North Washington Street

Streetscape Design Guidelines

January, 2010

City of Falls Church
300 Park Ave.
Falls Church, Virginia 22046

Robin S. Gardner, Mayor
Wyatt Shields, City Manager

City of Falls Church
Project Management Staff

Suzanne Cotellessa
General Manager Development Services

Wendy Block Sanford
Principal Planner/Transportation Planner

William Hicks
City Engineer

Project Team

EDAW AECOM
601 Prince St.
Alexandria, VA 22314

Rinker Design Associates
9300 West Courthouse Rd. Suite 300
Manassas, VA 20110

Low Impact Design Center
4600 Powder Mill Rd. Suite 200
Beltsville, MD 20705

Syska Hennesey Group
11350 Random Hill Rd. Suite 750
Fairfax, VA 22030

The Care of Trees
22830 Quicksilver Dr.
Dulles, VA 20166

Contents

Purpose
North Washington Street is a key commercial corridor in the City of Falls Church and an area with great potential for growth. Numerous mixed-use redevelopment efforts are planned along this critical link between the East Falls Church Metro Station and the heart of Falls Church. Changes to the existing sidewalks, bus stops and landscape treatment are necessary to serve these new destinations, to strengthen connectivity to existing amenities and to create an appealing gateway to the City. These guidelines for future streetscape enhancements were created with two overall goals in mind: to improve safety, comfort and convenience for pedestrians, and to create a sustainable streetscape that protects and improves environmental quality.

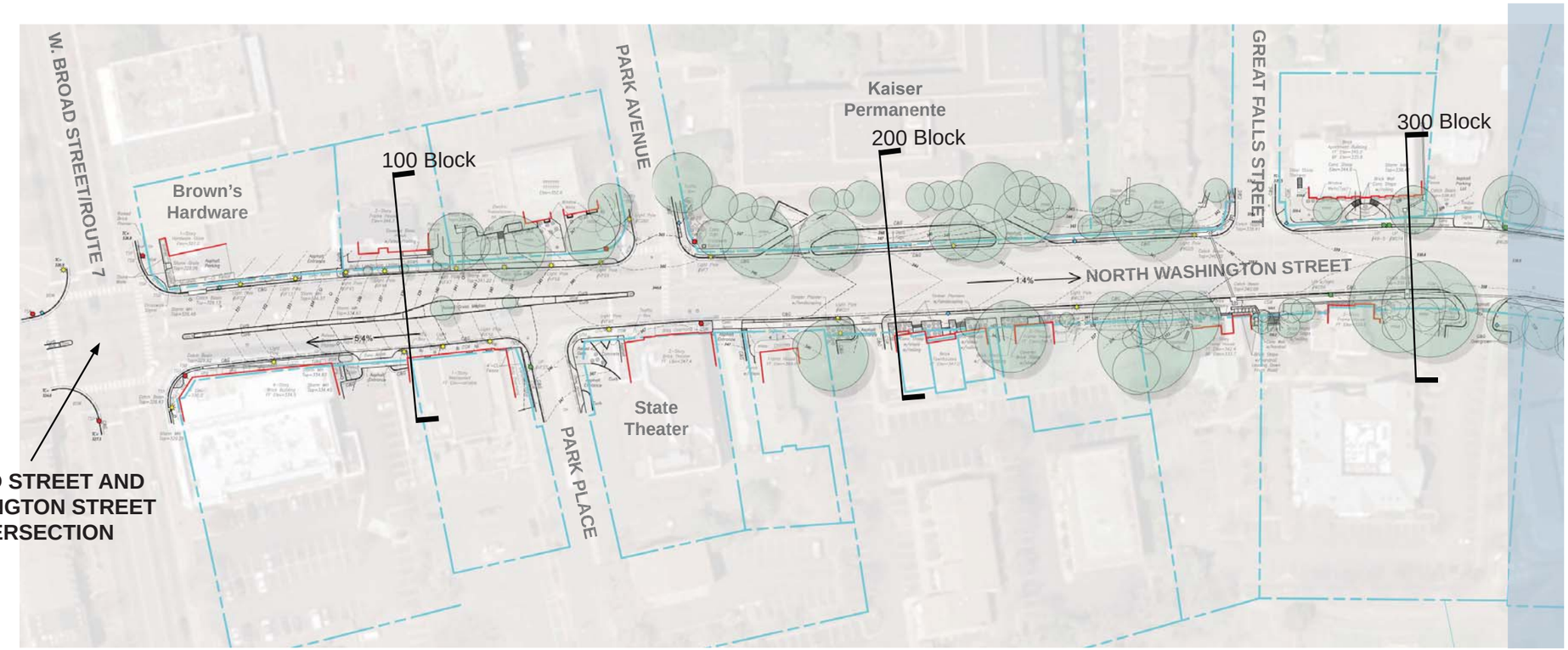
These guidelines describe design objectives as well as the desired dimensions and detailing for enhancements to the North Washington Street streetscape. They identify the typical streetscape elements, materials, furnishings, and infrastructure elements needed to create a unified character. The City anticipates that improvements will be implemented in sections by both public and private entities. As properties along North Washington Street redevelop, or as new construction takes place, the frontage of those properties shall be improved in keeping with the guidelines.

Applicability
These guidelines apply to North Washington Street between the intersection of Broad Street and the entrance to the Falls Church Volunteer Fire Station, adjacent to Arlington County. The design concepts and materials may also be adapted to guide improvements along South Washington Street.

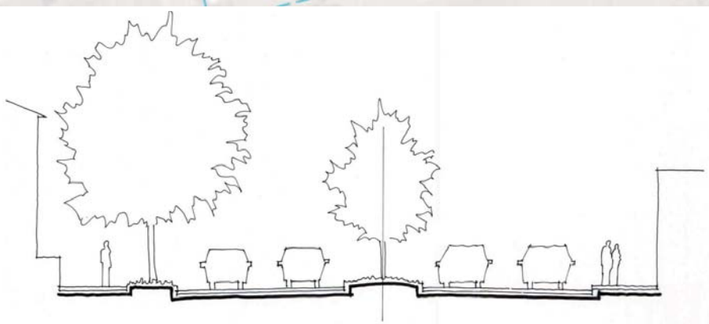
Comprehensive plan compatibility
These guidelines are consistent with the recommendations within the Comprehensive Plan. For instance, Chapter three, "Community Character Appearance and Design," discusses the busy character of North Washington Street and describes it as neither very attractive nor functional for pedestrians. Chapter four, "Land Use and Economic Development," states that at its gateways, the City should promote a positive image and create unique and innovative combinations of pedestrian access, public plazas or squares and a balance between the built and natural environment. Lastly, Chapter five, "Natural Resources and the Environment," states that the City should ensure that all City initiated projects are constructed using Low Impact Development (LID) techniques and other best management practices.

Existing Conditions

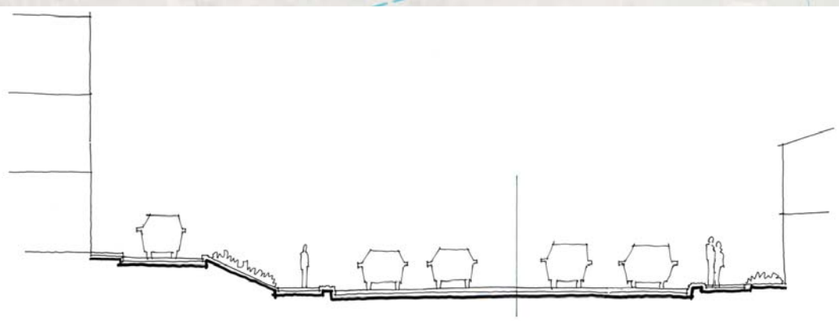
The North Washington Street corridor includes a mix of office, commercial and institutional uses. The street, also known as Route 29, is part of the National Highway system. VDOT has design oversight, but the City maintains and controls the street. There are two travel lanes in each direction with occasional turn lanes at signalized intersections. There are no on-street parking nor dedicated lanes for bicycles. The public realm between the back of the curb and the edge of the right-of-way is narrow, averaging a 2′ lawn verge with a 5′ sidewalk. The guidelines are based upon the premise that the City will maintain the streetscape and that curb-lines remain in place. Keeping the curb-line unchanged maintains traffic flow and minimizes impacts to private property. The existing conditions survey and sample sections of each block are depicted below.



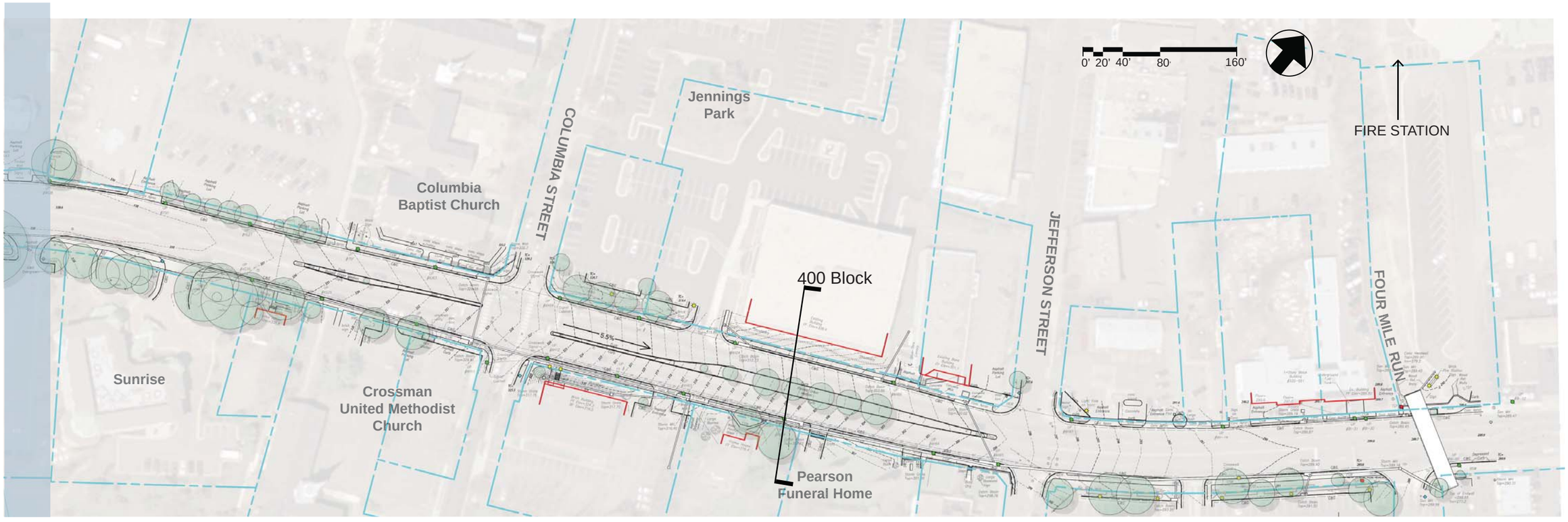
BROAD STREET AND WASHINGTON STREET INTERSECTION



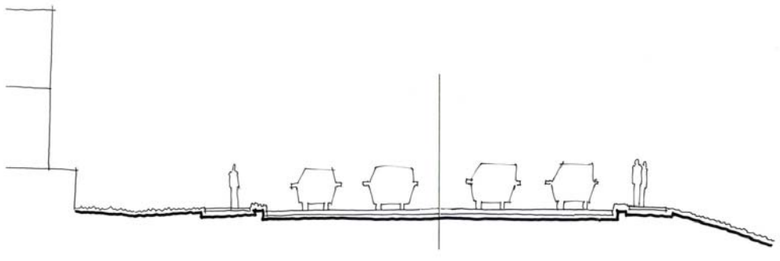
Section through 100 block looking north



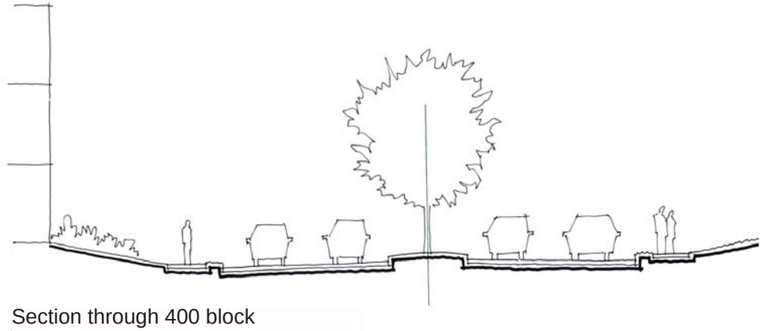
Section through 200 block looking north



Existing conditions



Section through 300 block
looking north



Section through 400 block
looking north

- Light Pole
- Fire Hydrant
- Utility Pole
- Traffic Signal Pole
- Drains/Inlets
- Face of Existing Building
- Right of Way
- Existing Trees

Public Engagement

Planning Process

As shown in the timeline on this page, the process to develop a streetscape plan for N. Washington Street has taken approximately one and a half years and has included input from residents, property and business owners, City boards and commissions, and the City Council.

The effort started with the planning team listening to community concerns and suggestions for the future streetscape in a public meeting. The team distributed a questionnaire to develop an understanding of community preferences and goals for the streetscape. This information guided the initial design work.

The team then vetted initial concepts and features of the streetscape with a number of individual stakeholders, and with the Planning Commission and the City Council in a series of worksessions.

At a second public forum, the community reviewed a revised plan and provided additional input, with a particular focus on site furnishings, paving materials and sidewalk width options.

The team then presented a final, revised plan to the City Council, who ultimately adopted the Plan in its current form. The Virginia Department of Transportation has also conceptually approved the streetscape design.

May, 2008
First public meeting to listen to community concerns and suggestions

Prepared site survey

Developed preliminary concepts

September, 2008
Stakeholder interviews to discuss preliminary concepts with key property owners

Developed draft master plan and coordinated with VDOT

Questionnaire responses

What is the best thing about N. Washington Street?

Mature trees
Median at Jennings Park
Approach from Arlington

What is the worst thing about N. Washington Street?

Narrow sidewalks
Lack of separation between cars and people
Lack of pedestrian amenities

If you could add one thing, what would you add?

Trees, Trees, Trees
Bus shelters

If you could take away one thing, what would you remove?

Overhead utilities

March, 2009

Planning Commission worksession to discuss draft master plan

May, 2009

City Council worksession to discuss draft master plan

Refined master plan based upon Commission and Council comments

June, 2009

Second public meeting to review the master plan and determine community preferences

July, 2009

City Council worksession to review community input

Developed draft design guidelines

November, 2009

Joint City Council and Planning Commision worksession

January, 2010

Submittal for adoption

Photos from public meetings

Goals derived from community input

Create a sense of separation between pedestrians and vehicles.

Provide sidewalks wide enough to allow for comfortable pedestrian flow.

Protect the existing shade trees.

Incorporate innovative stormwater management practices.

Provide appropriate shade, lighting and seating for pedestrians.

Provide shelters and seating for transit-riders at bus stops.

Move overhead utilities below ground.

Create connections between public amenities like parks and the Metro.

Create gateway features and various places of interest along the corridor.

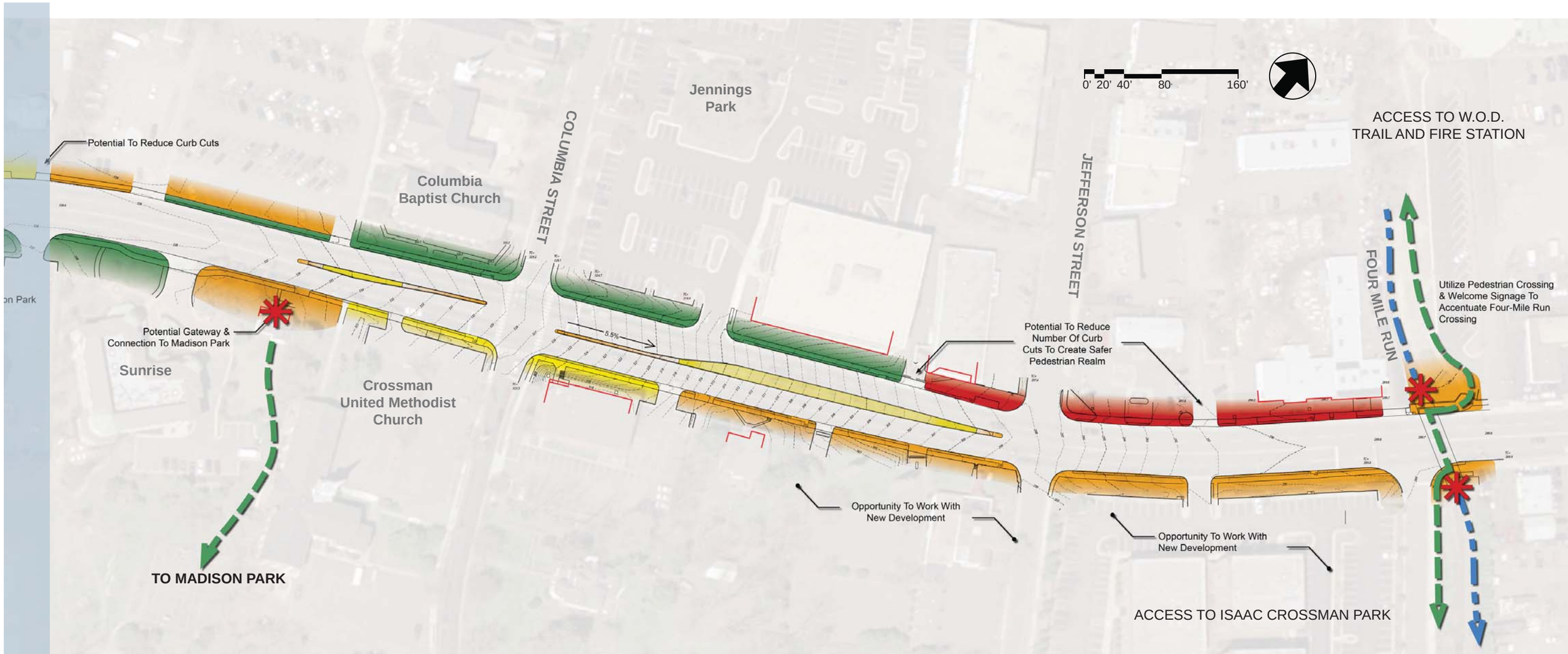
Create a streetscape that announces the arrival into Falls Church.

Site Analysis

Stakeholders influenced the guidelines from early-on in the process. The corridor's existing conditions were evaluated with the community's goals in mind. The analysis below indicates the relative degree to which an individual area must change to achieve the desired community goals.

