

An aerial photograph of a city park, likely Boston's Public Garden, with a large, modern, light-colored building in the background. The park is filled with trees, walkways, and people. A bus and cars are visible on a street in the foreground. The text is overlaid on the image.

City of Boston: Green Infrastructure Challenges & Successes

2022 National Stormwater Roundtable

October 19, 2022

Agenda

- Introduction
- Background Information
- What do we mean when we say “Green Infrastructure” or “GI”?
- New Cabinet Position: Director of Green Infrastructure
- Green Infrastructure Working Group
- Green Infrastructure Policy - Bumpouts/Curb Extensions
- Next Steps
- Question & Answer



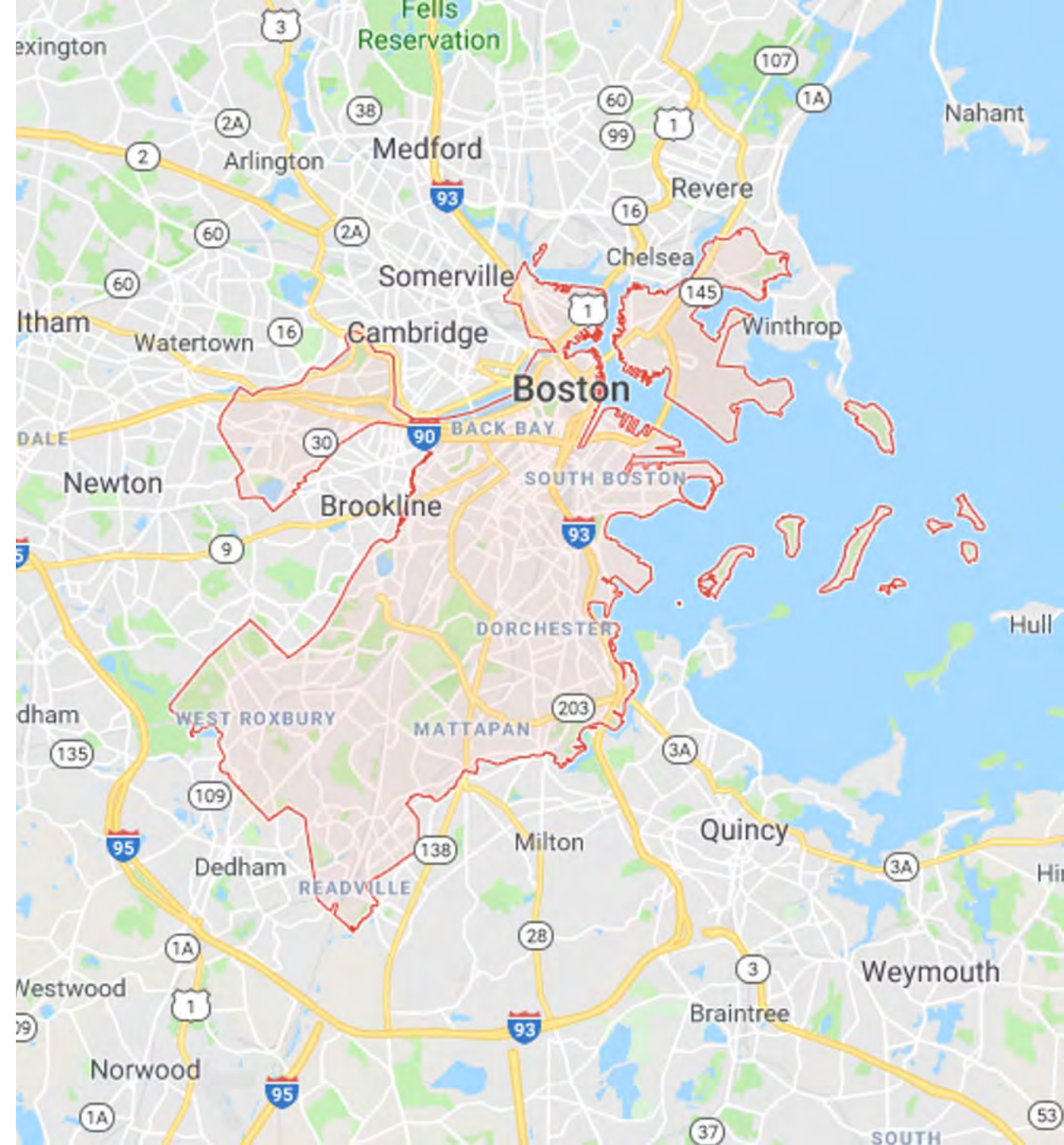
Introduction

Agenda

- Introduction
- **Background Information**
- What do we mean when we say “Green Infrastructure” or “GI”?
- New Cabinet Position: Director of Green Infrastructure
- Green Infrastructure Working Group
- Green Infrastructure Policy - Bumpouts/Curb Extensions
- Next Steps
- Question & Answer

Background Information

- 48 Square Miles
- Boston Water and Sewer Commission has Phase I NPDES Permit and Consent Decree (2012)
- Reduce phosphorus loading to the Charles River by 62% (30-year plan)
- City of Boston Public Works Department also performs stormwater services (e.g. street sweeping)

