed for up to 50% of the requirements listed in Table 1 provided the substitutions meet the intent of the regulations:

Table 2 – Landscape Edge Plant Type Substitutions

Required Plant Type	Substitution
1 Shade tree	2 Small deciduous trees, or 2 Evergreen trees, or 10 Shrubs
1 Evergreen tree	5 Shrubs
1 Shrub	3± perennial grasses*, or 5± herbaceous perennials*
* Minimum 1 gallon or #1 container installation size; ± quantities may be adjusted according to selection with justification or explanation from the Landscape Design professional	

b. Calculations & Plant Spacing Guidelines

Plant material requirements are based on linear feet of property line or other applicable site condition.

Calculations of required plant quantities shall be rounded up to the next whole number.

When the property line is crossed by a right-of-way, use-in-common access area or non-residential ***driveway***, the width of these areas shall not be computed as part of the total linear footage of the required ***perimeter landscape edge*** (see **Section 3.2.2**). No more than 15% of the required strip shall be covered with an impervious surface for pedestrian circulation or use.

Examples of landscape edge calculations and illustrations of planting schemes that fulfill the requirements of the regulations are provided in ***Appendix A.***

Plant materials should be chosen and located to achieve the desired level of ***buffer*** or ***screen*** per the edge type descriptions in Table 1.

Guidelines for plant spacing to achieve an effective screen or buffer is as follows:

- Planting requirements listed in Table 1 are not spacing requirements; they are the means to calculate the quantities required.
- Plant materials may be clustered in groups or planted in rows.
- To create an effective dense ***screen***, evergreen trees should generally be 10-15 feet on center unless a particularly narrow species or cultivar is used. Trees should be clustered in locations that are the most effective in ***screening*** undesirable views.
- Shade trees create a light buffer, open at ground level but with canopies that may eventually touch if clustered at a spacing of 25 feet on center.
- Clusters of small deciduous trees are generally an effective buffer when planted 15-20 feet on center.

Required planting in any landscape edge may be transferred to another area elsewhere within the project boundary, if such transfer meets the intent of the regulations. This method may be evaluated and approved on a project-by-project basis by the Department of Planning and Zoning.

c. Plant Size Requirements

The size of required plants at the time of installation shall be as follows:

- Shade trees must be a minimum of 2-1/2" ***caliper***.
- Small deciduous trees (single-stem and multi-stem species) must be at least 8' height at installation. Single stem species must also be a minimum of 1-1/2" ***caliper***.

- Small deciduous trees used to meet street tree requirements must be single-trunk specimens and a minimum of 2-1/2" ***caliper.***
- Small deciduous trees provided as a 1:1 substitution for internal landscape requirements must be a minimum of 2-1/2" ***caliper***.
- Most evergreen trees must be at least 6' height at installation. Refer to the recommended plant list maintained on the DPZ website for updates to accepted variations in size requirements.
- Shrub plantings for Landscape Edge Type E must be a minimum of 24" height at installation.
- Shrub plantings proposed as a substitute for required trees for all Landscape Edge Types, must be a minimum of 24" height.
- Minimum shrub sizes must be provided in accordance with the requirements of the site conditions outlined in the following subsections. Where a Site Condition does not specify a minimum shrub size, a minimum size of 24" height shall be provided.

Plant sizes shall be in accordance with ANSI Z60.2 *American Standard for Nursery Stock*, latest edition.

3.2.2 Perimeter Landscape

Perimeter landscape edges are required for all land uses and ***development*** types. This section describes the standard requirements and alternative methods for meeting the landscape requirements for a project's perimeter landscape plantings.

a. Standard Requirements

Perimeter landscape edges are required along the outside boundary of a property or development. The regulations do not require landscape edges between ***internal lots or parcels within the same development***. However, perimeter landscaping is required for the redevelopment of internal lots within recognized subdivisions (as defined in Section 16.108(b)(44)(iii) of the Subdivision and Land Development Regulations) that were recorded prior to the Howard County approval requirements as defined in subsection (i) and (ii) of Section 16.108(b)(44).

- For cluster subdivisions in the Rural Conservation and Rural Residential districts, the ***perimeter landscape edge*** shall be located at the perimeter of the cluster subdivision, not at the perimeter of the entire parcel. It is not intended that the preservation parcel be buffered or screened from adjacent properties.

Perimeter landscape edges for ***buffering*** or ***screening*** and their required edge type are based on land use. The type of required ***buffer*** or ***screen*** is determined by the degree of compatibility between the site uses and adjacent land uses.

[1]*See also Section 2.5 of this Manual. Expansions to existing developments that increase the number of residential units shall be required to provide perimeter landscaping between the proposed development and existing residential development.*

- Where possible, the ***perimeter landscape edge*** should be planted within the required setbacks established by the County Zoning Regulations.
- Buildings, parking, loading areas, stormwater management facilities, utility easements, storm drainage channels, play areas, drive aisles, parking spaces and similar uses may not be located in ***perimeter landscape edges***.
- Necessary pedestrian circulation, utility easements and access ***driveways*** may cross the ***perimeter landscape edges*** perpendicularly. Site design should create a balance between the required and proposed elements.
- Upon approval of the Department of Planning and Zoning and the Department of Public Works, necessary utility or other easements may overlap with up to 25% of the required edge, provided that the required landscaping may be placed in the reduced area.

b. Tables – Perimeter Adjacencies

Table 3 – Landscape Edge Adjacent to Roadways		
Land Use1	**Orientation of Structure or Use to Roadway**	**Landscape Edge Type$_2$**
Single Family Detached (SFD)	Front Side / Rear	None B
Single Family Attached (SFA) & Mobile Homes	Front Side / Rear	None C
Apartments	All Sides	B
Non-Residential	Front / Side Rear Rear – if Loading	B C D
Parking	N/A	E
[1] Residential ***open space*** and unbuilt areas of a non-residential ***development*** are considered to have the same land-use as the principal use. [2] Landscape Edge Types are provided in Table 1.		

Table 4 – Landscape Edge Adjacent to Perimeter Properties		
Land Use[1]	**Adjacent Land Use[1,2]**	**Landscape Edge Type**
Single Family Detached (SFD)	All Uses	A
Single Family Attached (SFA), Mobile Homes & Apartments	SFD SFA & Mobile Homes All Other Uses	C B A
Non-Residential (Commercial[3], Institutional) & Mixed Use	Residential All Other Uses	C A
Non-Residential (Industrial)	Residential Public Open Space All Other Uses	C C A
Loading	Residential All Other Uses	D C

[1] Residential ***open space*** and unbuilt areas of a non-residential ***development*** are considered to have the same land-use as the principal use.
[2] Rural Preservation Easements are considered residential uses
[3] Commercial solar facilities require a type D buffer, see **Section 3.2.10**

c. Native Plants & Biodiversity requirement

Plantings required for ***perimeter landscape edges*** shall meet the Native Plants & Biodiversity requirements outlined in **Section 4.1**.

Creating ***plant communities*** within ***perimeter landscape edges*** by including layers of herbaceous perennials and grasses is encouraged. See permitted substitutions provided in **Table 2**.

d. Alternative Methods

A variety of landscape treatments other than the planting stipulated in Table 1 may satisfy landscaping requirements. Alternative methods that may satisfy the landscape requirements include:

d.1 Preserving Existing Trees

The landscape planting requirement may be met by preserving existing trees, except for ***invasive species***. Individual trees may be credited toward meeting part or all of the landscape edge requirements. The existing trees under consideration for preservation shall be an equivalent tree type as required in the applicable landscape edge table. An existing landscape ***buffer*** may completely satisfy the landscape edge requirements if the existing ***buffer*** contains an equal number and type of trees as required in the applicable landscape edge table. Existing trees intended to satisfy the landscape edge requirements must be in good or excellent condition (as determined by a licensed arborist, forester, Certified Professional Horticulturist or Landscape Architect) and must not be an ***invasive species***.

Please note that the existing trees / trunks of the tree must be fully within the legal property boundary to be credited and to ensure they remain as part of the approved plan.

Existing trees proposed for credit shall be shown and labeled on the landscape plan and planting schedules for clarity in the plan review and for landscape inspection purposes. The species, condition, and ***caliper*** of the existing trees must be provided to receive credit.

The critical root zone of the existing trees must also be protected prior to and during construction with the current best practices for tree preservation. Include protection details and specifications on the landscape plans and in the sequence of construction in the grading and sediment and erosion control plan sheets.

As part of an approved plan, existing trees must be maintained and replaced as necessary in perpetuity.

d.2 Development adjacent to Existing Forest Conservation Easement

An existing retention forest conservation easement located along the property boundary may meet ***perimeter landscape edge*** requirements. The easement may be off-site along the shared property line and must be recorded and in good standing (i.e. has no issues with bond, no complaints, and no unresolved violations).

d.3 Proposed Forest Conservation Easement

Tree plantings proposed to meet Forest Conservation reforestation and/or afforestation requirements may be used to meet ***perimeter landscape edge*** requirements provided that:

- The proposed easement is within the project area and not an off-site planting area

- Tree size at time of installation is a minimum of 2-1/2" ***caliper***
- Tree plantings meet location criteria described in the Landscape Manual
- Tree plantings meet surety requirements
- Tree plantings are located in a Forest Conservation Easement proposed to be recorded and bonded with the proposed subdivision or development

d.4 Berm or Grade Change

A ***berm*** that is a minimum of 3 feet high, or a change in grade that causes a ***parking lot*** to be located lower than the adjacent roadway by 3 feet or more, may be substituted for 100% shrub planting in a Type E landscape ***buffer***. ***Berms*** may be substituted for evergreen trees or shrubs in meeting the intent of other perimeter landscaping requirements. In general, ***berms*** that ***buffer*** new ***development*** from an adjacent roadway should be a minimum of 3 feet high if the front or side of the structure(s) abut the roadway, and a minimum of 6 feet high if the rear of the structure or a loading area abuts the roadway. ***Berms*** between similar uses (i.e. residential to residential or non-residential to non-residential) should be a minimum of 3 feet high. Non-residential uses adjacent to residential properties should provide ***berms*** that are a minimum of 6 feet high to obtain a credit towards provision of required plant materials. In no instances will ***berms*** be substituted for required shade tree plantings.

d.5 Fence, Wall or Hedge

A fence, wall or ***hedge***, even when provided along the entire length of the perimeter, may only be credited towards meeting up to 50% of the required ***perimeter landscape edge*** plantings, except as noted below.

A fence, wall or ***hedge*** may be credited towards meeting up to 100% of the required ***perimeter landscape edge*** plantings in the following conditions:

- Site access areas
  - When the ***driveway*** can not provide required 10' width landscape area. See Section 16.120 of the Subdivision and Land Development Regulations.
  - When a change in use for an existing lot from residential to another non-residential approved use (either by right or through conditional use approval) requires additional screening and the existing conditions restrict planting areas.
  - When used as screening between residential and commercial use, a privacy fence may be proposed when plantings might restrict the usable back yard area. Applicable to single family detached or single family attached development only.

A fence, wall or hedge may be credited towards a reduction of the required perimeter landscape edge plantings in the following conditions:

- Apartments and multifamily developments may have a fence along a perimeter between the residential development and a non-residential development. In this case, the perimeter requirement shall include a shade tree every 40 feet. No substitutions without justification from the development team and approval by the Department of Planning and Zoning. The intent is to offer a visual buffer between the residential and non-residential uses when viewed from upper stories of apartment or multifamily buildings.

If walls, ***hedges*** and fences are proposed in lieu of some or all of the required landscape plantings, the designer shall provide written justification for the substitution for review and approval by Department of Planning and Zoning (DPZ) on a plan by plan basis.

DPZ may require at least 1 tree per 40-60 linear feet of wall or fence or one shrub or vine per 10 linear feet of wall or fence. Where walls or fences abut a public or private road right-of-way, the planting should be on the street side of the wall.

A masonry wall or solid fence at least 5 feet high must be provided between adjacent land uses or where rears of residential buildings or loading areas abut-roadways. A wall or fence at least 3-1/2 feet high is needed where ***parking lots*** abut roadways or where the fronts or sides of buildings abut roadways. In the latter case a solid or semi-transparent fence or wall may be approved.

Design professionals are advised to consult the Zoning Regulations to verify proposed fences meet the setback requirements.

3.2.3 Street Trees (Public & Private Roads)

Street tree requirements must be met in addition to the requirements for perimeter and internal landscaping required in Section 16.124 of the Howard County Subdivision and Land Development Regulations. **Street tree requirements must be calculated separately from all other landscape requirements.**

Street trees should be located in the road right-of-way either adjacent to the road pavement or within a landscaped median – see Section 3.2.3.f for more location guidance and requirements.
Street trees must be provided for public and private rights-of-way in all districts and shall be at least 2-1/2 inch ***caliper*** at time of installation.

Required rate and spacing of street trees:

- **1 shade tree per 40 linear feet of right-of-way**
- **1 small deciduous tree per 30 linear feet of right-of-way (when proposed as a substitute for shade trees)**

Refer to **Section 3.2.3.e** for streetscape layout and alternative street tree spacing.

Refer to **Section 4.2** for Street Tree Selection Criteria.

a. Existing trees

Roadway alignments should seek to preserve existing forest, stands of mature trees, and specimen trees on all ***development sites***. The preservation of these types of vegetation adjacent to public rights-of-way is encouraged. The Forest Conservation Manual, arborists and tree specialists should be consulted for appropriate methods of tree preservation. Credit for up to 100% of the street tree planting requirement may be granted for preservation of existing trees, except for ***invasive species***, immediately adjacent to the right-of-way.

b. Maintenance easements

If utilities cannot be configured to provide sufficient space for street tree planting within the right-of-way, the Department of Planning and Zoning may approve a location in a street tree maintenance easement adjacent to the right-of-way. The typical street tree maintenance easement is 10 feet wide.

c. Interaction with perimeter landscape edge plantings

Trees required to satisfy perimeter landscaping requirements may be planted within the public right-of way if approved by the Department of Planning and Zoning and the Department of Public Works. Street trees planted adjacent to the right-of-way may be clustered with existing trees or proposed perimeter landscaping to provide a more effective ***buffer*** or ***screen*** to satisfy the intent of the ordinance. This option must also be approved by the Department of Public Works and the Department of Planning and Zoning.

d. Interaction with parking lot plantings

In single family attached or apartment ***developments*** where ***internal roads*** are designed as part of the ***parking lots***, internal ***parking lot*** landscaping provided in accordance with the requirements of Section 16.124 of the Howard County Subdivision and Land Development Regulations and **Section 3.2.5** of the Landscape Manual shall satisfy street tree obligations.

Internal parking lot landscaping will be allowed to fulfill street tree requirements only for those segments of the roadway that are lined with parking spaces perpendicular to the roadway.

e. Typical Layout vs. Informal Clustering

A typical street tree layout results in regular spacing of trees at the required 30 or 40 feet on center, depending on tree type. Slight variations to this regular spacing may be required due to utility conflicts, access easements, private ***driveways*** and roads – see **Section 3.2.3.f** for more guidance.

However, if the number of street trees provided in a subdivision or ***development*** meets the intent of the spacing requirements, the Department of Public Works and the Department of Planning and Zoning may approve clustering of street trees.

Clustering of street trees could result in the location of trees within the right-of-way and in street tree maintenance easements adjoining the right-of-way. Spacing of trees in clusters could result in the spacing of small deciduous trees at 15-20 feet apart and the spacing of shade trees at 25-30 feet apart. In such cases, gaps between clusters could be double the spacing required above. **Appendix A, Figure 4** depicts typical street tree layout and informal clustering of street trees.

f. Street Tree Location Requirements

Trees shall be placed a minimum of 30 feet from all signs and intersections when planted between sidewalk and curb and be located with consideration of underground utilities and structures.

When trees are planted within 8 feet (96 inches) of curb, roadway, sidewalk or other pavement, tree ***root barrier*** or other physical barrier proposed to prevent root intrusion and heaving is required. Root barrier is also required when planting trees between a sidewalk and road and for trees otherwise surrounded by impervious pavement. Refer to **Appendix D.6** for more information.

Appendix A, Figure 5 illustrates required adjustments to the layout of street trees. The following standards shall govern the placement of street trees in public rights-of-way:

f.1 Street trees at roads with no sidewalk

Trees shall be planted 6 feet behind the curb.

f.2 Street trees at roads with sidewalk and required buffer zone

Refer to the applicable street type in the current Howard County Design Manual – Volume III, Complete Streets and Bridges for the required ***buffer zone*** width.

When the distance between the curb and sidewalk meets the required ***buffer*** zone width, trees shall be located within the right-of-way and shall be centered between the curb and the sidewalk.

f.3 Street tree at roads with sidewalk and less than required buffer zone

Refer to the applicable Complete Streets street type for the required ***buffer zone*** width.

When the distance between the curb and the sidewalk is less than the required ***buffer zone*** width, trees may be planted 3 feet from the sidewalk in the direction away from the road. A 10 foot wide tree maintenance easement shall be required if the right-of-way is limited.

f.4 Street tree at open space access point

Street trees may not be planted within 5 feet of an ***open space access point.***

g. Sight Triangles

g.1 Private driveways and roadways abutting public roadways

Street trees shall not be located within 10 feet of a ***driveway***.

When a ***driveway*** or private roadway intersects a public right-of-way or when the site abuts the intersection of two or more public rights-of-way, all landscaping within the sight triangle areas shall provide unobstructed across-visibility.

g.2 Landscape must be unobstructed across-visibility within sight triangle

Nothing at an elevation greater than the top of curb plus two (2) feet shall be allowed in any sight triangle area except single-trunk trees, provided that the lower branches are pruned provide visibility from the ground to a height of seven (7) feet.

h. Scenic Roads

Hedgerows, existing mature trees and/or forest along the rights-of-way and edges of ***scenic roads*** shall be preserved to the maximum extent practical. Refer to the current Howard County Design Manual – Volume III, Complete Streets and Bridges Manual and Howard County Code Section 16.125 for additional guidance on landscaping and maintenance along ***scenic roads***.

Where sufficient and acceptable vegetation does not exist or cannot be preserved, street trees and ***perimeter landscape edge*** plantings proposed to meet requirements along rights-of-way designated as a "***scenic road***" shall:

- be a ***native species***, commonly found on the site or in the surrounding area
- be planted to mimic and enhance the existing character of the ***scenic road***

3.2.4 Utility Easements and Overhead Power Lines

a. Small deciduous trees required below overhead power lines

Whenever possible, proposed trees should be located a sufficient distance away from existing overhead power lines to allow trees to mature without disturbance from standard vegetation maintenance typically associated with existing overhead power lines. However, when locating trees under overhead power lines is unavoidable the following requirements apply.

Landscape policies for trees located below or within close vicinity of overhead wires are based on BGE's recommendations, which advise the following:

- Trees planted within 20 feet on either side of pole-to-pole power lines shall have a mature height of 25 feet or less.
- Trees with mature heights greater than 25 feet should be planted at a distance away from overhead wires that is equal to or more than the expected mature height of the tree.

The following guidelines stipulate the maximum allowable size of trees located near overhead power lines for three defined zones.

Table 5 – Maximum Height of Trees near Overhead Power Lines

Zone	Distance from BGE power line	Maximum height of mature tree
Green	Up to 20 feet	25 feet
Yellow	20 feet – 40 feet	40 feet
Red	Beyond 45 feet	> 40 feet

When requirements for shade trees are located within 20 feet of existing overhead wires, substitutions for the use of small deciduous trees in lieu of shade trees will be accepted at a 1:1 ratio versus the typical 2:1 ratio.

b. Underground utilities and utility easements

Trees shall not be planted in utility easements or within 5 feet of a storm drain inlet structure.

3.2.5 Parking Lots

Landscape requirements for ***parking areas*** should be designed not only to improve aesthetics and traffic flow but also to reduce the urban heat island effect, manage stormwater, and increase climate resilience; and when possible, support other County initiatives and programs such as the Bee City program. Landscaped islands should be prioritized as opportunities to plant large-canopy native trees that maximize shading of impervious surfaces and create a multi-layer ***plant community***. These areas can also be designed to function as stormwater bioretention features that reduce runoff and filter pollutants.

a. Parking Lot Perimeter

Requirements for ***buffering*** of ***parking areas*** are intended to reduce the visual impact of automobiles and large expanses of paving from adjacent roadways and from abutting properties.

Typically, adjacent and abutting means the project boundary shares a boundary with the road right-of-way (ROW). However, in cases where a property is oddly shaped and does not technically share the ROW boundary, but the parking is visible from the roadway, the perimeter measurement should include the entire visibly adjacent parking. See example in Image 1 below.