Degree Of Change Necessary To Meet Community Goals

- No Change Required
- Opportunity To Enhance Experience
- Moderate Change Required
  *improvement warranted by context
- Significant Level Of Change Required
  *substandard or dangerous experience
- Significant Gateway / Opportunity



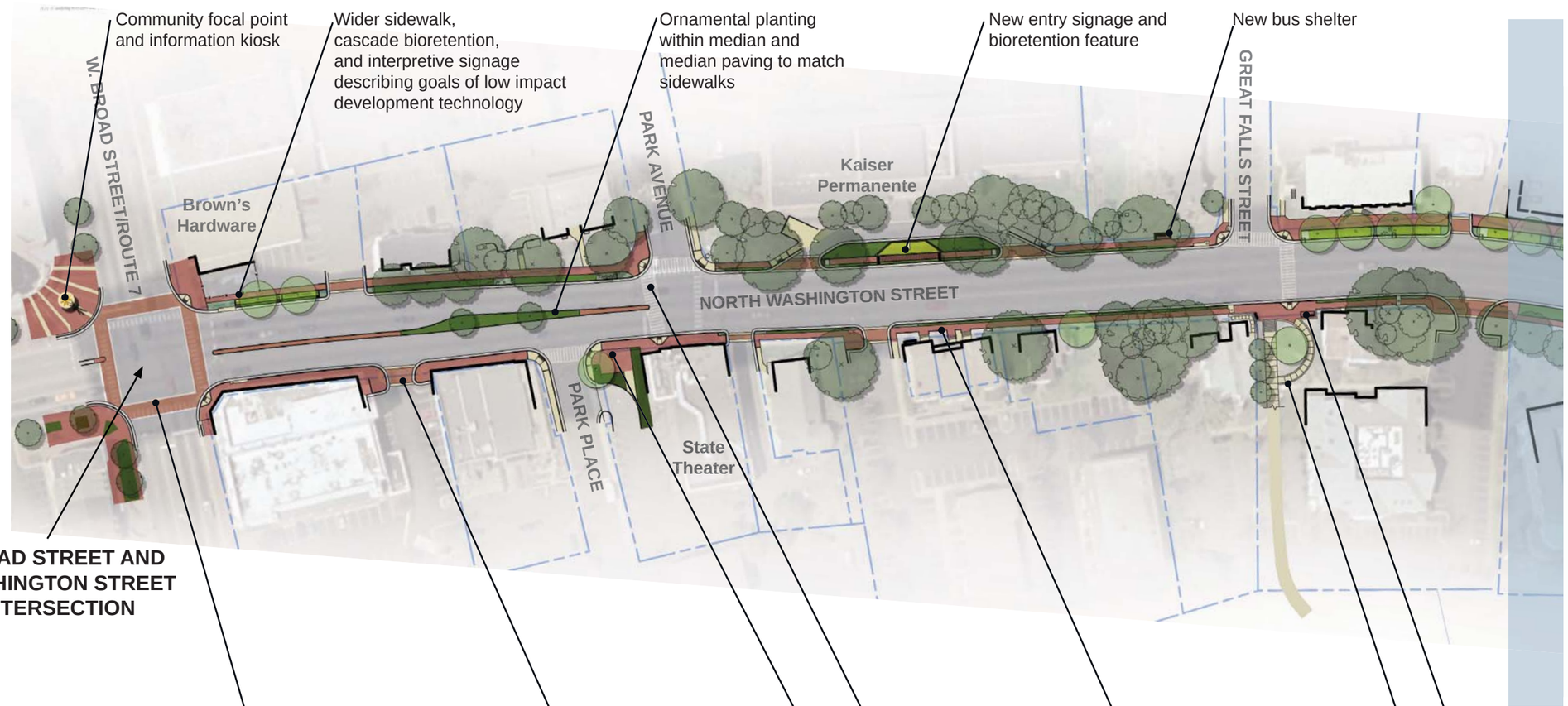
Site analysis

Master Plan

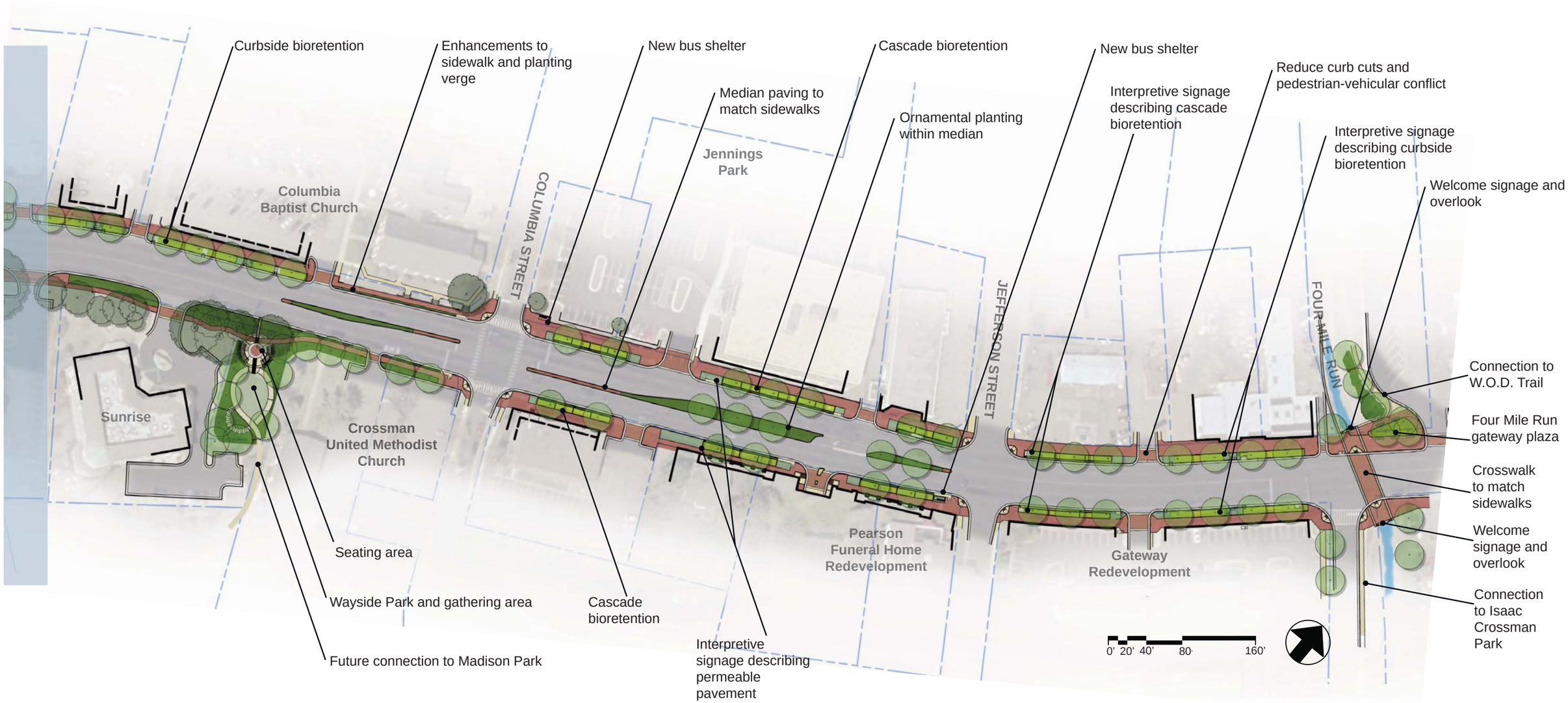
The streetscape master plan is guided by the following four principles:

- The streetscape shall integrate bioretention facilities and permeable pavements into the public realm as a means of detaining and filtering run-off.
- The streetscape shall provide unique places of interest at frequent intervals.
- The streetscape shall be built using materials and furnishings that are locally sourced, renewable, uniquely durable or otherwise ecologically beneficial. These elements shall compliment those of the Broad Street streetscape but not replicate them.
- The streetscape shall include educational elements that interpret the sustainable design components and technologies used in its construction.

These principles combine with the community's goals to form the basis of design guidelines. The illustrative plan below depicts the proposed streetscape features.



Bioretention
Ornamental Planting
Existing Trees
Proposed Trees
Permeable Pavement
Non-Permeable Pavement



Master plan

Stormwater Management

One of the primary goals for the improved streetscape is to incorporate sustainable stormwater management into the public realm. Bioretention facility and permeable pavement achieve this goal while providing attractive landscape amenities. These facilities areas are intended to supplement the existing drainage system, not replace it. New inlets can be installed in the curbs to divert runoff through the bioretention filters. Bioretention and permeable pavements provide a detention function in addition to filtering runoff. Some water will still flow directly into the existing pipe system but at a lower volume and rate than occurs now. The diagram below illustrates the proposed locations of the permeable pavement areas and the two types of bioretention, curbside and cascade. The curbside areas run parallel to the grade of the curb in the flat portions of the corridor. The cascade areas are terraced bioretention cells that step down the steeper portions of the corridor.

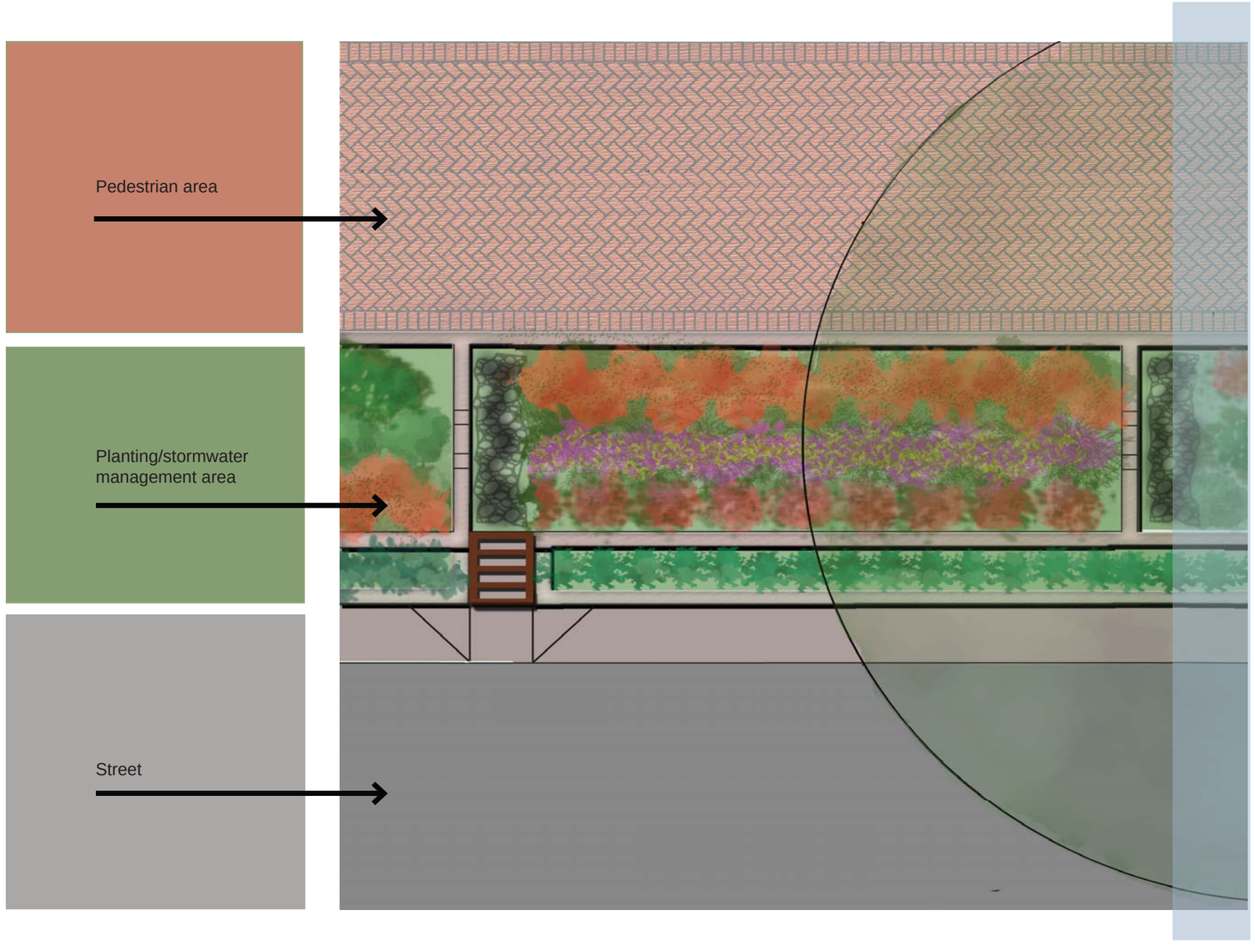
BROAD STREET AND WASHINGTON STREET INTERSECTION

Stormwater management strategies plan

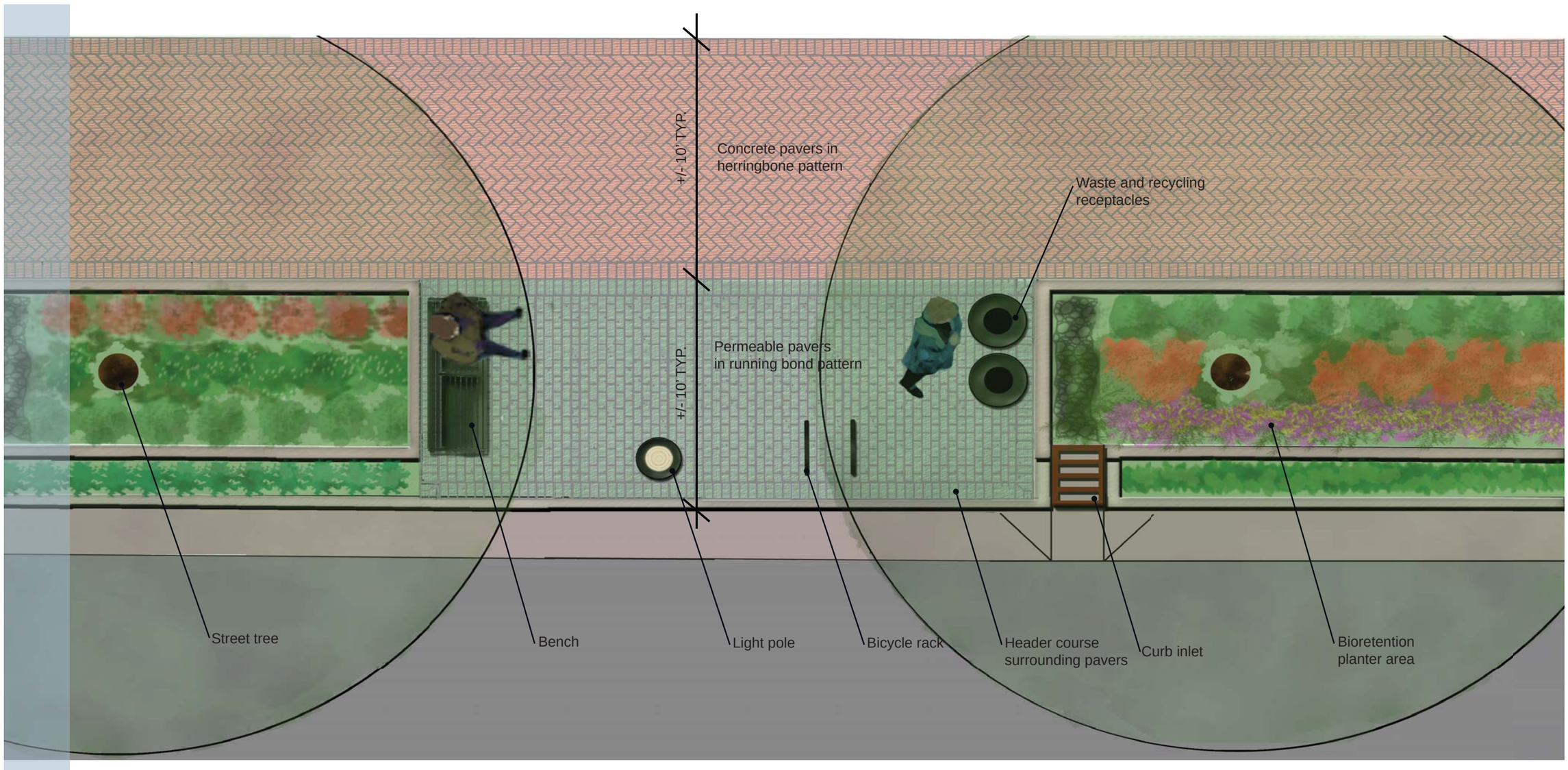
Streetscape Elements

The proposed North Washington Streetscape is broken down into three zones in order to achieve separation between pedestrians and vehicles, and to integrate innovative stormwater management features into the public realm. The first zone is a *red line*, where pedestrians walk. Adjacent is a *green line*, where ornamental planting, bioretention areas, and permeable pavement create a buffer from the final zone, the *gray line* of traffic.

The following illustrations depict how the conceptual green line and red line idea can be built in the landscape. The red line pedestrian area consists of concrete pavers on a rigid concrete base that relate in character to the Broad Street streetscape paving. The green line planting/stormwater management area consists of either ornamental planting or a curbside bioretention system or a strip of permeable pavement that intercepts sidewalk run-off.



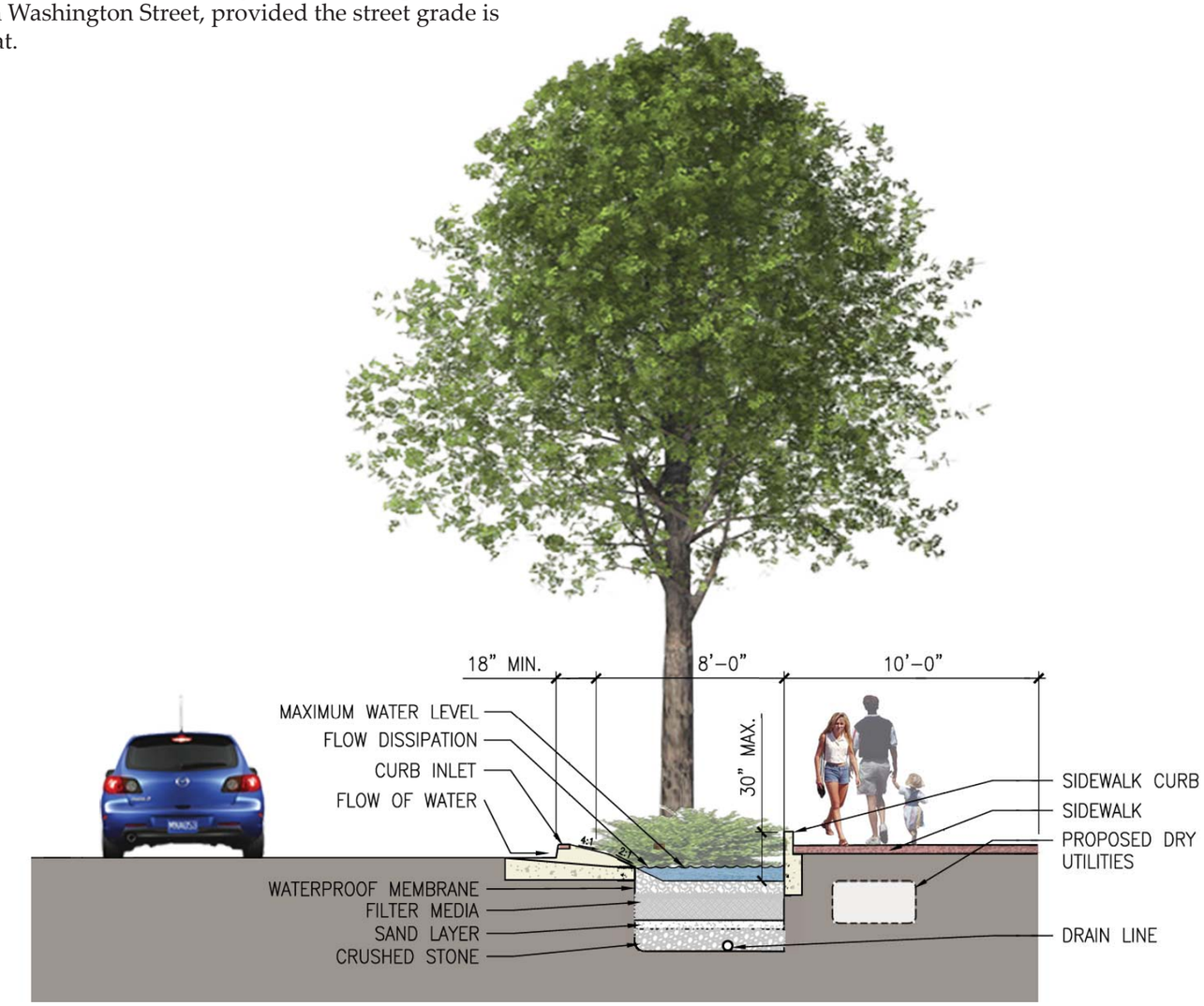
The typical streetscape section shall be approximately 20′ in width including 10′ for the pedestrian area and 10′ for the planting/stormwater management/seating area.