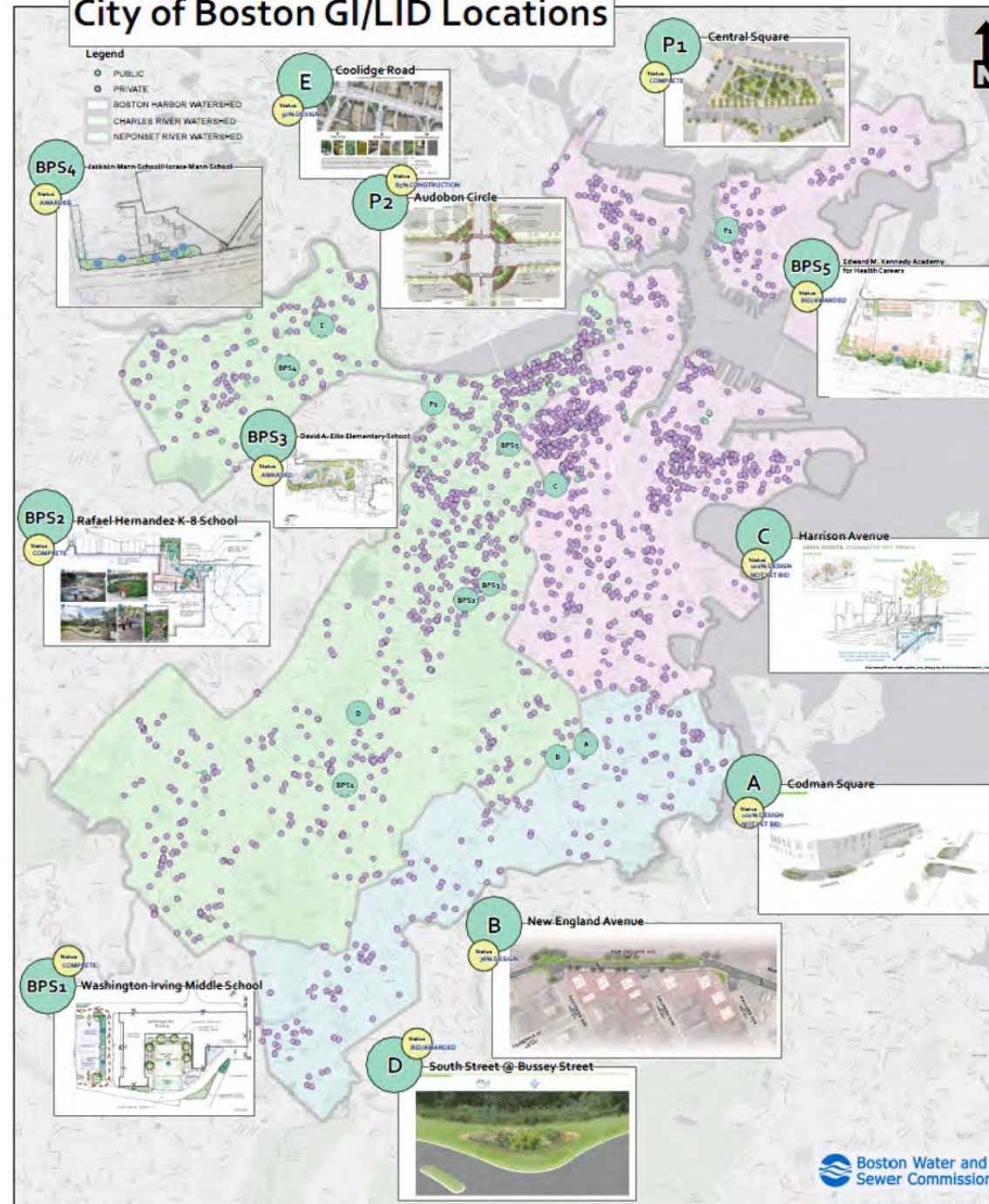


Background Information

- Stormwater permit and Consent Decree with BWSC, rather than the City, means collaboration to implement green infrastructure is crucial
 - City Departments, State Agencies, Watershed Groups, etc.
- Also need participation from private property owners
 - City of Boston and BWSC have stormwater requirements
 - e.g. Article 80/Smart Utilities (BPDA) and Site Plan Review Requirements (BWSC)



City of Boston GI/LID Locations

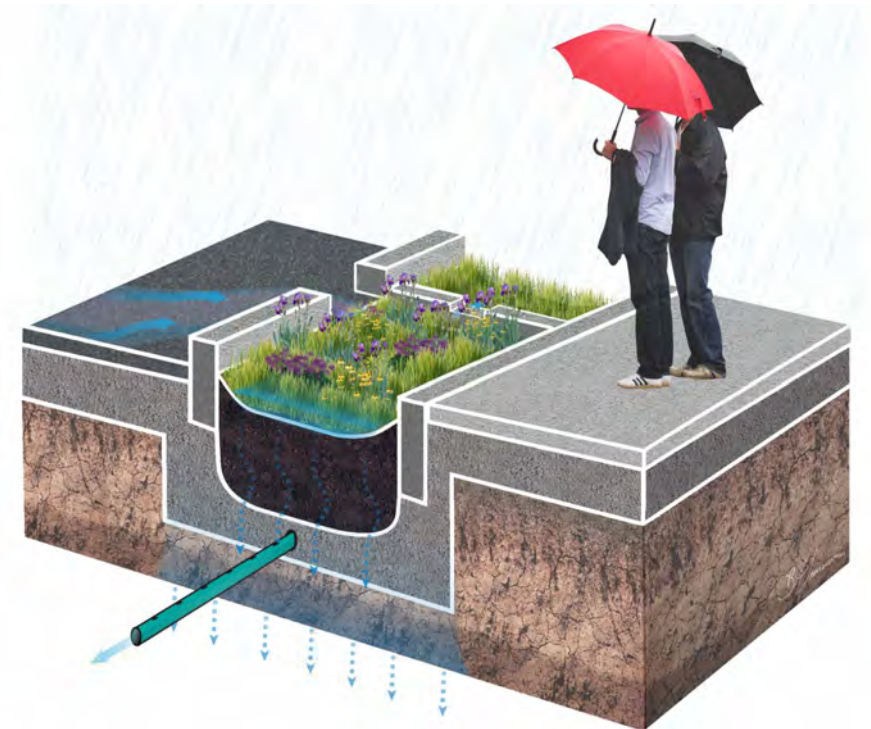


Agenda

- Introduction
- Background Information
- **What do we mean when we say “Green Infrastructure” or “GI”?**
- New Cabinet Position: Director of Green Infrastructure
- Green Infrastructure Working Group
- Green Infrastructure Policy - Bumpouts/Curb Extensions
- Next Steps
- Question & Answer

What do we mean when we say Green Infrastructure?

- Green Infrastructure (“GI”) is an approach to water management that restores or mimics the natural water cycle.
- GI features features, like rain gardens and right-of-way bioswales, utilize natural hydrologic processes to capture, purify and infiltrate stormwater back into the ground.




What does GI mean to the City?

- Increased urban green space / tree canopy
- Reduced urban heat island effect
- Slower streets / improved pedestrian & cyclist safety
- More biodiversity / pollinator habitat
- Reduced energy usage
- Improved Environmental Justice (e.g. air quality, access to nature, food security, etc.)
- Opportunities for environmental education



Agenda

- Introduction
- Background Information
- What do we mean when we say “Green Infrastructure” or “GI”?
- **New Cabinet Position: Director of Green Infrastructure**
- Green Infrastructure Working Group
- Green Infrastructure Policy - Bumpouts/Curb Extensions
- Next Steps
- Question & Answer



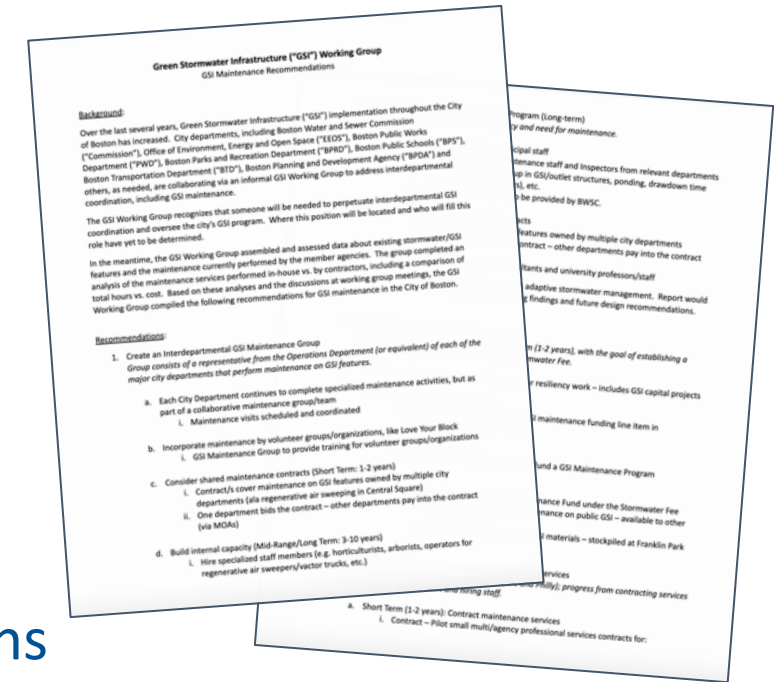
New Cabinet Position: Director of Green Infrastructure

