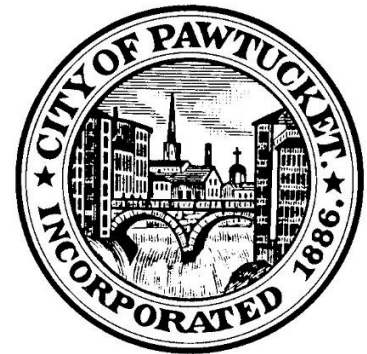


City of Pawtucket Green Infrastructure Installation in Transit-Oriented Development (TOD) District to Incentivize Economic Development and Assess Long-Term Maintenance

Pawtucket, Rhode Island

May 13, 2022



Engineering Department
engineering@pawtucketri.com, 401-728-0500 x240
Department of Public Works
City of Pawtucket
250 Armistice Boulevard
Pawtucket, RI 02860

Partner Organizations:
Narragansett Bay Commission
City of Central Falls

Executive Summary

The 165±-acre TOD District (“the District”) surrounds the site of the planned Pawtucket-Central Falls commuter rail station (“the Station”), a catalytic transportation improvement project scheduled for completion in 2022. Stormwater in the District is managed in a conventional gray stormwater system that enters the City’s combined sewer system which is a source of several water quality impairments in the Blackstone River. The District is comprised largely of industrial land uses that are now underutilized or vacant. Surface cover within the District is almost entirely (>86%) impervious, resulting in a gray, stifling environment that discourages redevelopment opportunities and degrades the quality of life for existing District residents.

Implementing green stormwater infrastructure (GSI) in the District offers an opportunity to both improve water quality and improve the District’s marketability through the introduction of a green space and enhancement of multi-modal (walking, biking, transit, automotive) transportation access. Despite these benefits, Pawtucket DPW staff—not unlike their counterparts in other municipalities—are reluctant to implement GSI features as they are unfamiliar with their maintenance requirements and associated costs.