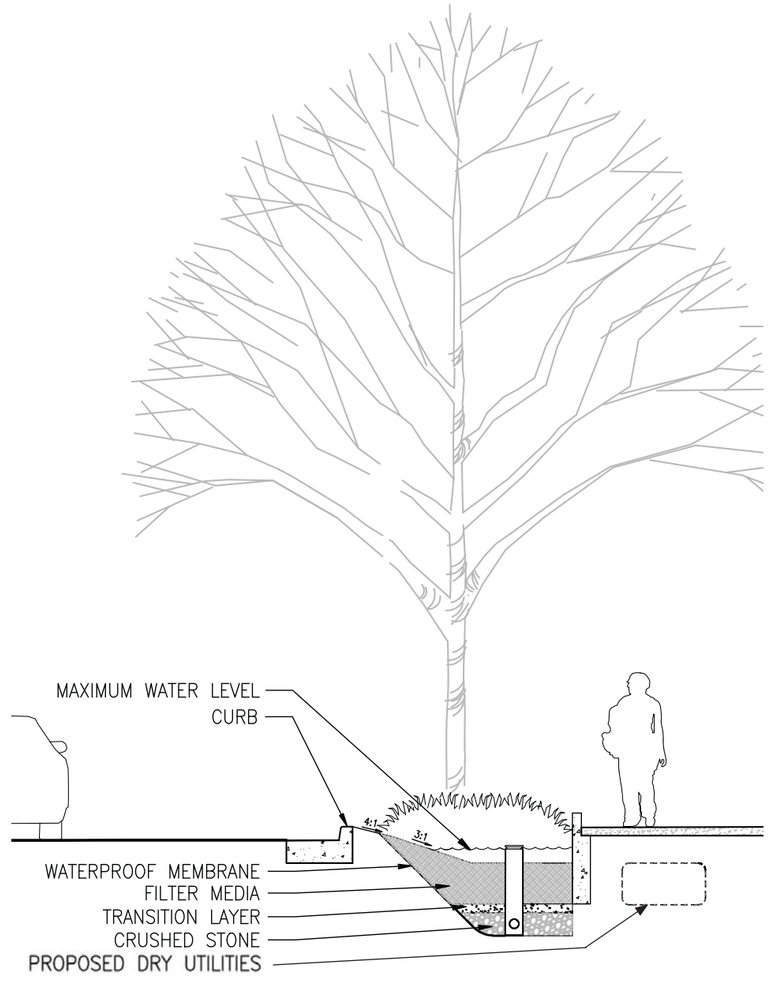
Example of typical sidewalk condition

Typical Curbside Bioretention Condition

The typical public realm section for curbside bioretention is approximately 20′ in width from the face of the curb to the face of a building with a sidewalk width of 10′. This is the typical condition desired for any new redevelopment along North Washington Street, provided the street grade is relatively flat.



Section through typical inlet condition



Section through typical curb condition

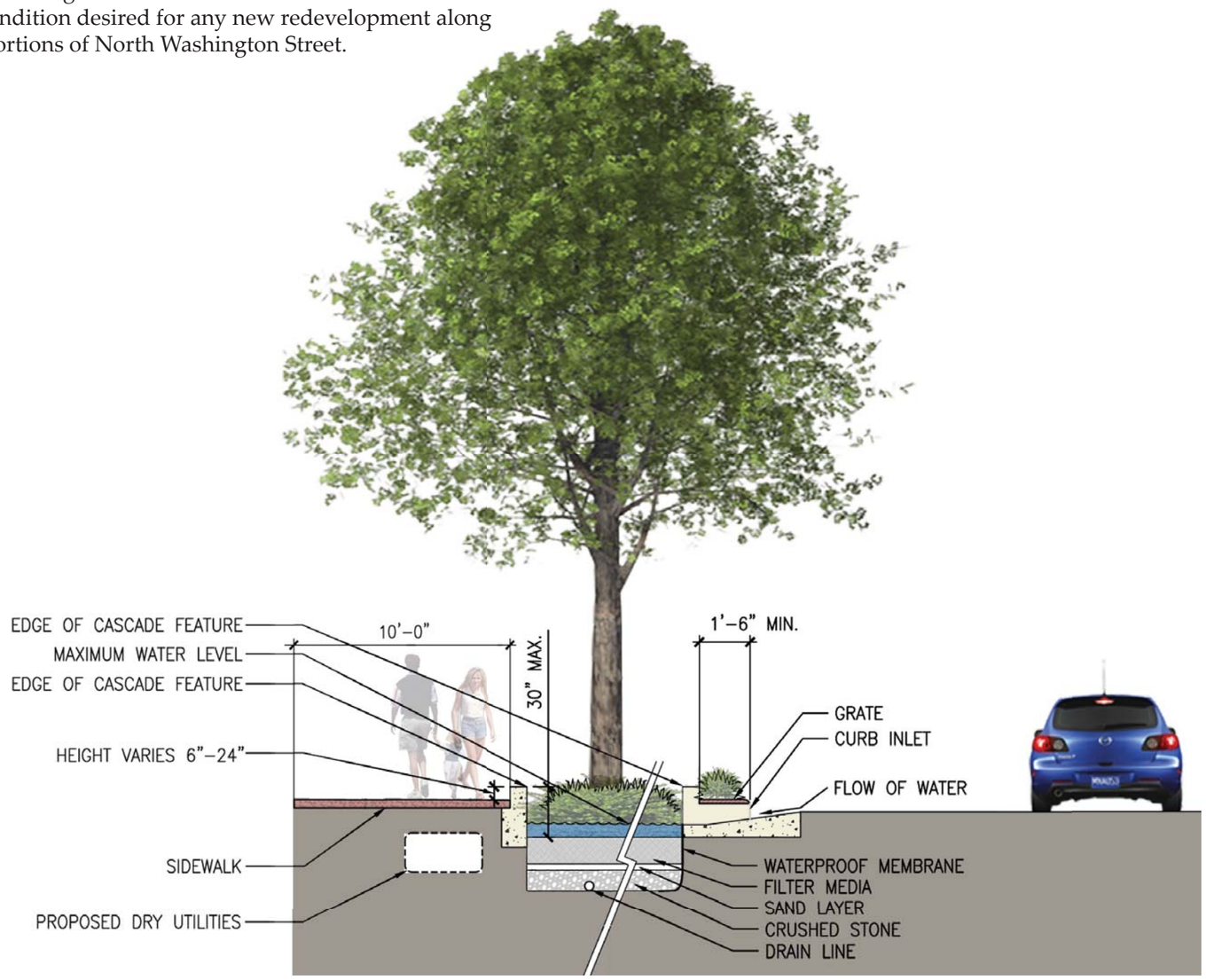
View of curbside bioretention from street

View of curbside bioretention from the sidewalk

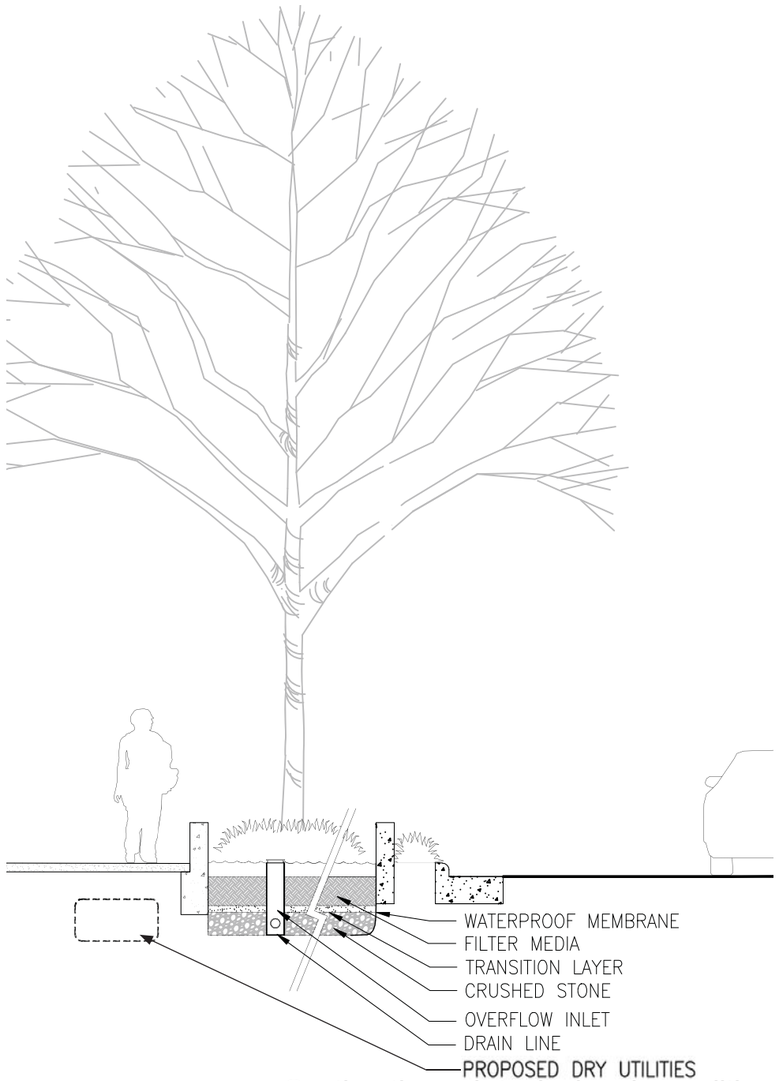
View of curbside bioretention curb inlet

Typical Cascade Bioretention Condition

The typical public realm section for cascade bioretention is approximately 20′ in width from the face of the curb to the face of a building with a sidewalk width of 10′. This is the typical condition desired for any new redevelopment along steeper portions of North Washington Street.

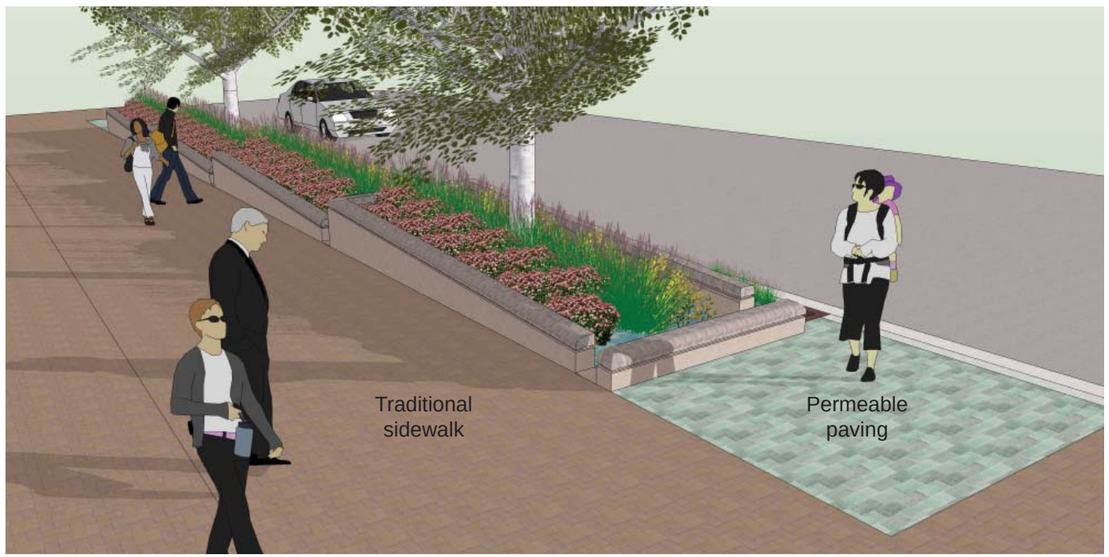


Section through inlet condition



Section through typical curb condition

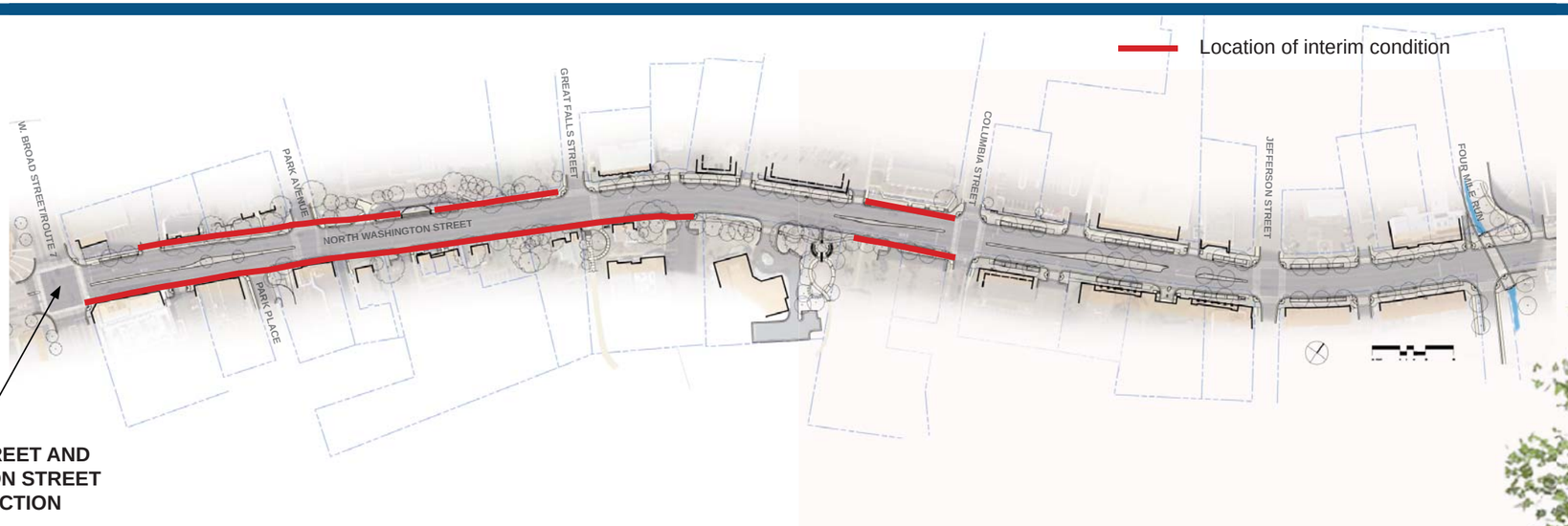
View of cascade bioretention curb inlet



View of cascade bioretention

View of cascade bioretention from sidewalk

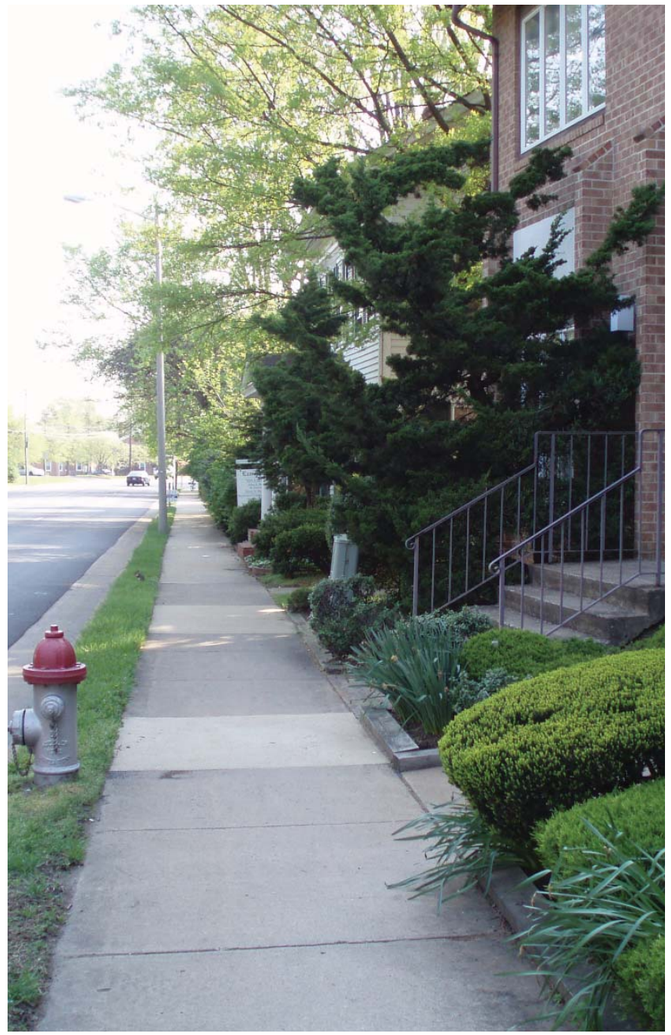
Typical Interim Condition



BROAD STREET AND WASHINGTON STREET INTERSECTION

A 20′ width of public realm is desired along each side of the entire corridor. However, some portions of the street are not anticipated to redevelop in the near term and the topography or existing buildings prohibit building the desired width until redevelopment occurs. In those cases, an interim condition may be built to make unifying improvements in a narrower envelope. The imagery above depicts the interim condition. The current lawn strip is replaced with low maintenance ornamental grasses and ground covers and the concrete sidewalk is replaced with pavers to match improvements elsewhere.

