

3

Streetscape Guidelines, The Details

3. STREETSCAPE GUIDELINES, The Details

The streetscape in Tysons serves many purposes and creates a visual character for the area. For the pedestrian, it is the surface upon which pedestrians will walk, a place to connect with transit, a place to rest, a place to acquire goods, a place to eat and drink, a place to enjoy at night as well as during the day, and a place to browse into store windows. The streetscape also serves the transportation network not only as a multi-modal connector for people, but as a place where cars and people experience signage that allows them to navigate the city streets. It also is where on-street parking is purchased and monitored and where bicycles park. Finally, the streetscape is a conduit for utility and infrastructure such as stormwater, electricity, fiber optic lines, gas and other utilities. What would appear to be simply sidewalk and street trees is a functioning system, comprised of many elements, that is used by many people.

All of the above functions require a physical presence in the streetscape; for this reason, attention must be paid to how all of the furnishings and amenities are organized in the streetscape such that pedestrian flow is not inhibited. In addition, above ground telecommunications equipment should be integrated into light poles or blended with street furniture or other structures in order to minimize its visual impact on the pedestrian realm. The following section describes where to locate streetscape elements and provides guidance on specific furnishings that should be used in Tysons.

In general, the aesthetic for the streetscape elements in Tysons should embrace innovative and contemporary design concepts, materials, and forms.

For new streets in Tysons, refer to Section 2.2 in these guidelines for the appropriate streetscape dimensions and zones. Although on public streets, the public right-of-way line falls somewhere within the expanse of

the streetscape, it is expected that the right-of-way line will be invisible to the eye, and that the design and maintenance of the streetscape will be consistent in character and quality for the entire streetscape width, from the curb to the building face.

All of the elements described in this section should be supplied, installed and maintained by the private sector and should be included in a streetscape furnishings plan in all Final Development Plans (FDPs). This maintenance will include, but not be limited to:

- Care, repair, and / or replacement of paving, lighting, and all street furnishings
- Horticultural maintenance and irrigation of all plantings including street trees, planters and shrub and groundcover plantings
- Replacement of any dead or dying plantings
- Regular maintenance including snow removal and debris pick up

The following recommendations for pedestrian realm streetscape details apply to all streetscape areas between the curb and build-to line on both public and private streets. They include hardscape elements, paving, planting, lighting, benches, litter and recycling receptacles, bike racks, signage and public art. Each section includes a description and design suggestions for each streetscape element.

Although unique design elements will emerge in all of the Tysons neighborhoods, there are several streetscape elements that should remain consistent throughout Tysons so they act as wayfinding elements and provide a degree of visual consistency. This section provides specifications for the preferred streetscape elements and design suggestions for the other elements.

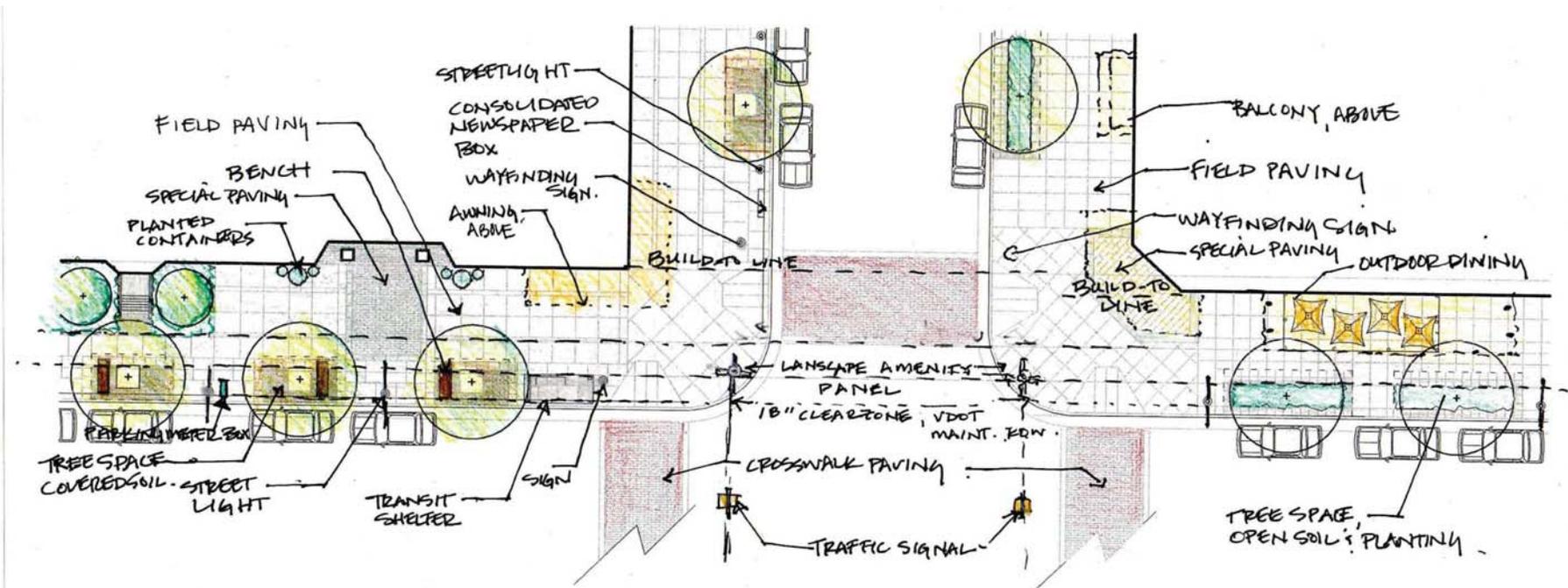
3.1 Detailing the Streetscape

The preferred materials include:

- Paving materials for primary pedestrian corridors (See Section 3.2D)
- Streetscape pole-mounted lighting (See Section 3.3)
- Streetscape furnishings by subdistrict including benches, litter and recycling receptacles, and bike racks (See Section 3.4)

It is anticipated that there will be cases when the recommended streetscape elements may need to be modified and flexibility will be provided as required on a case by case basis.

As neighborhoods develop over time, these guidelines will be updated to reflect the character of and precedent set by each place. Additionally, future revisions will include product and technology innovations that may need to be added or modified.



Above: Design sketch of a Local Street streetscape in Tysons.

3.2 Hardscape Design

Hardscape is the built environment in the urban landscape on which we walk and sit, and it includes architectural features that create edges and mark places. It comprises constructed elements such as paving, seat walls, water features, and raised planters. These elements can be found in the streetscape, in parks and in other the exterior spaces that make up the ground plane, as well as vertical elements that are incorporated into the urban landscape.

Hardscape elements are constructed of materials such as stone, brick, pre-cast concrete, metal, and wood, and should be sufficiently durable to withstand the harsh, outdoor urban environment. Sustainable building materials and methods that contribute to green building practices should be utilized. While it is desirable that all hardscape elements in Tysons adhere to these guidelines, the following design suggestions specifically pertain to hardscape elements that are located in the public pedestrian realm.



Given the varied topography in Tysons, grade changes within the streetscape an important and common consideration. Innovative design approaches that incorporate grade transitions into a site design while preserving pedestrian visibility and accessibility are expected. Large (long or tall) retaining walls as street edges should be avoided.

Low masonry walls can serve several purposes: they create transitions between grade changes, mark entrances, highlight architectural elements, serve as raised planters, and create the walls of water features. Masonry walls that are at a comfortable seat height can serve both as a structural element and a seat wall. Seat walls and raised planters can create an edge to a gathering space or performance space, and can act as landmarks in the streetscape.



Opposite Left: Sidewalk paving materials at vehicular entrance to parking garage, Washington, D.C.



Opposite Top Right: Fountain in Washington, D.C.

Opposite Bottom Right: Paving pattern, Frederick, MD

Opposite Bottom Far Right: Sidewalk paving materials, Washington, D.C.

Above Left: Seat wall, Washington D.C.

Above Right: Low, raised planting bed in building zone. Sign describing bio-retention function of planting bed.

Bottom Right: Paving materials, Austin, TX

Design Suggestions:

- ◆ Use high-quality masonry products and applications that complement adjacent architecture.
- ◆ Locate and design walls that are integrated into the architectural design of the building façade or urban park spaces. Walls should not be located in the sidewalk or landscape amenity panel zones of the streetscape or impede pedestrian traffic in any way.
- ◆ Construct seat walls 18 – 22 inches high and a minimum of 12 inches deep to provide a comfortable seating area.
- ◆ Use innovative design elements such as raised decorative features to discourage damage from skateboards, bicycles or maintenance equipment.



3.2B Water Features

Water features are an important element of the pedestrian realm because they provide places to play, attenuate street noise, create visual pleasure, and serve as landmarks and focal points. Water features are often used to mark places such as civic centers and cultural institutions and distinguish these places from other building entrances along the streetscape. There are many ways to creatively and beautifully integrate water features into the urban landscape, including the use of Low Impact Development techniques such as stormwater collection, storage, and circulation. The following are design suggestions for water features in the Pedestrian Realm.



Design Suggestions:

- ◆ Use high-quality masonry products and applications that complement adjacent architecture.
- ◆ Locate water features in the building zone, landscape amenity panel or urban park spaces. Water features should not be located in the sidewalk zone of the streetscape or impede pedestrian traffic in any way.
- ◆ Consider how the water feature will appear without the presence of water such as during the winter months or during periods of drought.
- ◆ Use water features to augment recycling, storage and recirculation of stormwater and HVAC condensate.
- ◆ Design all water features to adhere to Fairfax County standards for outfall, drainage, and other requirements.
- ◆ Maintain all water features on a regular basis.
- ◆ Consider the use of unobtrusive and well-integrated water features as barrier elements for sites which have additional security requirements.



Opposite Left: Streetscape Fountain in the building zone.

Opposite Right: Interactive spray fountain in a plaza.

Above Left: Water feature at the Dominion, Austin, TX.

Above Right: Fountain at Dupont Circle, Washington, D.C.

3.2C Paving

Paving in an urban environment must be able to withstand harsh weather conditions and a high volume of pedestrian traffic. It must also accommodate vehicular crossings at garage entrances, loading and unloading of materials for retail establishments, and the stresses caused by shoveling snow and de-icing treatments. It must also be easily repaired or replaced in the event of damage or utility work. Paved surfaces must be slip resistant and safe for pedestrian movement. Light colored paving can also remediate a heat-island effect and count towards LEED credits.

The paving in Tysons is described in the following pages by streetscape hierarchy corridor (See Section 2.4 for streetscape hierarchy). Following is a preferred material palette for the primary pedestrian corridors that will provide visual clues to pedestrians, act as a wayfinding tool and provide a unifying design element between neighborhoods.

Also included here are palettes for secondary corridors, tertiary corridors, and alleys which suggest a material framework, but offer flexibility in color, material and paving patterns.

The following paving palettes utilize materials that are cost effective and readily available in the market place and will simplify sidewalk repair over time.

The following material palettes consist of three elements: field paving, accent paving, and paving at tree planting spaces. Field paving is the predominant material used between the curb and the building face. Accent paving is used in limited quantities to highlight key places such as entrances, urban parks, pedestrian crossings and important intersections. Paving at tree planting spaces is a walkable surface that is supported

above a tree's soil volume (See section 3.2D and 3.2E for plan diagram). Tree planting spaces should be paved or covered when they are located in areas of high pedestrian traffic (See Section 3.6).

Flexibility is provided regarding the placement and design for paving patterns and control joint patterns. Additional flexibility will be afforded for innovative, sustainable paving materials that contribute to the neighborhoods sustainability goals.

How to Use this Document to Create a Paving Material Strategy:

1. Identify the appropriate streetscape hierarchy shown in Section 2.4 and / or which is contained in a rezoning application's pedestrian hierarchy plan.
2. Identify the soil percolation rates for the area to be paved to determine if porous pavement is a viable choice for the project.
3. Identify key places in the neighborhood where the location would benefit from accent paving. Examples include formal and primary entrances and transitions to public park space.
4. Determine locations for street trees and design paving around and with the tree planting spaces.
5. Understand the size, number and type of any utility access points and how they will be integrated into the paving design.
6. Refer to the materials lists, paving diagrams, images and product information on the following pages to determine the appropriate paving material.

Design Suggestions:

- ◆ Pave the sidewalk predominantly with field paving to minimize tripping hazards in the pedestrian travel way.
 - ◆ Use accent paving to highlight important places such as building or park entrances, tree planting spaces, mid-block crossings, public art work and water features.
 - ◆ Use porous paving over tree spaces should be porous, either by utilizing porous pavers, setting unit pavers on a pervious setting bed or using tree grates (See in Section 3.6).
 - ◆ Consider the use of porous pavers, pervious paving techniques, or other viable Low Impact Development (LID) techniques as stormwater infiltration tools in the streetscape.
 - ◆ Construct utility access doors using ADA compliant, slip resistant surfaces that are flush with adjacent paving, and attractively incorporated into the design of the pavement. This can be achieved by using like materials that are inset into the access door or grate or by using high-quality, creatively designed manhole covers.
 - ◆ Minimize the appearance of the service entrances in the sidewalk by using the same paving at driveway and service entrances that is used along the streetscape.
- ◆ Install ADA-compliant ramps and pavement treatments as required.
 - ◆ Paving used on public roadways is subject to VDOT approval.
 - ◆ Paving used on private Service Streets and roadways is subject to Fairfax County Department of Public Works and Environmental Services (DPWES) approval.



Right: Accent and field paving, Columbia Heights, Washington, D.C.

3.2D Paving - Primary Pedestrian Corridors

Primary pedestrian corridors will carry the most pedestrian activity and will connect people throughout Tysons. For these reasons, the following Preferred Paving Materials List specifies a consistent standard of quality and a general appearance for streetscape paving palettes in these pedestrian corridors to provide continuity in them. These paving specifications only apply to streetscape areas. Paving in urban parks is at the discretion of the design team. If, however, a park is directly adjacent to the streetscape, a creative transition to the streetscape paving should be utilized. On a case by case basis, deviations from this recommended paving list may be considered.

FIELD PAVING: There are two options for field paving and are specified in the Preferred Paving Materials List. One option should be chosen and remain consistent, at a minimum, on both sides of a street, and for an entire block, and as specified in the chart on this page.

ACCENT PAVING: Accent paving in primary pedestrian corridors should be beige or grey in color, but the size and type of paver is flexible and is specified in the Preferred Paving Materials List on the following page.

TREE PLANTING SPACES: Tree grates will provide an ADA compliant, permeable, walkable and cost effective covered surface over tree spaces (See section 3.6 for tree planting space details).

The following is a preferred paving materials list and paving diagrams and for these corridors.



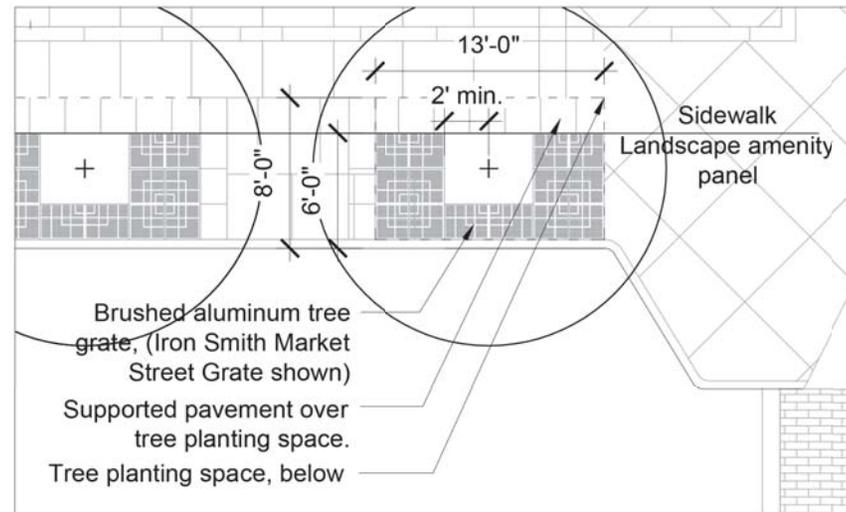
Primary Pedestrian Streetscape Corridors - Preferred Paving Materials List

(See pages 3-24 through 3-29 for images and product information)

	BUILDING ZONE	SIDEWALK	LANDSCAPE AMENITY PANEL
FIELD, OPTION A	<p><u>Cast in place concrete</u> Color: Buff Finish: Brush</p>	<p><u>Cast in place concrete</u> Color: Buff Finish: Brush</p>	<p><u>Cast in place concrete</u> Color: Buff Finish: Brush</p>
FIELD, OPTION B	<p><u>2' x 3' x 2' precast concrete pavers</u> Color: Limestone grey or limestone grey with black aggregate Finish: ADA non slip</p>	<p><u>2' x 3' x 2' precast concrete pavers</u> Color: Limestone grey or limestone grey with black aggregate Finish: ADA non slip</p>	<p><u>2' x 3' x 2' precast concrete pavers</u> Color: Limestone grey or limestone grey with black aggregate Finish: ADA non slip</p>
ACCENT	<p><u>Masonry unit pavers</u> To be used sparingly to accent special places such as building entrances, parks, etc. Color: beiges and greys. Color: Beiges and greys Finish: ADA non slip</p>	<p><u>Masonry unit pavers</u> To be used sparingly and should not exceed 25% of sidewalk zone paving, ADA compliant non-slip finish Color: Beiges and greys Finish: ADA non slip</p>	<p><u>Masonry unit pavers</u> To be used sparingly to accent special places such as building entrances, parks, etc. ADA compliant non-slip finish. Color: Beiges and greys Finish: ADA non slip</p>
TREE PLANTING SPACES	<p><u>Tree grates*</u> ADA non-slip compliant, Material: Brushed aluminum</p>	<p>NA</p>	<p><u>Tree grates*</u> ADA non-slip compliant Material: Brushed aluminum</p>

*All tree grates must be a minimum of 2' away from any tree trunk. See Planting Design Section 3.7

Opposite: Example of cast in place Concrete in a primary pedestrian corridor, Bethesda, MD



Tree planting space detail

Primary Pedestrian Corridor Paving Example
Tree planting space detail (Not to Scale)

3.2E Paving - Secondary and Tertiary Pedestrian Corridors

Secondary and tertiary pedestrian corridors are expected to be designed as complete streets and to create a sense of place. Secondary and tertiary corridors, however, will support less foot traffic and therefore a broader palette of materials is encouraged. Following is a suggested paving materials list and paving diagrams for these corridors.

FIELD PAVING: Any paving may be considered. To prevent trip hazards, unit pavers smaller than 2' x 2' should only be used as an accent. Permeable paving methods are encouraged.

ACCENT PAVING: Any paving may be considered. Permeable paving methods are encouraged.

TREE PLANTING SPACES: Tree grates or supported, permeable masonry paving units, will provide an ADA compliant, permeable, walkable and cost effective surfaces at tree spaces (See section 3.6 for tree planting space details). Open tree planting spaces and stormwater planting areas are encouraged.