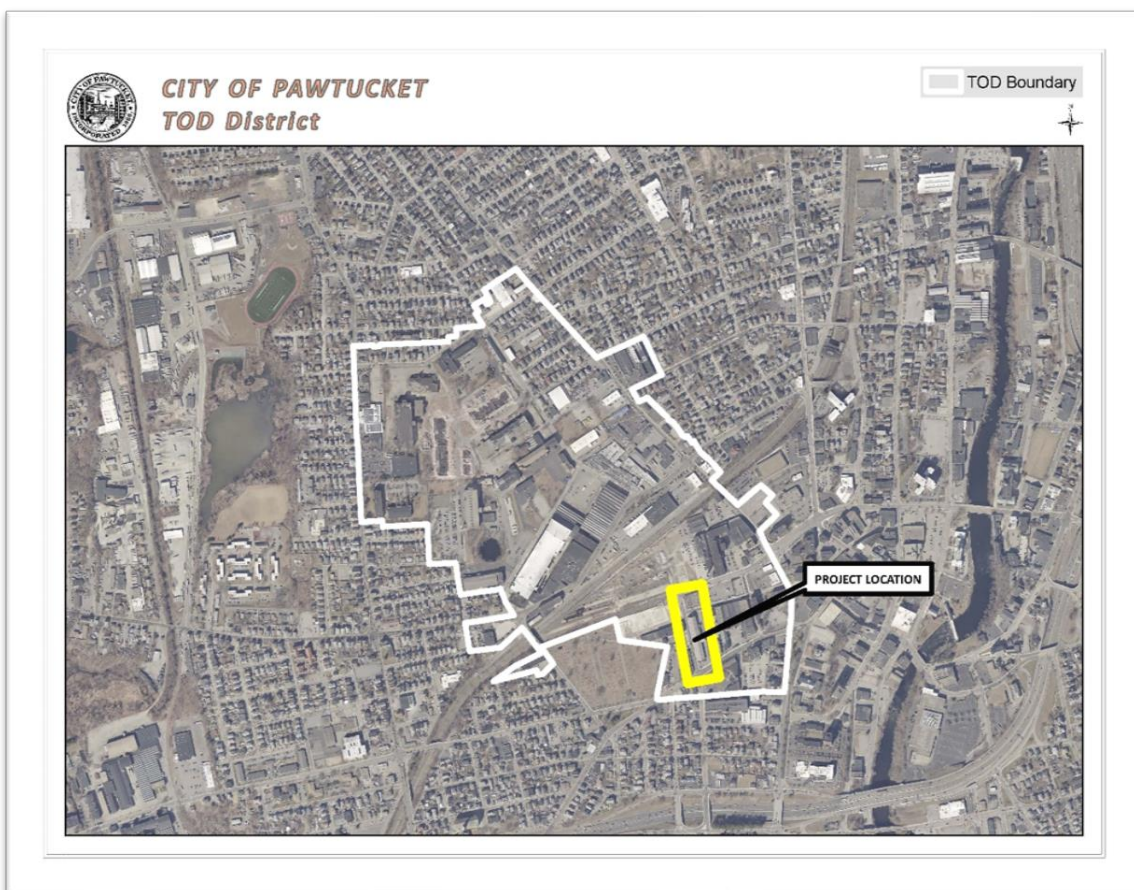


Figure 1: Transit Oriented Development (TOD) area and project site.

The “Green Infrastructure Installation in Transit-Oriented Development (TOD) District to Incentivize Economic Development and Assess Long-Term Maintenance Project” (the Project”) was designed to address these challenges in three meaningful ways:

1. The installation of GSI along Pine Street
2. The creation of GSI maintenance guide and instructional videos
3. And the creation of a District-wide stormwater master plan (still in draft phase)

Funding came from multiple sources with multiple matching requirements, adding to the complexity of the Project. See Table 1. and Table 2. for budget and match details.

Table 1. Grant and matching funds.

Grant Type	Federal Grant? (Y/N)	Grant Amount	Required Match Amount	Actual Match Provided	Match Source(s)	Notes
RIDEM - BWRf	N	\$375,000.00	\$375,000.00	\$420,300.00	RIB Loan - \$350,000 City (in-kind) - \$15,000 City (cash) - \$55,300	1. Matching contributions can be federal funds (RIB loan is federal), as the grant is not federally derived. 2. City's in-kind match is \$15K worth of my time. 3. City's portion of cash match will be the fee we pay to a consultant to complete a stormwater master plan for the TOD District. We cannot use RIB financing for this purpose; therefore, sewer bond will be used. Applicability of bond funds for this purpose was affirmed by bond counsel.
SNEP (EPA)	Y	\$376,500.00	\$124,242.00	\$375,000.00	RIDEM BWRf grant	Matching funds cannot be federally derived. Our match (BWRf grant) is derived from a state-issued bond fund. Full grant is \$575K, Pine St portion is \$375K.

Table 2. Overview of project funding and expenses.

FUNDING		EXPENSES	
Amount	Type	Amount	Type
\$ 375,000.00	RIDEM Grant	\$ 207,259.00	Pine St Improvements / O&M Design Contract
\$ 376,490.00	SNEP Grant	\$ 2,000.00	Travel to RAE Conference
\$ 338,000.00	RIB CWSRF Loan	\$ 865,000.00	Streetscape Construction Contract
\$ 35,000.00	Sewer bond	\$ 50,000.00	Stormwater Master Plan (TOD District)
\$ 1,124,490.00		\$ 1,124,259.00	

The City was initially awarded a \$575,000 grant from the Bay and Watershed Restoration Fund (BWRf via RIDEM) to install GSI within the District; \$375K allotted for this Project. The scope of the Project at this point included both GSI installations and the development of a District-wide stormwater master plan, the latter of which we intend to use as a regulatory instrument that translates the stormwater-related benefits of the GSI installations into stormwater permitting “credits” for District developers’ use (this is still in draft form and not yet published).

The City applied for additional funding from the EPA (Restore America’s Estuaries, via SNEP) in the amount of \$375,000. The funding granted from SNEP added immense value to the project and helped address the aforementioned challenges in some unique ways. Primarily, this funding has been used to build additional GSI features, enabling Pawtucket to treat stormwater runoff from a *larger* impervious surface area. See the image below for an overview of the GSI.