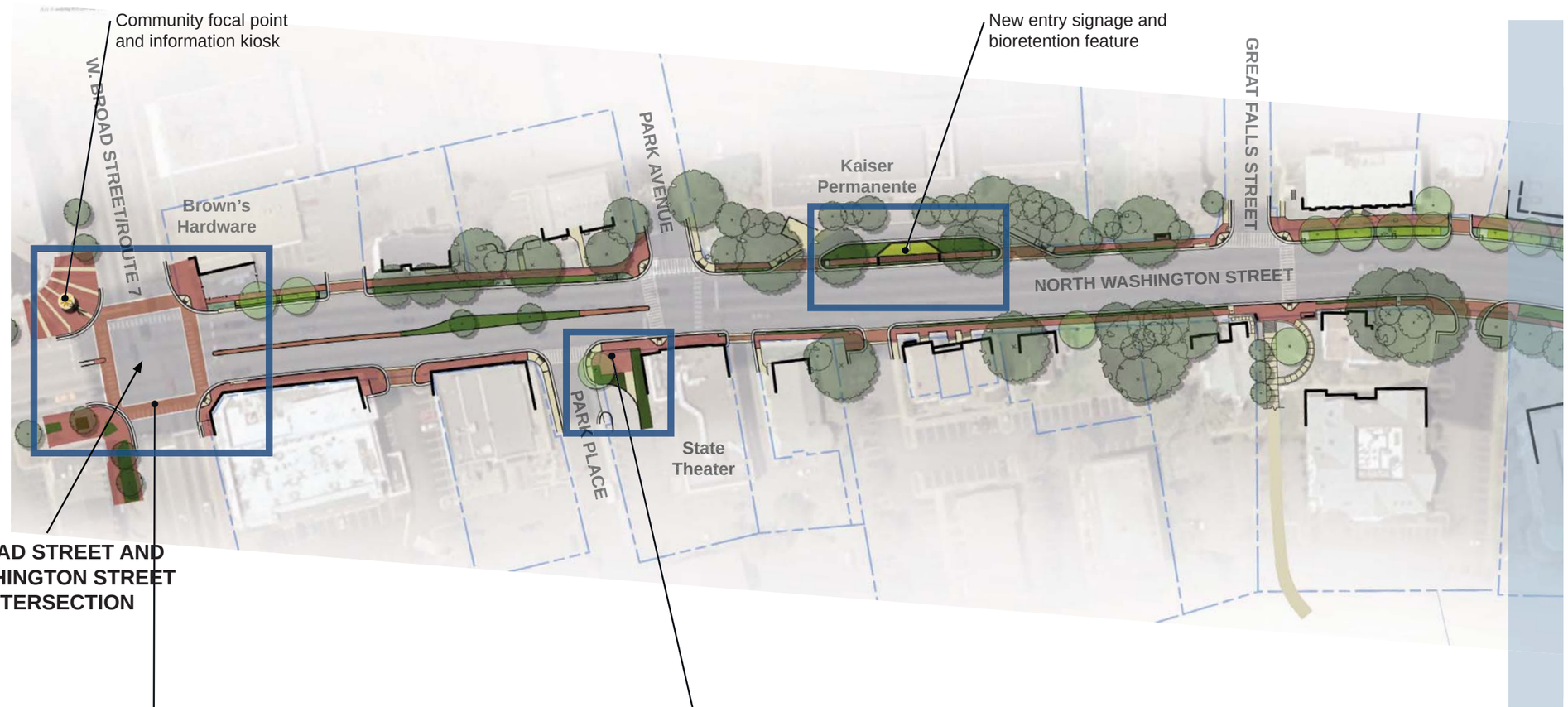
Section of interim condition



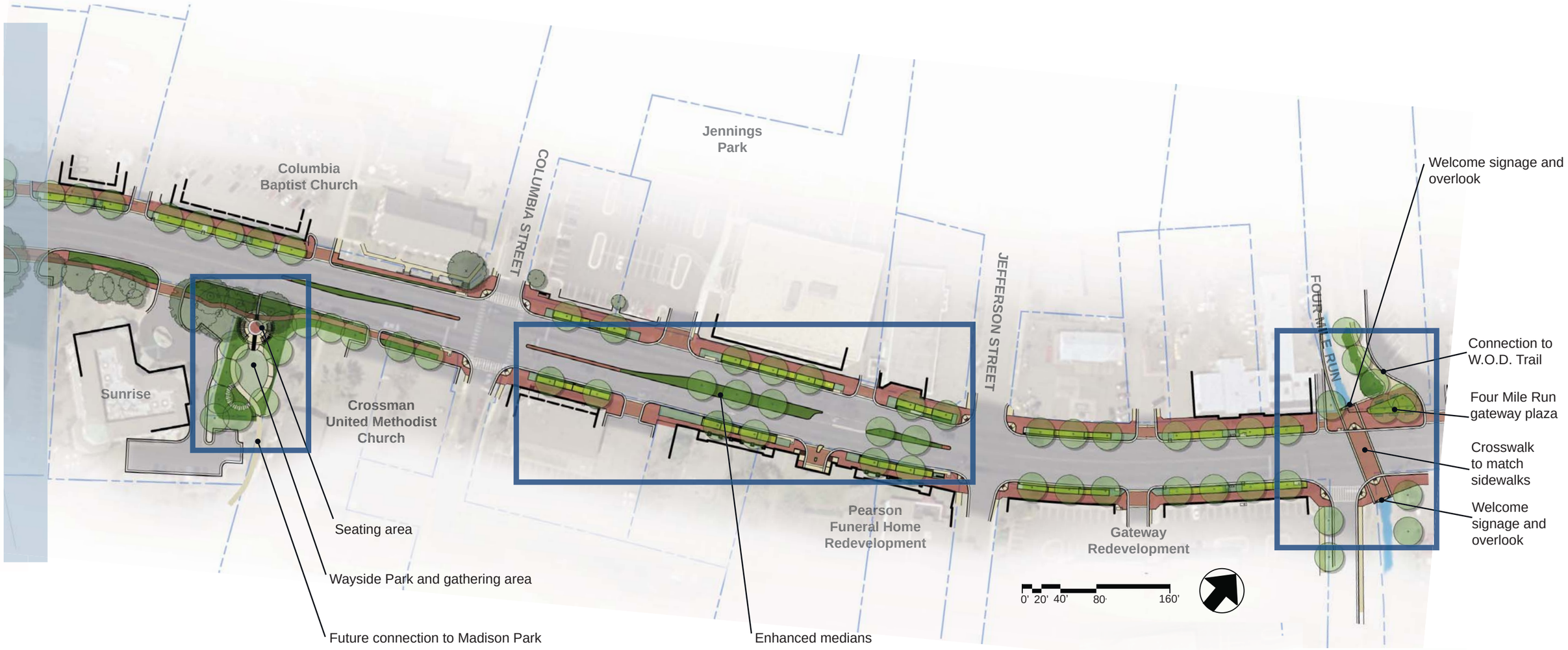
Example properties where the interim condition may be necessary

Places of Interest

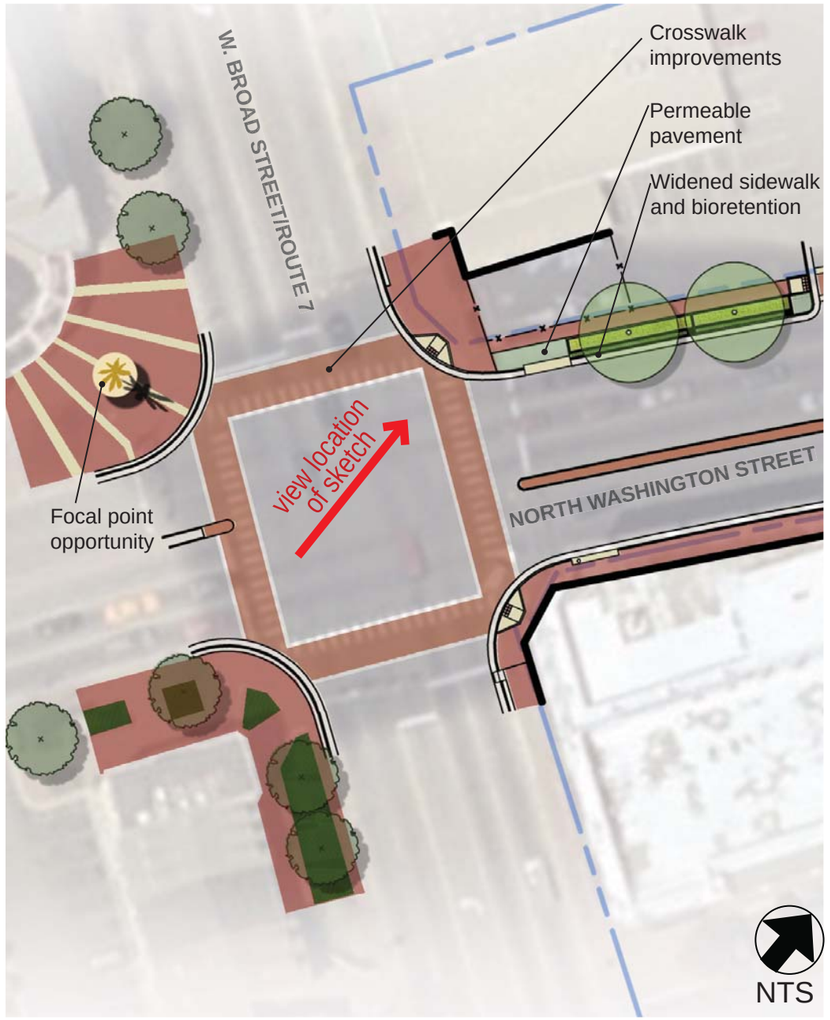
The illustrative plan highlights “places of interest” along North Washington Street. These locations are planned to enhance City gateways, provide areas of respite for pedestrians, create connections to Falls Church amenities and provide demonstrations of sustainable streetscape technologies.



Places of interest
Bioretention
Ornamental Planting
Existing Trees
Proposed Trees
Permeable Pavement
Non-Permeable Pavement



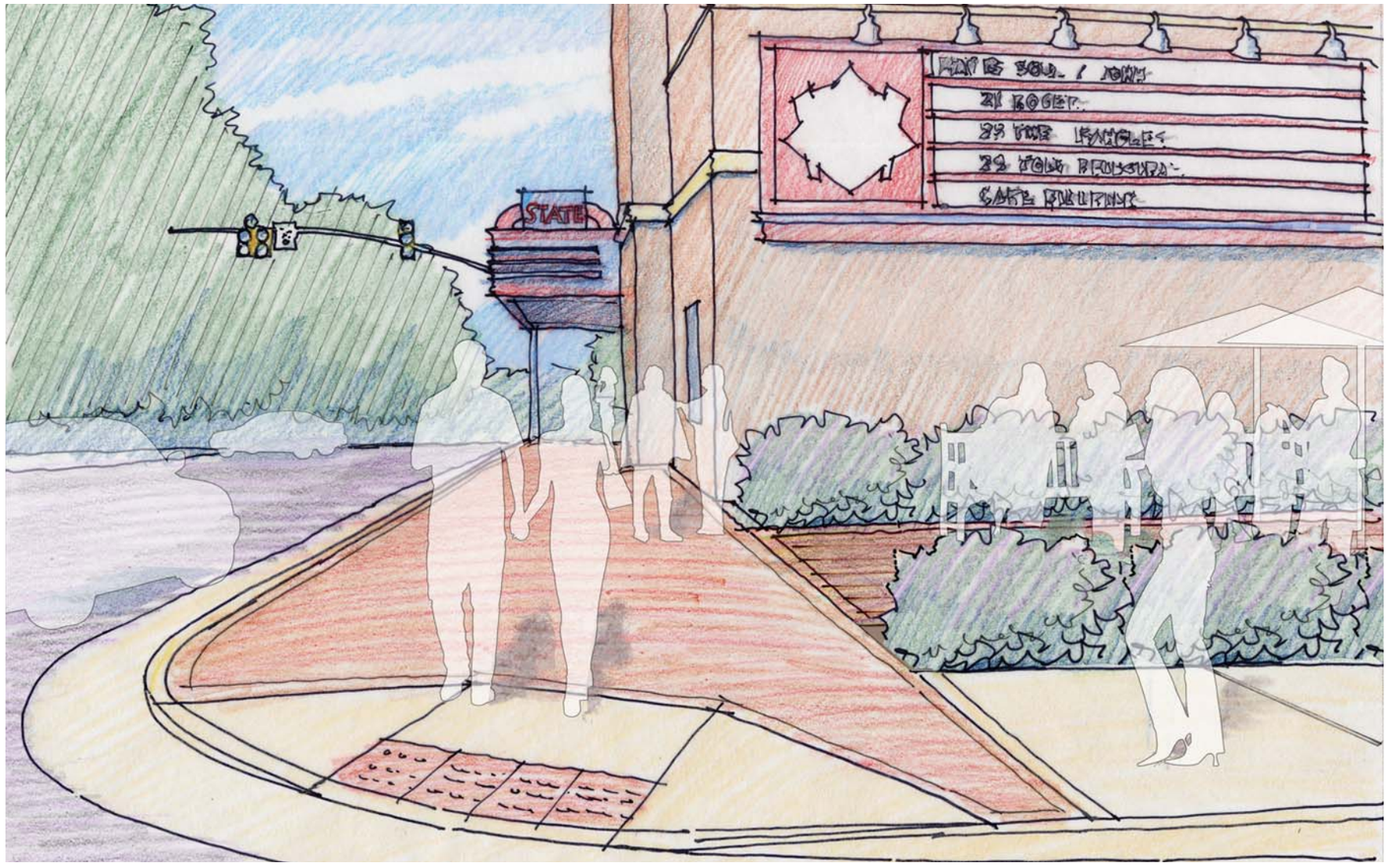
Places of interest plan



Enlargement of intersection

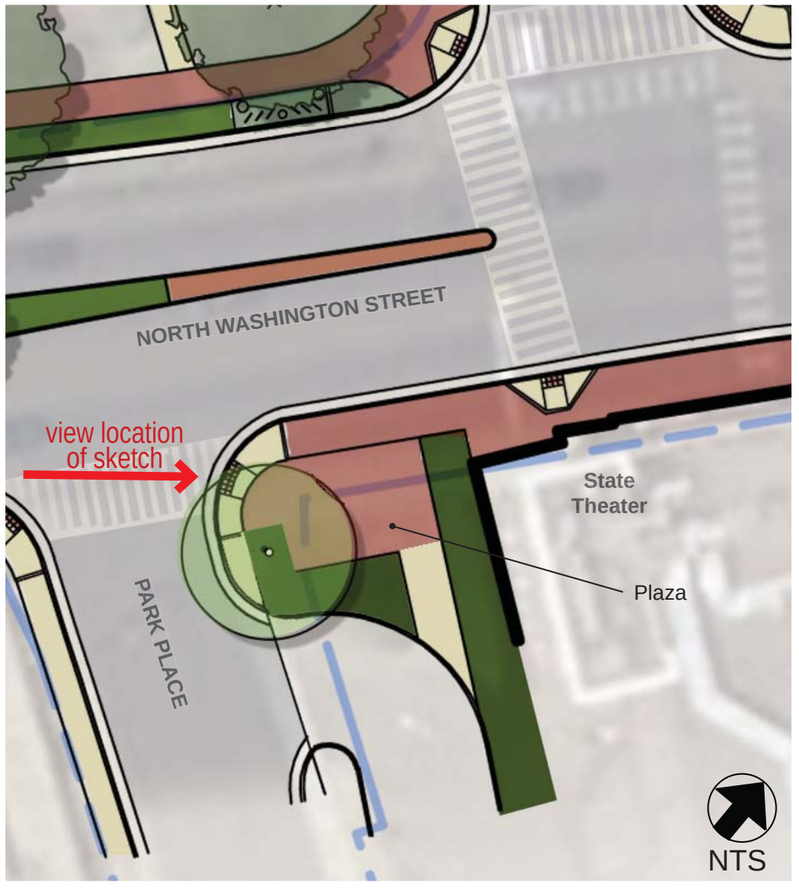
Broad St. and Washington St.

The intersection of Broad Street and Washington Street represents the heart of Falls Church. The design guidelines recommend enhancing the pedestrian appeal of this intersection by changing the texture and color of the crosswalks to match that of the Broad Street streetscape. In addition, the southwest corner of the intersection should become a civic focal point. This could be the location of a commemorative sculpture, an architecturally significant kiosk that orients visitors and residents to destinations within the city, or a modest civic water feature. Knowing that the northwest corner of the intersection may redevelop in the long term, interim improvements can be made to open views to Brown's Hardware, widen the sidewalk and incorporate tree plantings and bioretention facilities along North Washington Street. These changes would involve creating new fencing for the store's outside storage and display and could provide a demonstration area for household "green" technologies such as rain barrels and solar panels.