3.2E Paving - Secondary and Tertiary Pedestrian Corridors

Secondary and Tertiary Streetscape Corridors - Suggested Paving Materials List

(See pages 3-24 through 3-29 for images and product information)

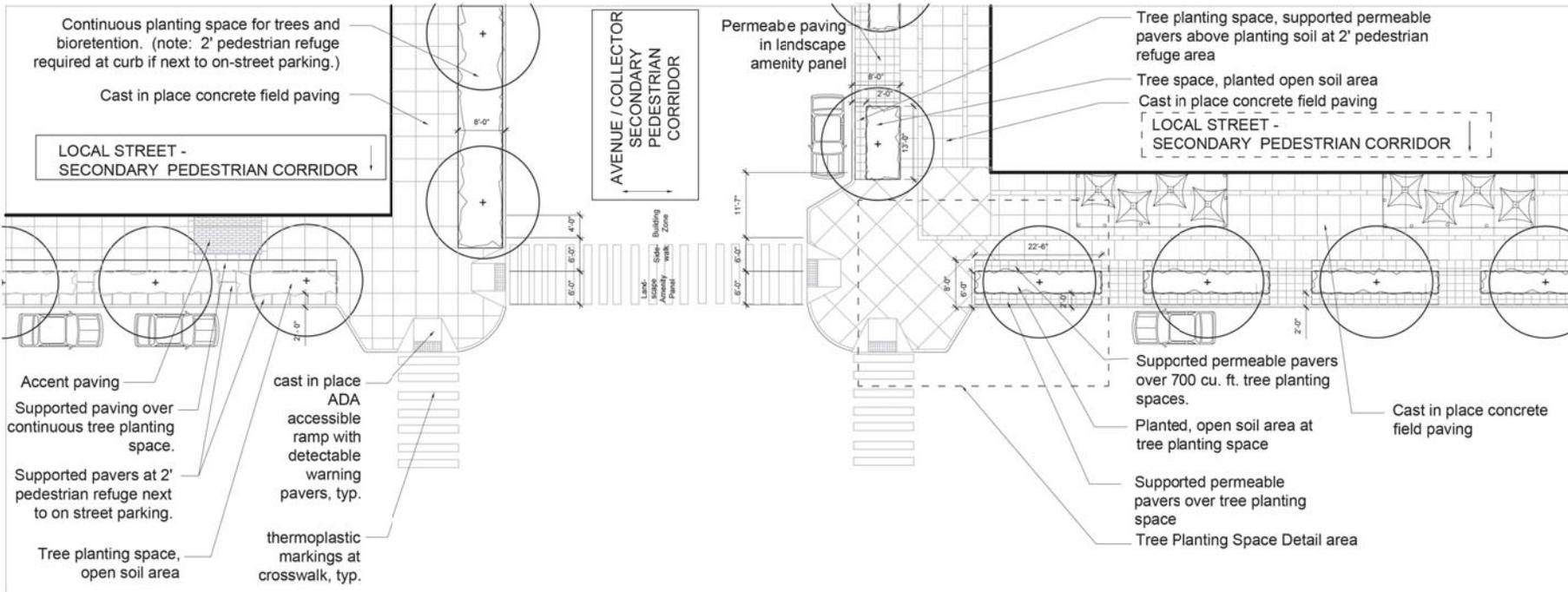
	BUILDING ZONE	SIDEWALK	LANDSCAPE AMENITY PANEL
FIELD, SUGGESTION A	<u>Cast in place concrete</u> Color: Buff Finish: Brush	<u>Cast in place concrete</u> Color: Buff Finish: Brush	<u>Cast in place concrete</u> Color: Buff Finish: Brush
FIELD, SUGGESTION B	<u>Any unit pavers (no smaller than 24" x 24")</u> Color: Any Finish: ADA non slip	<u>Any unit pavers (no smaller than 24" x 24")</u> Color: Any Finish: ADA non slip	<u>Any unit pavers</u> Color: Any, permeable pavers encouraged Finish: ADA non slip
ACCENT	<u>Masonry unit pavers</u> To be used sparingly to accent special places such as building entrances, parks, etc. Color: beiges and greys. Color: Any Finish: ADA non slip, permeable pavers encouraged	<u>Masonry unit pavers</u> To be used sparingly and should not exceed 25% of sidewalk zone paving, ADA compliant non-slip finish Color: Any Finish: ADA non slip, permeable pavers encouraged	<u>Masonry unit pavers</u> Permeable pavers encouraged Color: Any Finish: ADA non slip finish
TREE PLANTING SPACES	<u>Tree grates or supported, permeable masonry unit pavers*</u> Color: Any Finish: ADA non slip	NA	<u>Tree grates or supported, permeable masonry unit pavers*</u> Color: Any Finish: ADA non slip

*See Planting Design Section 3.7 for suggested methods to support paving over tree planting spaces. All tree grates must be a minimum of 2' away from any tree trunk.

Opposite Top: Stone, cast in place concrete paving and stormwater storage in the streetscape. Roombeek the Brook, Netherlands. Buro Sant en Co Landscape Architecture. Image: Bruno Sant en Co.

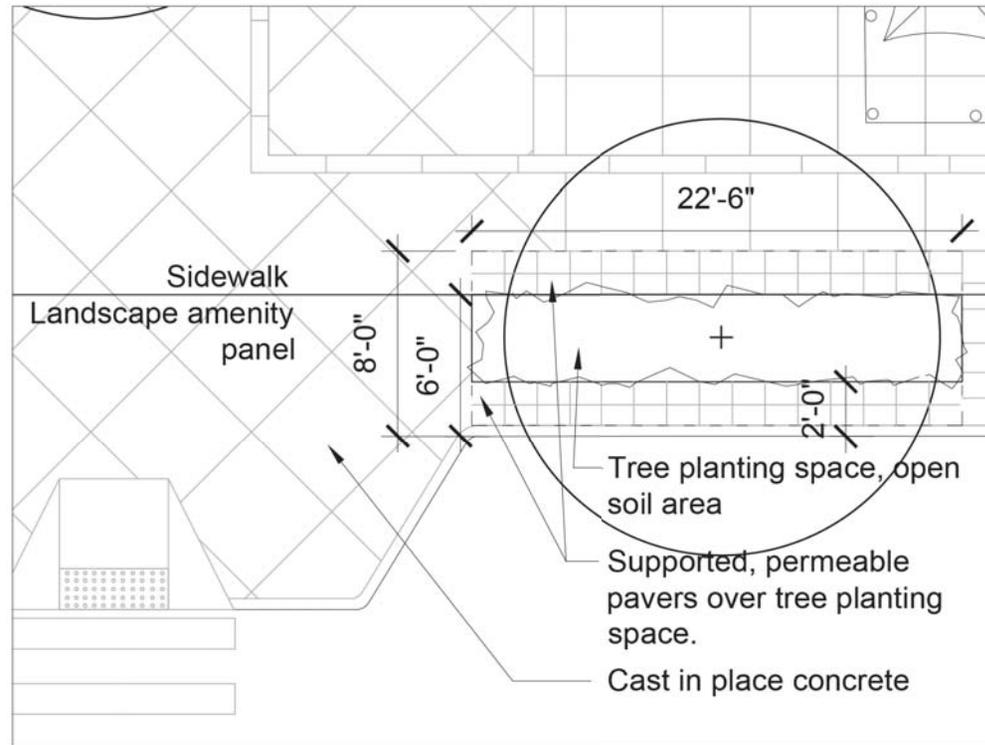
Opposite Bottom: Aerial view of paving and stormwater in the streetscape. Roombeek the Brook, Netherlands. Buro Sant en Co Landscape Architecture. Image: Bruno Sant en Co.

3.2E Paving - Secondary and Tertiary Pedestrian Corridors



Secondary Pedestrian Corridor Paving Example - Plan
(Not to Scale)

All measurements shown are from face of curb.



Secondary Pedestrian Corridor Paving Example
Tree planting space detail (Not to Scale)

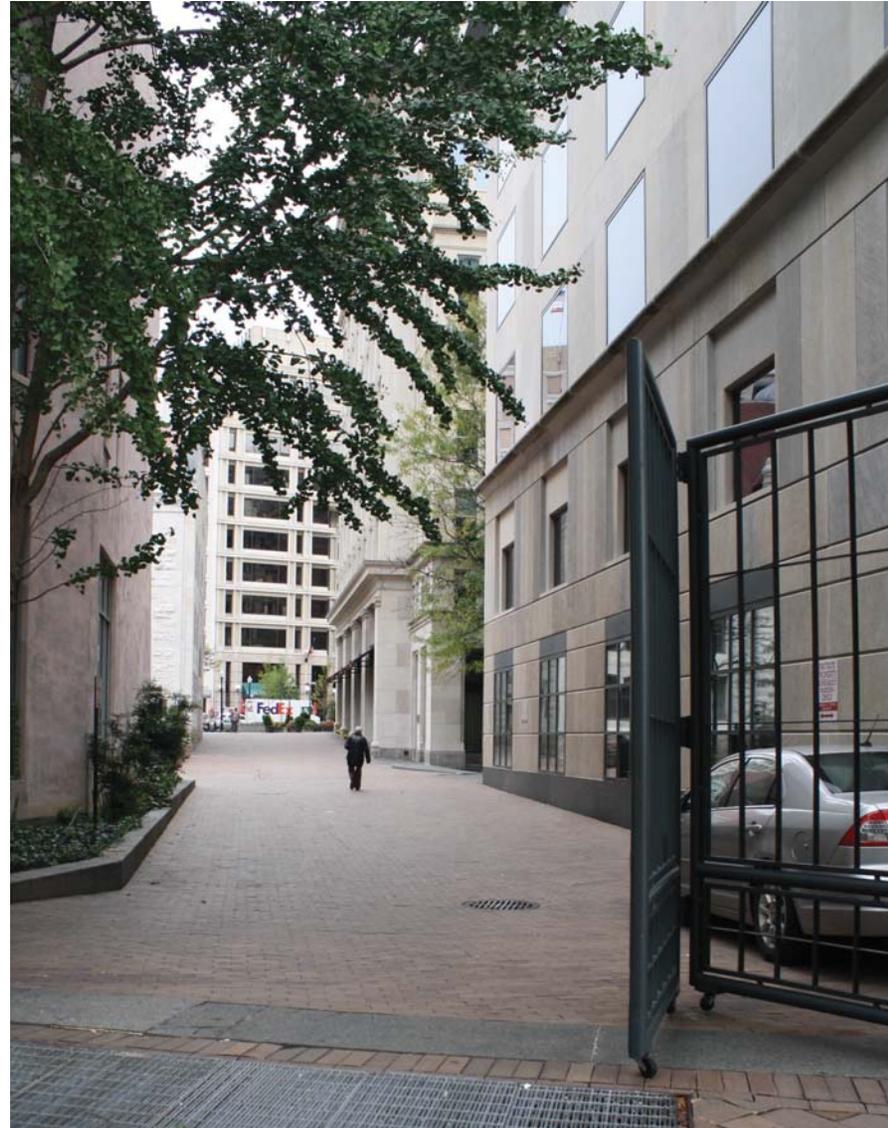
3.2F Paving - Service Streets

The primary function of service streets is to provide building access for service and delivery vehicles. High volumes of pedestrian and vehicular traffic are not anticipated on service streets. Additionally, many utilities such as transformers, stormwater, and other infrastructure will be located below service streets and in the buildings adjacent to them. These utility and service functions require ease of use for large trucks and in some cases, the operation of large machinery to facilitate loading, repair, trash removal and other service needs. Finally, service streets provide space for possible stormwater infiltration and collection. For these reasons, the paving and structure of the pedestrian zones on service streets may deviate from standard roadway and sidewalk materials. When appropriate, the use of roadway grade unit pavers, permeable paving or other paving material may be used to improve the appearance of a service street, increase the efficiency for trucks and equipment and decrease impervious paved areas.

On service streets, safe and ADA accessible pedestrian access may be accommodated by indicating pedestrian zones with changes in paving rather than creating a raised sidewalk and curb. This will allow for greater flexibility in turning movements for large trucks.

In some cases, service streets can function as an intimate alley that may offer some service and loading opportunities, but may also be serve as a pedestrian connection point. In these cases, a creative design that accommodates attractive, roadway grade unit pavers may be considered.

The following is a suggested paving materials list for Service Streets and a diagram that demonstrates how these suggestions may be implemented.



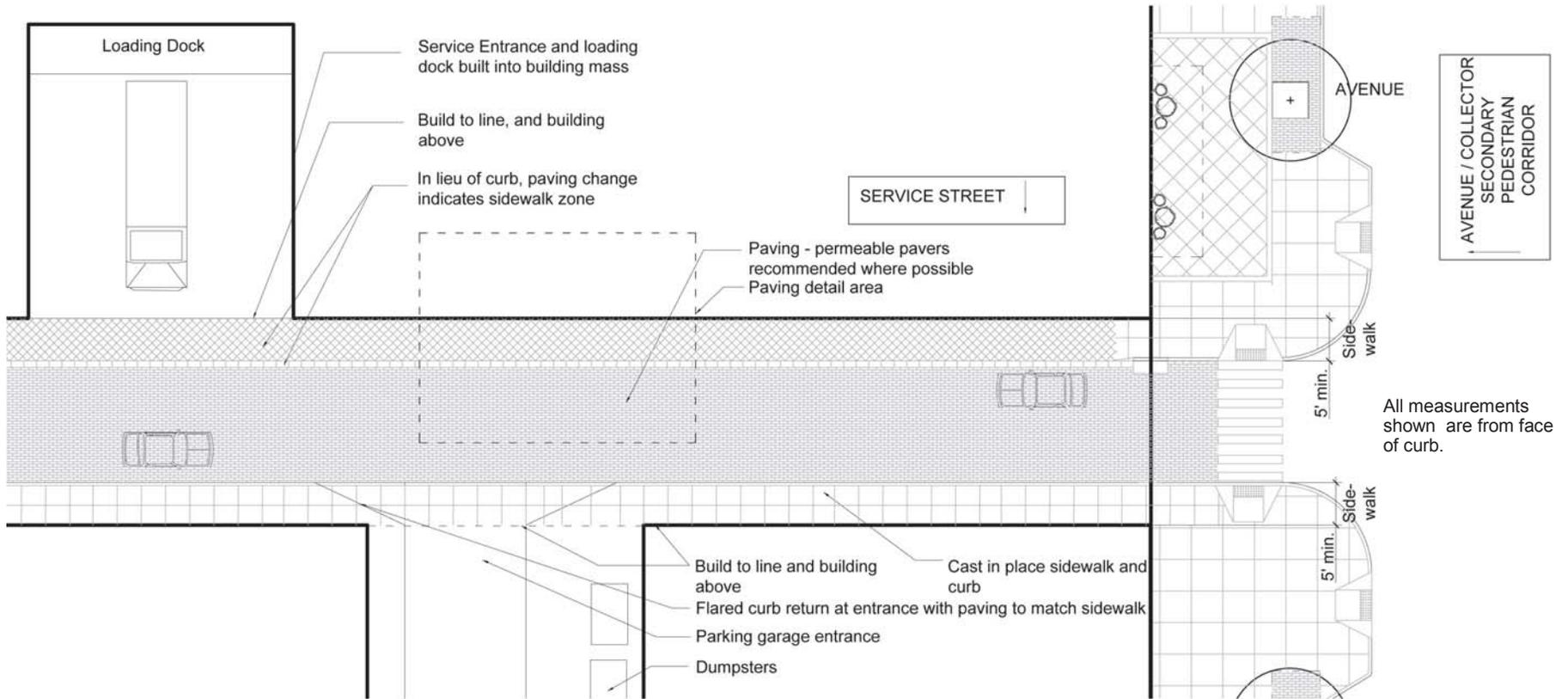
Tertiary Streetscape Corridors at Service Streets Suggested Paving Materials List

(See pages 3-24 through 3-29 for images and product information)

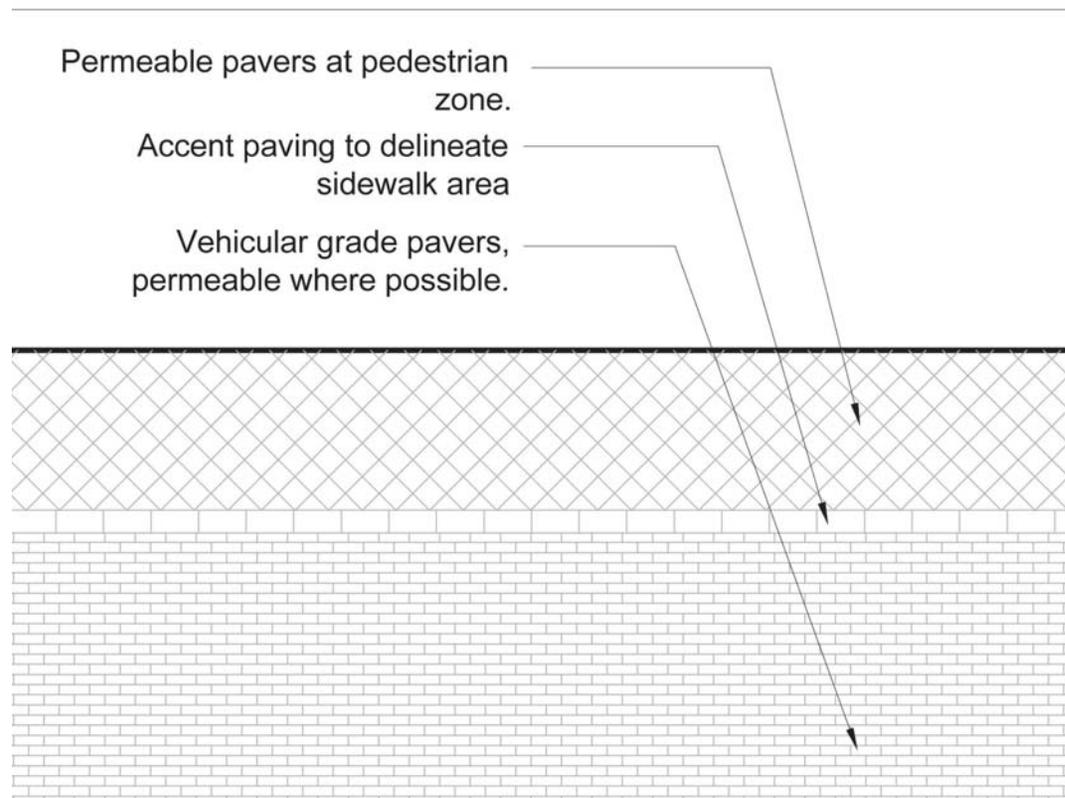
	SIDEWALK	STREET
FIELD (SUGGESTION A)	<p><u>Cast in place concrete</u></p> <p>Color: Buff</p> <p>Finish: Brush</p>	<p><u>Asphalt or permeable concrete</u></p> <p>Specifications per VDOT and Fairfax County DPWES standards</p>
FIELD (SUGGESTION B)	<p><u>Masonry unit pavers</u></p> <p>Size: 12" x12" minimum</p> <p>Color: Any</p> <p>Finish: ADA non slip, permeable pavers encouraged</p>	<p><u>Masonry unit pavers</u></p> <p>Specifications per VDOT standards</p> <p>Color: Any</p> <p>Finish: ADA non slip, permeable pavers encouraged</p>
ACCENT	<p><u>Masonry unit pavers rated for vehicular traffic</u></p> <p>Used to delineate sidewalk area when no curb is included</p> <p>Size: 12" x12" minimum</p> <p>Color: Any</p> <p>Finish: ADA non slip, permeable pavers encouraged</p>	<p><u>Permeable masonry unit pavers rated for vehicular traffic</u></p> <p>Specifications per VDOT standards</p> <p>Size: varies</p> <p>Color: Any</p> <p>Finish: ADA non slip</p>

Opposite: Service street, Washington, DC

3.2F Paving - Service Streets



Service Street Paving Example- Plan
(Not to Scale)



Service Street Paving Example
Detail (Not to Scale)

3.2G Paving - Product information

FIELD PAVING—Cast in Place Concrete

Location: Building zone, sidewalk, landscape amenity panel

Product Description: Cast in place concrete, brush finish

Color: Buff, suggested scoring patterns: 3' x 3' square or 2' x 3' rectangular London Bond. Creative scoring patterns used to highlight building entrances or other streetscape elements are encouraged.