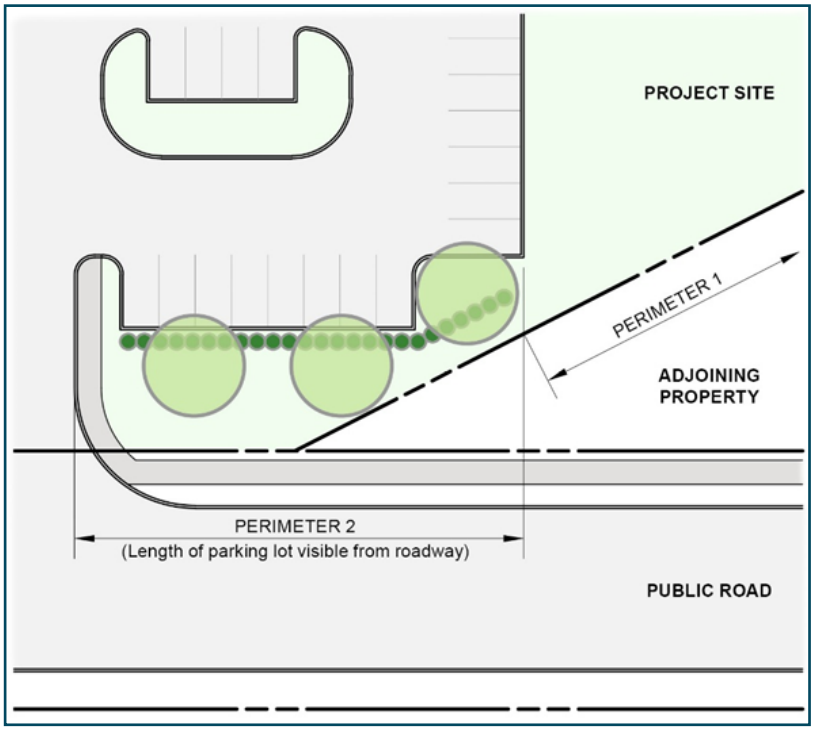


Image 1

Requirements for parking lot perimeters are as follows:

For parking lots adjacent to roadways, a Type E landscape edge is required.

The combination of low shrubs and shade trees is intended to partially screen parked cars from adjacent roadways, while still allowing for some visibility into the site. The public safety goal of this treatment is to prevent headlight beams from reaching the travel lanes of the adjacent roadway.

The intent of the Type E landscape edge requirement for this site condition is to create a minimum buffer height of 3 feet through the use of shrubs, or an alternative method, such as a change in grade, a berm, a fence or wall. The alternative methods for ***perimeter landscape edges*** can be applied to required landscape edges for ***parking lots*** adjacent to roadways – see **Section 3.2.2.c**.

For parking lots adjacent to adjoining properties, use the required perimeter landscape edge type specified in Section 3.2.2.a.

*Perimeter **parking lot** landscape requirements may exceed those specified in the landscaping regulation for:*

- special exception uses approved by the decision and order issued by the Board of Appeals
- plans approved with modifications by the Planning Board
- plans requiring other approval processes

a.1 Commercial areas

In most commercial areas, the desire to identify buildings from the roadway requires that eye level sight lines be preserved. Thus, the use of evergreen trees or small deciduous trees with low canopies may not be desirable.

However, for commercial parking lots adjacent to residential land uses, required planting should be clustered in the areas where it is most needed to buffer or screen objectionable views. In such instances, it may be appropriate to substitute evergreen trees, small deciduous trees or shrubs for the required perimeter shade trees.

a.2 Residential areas

In residential areas, the preservation of existing vegetation as a ***buffer*** between ***parking areas*** and roadways or other perimeter land uses is strongly recommended.

Substitution of evergreen trees or small deciduous trees for required shade trees may be appropriate to ***buffer*** residential communities from surrounding roadways.

For residential ***parking lots*** adjacent to other residential properties, clustering of evergreen trees or use of dense mixed plantings between the ***parking areas*** and the property perimeter is recommended.

b. Internal Landscaping

All ***parking lots*** must provide permanently landscaped areas consisting of planted islands, peninsulas, or medians within the interior of the lot. Landscaped areas should divide lots into groups of parking spaces to relieve the monotony of large expanses of paving and contribute to efficient and safe circulation of traffic in the ***parking areas.***

Expansion of an existing ***parking lot*** or loading area that increases the area or number of spaces by 50% or more shall be required to provide landscaping for the entire ***parking lot*** or loading area in accordance with these regulations. Expansions of less than 50% shall be required to provide landscaping for the additional ***development*** only.

Required ***buffering*** along the perimeter of any ***parking lot*** cannot be credited as part of the interior landscaping requirements. Moreover, where a ***parking lot*** abuts buildings on the site, plantings adjacent to those buildings shall not be considered as part of the interior landscaping requirements.

- Landscaped islands shall be minimum of 12 feet in width (face of curb to face of curb) and a minimum of 200 square feet.
- The island should be completely curbed or otherwise protected from vehicle traffic. Curbs may be constructed to include curb cuts or areas of flush curb allowing stormwater runoff to flow into the landscape island when it also serves as a stormwater management biorientation area.
- Walkways located within a landscaped island are permitted, but shall not be counted as part of the minimum width or area of the island.
- The primary trees to be used in ***parking lots*** shall be shade trees. Trees that produce large fruits or nuts, such as oak trees, are prohibited in parking areas.
- Small deciduous trees or evergreen trees may be used if it can be demonstrated that they will not inhibit visibility and safe circulation of pedestrians and vehicles. When allowed, small deciduous trees and evergreen trees must be substituted for shade trees at a 2:1 ratio, up to a maximum of 50% of the required shade trees.
- Use of shrubs, perennials and grasses is encouraged to create ***plant communities***, however, substitution for required shade trees does not meet the cooling intent and is not accepted unless the substitutions area proposed as part of a ***parking lot*** proposing solar canopies. Refer to **Section 3.2.10.b** for ***parking lots*** with existing or proposed solar canopies.

b.1 Standard Calculation

Internal parking lot landscaping shall be shown on the Site Development Plan, and Landscape Plans shall include Schedule C (see **Appendix B**).

Table 6 – Parking Lot Internal Landscaping			
Land Use	**Landscaped Islands (ratio)**	**Shade Trees**	**Max. grouping of parking spaces without island**
Residential: Single Family Attached, Apartments	1:10 spaces	1:10 spaces	12 spaces
Non-Residential	1:20 spaces	1:20 spaces	24 spaces

b.2 Alternate Calculation

For ***parking lots*** with islands between bays of parking spaces that create long contiguous planting areas with trees, groups of parking spaces without islands may exceed the maximum grouping listed in Table 6.

When this option is used the requirements for shade trees shall be **1 shade tree per 60 linear feet of parking lot island between parking bays.**

For example, as shown in Image 2, if the parking lot island separates two parking bays with groups of forty (40) 9-foot-wide parking spaces (360 linear feet), 6 shade trees are required, totaling 12. Using the standard calculation in Table 6, based on 280 parking spaces, 14 trees would have been required.

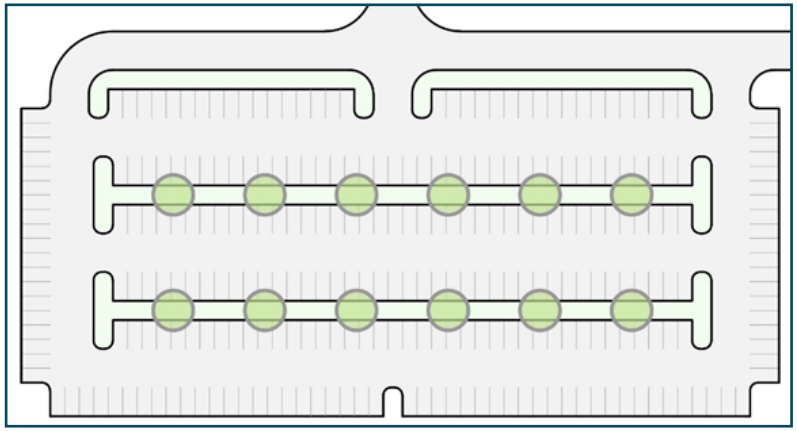


Image 2

b.3 Residential Parking Lots

Parking lots for single family attached and apartment dwelling units shall have 1 landscaped island per 10 parking spaces and 1 shade tree per 10 parking spaces. This requirement does not necessarily mean that an island with a shade tree must occur every 10 spaces; the requirement is a means of calculating planting requirements. Grouping of parking spaces should generally not exceed 12 in a row for residential land uses. Landscaped areas in residential ***parking lots*** may be internal islands and peninsulas, perimeter corner green areas formed where two rows of parking spaces abut or peninsula areas formed where ***parking areas*** and access roads or entrance ***driveways*** abut. Trees provided to meet internal planting requirements may be located in internal landscaped areas, perimeter corner areas or entrance area peninsulas. See **Appendix A, Figure 6**.

As described in **Section 3.2.3 Street Trees**, internal parking lot landscaping provided in single family attached ***developments*** will satisfy the street tree obligations for internal public rights-of-way. In such cases, plantings within the public right-of-way need not be shown on the road construction drawings, but must be included on the Site Development Plan.

b.4 Non-Residential Parking Lots

Parking lots for office, industrial, retail, institutional and related commercial uses shall have 1 landscaped island per 20 parking spaces and 1 shade tree per 20 parking spaces. This requirement is a means of calculating planting obligations.

Grouping of parking spaces should generally not exceed 24 in a row for commercial and institutional lands uses but may be permitted at up to 30 in a row for large regional shopping centers and malls. In large ***parking lots***, the creation of large islands that permit the planting of groups or rows of trees is encouraged. A large island should be the equivalent square area of four 200 SF islands and break up a double row of parking strips.

Landscaped areas may be internal islands and peninsulas. Trees provided to meet internal planting requirements must be located in internal landscaped areas except when displaced by parking lot solar canopies (refer to **Section 3.2.10.b**). See **Appendix A, Figure 7** for non-residential parking lot example.

3.2.6 Parking Structures

Landscape requirements for parking structures are intended to screen view of cars at the ground level and minimize view of monotonous building mass. Masonry walls and ground level plantings should provide screening between column supports where the ground level is occupied by vehicle storage.

Where parking structures are located along public streets, landscaping the area between the sidewalk and the face of the structure with a second row of street trees and ground level plantings is encouraged where possible.

Where parked vehicles can occupy the ground level and would be visually open to the street:

Provide Type E landscape edge plantings in addition to street trees required in Section 3.2.3.

3.2.7 Loading & Service Areas

Loading and service areas include dumpster and compactor areas, residential trash collection pads, truck loading facilities, dock areas, drive-in loading bays and at grade service entrances to structures.

An enclosure shall be provided for dumpsters or trash bins, except for dumpsters internal to an industrial ***development*** that will not be seen from the public road or adjacent non-industrial uses. Enclosures shall be primarily opaque and may consist of fencing, brick or masonry walls; additionally, enclosures may be extensions of the building architecture with consistency of materials, color and design.

For loading and service areas adjacent to roadways or residential properties:

Provide a Type D landscape edge between the loading or service area and any public or private road, residential structure or lot.

For loading and service areas adjacent to perimeter boundaries other than those specified above:

Provide a Type C landscaped edge

Permitted plant type substitutions for loading and service areas include only small deciduous trees, evergreen trees, and shrubs. Herbaceous perennials and grasses are not suitable substitutions for ***screening*** loading and service areas.

The linear feet of landscape edge shall be measured along all portions of the perimeter of the loading and/or service area facing the adjacent property or roadway. ***Screen*** or ***buffer*** plantings shall be designed and located in a manner that does not impair sight distances at intersections.

Landscape requirements for loading areas may exceed those specified in the landscaping regulation for:

- special exception uses approved by the decision and order issued by the Board of Appeals
- plans approved with modifications by the Planning Board
- plans requiring other approval processes

a. Community Refuse Pad for Private Access Place Street

When a developer creates a Private Access Place street in a residential community, an area must be designated on the construction plans for a 4’ x 10’ community refuse pad. The refuse pad shall include a landscaped ***buffer*** and/or fence along the perimeter of the pad.

The ***buffer*** shall consist of evergreen shrubs of a height of 3 to 4 feet minimum, and with spacing every 3 feet or so. The desired effect is that of an evergreen ***hedge***. The surety for these shrubs and any related fence should be posted with that of the Private Access Place landscape "street" trees.

b. Residential Community Trash & Recycling Pads

Trash and recycling rules and regulations require collection pads be placed within 5 feet of the public roadway. Residential community trash and recycling pad placements should be located within the County right-of-way to comply with the regulations. Landscaping shall not be located on the side of the trash pad facing or oriented towards the public road to allow for ease of pick-up and accessibility for the trash collection service. However, landscaping is allowable on the ends and back side of the trash pad facing or oriented towards the residential ***development*** unless Subdivision Review Committee (SRC) comments prohibit the landscaping. The placement of community trash pads and landscape ***screening*** will be reviewed on a case-by-case basis on subdivision and Site Development Plans. Where landscape ***screening*** cannot be provided to allow for full and open access and pick-up services for trash and recycling collection, comments received from SRC agencies indicating that landscaping should not be allowed shall supersede the landscape requirements.

3.2.8 Residential Development Internal Landscaping

Internal landscaping is required within all new single family attached, mobile home, and apartment ***developments***. Expansion to existing ***development*** that increases the number of single family attached units or apartments by 50% or more shall be required to provide landscaping for the entire site in accordance with these regulations. Expansion of less than 50% of the number of existing units shall be required to provide landscaping for the additional ***development*** only.

In addition to the requirements outlined in Table 7:

A landscaped area with a minimum width of 15 feet shall be provided between common parking areas and any adjacent residential structure.

Table 7 – Residential Development Internal Landscaping		
	Required Plantings	**Placement**
Single Family Attached, Mobile Homes	1 Shade Tree1 per 2 units	• open space • other on-site locations meeting the intent of regulations • residential lots
Apartments (1-4 stories)	1 Shade Tree1 per 5 units	• open space • other on-site locations meeting the intent of regulations
Apartments (5+ stories)	1 Shade Tree1,2 per 7 units (a mix of shade trees, ornamental trees and shrubs is encouraged using substitutions below)	• open space • building edge / foundation • other on-site locations meeting the intent of regulations
[1] Small deciduous or evergreen trees may be substituted for shade trees at a 1:1 ratio. Shrubs may be substituted for shade trees at 10:1. No more than 50% of the required shade trees may be substituted. [2] Shall be native species		

Landscape planting requirements shall be shown on the Site Development Plan. Landscape Plans shall include Schedule E (see **Appendix B**).

See **Appendix A, Figure 8**.

a. Native Plants & Biodiversity requirement

Plantings required for Residential Development Internal Landscaping shall meet the Native Plants & Biodiversity requirements outlined in **Section 4.1**.

3.2.9 Recreation Open Space

Per Section 16.121 of the Subdivision and Land Development Regulations, the ***open space*** required for residential and mixed-use ***developments*** is intended to protect environmental resources and provide for recreation or public use. The ***open space*** regulations also describe the suitability of proposed open space areas, which supports the landscape manual's intention for the ***open space*** to be an amenity to the ***developments*** and their surrounding communities and not simply an aggregation of left over spaces. Refer to Section 16.121(a) of the Subdivision and Land Development Regulations for the required amount of ***open space*** and recreation open space.

Recreation open space should provide additional landscaping and opportunities for the ultimate HOA or other named owners group (such as a condominium association) to add landscaping.

Landscape requirements for recreation open space apply to developments with 5,000 square feet of required recreation open space, or greater, and shall be provided as follows:

100 square feet of plant bed area for the first 5,000 square feet of required recreation open space, and

100 square feet of plant bed area for each additional 1,000 square feet of required recreation open space

The minimum provided plant bed area shall be 300 square feet.

- For example, for 5,000-7,999 SF of required recreation open space, 300 square feet of plant bed area shall be provided. For 8,000 square feet of required recreation open space, the provided plant bed area shall be 400 square feet.

The maximum required plant bed area is 1,200 square feet.

If multiple beds are proposed to meet the requirements, the minimum for each bed shall be 300 square feet.

The plant beds may be located within the recreation open space and should be placed to allow ***active recreation activities***. The beds may also be adjacent to or just outside the recreation open space, or provided with an entry sign feature, along sidewalks and other areas that meet the intent.

For the purpose of calculating required plant bed area, use the required recreation open space for the project prior to deducting any allowed amenity credits (e.g. gazebos, patios, etc.)

Plant beds shall be reasonably planted and can have a significant portion of the bed available for future Bee City plantings. Notes on the landscape plans shall identify these optional opportunities for the benefit of the HOA and include reference to the resources available through the Office of Community Sustainability. Refer to the Howard County ***Bee City USA*** program for more resources.

Generally, plant beds for recreation open space areas shall include a minimum of 4 native shrubs per 300 square feet of planting bed in addition to required internal landscape plantings. Surety shall be place for the required shrubs.

Trees required for residential **development** internal landscaping may be located in recreation open space plant beds.

Plant beds shall be prepared planting beds – refer to **Section D.4 of Appendix D** for plant bed preparation guidelines.

a. Plant Type Substitutions

The following plant type substitutions may be provided in lieu of the requirements listed above for recreation open space requirements, provided the substitutions meet the intent of the regulations:

Table 8 – Recreation Open Space Plant Type Substitutions	
Required Plant Type	**Substitution**
1 Shrub	Herbaceous perennials* and/or perennial grasses* Plan preparer may propose an appropriate substitution rate of perennials and/or grasses based on specific proposed species to meet the intent of the regulations
* Minimum 1 gallon or #1 container installation size; only allowed as a substitution for up to 50% of shrub requirement	

b. Native Plants & Biodiversity requirement

Plantings required for Recreation Open Space shall meet the Native Plants & Biodiversity requirements outlined in Section 4.1.

3.2.10 Ground-Mount Solar Collectors

a. Commercial Facilities

A Type D perimeter landscape edge is required for commercial solar collector facilities and solar collector facilities allowed by right per the Renewable Energy Certainty Act (HB1036), and ***buffers*** should address adjacent property views to provide maximum ***screening*** potential of the proposed solar facility. Parameters for the ***perimeter landscape edges*** are based on requirements outlined in the Renewable Energy Certainty Act (HB1036) and are as follows:

The landscape ***buffer*** shall be a minimum of 10 feet and a maximum of 35 feet wide. The buffer shall:

- Be provided along all property lines,
- Be provided along locations of the exterior boundary for the solar energy generating station where existing wooded vegetation of 50 feet or more in width does not exist; or
- An alternative location within the boundary for the solar energy generating station if the owner demonstrates that the alternative locations would maximize the visual ***screening***

A landscape ***buffer*** or vegetative ***screen*** that provides four-season visual ***screening*** of the solar energy generating station (solar collector facility) shall be provided between any fencing and the public view and includes multi-layered staggered rows of overstory and understory trees and shrubs that are:

- A mixture of evergreen and deciduous vegetation
- Predominantly native to the region
- More than 4 feet in height at planting
- Are designed to provide ***screening*** or ***buffering*** within 5 years of planting

Berms are not required; however, ***berms*** are permitted in addition to the required landscape plantings. A berm may not be proposed in lieu of any plantings required for solar collector facilities.

Proposed landscape plantings should be located at a sufficient distance from existing overhead power lines to allow plantings to mature and avoid disturbance from standard vegetation maintenance typically associated with existing overhead power lines.
Planting requirements shall be shown on the Site Development Plan. Landscape Plans for solar collector facilities shall include Schedule A (see **Appendix B**).

a.1 Native Plants & Biodiversity requirement

Plantings required for landscape ***buffers*** / vegetative ***screening*** shall meet the Native Plants & Biodiversity requirements outlined in **Section 4.1**.

Creating ***plant communities*** within the landscape ***buffers*** or vegetative ***screening*** in support of Howard County's Bee City initiatives is desired. Using the substitution chart shown in Table 2 as a guideline, designers are encouraged to include layers of herbaceous perennials and grasses in addition to trees and shrubs to create a robust ***plant community***.

a.2 Pollinator-friendly Meadow Plantings

Creating and managing native pollinator-friendly meadows amid the solar collector facility is encouraged. Meadows require less frequent mowing and provide more ecological value than turf grass by increasing ***biodiversity*** and creating habitat that supports native pollinating insects and other wildlife.

Pollinator-friendly meadow plantings are not required as part of the landscape plan and will not be reviewed by the County. No surety will be required. If the project proposes meadow planting, the intent should be indicated with a note in the landscape plan notes. For

example, “In addition to the required landscaping shown on this plan, the landscaped areas between and/or beneath the ground-mount solar collectors will be planted as a meadow and not turf grass in support of the County’s Bee City program initiatives.” Refer to the Howard County Bee City USA program for more resources.

b. Solar Canopies over Parking

The following ***parking lot*** internal landscape requirements apply to existing ***parking lots*** retrofitted to add solar canopies over parking spaces and to new ***development*** proposing solar canopies over parking spaces or proposing a ***parking lot*** that will receive solar canopies in the future (‘***solar-ready’ parking lots***).

Plantings required for Solar Canopies over Parking shall meet the Native Plants & Biodiversity requirements outlined in **Section 4.1**.

When plantings are located or proposed under solar canopies by the designer:

- The landscape plan shall detail how plantings will receive sufficient water (e.g. gutter system for the canopy that outfalls to planted islands, proposed grades that direct rainwater to the planting areas, etc.).
- Plant selection must address available light with details depicting canopy height and calculated available light that will reach the planted areas

b.1 For existing parking lots that add solar canopies over a portion of or all parking spaces:

Landscaped islands that are part of the previously approved plan that will be displaced by new solar canopies as part of the retrofit work must be replaced at a 1:1 rate elsewhere within the ***parking lot***.

- Trees and plantings that are part of the approved plan that will be displaced by the solar canopies must be replaced at a 1:1 rate elsewhere in the parking lot
- Proposed location of replaced landscaping must meet the intent of its original location
- Substitutions may be used following the substitution chart shown in Table 9, for up to 100% of the displaced landscaping.

b.2 For new development proposing parking lots with solar canopies over a portion of or all parking spaces and for ‘solar-ready’ parking lots:

The islands and trees required shall be calculated based on **Section 3.2.5.b**

Using the required area (SF) of islands and quantities as a base:

- Trees and islands may be located elsewhere within the ***parking lot***
- Substitutions may be used following the substitution chart shown in **Table 9**, for up to 100% of the displaced landscaping.