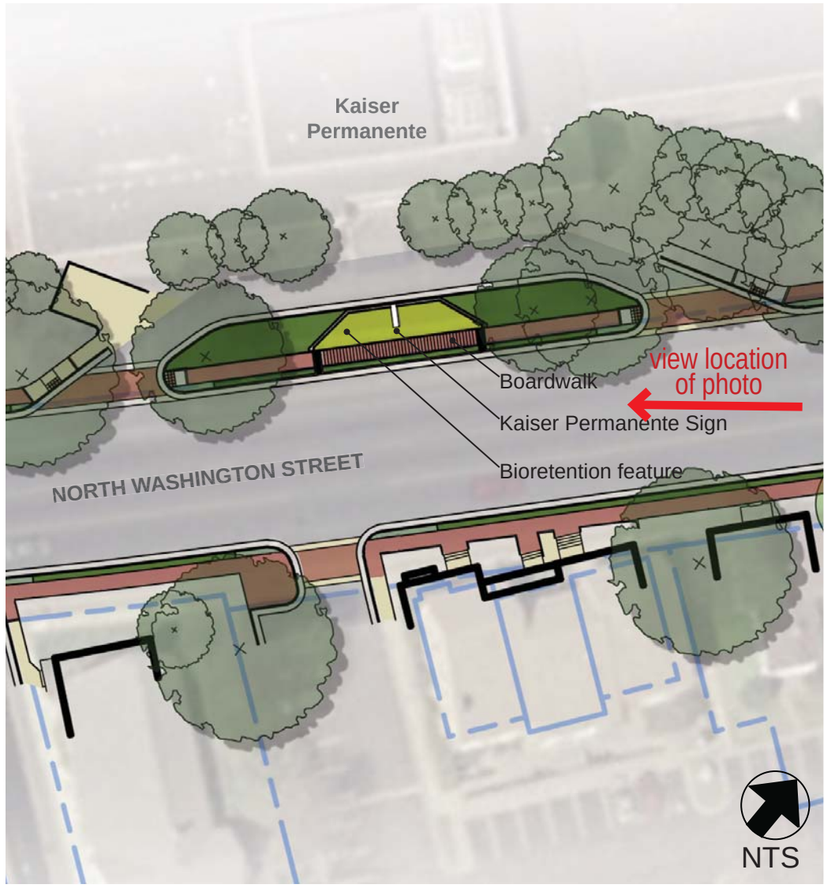


State Theater Plaza

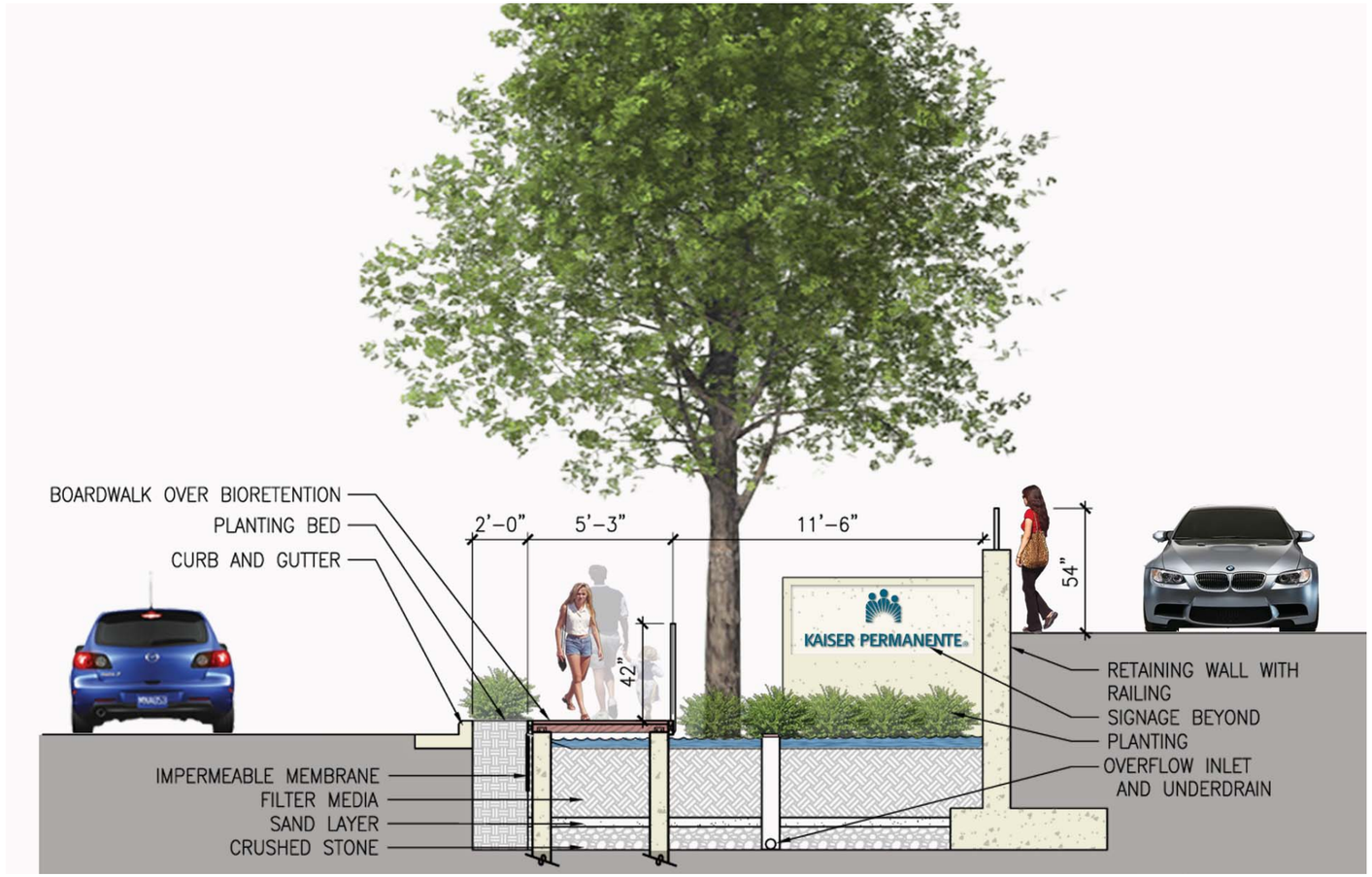
Currently, the sidewalk and crosswalk in this area become congested when State Theater patrons gather before and after events. In order to alleviate these pedestrian conflicts, the sidewalk can be widened and a gathering plaza can be built south of the theater. Situated between the current sidewalk and the parking area, this plaza could be constructed to match the streetscape elements and can include ornamental plantings, shade trees, new tables, umbrellas and chairs, as well as signage leading to other Falls Church attractions.



Enlargement of plaza



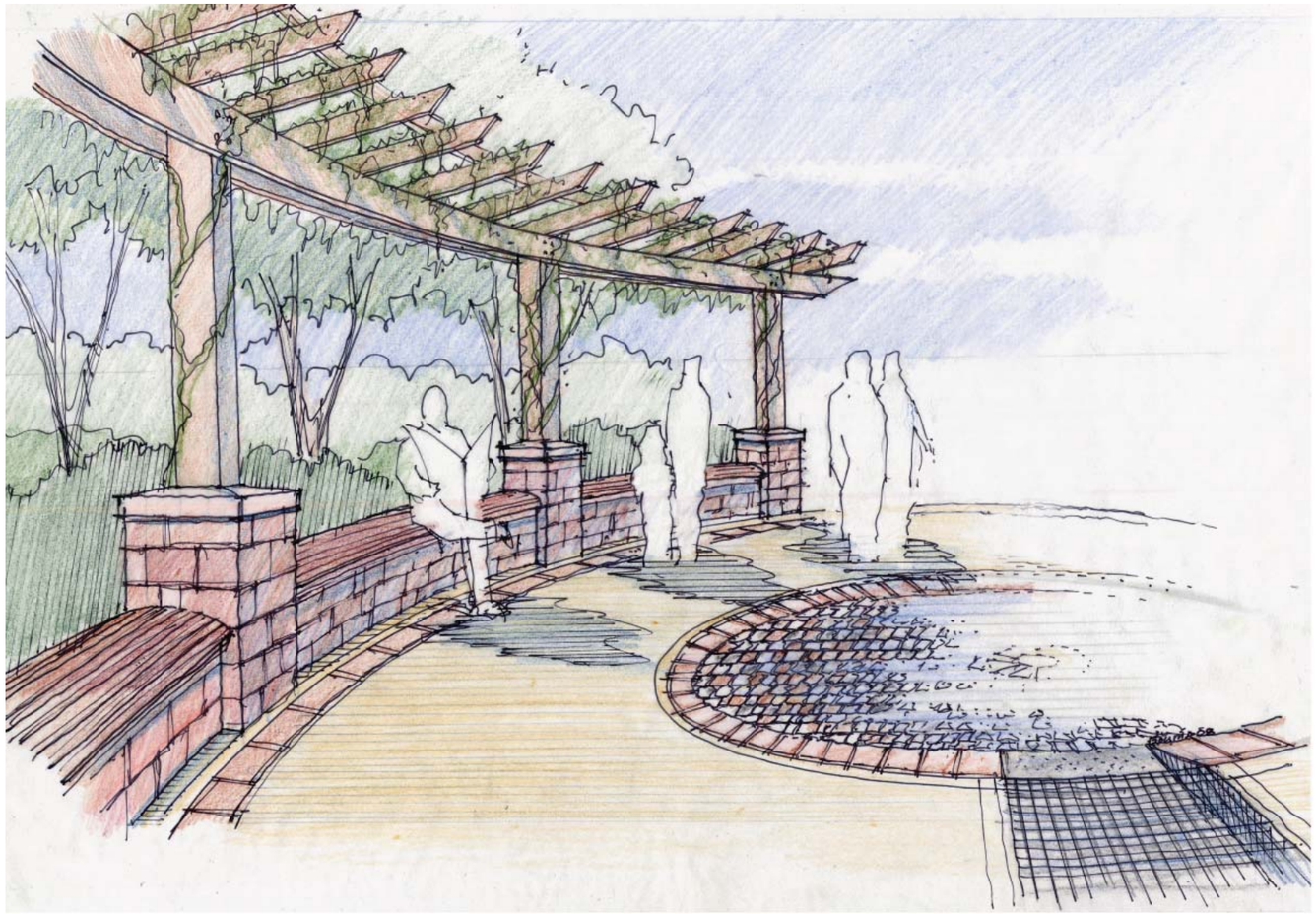
Enlargement of entrance



Section through entrance

Kaiser Permanente Entrance

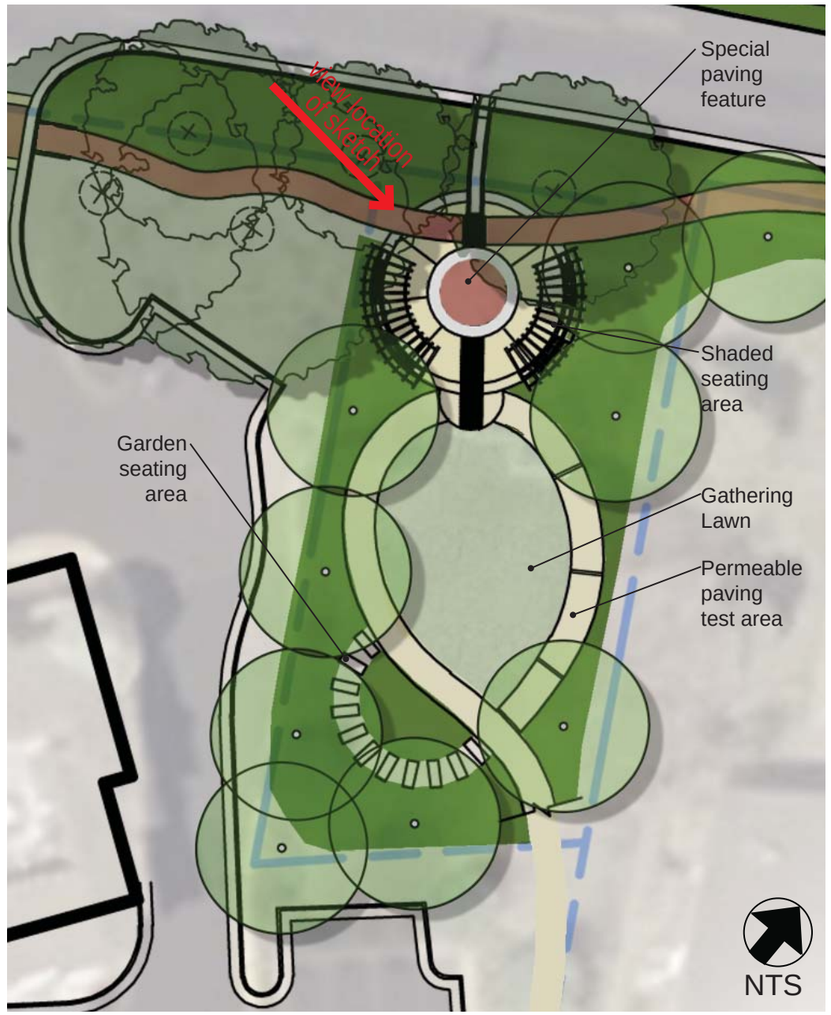
The entry to the Kaiser Permanente building can be a model for stormwater management near the top of the watershed. Diverting, detaining and filtering runoff near the top of the watershed can reduce downstream infrastructure maintenance. The area between the entry driveway and the curb can be used to create a unique public stormwater management feature. By replacing the existing earthen slope with a retaining wall, space becomes available for a bioretention feature that pedestrians cross on a boardwalk. The boardwalk would include a railing and follow appropriate safety and accessibility guidelines. Signage for Kaiser Permanente can be incorporated into the feature.



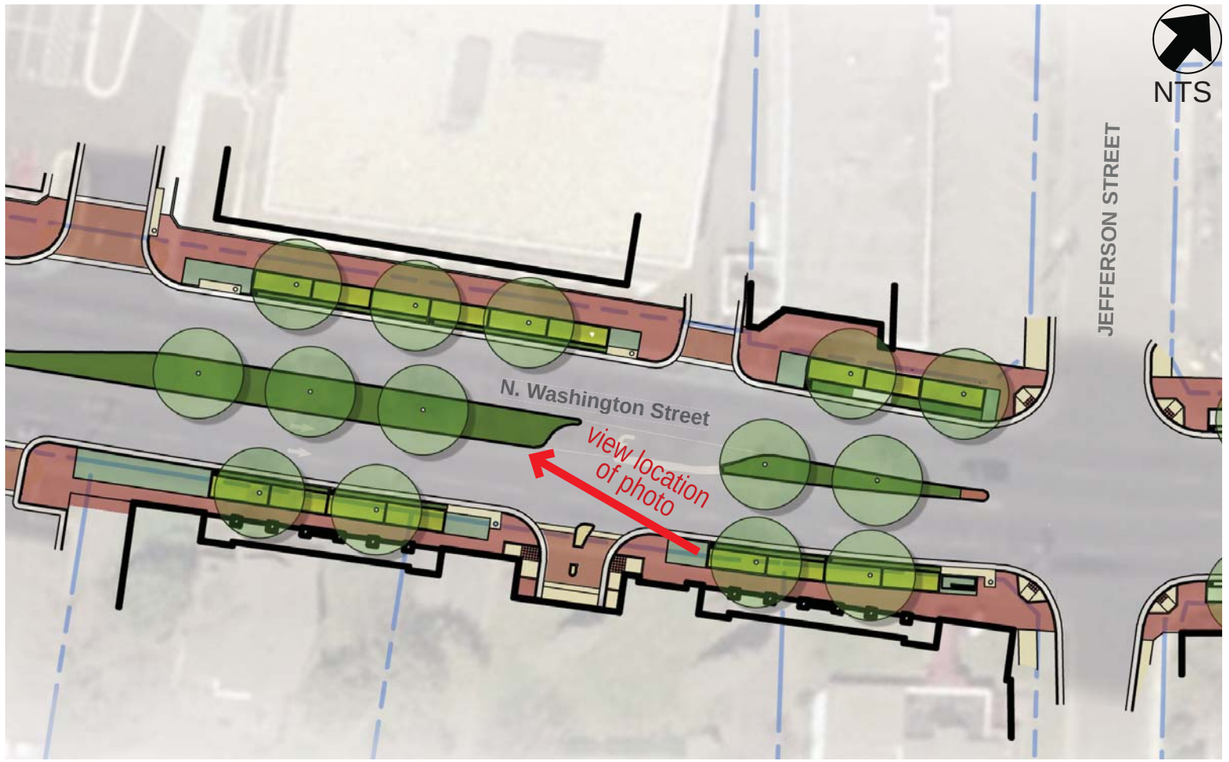
Wayside Park

Located at the half way point of North Washington Street, the City-owned Miller House can become a garden-like wayside park. Trellis covered seating areas can be arranged within the existing trees to create a feeling of separation from the street. Wayside park can support small gatherings associated with the adjoining property owners, serve as a test site for new permeable pavement technologies and eventually create a more public entrance to Madison Park from North Washington Street. Wayside Park can also filter stormwater by diverting a portion of the curb drainage through a runnel in the main seating area. A pavement feature can dissipate the flow of water and allow it to slowly filter through a gathering lawn or bioretention feature. It will be important to maintain adequate views into the park for public safety.

Photo of Miller House



Enlargement of Wayside Park



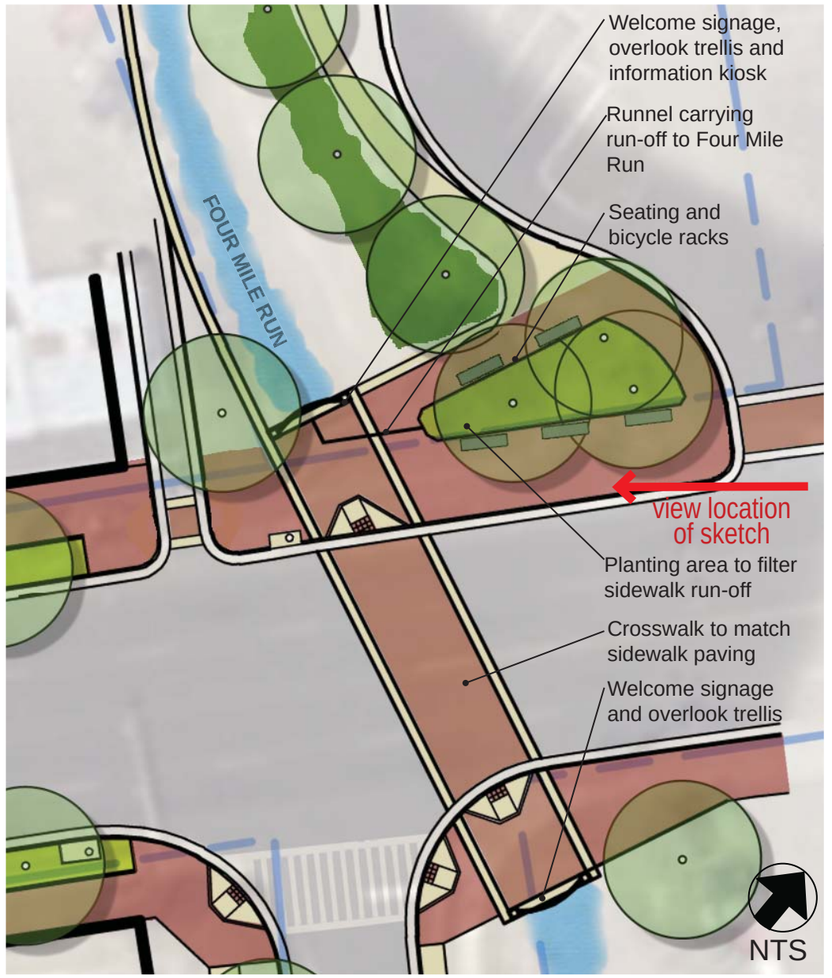
Enlargement of the median south of Jefferson Street

Boulevard Medians

The medians within North Washington Street are places of interest of a different type. Rather than being places for people to gather, they play an important role in establishing the visual appeal of the city. These medians are highly visible to motorists and they can be further enhanced with new ornamental plantings. While beautifying the street, the new groundcovers and small shrubs within the medians should be of a size that do not block drivers' views. The existing trees in the median south of Jefferson Street currently contribute to the gateway experience but they are not in good health. The guidelines propose to remove unhealthy trees within the medians and replace them with new shade trees better suited for those conditions. The new trees are intended to reinforce the sense of arrival to the city and complement the streetscape improvements on either side of the street.

Four Mile Run Gateway

Four Mile Run gateway is an opportunity to create a grand entrance to the City. The gateway can include welcome signage incorporated into an overlook trellis and opened views to Four Mile Run. In addition, a new signature crosswalk can connect creek-side trails and an inviting plaza space can be built near the entrance to the fire station. The new gateway plaza can incorporate a planting area to capture and filter plaza run-off. After treatment, the run-off can then pass through a runnel in the pavement that spills into Four Mile Run during rain events. Interpretive education elements can be integrated into the railing along the plaza as well as shaded seating and bicycle racks. This gateway will increase in importance due to its proximity to the East Falls Church Metro Station.