Image: Bruno Carvalho

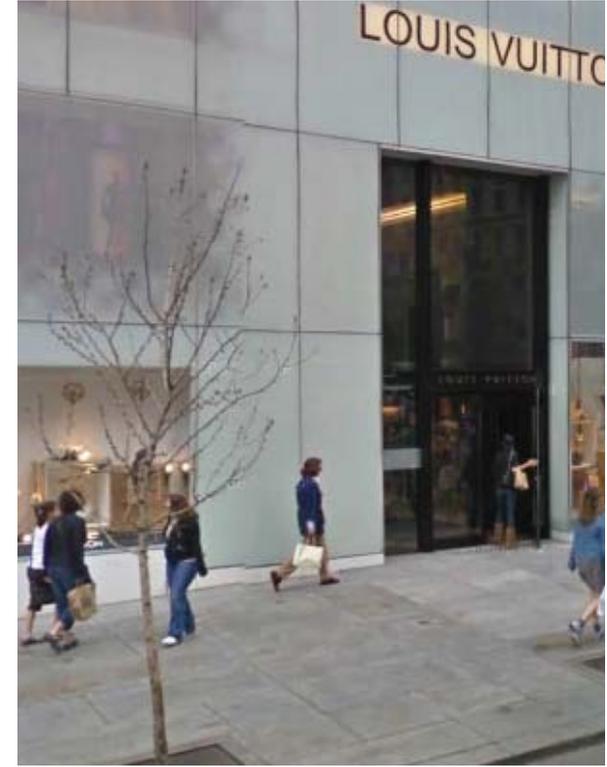


Image: Bruno Carvalho

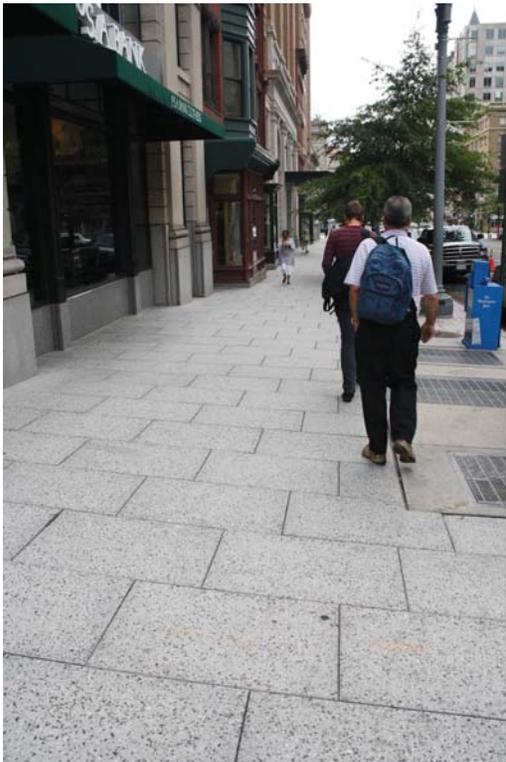
FIELD PAVING — Unit Pavers

Location: Landscape amenity panel, sidewalk, building zone.

Product Description: 2' x 3' x 2" min. precast concrete, stone pavers, or permeable pavers.

Color: Limestone grey or limestone grey with black aggregate, ADA, non-slip finish.

Suggested product example: Hanover Prest Pavers, Matrix #M1109, Tudor Finish. www.hanoverpavers.com



3.2G Paving - Product Information

ACCENT PAVING— Small Unit Pavers

Location: Landscape amenity panel, building zone and select accents that make up no more than 25% of the sidewalk

Product Description: Brick, concrete, stone, or permeable pavers (or unit pavers set in pervious setting bed). Non-slip finish
Color: Any



OTHER—TREE GRATES

Location: Landscape amenity panel, building zone

Product Description: Primary pedestrian corridors tree spaces: brushed, cast aluminum grate, suggested pattern: Ironsmith Market Street Grate www.ironsmith.cc or approved other. Secondary and tertiary corridors any ADA compliant, non-slip grate. Set on frame. (Note: all tree grates should be offset by 2 ft. (min.) from any tree trunk. (See Section 3.6 for tree planting space details)



3.2G Paving - Product Information

OTHER—ADA Accessible Ramp Paving

Location: ADA curb ramps

Product Description: Pre-cast detectable warning pavers
Charcoal grey suggested but color to be determined by project such that ADA requirements are met

OTHER—Crosswalk Paving—Thermoplastic Markings

Location: Crosswalks as approved by VDOT

Product Description: Imprinted pattern in asphalt with thermoplastic paint applied. Color and pattern may vary as approved by VDOT



OTHER—Crosswalk Paving— Masonry Unit Pavers

Location: Local Street crosswalks at primary pedestrian corridors and as permitted by VDOT and FCDOT

Product Description: Pre-cast concrete or stone unit pavers or paver sets

OTHER—Crosswalk Paving— Stamped Asphalt

Location: Local Street crosswalks at primary pedestrian corridors and as permitted by VDOT and FCDOT

Product Description: Stamped and colored asphalt



3.3 Lighting

Lighting in Tysons will help to create a safe environment for both pedestrians and cars. Pole mounted lights in the streetscape will illuminate the ground plane and serve as armatures for wayfinding signage and seasonal or event specific banners that highlight local events and places. Additionally, streetscape lighting will be augmented by building mounted and accent lighting for signage and by lighting in and around architectural projections. It is intended that the quality of light from all fixtures will create a pleasant and safe environment that encourages pedestrian activity at night.

Emerging sustainable lighting technologies including LED lights will provide the opportunity to light the streetscape and streets in Tysons in an energy efficient manner while providing a pleasant quality of light. Developers are encouraged to use energy efficient lighting technology when possible for all streetscape and site lighting.

All lighting design is subject to review by Fairfax County and must comply with the Outdoor Lighting Standards contained in Article 14 of the Zoning Ordinance and any requirements set forth in the Public Facilities Manual. Additionally, all street lighting must comply with applicable VDOT standards for roadway lighting. Lighting levels for both roadways and pedestrian paths should be adequate, but not over lit. After installation, lighting should continue to be monitored for levels and hue, and adjustments made as necessary.

The following sections provide guidance on lighting design for the streetscape, site and building design in Tysons.



The following are general design suggestions for streetscape lighting as well as specifications for the three preferred pole-mounted light fixtures. Two of the options should be used in each development for lighting the streetscape and the roadway for Local Streets, and Avenues/Collectors; the GE Evolve option should be used for the Boulevards, or in other cases where the roadway is wider. All fixtures offer a variety of mounting heights and light configurations to accommodate a safe and pleasant standard of light, and can accommodate banner arms as needed.

As technology changes, new lighting options may become available. Any new light fixtures used should be of complimentary style with the lights in these design guidelines.

Design Suggestions:

- ◆ Refer to Section 3.3B for the preferred fixtures for all new pole mounted, streetscape lighting.
- ◆ Any lighting that is not located in the streetscape can be at the discretion of the design team, provided such lighting complies with all applicable requirements.
- ◆ Use full cut-off or directionally shielded and controlled lighting to highlight important architectural or streetscape elements.
- ◆ Use energy efficient technologies such as solar powered lights, LED fixtures and photocells to reduce energy consumption.



Opposite: Shirlington, VA evening streetscape, Image: KevinH - Flickr.com

Above Right Top: Downtown Denver, Image: Downtownnews.org

Above Right Bottom: Citygarden fountain at night, St. Louis. Image: ronronron - Flickr.com

3.3B Preferred Streetscape Lights - Product Information

Pedestrian Scale Streetscape Lights—Option A

Product Name / Manufacturer: Se'lux , Arc Mini, Spanner Arm Series. Silver finish, LED or HID lamp, tempered flat glass lens. AT535 pole with base cover. LED Model# ARC MINI – ARC2-L-R(*)-ASI-LED-SV-S635-18-125-SV-BC(*) HID Model # AT535-18-188-SV-BC(*)
 www.selux.com or approved other

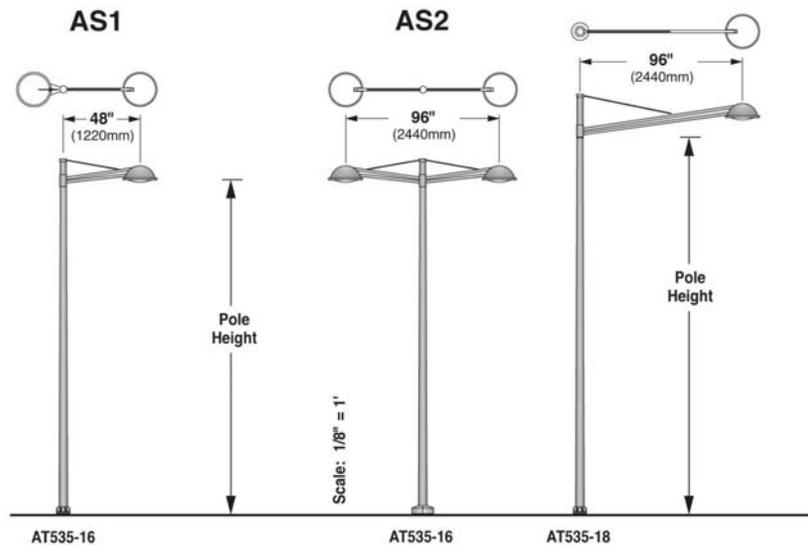
Specifications: Meet Illuminating Engineer Society (IES) photometric performance standards for urban streets and streetscapes

Location: Landscape amenity panel, medians for all new developments in Tysons

Other: Banner arms and signage connections encouraged



Spanner Arm Series



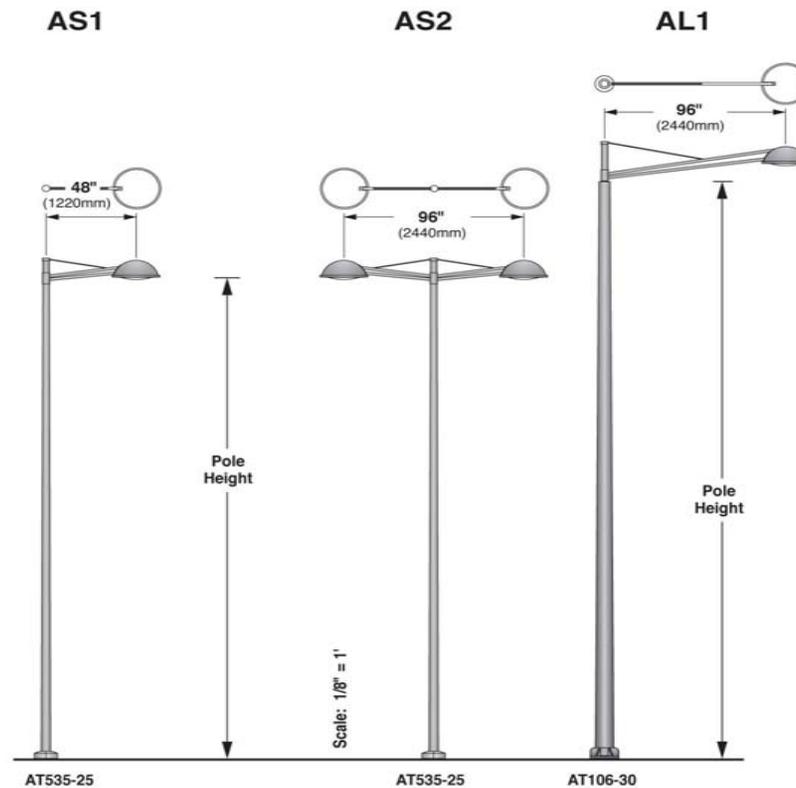
Roadway Scale Street Lights—Option A

Product Name / Manufacturer: Se'lux , Arc, Spanner Arm Series. Silver finish, HID or LED lamp, tempered flat glass lens. AT635 or AT106 pole with base cover. LED Model # ARC – ARC-L-R(*)-ASI-LED-SV-AT635-25-188-SV-BC(*) or HID Model #AT106-35-188-SV-BC(*)
www.selux.com or approved other

Specifications: Meet Illuminating Engineer Society (IES) photometric performance standards for urban streets and streetscapes

Location: Landscape amenity panel, medians at wider roads such as Boulevards or multi-lane Avenues and Collectors

Other: Can also be combined with Arc Mini fixtures at lower mounting height to illuminate both roadway and streetscape on one pole. Banner arms and signage connections encouraged

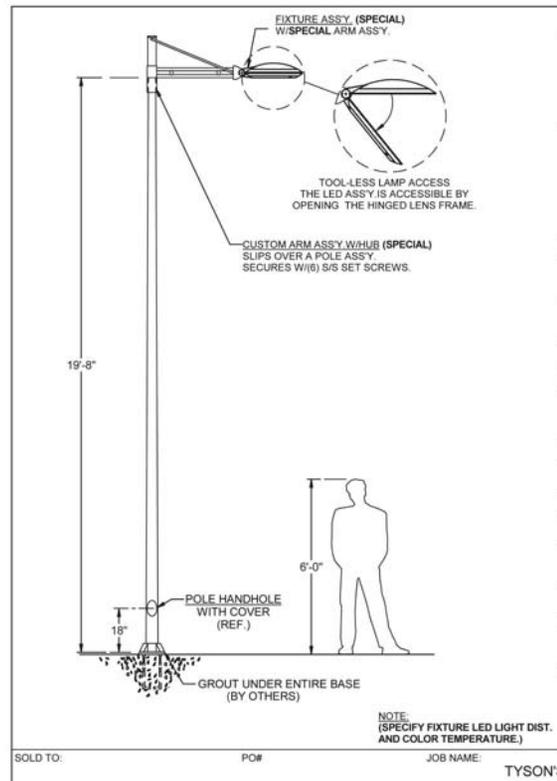


3.3B Preferred Streetscape Lights - Product Information

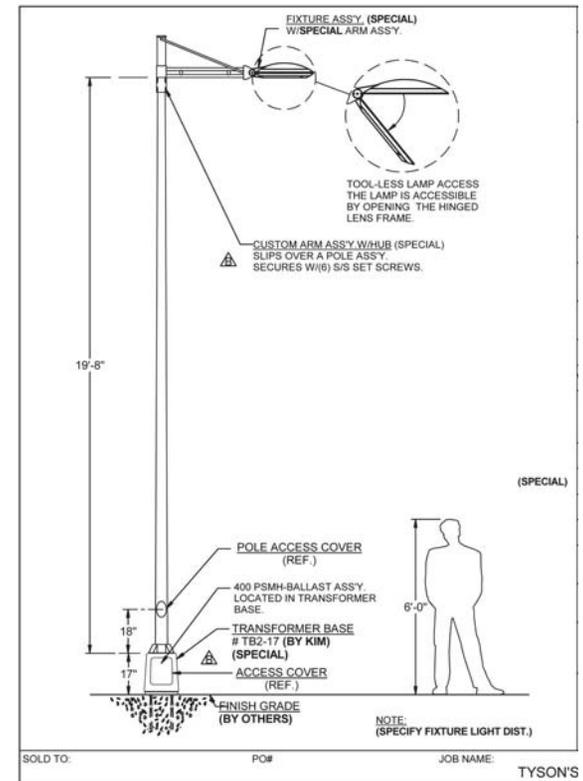
Pedestrian Scale Streetscape Lights—Option B

Product Name / Manufacturer: Architectural Area Lighting Flex Series: Matte aluminum finish. HID option item number FH3-400PSMH-11A-1750-B, or LED option item number FH-T2-32LED-5K-350 www.aal.net or approved other

Specifications: Meet Illuminating Engineer Society (IES) photometric performance standards for urban streets and streetscapes
 Location: Landscape amenity panel and medians for all new developments in Tysons
 Other: Banner arms and signage connections encouraged



LED Option



HID Option

3.3B Preferred Streetscape Lights - Product Information

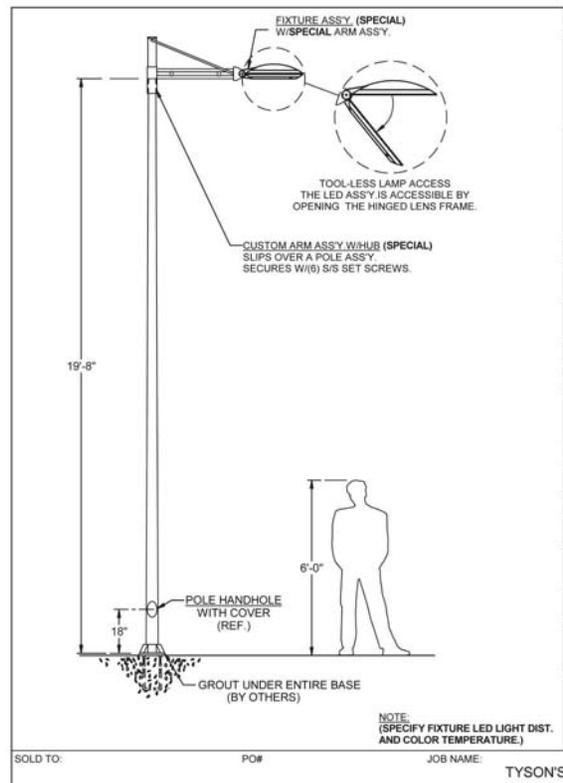
Roadway Scale Street Lights—Option B

Product Name / Manufacturer: Architectural Area Lighting Flex Series: Matte aluminum finish. HID option item number FH3-400PSMH-11A-1750-B, or LED option item number FH-T3-56LED-5K-700 www.aal.net or approved other