Agenda

- Introduction
- Background Information
- What do we mean when we say “Green Infrastructure” or “GI”?
- New Cabinet Position: Director of Green Infrastructure
- **Green Infrastructure Working Group**
- Green Infrastructure Policy - Bumpouts/Curb Extensions
- Next Steps
- Question & Answer

GI Working Group 1.0

- Informal GI Working Group first convened in June 2018 to facilitate interdepartmental collaboration and maintenance for GI
- Original members included:
 - Boston Water and Sewer Commission
 - Environment Department
 - Boston Parks and Recreation Department
 - Boston Planning and Development Agency
 - Boston Public Schools
 - Boston Public Works Department
 - Boston Transportation Department
 - Public Facilities Department
- Drafted fact sheets and GI maintenance recommendations
- Group 1.0 was put on hold during COVID



Goals for the Current GI Working Group

1. Increase GI implementation by providing education and resources
2. Facilitate collaboration across departments through regular convenings
3. Assemble and implement an interdepartmental plan for GI maintenance
4. Provide a forum to discuss department-specific and city-wide GI needs
5. Utilize subgroups to create design standards, guidelines, draft policy, etc.

Agenda

- Introduction
- Background Information
- What do we mean when we say “Green Infrastructure” or “GI”?
- New Cabinet Position: Director of Green Infrastructure
- Green Infrastructure Working Group
- **Green Infrastructure Policy - Bumpouts/Curb Extensions**
- Next Steps
- Question & Answer



Union St

Lyne Rd

Lyne Rd

Winship St

Chestnut Hill Ave

Chestnut Hill Ave

Priscilla Rd

Priscilla Rd

Ave

GI Policy - Bumpouts/Curb Extensions

Three (3) components:

1. Five (5) Design Alternatives

- ROW Bioretention
- Infiltration Tree Pit/Tree Trench
- Porous Paving
- Subsurface Infiltration Area
- One-time Seeding