A planted landscape island is required at all ends of the solar canopy rows.

b.3 Plant Type Substitutions

For ***parking lot*** internal landscaping where solar canopies are over parking spaces, the following plant type substitutions may be provided in lieu of shade trees, provided the substitutions meet the intent of the regulations:

Table 9 – Solar Canopies over Parking Plant Type Substitutions

Required	Substitution
1 Shade tree	1 Small deciduous tree AND 3 Shrubs AND Optional herbaceous perennials* and/or ornamental grasses*
1 Shade tree	5 Shrubs AND Optional herbaceous perennials* and/or ornamental grasses*
1 Shade tree	3 Shrubs AND 3-7 herbaceous perennials* and/or ornamental grasses*
* Minimum 1 gallon or #1 container installation size	

3.2.11 Stormwater Management Facility Landscape Edge

Landscape edge requirements for stormwater management (SWM) facilities apply to new or expanded or replaced structural water quality stormwater BMPs, including but not limited to ponds and extended detention facilities. These requirements are not applicable to ESD practices, such as micro-bioretention facilities, rain gardens, etc. Refer to the current Maryland Department of the Environment Maryland Stormwater Design Manual for descriptions of structural (BMP) and ESD practices.

These requirements apply to all zoning districts with some exceptions for parcels zoned M-1 and M-2, as described below.

For SWM facilities that have an internal location within the development:

- Type B landscape edge shall be provided between the SWM facility and any adjacent structure or internal residential lot.
- Perimeter length is calculated along the lot or easement boundary.
- Internal landscape edges shall be reflected in Schedule H (see **Appendix B**) and included on the Landscape Plan

For SWM facilities adjacent to roadways or perimeter properties:

- Type B landscape edge shall be provided, unless a Type C landscape edge is required in **Tables 3 or 4**.
- Landscape edge type(s) for SWM facilities shall be reflected in the Schedule A (see **Appendix B**) included on the Landscape Plan.

See **Appendix A, Figure 9** for illustrations / examples.

a. M-1 and M-2 zoning districts

SWM areas not adjacent to residential zoning or a public road are exempt from these requirements.

For SWM areas adjacent to a public road, the required ***buffer*** should be calculated based on the entire pond perimeter within view of the public road.

The required ***buffer*** should create or provide habitat for native pollinators. Additional plantings may be required by DPZ to enhance the view of the SWM facility from residential uses.

Alternative methods of meeting the regulations may be proposed and approved.

b. Plant Type Substitutions

The following plant type substitutions may be provided in lieu of the requirements listed above for SWM landscape edge requirements, provided the substitutions meet the intent of the regulations:

Table 10 – SWM Landscape Edge Plant Type Substitutions

Required	Substitution
1 Shade tree	For up to 50% of required shade trees: 2 Small deciduous trees, or 2 Evergreen trees
1 Shade tree	For up to 25% of required shade trees: 10 Shrubs

Existing trees used for credit must meet the requirements outlined in **Section 3.2.2.d.1**.

c. Location Requirements for SWM Landscape Edge Plantings

Plantings within the landscape edge may not encroach on maintenance access to the facility as required by the Department of Public Works.

Planting will not be allowed on any SWM facility dam/berm or in any other location that could threaten the structural integrity of the facility. Refer to Maryland Department of the Environment Stormwater Design Manual Appendix A.1 for more information.

These restrictions do not supersede perimeter landscaping requirements. Stormwater management facilities must be located to avoid conflict with perimeter landscape edge plantings.

d. Plantings within a SWM facility

Planting within SWM facility basin shall be in accordance with the most current Maryland Department of the Environment (MDE) manual.

e. Native Plants, Biodiversity, Plant Communities

Plantings required around SWM areas shall meet the Native Plants & Biodiversity requirements outlined in **Section 4.1**. Plants that are associated with stream, pond or wetland habitat provide an attractive character for such facilities but should be used only if suited to site conditions.

Additionally, creating ***plant communities*** with SWM plantings and SWM landscape edge plantings is encouraged. Include layers of herbaceous perennials and grasses using the substitution chart shown in **Table 2** in addition to trees and shrubs to create a robust ***plant community.***

3.2.12 Historic Structures and Areas

For ***developments*** adjacent to or adjoining historic properties:

- A Type D landscape edge may be required.

Evergreen trees create solid ***buffers*** between proposed ***developments*** and adjoining existing historic properties. Layout of required planting should respond to the site's and adjoining property's historic context, and designers should consider whether a staggered or naturalistic design or a formal ***hedge*** is more appropriate.

Supplemental planting may be required, particularly when there are modifications to the historic environmental setting. Preservation of existing specimen trees, ***hedge*** rows, woods, and terrain contribute to the setting of a historic property.

Chapter Four Plant Selections

Chapter 4 Plant Selections

Plant material selected should be appropriate to the specific environmental conditions created and/or existing on project sites, including site specific microclimates, and should survive environmental stresses of their proposed location. Additionally, plant materials may be selected to provide screening of potentially objectionable views (e.g. from residential properties), to provide barriers to potentially undesirable relationships (e.g. to pedestrian circulation), or used to enhance an amenity feature. In the first case, evergreen trees may be preferred; in the second case, dense shrubbery might be provided; in the latter case, plants with ornamental characteristics would be preferred.

4.1 Native Plants & Biodiversity

Native plants and plant ***biodiversity*** are important factors in supporting a wide range of animal species and influencing vital ecosystem functions like biomass production and soil health.

Native plants are well-adapted to the local environment, which makes them crucial for maintaining ***biodiversity*** and supporting the health of the ecosystem. Prioritizing native plants can help with things like:

- ***Supporting Wildlife***: Native plants provide food and shelter for local wildlife, such as pollinators (bees, butterflies) and other animals.
- ***Soil Health:*** Native plants help maintain soil structure and prevent erosion. Their root systems can improve water retention and nutrient cycling in the soil.
- ***Invasive Species Control:*** Encouraging the growth of native plants can help reduce the spread of ***invasive species*** that often disrupt local ecosystems.
- ***Climate Resilience:*** Native plants are better suited to handle local climate conditions, making them more resilient during changes like droughts or heavy rainfall.

The purpose of the following requirements is to increase the use of native plants and to support botanical ***biodiversity*** in Howard County.

DPZ recognizes that there may be some projects for which strict adherence to these requirements may not be feasible or practical. The plan preparer may propose an alternative that will be reviewed by DPZ on a project-by-project basis. See **Section 2.7.2** of this manual.

4.1.1 Native Plants Requirements

Native plant species are required for the following site conditions:

- Perimeter Landscape Edges (3.2.2)
- Residential Development Internal Landscaping (3.2.8)
- Recreation Open Space (3.2.9)
- Ground-Mount Solar Collectors (3.2.10)

- Stormwater Management Facilities (3.2.11)

Landscape Plan plant schedules shall identify the proposed plant species that meet the native requirements.

Refer to Section 4.1.3 for guidance on determining acceptable native species.

Refer to Section 4.5 and Section 4.6 for strictly prohibited invasive species and non-native species that are not suitable for certain conditions.

a. Percentage of plant palette required to be native

Requirements are as follows:

Table 11 – Minimum percentage of plants required to be native species	
Plant Type	**Percentage Native**
Shade Trees	70%
Small Deciduous Trees	70%
Evergreen Trees	40%
Shrubs	60%
Herbaceous Perennials/Grasses	80%

4.1.2 Species Diversity Requirements

By providing a greater number of unique species in a project's proposed plant palette, this requirement is intended to support plant ***biodiversity*** and help reduce the negative impacts of monocultures.

Some genera (e.g. Acer spp., Ilex spp.) include several native and ***non-native species***. In cases where a single genus dominates the proposed plant palette, DPZ may require that some species be exchanged with those of another genus.

These requirements are not intended to discourage appropriate design decisions (i.e. plant massing, cohesive plant palettes, repetitions, etc.)
Requirements for all land use / development types:

Table 12 – Species diversity, Trees	
Number/Qty of Plants per Plant Type - Trees	**Maximum Percentage of one species**
1-10	100%
11-30	50%
31-60	40%
61-100	25%
101+	20%

Table 13 – Species diversity, Shrubs	
Number/Qty of Plants per Plant Type - Shrubs	**Maximum Percentage of one species**
1-10	100%
11-50	50%
51-100	30%
100-250	15%
250+	10%

4.1.3 Native Plants Selection

For the purpose of the Landscape Manual, native plants are generally defined as:

> **plant species that occur naturally in their ecoregion and habitat where, over the course of evolutionary time they have adapted to physical conditions and co-evolved with the other species in the system.**

Ecoregions are identified by the US EPA Level IV & III Ecoregions, refer to DPZ Landscape Manual webpage for supporting documents and reference links.

While straight species of native plants is preferred, to meet the requirements for native plant species per Section 4.1.1, cultivars of natives as defined above may also be used. However, recommendations for choosing cultivars are as follows:

- Prioritize straight species: It is recommended to use straight species of native plants, especially those sourced locally, and it is highly recommended to do so for ecological restoration projects.
- Choose wisely: If using cultivars, select those that are as close to the original native species as possible in terms of traits that affect wildlife (e.g., flower color, bloom time).
- Balance species and cultivars: When using cultivars in designed landscapes, include a mix of both cultivars and straight species to provide a range of benefits for wildlife.
- Research specific cultivars: Before planting, research the specific cultivar to understand its potential impact on wildlife and the environment.
- Consider local ecotypes: If possible, prioritize plants from local ecotypes (geographic origins) as they are likely to be best adapted to the local environment.
- Encourage nurseries to stock straight species: Support nurseries that offer straight species of native plants

Resources for and lists of native plants that generally meet the definition above can be found on the DPZ Landscape Manual webpage.

4.2 Street Tree Selection Criteria

Please also refer to the Howard County Design Manual, Volume III, Complete Streets and Bridges. Criteria here is not intended to conflict or replace the requirements in the Design Manual. Where conflicts are noted, the Complete Streets Design Manual prevails. The following criteria must be addressed when selecting street trees for a particular location:

- Trees must fit the space limitations when mature. The species, ultimate size of the tree and the canopy desired should be appropriate to the size of the right-of-way and the road classification (i.e., local, collector or arterial road).

- Trees should be selected to survive the environmental stresses of the proposed location. The recommended street tree list includes trees selected for appropriate branching habits, tolerance of local environmental conditions such as soil and rainfall, and have relatively low susceptibility to pests and disease.
- Shade trees are preferred as street trees.
- Street trees shall be selected and located to minimize conflict between tree canopy/limbs and tall trucks and buses.
- Small trees may be desirable to provide variety in the streetscape. However, small trees are not permitted in situations where they inhibit sight distance, conflict with pedestrian circulation or create maintenance problems.
- Small trees will be permitted under the following conditions and in the following locations:
  - Within street rights-of-way when:
    - no sidewalk is required;
    - the distance between the curb and the sidewalk is 8 feet or greater; or
    - the tree may be pruned to 8 foot clear trunk without destroying the shape of the crown of the tree.
  - In street tree maintenance easements adjacent to the right-of-way.
  - In median strips of divided highways, provided that trees are located a minimum of 20 feet from the nose of the median island and will not interfere with travel lanes when mature.
- Small trees, with a mature height of 25 feet or less, must be selected for planting under power lines when planting beneath the power lines cannot be avoided.
- No needle evergreen trees will be permitted in a public right-of-way.
- No thorn bearing trees or trees with rigid, sharply pointed leaves (such as holly trees) will be permitted adjacent to sidewalks.
- Every effort shall be made to diversify species and cultivars of species of trees planted on different streets or between blocks on very long streets. This practice provides for long term survival of the landscape, should one species suffer a blight or infestation of an introduced pest.
- Street trees should be selected so that the County's roadway network exhibits a variety of species with differing colors, textures and forms.

4.3 Recommended Street Trees

The Recommended Street Trees list is not comprehensive and is not intended to limit proposed street trees to the species on this list. Other plant species or cultivars may be considered for street tree planting upon a request for approval from the Department of Planning and Zoning (DPZ) and the Department of Public Works (DPW).

Refer to **Section 3.2.3.f** for street tree spacing requirements for guidance and **Section 3.2.4** for locating street trees beneath overhead wires.

Recommended Street Tree List can be found on the DPZ Landscape Manual webpage.

4.4 Recommended Plants

The Recommended Plants list is not comprehensive and is not intended to limit landscape architects or other approved design professionals from choosing plant material not included in this list. The recommendations are provided for guidance only. Professionals are encouraged to create the best designs for each unique project that meet the intent of the landscape regulations.

Recommended Plants List can be found on the DPZ Landscape Manual webpage.

4.5 Prohibited & Limited Plants

Invasive species per **Section 4.6** of the Landscape Manual are prohibited. For convenience, the Prohibited and Limited Plants list highlights several exotic invasive trees and shrubs that have been historically used and/or are commonly found in the landscape.

Additionally, the Prohibited and Limited Plants list includes plants that are prohibited or strictly limited for planting use because of their associated problems with disease, pests, undesirable characteristics, maintenance issues and liability concerns.

Prohibited & Limited Plants List can be found on the DPZ Landscape Manual webpage.

These lists are not comprehensive and are subject to change. Landscape Architects and design professionals are expected to maintain relevant continuing education and training requirements that will inform plant selection without reliance on lists from DPZ.

4.6 Invasive Species

Invasive species are prohibited and shall not be used on ***development*** projects. Any existing tree proposed to meet Landscape Manual requirements shall not be an ***invasive species***.

Additionally, existing vegetated areas to be retained that contain ***invasive species*** should conform to the requirements of the Landscape Manual. ***Invasive species*** found on site should be removed to allow for long-term health of the landscape, and in some cases, eradication may be required.

Plantings proposed to meet landscape requirements shall not include species identified by the Maryland Department of Agriculture's "Maryland Invasive Plants Prevention and Control" program and/or species identified in "Invasive Species of Concern in Maryland" by the Maryland Invasive Species Council (as updated periodically).

Please see Links and Resources on the DPZ Landscape Manual webpage for referenced resources and additional information.

4.7 Substitutions

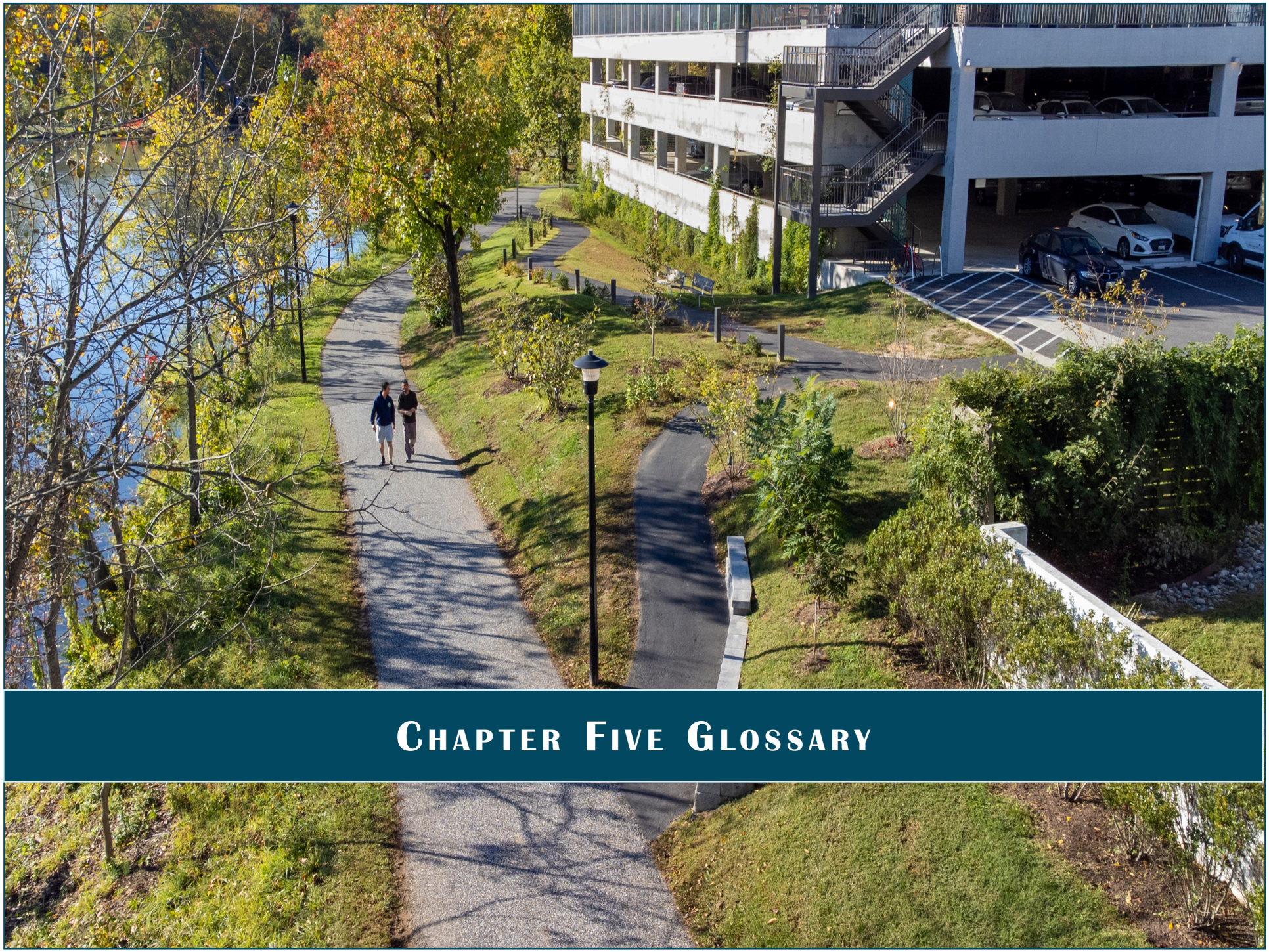
The Landscape Architect or design professional should indicate on the landscape plans if prior approval is necessary for substitutions made at the time of installation and clarify if the approval should be sought from the Design Professional or the Department of Planning and Zoning. Examples of when prior approval by DPZ is required include, but is not limited to, the following:

- A Landscape Plan that was part of an approval for a Conditional Use plan
- Landscape Plan modifications made a part of the Planning Board approval
- Additional Landscaping recommended through Design Advisory Panel (DAP) motions and endorsements
- Creation of a Zoning overlay approved by the Zoning Board
- A Landscape Plan meeting other Design Manual criteria

When permitted, minor plant substitutions may be made to an approved planting plan at time of installation within the following limits:

- The number, size and location of plants has not changed.
- The general type of plant remains the same (shade tree, evergreen tree, small deciduous tree) and the substitute plant is included in the recommended plant lists.
- The ***biodiversity*** requirements outlined in **Section 4.1.2** are maintained.

When equal substitutions are made, no prior approval is needed from the Department of Planning and Zoning; however, a revised plant list must be submitted with the required 1 year plant warranty prior to release of surety. If changes in the general type of plant material are to be made or if a change in an optional treatment is proposed, written authorization must be requested from the Department of Planning and Zoning. In such a case, the Department may require the landscape plan to be revised utilizing the “red-line revision process.”



Chapter Five Glossary

Chapter 5 Glossary

* As defined in referenced regulations and manuals

Active recreation activities – for the purpose of the open space landscape requirements, a variety of activities that require sufficient unobstructed space to perform comfortably; examples include frisbee, yoga or tai chi, playing catch or tag, lawn games, etc.

Bee City USA – a national program, run by the Xerces Society for Invertebrate Conservation, that mobilizes communities to protect pollinators by creating pollinator-friendly habitats, reducing pesticide use, and engaging residents through educational events. The program provides a framework for cities, towns, and counties to become certified affiliates by making commitments to conservation. Howard County's Bee City program is administered through the Office of Community Sustainability.

Berm – an earthen mound designed to buffer adjacent uses, screen undesirable views, reduce noise, etc.

Biodiversity – the variety and variability of plant life within a specific region, encompassing the different species of plants, their genetic diversity, and the ecosystems they inhabit. Plant biodiversity is crucial for a healthy ecosystem. Diverse ***plant communities*** support a wide range of animal species, provide essential resources like food and medicine, and contribute to ecosystem stability.

***Buffer Zone** – see Howard County Design Manual, Volume III, Complete Streets and Bridges

Buffer / Buffering – the use of landscape materials to lessen the visual impact of a use, or to visually or physically separate uses, while not necessarily shielding a structure or use from view (see "Screen").

Caliper – tree diameter measured above the root collar in accordance with ANSI Z60.2 American Standard for Nursery Stock, latest edition.

Deciduous – a plant with foliage that is shed annually.

DPZ – the Howard County Department of Planning and Zoning.

Development – the establishment of a principal use of a site; a change in a principal use of a site; or the improvement or alteration of a site by the construction, enlargement, or relocation of a structure; the provision of stormwater management or roads; the grading of existing topography; the clearing or grubbing of existing vegetation; or any other nonagricultural activity that results in a change in existing site conditions, including increasing number of dwelling units.

***Driveway** – see Subdivision and Land Development Regulations Sec. 16.108(b)(18.1)

Evergreen – a plant with foliage that persists and remains year-round.

***Forest** – see Planning, Zoning and Subdivisions and Land Development Regulations Subtitle 12 Forest Conservation Sec. 16.1201(g)

***Forest Conservation** – see Planning, Zoning and Subdivisions and Land Development Regulations Subtitle 12 Forest Conservation Sec. 16.1201(h)

***Forest Conservation Plan** – see Planning, Zoning and Subdivisions and Land Development Regulations Subtitle 12 Forest Conservation Sec. 16.1201(j)

Hedge – a linear boundary or 'live fence' formed by shrubs, or sometimes small trees or a combination of trees and shrubs, planted very close together and trained to form a barrier, provide privacy, or mark the boundary of an area, such as between neighboring properties

Internal lots or parcels within the same development – Existing lots internal to a recorded subdivision that received Howard County approval as defined in Section 16.108(b)(44)(i)&(ii) of the Subdivision and Land Development Regulations which have not been reconfigured or resubdivided and where the number of dwelling units has not increased. Note that when an increase in dwelling units is proposed, the development is subject to perimeter landscape requirements.