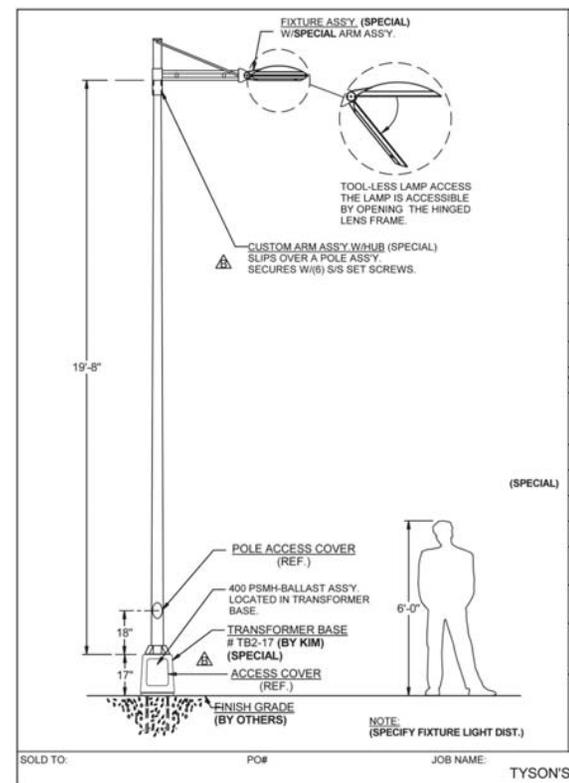
Specifications: Meet Illuminating Engineer Society (IES) photometric performance standards for urban streets and streetscapes

Location: Landscape amenity panel and medians for all new developments in Tysons

Other: Can also be combined with additional fixture at lower mounting height to illuminate both roadway and streetscape on one pole. Banner arms and signage connections encouraged



LED Option



HID Option

3.3B Preferred Streetscape Lights - Product Information

Pedestrian Scale Streetscape Lights—Option C

Product Name / Manufacturer: GE Evolve LED: Corrosion resistant powder painted finish. LED option item number ESRI_C3A11740
www.gelighting.com or approved other

Specifications: Meet Illuminating Engineer Society (IES) photometric performance standards for urban streets and streetscapes
Location: Landscape amenity panel and medians for all new developments in Tysons
Other: Banner arms and signage connections encouraged

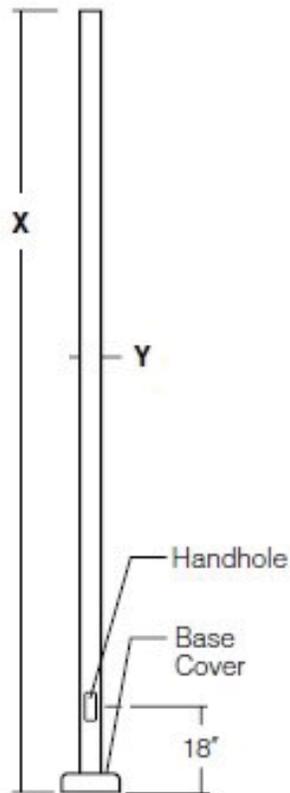


Above Right: GE Evolve installed in Oakland, CA. Image: <http://www.businesswire.com/news/home/20140508006463/en/GE%E2%80%99s-LED-Street-Lighting-Installation-Demonstrates-Ongoing>

Roadway Scale Street Lights—Option C

Product Name / Manufacturer: GE Evolve LED Roadway: Corrosion resistant powder painted finish. LED option item number: ESRI_C3A11740
www.gelighting.com or approved other

Specifications: Meet Illuminating Engineer Society (IES) photometric performance standards for urban streets and streetscapes
Location: Landscape amenity panel and medians for all new developments in Tysons
Other: Can also be combined with additional fixture at lower mounting height to illuminate both roadway and streetscape



Evolve™ LED Roadway Lighting

Scalable Cobrahead (ERS1, ERS2, ERS3 & ERS4)



3.3C Building Mounted and Site Lighting

Specific building mounted and accent lighting fixtures are not specified in these guidelines because they should be integrated aesthetically and sustainably into the design of individual buildings and sites. The following are qualitative design suggestions that should guide the choices for this type of lighting:



Design Suggestions:

- ◆ Create visual interest by illuminating architectural features such as overhangs and canopies.
- ◆ Use building mounted fixtures to highlight entrances, doorways, and porticos.
- ◆ Light alleys with building mounted light fixtures.
- ◆ Consider creative and tasteful lighting concepts for tower elements that will add interest to the skyline of Tysons.
- ◆ Integrate lighting design elements for all signage in Comprehensive Sign Plans.
- ◆ Incorporate site lighting into hardscape elements such as steps, railings and in the paving to illuminate the pedestrian realm.
- ◆ Consider a seasonal lighting strategy for prominent pedestrian activity zones such as shopping districts and civic centers.
- ◆ Avoid over lighting buildings that is intrusive to adjacent buildings and streetscapes.
- ◆ Avoid excessive interior retail lighting that creates bright light that spills into the streetscape.

- ◆ Utilize bird-friendly site and building lighting methods such as implementing a “lights out” policy in tall building towers during peak bird migration periods and reducing light trespass from interior sources. (See Chapter 8, Resources for additional bird-friendly design resources)



Opposite: New York Times Building, bird-friendly site lighting and façade, Image: FX FOWLE Architects

Above Left: Georgelas Spring Hill Station development. WDG Architecture., Image: WDG Architecture

Above and Bottom Right: Toronto's skyline is shown above, both with lights at normal levels (top) and during times of heavy bird migration when lights are dimmed (bottom). In addition to saving birds, Lights Out programs save building managers an average of \$6,000 per year on utilities. Photo credit: WWF Canada



3.4 Streetscape Furnishings

Streetscape furnishings are an important element of neighborhood identity. They serve a practical purpose while helping to provide the character of a place. Following are specific guidelines for Tysons-wide elements such as transit shelters, traffic signal poles and parking stations. These are followed by recommendations for district-specific furnishings including benches, litter and recycling receptacles, and bicycle facilities. Furnishings in parks and other private exterior spaces are at the discretion of the design team.



Design Suggestions:

- ◆ Locate all **furnishings** outside of VDOT clear zones and required sight line distances. (See Transportation Design Standards for Tysons Corner Urban Center for clear zone and sight line distances)
- ◆ Do not locate **furnishings** of any kind in the sidewalk zone.
- ◆ Limit **Outdoor dining** to the building zone area of the sidewalk and do not place any outdoor dining amenities in the sidewalk zone or the landscape amenity panel. Do not allow outdoor dining areas to “creep” into the sidewalk.
- ◆ Use **outdoor dining** furnishings that are constructed of high-quality materials and complement the architecture of the adjacent buildings.
- ◆ Surround all **outdoor dining** areas by an ornamental boundary such as moveable posts and rails.
- ◆ Use removable **outdoor dining elements** including, but not limited to, seating, tables, umbrellas, service carts and fencing.
- ◆ Use streetscape **furnishings** that can withstand harsh weather and other urban site conditions.
- ◆ Use furnishings that are designed using **universal design principles** and are adaptable to users of varied mobility levels.
- ◆ Use high quality **free-standing planters** that will withstand harsh weather and other urban site conditions. This may include, metal,

stone, terra cotta, resin, or fiberglass. Do not use thin plastic pots. See Section 3.6D for planting and maintenance recommendations for free-standing planters.

- ◆ Cluster **Newspaper vending machines** in racks to minimize the footprint and visual complexity of numerous structures.
- ◆ Use hardened street furniture, street furnishings that are crash and blast resistant, which can be unobtrusive and also serve as site amenities for sites with additional **security** requirements.



Opposite: Bethesda, MD Benches in streetscape

Above Left (Left): Stacked newspaper kiosk. Image: Bruno Carvalho

Above Left (Right): Outdoor dining, Washington, D.C.

Bottom Right: Public art as seating, Artist: Cliff Garten, Salt Lake City, UT

3.4A Transit Shelters

All Fairfax County transit shelters should be specified as the FCDOT standard transit shelter. The preferred standard shelter option for Tysons is shown on the following page. All transit shelter specifications and locations are subject to review by FCDOT.

In an effort to enhance the streetscape and the sense of place in Tysons, and allow for innovation in transit systems, a stakeholder group such as the Tysons Partnership is encouraged to work with OCR, FCDOT and VDOT on a Tysons wide transit shelter strategy. This shelter strategy should be contemporary in nature, incorporate innovative technology to provide real-time ridership information, utilize solar power and other sustainable elements, fit in with the grey color pallet of the street lights and furnishings and should include a side opening for ADA wheelchair access. Shelters can look to incorporate technology based on Transit Demand Management strategies in coordination with and approval from OCR, FCDOT, and VDOT.

Transit shelters should be placed within the landscape amenity panel and not project into the clear sidewalk zone. Shelters should be placed so that they adhere to ADA accessibility standards. Alternatively, shelters can be integrated into the building design and placed in the building zone when the site conditions are favorable for this option.



Transit Shelters

Product Description: Fairfax County Standard Transit Shelter

Manufacturer: Tolar Manufacturing Euro Series

Color: (Grey) Drylac Powder Coat 049/73510



Opposite Top: Bus Shelter integrated into building, Design: The Boro development, illustrative

Opposite Bottom: Bus Shelter integrated into building, Design: The Boro development, elevation

Above Left: Tolar manufacturing Euro series bus shelter, Image: Metro Magazine

Above Right: Tolar manufacturing Euro Series bus shelter, Image: Staff

3.4B Traffic Signal Poles

Traffic signal poles will be located at many of the intersections and should be coordinated both in color and appearance with the street lights specified previously and with those specified by the Dulles Rail Project for Route 7. The following specification and image represent the post base that will be used on the Route 7 lights which coordinates with the bases of the proposed streetscape lights.

Design Suggestions:

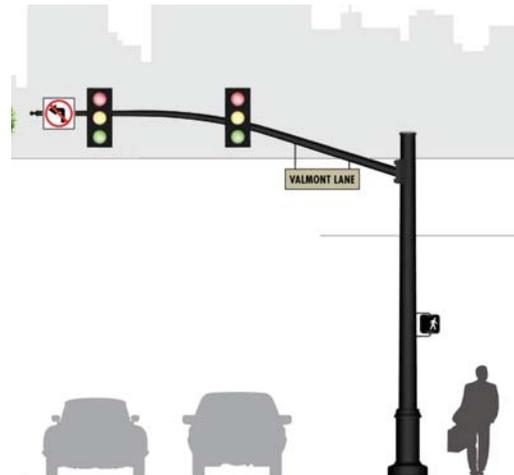
- ◆ When possible street lighting and traffic signals should be co-located on one pole.
- ◆ All signal heads and pedestrian signals should adhere to VDOT specifications.

Traffic Signal Poles and Bases

Product Description: Valmont Industries, round, tapered pole with Renaissance A02 post base, or approved other

Material: Per VDOT specifications

Color: (Dark Grey) Drylac Powder Coat RAL 9004, or approved other



RENAISSANCE A02
ALUMINUM
COMPONENTS

The streetscape serves as a transition between the street and buildings, and while it is a place where people travel on foot, there are many built objects in the streetscape that assist in the operations of vehicular traffic.

Parking meters, traffic signals and transit shelters are three of these elements, all of which take up a great deal of space in the streetscape. Care should be taken to co-locate these and other streetscape elements in order to minimize the amount of appurtenances in the streetscape. Additionally, using new and innovative products that minimize the footprints of these elements is encouraged. The placement of many of these elements should follow all building code requirements for ADA accessibility as well as any requirements by VDOT, FCDOT, or Fairfax County DPWES. The following are recommendations for parking meters, traffic signal poles and transit shelters.

Parking Meters & Stations

Parking meters and stations are a common part of urban living and once a parking authority (public or private) has been established, a comprehensive strategy for the type, placement and aesthetic of parking meters should be established. This should be undertaken in consultation with VDOT, Fairfax County DPWES, and FCDOT.

Design Suggestions:

- ◆ Use parking stations throughout Tysons that are similar in style and manner of operation.
- ◆ Use multi-space parking stations to minimize the number of meters in the streetscape.
- ◆ Use stations that accept multiple forms of payment, including credit/debit cards, online payment and pay-by-phone.
- ◆ Utilize innovative technologies such as solar power to operate the stations.



This Page, Left: Multi-space parking meter with solar panel, Washington, D.C.



This Page, Right: Digital parking meters with credit card payment method. Washington, D.C.

3.4D Bicycle Racks and Facilities

Bicycle racks are expected to be prominent and frequent elements in Tysons in parks, the streetscape, and in private spaces including courtyards and garages. Additionally, bike-share programs are anticipated. The Fairfax County Department of Transportation is in the process of creating the [Fairfax County Guidelines for Bicycle Parking](#) which includes standard specifications for bike racks and should be referenced prior to specifying bicycle rack or parking design. The following guidelines for bike racks are specific to Tysons.

Bicycle parking should be carefully located to provide visual prominence while avoiding conflicts with pedestrian flow. Innovative, efficient, and attractive designs for bike parking areas such as stacked racks or architectural bike stations should be planned for and located early in the design of a neighborhood.

Following are Tysons-wide bicycle parking design suggestions that should be considered when choosing and locating bike racks. Additionally, Sections 3.4E—3.4J provide alternate suggestions for district specific bicycle racks that adhere to the parameters for bike racks in the Fairfax County Department of Transportation's [Bicycle Parking Guidelines](#). For more information, see Chapter 8, Resources.

This Page, Left: Bike Share at streetscape edge with street trees, Image: Inhabitat.com

This Page, Right: Tysons Corner Center custom racks by Dero, Image: accesstysons.com

Design Suggestions:

- ◆ Consider using the custom Tysons bike rack as suggested on the following page. Efforts should be coordinated with Fairfax County and the Tysons Partnership to determine appropriate locations for using this custom design. Potential locations are along the Circuit Trail Loop or a future Metrorail Green Artery, both of which are described in Chapter 6.
- ◆ Plan early for bike share programs so that they can be located in a manner that does not conflict with street trees or pedestrian flow (A). Also, plan for solar-powered bike stations by locating facilities appropriately so that they receive adequate sunlight.
- ◆ Consider using “art” racks, (custom designed, signature racks) at prominent locations (B).
- ◆ Consider bike garages in buildings or the use of bike valets to reduce the amount of bike storage on busy



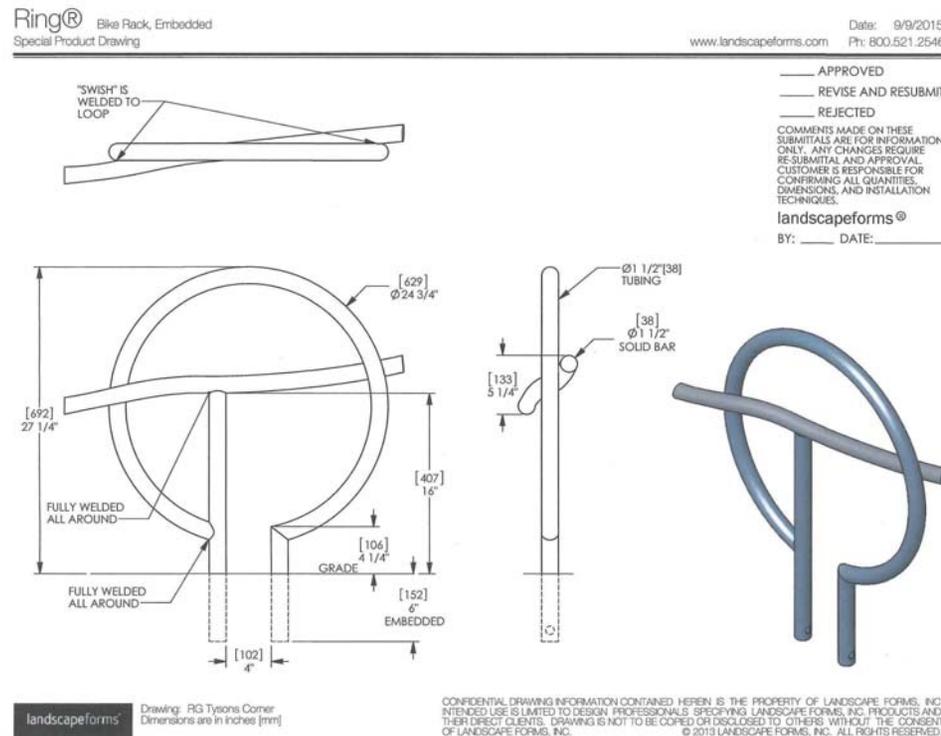
A



B

Tyson's Custom Bicycle Rack

Product Description: Custom design, adapted from the Landscape Forms Ring Bike Rack (www.landscapeforms.com)
 Material: Stainless Steel
 Other: Dero Bike Rack Co. (www.dero.com) is also a preferred option



3.4E Streetscape Furnishings by Subdistrict

As neighborhoods in Tysons emerge with their own sense of place and identity, streetscape elements will add to their unique character. For this reason, the following palette of furnishings by subdistrict was chosen to differentiate between each subdistrict and provide a visual clue in the streetscape that one has left on district and entered another.

Flexibility will be considered for alternative designs or selections particularly when site furnishings are designed as public art elements or when a community organization or an entity such as a business improvement district creates a neighborhood-specific palette of furnishings. If an alternative design is suggested by a single rezoning case as an alternative to one of these subdistrict palettes, it may be considered provided that the furnishings are submitted early in the Final Development Plan review process of a rezoning case and be vetted with other sub-district landowners.

Furnishings that are located in places such as the building zone, parks, quasi-public space or private open space areas, may be chosen at the discretion of the design team. Any Tysons-specific furnishings proposed by the Tysons Partnership and/or similar neighborhood organizations are encouraged to be implemented.

Design Suggestions:

- ◆ Locate all furnishings outside of VDOT clear zones and sight distances. (See Transportation Design Standards for Tysons Corner Urban Center)
- ◆ Do not locate furnishings of any kind in the sidewalk zone.
- ◆ Use outdoor dining furnishings that are constructed of high-quality materials and that complement the architecture of the adjacent buildings.
- ◆ Use streetscape furnishings that can withstand harsh weather and other urban site conditions.
- ◆ Seating should be designed using universal design principles and be adaptable to users of varied mobility levels.



Above Left: Portland Streetscape - Landscape Forms custom litter receptacle, Image: Landscape Forms

Above Right: Forms + Surfaces streetscape furnishings, Image: Forms+Surfaces

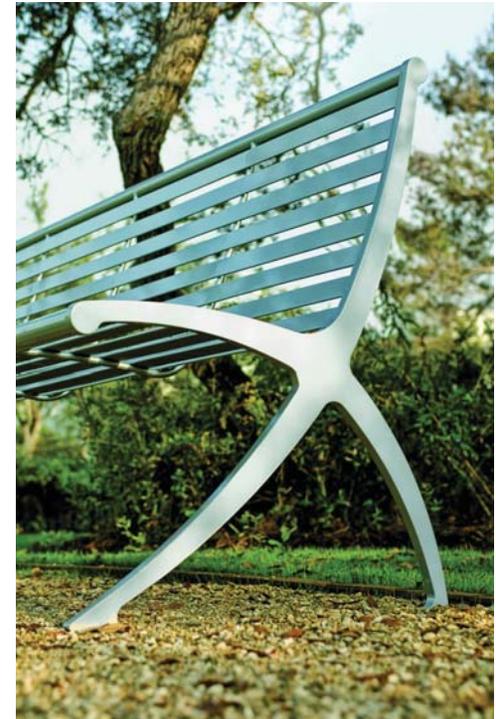
3.4F Streetscape Furnishings / Tysons East & East Side

Benches

Product Name / Manufacturer: Landscape Forms, Park Vue Bench, Silver powder coat finish. www.landscapeforms.com, or approved other

Location: Building zone, landscape amenity panel

Other: Backless bench, and bench with or without arms are all acceptable



Litter / Recycling Receptacles

Product name / Manufacturer: Victor Stanley, Steelsites litter receptacle SDC-36, Recycling receptacle RSDC-36, Silver powder coat finish
www.victorstanley.com, or approved other

Location: Building zone, landscape amenity panel

Bicycle Rack

Product name / Manufacturer: Landscape Forms, Ring Bicycle Rack, stainless steel
www.landscapeforms.com, or approved other

Location: Building zone, landscape amenity panel



 **VICTOR STANLEY, INC.**
Manufacturers of Quality Site Furnishings since 1962.

SDC-36 Steelsites™ Series side-deposit side-door litter receptacles.
Visit www.victorstanley.com for details.