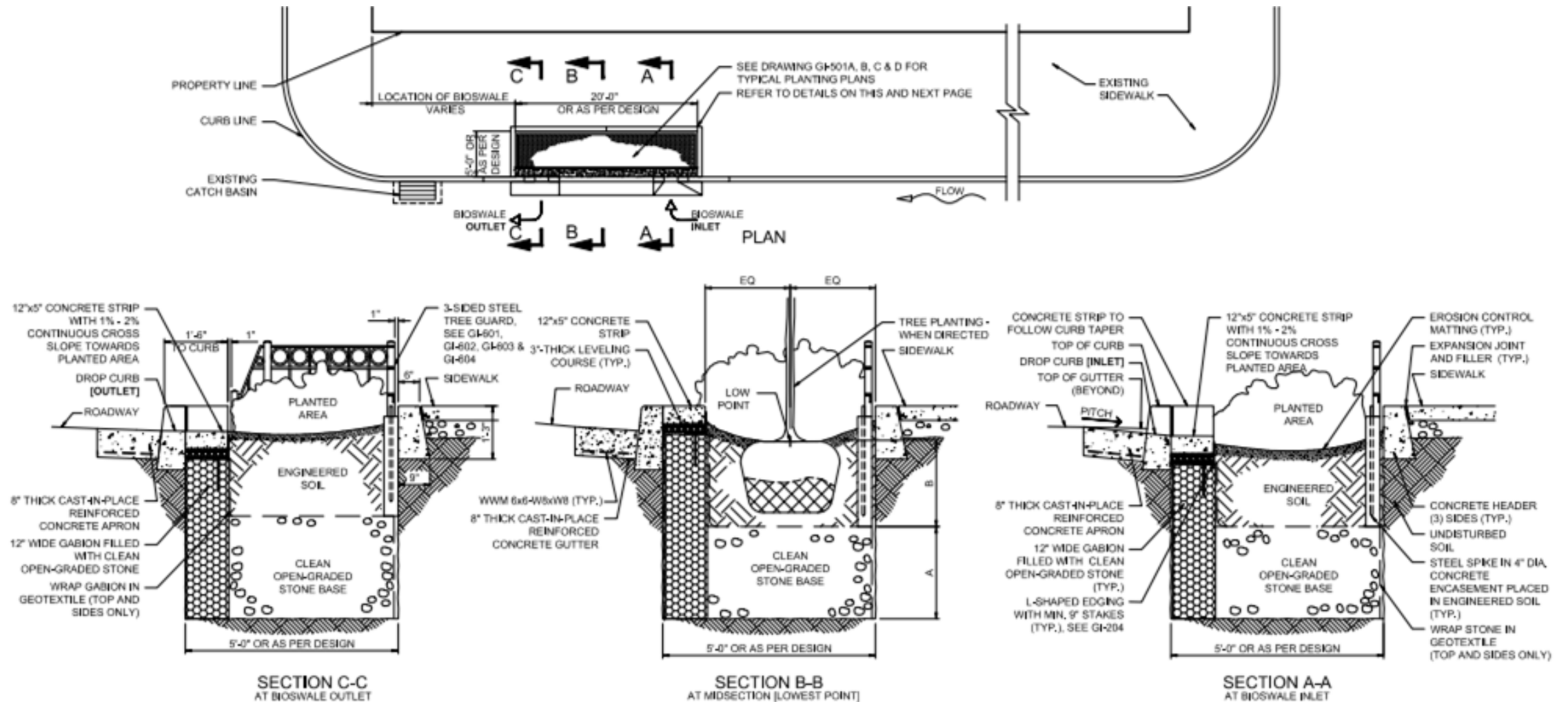
1. Two (2) Maintenance Contracts

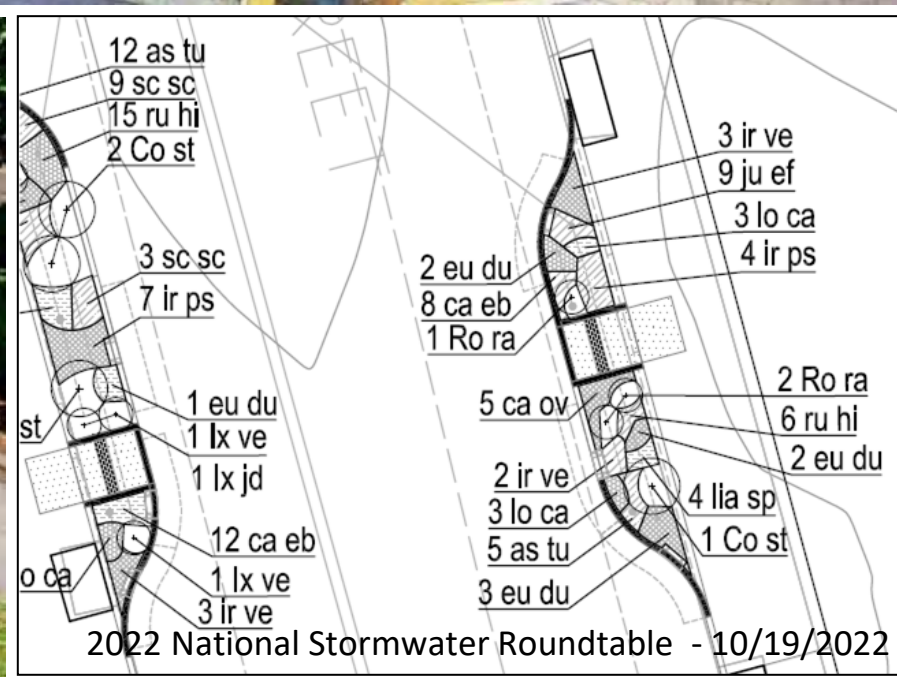
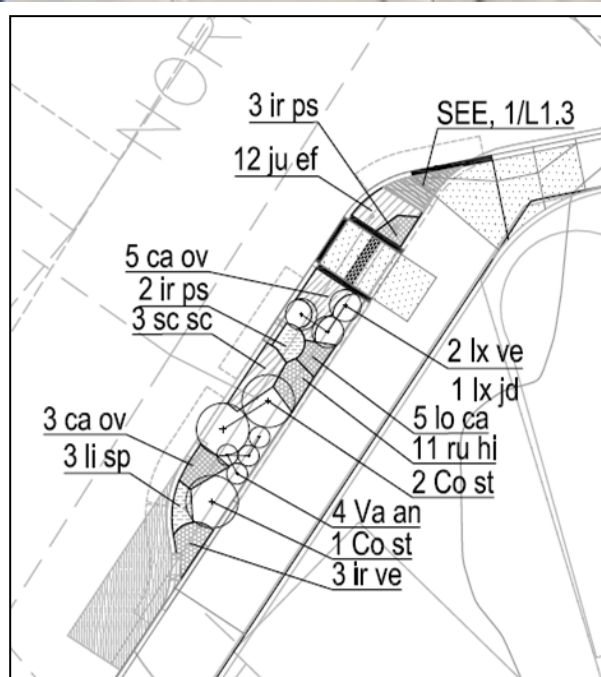
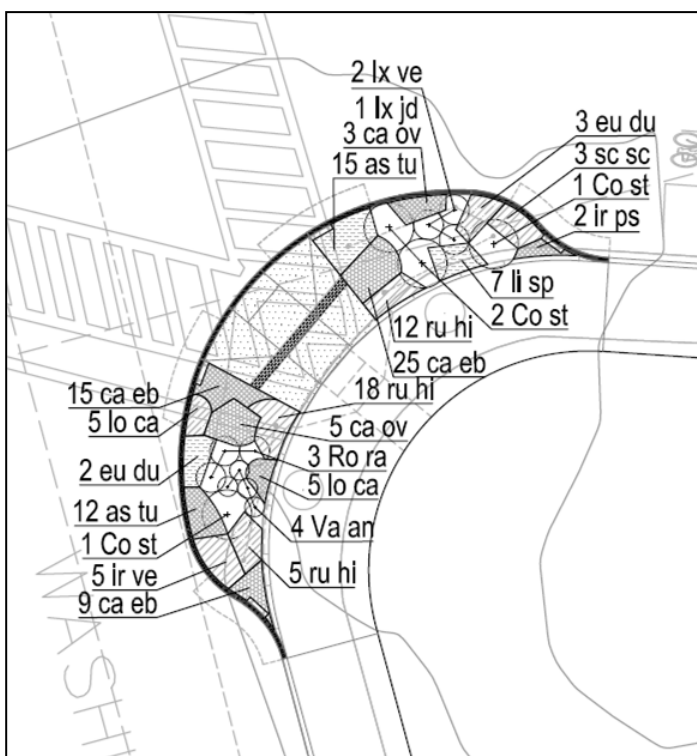
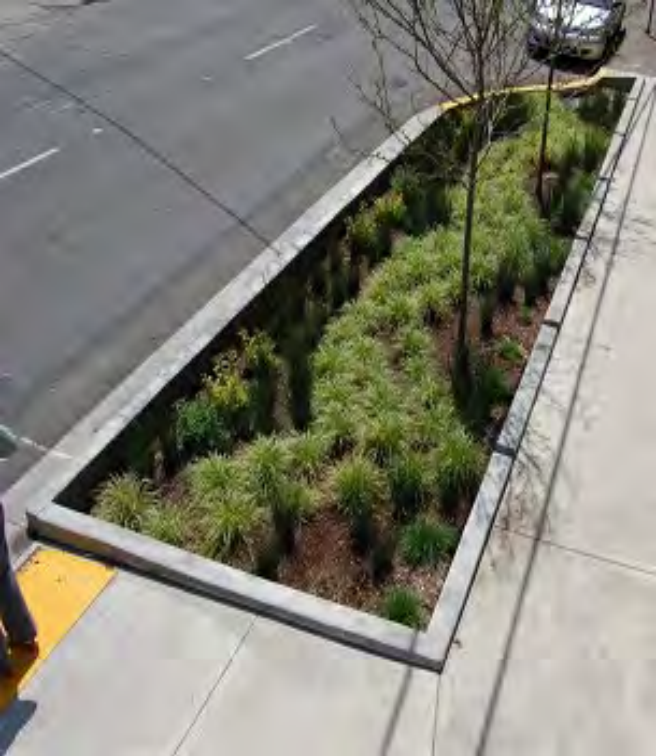
- Regenerative Air Vacuum Sweeping
- Landscape Maintenance

1. Volunteer Program

Design Alternative #1: ROW Bioretention

- Includes Bioretention Areas, Rain Gardens, Bioswales, etc.