Internal Road – the portion of a roadway that is primarily intended for access and circulation within a ***development*** and is a minimum of 30 feet in length. An internal road is not a ***parking lot*** aisle, mini-warehouse service lane, passenger/parcel pickup lane or drive-thru service lane.

Invasive Species – For purposes of this manual, invasive species are those identified in (1) Invasive Species of Concern in Maryland (as updated periodically by the Maryland Invasive Species Council), or (2) Plant Invaders of Mid-Atlantic Natural Areas, published by the National Park Service, U.S. Fish and Wildlife Service (as updated periodically). See DPZ Landscape Manual webpage for links to referenced resources.

Maintenance Agreement – a legally binding agreement to ensure the survivability of all sites afforested, reforested or landscaped.

Native Species (Native Plant) – plant species that occurs naturally in its ecoregion and habitat where, over the course of evolutionary time it has adapted to physical conditions and co-evolved with the other species in the system. Ecoregions as identified by the US EPA Level IV & III Ecoregions.

Non-native Species (Non-native Plant) – (also called non-indigenous, alien, or exotic) a plant that was introduced, accidentally or purposefully, into an ecosystem through human activities and did not evolve in or migrate to a specific area. Non-native species can come from other continents, other countries and other parts of the United States.

***Open Space** – a separate lot or area which provides for protection of the environment, for recreation or for public use, including public facilities such as schools, libraries, fire stations and parks as shown on the general plan or hiking, biking, and equestrian trails. (16.108(b)(33))

Open Space Access Point – refer to Section 16.121 (e) of the Subdivision and Land Development Regulations

***Parking Area** – see Zoning Regulations (Section 103.0 – Definitions)

***Parking Lot** – see Zoning Regulations (Section 103.0 – Definitions)

Parking Lot, 'Solar-Ready' – a parking lot intentionally designed to have solar canopies installed over a portion of or all the parking spaces in a future design and/or construction phase

Perimeter Landscape Edge – the area around the perimeter of a ***development*** reserved for ***buffer*** or ***screen*** plantings. In certain developments or uses, there may be a minimum width required.

Plant bed – a designated area where shrubs, herbaceous perennials and perennial grasses, and sometimes trees, are grouped together and separated from the lawn or other surrounding landscape surface; mulched and edged or raised to provide better definition and ease of maintenance

Plant community – an assemblage of plants that co-exist in a similar environment. Different communities are defined by their structure, form, and species composition. Plant communities are both spatially and temporally dynamic. For the purpose of requirements in this manual, a plant community should consist of overstory and understory trees and shrubs combined with herbaceous perennials and grasses that are compatible and complementary to each other in providing wildlife habitat and forage opportunities.

Revision plat – a legal document that makes changes to an existing, recorded subdivision plat. It is used for minor or major corrections, such as adjusting lot lines, consolidating lots, creating or moving easements, without creating new lots.

Root barrier – a physical barrier, often made of materials like high-impact plastic, polypropylene, or geotextile fabrics, installed vertically into the ground, to protect structures like foundations, driveways, and sidewalks from potential damage caused by tree or plant roots by blocking, deflecting or redirecting roots away from hardscapes

***Scenic Road** – see Planning, Zoning and Subdivisions and Land Development Regulations Subtitle 14 Scenic Roads (Sec. 16.1402)

Screen – a type of buffer used to substantially shield a structure or use from view.

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Shrub – a woody plant, smaller than a tree, which consists of a number of small stems from the ground or small branches near the ground. May be deciduous or evergreen.

***Sidewalk** – see Subdivision and Land Development Regulations Sec.16.108(b)(50)

Sight Triangle – a triangular zone at intersections and ***driveways*** that must be kept clear of any obstructions to provide drivers with an unobstructed line of sight. Refer to Howard County Design Manual Volume III Complete Streets and Bridges for more information regarding intersection sight distance.

Solar Canopy over Parking – a ground-mount solar collector that is designed to be installed over parking spaces in a parking lot

***Solar Collector Facility, Commercial Ground-Mount** – see Howard County Zoning Regulations Sec. 103.0

***Solar Collector, Accessory Ground-Mount** – see Howard County Zoning Regulations Sec. 103.0

Specimen Tree – a tree with a diameter at breast height (dbh) of 30 in. (75 cm) or more, or a tree having 75% or more of the diameter of the current state champion for that species. This includes champion trees, which are the largest trees of their species within the United States, the state, county, or municipality as determined by the Maryland Department of Natural Resources.

Street Tree – a shade tree planted within a public right-of-way or within a street tree maintenance easement adjacent to a roadway with the intent to provide shade over the street or sidewalk and to give the street a sense of spatial definition. The minimum ***caliper*** of a street tree at time of planting shall be 2½ inches, in accordance with ANSI Z60.2 American Standard for Nursery Stock, latest edition.

Tree – a large, branched, woody plant having one or several self-supporting stems or trunks that reach a height of at least 20 feet at maturity.

Tree, Evergreen – an evergreen plant with a mature height typically exceeding 15 feet. Minimum height at planting shall be 6 feet, or size in accordance with the current recommended plant list on the DPZ Landscape Manual supporting documents webpage, in accordance with ANSI Z60.2 American Standard for Nursery Stock, latest edition.

Tree, Multi-stem/Multi-trunk – tree with multiple stems (trunks) as described in the ANSI Z60.2 American Standard for Nursery Stock, latest edition.

Tree, Shade – a deciduous (or rarely, an evergreen) tree planted primarily for its high crown of foliage or overhead canopy with a mature height of 30 feet or greater. The minimum ***caliper*** at time of planting shall be 2½ inches, and the minimum height for multi-stem/multi-trunk trees shall be 12 feet, both in accordance with ANSI Z60.2 American Standard for Nursery Stock, latest edition.

Tree, Small – a deciduous or evergreen tree that generally does not exceed a height of 30 feet at maturity.

Tree, Small Deciduous – a deciduous tree planted primarily for its ornamental value (typically flowers), or for screening, and generally does not exceed a height of 30 feet at maturity. The minimum ***caliper*** for single stem trees at the time of planting shall be 1½ inches, and the minimum height for multi-stem/multi-trunk trees shall be 8 feet, or size in accordance with the current recommended plant list on the DPZ Landscape Manual supporting documents webpage, both in accordance with ANSI Z60.2 American Standard for Nursery Stock, latest edition. A multi-stem small tree must reach a mature height of 15 feet minimum.

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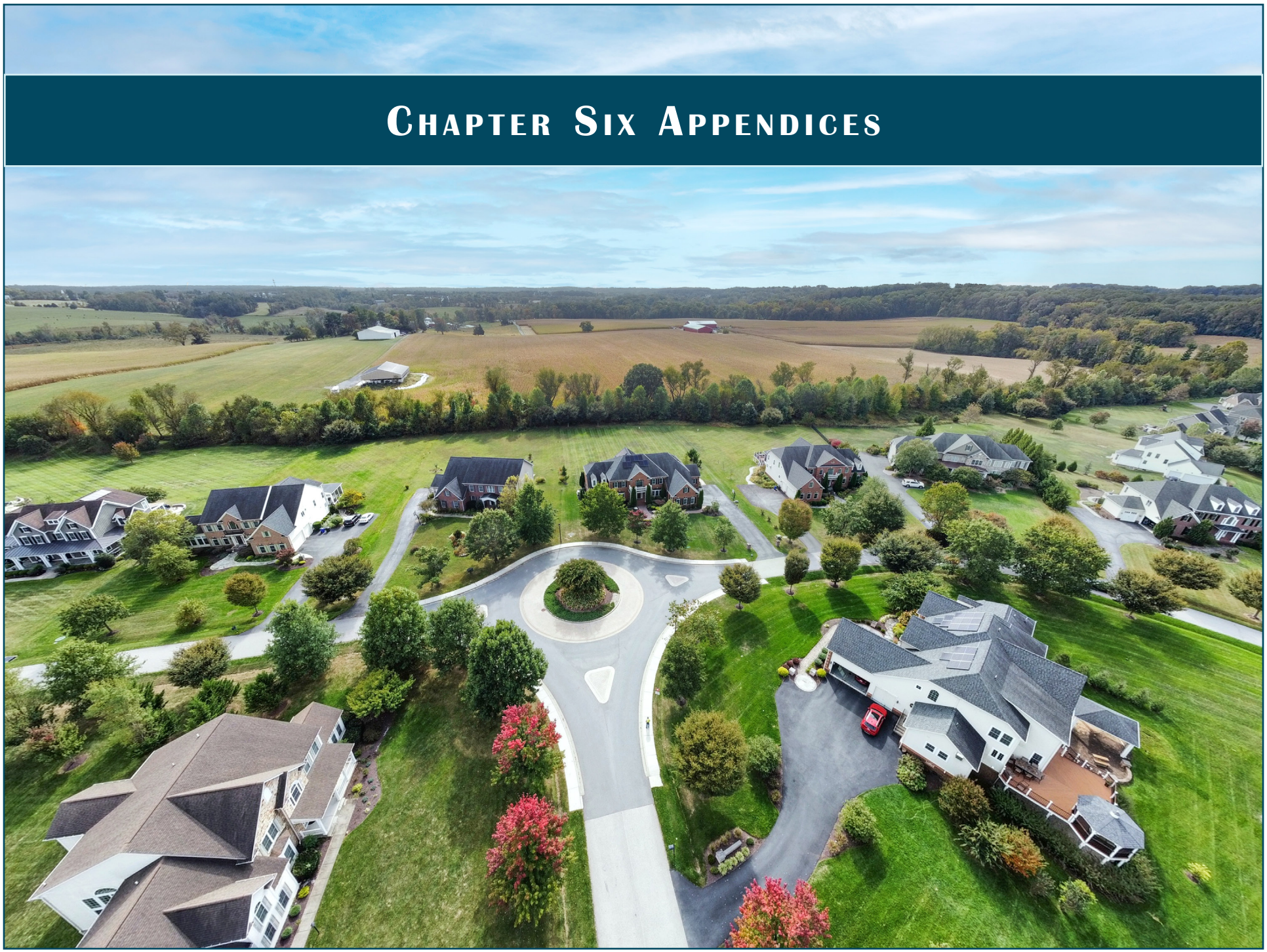
Chapter Six Appendices



Chapter 6 Appendices

Appendix A. Example Diagrams

The diagrams provided herein show examples of how to calculate and apply the standard requirements for several site conditions as outlined in the Landscape Manual. Project sites often have unique site conditions or a specific set of project design criteria that may make strict application of the standard requirements impractical and/or other options may better serve the intent of the landscape requirements. The examples provided do not and cannot address all possible site conditions and are provided for information only.

Refer to **Section 2.7** for other options to meet the regulations.

FIGURE 1A – LANDSCAPE EDGES

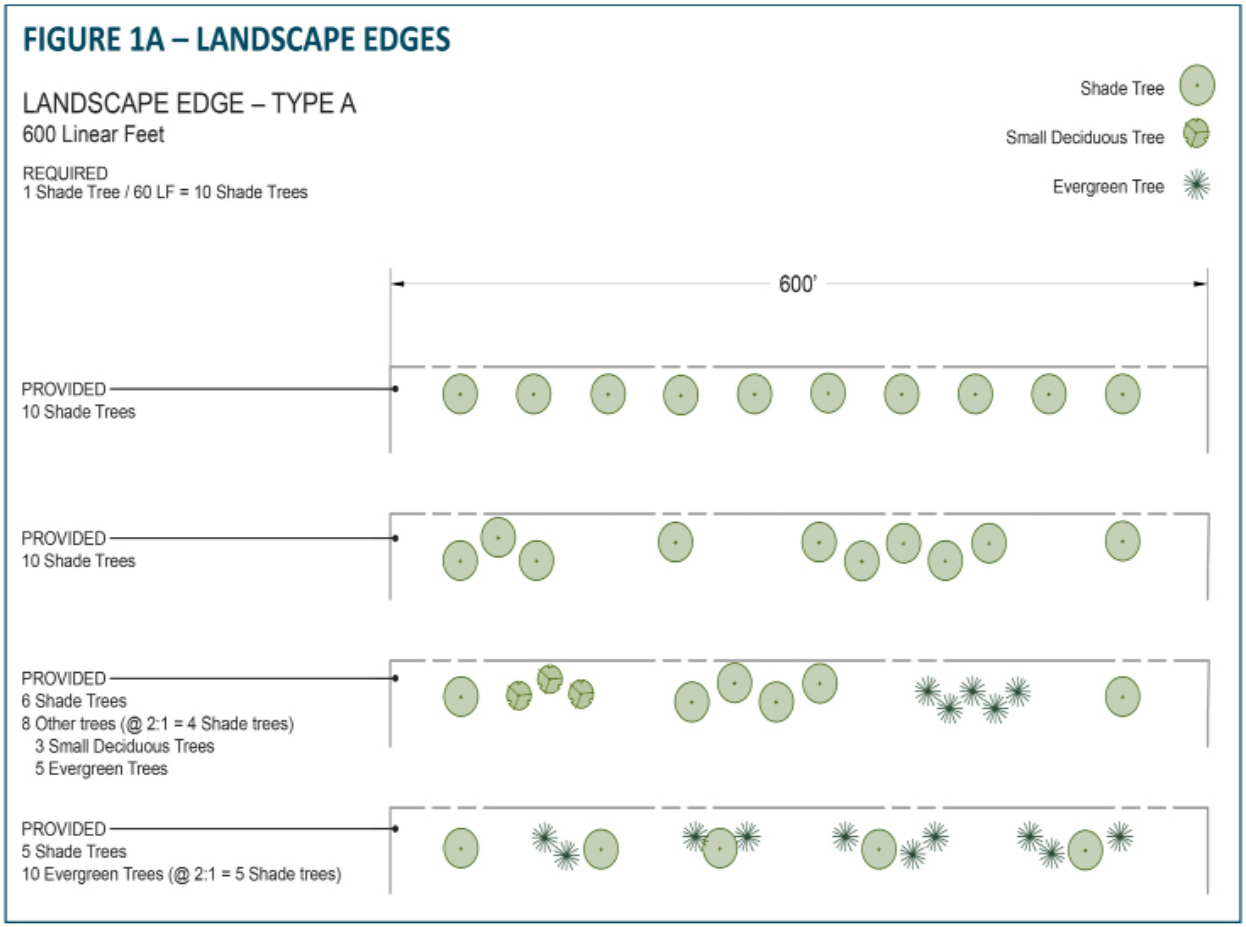
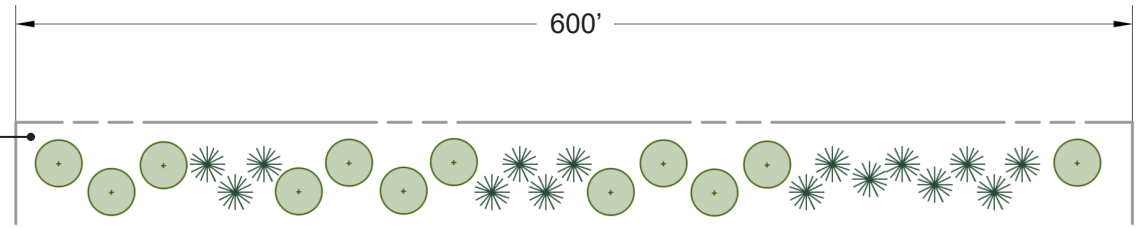


FIGURE 1B – LANDSCAPE EDGES

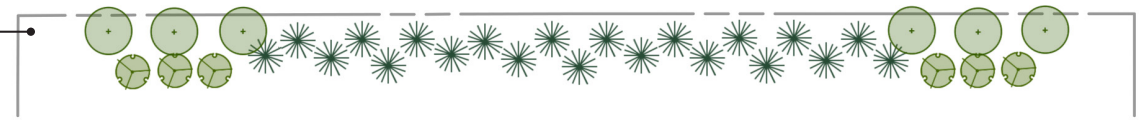
LANDSCAPE EDGE – TYPE B

600 Linear Feet

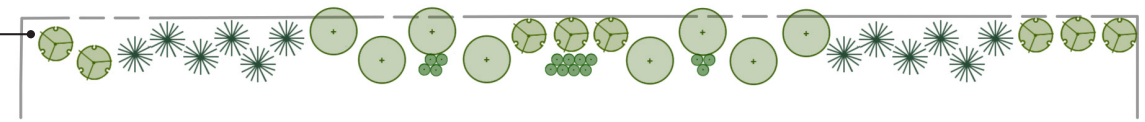
REQUIRED
1 Shade Tree / 50 LF = 12 Shade Trees
1 Evergreen Tree / 40 LF = 15 Evergreen Trees



PROVIDED
12 Shade Trees
15 Evergreen Trees



PROVIDED
6 Shade Trees
12 Other Trees (@ 2:1 = 6 Shade trees)
6 Small Deciduous Trees
6 Evergreen Treees
15 Evergreen Trees



PROVIDED
8 Shade Trees
8 Small Deciduous Trees (@ 2:1 = 4 Shade trees)
12 Evergreen Trees
15 Shrubs (@ 5:1 = 3 Evergreen Trees)

FIGURE 1C – LANDSCAPE EDGES

LANDSCAPE EDGE – TYPE C

600 Linear Feet

REQUIRED
1 Shade Tree / 40 LF = 15 Shade Trees
1 Evergreen Tree / 20 LF = 30 Evergreen Trees
1 Shrub / 8LF = 75 Shrubs

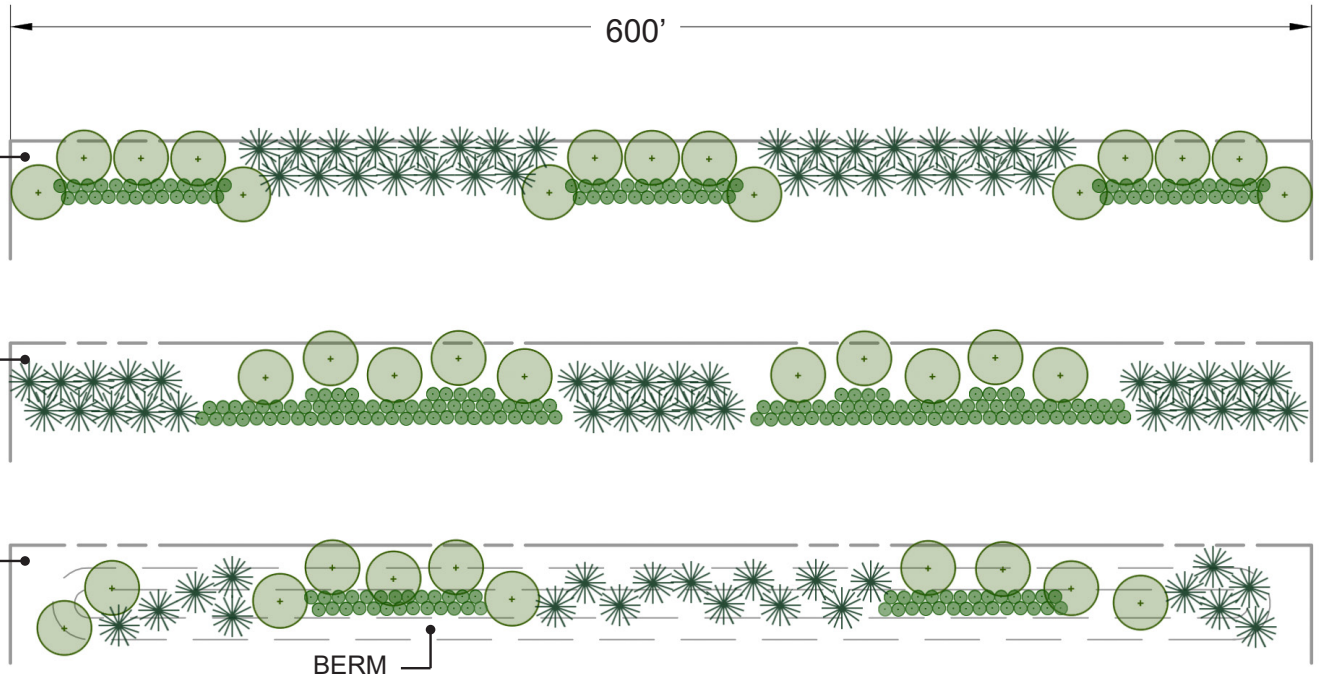
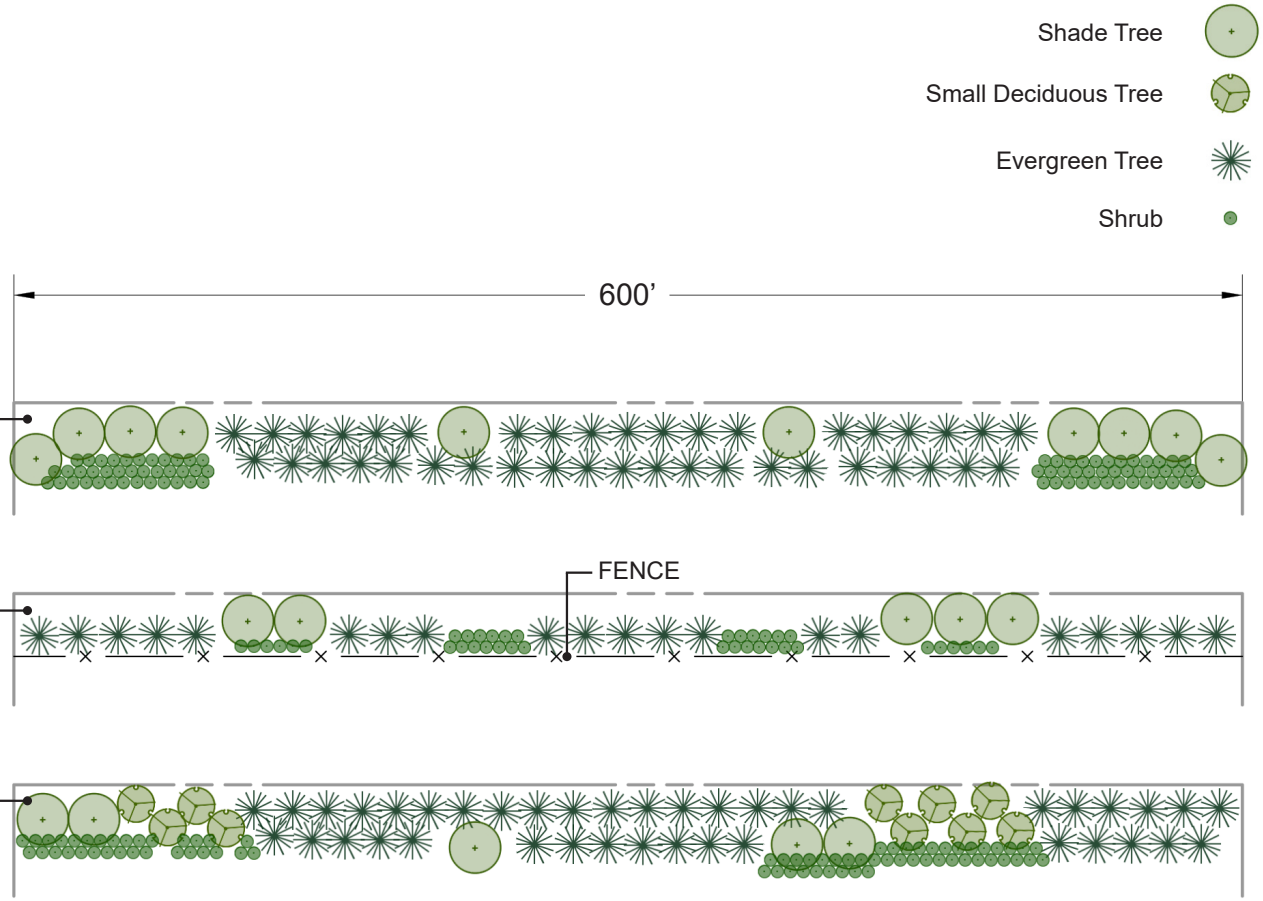