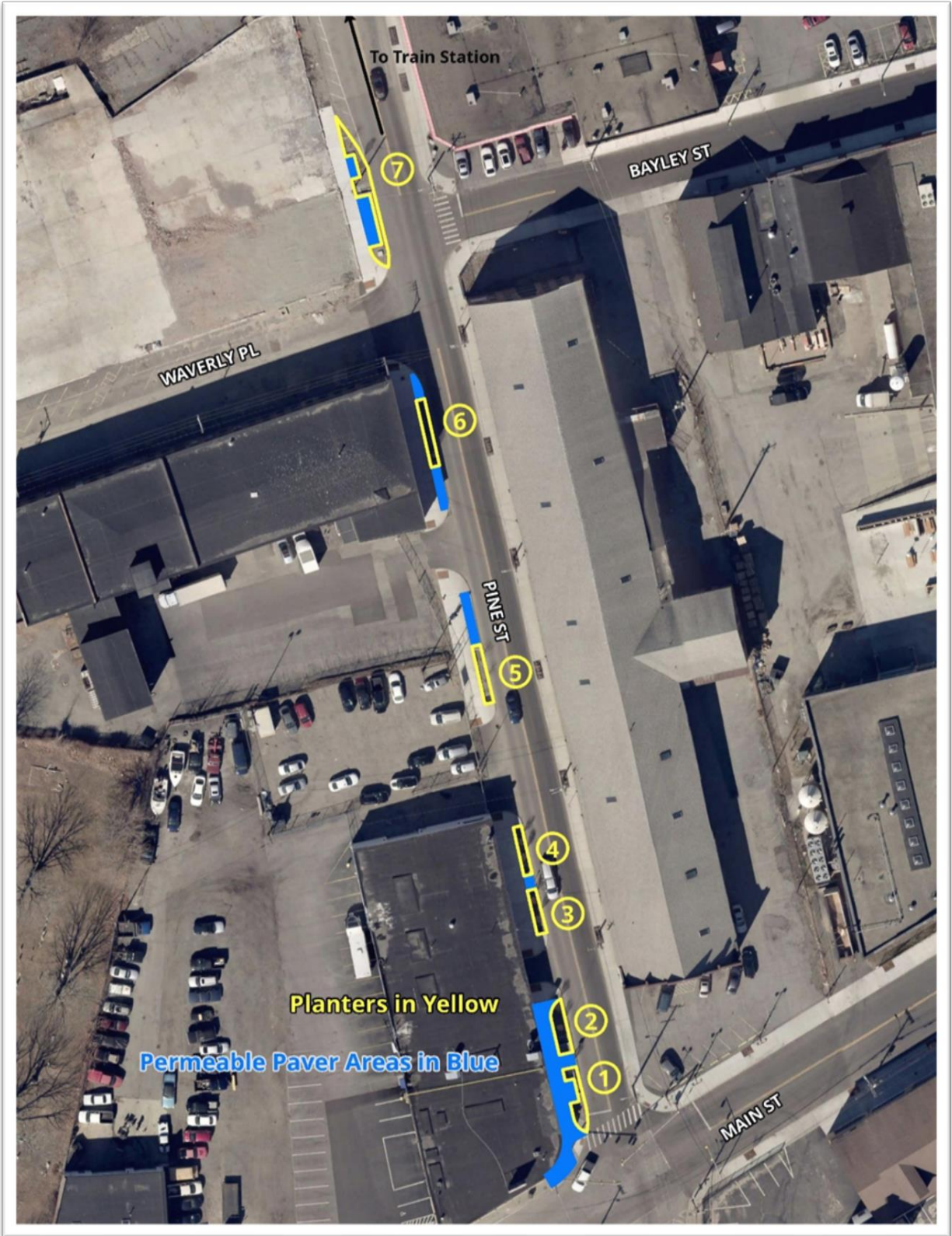


Figure 2: Locations of planters and permeable pavers along Pine Street.

The Pine Street GSI treatment system is composed of three key elements

- Pretreatment structures
- Planter beds and overflow structures
- Pervious pavers

Pretreatment Structures (seen below) capture trash and sediment from stormwater before they reach the planter beds. Six of the seven curb inlet planters have a grouted forebay. The curb inlet planter that does not have a grouted forebay is located at the intersection of Pine and Waverly. This planter uses a deep sump catch basin as a pretreatment structure. After the pretreatment structures have filtered sediment and debris from incoming stormwater, the water flows into the planter bed.