3.4G Streetscape Furnishings / Tysons Central 123 & North Central

Benches

Product Name / Manufacturer: Urbanscape Dewart Bench DE1113C, with horizontal slats. Stainless powder coat finish.
www.urbanscapefurniture.com, or approved other

Location: Building zone, landscape amenity panel



Litter / Recycling Receptacles

Product name / Manufacturer: Urbanscape Receptacle TA3F33P and TA3F33P with Bonnet for Recycling Receptacle . Stainless powder coat www.urbanscapefurniture.com, or approved other

Location: Building zone, landscape amenity panel

Bicycle Rack

Product name / Manufacturer: Urbanscape Loop Bike Rack BRH5381. Stainless powder coat. In-ground or surface mount www.urbanscapefurniture.com, or approved other

Location: Building zone, landscape amenity panel



3.4H Streetscape Furnishings / Tysons Central 7 & Old Courthouse

Benches

Product Name / Manufacturer: Landscape Forms Rest Metro 40 Bench, Silver powder coat finish. www.landscapeforms.com, or approved other

Location: Building zone, landscape amenity panel

Other: Backless bench, and bench with or without arms are all acceptable. Use of one or two seat dividers should be considered



Litter / Recycling Receptacles

Product name / Manufacturer: Creative Pipe Degaldo trash receptacle and recycling receptacle, Grey powder coat RAL 7040: DLGT-HLS-36-F-P-DT and DLGT HLS-36-F-P-LDD
www.creativepipe.com, or app. other.

Location: Building zone, landscape amenity panel

Other: Stainless steel also acceptable

Bicycle Rack

Product name / Manufacturer: Creative Pipe Horseshoe Rack, flanged surface mount, Stainless Steel.
www.creativepipe.com, or approved other

Location: Building zone, landscape amenity panel



3.4J Streetscape Furnishings / Tysons West & West Side

Benches

Product Name / Manufacturer: Forms + Surfaces Trio Bench with aluminum texture powder coated frame, clear anodized aluminum slats.
www.forms-surfaces.com, or approved other

Location: Building zone, landscape amenity panel

Other: Backless bench, and bench with or without arms are all acceptable



Litter / Recycling Receptacles

Product name / Manufacturer: Landscape forms Poe receptacle square opening for trash, round opening for recycle. Silver powder coat www.landscapeforms.com or approved other

Location: Building zone, landscape amenity panel

Bicycle Rack

Product name / Manufacturer: Landscape Forms Bola Bicycle Rack, stainless steel www.landscapeforms.com, or approved other

Location: Building zone, landscape amenity panel



3.5 Public Art

Public art installations are important elements in the urban landscape and can be located in parks, in the streetscape, at building entrances, and other strategic locations. Art pieces can reflect neighborhood character and act as landmarks which distinguish one place from another.

The Art In Transit program that is associated with the four new Metro stations in Tysons will set the stage for other art installations in the area. Public art pieces are encouraged throughout the pedestrian realm in Tysons. Although no style or type of art is preferred or recommended in these guidelines, the following are design suggestions for locating public art.



Design Suggestions:

- ◆ Work with the Arts Council of Fairfax County to facilitate a public art program and to connect with local artists.
- ◆ Include local, national and international artists' work of all scales.
- ◆ Consider establishing places that will house temporary and rotating art installations, such as in medians, or on sites that are slated for phased development.
- ◆ Consider various and emerging forms of art including digital media, sculpture, painting, murals, digital displays, performance art, and other forms of artistic expression.
- ◆ Locate art in prominent places within primary pedestrian corridors such as at major intersections, locations of civic uses and in retail areas.
- ◆ Do not install public art installations that could impede pedestrian traffic flow in the sidewalk zone of the streetscape.
- ◆ Consider both pedestrian and automobile scale art pieces.
- ◆ Consider functional art that can be incorporated into benches, bicycle racks or fences.



Opposite Left: Greensboro Metro Art, Artist: David Dahlquist, Image: Staff

Opposite Right: Springhill Metro Art, Artist: Barbara Grygutis, Image: Staff

Above Left Top: Tysons Luxury Lilies Mural, Artist: Naturel, Image: Staff

Above Left Bottom: Temporary Projection "For the Capitol", Artist: Jenny Holzer, Image: Jenny Holzer

Above Right Top: Temporary installation in a median, Arlington, VA. "CO2LED" Artists: Jack Sanders, Robert Gay, Butch Anthony, Image: Sanders, Gay, and Anthony

Above Middle Bottom: Tysons Tiles, Artist: Julia Vogel, Image: Staff

Above Right Bottom: Sculpture at Tysons West, Artist: Robert Cole, Image: Staff

3.6 Planting Design

Planting in the urban landscape is one of the most versatile and affordable design elements that can provide shade, texture, and color to public spaces, creating visual interest and encouraging pedestrian activity within the pedestrian realm. In addition to providing visual interest, well planted spaces in the pedestrian realm provide significant benefits to the urban ecology and environment. Stormwater remediation, urban heat island effect reductions, biodiversity and carbon sequestration are a few of the benefits that planting provides.

In addition to planting on the street-level, Tysons' urban architecture will provide many opportunities for parks and planted spaces on roof tops, building step back areas or other structures. These green roof spaces will provide places for recreation and relaxation, and all will offer additional ecological benefits for Tysons and the region.

The following are design suggestions and references to be used when designing streetscape and other planted spaces in the pedestrian realm.



Tree Space Design

Fairfax County recognizes the importance of a robust tree canopy and has established a county-wide goal to increase the overall tree canopy from 40% to 45% by 2037. The urban landscape in Tysons provides a unique opportunity to contribute to Fairfax County’s tree canopy by replacing parking lots and treeless street edges with well designed blocks that accommodate a planted pedestrian realm. The Comprehensive Plan calls for a 10% tree canopy coverage goal for each new redevelopment project. By implementing the conceptual grid and the streetscape planting design recommendations from the Comprehensive Plan, it is estimated that, over time, approximately 15,000—20,000 street trees will be planted in the Tysons streetscape alone. This streetscape tree canopy, along with that of other planted spaces such as urban parks and green roofs, could result in a significant increase in Tysons’ overall tree canopy .

To achieve the tree canopy goal noted above and to create a well planted urban pedestrian realm, one of the most fundamental elements of horticulture that must be addressed is soil. The ability for trees to grow and thrive in a harsh urban environment is dependent on the quality and volume of soil provided for trees. Without adequate, uncompacted soil urban trees will be short lived and provide little aesthetic and ecological benefit. Traditional “tree pit” designs that provide limited space for tree roots are the primary cause of poor tree health. They also create dangerous conditions where tree roots grow into sidewalk areas and crack paved surfaces. Innovative horticultural and design engineering research provides an alternative approach to tree planting that should be applied in Tysons.



Opposite: Washington DC Streetscape—1105 K St., NW

Right: Pennsylvania Avenue Streetscape, Washington, D.C.

3.6A Tree Space Design

Casey Trees, along with an advisory group of arborists, urban foresters, landscape architects and horticulturalists published a report that outlines innovative design strategies that provide healthy environments for urban trees. The following section includes many of the concepts in the Casey Tree report; further information can be found at www.caseytrees.org.

The Casey Trees report and this document use the term tree space to replace commonly used terms such as “tree pits” and “tree boxes.” As defined on page 7 of Tree Space Design: Growing the Tree out of the Box, Tree space is the open or covered area that is dedicated for the planting and growing of a street tree.

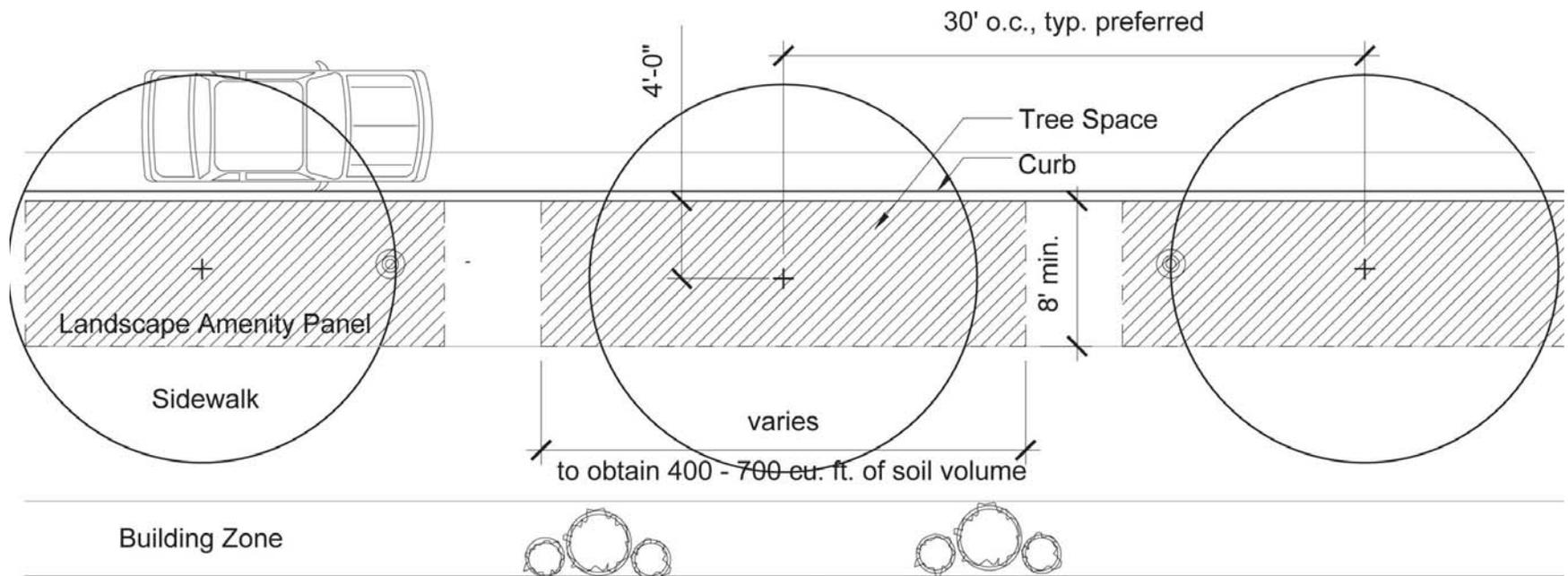
As noted in the Comprehensive Plan, the goal for tree spaces is to provide an environment that promotes healthy root growth. Because the ultimate size and health of trees is largely dependent on soil volume, tree spaces should be a minimum of 4 feet deep and provide a minimum soil volume in the root zone of approximately 700 cubic feet. The length and width of tree spaces varies depending on the streetscape type and the amount of anticipated pedestrian traffic on that streetscape. Tree space soil volumes greater than 700 cubic feet are highly encouraged and will lead to larger tree canopies. For two or more trees planted in a contiguous area, the volume of soil per tree could be reduced as tree roots will share much of the same space. Provision of continuous tree spaces is highly encouraged.

There are different strategies to achieve the elements necessary for trees to thrive in an urban environment. Some strategies include structural elements, while others may involve providing more than the minimum landscape amenity panel width if structural components are not desired. For example, with a 6' wide landscape amenity panel, 2' of space will be located underneath the sidewalk zone (cantilevered sidewalk) in order to meet current Public Facility Manual (PFM) requirements. If an 8' wide landscape amenity panel is provided, no cantilever is required, as the tree space design can meet PFM requirements.

The benefits of using this method of tree space design include:

- ◆ Better Shade - trees planted in tree spaces of 700 cubic feet of soil reach an approximate 18 - 20 foot diameter canopy size before they show signs of decline compared to traditional “tree pit” trees which result in trees achieving a 5 - 10 foot diameter canopy.
- ◆ Lower Maintenance Costs - Trees planted in tree spaces are healthier and require less maintenance because they have a healthy root environment and suffer from fewer stress-related diseases.
- ◆ Lower Replacement Costs - Trees planted in tree spaces of 700 cubic feet of soil live 10 - 20 years versus “tree pit” trees which average a 5-year life expectancy.
- ◆ Safer Sidewalks - Trees planted in tree spaces have adequate soil volumes for their roots versus “tree pit” trees which have to break out of their small root zones and crack or buckle adjacent sidewalks to find air and water.

The following tree space design should provide both a healthy environment for tree roots and accommodate the high volume of pedestrian traffic that is expected in Tysons. Although the surface area of the tree space is larger than traditional “tree pits,” only a portion of the surface area must remain open soil area. The remainder of the surface area may be covered with a permeable, walkable paving system that protects tree roots from compaction and allows for pedestrian traffic above the tree space.



Above Left: Tree Space design diagram, Open Soil Area. © 2008 Casey Trees.

Above Right: Tree Space design diagram, Covered Soil Area. © 2008 Casey Trees.

Bottom: Tree space conceptual Diagram.

3.6A Tree Space Design

Greater soil volume will lead to healthier trees; however, there are many variables in building the urban streetscape, such as pedestrian traffic, underground utility infrastructure, and economic viability, that could potentially conflict with the goal of healthier trees. For this reason, it is important to balance healthy trees and walkable and buildable streetscapes. With this understanding, the recommendation for tree space design in Tysons is as follows:

- ◆ 700 cubic feet is the suggested volume for street trees in Tysons. 400 cubic feet is the minimum that will be considered by the Urban Forest Management Division (UFMD).
- ◆ Achieving these soil volumes can be achieved by using:
 - A. Open soil areas (Detailed in section 3.6B) or
 - B. Covered soil areas (Detailed in section 3.6C) that utilize assorted methods for structurally supporting pavement over planting soil.
- ◆ The following recommendations include tree planting details that demonstrate how innovative planting methods can accommodate both the suggested soil volumes and provide a desirable amount of paved surface area for pedestrians. Additionally they demonstrate how the 8' minimum planting space width, called out in the Fairfax County Public Facilities Manual, can be achieved in the Tysons streetscape.
- ◆ A minimum of 400 cubic feet of soil volume may be utilized for the following conditions:
 - A. Primary pedestrian corridors (see Section 2.4)
 - B. Secondary pedestrian corridors that are located in retail areas
 - C. Where utilities cannot be located in the roadway or under the sidewalk zone and must cross a tree planting area
- ◆ Larger soil volumes (700 cubic feet), which can be achieved in a number of ways and they are detailed in the following section and in the Casey Tree publication Tree Space Design: Growing the Tree out of the Box, should be utilized for the following conditions:
 - A. Secondary Pedestrian Corridors in residential areas
 - B. Tertiary Pedestrian Corridors in residential areas
 - C. Public and private parks
- ◆ Utilize innovative methods to increase soil volume for trees such as providing root paths to adjacent open soil areas or by planting trees in contiguous soil planting areas. This and other methods are detailed in Tree Space Design: Growing the Tree out of the Box



Above left, top Washington, D.C. Streetscape with planting in the building zone and continuous street tree planting spaces in the landscape amenity panel .

Above left, bottom Michigan Avenue Streetscape, Chicago, IL Image: Bruno Carvalho

Above right: Washington, D.C. Streetscape and street trees using partially open and partially covered tree spaces. Root path connection to green space on right.

3.6A Tree Space Design

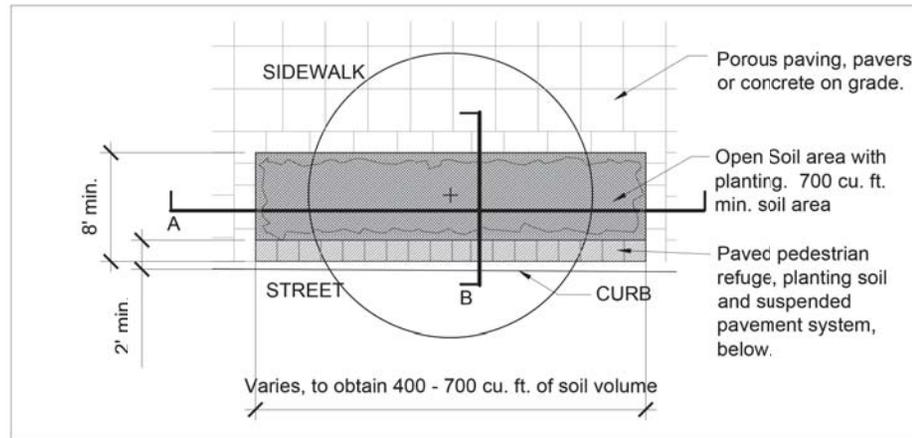
Open Soil Area

Page 5 of Tree Space Design: Growing the Tree out of the Box defines open soil area as “an unpaved area of soil surrounding a tree which contains existing, new or amended soil.” Open soil area is encouraged when space and pedestrian flow allows it. This planting method provides space for ornamental plantings and trees in the tree space and maximizes the amount of stormwater that can be absorbed into the ground.

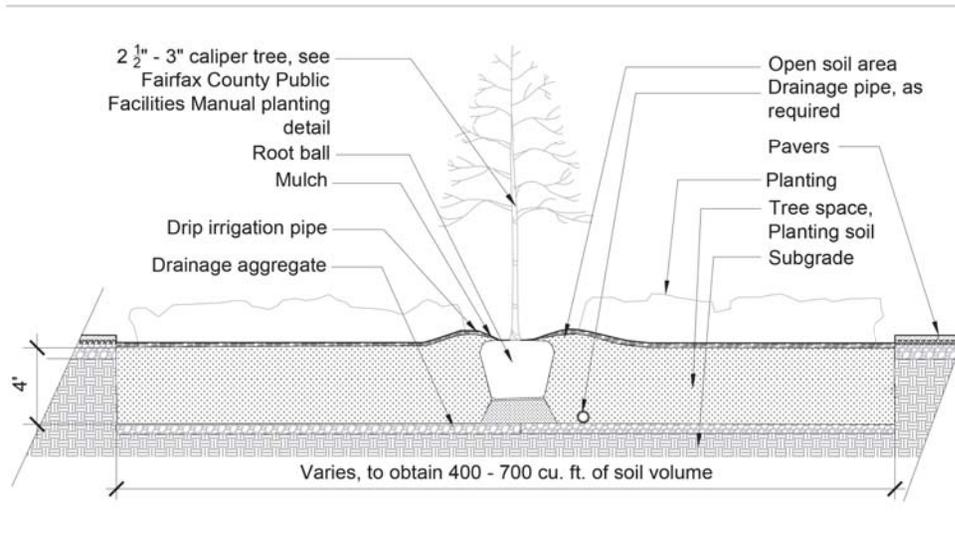


Design Suggestions:

- ◆ To ensure clear pedestrian circulation, open soil areas should not be used in high volume, primary pedestrian corridors (Section 2.4) or in any activity nodes or retail areas. If used, they should not exceed 12 feet by 8 feet as measured at the surface. (See Covered Soil Area details on the next page)
- ◆ Continuous open soil areas may be considered in secondary corridors with lower pedestrian volumes and in tertiary corridor landscape amenity panels. However, where on-street parking is adjacent to the streetscape, a 2 foot, minimum, paved walkway should be provided both parallel to the curb and as paths, at 12 foot increments, from the curb to the sidewalk.
- ◆ A permanent, automatic irrigation system should be provided for tree and ornamental plantings.
- ◆ Open soil areas should be planted with turf or hardy, drought tolerant perennials, grasses and/or small shrubs that do not conflict with vehicular sight line distances. (See recommended plant list in Section 3.6H)
- ◆ To avoid compaction of soil and damage to ornamental plantings, a low fence structure could be installed to discourage pedestrians from walking in planted areas.