FIGURE 1D – LANDSCAPE EDGES

LANDSCAPE EDGE – TYPE D

600 Linear Feet

REQUIRED
1 Shade Tree / 60 LF = 10 Shade Trees
1 Evergreen Tree / 15 LF = 40 Evergreen Trees
1 Shrub / 8 LF = 75 Shrubs



PROVIDED
10 Shade Trees
40 Evergreen Trees
75 Shrubs

PROVIDED
Solid Fence/Wall to meet 50% Required plants
5 Shade Trees (50% of10)
20 Evergreen Trees (50% of 40)
38 Shrubs (50% of 75)

PROVIDED
5 Shade Trees
10 Small Deciduous Trees (@ 2:1 = 5 Shade trees)
40 Evergreen Trees
75 Shrubs

FIGURE 1E – LANDSCAPE EDGES

LANDSCAPE EDGE – TYPE E

600 Linear Feet

REQUIRED
1 Shade Tree / 40 LF = 15 Shade Trees
1 Shrub / 4 LF = 150 Shrubs

PROVIDED
15 Shade Trees

150 Shrubs

PROVIDED
Solid Fence/Wall to meet 50% Required plants
8 Shade Trees (50% of 15)
75 Shrubs (50% of 150)

PROVIDED
6 Shade Trees
18 Evergreen Trees (@ 2:1 = 9 Shade trees)
0 Shrubs (Berm to meet 100% of Required Shrubs)

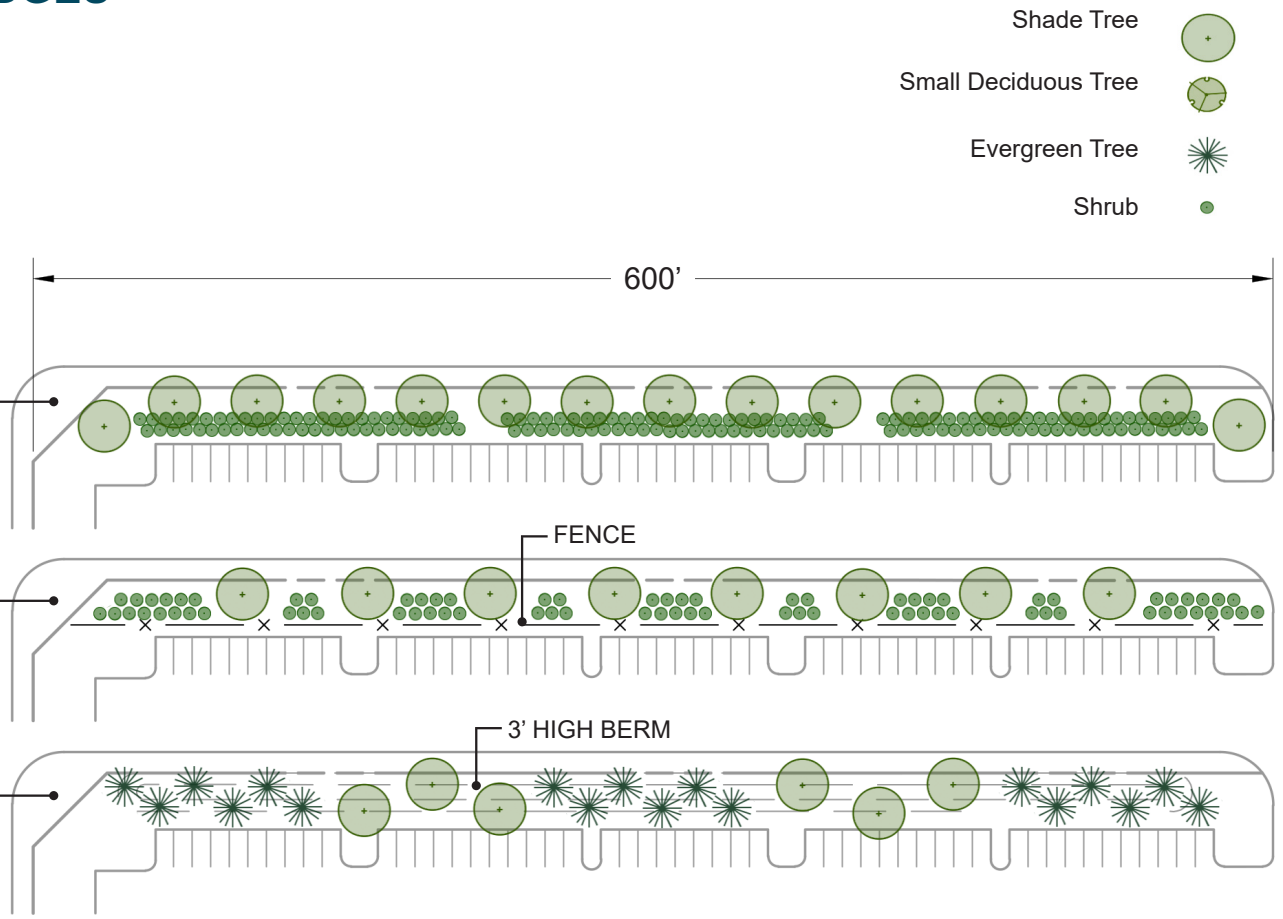


FIGURE 2A – RESIDENTIAL PERIMETER LANDSCAPE EDGES, SINGLE FAMILY DETACHED (SFD)

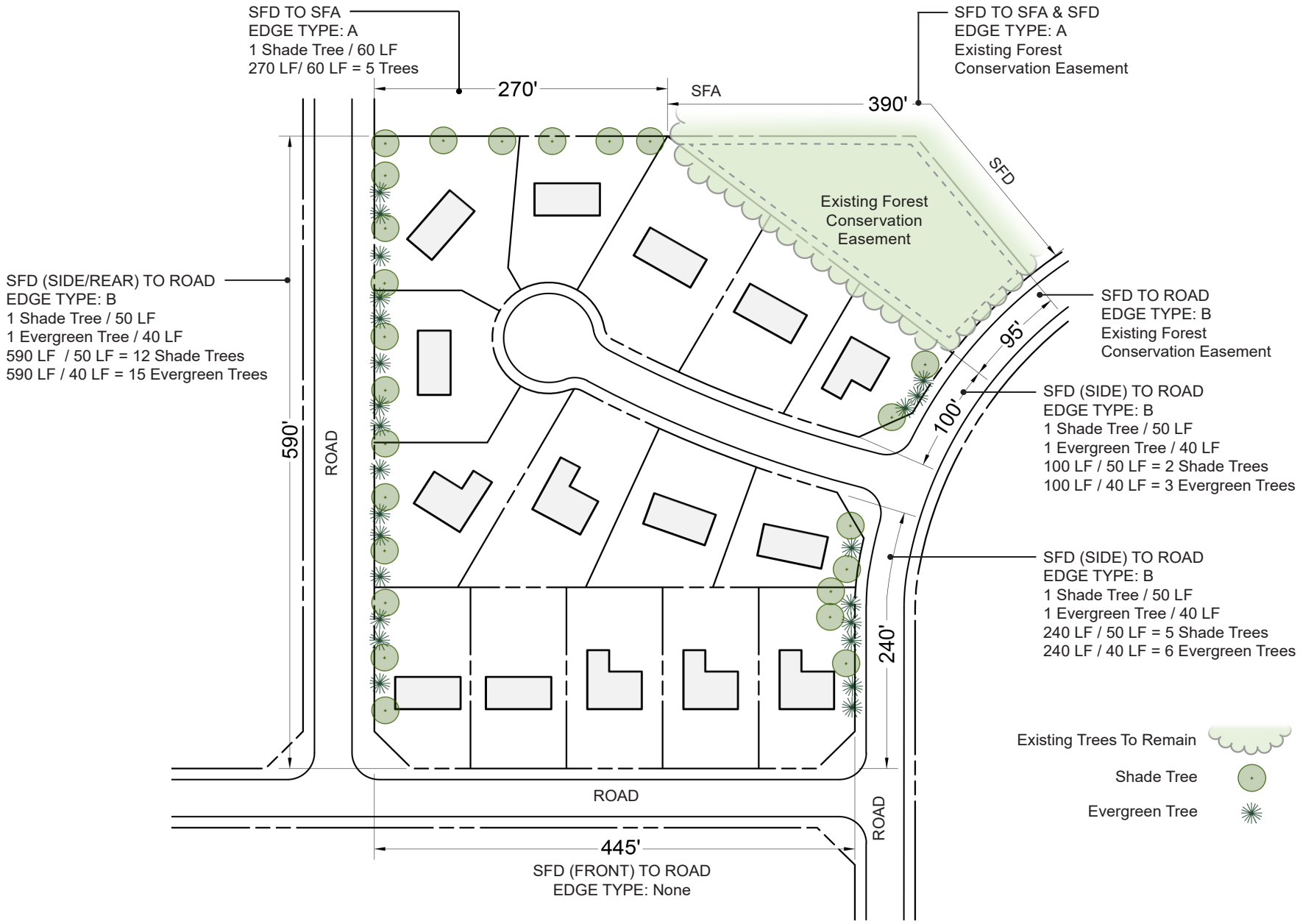


FIGURE 2B – RESIDENTIAL PERIMETER LANDSCAPE EDGES, SINGLE FAMILY ATTACHED (SFA)