Enlargement of four mile run gateway

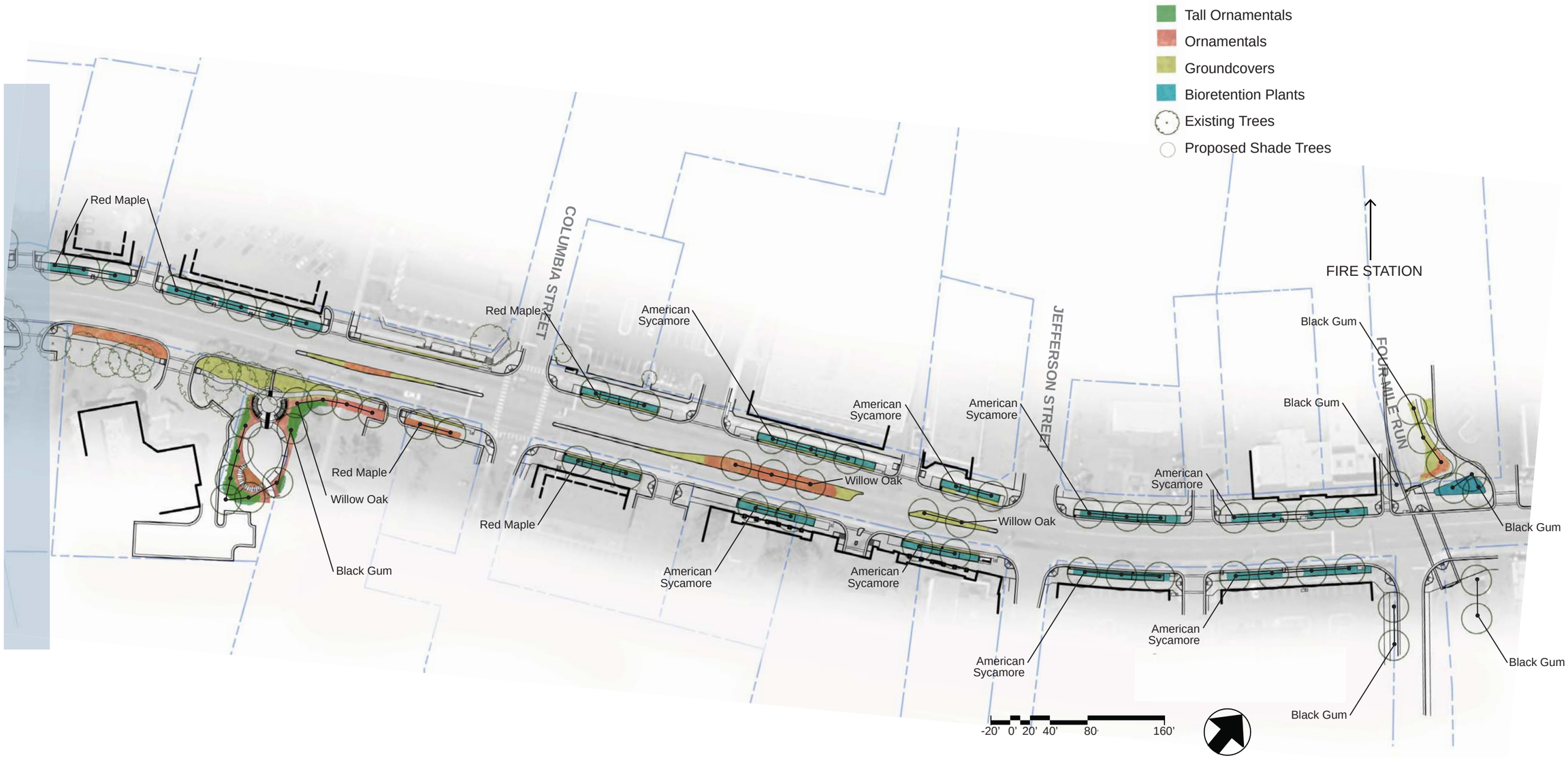
Planting Design

The plant palette for North Washington Street is chosen to accomplish the following:

- Minimize maintenance
- Avoid the need for irrigation after establishment
- Provide seasonal interest
- Provide shade
- Utilize native plant materials to the extent practical
- Contribute to a unified streetscape appeal

The diagram below illustrates the proposed location for new street trees, shrubs and ground covers.

Planting plans for individual properties shall utilize the plant materials listed in the plant palette. The “tall ornamental” category is to be planted outside of the 8′ VDOT clear zone from the face of the curb.



Conceptual planting plan

Plant Palette

Shade trees

Red Maple, *Acer rubrum*
American Sycamore, *Platanus occidentalis*
Black Gum, *Nyssa sylvatica*
Willow Oak, *Quercus phellos*

Tall ornamentals (>30”)

New Jersey Tea, *Ceanothus americanus*
Winterberry, *Ilex verticillata ‘Jim Dandy’*
Slender Rush, *Juncus tenuis*
Fountain Grass, *Pennisetum alopecuroides ‘Little Bunny’*
American Beautyberry, *Callicarpa americana*

Ornamentals (<30”)

Glossy Abelia, *Abelia x grandiflora ‘Little Richard’*
Orange New Zealand Sedge, *Carex testacea*
Deer-Tongue, *Dichanthelium clandestinum*
Northern Bush Honeysuckle, *Diervilla lonicera*
Gold Tide Forsythia, *Forsythia x ‘Courtasol’ (Gold Tide)*
Dwarf Inkberry, *Ilex glabra ‘Shamrock’*
Switch Grass, *Panicum virgatum ‘Shenandoah’*
Dwarf Fountain Grass, *Pennisetum alopecuroides ‘Hameln’*
Autumn Fire Sedum, *Sedum x ‘Autumn Fire’*

Bioretention plants

Coastal Sweet Pepperbush, *Clethera alnifolia ‘Hummingbird’*
Bottlebrush Grass, *Elymus hystrix*
Purple Lovegrass, *Eragrostis spectabilis*
Virginia Sweetspire, *Itea virginiana ‘Little Henry’*
Dwarf Inkberry, *Ilex glabra ‘Shamrock’*
Winterberry, *Ilex verticillata ‘Nana’ (Red Sprite)*
New England Aster, *Aster novae-angliae*
Threadleaf Tickseed, *Coreopsis verticillata ‘Zagreb’*

Groundcovers

Bearberry, *Arctostaphylos uva-ursi ‘Massachusetts’*
Pennsylvania Sedge, *Carex pensylvanica*
Red Fescue, *Festuca rubra*
Andorra Juniper, *Juniperus horizontalis ‘Plumosa Compacta’*
Clumping Liriope, *Liriope muscari*
Creeping Liriope, *Liriope spicata*
Creeping Raspberry, *Rubus pentalobus*

Shade Trees


Red Maple

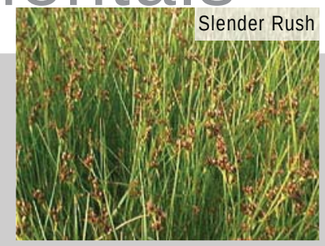

American Sycamore


Black Gum


Willow Oak

Tall Ornamentals


Winterberry


Slender Rush

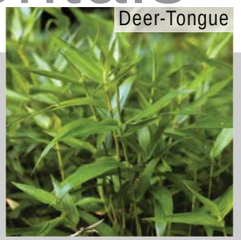

New Jersey Tea


‘Little Bunny’ Fountain Grass


American Beautyberry

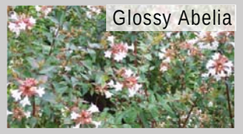
Ornamentals

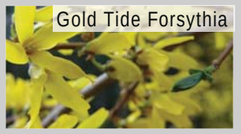

Autumn Fire Sedum


Deer-Tongue

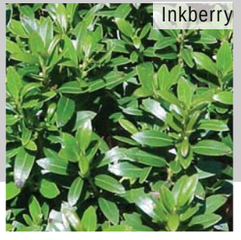

‘Hameln’ Dwarf Fountain Grass

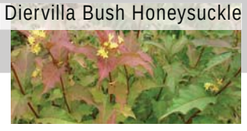

Switch Grass


Glossy Abelia


Gold Tide Forsythia


Orange Sedge


Inkberry


Diervilla Bush Honeysuckle

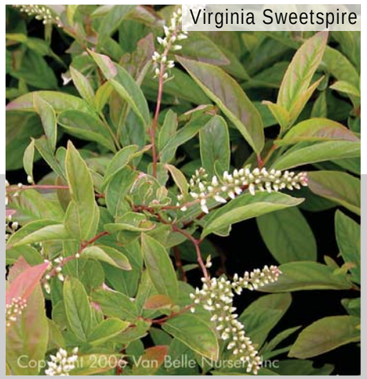
Bioretention Plants


New England Aster


Purple Lovegrass


Bottlebrush Grass


Dwarf Inkberry


Virginia Sweetspire


Threadless Tickseed


Sweet Pepperbush


Winterberry

Groundcovers


Bearberry


Pennsylvania Sedge


Red Fescue


Andorra Juniper


Liriope


Creeping Raspberry

Typical Planting Concept

The diagram below illustrates the recommended planting concept for curbside and cascade bioretention facilities. The goals of the planting arrangements are to create unity by using a limited number of plants in an organized rhythm, and to avoid an overly rigid planting scheme by alternating the location of each plant group. This is achieved by creating a framework of 3 consistent rows parallel to the street, and then alternating the specific plant material in each strip every 20 feet.

A- New England Aster and Threadless Tickseed

B- Purple Lovegrass

C- Bottlebrush Grass and Sweetpepper Bush

D- Dwarf Inkberry

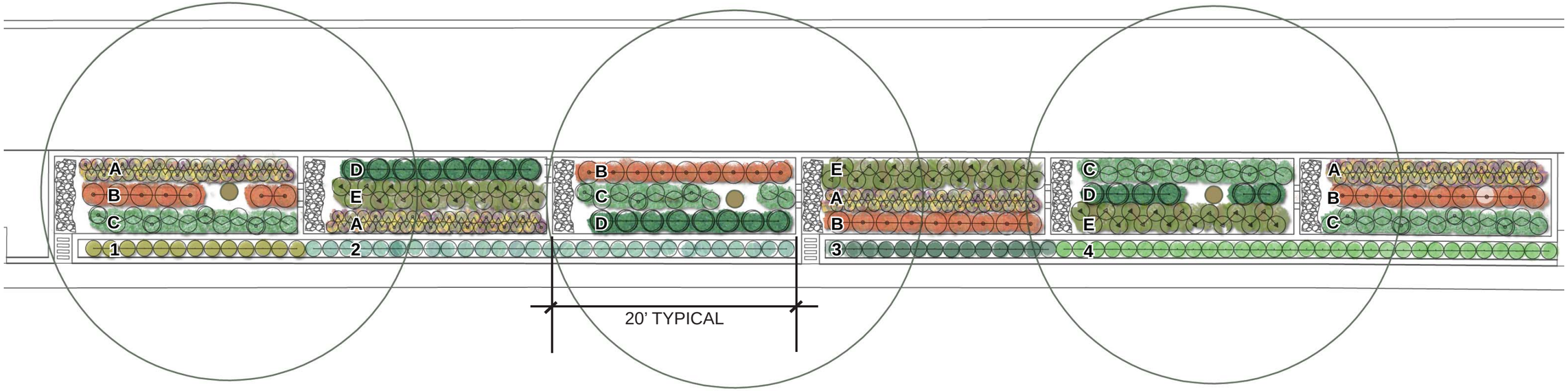
E- Virginia Sweetspire and Winterberry

1- Bearberry

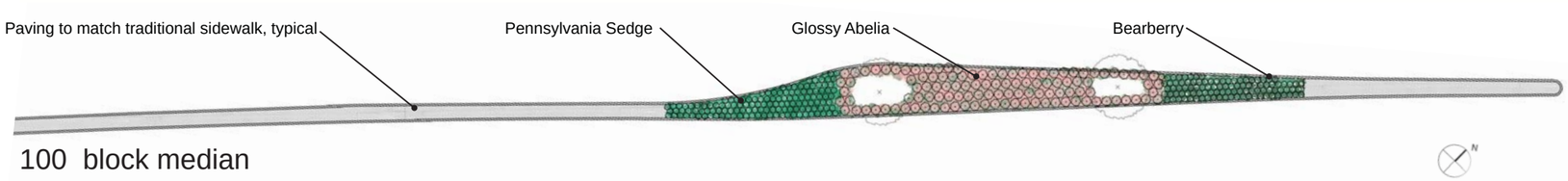
2- Pennsylvania Sedge

3- Red Fescue

4- Andorra Juniper

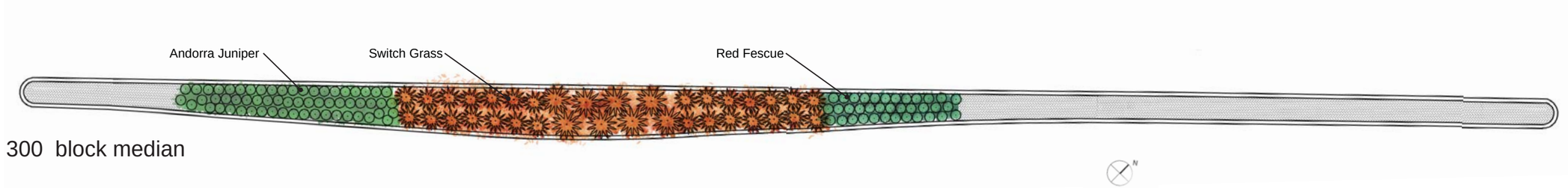


Enlargement of streetscape planting plan

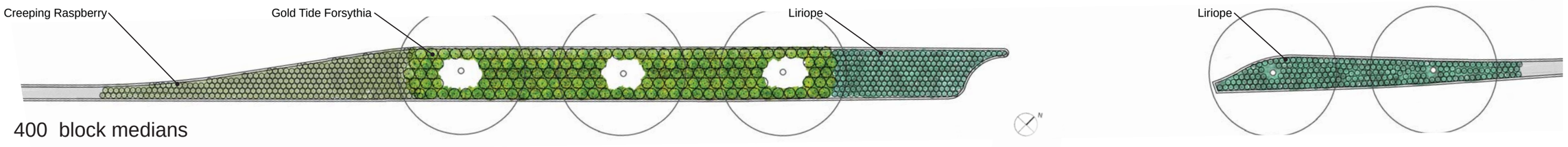


100 block median

The diagrams to the left illustrate the recommended planting concept for the medians. The planting arrangements create strong visual interest within the roadway that relates to the streetscape plantings along each side of the street. This is achieved by incorporating simple masses of tolerant groundcovers and small shrubs, similar to those found in the curbside planting areas.



300 block median

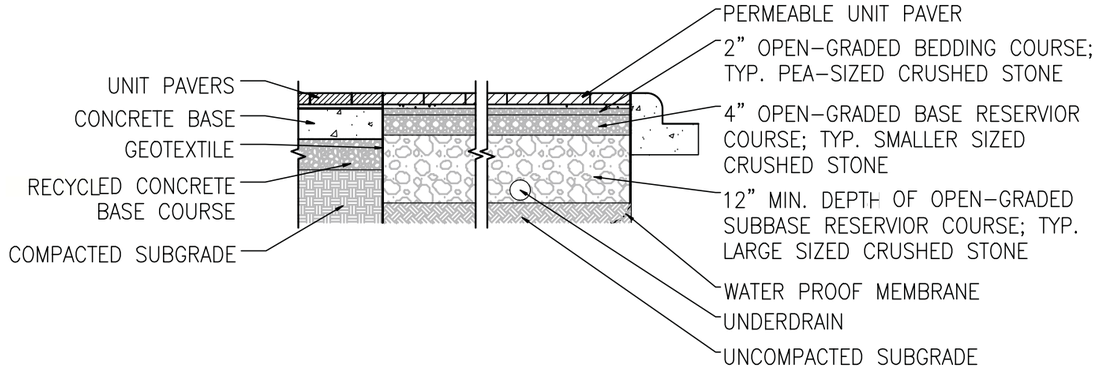


400 block medians

Median planting plans

Materials and Furnishings

The following paving materials and site furnishings shall be used to unify the streetscape. As technology progresses, other products may become available which meet the design intent and durability needed, while achieving a high level of sustainable performance and fabrication. In that event, the director of engineering my approve substitutions to these specific products on a case by case basis.



Concrete pavers

Brand: Interlock Paving Systems, Inc.
-or approved equal

Model: Holland I concrete unit pavers

Size: 4” x 8”

Color: Virginia Red

Pattern: Herringbone

Sustainability: Manufactured within 500 miles

Permeable paving

Brand: Nitterhouse *-or approved equal*

Model: AquaPave concrete pavers

Size: 4” x 8” x 3-1/8”

Color: J30 EcoGreen

Pattern: Running Bond

Sustainability: Manufactured within 500 miles, eliminate surface runoff, remove 99.9% of oil and hydrocarbons and up to 97% of heavy metals from stormwater

Bench

Brand: Landscape Forms -*or approved equal*

Model: Plainwell bench

Seat: aluminum, without center arm

Size: 25” x 72”

Color: Ivy

Sustainability: recycled material content of 35% or greater, post consumer content of 19% or greater and the post industrial content is 33% or greater.

Litter/Recycling Receptacle

Brand: Victor Stanley -*Or approved equal*

Model: Concourse

Opening: side with standard wording for signage

Size: 24” x 35”

Color: Tavern Square Green

Sustainability: Approximately 98% of the raw material used in steel bar production is either post-consumer or post-industrial recycled scrap steel. The majority of our steel bar raw materials are from mills within 300 miles of our Maryland manufacturing facilities. 100% of our steel bar material is from domestic (USA) electric furnace mills.

**Litter and Recycling Receptacles shall be located together in pairs. Each pair shall be spaced approximately every 200’ or one block, whichever is less.*

Bike rack

Brand: Landscape Forms -*or approved equal*

Model: Ring

Finish: powder coated steel

Size: 1.5” x 25”

Color: Ivy

Sustainability: recycled material content of 91% or greater, post consumer content of the litter is 50% or greater and the post industrial content is 32% or greater.

Typical Bus Shelter

Bus shelter

Brand: Columbia Equipment Company *-or approved equal*

Size: 5’ x 9’ non-cantilevered open front shelter

Roof: traditional hipped skylight (bronze glazing)

Finish: powder coated finish in Tiger Drylac 59/50412 Fence Green, or color to match Landscape Forms Ivy

Framing: 2.5” x 2.5”

Windows: tempered glass with top horizontal

Options:

36” map panel in piano hinged plexiglass casing
Integrated, full length, recycled plastic bench
Florescent Kenall #7140 outdoor light fixture with photocell

Sustainability: Manufactured within 500 miles. The aluminum parts are made with approximately 10% to 20% recycled materials; the tempered glass contains 20% to 23% recycled material, and the recycled plastic bench material contains about 97% recycled material.

Green Roof Option

The City encourages the addition of a green roof to each bus shelter to demonstrate how small-scale improvements can accumulate to have a larger effect on environmental quality. A customized system, such as the one manufactured and installed by ZinCo green roof system, can be added to separately manufactured shelters.