Figure 3. Grouted forebays, in use and after being cleaned.

Planter beds

Here, water infiltrates into a specially designed, high-performance soil media designed to filter bacteria and nutrients like nitrogen and phosphorus. Trash and sediment can clog the soil media and cause the beds to fail, so it's important to maintain these. Specially selected plants and trees provide both aesthetic quality and pollutant removal. These plants were selected based on the light conditions on Pine Street, and on their ability to withstand the wet and dry conditions in the planter bed. These plants are hardy and native to New England but can get overgrown by weeds. Weedy beds have generated some public complaints, so maintaining a schedule for removal is key.

The next part of the planter beds is the overflow structure. These are located at the opposite end from the pretreatment structures and serve to prevent flooding of the planter beds during larger storms. There are two kinds of overflow structures: beehive grates and gabion baskets. Beehive grates connect to an existing drainage pipe. Gabion baskets provide limited void space for some extra water storage.



Figure 4. Overgrown planter bed (left) and freshly weeded planter bed (right).

The third stormwater treatment element is the pervious paver system. In a few locations along Pine Street, the typical concrete sidewalk was replaced with pavers to allow stormwater to flow in between the stones and infiltrate into the ground. There's a reservoir of gravel under the pavers to store stormwater that would otherwise go into the planters or into the storm drains.



Figure 5. Pervious paver sidewalk

As previously mentioned – the funding provided by SNEP supported this project by allowing the City to not only install more infrastructure and treat a larger catchment area, it also funded a much-needed operations and maintenance program.

This experience has been closely documented throughout the project in an effort to maximize its transferability to other communities. A Green Infrastructure Maintenance Quick Reference Guide (attached at the end of this report) was created to illustrate the maintenance resource requirements (e.g. skill, equipment, time, materials needed) of each type of practice, and serves as a resource for municipal operations managers, engineers, and planners. A set of instructional videos have been produced, featuring demonstrations of maintenance activities performed by Pawtucket DPW's own maintenance staff. The videos have been designed specifically

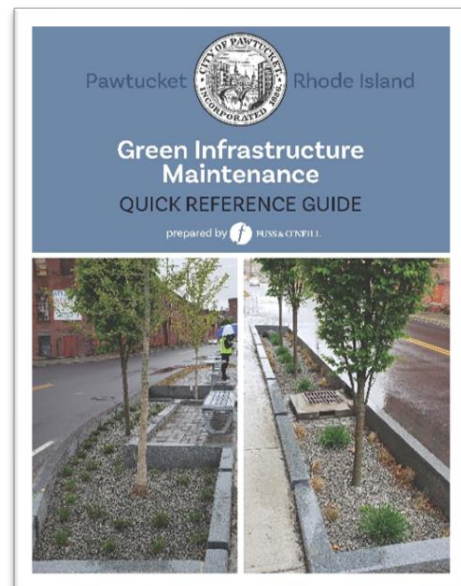


Figure 6. Cover of Quick Reference Guide.

as an educational resource for DPW maintenance staff. The funding we received from SNEP for these additional features has demonstrated the use of green infrastructure to retrofit an existing City street as a Green and Complete Street leading to the train station site. GSI installation is used to separate pedestrian traffic from vehicular traffic, and is demonstrating how stormwater management investments can be used to enhance the marketability and livability of a highly urbanized area by improving walkability, bicycle access, and neighborhood aesthetics.

Green Infrastructure Installation in Transit-Oriented Development (TOD) District to Incentivize Economic Development and Assess Long-Term Maintenance Project is supported by the Southeast New England Program (SNEP) Watershed Grants. SNEP Watershed Grants are funded by the U.S. Environmental Protection Agency (EPA) through a collaboration with Restore America's Estuaries (RAE). For more on SNEP Watershed Grants, see www.snepgrants.org



Figure 7. Pine Street facing south; before (left) and after (right). "After" picture was taken during routine maintenance of the planter beds by City of Pawtucket DPW staff.