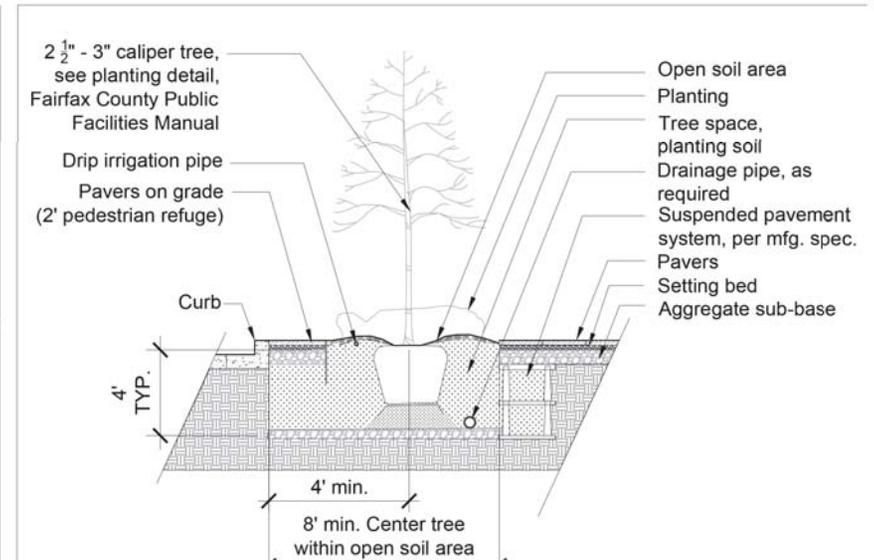
Tree Space Design - Open Soil Area, Plan



Tree Space Design - Open Soil Area, Section A

Opposite: Streetscape, Washington, D.C.

Above: Urban Street Tree Planting Details, Plan and Sections—Open Soil Area

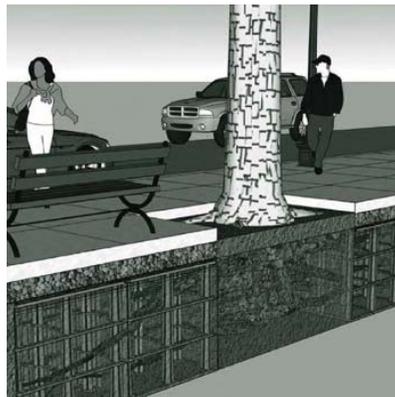


Tree Space Design - Open Soil Area, Section B

3.6A Tree Space Design

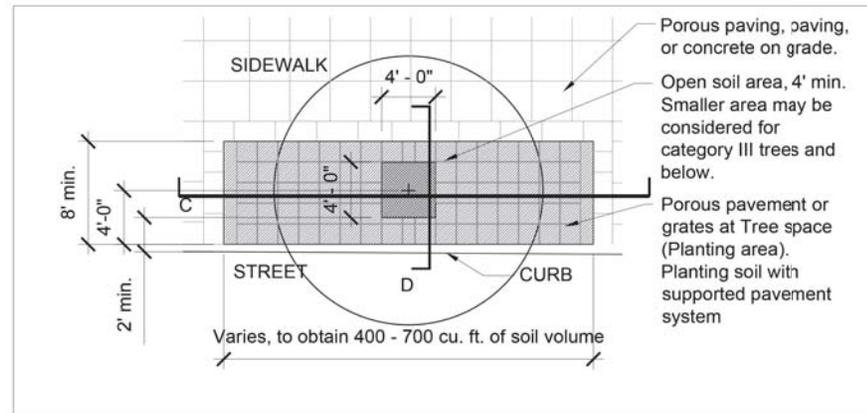
Covered Soil Area

A covered soil area, or “an area of soil that is under pavement and specially designed to accommodate tree root growth”³ should be used in areas of high pedestrian traffic, especially at transit stops. The following design suggestions, details, and images describe these methods for providing covered soil areas:

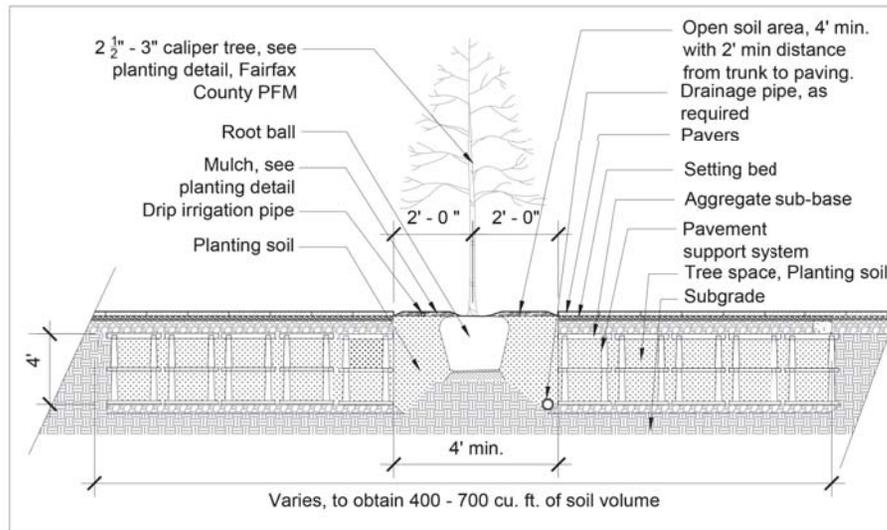


Design Suggestions:

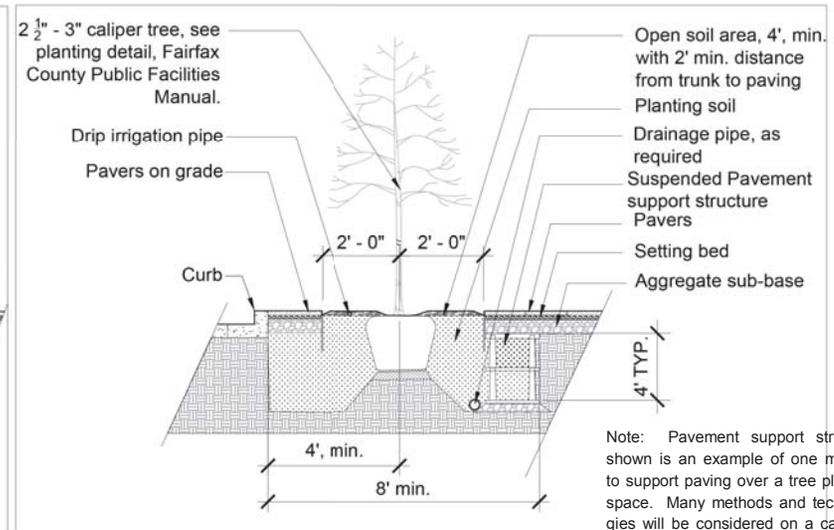
- ◆ Maintain a minimum open soil area of 4 foot by 4 foot around the base of trees. A 2 foot by 2 foot opening may be acceptable for some ornamental trees. (See Ornamental Tree Recommended Plant List in Section 3.6H)
- ◆ Utilize supported pavement technologies such as structural cells, cantilevered paving and properly placed tree grates for the covered area of the tree space.
- ◆ All paving that is supported above tree spaces should be permeable so that water and air can reach tree roots. This can be achieved by using permeable or traditional unit pavers set in an aggregate base and a permeable sub-base above tree spaces. (See Section 3.2C for recommended paving materials)
- ◆ If tree grates are used as the walkable surface over the tree space, they should be placed at least 2 feet away from all sides of the tree trunk. Tree grates should not be used directly adjacent to tree trunks as they are rarely maintained over time and cause serious damage to trees when trunks grow into narrow grate openings.
- ◆ Install a permanent, automatic irrigation system to support healthy plant growth.



Tree Space Design - Covered Soil Area, Plan



Tree Space Design - Covered Soil Area, Section C



Tree Space Design - Covered Soil Area, Section D

Note: Pavement support structure shown is an example of one method to support paving over a tree planting space. Many methods and technologies will be considered on a case by case basis and as approved by the Urban Forestry Management Division.

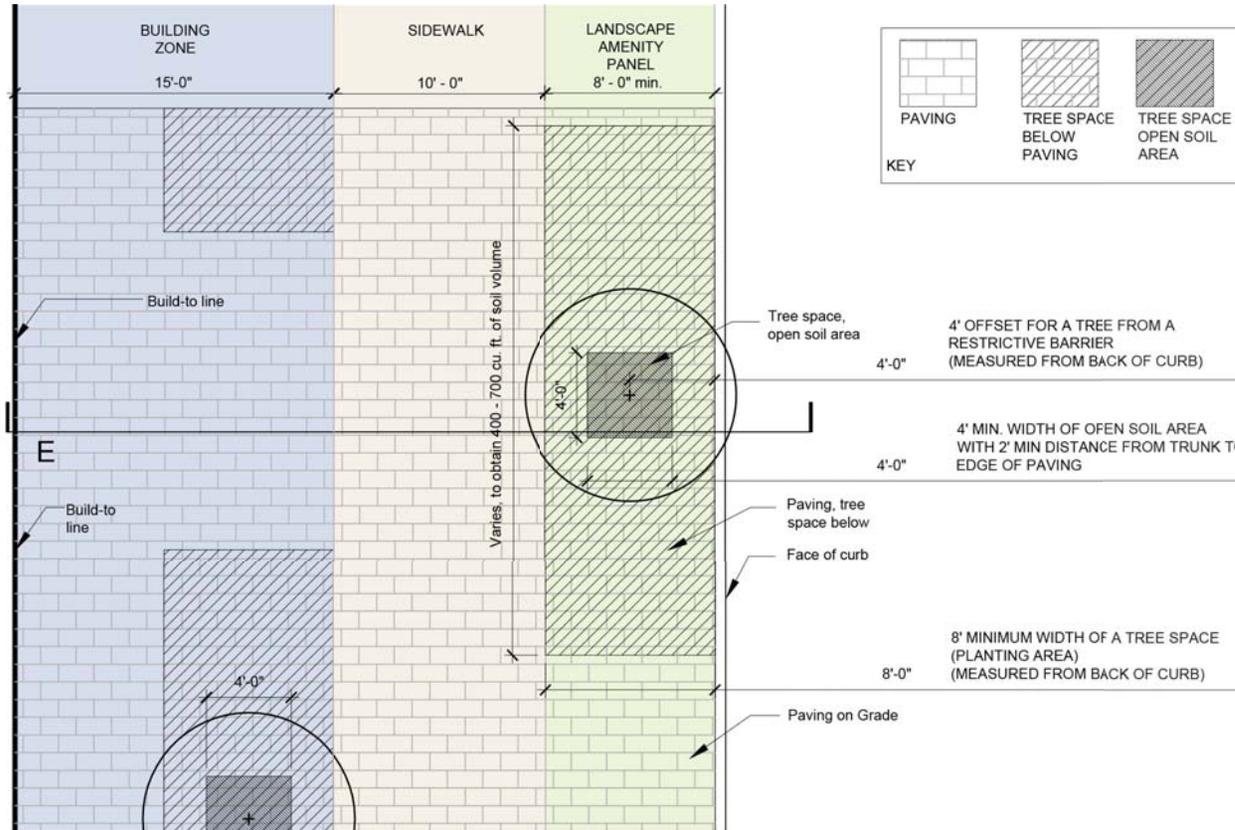
- Opposite Top:** Covered soil area using tree grates. Image: Casey Trees
- Opposite Bottom Left:** Covered soil area using pavers. Image: Casey Trees
- Opposite Bottom Right:** Covered soil area diagram. Image: DeepRoot
- Above:** Urban Street Tree Planting Detail, plan and sections - Covered Soil Area

3.6A Tree Space Design - Boulevard

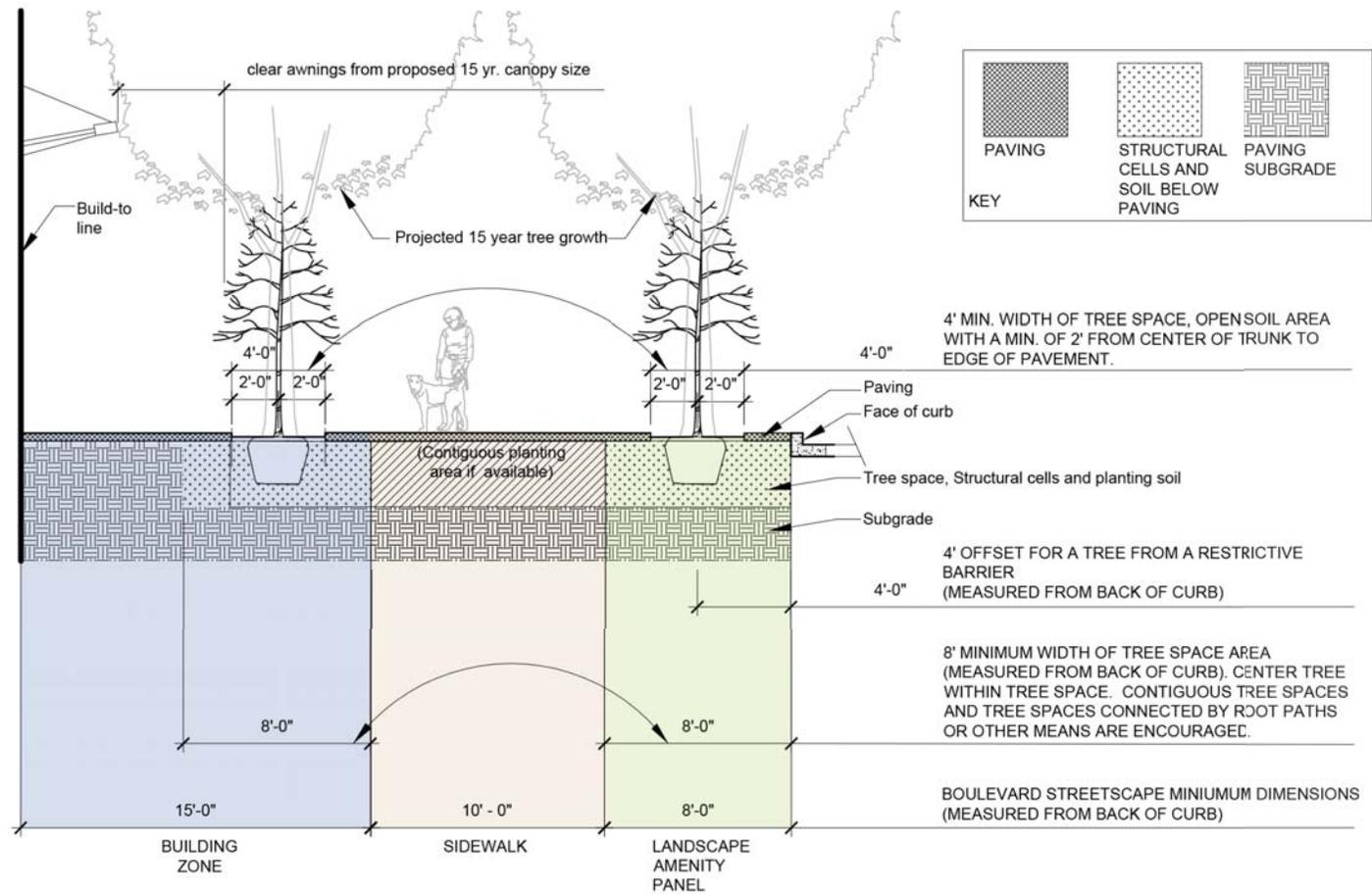
The dimensions of the streetscapes in Tysons vary by each of the streetscape types (Boulevard, Avenue/Collectors, Local, and Service Streets). In coordination with the Fairfax County Urban Forest Management Division (UFMD), the following details have been developed and show how tree spaces can be accommodated in each of the Tysons streetscape types. Street trees are generally not anticipated to be planted on service streets therefore, that streetscape type is not represented in the following diagrams.

Tree Space Design - Boulevard

The following diagrams depict a conceptual covered tree space on a Boulevard but it is anticipated that both open and covered soil tree spaces could be used. In primary pedestrian corridors, covered soil using tree grates is preferred. The flexibility exists to use either open or covered tree spaces in secondary and tertiary corridors. In both open and covered tree spaces and for all streetscape types, a 2 foot pedestrian refuge strip should be provided adjacent to on-street parking.