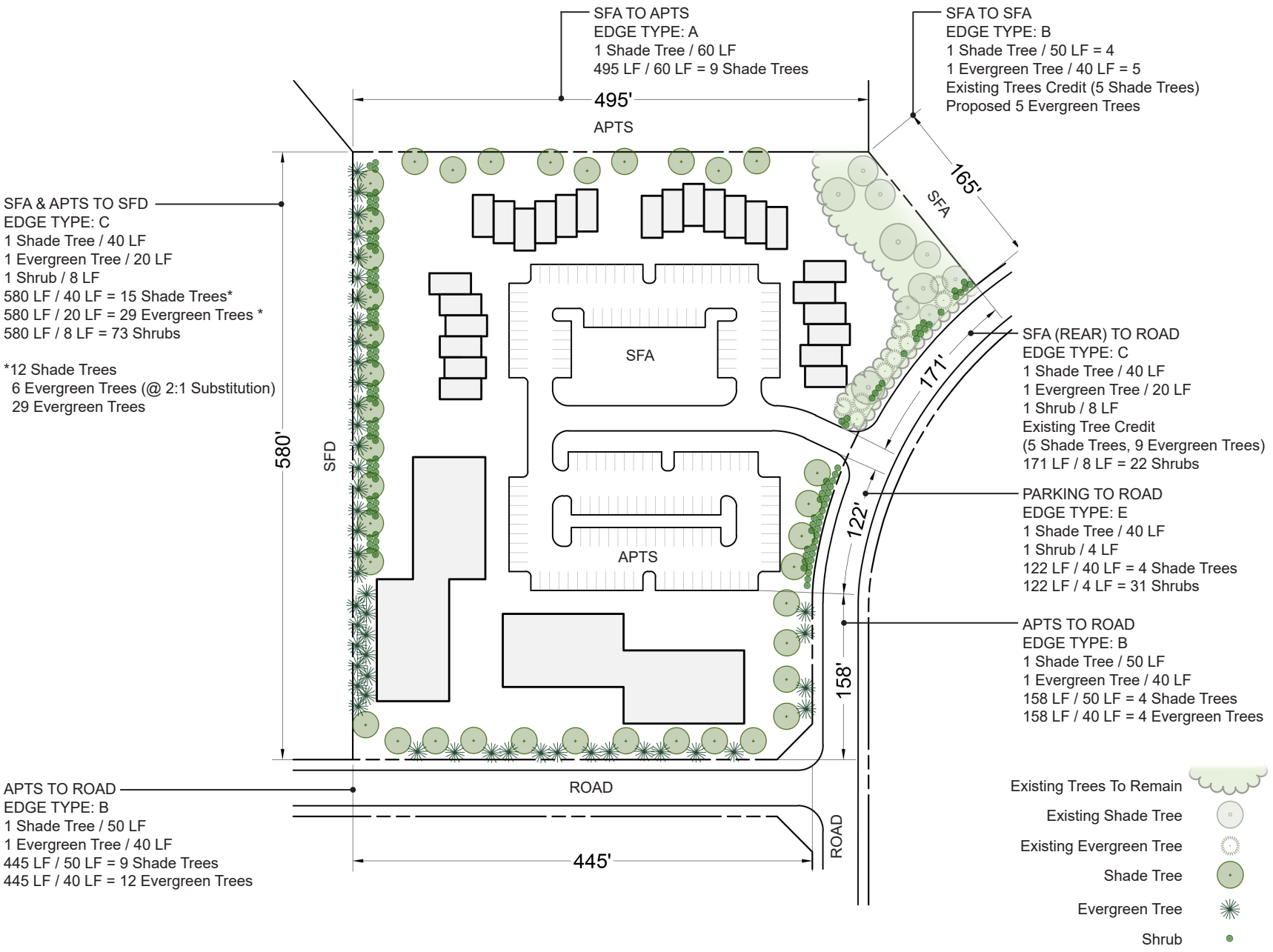


FIGURE 3A – NON-RESIDENTIAL PERIMETER LANDSCAPE EDGES, OFFICE/INSTITUTIONAL

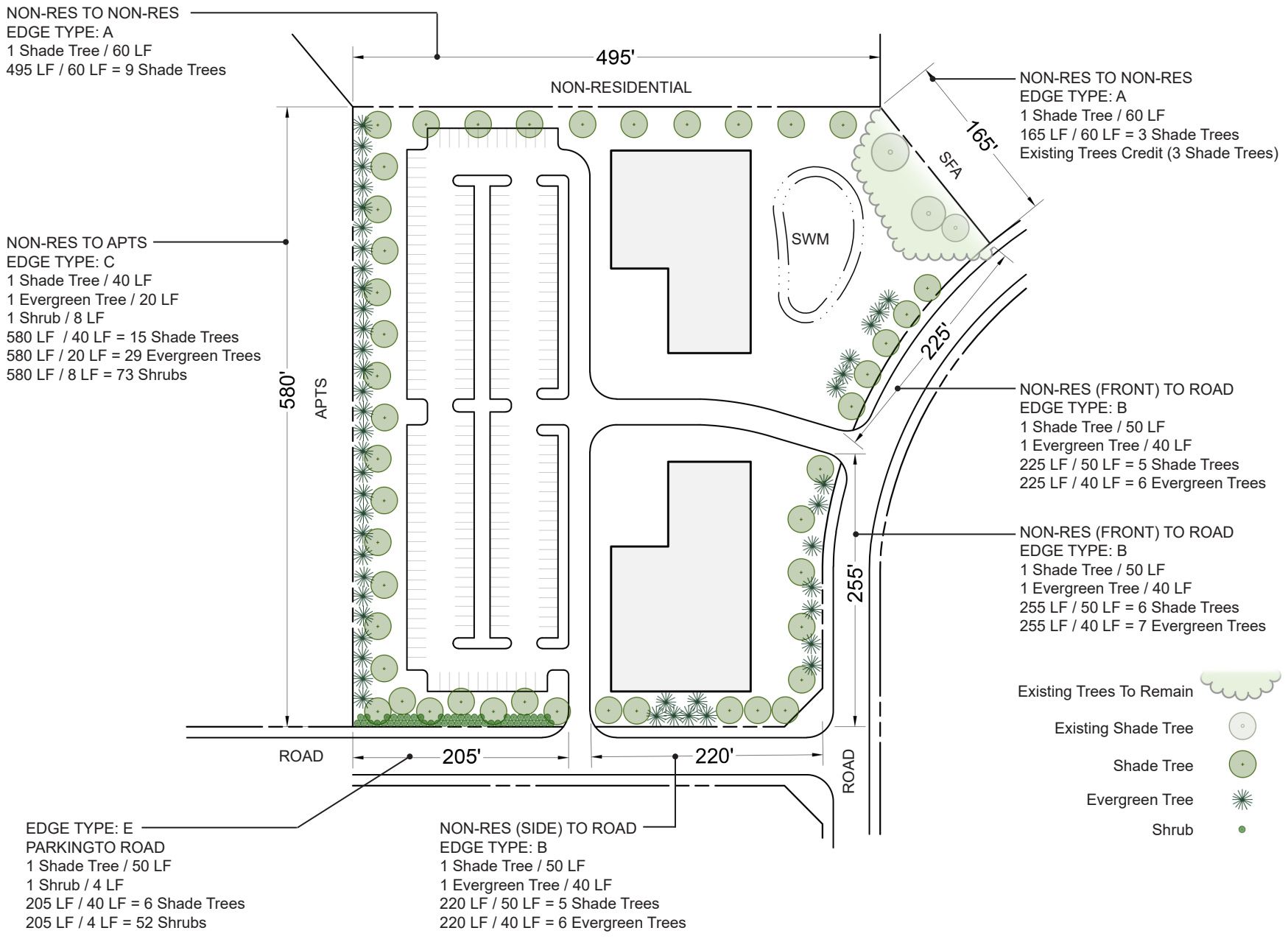


FIGURE 3B – NON-RESIDENTIAL PERIMETER LANDSCAPE EDGES, COMMERCIAL

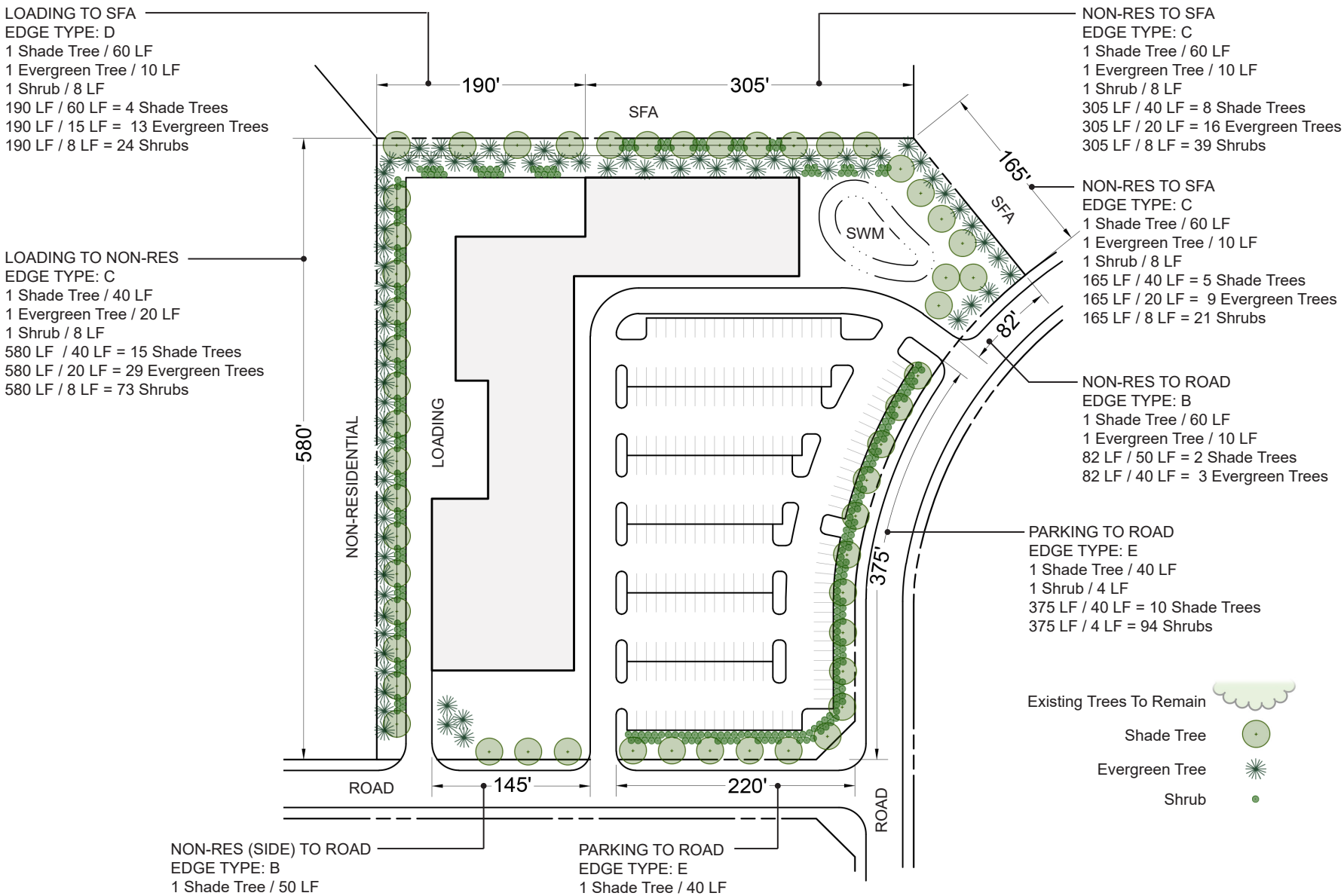


FIGURE 4 – STREET TREE LAYOUT, TYPICAL VS. INFORMAL CLUSTERING

FIGURE 5A – STREET TREE LOCATION CRITERIA

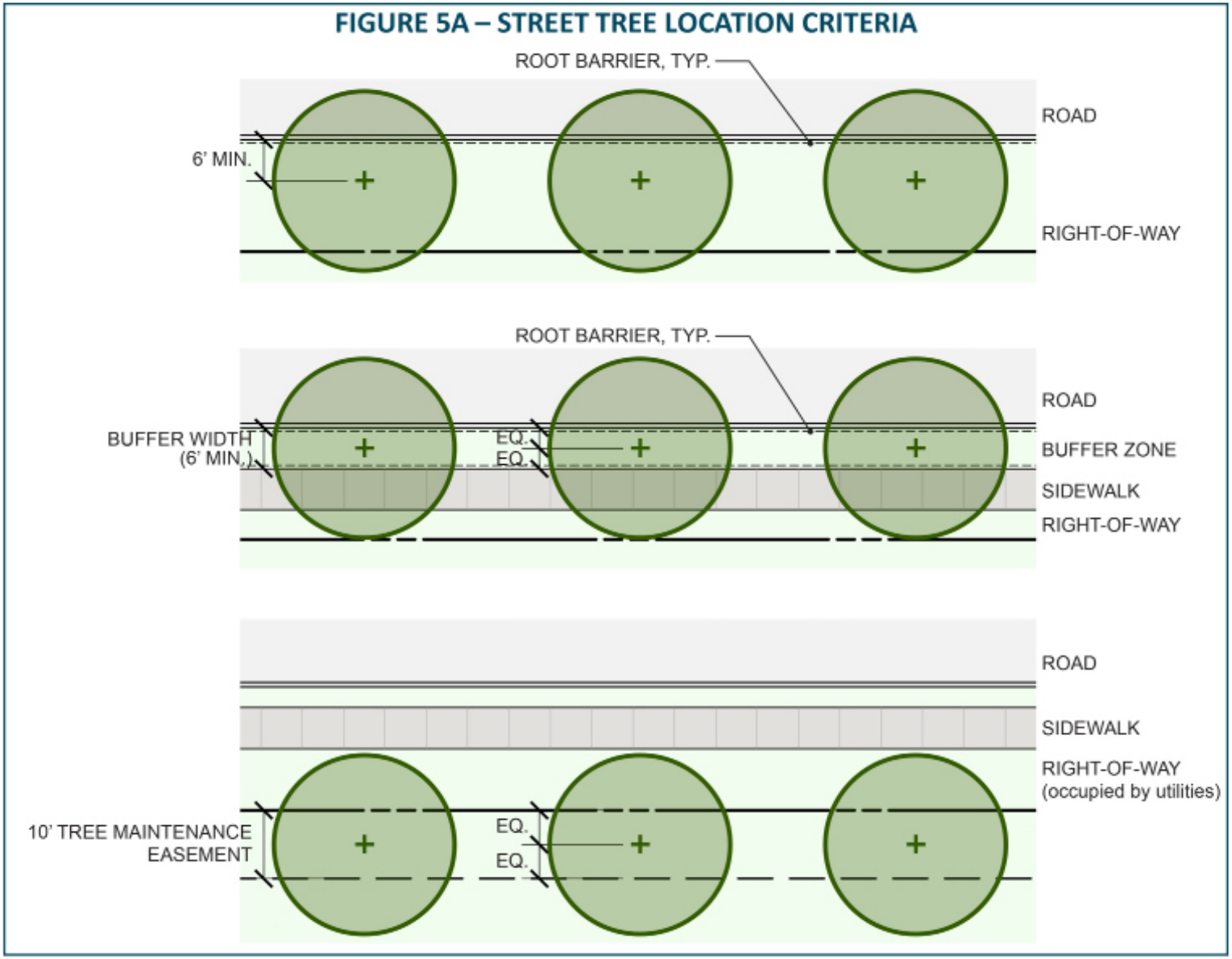


FIGURE 5B – STREET TREE LOCATION CRITERIA

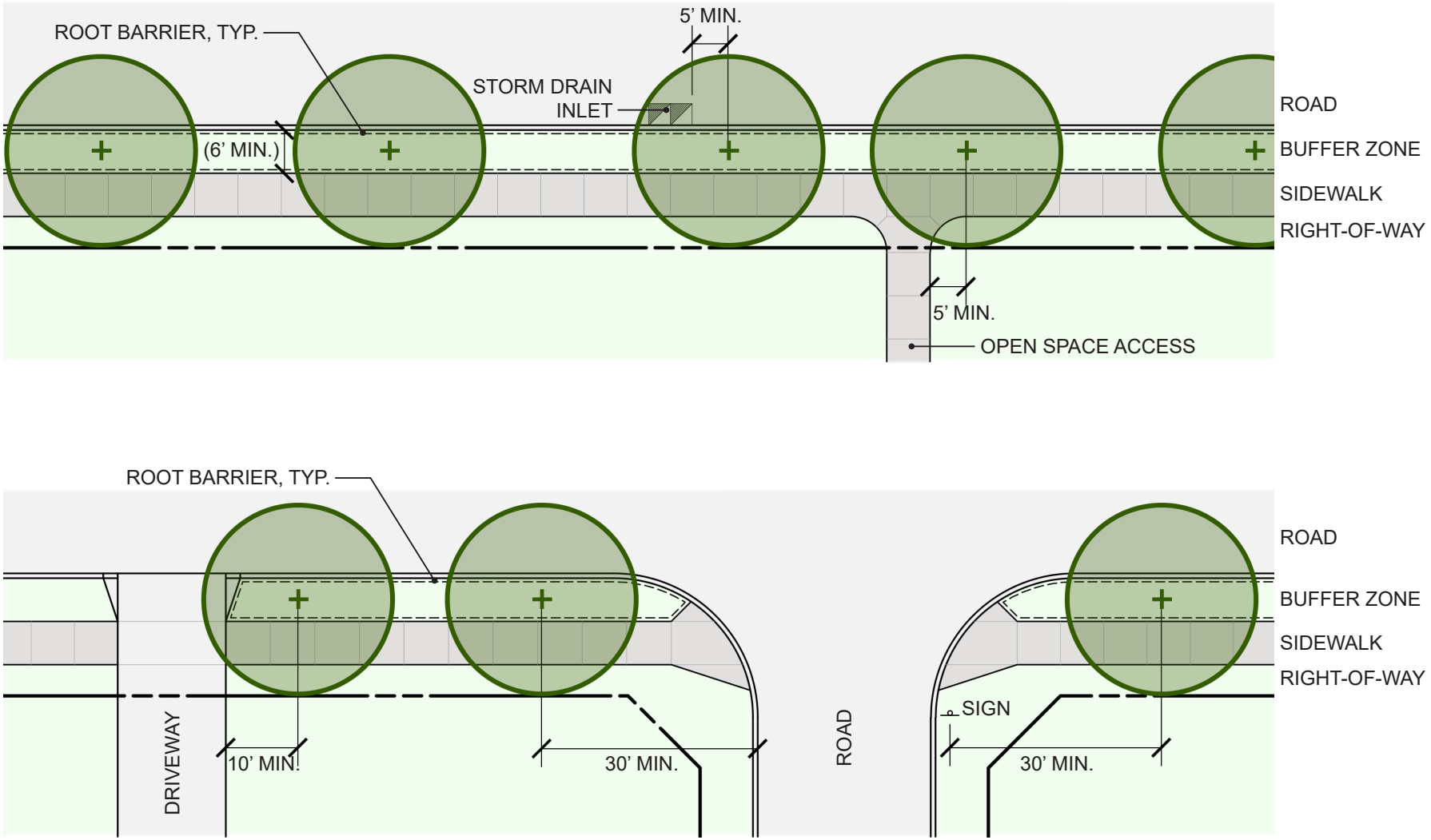
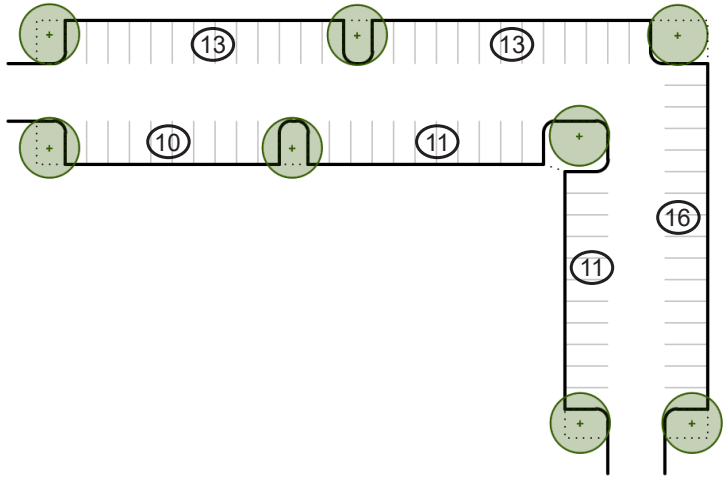


FIGURE 6 – RESIDENTIAL PARKING LOT, INTERNAL LANDSCAPING



Number of Parking Spaces: 74

REQUIRED

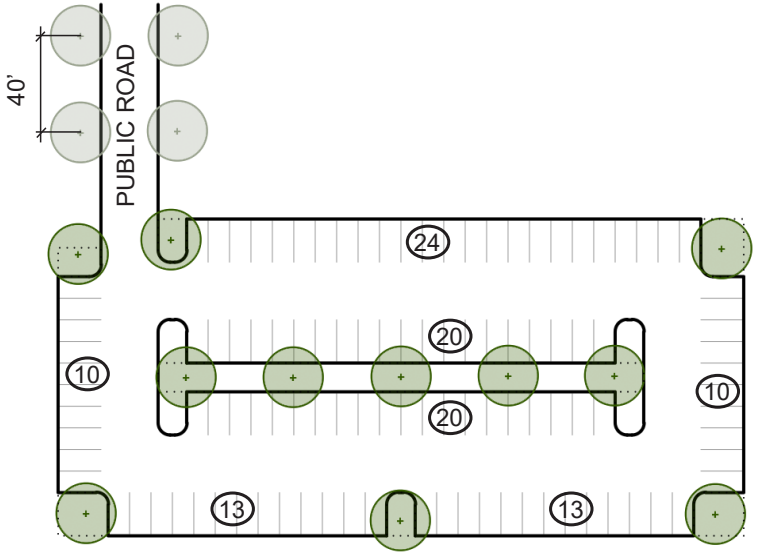
1 Island / 10 Spaces @ 200 SF Min. Area & 12' Min. Width
74 Spaces / 10 Spaces = 8 Islands
(8 Islands x 200 SF = 1,600 SF min.)

1 Shade Tree / 10 Spaces
74 Spaces / 10 Spaces = 8 Shade Trees

PROVIDED

8 Typical Islands (@ 200 SF min.)
Total Area of Landscaped Islands = 2,217 SF

8 Shade Trees



Number of Parking Spaces: 110

REQUIRED

1 Island / 10 Spaces @ 200 SF Min. Area & 12' Min. Width
110 Spaces / 10 Spaces = 11 Islands
(11 Islands x 200 SF = 2,200 SF min.)

1 Shade Tree / 10 Spaces
110 Spaces / 10 Spaces = 11 Shade Trees

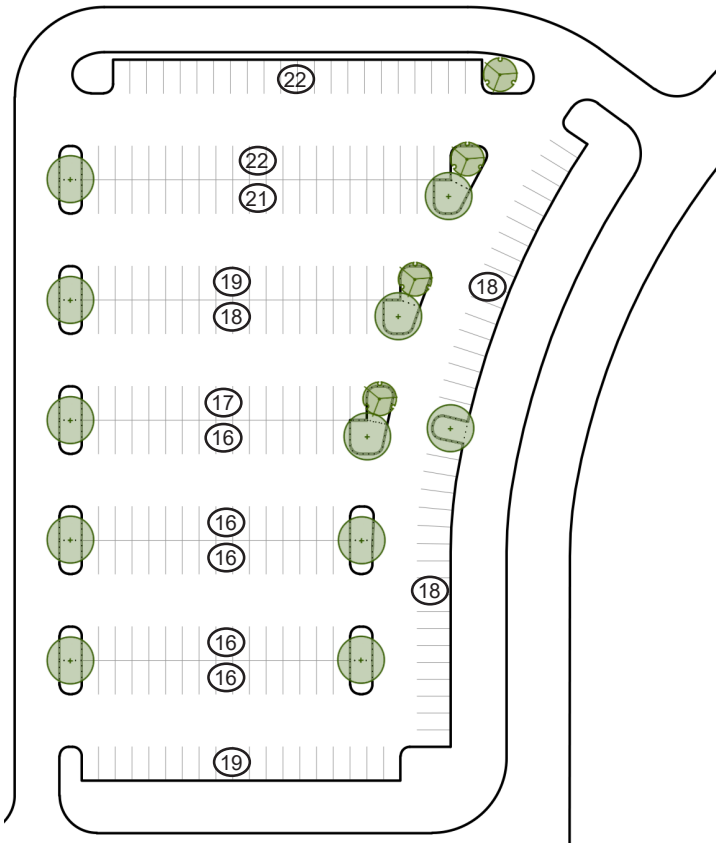
PROVIDED

10 Typical Islands, 1 Large Island (@ 800 SF min.)
Total Area of Landscaped Islands = 5,062 SF

11 Shade Trees

Shade Tree

FIGURE 7 – NON-RESIDENTIAL PARKING LOT, INTERNAL LANDSCAPING



Number of Parking Spaces: 254

REQUIRED

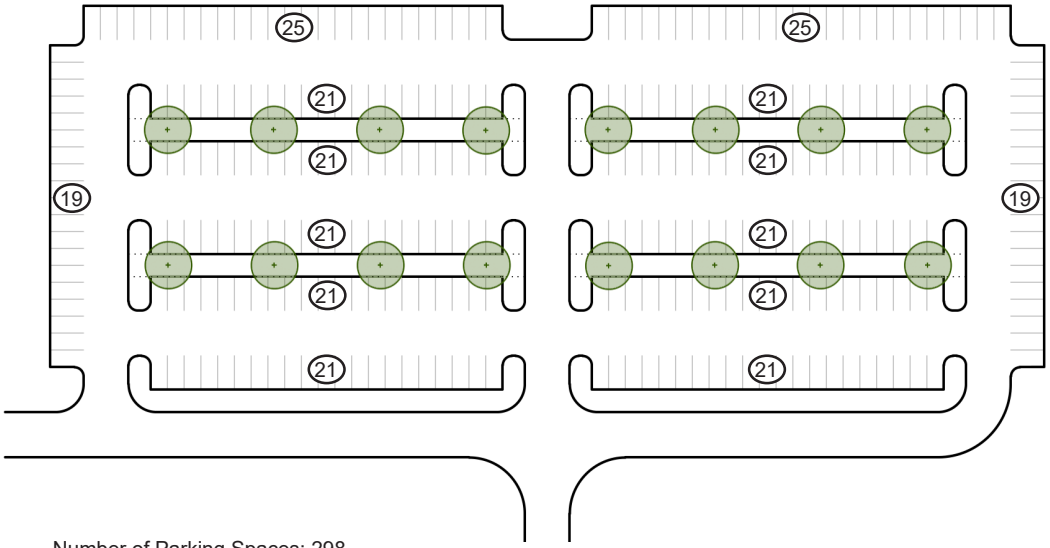
1 Island / 20 Spaces @ 200 SF Min. Area & 12' Min. Width
254 Spaces / 20 Spaces = 13 Islands
(13 Islands x 200 SF = 2,600 SF min.)

1 Shade Tree / 20 Spaces
254 Spaces / 20 Spaces = 13 Shade Trees

PROVIDED

21 Typical Islands (@ 200 SF min.)
Total Area of Landscaped Islands = 4,816 SF

11 Shade Trees
4 Small Deciduuous Trees



Number of Parking Spaces: 298

REQUIRED

1 Island / 20 Spaces @ 200 SF Min. Area & 12' Min. Width
298 Spaces / 20 Spaces = 15 Islands
(14 Islands x 200 SF = 2,800 SF min.)

1 Shade Tree / 20 Spaces
298 Spaces / 20 Spaces = 15 Shade Trees

PROVIDED

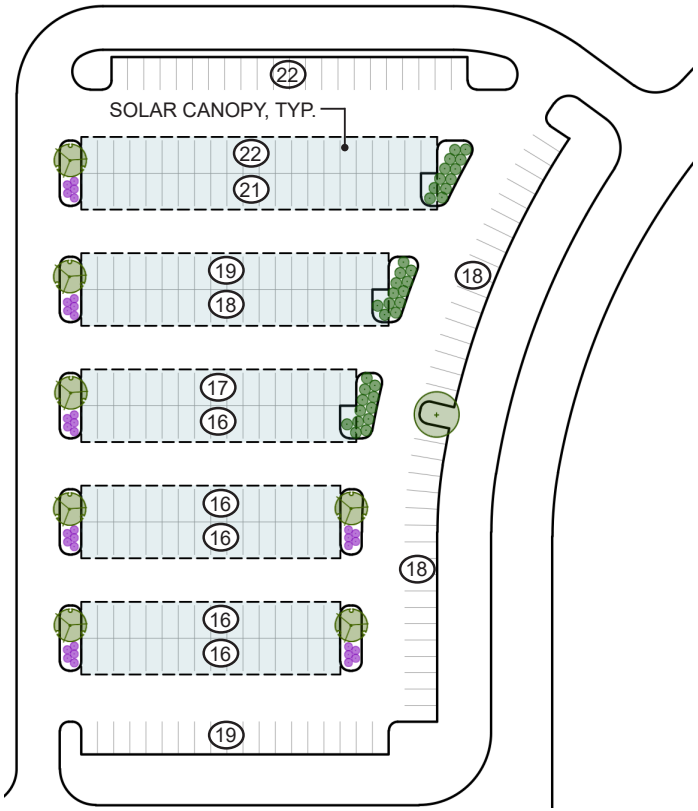
16 Typical Islands (@ 200 SF min.), 4 Long Islands (@ 800 SF min.)
Total Area of Landscaped Islands = 13,508 SF

16 Shade Trees

Shade Tree

Small Deciduous Tree

FIGURE 8 – SOLAR CANOPIES OVER PARKING



Number of Parking Spaces: 254

REQUIRED

1 Island / 20 Spaces @ 200 SF Min. Area & 12' Min. Width
254 Spaces / 20 Spaces = 13 Islands
(13 Islands x 200 SF = 2,600 SF min.)