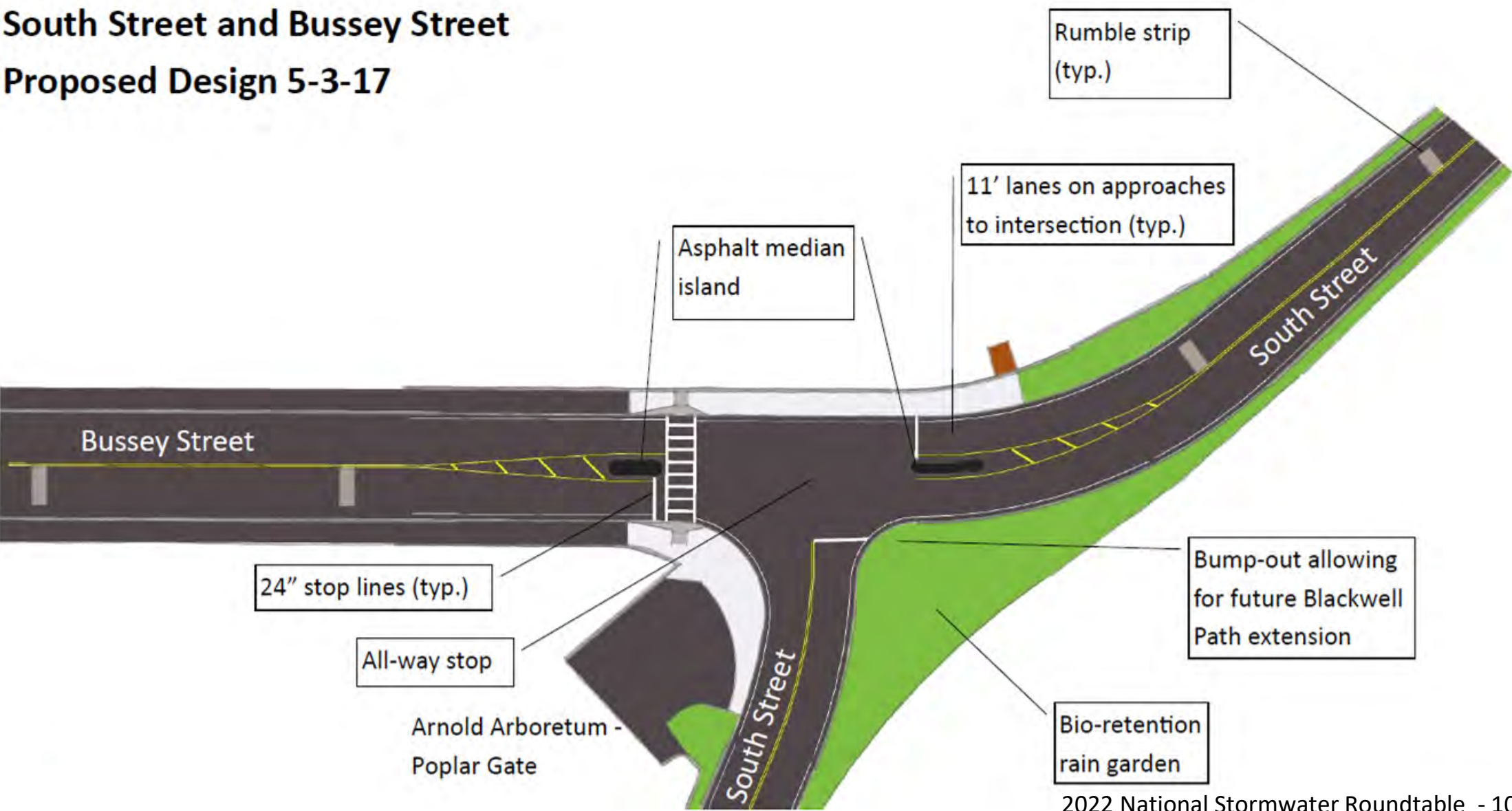


South Street & Bussey Street

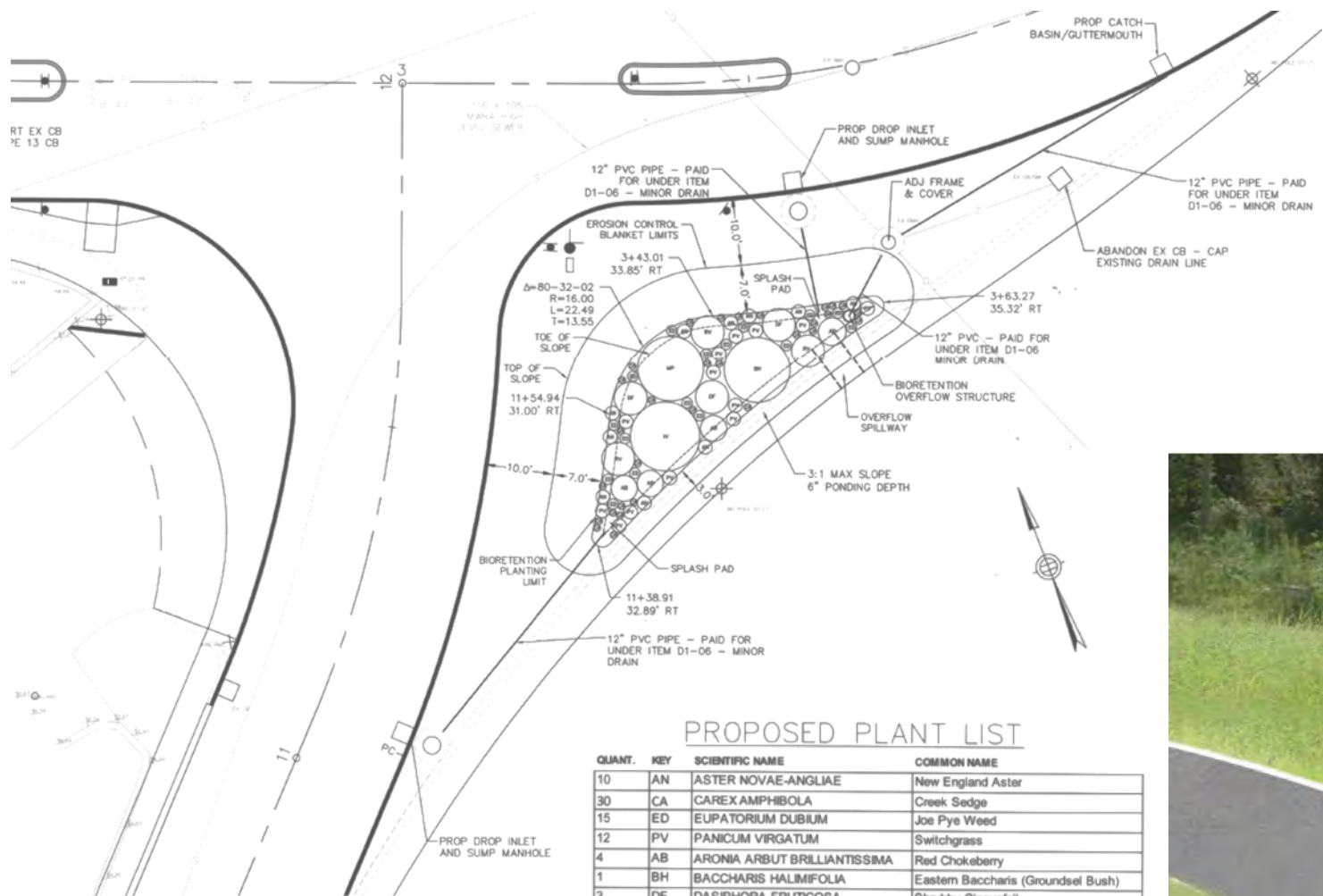


South Street & Bussey Street

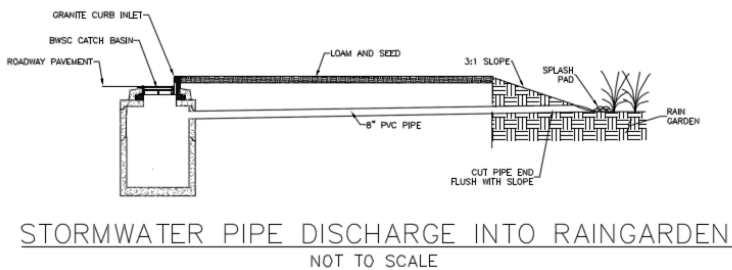
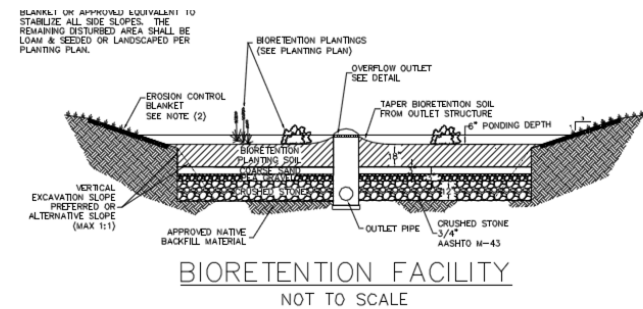
South Street and Bussey Street
Proposed Design 5-3-17



South Street & Bussey Street



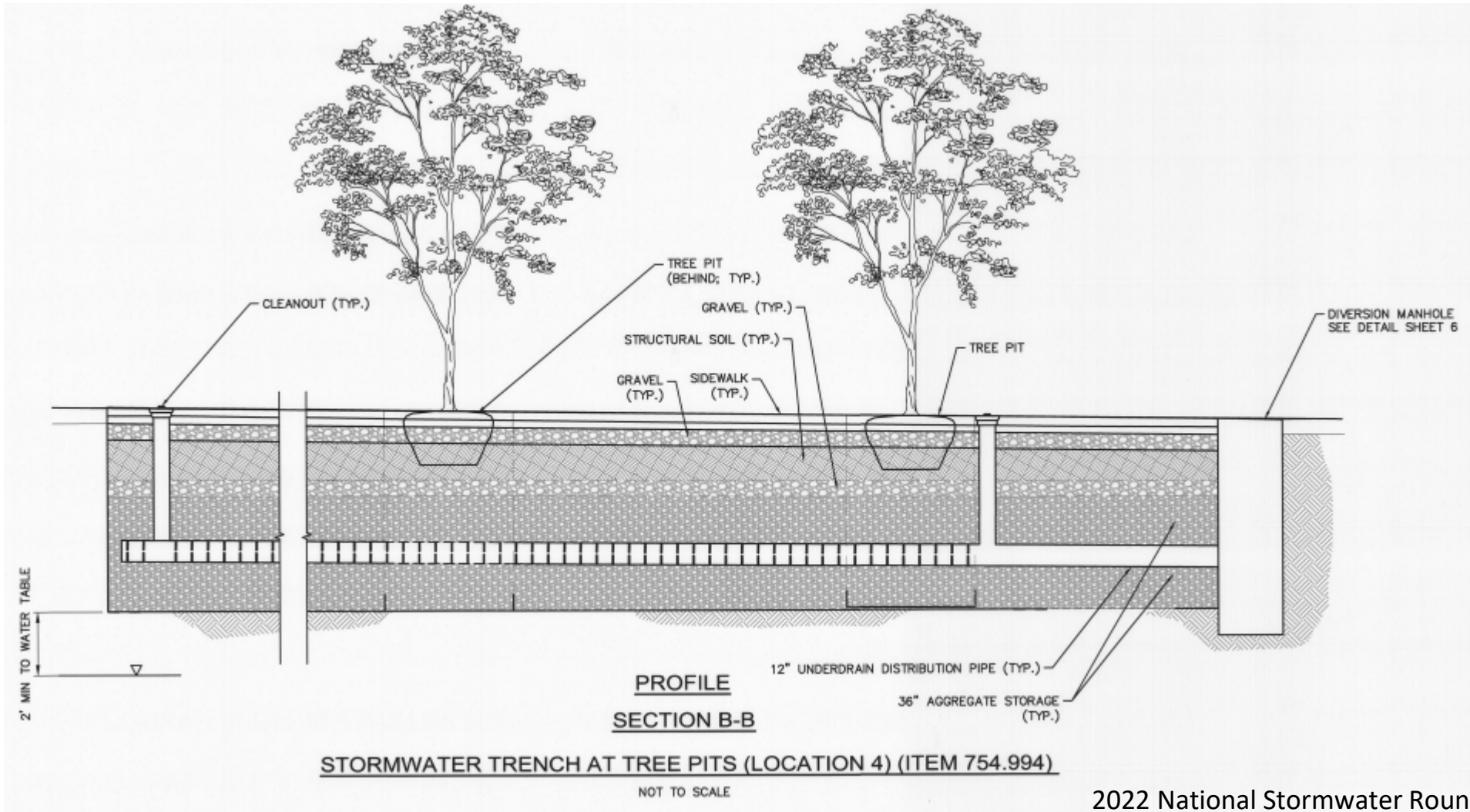
PROPOSED PLANT LIST			
QUANT.	KEY	SCIENTIFIC NAME	COMMON NAME
10	AN	ASTER NOVAE-ANGLIAE	New England Aster
30	CA	CAREX AMPHIBOLA	Creek Sedge
15	ED	EUPATORIUM DUBIUM	Joe Pye Weed
12	PV	PANICUM VIRGATUM	Switchgrass
4	AB	ARONIA ARBUT BRILLIANTISSIMA	Red Chokeberry
1	BH	BACCHARIS HALIMIFOLIA	Eastern Baccharis (Groundsel Bush)
3	DF	DASIPHORA FRUTICOSA	Shrubby Cinquefoil
1	IV	ILEX VERTICILLATA	Common Winterberry
1	MP	MYRICA PENNSYLVANICA	Northern Bayberry
3	RV	RHODODENDRON VISCOSUM	Swamp Azalea





Design Alternative #2: Infiltration Tree Pit/Tree Trench

- Subsurface infiltration (stone or sand based structural soil) with tree plantings