Tree Space Design Boulevard - Plan

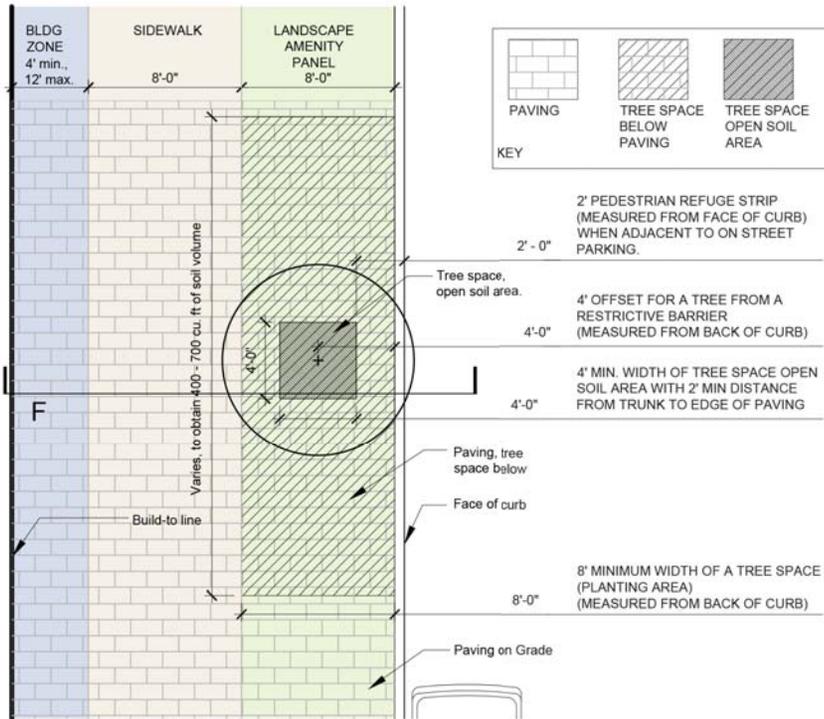


Tree Space Design Boulevard - Section E

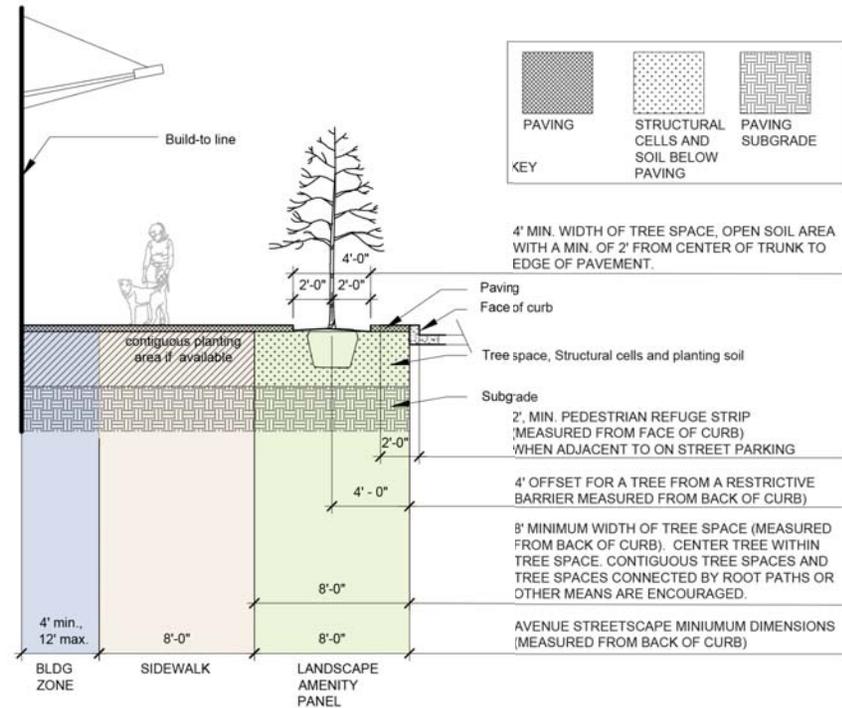
3.6A Tree Space Design - Avenue / Collector

Tree Space Design - Avenue / Collector

The following diagrams depict a conceptual covered tree space on an Avenue / Collector but it is anticipated that both open and covered soil tree space details could be used. In primary pedestrian corridors covered soil using tree grates is preferred. Flexibility exists to use either open or covered tree spaces in secondary and tertiary corridors. In both open and covered tree spaces and for all streetscape types, a 2 foot pedestrian refuge strip should be provided adjacent to on-street parking.



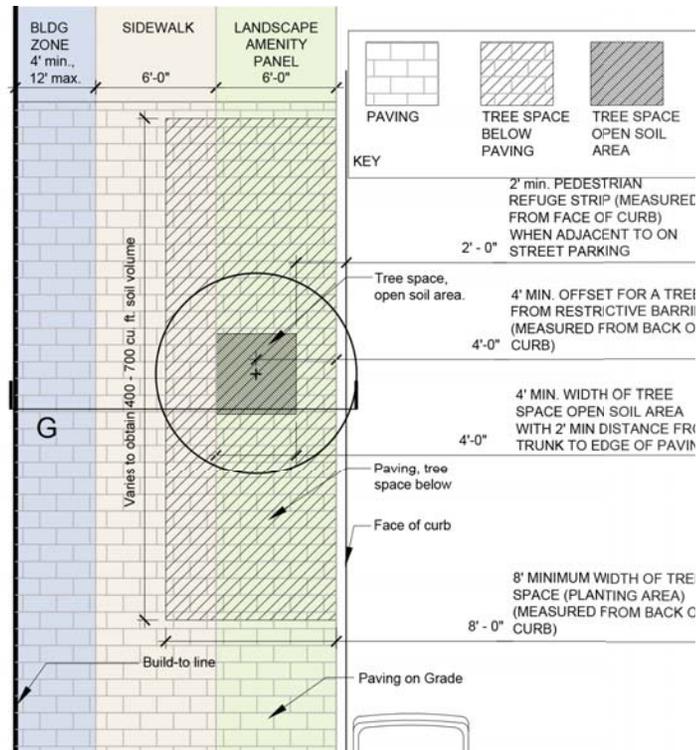
Tree Space Design Avenue / Collector - Plan



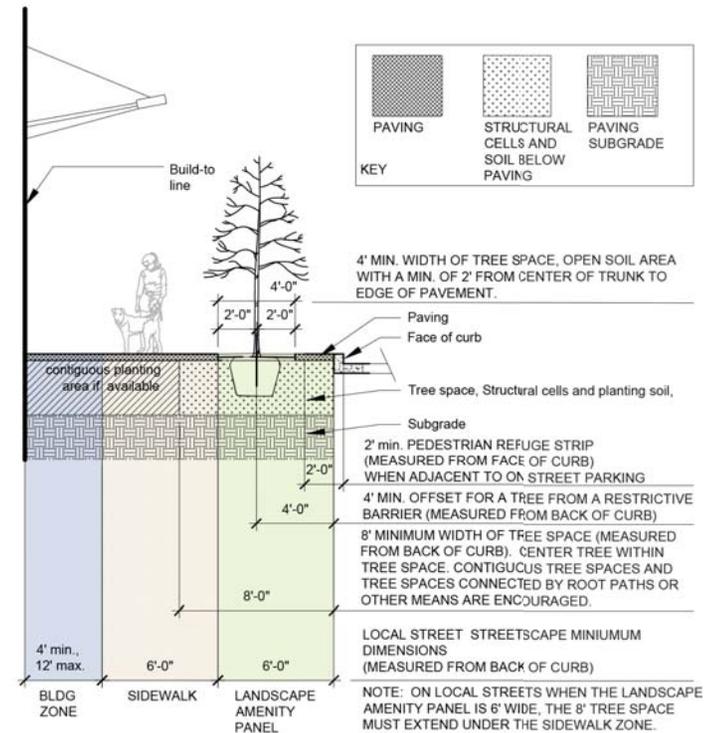
Tree Space Design Avenue / Collector - Section F

Tree Space Design—Local Street

The following diagrams depict a conceptual covered tree space on a Local Street but it is anticipated that both open and covered soil tree space details could be used. In primary pedestrian corridors covered soil using tree grates is preferred. Flexibility exists to use either open or covered tree spaces in secondary and tertiary corridors. In open soil areas, the 6 feet minimum local streetscape landscape amenity panel will require 2 feet of covered soil area for all tree spaces in the sidewalk zone to meet the required 8 foot wide planting space called out in the Fairfax County Public Facilities Manual. This detail is shown below. In both open and covered tree spaces and for all streetscape types, a 2 foot pedestrian refuge strip should be provided adjacent to on-street parking.



Tree Space Design Local Street - Plan



Tree Space Design Local Street - Section G

3.6B Street Trees

Street trees in Tysons will contribute to the transition from the ground plane to adjacent tall buildings. They will provide shade and seasonal interest, and will complement the lines of streets and architecture. They will add to bio-diversity, stormwater remediation and improve air quality in Tysons.

This section provides recommendations and design considerations for planting street trees. For primary pedestrian corridors and on select important streets (as listed in section 3.6H), refer to the Primary Pedestrian Corridors and Important Streets Plant List in Section 3.6H. Street trees on secondary and tertiary pedestrian corridors are at the discretion of the design team, but should adhere to the following design suggestions and may be from the list of suggested shade trees that are suitable for street tree applications (Section 3.6H) or approved others.



Design Suggestions:

- ◆ Use street tree species and cultivars that are proven to survive in urban conditions. Native species are preferred, but non-native species will be considered provided they are drought tolerant, disease resistant and non-invasive. (See recommended plant list in Section 3.6H)
- ◆ Keep street tree species along primary pedestrian corridors and monumental streets consistent on both sides of the street and along the entire length of the street. (see Section 3.6H)
- ◆ Keep trees species along other streets consistent, at a minimum, along each block and on opposite sides of streets.
- ◆ Use street trees in both the landscape amenity panel and, when space allows, the building zone .
- ◆ Install trees at a minimum of 4 inch in caliper in primary pedestrian corridors and on important streets as listed in Section 3.6H. These trees should be free of branches such that vehicular clear zones may be achieved. Refer to the [American Standard for Nursery Stock](#) for appropriate tree size and branching height relationships for each species.
- ◆ Install trees at a minimum of 3 inch caliper along secondary and tertiary streets. These trees should be free of branches such that vehicular clear zones may be achieved. Refer to the [American Standard for Nursery Stock](#) for appropriate tree size and branching height relationships for each species.

Design Suggestions (cont.):

- ◆ Plant trees at an appropriate time of the planting season to optimize temperate conditions and availability of irrigation water.
- ◆ Provide permanent, automatic irrigation for all trees in Tysons. The use of rainwater or other sustainable sources for irrigation is encouraged. Additionally, the use innovative water saving measures such as rain sensors and timers to conserve water use.
- ◆ Regularly maintain all trees and tree spaces regularly including removal of all stakes and guy wires one year after planting, regular removal of weeds and debris in all tree spaces, regular irrigation and irrigation maintenance, plant health care monitoring and treatment of insects and diseases.
- ◆ Do not use permanent tree mounted lighting that requires damaging attachment to trunks or branches.
- ◆ When using tree grates, install them with a minimum of 2 feet clear of any tree trunk on all sides. (See section 3.6A)



Opposite Left: Elms in downtown Frederick, MD

Opposite Right: Street tree planting, Washington, D.C.

Above Right: Street tree planting, Washington, D.C.

3.6C Ornamental Planting

Ornamental plantings will activate the ground plane of the streetscape and pedestrian realm. They will add vibrant and colorful seasonal interest. Ornamental plantings provide diversity of species, color, texture and fragrance. Ornamental planting can occur in the landscape amenity panel, the building zone, and in urban parks as well as in other semi-public and private spaces.



Design Suggestions:

- ◆ Utilize drought tolerant and non-invasive species that are suited to urban conditions. (See recommended plant list in Section 3.6H)
- ◆ Include permanent, automatic irrigation systems in all ornamental planting areas.
- ◆ Adhere to vehicular sight line requirements as specified by VDOT.
- ◆ Do not install ornamental plantings in the sidewalk zone of the streetscape or impede pedestrian traffic in any way
- ◆ Ornamental plantings consist of evergreen, ornamental or flowering trees, deciduous and evergreen shrubs, grasses, perennials, and annuals.
- ◆ Include ornamental trees that are at least 2 1/2 inch to 3 inch caliper at the time of installation. When using a multi-stemmed variety, install trees whose stem diameters add up to at least 3 inches and are 8 feet in height. Install evergreen trees that are at least 8 feet in height.
- ◆ Consider seasonal interest and viability when designing ornamental plantings.

Design Suggestions (cont.):

- ◆ Consider raised planting beds at building entrances and along the build-to line as well as in other areas of the building zone, and incorporate seat walls into raised beds as appropriate.
- ◆ Consider installing a low fence structure to discourage pedestrians from walking in and compacting planted areas.
- ◆ Maintain all pedestrian realm ornamental planting areas on a regular basis. This should include horticultural care as well as litter removal.



Opposite: Building zone ornamental planting, Bethesda, MD



Above Bottom Left: Ornamental Planting at Lurie Garden—Millenium Park, Image: Linda Bryan, Mark Tomaras

Above Bottom Center: Landscape amenity panel ornamental planting with metal edging. Washington, D.C.

Above Right: Seasonal early fall plantings, Carroll Creek Linear Park, downtown Frederick, MD



3.6D Free-Standing Planters

In many cases, planting in the pedestrian realm will occur in free-standing planters, raised beds, hanging planters and other containers. Containers provide additional interest and are encouraged in both the landscape amenity panel and the building zone. Planting in containers is intended to supplement in-ground planting, and should not be the only means to achieve planting in the pedestrian realm. The following design suggestions describe the character of free standing container planting and where they should be located. Guidelines for specific containers and hardscape materials are found in Section 3.3, Streetscape Furnishings. (See Section 3.6H for recommended plants)



Design Suggestions:

- ◆ Utilize drought tolerant and non-invasive species that are suited to urban conditions. Native species are encouraged. (See recommended plant list in Section 3.6H)
- ◆ Use planters to define streetscape areas such as building entrances, outdoor dining areas, seating areas, and park entrances.
- ◆ Do not place planters in the sidewalk zone of the streetscape or in other places that would impede pedestrian traffic in any way.
- ◆ Use planters that are an appropriate size, mass, and design to complement the style of adjacent buildings and the neighborhood
- ◆ Use planters that are made from materials that will hold up to severe outdoor, urban conditions such as UV exposure, winter weather, and pollution.
- ◆ Provide drainage holes in all planters.
- ◆ Provide irrigation for permanent planters greater than 3 feet in diameter. The use of rainwater or other sustainable sources for irrigation is encouraged. Additionally, the use innovative water saving measures such as rain sensors and timers to conserve water use.
- ◆ Use small shrubs, perennials, grasses, and annuals in planters.

Design Suggestions (cont.):

- ◆ Rotate container plants throughout the growing season to maximize seasonal interest.
- ◆ Maintain containers on a regular basis including irrigation, horticultural care, and litter removal.
- ◆ Remove and replace cracked or damaged containers.



Opposite: Ornamental trees in free-standing planters. Washington, D.C.

Above Bottom Left: Building zone free-standing planters planted with shrubs, annuals, and perennials, Image: Tournesal Site Works, www.tournesalsiteworks.com

Above Right: Landscape amenity panel planting including free-standing planters and raised beds. Chicago, IL, Image: Haddonstone, Ltd. www.haddonstone.com



3.6E Vertical Planting

Innovations in planting design for the urban landscape have created new ways in which sites can be augmented by planting. Vertical planting techniques used in planters along a structure's façade, directly on building walls, as armature to enhance a wall, or as free-standing vertical trellis systems all add to the beauty of the pedestrian realm. These techniques offer aesthetic and environmental benefits and should be considered, where appropriate, when designing the pedestrian realm in Tysons.

The application of a vertical planting wall is generally discouraged over the use of architectural treatments, as the climate in this region is not ideal in supporting planting walls that thrive and provide year-round interest. However, vertical planting can be a beneficial part of the pedestrian realm and for parking structure screening when very specific site conditions exist. Adequate microclimate elements such as light levels and wind need to be considered when proposing a vertical planting wall as part of a design.



Design Suggestions:

- ◆ Consider vertical planting concepts early in the building design phase so that the proper infrastructure, such as, structural elements, water proofing and irrigation can be included.
- ◆ Use vertical planting to highlight entrances to buildings, enhance exterior parking garage walls and provide visual interest along building facades.
- ◆ Include appropriate plants for all vertical planting systems. In the case of trellis systems, use vines that are suited to the Mid-Atlantic region and are not invasive. For planted walls, choose plants that are appropriate for the wall's solar orientation and irrigation specifications.
- ◆ Use trellis systems that can hold up to severe outdoor conditions such as UV radiation, winter weather, wind and pollution.
- ◆ Maintain vertical plantings on a regular basis and include regular irrigation, horticultural care and litter removal. Maintenance should include monitoring of the vertical planting surface or system to prevent structural failure, paint chipping and other damage.



Opposite: Musee du Quai Branly, vertical planting with a living wall, Designers: Jean Nouvel and Patrick Blanc, Image: inhabitat.com

Above Left: Vancouver Airport, vertical planting with a living wall, Sharp & Diamond Landscape Architecture, Image: [Landscape Architecture Magazine](#), April 2010

Above Right: Portland Airport, vertical planting with vines on screens, Image: of Tournesol Site Works, www.tournesol.com

3.6F Planting for Stormwater Remediation and Use of Low Impact Development Techniques

Low Impact Development (LID) is development techniques that manage the impact of a site's stormwater on the greater environment. This is achieved by slowing, cooling and reducing the volume of stormwater that enters downstream waterways. Additionally, some LID techniques can reduce the amount of pollutants in stormwater. Rain gardens and bio-swales, planted spaces that temporarily hold water while it can infiltrate into the ground, are commonly used to achieve LID goals. Planting strategies are used as an element to beautify and increase functionality of these systems. Creative landscape architecture, civil engineering and horticultural methods can result in effective, environmentally sensitive, and aesthetically pleasing planted systems in urban environments. The streetscape provides locations in which these techniques can be implemented. Particular attention must be paid to the types of plants used in stormwater design and will be addressed in Section 3.6H.

Bioretention planting areas require regular maintenance and the cost should be accounted for in a development's maintenance budget. As these tree spaces are designed to help meet a project's stormwater management and tree canopy goals, as well as providing a beautiful pedestrian environment, and are urban in nature, the entire system may need to be replaced over time as the bioretention media breaks down, trees and plantings reach their life cycle, and normal wear and tear of streetscape elements occurs.



Design Suggestions:

- ◆ Consider including LID techniques early in the design process so that they are part of a comprehensive stormwater management system and to insure that the proper infrastructure is planned.
- ◆ Design all LID planting areas to perform safely, effectively and over time in various states of inundation and drought. All areas will be reviewed by Fairfax County staff for compliance to all stormwater design requirements.
- ◆ Consider using LID planting areas in the landscape amenity panel and the building zone where they do not impede pedestrian traffic.
- ◆ Limit LID techniques in the sidewalk zone to the use of permeable paving and possible sub-grade water storage systems.
- ◆ Ensure that all LID planting areas are safely designed and placed in the urban landscape so that grade changes and flooding concerns do not compromise the safety of pedestrians, vehicles, or adjacent structures. LIDS located in the right-of-way are allowed per the Tysons Memorandum of Agreement between Fairfax County and VDOT, but are subject to VDOT review.
- ◆ Include plants that can thrive in conditions of inundation and drought and have been proven for use in rain garden or bio-retention applications. (See Section 3.6H for a recommended plant list.)

3.6F Planting for Stormwater Remediation and Use of Low Impact Development Techniques



Opposite: Atwater Place Development, Portland Oregon, Image: City of Portland

Top Left: Urban Bio-retention Cell, New York City, New York, Image: Inhabitat.com Yuka Yoneda

Top Right: John Ross Building, Portland, Oregon, Image: City of Portland

Bottom Right: The Merriweather development, Portland, Oregon, Image: City of Portland



3.6G Planting for Green Roofs

The vision for Tysons includes a sustainable landscape with the frequent and creative use of green roof technology. Green roofs provide environmental benefits such as remediation of as much as 50% of roof drainage, reduction in heat island effect and the provision of habitat for birds and butterflies. Green roofs also add a picturesque element to the urban skyline from adjacent buildings. Planting strategies for green roofs may be as simple as minimal soil depths planted with sedum sod, or as intricate as raised beds with trees, shrubs, perennials, sod and even food crops.

Although green roofs are largely within the private spaces on top of buildings, there may be instances when a green roof is appropriate for public and civic space within the pedestrian realm. Green roofs will thrive over underground parking and other architectural elements. Additionally, sites that are challenged with extreme grade changes can use green roof design to integrate at-grade public space into activated architecture. The many ways in which green roofs may be integrated into private roof areas, are discussed in Chapter 4, Site and Building Design.