SNEP Watershed Grants Final Progress Report

1. Cover Information

May 13th, 2022

Green Infrastructure Installation in Transit-Oriented Development (TOD) District to Incentivize Economic Development and Assess Long-Term Maintenance

Contract Number SNEPWG18-3 -Pawtucket

Grant Period: September 1, 2018 – June 30, 2020

Extended Through March 31st, 2022

Grantee Organization

City of Pawtucket

Emily Morse, GIS Coordinator

401-728-0500 x240

emorse@pawtucketri.com

Reporting Period

January 1st, 2022 – March 31st, 2022

Progress Report #8

2. Project Report Narrative

2.A. Project Results

Goals of the Project:

- improve stormwater quality by treating stormwater via various GSI
- decrease the impervious surface area of the TOD District
- improve the marketability of the TOD District by adding green space and multi-modal transportation access
- create GSI operations and maintenance content to support DPW staffers and City Managers in Pawtucket
- retrofit an existing city street into a thriving Complete and Green Street

Short-term Objectives - Met

- prove that alternative green stormwater infrastructure can be effectively and handily maintained by DPW staff
- the GSI is treating stormwater, the plant-life selected is thriving

Short-term Objectives – Not Yet Met

- public complaints regarding the weedy-ness of the planter beds, a shift in perception of what “green” stormwater infrastructure truly looks like is needed, not unique to Pawtucket

Long-term Objective – Too Soon to Tell

- long-term maintenance of all GSI must be adhered to
- replication of this Project (retrofit gray and dreary city street-to-Complete and Green Street) in other areas throughout the City; currently 1 project is in design phase and 1 is in conceptual phase

The following tasks have been completed to date:

- Procured design services via public request for qualifications (RFQ) and awarded design contract to Fuss & O’Neill, Inc.
- A. Silvia attended Restore America’s Estuaries Biannual Summit in Long Beach, CA in early December and participated in a panel discussion focused on SNEP and its newest round of projects.
- Prepared and submitted a QAPP for the project; approval granted from USEPA.
- Conducted kick-off meeting and planned and scheduled two workshops with project stakeholders to develop concept design for the project.
- Conducted two design workshops with stakeholders and finalized preliminary/conceptual project design
- Attended a meeting with RIDEM OCTA
- Submitted Certificate of Approval Application to RIDEM for SRF Funding Prepared 70% and 100% design documents and corresponding cost estimates
- Finalized the design of the proposed green infrastructure improvements
- Final design produced by Fuss & O’Neill, Inc. and put out to bid.
- Conducted Pre-Bid Meeting
- Awarded Contract
- Commenced construction of the green infrastructure improvements
- Obtained final QAPP approval
- Continued Installation of green infrastructure improvements (pavers, sidewalks, bioretention basins, etc.)
- Completed paving operations
- Installed Major landscaping items (trees, shrubs, etc.)
- Installed Inlet screens and wheel guards
- Constructed sediment forebays
- Installed signage and pavement striping
- Installed traffic detector loop
- Installed sculpture footings
- Installed some street furniture (benches)
- Installed landscaping items
- Installed remaining street furniture (benches and table)
- Fuss & O’Neill issued Construction Verification Letter (dated June 30, 2021)
- Created initial draft of maintenance documentation

- Shot footage for visualization materials for BMP maintenance videos
- Completed development of maintenance documentation
- Edited, narrated and published visualization materials for installed BMPs

2.B. Work Remaining Under Current Contract

Next project steps include:

- Install aluminum “Nature at Work” type signage; can be completed post – contract.
Note — this is off budget, DEM in-kind

2.C. Compliance

QAPP has been approved.

2.D. Project Partners

Project stakeholders were invited to the project Stakeholder Workshop Meetings. Attendees included:

- City of Central Falls Planning Department
- City of Pawtucket Planning Department
- City of Pawtucket Police Department
- City of Pawtucket Fire Department
- City of Pawtucket Department of Public Works
- Rhode Island Department of Transportation
- The Pawtucket Foundation
- The Nature Conservancy
- The Audubon Society
- Rhode Island Division of Planning
- Rhode Island Public Transit Authority
- Horsley Witten

2.E. Volunteer and Community Involvement

Stakeholders participated in a series of workshops to develop the concept designs (see report #2).

2.F. Outreach & Communications

Outreach and communication to date has been limited to engaging project stakeholders in design development process.