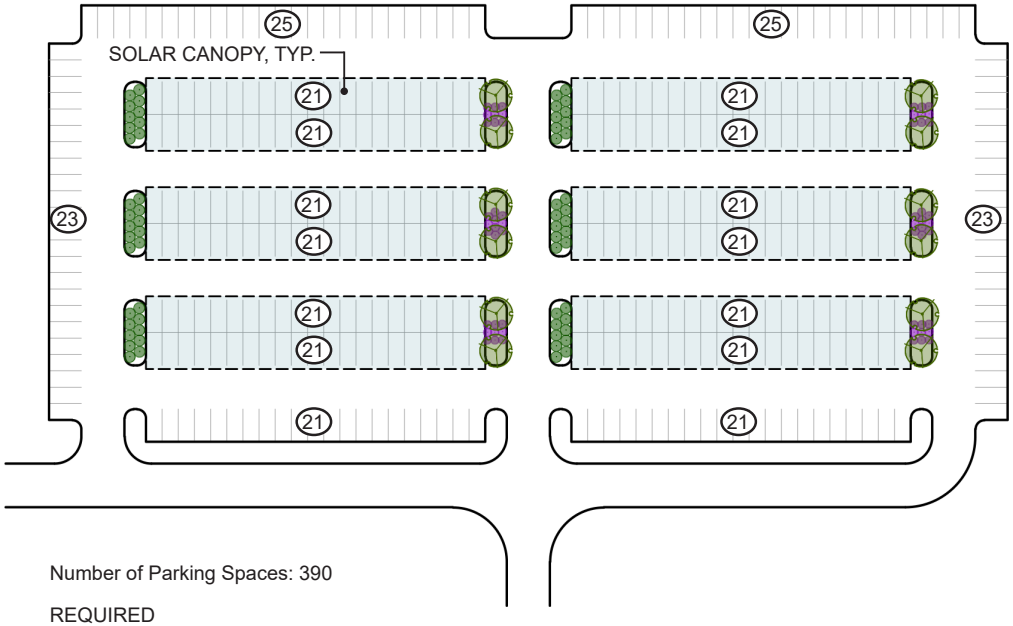
1 Shade Tree / 20 Spaces
254 Spaces / 20 Spaces = 13 Shade Trees

PROVIDED

21 Typical Islands (@ 200 SF min.)
Total Area of Landscaped Islands = 4,816 SF

1 Shade Tree + 12 Shade Trees* = 13 Shade Trees*

* Substitutions:
7 Shade Trees = 7 Small Deciduous Trees + 21 Shrubs
5 Shade Trees = 15 Shrubs + 35 Perennials/Grasses



Number of Parking Spaces: 390

REQUIRED

1 Island / 20 Spaces @ 200 SF Min. Area & 12' Min. Width
390 Spaces / 20 Spaces = 20 Islands
(20 Islands x 200 SF = 4,000 SF min.)

1 Shade Tree / 20 Spaces
390 Spaces / 20 Spaces = 20 Shade Trees

PROVIDED

24 Typical Islands (@ 200 SF min.)
Total Area of Landscaped Islands = 4,926 SF

20 Shade Trees*

* Substitutions:
12 Shade Trees = 12 Small Deciduous Trees + 36 Shrubs
8 Shade Trees = 24 Shrubs + 56 Perennials/Grasses

Shade Tree
Small Deciduous Tree
Shrub
Herbaceous Perennial/Grass

FIGURE 9A – RESIDENTIAL INTERNAL LANDSCAPE, SINGLE FAMILY ATTACHED

Number of Units = 53

REQUIRED
1 Shade Tree / 2 Units
53 Units / 2 = 27 Shade Trees

PROVIDED
17 Shade Trees
20 Other Trees (@ 2:1 substitution)
10 Small Deciduous Trees
10 Evergreen Trees

FIGURE 9B – RESIDENTIAL INTERNAL LANDSCAPE, APARTMENTS (1-4 STORIES)

Number of Stories = 3
Number of Units = 70

REQUIRED
1 Shade Tree / 5 Units
70 Units / 5 = 14 Shade Trees

PROVIDED
10 Shade Trees
8 Other Trees (@ 2:1 substitution)
8 Small Deciduous Trees

Appendix B. Schedules

A completed schedule for each site condition required shall be included on the Landscape Plan.

SCHEDULE A: PERIMETER LANDSCAPE

SCHEDULE A - PERIMETER LANDSCAPE EDGE														
					REQUIRED PLANTS (QTY)			PROPOSED PLANTS (QTY)			SUBSTITUTIONS (QTY)***				
PERIMETER*	LAND USE / ROADWAY ADJACENCY	LANDSCAPE EDGE TYPE	PERIMETER LENGTH (LF)	EXISTING TREES CREDIT (QTY)**	SHADE TREES EDGE TYPE (RATE)	EVERGREEN TREES EDGE TYPE (RATE)	SHRUBS EDGE TYPE (RATE)	SHADE TREES	EVERGREEN TREES	SHRUBS	EVERGREEN TREES (2:1)	SMALL DEC. TREES (2:1)	SHRUBS (10:1 SHADE TREE) (5:1 EVERGREEN TR.)	GRASSES (3:1)	PERENNIALS (10:1)
P-1	ADJACENT TO ROADWAY / PERIMETER PROPERTY			__ SHADE __ EVERGREEN											
P-2, ...	ADD ROWS FOR EACH PERIMETER														
			TOTAL												
P-1 SUBSTITUTION SUMMARY: _____DESCRIPTION_____															
P-2 SUBSTITUTION SUMMARY:, ... (ADD ROWS AS NEEDED FOR SUBSTITION SUMMARIES FOR EACH APPLICABLE PERIMETER)															

* Label perimters on plan using the same key/identifier listed in schedule

** If no existing trees credit, column may be omitted

*** If no substitutions are proposed, columns may be omitted

SCHEDULE A - PERIMETER LANDSCAPE EDGE (EXAMPLE 1 - PLANT TYPE SUBSTITUTIONS; NO EXISTING TREE CREDIT)														
				REQUIRED PLANTS (QTY)			PROPOSED PLANTS (QTY)			SUBSTITUTIONS (QTY)				
PERIMETER	LAND USE / ROADWAY ADJACENCY	LANDSCAPE EDGE TYPE	PERIMETER LENGTH (LF)	SHADE TREES B (1:50) C & E (1:40)	EVERGREEN TREES B (1:40), C (1:20)	SHRUBS C(1:8) E (1:4)	SHADE TREES	EVERGREEN TREES	SHRUBS	SMALL DEC. TREES (2:1)	SHRUBS (5:1)	GRASSES (3:1)	PERENNIALS (10:1)	
P-1	NON-RESIDENTIAL TO RESIDENTIAL	C	815	21	41	102	10	34	82	16	35	60		
P-2	NON-RESIDENTIAL TO RESIDENTIAL	C	638	16	32	80	13	22	80	12	50			
P-3	NON-RESIDENTIAL FRONT TO ROAD	B	743	15	19	-	15	11	-		20			
P-4	PARKING TO ROAD	E	210	6	-	53	6	-	45			12	40	
			TOTAL	**58**	**92**	**235**	**44**	**67**	**207**	**28**	**105**	**72**	**40**	
P-1 SUBSTITUTION SUMMARY: 35 SHRUBS SUBSTITUTED FOR 7 EVERGREEN TREES; 16 SMALL DECIDUOUS TREES SUBSTITUTED FOR 8 SHADE TREES; 60 GRASSES SUBSTITUTED FOR 20 SHRUBS														
P-1 RELOCATION TO P-2: RELOCATE 3 SHADE TREES FROM P-1 REQUIREMENT TO P-2 TO PROVIDE AID IN DESIRED SCREENING ALONG P-2														
P-2 SUBSTITUTION SUMMARY: 12 SMALL DECIDUOUS TREES SUBSTITUTED FOR 6 SHADE TREES; 50 SHRUBS SUBSTITUTED FOR 10 EVERGREEN TREES														
P-3 SUBSTITUTION SUMMARY: 20 SHRUBS SUBSTITUTED FOR 4 EVERGREEN TREES														
P-4 SUBSTITUTION SUMMARY: 12 GRASSES AND 40 HERBACEOUS PERENNIALS SUBSTITUTED FOR 8 SHRUBS														

SCHEDULE A - PERIMETER LANDSCAPE EDGE (EXAMPLE 2 - EXISTING TREE CREDIT)												
					REQUIRED PLANTS (QTY)			PROPOSED PLANTS (QTY)			SUBSTITUTIONS (QTY)	
PERIMETER	LAND USE / ROADWAY ADJACENCY	LANDSCAPE EDGE TYPE	PERIMETER LENGTH (LF)	EXISTING TREES CREDIT (QTY)	SHADE TREES A (1:60), B (1:50) C (1:40)	EVERGREEN TREES B (1:40), C (1:20)	SHRUBS C (1:8)	SHADE TREES	EVERGREEN TREES	SHRUBS	SMALL DEC. TREES (2:1)	SHRUBS (5:1)
P-1	SFA RESIDENTIAL TO SFD	C	542	3 SHADE 4 EVERGREEN	14-(3) = 11	28-(4)=22	68	11	22	68	-	-
P-2	SFA RESIDENTIAL TO SFA	B	692	-	14	18	-	10	14	-	8	20
P-3	SFA RESIDENTIAL TO INSTITUTIONAL	A	550	5 SHADE	10-(5)=5	-	-	5		-	-	-
P-4	SFA RESIDENTIAL (SIDE) TO ROAD	C	310	7 SHADE 6 EVERGREEN	8-(7)=1	16-(6)=10	39	1	7	39	-	15
			TOTAL	**15 SHADE 12 EVERGREEN**	**31**	**50**	**107**	**27**	**43**	**107**	**8**	**35**
EXISTING TREES CREDIT: REFER TO EXISTING TREE TABLE (OR LABELS ON THE PLAN WITH SPECIES)												
P-2 SUBSTITUTION SUMMARY: 8 SMALL DECIDUOUS TREES SUBSTITUTED FOR 4 SHADE TREES; 20 SHRUBS SUBSTITUTED FOR 4 EVERGREEN TREES												
P-4 SUBSTITUTION SUMMARY: 15 SHRUBS SUBSTITUTED FOR 3 EVERGREEN TREES												

SCHEDULE B: STREET TREES

SCHEDULE B - STREET TREES					
ROAD KEY	LENGTH OF RIGHT-OF-WAY (LF) PUBLIC / PRIVATE	REQUIRED TREES (QTY)		PROVIDED TREES (QTY)	
		SHADE TREES (1:40LF)	SMALL DEC. TREES* (1:30LF)	SHADE TREES	SMALL DEC. TREES*
ROAD-A					
ROAD-B, ...	ADD ROWS FOR EACH ROAD				
	TOTAL				

* When proposed as substitute to shade trees - if none proposed, omit columns

SCHEDULE C: PARKING LOT INTERNAL LANDSCAPING

SCHEDULE C - PARKING LOT INTERNAL LANDSCAPING	
NUMBER OF PARKING SPACES	
NUMBER OF TREES REQUIRED RESIDENTIAL (1:10) NON-RESIDENTIAL (1:20)	
NUMBER OF LANDSCAPE ISLANDS REQUIRED (MIN. 200SF EACH) RESIDENTIAL (1:10) NON-RESIDENTIAL (1:20)	
TOTAL ISLAND AREA REQUIRED	
NUMBER OF TREES PROPOSED*	
NUMBER OF LANDSCAPE ISLANDS PROPOSED (MIN. 200SF EACH)	
TOTAL ISLAND AREA PROPOSED	

* Provide notes describing proposed plant type substitutions

SCHEDULE D: LOADING & SERVICE AREAS

SCHEDULE D - LOADING AND SERVICE AREAS*												
				REQUIRED PLANTS (QTY)			PROPOSED PLANTS (QTY)			SUBSTITUTIONS (QTY)***		
FEATURE**	LAND USE / ROADWAY ADJACENCY	LANDSCAPE EDGE TYPE	LENGTH OF PERIMETER (LF)	SHADE TREES EDGE TYPE (RATE)	EVERGREEN TREES EDGE TYPE (RATE)	SHRUBS EDGE TYPE (RATE)	SHADE TREES	EVERGREEN TREES	SHRUBS	EVERGREEN TREES (2:1)	SMALL DEC. TREES (2:1)	SHRUBS (10:1 SHADE TREE) (5:1 EVERGREEN TR.)
TRUCK LOADING FACILITY	ADJACENT TO ROADWAY / PERIMETER PROPERTY											
DUMPSTER & COMPACTOR AREA	ADJACENT TO ROADWAY / PERIMETER PROPERTY											
....	ADD ROWS FOR EACH PERIMETER											
			TOTAL									
D1 SUBSTITUTION SUMMARY: _____DESCRIPTION_____												
D2 SUBSTITUTION SUMMARY:, ... (ADD ROWS AS NEEDED FOR SUBSTITION SUMMARIES FOR EACH APPLICABLE PERIMETER)												

* Note on schedule if loading / service area is associated with special exception uses, a Private Access Street, or Subdivision Review Committee comments (see Section 3.2.6 of this manual)

** List all applicable loading / service area features, such as: dumpster and compactor areas, residential trash collection pads, truck loading facilities, dock areas, drive-in loading bays and at grade service entrances to structures, etc. Labels / plan call-outs should match features listed on Schedule D.

*** If no substitutions are proposed, columns may be omitted

SCHEDULE E: RESIDENTIAL DEVELOPMENT INTERNAL LANDSCAPING

SCHEDULE E - RESIDENTIAL DEVELOPMENT INTERNAL LANDSCAPING*	
NUMBER OF DWELLING UNITS	
NUMBER OF TREES REQUIRED* SINGLE FAMILY ATTACHED (1 TREE : 2DU) MOBILE HOMES (1 TREE : 2DU) APARTMENTS, 1-4 STORIES (1 TREE : 5DU) APARTMENTS, 5+ STORIES (1 TREE : 7 DU)**	
NUMBER OF TREES PROVIDED SHADE TREES OTHER TREES (1:1 SUB. UP TO 50% REQ'D) SHRUBS	

* Only list development type(s) that applies to project site

** Refer to Section 3.2.7 & Table 7 for more guidance

SCHEDULE F: RECREATION OPEN SPACE

SCHEDULE F - RECREATION OPEN SPACE	
REQUIRED RECREATION OPEN SPACE (SF)*	
REQUIRED PLANT BED AREA (SF)	
IF REQUIRED REC. OPEN SPACE = 5,000-7,900 SF	300 SF
OR IF REQUIRED REC. OPEN SPACE =< 8,000 SF	
100SF FOR FIRST 5,000 SF	100 SF
100 SF PER EACH ADDITIONAL 1,000 SF	
TOTAL AREA REQUIRED	
REQUIRED SHRUBS (2 SHRUBS PER 100 SF REQUIRED PLANT BED AREA)	
PROVIDED PLANT BED AREA (SF)	
PROVIDED SHRUBS **	

* Do not deduct amenity area credits from required recreation open space for calculating this landscape requirem

** Provide notes describing proposed plant type substitutions

SCHEDULE F - RECREATION OPEN SPACE (EXAMPLE 1)	
REQUIRED RECREATION OPEN SPACE (SF)	**6,225 SF**
REQUIRED PLANT BED AREA (SF)	
IF REQUIRED REC. OPEN SPACE = 5,000-7,900 SF	300 SF
TOTAL AREA REQUIRED	**300 SF**
REQUIRED SHRUBS (2 SHRUBS PER 100 SF REQUIRED PLANT BED AREA)	**6**
PROVIDED PLANT BED AREA (SF)	**310 SF**
PROVIDED SHRUBS	**6**

SCHEDULE F - RECREATION OPEN SPACE (EXAMPLE 2)	
REQUIRED RECREATION OPEN SPACE (SF)	**10,360 SF**
REQUIRED PLANT BED AREA (SF)	
IF REQUIRED REC. OPEN SPACE =< 8,000 SF	
100SF FOR FIRST 5,000 SF	100 SF
100 SF PER EACH ADDITIONAL 1,000 SF	500 SF
TOTAL AREA REQUIRED	**600 SF**
REQUIRED SHRUBS (2 SHRUBS PER 100 SF REQUIRED PLANT BED AREA)	**12**
PROVIDED PLANT BED AREA (SF)	**635 SF**
PROVIDED SHRUBS*	**12**
SHRUBS	8
HERBACEOUS PERENNIALS*	20
PERENNIAL GRASSES*	6

* PROPOSED SUBSTITUTIONS:

20 HERBACEOUS PERENNIALS FOR 2 SHRUBS

6 PERENNIAL GRASSES (36" HEIGHT AT MATURITY) FOR 2 SHRUBS

SCHEDULE G: NATIVE PLANTS & BIODIVERSITY

SCHEDULE G - NATIVE PLANTS						
		PROVIDED % PER SITE CONDITION*				
PLANT TYPE	REQUIRED %	PERIMETER LANDSCAPE	INTERNAL RESIDENTIAL	OPEN SPACE	SOLAR COLLECTORS	SWM
SHADE TREES	70%	qty. native / total = %				
SMALL DECIDUOUS TREES	70%					
EVERGREEN TREES	40%					
SHRUBS	60%					
HERBACEOUS PERENNIALS & GRASSES	80%					

*Omit columns for site conditions not applicable to project

SCHEDULE G - NATIVE PLANTS (EXAMPLE)				
		PROVIDED % PER SITE CONDITION		
PLANT TYPE	REQUIRED %	PERIMETER LANDSCAPE	INTERNAL RESIDENTIAL	OPEN SPACE
SHADE TREES	70%	90/125= 72%	18/25 = 72%	12/15 = 80%
SMALL DECIDUOUS TREES	70%	46/65 = 70%	12/16 = 75%	12/15 = 80%
EVERGREEN TREES	40%	20/50 = 40%	5/5 = 100%	-
SHRUBS	60%	180/300 = 60%	25/40 = 62%	-
HERBACEOUS PERENNIALS & GRASSES	80%	80/100 = 80%	-	-

SCHEDULE H: STORMWATER MANAGEMENT FACILITIES

SCHEDULE H - STORMWATER MANAGEMENT FACILITIES														
				REQUIRED PLANTS (QTY)			PROPOSED PLANTS (QTY)			SUBSTITUTIONS (QTY)*				
KEY	LAND USE / ROADWAY ADJACENCY	LANDSCAPE EDGE TYPE	PERIMETER LENGTH (LF)	SHADE TREES EDGE TYPE (RATE)	EVERGREEN TREES EDGE TYPE (RATE)	SHRUBS EDGE TYPE (RATE)	SHADE TREES	EVERGREEN TREES	SHRUBS	EVERGREEN TREES (2:1)	SMALL DEC. TREES (2:1)	SHRUBS (10:1)	GRASSES (3:1)	PERENNIALS (10:1)
SWM-1	ADJACENT TO INTERNAL STRUCTURE OR LOT													
SWM-2, ...	ADD ROWS FOR EACH PERIMETER INTERNAL TO SITE													
			TOTAL											
SWM-1 SUBSTITUTION SUMMARY: _____DESCRIPTION_____														
SWM-2 SUBSTITUTION SUMMARY:, ... (ADD ROWS AS NEEDED FOR SUBSTITION SUMMARIES FOR EACH APPLICABLE PERIMETER)														

*If no substitutions are proposed, these columns may be omitted

SCHEDULE H - STORMWATER MANAGEMENT FACILITIES (NON-RESIDENTIAL SWM EXAMPLE - PLANT TYPE SUBSTITUTIONS; NO EXISTING TREE CREDIT)											
				REQUIRED PLANTS (QTY)			PROPOSED PLANTS (QTY)			SUBSTITUTIONS (QTY)	
KEY	LAND USE / ROADWAY ADJACENCY	LANDSCAPE EDGE TYPE	LENGTH OF PERIMETER (LF)	SHADE TREES B (1:50) C (1:40)	EVERGREEN TREES B (1:40), C (1:20)	SHRUBS C (1:8)	SHADE TREES	EVERGREEN TREES	SHRUBS	SMALL DEC. TREES (2:1)	SHRUBS (10:1)
SWM-1	SWM TO INTERNAL STRUCTURE	B	105	3	3	-	3		-		15
			TOTAL	**3**	**3**	**0**	**3**	**0**	**0**	**0**	**15**
SWM-1 SUBSTITUTION SUMMARY: 15 SHRUBS SUBSTITUTED FOR 3 EVERGREEN TREES											

Appendix C. Requirements for Landscape Plan

Note: Refer to the Department of Planning and Zoning checklists for the most current submission requirements per each plan type submittal.

Landscape Plans provided as part of the plan set for Site Development Plans or provided with supplemental plans for Final Plans must include the following information:

- Existing base information required for the Final Plan or Site Development Plan
- Proposed grading, structures, parking and loading areas, pedestrian areas, roads, ***driveways*** and access areas, easements, utilities, storm drains and stormwater management areas, signs, lighting, etc.
- Location, general type and quality of existing vegetation and specimen trees
- The location and type of all existing freestanding trees on the property over 6 inches in caliper and all small tree groups or hedgerows that do not meet the definition of a forest
- Existing vegetation to be saved; existing forest areas to be saved in accordance with the forest conservation plan shall be identified
- Sedimentation and erosion control plan identifying methods and details for protection of exiting vegetation during construction
- Location and identification by symbol (graphic, letter and/or number) of all proposed plants
- Plant schedule that includes botanical and common name, quantity, spacing and size at time of planting of all proposed plant materials and other landscaping
    - o Plant schedule shall also note which plants are proposed to meet native plant requirements
- Location, description and necessary details of other landscape improvements, such as earth berms, walls, fences, screens, street furniture, lights and courts or paved areas
- Plant installation details, root barrier details, soil preparation information
- Schedules showing required and proposed quantities of landscape elements. All schedules included in **Appendix B** are based on the landscape types and planting requirements described in **Section 3.2**
- Certification and signature of the owner and signature of the Landscape Architect, Certified Professional Horticulturist or Chesapeake Bay Landscape Professional

Appendix D. Stormwater Management Facilities (3.2.11)

Landscape Plan preparers should have their own set of landscape installation guidelines, planting details, root barrier details and specifications, and soil preparation specifications, which are customized to the specific project site and conditions. However, in addition to the landscape standards and details (as applicable to the project site) outlined in the Howard County Design Manual, Volume IV,

the following guidelines and details are provided for information only and are not meant to replace site specific details and specifications as provided by the Landscape Architect.

D.1 General Planting Standards

Planting standards must be as outlined below or as specified by best practices in the industry. Any item or procedure not mentioned below may be as specified in the Landscape Specification Guidelines published by the Landscape Contractors Association (latest edition) or as subsequently amended. In addition to meeting the General Planting Standards described below, plantings required by other Howard County manuals may supersede these standards.