Design Suggestions:

- ◆ Use tall green roof tolerant plants for lower roof spaces that are visible from the ground plane and from raised Metro platforms.
- ◆ Incorporate green roof concepts early in the design phase of any project so that the proper infrastructure can be included.
- ◆ Consider locating civic uses such as schools, libraries and recreation centers adjacent to green roof spaces and programming the green roof space accordingly.
- ◆ Include hardscape paths for pedestrian circulation and seating. Also include paths that accommodate horticultural green roof and building mechanical maintenance.
- ◆ Consider green roof urban agricultural practices such as herb farming and space for urban bee keeping in green roof designs.
- ◆ Refer to Fairfax County DPWES Recommended Plant Lists (see Resources, Chapter 8) for extensive and intensive vegetated roofs. These lists are not exhaustive and are intended to give the designer a palette of plan materials to choose from.



Top Left: Rooftop Haven for Urban Agriculture, Gary Corner Youth Center, Chicago, IL Hoerr Schaudt Landscape Architects, Image: Scott Shigley

Top Right: View of Washington Mutual Center Roof Garden by Phillips Farevaag Smalenberg. Seattle, WA Image: Joseph Fry (PFS)

Bottom Left: Pepco substation green roof, Washington DC, Oehme, van Sweden & Associates. Image: Roger Foley

Bottom Right: Washington Mutual Center Roof Garden by Phillips Farevaag Smalenberg. Seattle, WA Image: Lara Swimmer Photography

3.6H Plant Lists

Street Trees—Primary Pedestrian Corridors and Important Streets in Tysons

There are two types of streets on which a consistent tree planting strategy along the length of the entire street is preferred. These streets are primary pedestrian corridors, (see Section 2.4), and the streets that exist today that will transform into important pedestrian and vehicular corridors. On all of these streets, tree varieties will assist with wayfinding for pedestrians, bicyclists, and vehicles and will provide a sense of place for each street.

When redevelopment occurs on primary pedestrian corridors, as well as Route 7, Route 123, Greensboro Drive, Boone Boulevard and International Drive, a street tree from the following list should be chosen and remain consistent on both sides of the street and along the entire length of the street. The redevelopment project that proposes the first trees on any primary pedestrian corridor will set the precedent for future cases. Any future development should follow the precedent set by the first case and also specify the same trees along the length this primary pedestrian corridor. All street trees in primary pedestrian corridors and on important streets should be a minimum of 4 inch in caliper at the time of planting. Street trees should be free of branches such that vehicular clear zones may be achieved. Refer to the American Standard for Nursery Stock for appropriate tree size and branching relationships for each species. Following is the recommended plant list for primary pedestrian corridors. This list refers to street trees only. Primary pedestrian corridors that are located in urban parks are exempt from this list. Flexibility is available to choose species that are not listed here; however, they are subject to approval by Fairfax County UFMD. Consult the Fairfax County Public Facilities Manual for an extensive list of trees.

	<u>Botanical Name</u>	<u>Common Name</u>	<u>Mature</u>	<u>Mature</u>	<u>Caliper size</u>
	STREET TREES FOR PRIMARY PEDESTRIAN CORRIDORS AND IMPORTANT STREETS		<u>Height</u>	<u>Spread</u>	<u>At Planting</u>
AR	<i>Acer rubrum 'Columnare'</i>	Columnar Red Maple	60'	15'	4" min.
CB	<i>Carpinus betulus 'Columnaris'</i>	Columnar European Hornbeam	30'-50'	20'-30'	4" min.
CJ	<i>Cercidiphyllum japonicum</i>	Katsura Tree	40'-60'	20'-30'	4" min.
GB	<i>Ginkgo biloba 'Autumn Gold'</i>	Autumn Gold Sentry Ginkgo	65'	30—40'	4" min.
GT	<i>Gleditsia triacanthos var. inermis</i>	Honeylocust	45'-55'	35'-45'	4" min.
PA	<i>Platanus x acerfolia 'Liberty'</i>	London Planetree	60'-80'	50'-60'	4" min.
QP	<i>Quercus phellos</i>	Willow Oak	40'-60'	30'-40'	4" min.
SJ	<i>Ulmus Americana 'Valley Forge'</i>	Valley Forge Elm	50'-70'	40'-50'	4" min.
TC	<i>Tillia cordata 'Greenspire'</i>	Greenspire Little Leaf Linden	40'-50'	30'	4" min.



Ginkgo biloba



Quercus rubra



Quercus phellos



Tilia cordata



Gleditsia triacanthos inermis



Acer rubrum

3.6H Plant Lists

Street Trees— All other roads and Shade Trees

Street trees on all streets other than those mentioned on the previous page, may be chosen from the following list of street trees. All street trees should remain consistent on either side of the street for a minimum of one block. Shade trees that are to be used in park spaces or other areas that are not in the streetscape are at the discretion of the design team. Street trees should be free of branches such that vehicular clear zones may be achieved. Refer to the American Standard for Nursery Stock for appropriate tree size and branching relationship for each species. The following list represents a sample of street tree species for urban conditions that should be considered. Consult the Fairfax County Public Facilities Manual for an extensive list of trees.

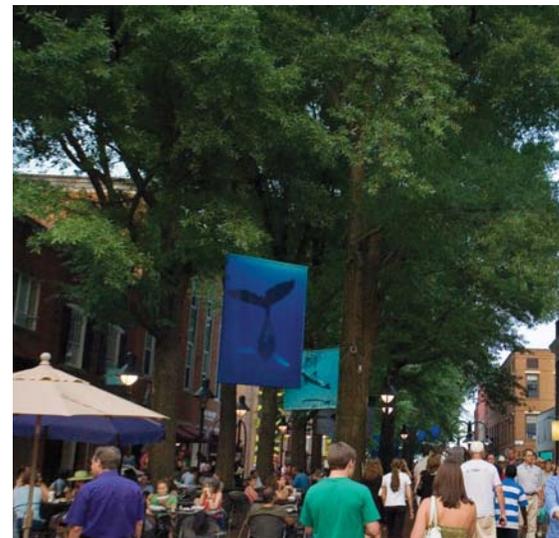
<u>Botanical Name</u>	<u>Common Name</u>	<u>Mature</u>	<u>Mature</u>	<u>Preferred</u>	<u>Caliper size</u>
SECONDARY, TERTIARY CORRIDOR, AND SHADE TREES		<u>Height</u>	<u>Spread</u>	<u>Street Trees</u>	<u>at Planting</u>
<i>Acer rubra</i> 'October Glory'	October Glory Red Maple	40'-60'	25'-45'		3" min.
<i>Acer rubrum</i> 'Columnare'	Columnar Red Maple	60'	15'	Yes	3" min.
<i>Carpinus betulus</i>	European Hornbeam	40'-60'	40'-50'		3" min.
<i>Carpinus betulus</i> 'Columnaris' or 'Fastigiata'	Columnar European Hornbeam	30'-50'	20'-30'	Yes	3" min.
<i>Cercidiphyllum japonicum</i>	Katsura Tree	40'-60'	20'-30'	Yes	3" min.
<i>Ginkgo biloba</i> 'Princeton Sentry'	Princeton Sentry Ginkgo	65'	25'	Yes	3" min.
<i>Gleditsia triacanthos</i> var. <i>inermis</i>	Honeylocust	45'-55'	35'-45'	Yes	3" min.
<i>Platanus x acerfolia</i> 'Liberty' or 'Columbia'	London Planetree	60'-80'	50'-60'	Yes	3" min.
<i>Quercus alba</i>	White Oak	60'-80'	60'	Yes	3" min.
<i>Quercus phellos</i>	Willow Oak	40'-60'	30'-40'	Yes	3" min.
<i>Quercus rubra borealis</i>	Northern Red Oak	75'	50'-60'		3" min.
<i>Sophora japonica</i>	Japanese Scholar Tree	50'-70'	40'-50'	Yes	3" min.
<i>Tillia cordata</i> 'Greenspire'	Greenspire Little Leaf Linden	40'-50'	30'	Yes	3" min.
<i>Zelkova serrata</i> 'Green Vase'	Green Vase Zelkova	50'-60'	40'-50'	Yes	3" min.



Ginkgo biloba



Quercus rubra—leaf



Quercus phellos



Tilia cordata



Gleditsia triacanthos inermis—leaf



Acer rubrum

3.6H Plant Lists

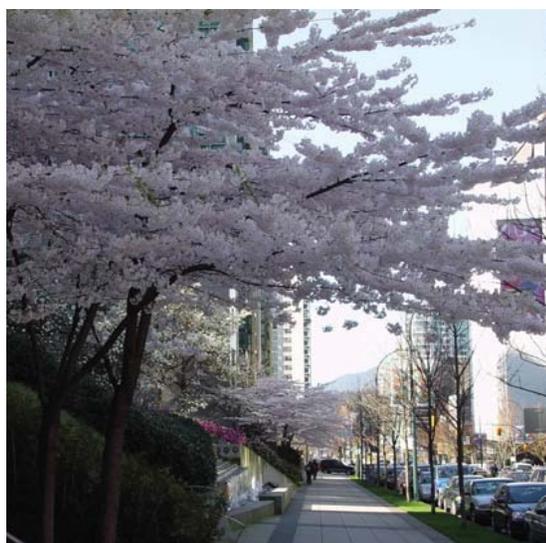
Ornamental Trees

The suggested ornamental tree plant list below represent only a sample of the plant varieties suited for urban conditions that should be considered for use in the streetscape and in public parks and other open spaces. Consult the Fairfax County Public Facilities Manual for an extensive list of trees.

<u>Botanical Name</u>	<u>Common Name</u>	<u>Mature</u>	<u>Mature</u>
ORNAMENTAL TREES		<u>Height</u>	<u>Spread</u>
<i>Acer ginnala</i>	Amur Maple	15'-20'	15'-20'
<i>Amelanchier arborea</i>	Serviceberry	15'-25'	10'-15'
<i>Cercis canadensis</i>	Eastern Redbud	20'-30'	25'-35'
<i>Cladrastris kentukea</i>	Yellowwood	30'-50'	40'-55'
<i>Cornus kousa</i>	Kousa Dogwood	20'-30'	20'-30'
<i>Halesia carolina</i>	Carolina Silverbell	30'-40'	25'-35'
<i>Lagerstroemia indica 'Natchez'</i>	White Crape Myrtle	15'-25'	15'-20'
<i>Magnolia stellata</i>	Star Magnolia	15'-20'	10'-15'
<i>Magnolia virginiana</i>	Sweetbay Magnolia	10'-30'	10'-20'
<i>Magnolia x soulangiana</i>	Saucer Magnolia	20'-30'	20'-30'
<i>Parrotia persica</i>	Persian parrotia	30'-40'	15'-30'
<i>Styrax japonicus</i>	Japanese Snowbell	20'-30'	20'-30'



Amelanchier arborea—berry and leaf



Prunus yedoensis



Cercis canadensis



Magnolia x soulangiana



Styrax japonica—flower and leaf



Lagerstroemia indica—bark

3.6H Plant Lists

Evergreen Trees

The suggested evergreen tree plant list below represent only a sample of the plant varieties suited for urban conditions that should be considered for use in the streetscape and in public parks and other open spaces. Consult the Fairfax County Public Facilities Manual for an extensive list of evergreen trees.

<u>Botanical Name</u>	<u>Common Name</u>	<u>Mature</u>	<u>Mature</u>
EVERGREEN TREES		<u>Height</u>	<u>Spread</u>
Picea abies	Norway Spruce	40'-60'	30'-35'
Juniperus virginiana	Eastern Red cedar	40'-50'	8'-15'
Ilex opaca	American Holly	30'-60'	15'-35'
Ilex x ' <i>Nellie R. Stevens</i> '	Nellie R. Stevens Holly	20'-30'	10'-20'
Ilex x attenuata ' <i>Fosteri</i> '	Foster's Holly	15'-25'	8'-12'
Cedrus atlantica	Blue Atlas Cedar	40'-60'	30'-40'



Juniperus virginiana



Ilex x attenuata 'fosteri'



Picea abies



Cedrus atlantica

3.6H Plant Lists

Shrubs

The suggested shrub plant list below represent only a sample of the plant varieties suited for urban conditions that should be considered for use in the streetscape and in public parks and other open spaces. Consult the Fairfax County Public Facilities Manual for an extensive list of shrubs.

<u>Botanical Name</u>	<u>Common Name</u>	<u>Mature</u>	<u>Mature</u>
DECIDUOUS SHRUBS		<u>Height</u>	<u>Spread</u>
<i>Rhododendron sp.</i>	Azalea	4'	4'
<i>Cornus sanguinum 'Midwinter Fire'</i>	Midwinter Fire Red Twig Dogwood		
<i>Cotoneaster dammeri</i>	Cotoneaster	2'	6'
<i>Deutzia gracillis 'Nikko'</i>	Nikko Deutzia	2'	4'
<i>Fothergilla gardenii</i>	Fothergilla	3'	3'
<i>Hamamelis x intermedia 'Arnold's Promise'</i>	Arnold's Promise Witchazel	8'	5'
<i>Hydrangea quercifolia</i>	Oak Leaf Hydrangea	5-6'	5'-6'
<i>Ilex verticillata</i>	Winterberry Holly	3'-5'	3'-5'
<i>Itea virginica</i>	Virginia Sweetspire	3'-6'	3'-6'
<i>Styrax americanus</i>	American Snowbell	6'-10'	6'-10'
<i>Prunus laurocerasus 'Otto Luyken'</i>	Otto Luyken Cherry Laurel	4'	4'
<i>Forsythia x intermedia</i>	Forsythia	8'-10'	10'-12'
EVERGREEN SHRUBS		<u>Height</u>	<u>Spread</u>
<i>Abelia 'Edward Goucher'</i>	Edward Goucher Glossy Abelia	6'-8'	4'-6'
<i>Cotoneaster adpressus var. praecox</i>	Creeping Cotoneaster	2'	6'
<i>Ilex crenata</i>	Japanese Holly	4'-6'	4'-6'
<i>Ilex glabra</i>	Inkberry Holly	3'-5'	3'-5'
<i>Juniperus chinensis 'Sea Green'</i>	Sea Green Chinese Juniper	6'	6'
<i>Taxus x media 'Densiformis'</i>	Densiformis Spreading Yew	4'	8'



Cornus sanguinum 'Midwinter Fire'



Hydrangea quercifolia



Hamamelis x intermedia 'Arnold's Promise'



Ilex glabra



Ilex crenata



Prunus laurocerasus 'Otto Luyken'

3.6H Plant Lists

Perennials, Grasses and Groundcovers

The suggested perennial, grass, and groundcover plant list below represent only a sample of the plant varieties suited for urban conditions that should be considered for use in the streetscape and in public parks and other open spaces. Consult the Virginia Cooperative Extension for additional plant lists.

<u>Botanical Name</u>	<u>Common Name</u>	<u>Mature</u>	<u>Mature</u>
PERENNIALS , GRASSES AND GROUNDCOVERS		<u>Height</u>	<u>Spread</u>
<i>Amsonia tabernaemontana</i>	Blue Star	18"	18"
<i>Aster novae-angliae</i> or <i>oblongifolius</i>	Aster	18-24"	18"
<i>Coreopsis verticillata</i> 'Moonbeam'	Tickseed	18"	18"
<i>Echinacea purpurea</i>	Purple Coneflower	24"	12"
<i>Geranium sanguineum</i>	Bloody Cranesbill	9"-18"	12"-18"
<i>Hemerocallis</i> sp.	Daylily	12"-48"	12"
<i>Iris sibirica</i> 'Caesar's Brother'	Siberian Iris	36"-48"	24"-36"
<i>Liriope muscari</i> 'Big Blue'	Big Blue Lily Turf	12"-24"	12"-24"
<i>Miscanthus sinensis</i> 'Gracillimus'	Maiden Grass	4'-6'	3'
<i>Panicum virgatum</i>	Switchgrass	3'	3'-6'
<i>Pennisetum orientale</i>	Dwarf Fountain Grass	18"-30"	18"-30"
<i>Perovskia atriplicifolia</i>	Russian Sage	36"	24"-36"
<i>Rudbeckia fulgida</i> 'Goldsturm'	Black-eyed Susan	24"	24"
<i>Salvia nemorosa</i> 'May Night'	May Night Meadow Sage	18"	18"
<i>Sedum</i> 'Autumn Joy'	Autumn Joy Sedum	18"	18"-24"



Geranium sanguineum



Amsonia taebernaemontana



Coreopsis verticillata 'Moonbeam'



Penesetum orientale



Panicum virgatum



Liriope spicata

3.6H Plant Lists

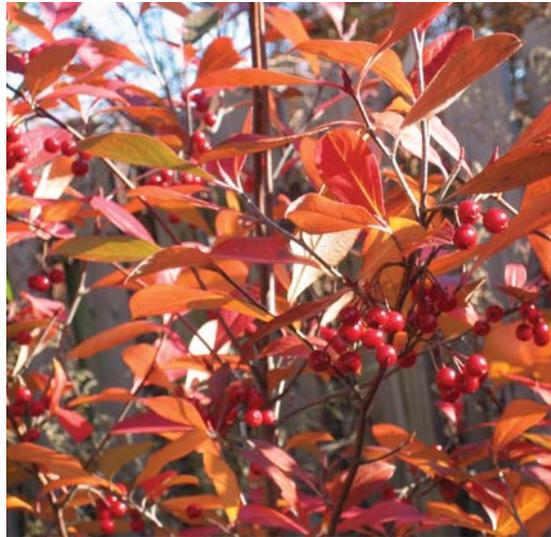
Plants for Stormwater Remediation (Bio-Retention)

The suggested perennial, grass and groundcover plant list below represents only a sample of the plant varieties suited for urban conditions that should be considered for use in the streetscape and in public parks and other open spaces. Consult the Fairfax County DPWES Recommended Plant List for Bioretention Facilities for additional plants. (See Resources, Chapter 8)

<u>Botanical Name</u>	<u>Common Name</u>	<u>Mature</u>	<u>Mature</u>
Plants for Stormwater Remediation (Bio-retention)		<u>Height</u>	<u>Spread</u>
Trees			
<i>Betula nigra</i>	River birch	25'	15'
<i>Amelanchier canadensis</i>	Serviceberry	20'	15'
Shrubs		<u>Height</u>	<u>Spread</u>
<i>Aronia arbutifolia</i>	Choke cherry	2'	4'
<i>Callicarpa americana</i>	Beautyberry	3'	3'
<i>Cornus stolonifera</i>	Red Twig Dogwood		
<i>Myrica pennsylvanica</i>	Wax Myrtle	5-6'	5'-6'
<i>Ilex glabra</i>	Inkberry	2'-4'	2'-4'
Perennials/Grasses/Groundcovers		<u>Height</u>	<u>Spread</u>
<i>Asclepias tuberosa</i>	Milkweed	30"	24"
<i>Carex strica</i>	Tussock Sedge	18"	12"
<i>Chelone glabra</i>	Turtlehead	18"	12"
<i>Iris vericolor</i>	Iris	24"	12"
<i>Lobelia cardinalis</i>	Cardinal flower	15"	15"
<i>Panicum virgatum</i>	Switchgrass	36"	18"-24"



Betula nigra



Aronia arbutifolia



Ilex glabra



Iris versicolor



Panicum virgatum



Lobelia cardinalis