Central Square



LEGEND

Stormwater Infiltration Trench Under Standard Pavement

Stormwater Infiltration Trench Under Porous Pavement

Tree Trench with Sand-Based Structural Soil

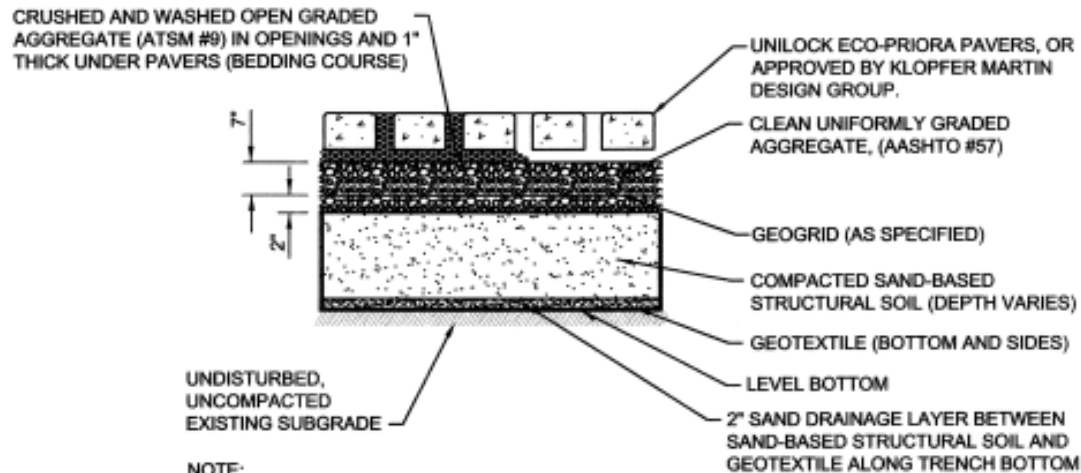
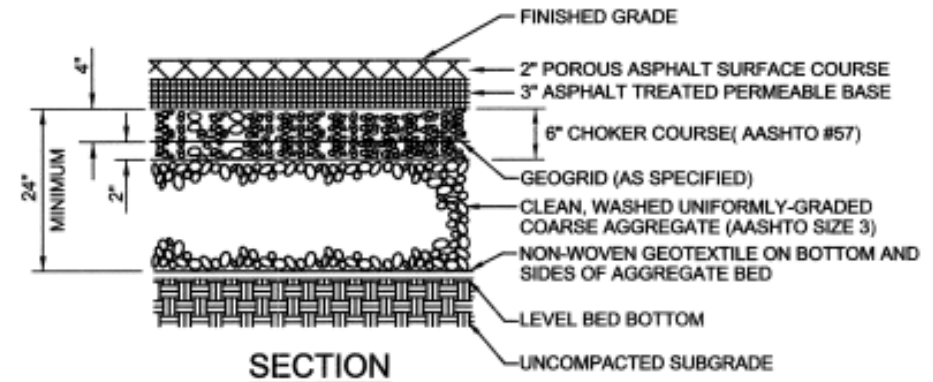
Approximate Drainage Area

2022 National Stormwater Roundtable - 10/19/2022



Design Alternative #3: Porous Paving

- Includes Porous Asphalt, Permeable Pavers (pavers are permeable), Porous Paving Installations (gaps between pavers are permeable) & Porous Concrete



NOTE:

1. CONTRACTOR SHALL CAREFULLY FOLLOW REQUIREMENTS OF THE APPLICABLE PROJECT SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER.

GENERAL NOTES FOR POROUS PAVEMENT SYSTEMS:

1. CONTRACTOR SHALL CAREFULLY FOLLOW THE REQUIREMENTS OF THE APPLICABLE PROJECT SPECIFICATIONS AND AS DIRECTED BY ENGINEER.
2. NOTIFY ENGINEER AND OWNER AT LEAST 48 HOURS BEFORE ALL INFILTRATION BED AND POROUS PAVING WORK.
3. THE ENGINEER RESERVES THE RIGHT TO TEST SUBGRADE FOR PERMEABILITY AND COMPACTION PRIOR TO INSTALLATION OF GEOTEXTILE AND AGGREGATE.
4. EXISTING SUBGRADE UNDER BED AREAS SHALL NOT BE COMPACTED OR SUBJECT TO CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO GEOTEXTILE AND STONE BED PLACEMENT. EXCAVATORS/BACKHOES SHOULD BE USED TO EXCAVATE THE BED AREA SUCH THAT EQUIPMENT IS NEVER RUNNING ON EXPOSED BED BOTTOMS. ONLY VERY LOW GROUND PRESSURE (4 PSI OR LESS) EQUIPMENT IS ACCEPTABLE IN THE BED AREAS WHEN EXCAVATION IS WITHIN 1 VERTICAL FOOT OF THE FINAL BED BOTTOM ELEVATION.
5. TAKE ANY AND ALL MEASURES NECESSARY TO TEMPORARILY PREVENT SEDIMENTATION OF THE INFILTRATION BEDS AND THE POROUS PAVEMENT SYSTEMS DURING CONSTRUCTION AND UNTIL THE SITE IS COMPLETELY AND PERMANENTLY STABILIZED.
6. SUBMIT ALL REQUIRED MIX DESIGN, TESTING, AND MATERIAL INFORMATION FOR REVIEW AT LEAST 2 WEEKS IN ADVANCE OF PROPOSED PAVEMENT SYSTEM CONSTRUCTION, (SEE SPECIFICATIONS).
7. PREVENT VEHICULAR TRAFFIC UNTIL CURING PERIOD IS FINISHED (SEE SPECIFICATIONS).
8. EXTEND GEOTEXTILE AT LEAST 4 FEET BEYOND EDGE OF BED DURING CONSTRUCTION AND WRAP BACK TO PREVENT SILTATION OF BED. TRIM BACK WHEN SITE IS COMPLETELY STABILIZED.