D.2 Size, Condition, & Quality

- Quality and size of plants, spread of roots, and size of root balls must be in accordance with ANSI Z60.2 American Standard for Nursery Stock, latest edition.
- Minimum tree and shrub sizes must be provided in accordance with the Plant Size Requirements as described in Section 3.2.1.c of the Landscape Manual.
- Major deciduous trees must have a clear trunk, free of branches, to a minimum height of 6 feet.
- Plants shall not have multiple leaders, unless this is the natural form; multi-stem trees are not acceptable for required street tree planting.
- Plants shall have been grown in a climate with similar conditions to the project location for two years before planting.
- Plants shall be high quality nursery grown. Plants shall be healthy and vigorous, typical of their species and variety; and have well-developed branches, densely foliated, and vigorous root systems.

D.3 Installation

- Contact Miss Utility in advance of any digging.
- Dig planting pits and beds, amend soils, backfill planting areas, and install plants only when soil conditions are not wet, and when mixing and backfilling will not adversely affect soil structure.
- The plan preparer of the landscape plan shall include all standard details that apply to a given project as part of the landscape plan submission. Plants must be installed in accordance with the approved planting details.
- Do not handle, move, bind, tie, or otherwise treat plants so as to damage the root ball, roots, trunk, or branches in any way.
- Plants delivered on site not planted the same day must receive proper care and watering at all times.
- At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. When the root flare is not visible, the soil on the top of the root ball shall be shaved, without damaging the trunk, to expose the natural flare. The top of the root ball is the level where the natural flare enters the soil.

- All trees must be set so that the top one-eighth of the root ball sits above the finish grade, or in accordance with the planting details on the approved Landscape Plan.
- Plants shall rest on undisturbed existing soil in the planting holes. When plantings are proposed in fill areas, a sequence of construction note shall specify:
  - fill in planting areas shall be compacted in three inch lifts during fill and grading operations
  - the site shall settle naturally for one year after finish grade and before plant installation.
- Care shall be exercised in setting all plants vertically and locating street trees in the center of tree pits.
- All trees must be staked or braced to provide stabilization during the period of establishment. When staking or bracing trees, use the simplest and least restrictive method required to provide stabilization in accordance with best practices of the industry. All staking and bracing shall be completed the same day as planting and shall be removed after one year.
- Mulch shall be a natural product of 98% shredded hardwood bark and contain less than 2% wood or other debris, with no additives or other treatment. Mulch shall be applied to a uniform minimum depth of 3 inches and shall be so distributed as to create a smooth, level cover over the exposed soil, and should not be mounded at the bases of trees. Do not place mulch within at least 3 inches of trunks or stems to avoid mounding above the root flare.
- Plants must be watered to saturate each individual planting hole on the same day as planting and every three days after planting for a minimum of 2 weeks. During this period, rainfall does not constitute watering.
- Continued water and care should be specified by the plan preparer to ensure the plantings establish and thrive.

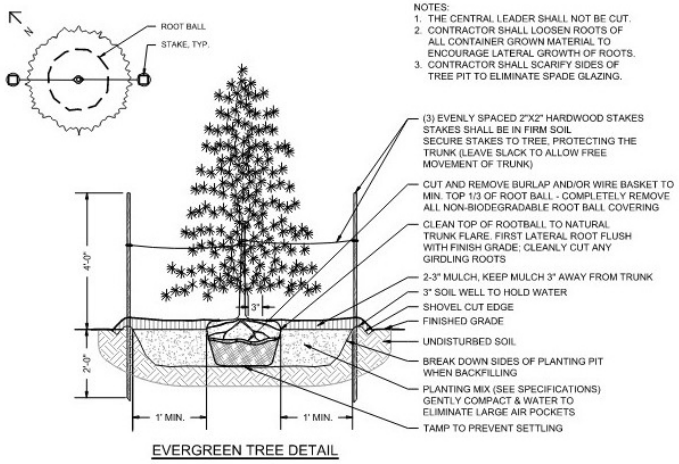
D.4 Preparing Plant Beds

Any plantings that are proposing shrubs, perennials and grasses shall be planted in prepared planting beds. Trees may be included in planting beds at the designer's discretion. Designers should include specifications for the planting beds that are specific to the site conditions and proposed plantings. In general, the specifications should include:

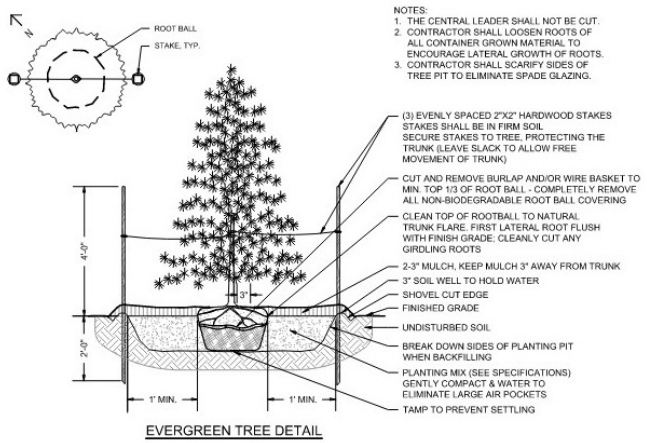
- Soil testing to determine requirements for amendments such as organic material, fertilizer, lime and other amendments.
- Before adding soil amendments, the plant bed shall be free of trash and large debris.
- Soil amendments, as recommended based on soil test results, shall be incorporated into the plant bed areas as directed by Landscape Architect's specifications. At a minimum, organic matter shall be spread over the bed to a depth of 2" after the soil has been loosened. The organic matter shall then be worked into the bed.
- Plant beds shall have a shovel-cut or machine cut edge with a depth of 2" to 3".

- The plant bed shall be slightly raised from the surrounding area as a result of the amendments and not lower, except when the planting area is meant to serve as a SWM facility.
- The entire plant bed shall be mulched after plants are installed and any required top dressings are applied (e.g. fertilizers, pre-emergents, etc.). Mulch shall be a natural product of 98% shredded hardwood bark and contain less than 2% wood or shrubs. Do not place mulch within at least 3 inches of trunks or stems to avoid mounding above the root flare.
- If other mulch materials are specified, the landscape professional shall include detailed specifications for use of the materials and any special handling of the plant material required (i.e. additional watering).

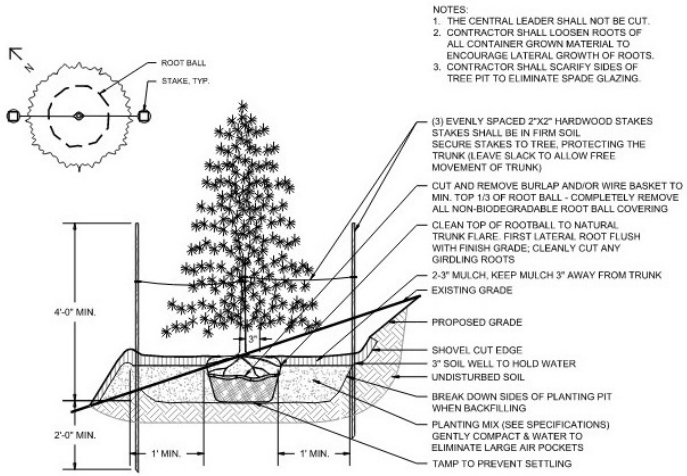
D.5 Planting and staking details



EVERGREEN TREE DETAIL

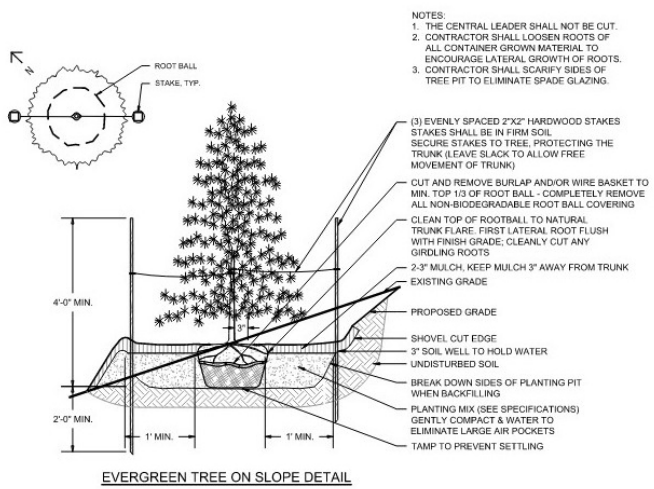


EVERGREEN TREE DETAIL



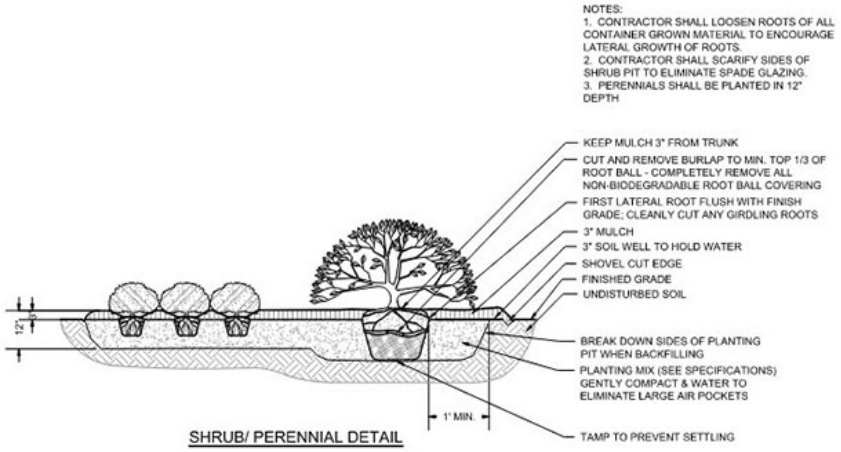
EVERGREEN TREE ON SLOPE DETAIL

GENERAL TREE STAKING NOTES:
1. TREE STAKING TIES CAN INCLUDE GALVANIZED TWISTED WIRE WITH HOSE SECTIONS AGAINST THE TRUNK, TIE WEBBING, POLY CHAIN-LOCK TREE TIE OR OTHER SUITABLE MATERIAL.
2. GUYING, RATHER THAN STAKING, IS APPROPRIATE FOR LARGE CALIPER TREES (LARGER THAN 3" CAL.), LARGE ROOTBALLS (42" DIA. OR LARGER), OR WHEN NECESSARY ACCORDING TO SITE CONDITIONS, SUCH AS EXPOSED AND WINDY SITES OR SITES WITH AN EXCESS FILL CONDITION. LANDSCAPE ARCHITECT SHALL PROVIDE GUYING DETAIL.
3. REMOVE ALL TREE STAKING AND GUYING MATERIALS FROM THE TREE AFTER THE FIRST GROWING SEASON.



EVERGREEN TREE ON SLOPE DETAIL

GENERAL TREE STAKING NOTES:
1. TREE STAKING TIES CAN INCLUDE GALVANIZED TWISTED WIRE WITH HOSE SECTIONS AGAINST THE TRUNK, TIE WEBBING, POLY CHAIN-LOCK TREE TIE OR OTHER SUITABLE MATERIAL.
2. GUYING, RATHER THAN STAKING, IS APPROPRIATE FOR LARGE CALIPER TREES (LARGER THAN 3" CAL.), LARGE ROOTBALLS (42" DIA. OR LARGER), OR WHEN NECESSARY ACCORDING TO SITE CONDITIONS, SUCH AS EXPOSED AND WINDY SITES OR SITES WITH AN EXCESS FILL CONDITION. LANDSCAPE ARCHITECT SHALL PROVIDE GUYING DETAIL.
3. REMOVE ALL TREE STAKING AND GUYING MATERIALS FROM THE TREE AFTER THE FIRST GROWING SEASON.



D.6 Root barrier details and specifications

Details and specifications herein are general in nature and are provided as examples. Landscape Plan preparer shall provide root barrier details and specifications customized to specific project site conditions and product specified.

D.6.1 Root barrier product

Black, molded, modular panels 24 inches high (deep), 85 mils thick, and with vertical root deflecting ribs protruding 3/4 inch out from panel surface; manufactured with minimum 50 percent recycled polyethylene plastic with UV inhibitors.

D.6.2 Root barrier installation

Install root barrier where trees are planted within 96 inches of paving or other hardscape elements, such as walls, curbs, and walkways, unless otherwise indicated on Drawings.

Align root barrier with bottom edge angled at 20 degrees away from the paving or other hardscape element and run it linearly along and adjacent to the paving or other hardscape elements to be protected from invasive roots.

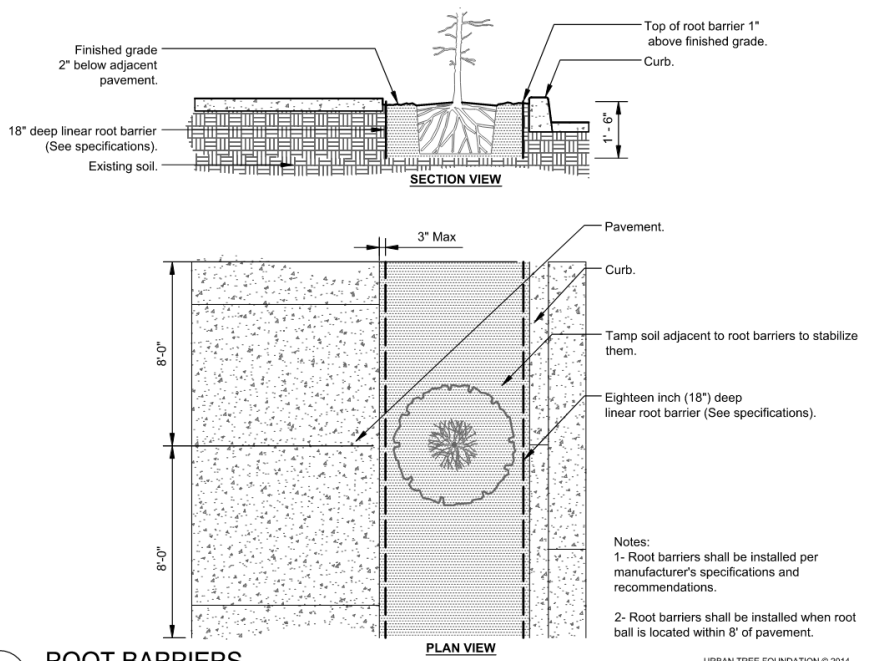
Install root barrier continuously along all paving edges and hardscape elements, unless otherwise approved by Department of Planning and Zoning.

- Position top of root barrier according to manufacturer's written recommendations.
- Overlap root barrier a minimum of 12 inches at joints.
- Do not distort or bend root barrier during construction activities.
- Do not install root barrier surrounding the root ball of tree.

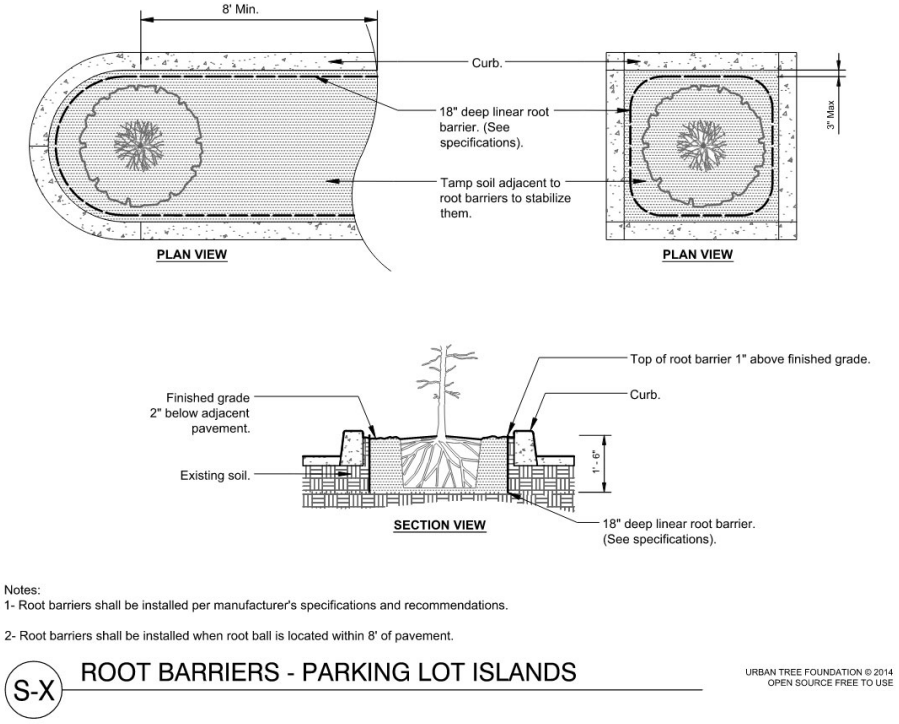
D.6.3 Generic root barrier details (per Urban Tree Foundation open-source details)

These details are generic in nature. Landscape architect or designer shall provide details specific to project/site conditions.

Note: Continuous root barrier is required per Landscape Manual Appendix D.6.2



S-X ROOT BARRIERS



S-X ROOT BARRIERS - PARKING LOT ISLANDS

D.7 Soil preparation

Landscape Plan preparers must include soil preparation specifications as part of the Landscape Plan submission that are customized to the specific project site and proposed plantings. The following serves as a guide or checklist for minimum standards and are not intended to be copied directly onto the plans by the design professional.

D.7.1 Soil Composition

Black, molded, modular panels 24 inches high (deep), 85 mils thick, and with vertical root deflecting ribs protruding 3/4 inch out from panel surface; manufactured with minimum 50 percent recycled polyethylene plastic with UV inhibitors.

In general, planting specifications should include the following considerations on all landscape plans:

- When possible, existing topsoil should be stockpiled separately from subsoil during mass grading to be redistributed at final grade. Topsoil should not be permanently removed from a project site.
- Using subsoil for planting areas and turf areas should be avoided. When unavoidable, appropriate soil amendments should be provided.
- Redevelopment of sites no longer in a natural condition should include detailed soil specifications for the site and proposed plantings.
- Planting soils may be native soils, organically amended existing soil, or a topsoil blend mixed to achieve the specifications on the plans.
- Minimize compaction of planting areas during construction.
- Percolation testing and soil composition testing are recommended to inform soil preparation specifications for each site.
- Soil composition standards - amend existing soil as needed or provide a topsoil mix to achieve required ranges. Ranges shall be determined by landscape professional and be specific to the project and proposed planting.
- Amend soils and fertilize planting areas and tree pits as needed to remedy specific deficiencies revealed by a soil test. The use of compost or other natural nutrient sources and soil amendments is encouraged.

D.7.2 Soil Volume Standards for Tree Plantings

In order to provide trees an adequate volume of quality soil to thrive, trees planted in parking lot landscape areas and between sidewalks and road rights-of-way or any location surrounded by impervious area, planting details shall include current best practices for providing appropriate planting soil.

In urban areas or planting areas contained by impervious surfaces, the specifications for adequate soil volumes shall address site-specific conditions such as sidewalk widths and the presence of utilities.

The following should be considered for urban areas and tree planting areas contained by impervious surfaces:

- The sizing of tree pits and planting areas and the required minimum soil volume per tree or per planting area
- The use of structural soil
- The use of larger, continuous planting beds

Appendix E. Maintenance Guidelines

Landscape architects and designers should include minimum landscape maintenance requirements with the landscape plan that are specific to each project. The information provided here if for information only and not intended to replace the Landscape Architect's specifications.

E.1 Plant Maintenance

Maintain the required warranty period.

Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

- Contractor shall routinely monitor soil moisture and thoroughly water plantings on a weekly basis for the first 30 days. After the initial 30-day period following installation, contractor shall thoroughly water plantings on a bi-weekly basis or as needed to maintain adequate soil moisture. More frequent watering may be needed for plants grown in nursery soil mixes lighter than the end planting mix and in periods of drought.
- Fill in, as necessary, soil subsidence that may occur because of settling or other processes.
- Replace decomposed mulch materials and materials damaged or lost in areas of subsidence. Re-mulching of the plant materials is required as necessary, but excessive mulch buildup and creation of mulch volcanoes is not acceptable.
- Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.
- Protect plants and planting areas from damage.
- necessary for plant establishment after one year.

Keep plants healthy, vigorous, trim and neat.

- Protect plants and planting areas from damage.
- Keep plants healthy, vigorous, trim and neat.
- Maintain stakes and guys in taut and rigid state with wires in place and safety flags clearly visible. Remove stakes and guys when no longer necessary for plant establishment after one year.

E.2 Repair and Replacement

General: Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Landscape Architect.

- Submit details of proposed pruning and repairs.
- Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
- Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Landscape Architect.

Remove and replace trees that are more than 25 percent dead or in an unhealthy condition as identified before the end of the corrections period or are damaged during construction operations that Landscape Architect determines are incapable of restoring to normal growth pattern.

- Provide new trees of same size as those being replaced for each tree of 6 inches or smaller in ***caliper*** size.
- Species of Replacement Trees: Species selected by Landscape Architect and as approved by Department of Planning and Zoning

E.3 Cleaning and Protection

During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

After installation and before Substantial Completion, remove nursery stakes, tie tape, wire, burlap, and other debris from plant material, planting areas, and Project site.

At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

E.4 Maintenance Service

Maintenance Service for Trees, Shrubs, Herbaceous Perennials and Grasses: Provide maintenance by skilled employees of landscape installer. Maintain as required in "Plant Maintenance". Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

Maintenance Period: 24 months from date of Substantial Completion.

Appendix F. Landscape Plan Preparer Professional Statement

Include the Professional's Review Statement and the transmittal of drawings/documents with the Landscape Plan submission. A copy of this document can be found on the DPZ ProjectDox website and the Landscape Manual webpage.