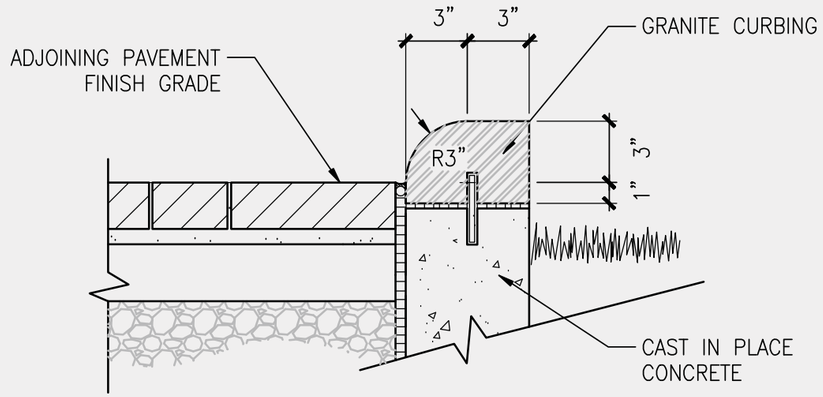
Photo of typical bus shelter

Illustration of typical bus shelter with green roof option

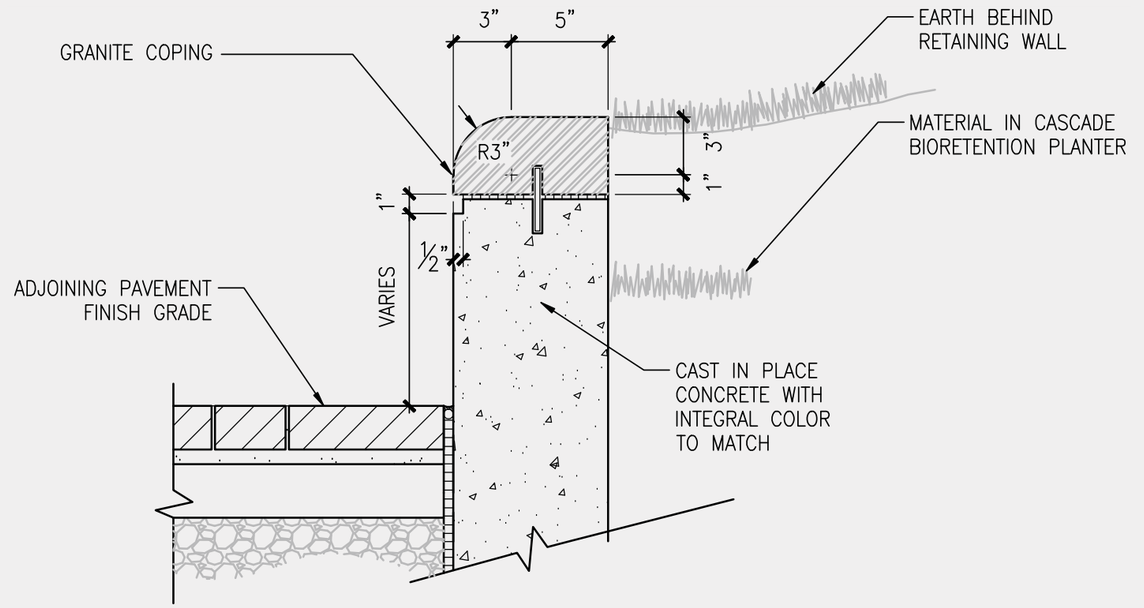
Example of a bus shelter with a green roof in the United Kingdom

Typical Site Walls and Planter Curbing

The following illustrations depict the desired form, color and character of site walls. These standards apply to retaining walls and/or planter curbing and cascade bioretention walls.



Section through planter curb



Section through retaining wall or cascade planter wall

Granite

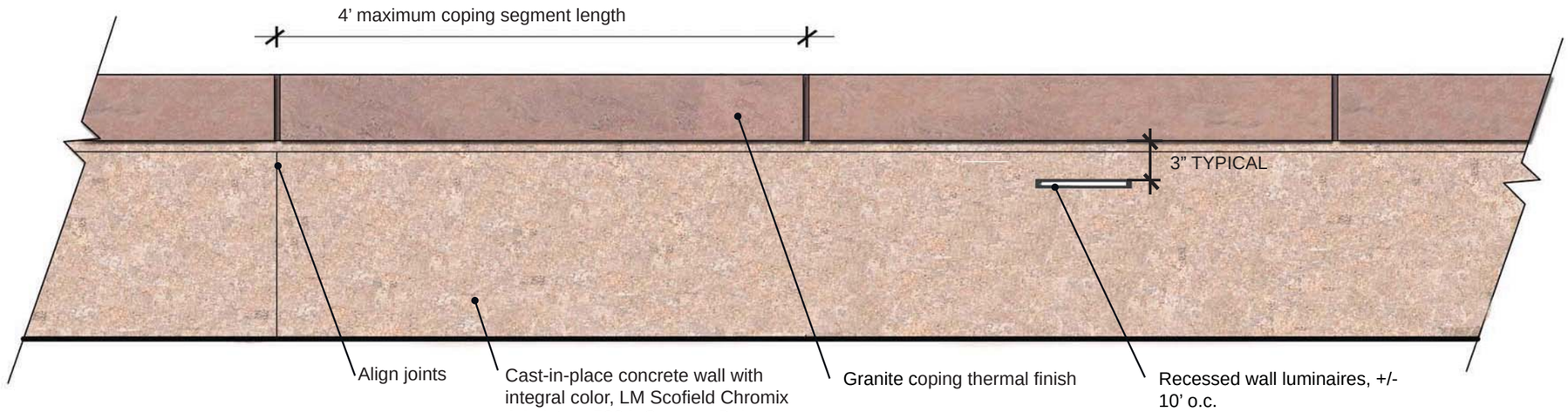
Brand: Cold Spring Granite Company - *or approved equal*

Color: Radiant Red

Finish: Thermal

Quarry: Fredericksburg, Texas

Sustainability: The durability of granite reduces long term maintenance compared to other materials.



Retaining wall or cascade planter wall elevation

Design intent of planter curb

Design intent of cascade planter wall or retaining wall

Interpretive Signage

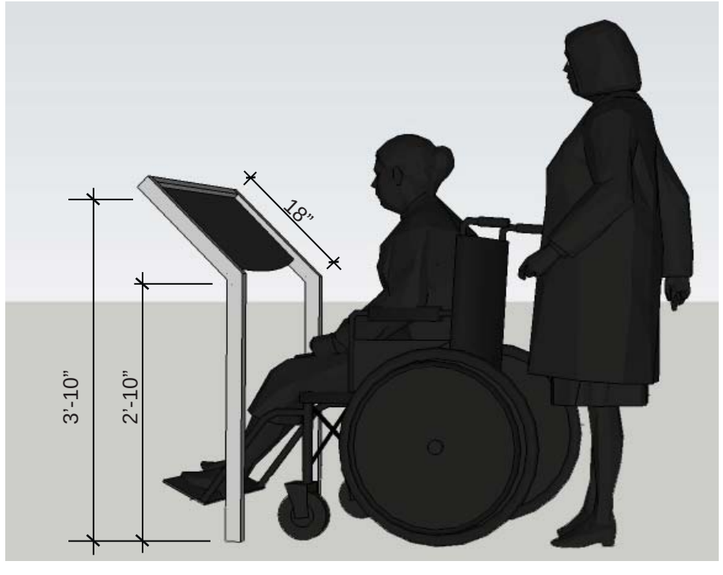
Interpretive signage will describe the sustainable technologies and practices within the North Washington streetscape and raise awareness of their associated environmental benefits. The proposed signage system is designed to meet the following goals:

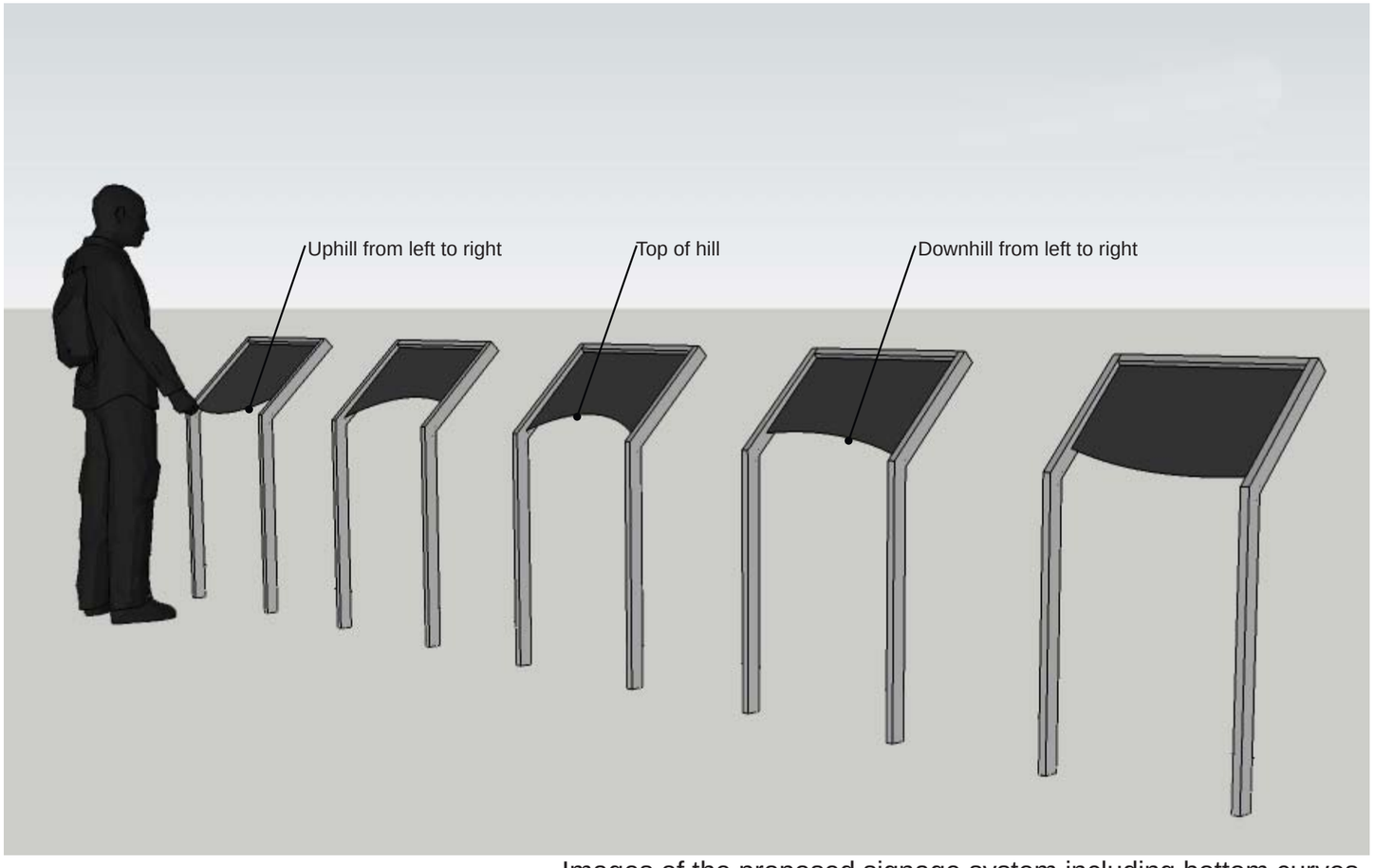
•Utilize environmentally friendly materials and simple construction methods.

•Provide legible graphics and text that meet ADA guidelines.

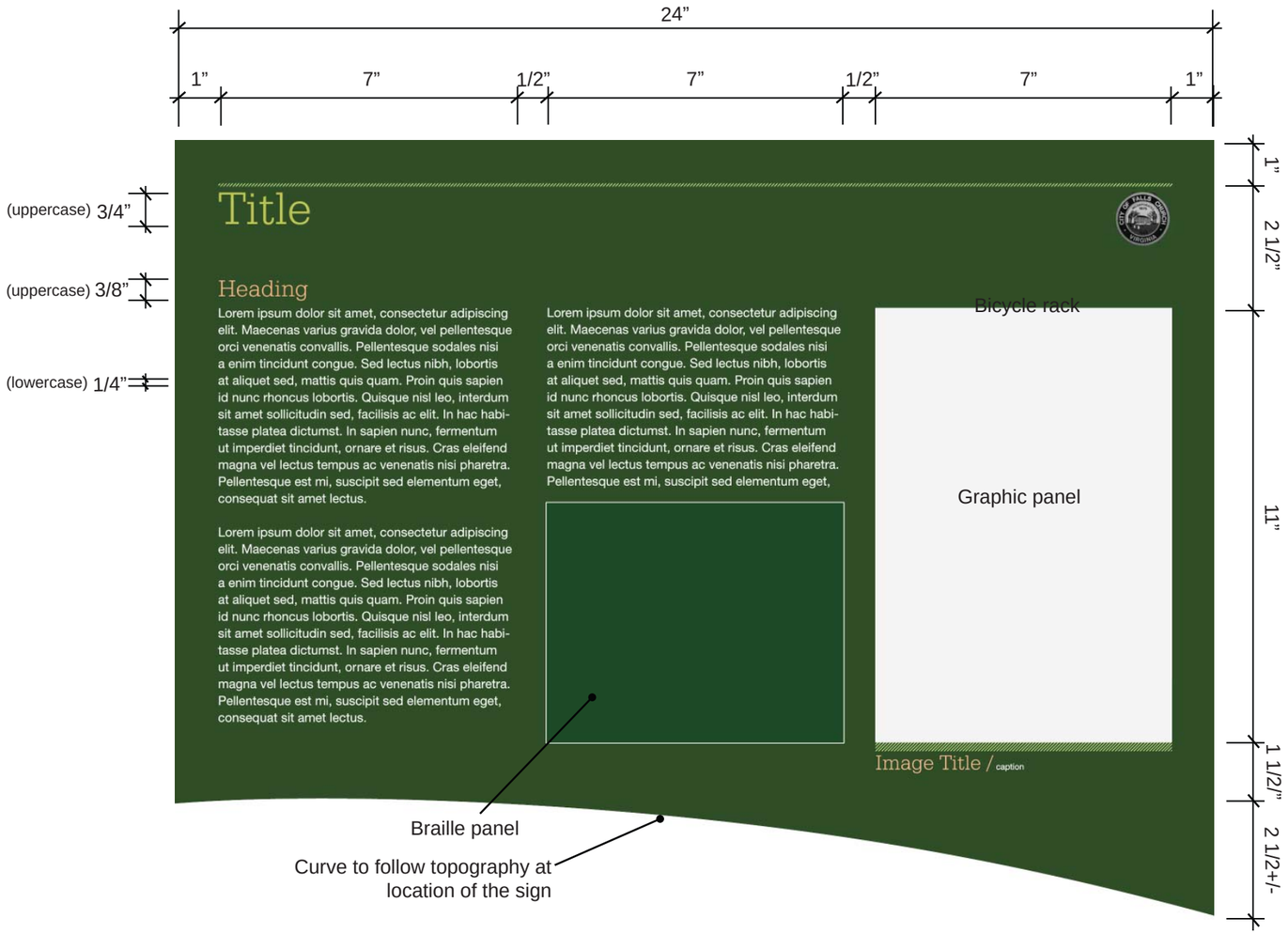
•Create a unified system with subtle variation between signs.

The system is designed to be comfortable to read, simple to build locally and incorporate a dynamic variation that relates to the street. The bottom of each sign is intended to be curved in a unique way. The curve shall be an exaggeration of the topography at the location of each individual sign. This slight variation references the dynamic flow of water and emphasizes the uniqueness of this street. The following illustrations depict the design intent for the signs including two alternative content layouts for the sign panel.





Images of the proposed signage system including bottom curves that relate to the topography at location of the sign



Sign panel layout

Fonts

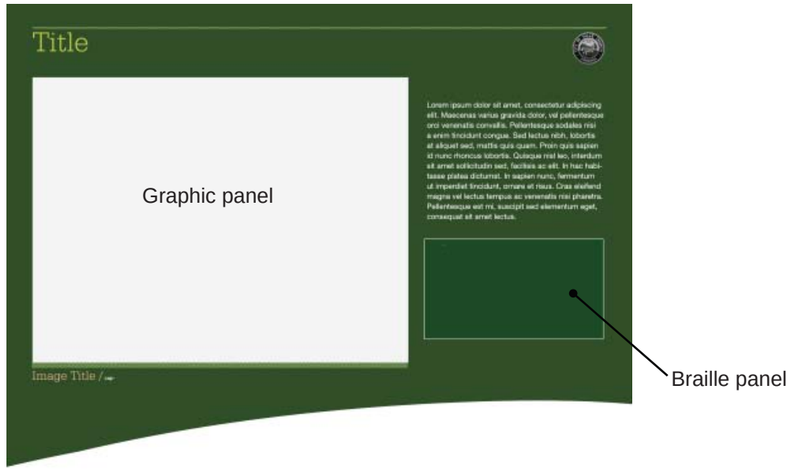
Title: Serifa Light 81 pt.

Heading: Serifa Light 41 pt.

Body text: Helvetica Nueu Roman 21 pt./ 28 pt.

Image title: Serifa Light 36 pt.

Image caption: Helvetica Nueu Roman 14 pt.



Alternative layout that emphasizes the graphics

Sign panel

Frame: 2” x 2” Powder coated steel

Sign panel: graphic and text content shall be applied to ¼” steel panel using Direct to substrate printing methods and two coats of automotive clear coat.

Background color: Pantone 5605 C

Title and line color: Pantone 7495 C

Heading and Image Title color: Pantone 7523 C

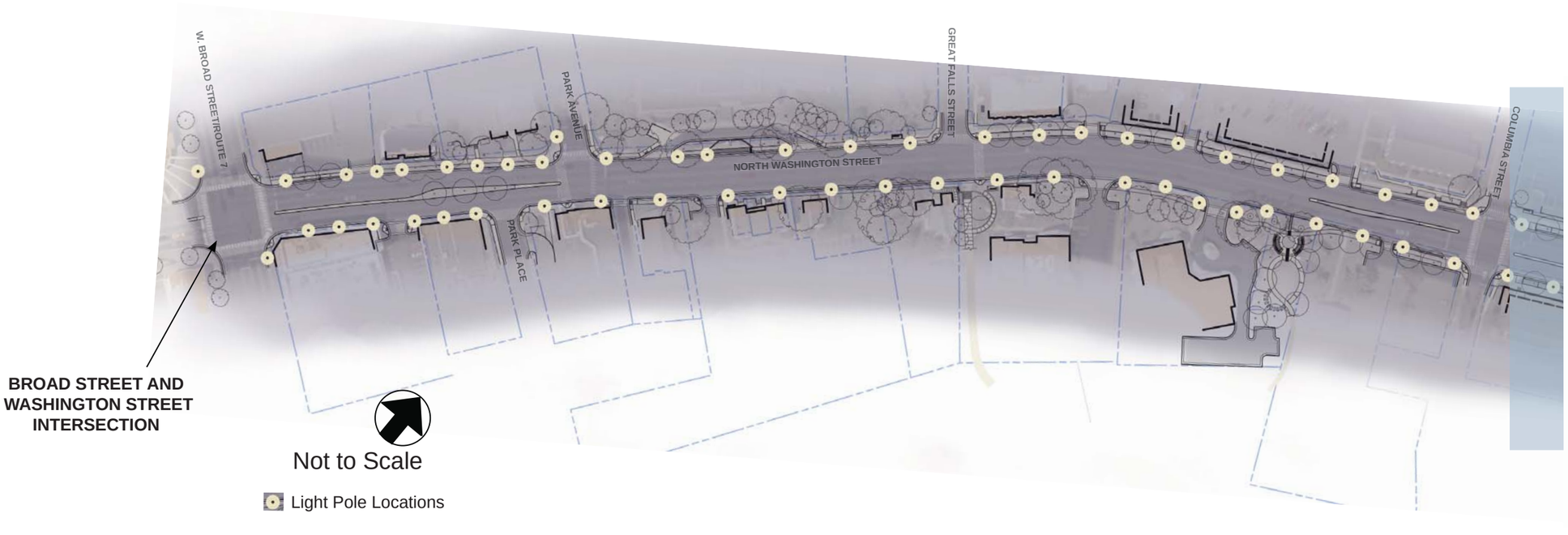
Text color: white

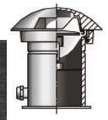
Sustainability: Manufactured within 500 miles using materials with high recycled content

Lighting

Lighting shall be provided by luminaire fixtures on posts, similar to those on Broad Street, to create a more pedestrian-friendly atmosphere. The diagram below indicates the approximate locations of the fixtures. The proposed fixture shall use a metal halide light source, or approval equivalent, to achieve an optimal balance of efficiency and pedestrian-friendly quality of light. The fixture shall also meet Dark Skies Initiative criteria.