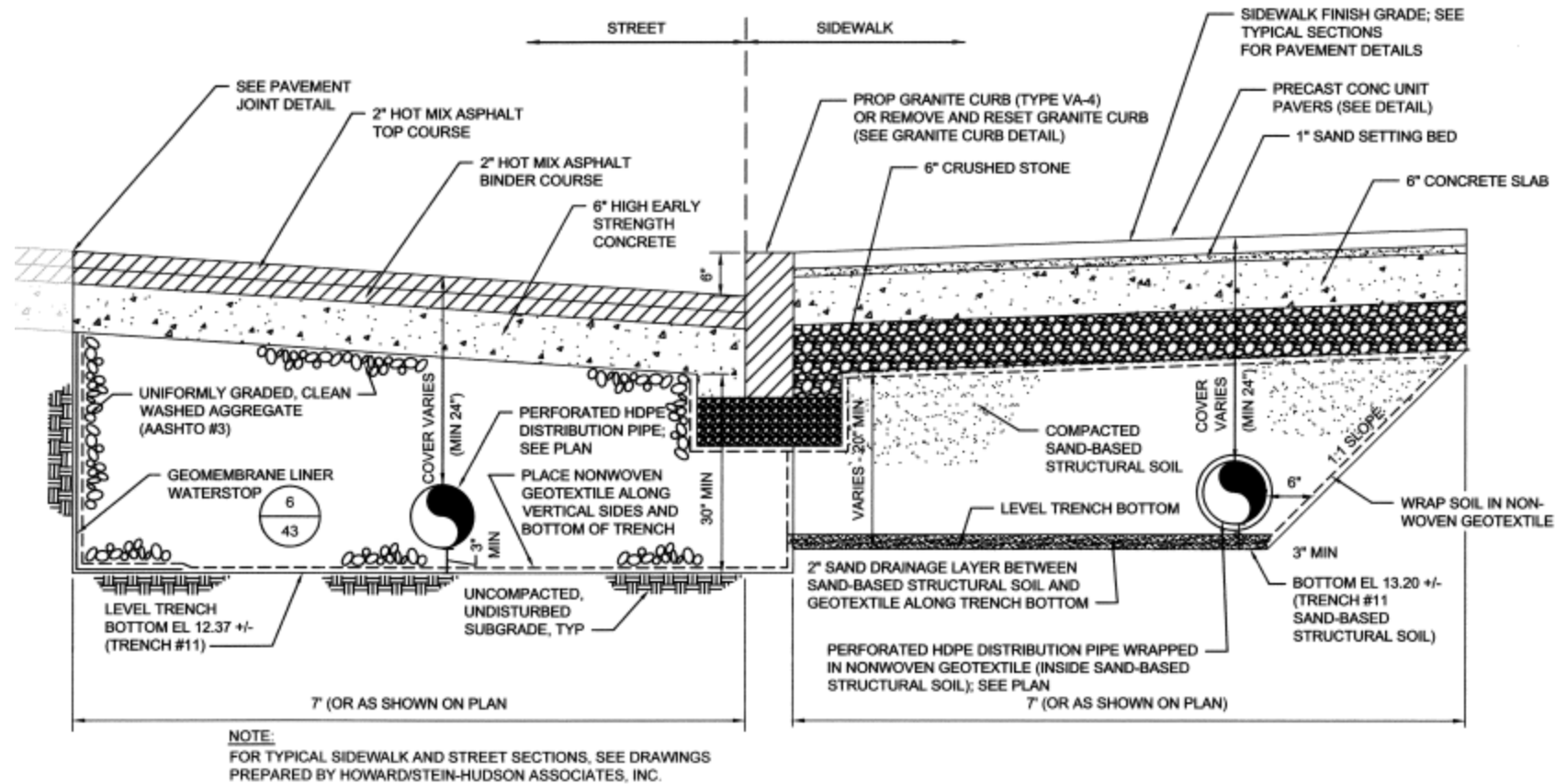






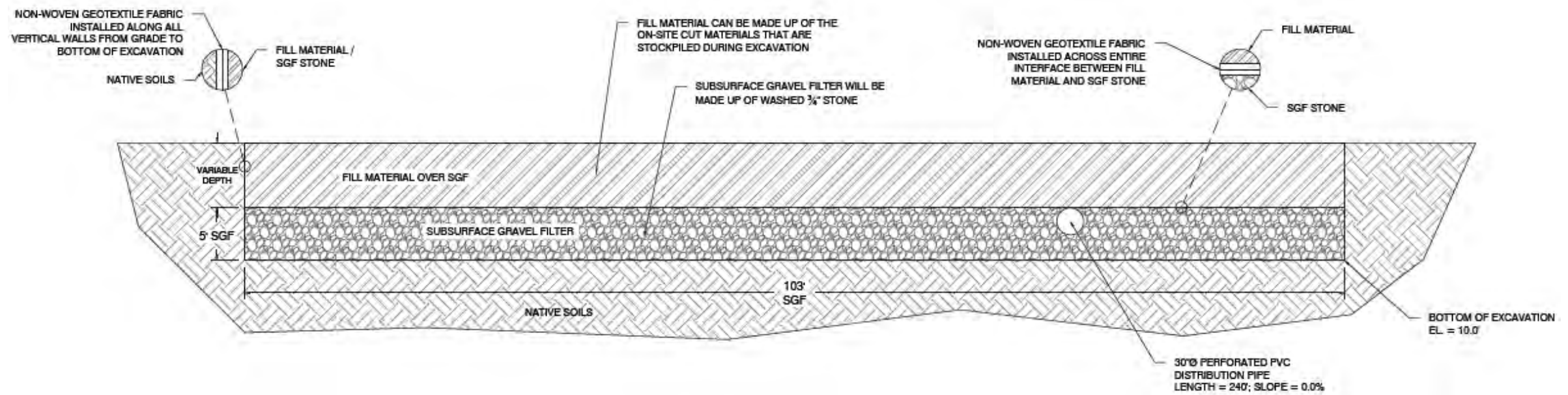
Design Alternative #4: Subsurface Infiltration Area

- Stone infiltration area (with or without perforated pipe) under varied surfaces



**INFILTRATION TRENCH/BED SECTION - STREET/SIDEWALK
(UNDER STANDARD ASPHALT AND PRECAST CONC UNIT PAVERS)**

B
NTS
35





Design Alternative #5: One-time Seeding

- Substitute for paving and/or loam & seed - planting soil, low-grow groundcover or wildflower mix



Operations and Maintenance Components

- Two (2) On-Call Green Infrastructure Maintenance Contracts
 - Regenerative Air Vacuum Sweeping Contract
 - Landscape Maintenance Contract
- Volunteer Program
 - Residents can “adopt” a GI feature on public land
 - Volunteers perform beautification and cleanup activities
 - Individuals sign waivers online and submit an annual report at the end of the year

Agenda

- Introduction
- Background Information
- What do we mean when we say “Green Infrastructure” or “GI”?
- New Cabinet Position: Director of Green Infrastructure
- Green Infrastructure Working Group
- Green Infrastructure Policy - Bumpouts/Curb Extensions
- **Next Steps**
- Question & Answer

Next Steps

- Update City Standard Details and Specifications
- Finish Green Infrastructure Database
- Create City Green Infrastructure Maintenance Program
- Author Additional Green Infrastructure Policies
- National Green Infrastructure Certification Program (NGICP) Training



Agenda

- Introduction
- Background Information
- What do we mean when we say “Green Infrastructure” or “GI”?
- New Cabinet Position: Director of Green Infrastructure
- Green Infrastructure Working Group
- Green Infrastructure Policy - Bumpouts/Curb Extensions
- Next Steps
- Question & Answer



Question & Answer

Thank You!

Kate England

Director of Green Infrastructure

katherine.england@boston.gov