As technology changes and new proven lamp options become available, different light sources may be considered. The light source shall have a minimum initial lumen level of 13,000 lms, a minimum lamp life expectancy of 24,000 hours and a minimum CRI of 65, or be approved by the Director of Engineering.





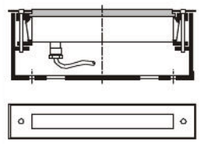
Low profile in-grade luminaires

Brand: Bega

Fixture: 8671LED 60 degree port

Lamp: 2W LED 24V DC

**This fixture can be used for additional path lighting in curbside bioretention applications. The fixture shall be located, at appropriate intervals, in the spaces between segments of planter curb.*

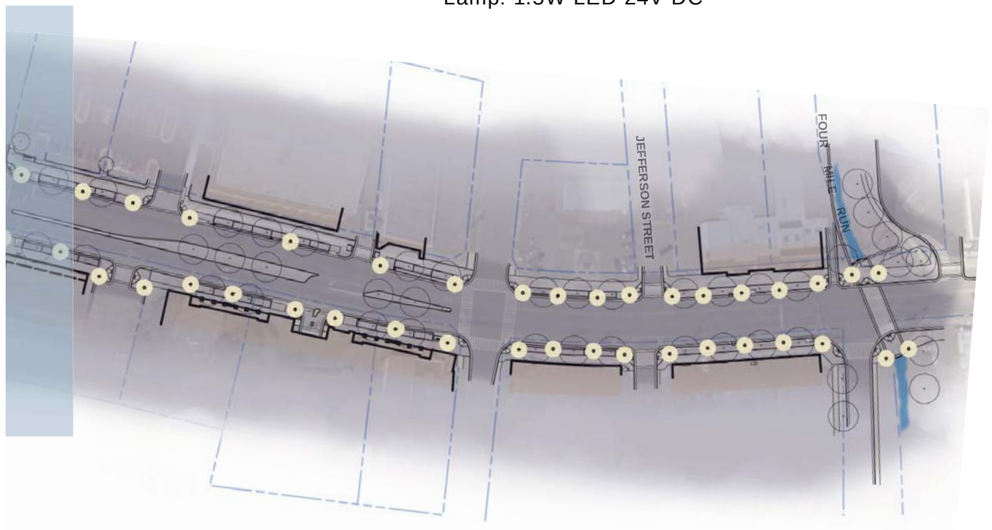


Recessed wall luminaire

Brand: Bega

Fixture: 8301LED

Lamp: 1.5W LED 24V DC



Lighting plan

Street lamp

Brand: King Luminaire, Stresscrete Group

Fixture: K118-EAR-II-150 (MED)-MH(PS)-120-K16-PBC

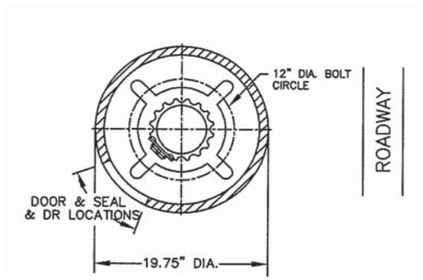
**The louvered optics specified will give a cut off rating of 2.5" at or above 90 degrees. This option best meets the Dark Skies cut-off performance from a pole mounted fixture.*

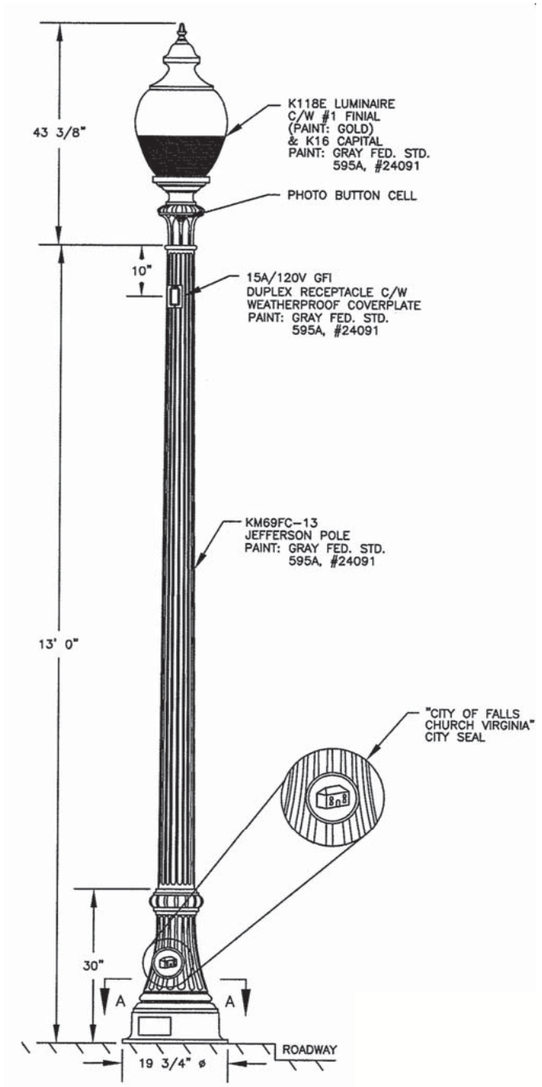
Finial: gold

Capital: gray fed. standard 595A, #24091

Ballast:
M150MLTLC3M
HX-HPF
Universal
Quick Disconnect

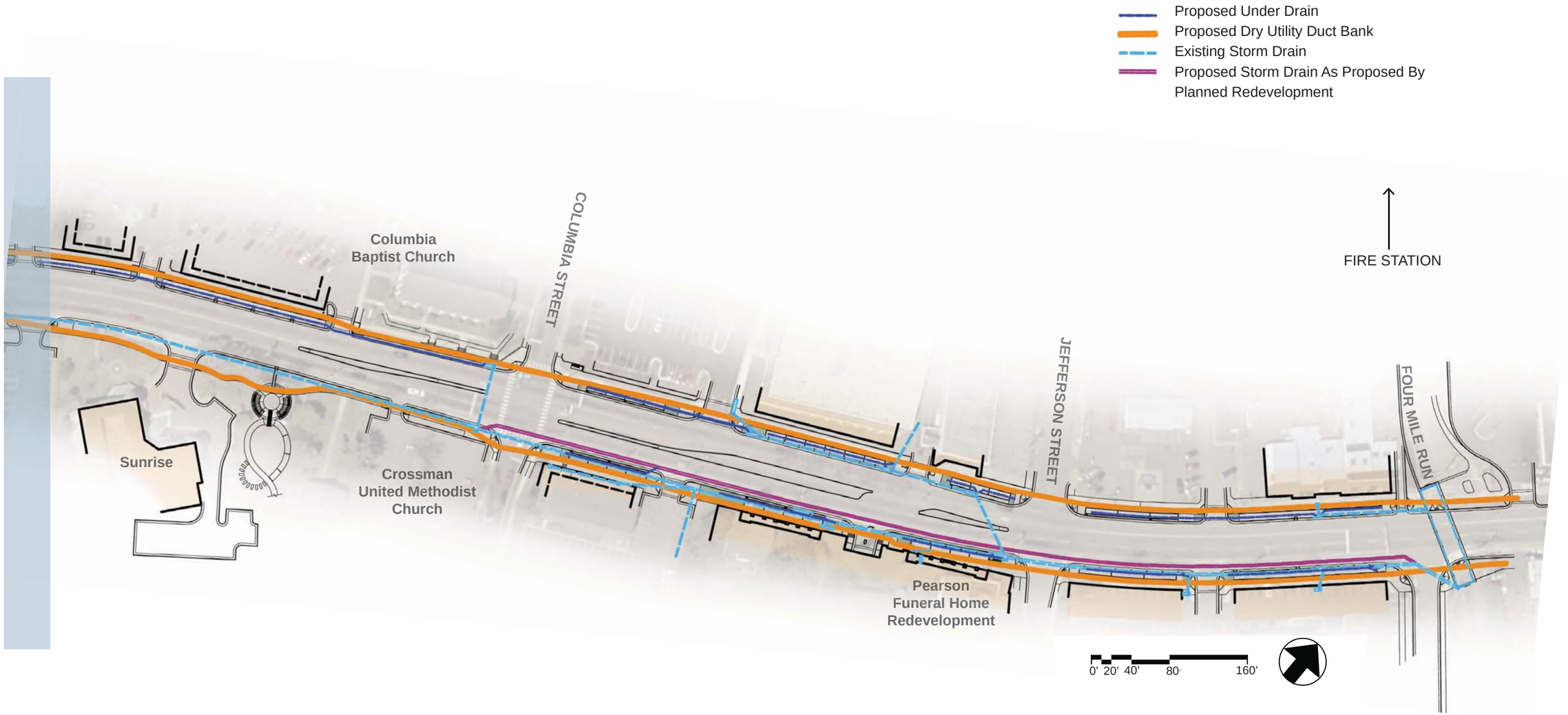
Pole:
Jefferson
KM69FC-13-DR &AB
FLTD Cast Aluminum Shaft
cast aluminum base
gray fed. standard 595A, #24091
shaft top diameter= 5"
overall length= 13'-0"





Utilities

Moving overhead lines underground is an important goal for the streetscape. The diagram below illustrates the proposed concept for routing dry utility duct banks and connecting new storm drainage systems to the existing infrastructure. Proposed underdrain from permeable pavement and bioretention facilities shall intersect the existing drainage system. Duct banks for dry utilities and undergrounding overhead utilities shall follow the street below the sidewalk.



Utility plan

Appendix

Typical Inlet

Run-off will enter each of the bioretention facilities through inlets installed in the curb. The design below is a proven example of the type of inlet appropriate for curbside and cascade bioretention from Portland, Oregon. This design is to be used as a guideline. VDOT curb standards will apply to the design of inlets for North Washington Street.

STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS

- Green Streets -

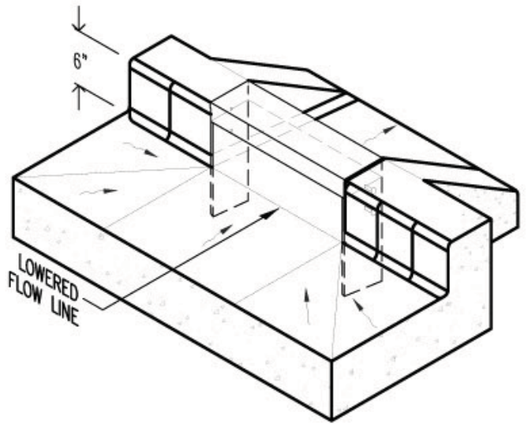
Concrete Inlet, Type PB (Metal)

For Neighborhood Collectors and Above

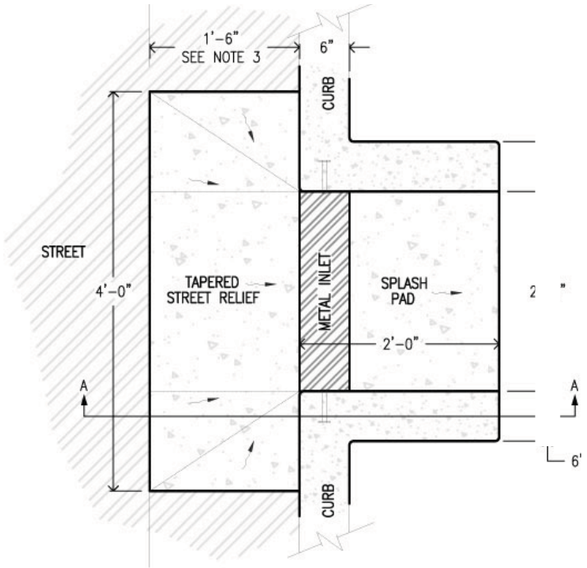
Bureau of Environmental Services

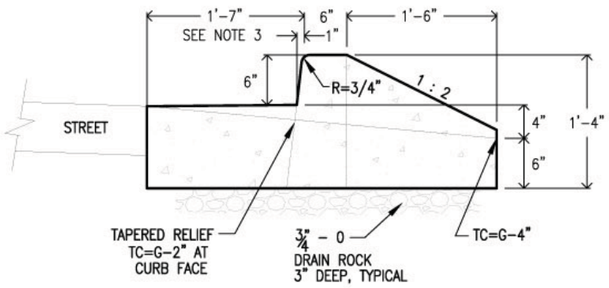
NUMBER

SW-331



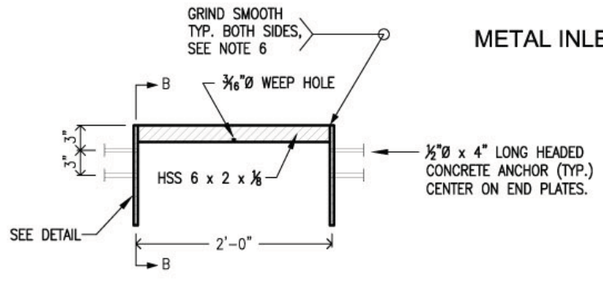
ISOMETRIC





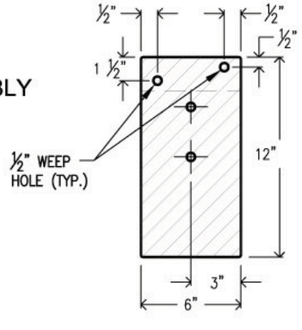
NOTES:

1. Headed concrete anchors shall meet the requirements of ASTM A-108.
2. HSS 6 x 2 x 1/8 shall meet the requirements of ASTM A-500 Grade B.
3. End Plates shall meet the requirements of ASTM A-36.
4. Entire assembly shall be Hot-Dip Galvanized in accordance with ASTM A-123.
5. Design vertical wheel load is 8.5kips (1/2 of tandem axle weight specified in FHWA-HOP-06-105).
6. Single Bevel Groove Weld.



ELEVATION

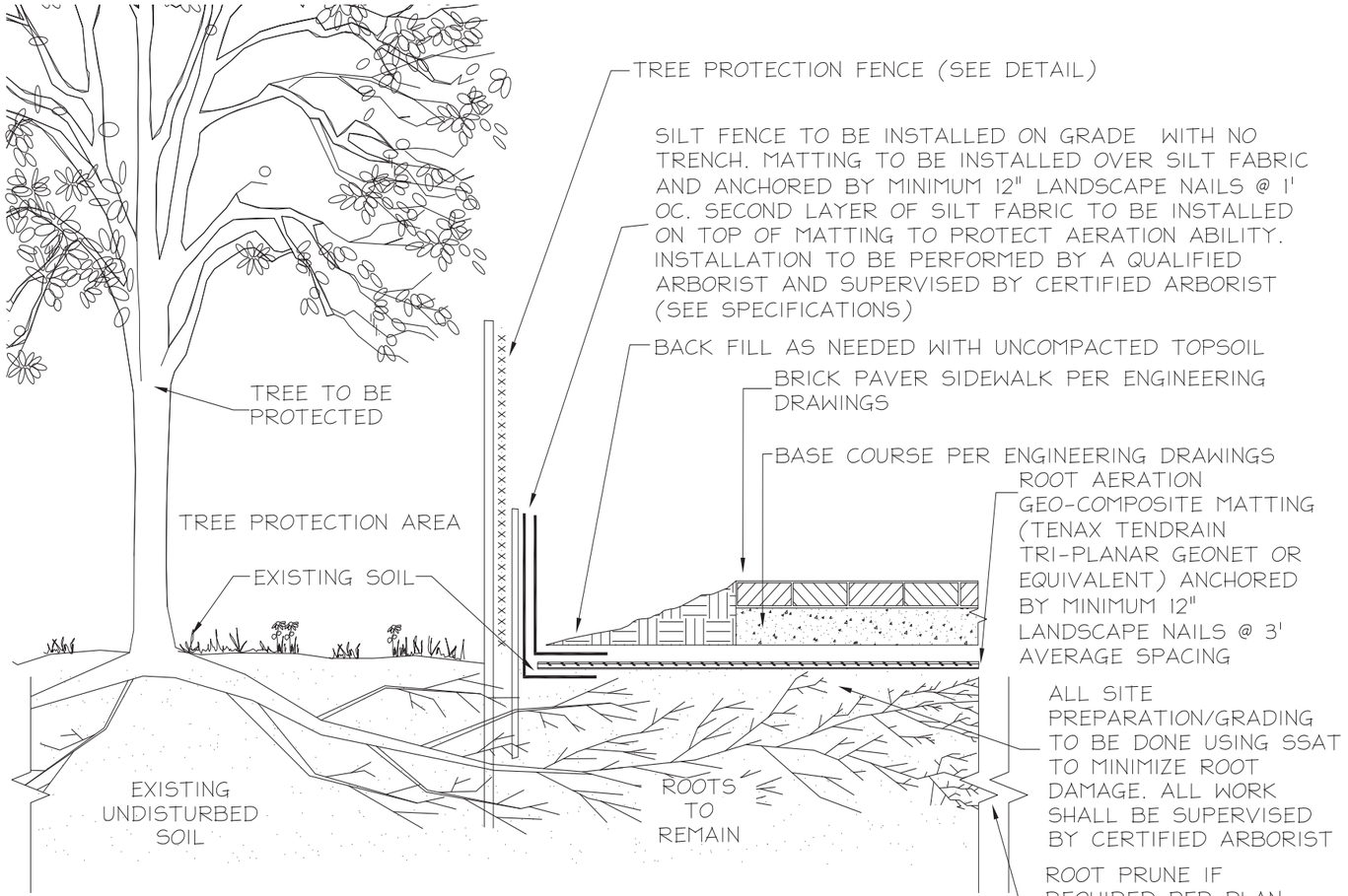
METAL INLET ASSEMBLY



SECTION B-B
END PLATE DETAIL

Tree Preservation Strategies

The illustrations below depict strategies for protecting the health of existing trees during construction and when improving hardscape elements close to the tree roots.



NOTES:

1. ALL WORK SHALL BE SUPERVISED BY AN ISA CERTIFIED ARBORIST
2. NO ROOTS GREATER THAN 1" SHALL BE CUT WITHOUT REVIEW BY CITY ARBORIST AND PROJECT ARBORIST
3. EXCAVATION SHALL BE NOT MORE THAN MINIMUM NEEDED TO ACHIEVE REQUIRED FINAL GRADE
4. ALL EXCAVATION SHALL BE BY SSAT AND/OR BY HAND AS DIRECTED BY CERTIFIED ARBORIST
5. WORK SHALL NOT DAMAGE TREE TRUNK, LIMBS OR ROOTS TO REMAIN