3. Project Budget Report

3.A. Budget Table

Summary Budget Table

Project Task/Category	SNEP FUNDING				NON-FEDERAL MATCH				Match Source
	Total Amount Per Contract	Amount Expended This Period	Amount Expended Cumulative	Balance To Finish	Total Amount Per Contract	Amount Expended This Period	Amount Expended Cumulative	Balance To Finish	
Personnel				\$0.00	\$3,280.00	-	\$4,840.00	-\$1,560.00	City of Pawtucket
Fringe				\$0.00	\$1,148.00	-	\$886.00	\$262.00	City of Pawtucket
Travel	\$1,966.06		\$1,966.06	\$0.00		-		\$0.00	
Contractual	\$374,327.33	\$13,493.08	\$374,327.33	\$0.00	\$116,870.00	-	\$118,297.70	-\$1,427.70	RIDEM - BWRF
Total Direct	\$376,293.39	\$13,493.08	\$376,293.39	\$0.00	\$121,298.00	-	\$124,023.70	-\$2,725.70	
Total Direct Modified	\$64,900.00		\$0.00	\$64,900.00	\$29,428.00	-	\$0.00	\$29,428.00	
Indirect	\$196.61		\$196.61	\$0.00	\$2,943.00	-	\$217.30	\$2,725.70	
Total	\$376,490.00	\$13,493.08	\$376,490.00	\$0.00	\$124,241.00	-	\$124,241.00	\$0.00	

Summary Budget Table

	SNEP FUNDING										NON-FEDERAL MATCH							
Project Task/Category	Total Amount Per Contract	Invoice 1	Invoice 2	Invoice 3	Invoice 4	Invoice 5	Invoice 6 (current period)	Amount Expended Cumulative	Balance To Finish	Total Amount Per Contract	Invoice 1	Invoice 2	Invoice 3	Invoice 5	Amount Expended This Period	Amount Expended Cumulative	Balance To Finish	Match Source
Personnel									\$0.00	\$3,280.00	\$0.00	\$1,610.00	\$1,700.00	\$1,530.00	-	\$4,840.00	-\$1,560.00	City of Pawtucket
Fringe									\$0.00	\$1,148.00	\$0.00	\$563.00	\$170.00	\$153.00	-	\$886.00	\$262.00	City of Pawtucket
Travel	\$2,000.00	\$1,966.06						\$1,966.06	\$33.94						-	\$0.00		
Contractual	\$374,293.39	\$0.00	\$133,475.65	\$13,094.40	\$191,188.00	\$23,076.20	\$13,493.08	\$374,327.33	-\$33.94	\$116,870.00	\$0.00	\$8,406.75		\$109,890.95	-	\$118,297.70	-\$1,427.70	RHEM - BWPF
Total Direct	\$376,293.39	\$1,966.06	\$133,475.65	\$13,094.40	\$191,188.00	\$23,076.20	\$13,493.08	\$376,293.39	\$0.00	\$121,298.00	\$0.00	\$10,579.75	\$1,870.00	\$111,573.95	-	\$124,023.70	-\$2,725.70	
Total Direct Modified	\$64,900.00	\$1,966.06						\$0.00	\$64,900.00	\$29,428.00	\$0.00			-	\$0.00	\$29,428.00		
Indirect	\$196.61	\$196.61						\$196.61	\$0.00	\$2,943.00	\$0.00	\$217.30		-	\$217.30	\$2,725.70		
Total	\$376,490.00	\$2,162.67	\$133,475.65	\$13,094.40	\$191,188.00	\$23,076.20	\$13,493.08	\$376,490.00	\$0.00	\$124,241.00	\$0.00	\$10,797.05	\$1,870.00	\$111,573.95	-	\$124,241.00	\$0.00	

3.B. Budget Narrative

There has been work performed during this reporting period, as follows:

1. Grant Funds Expenditure – Work within this period has included the development, editing and narrating of footage for maintenance videos and the design and creation of “Nature at Work” signage.
2. Matching Funds Expenditure – The City has met its matching fund obligation as noted in previous progress reports.

4. Supporting Materials

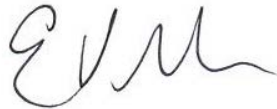
Attached to this document are the following:

- Fuss and O’Neill Invoices (3)
- Operations and Maintenance Quick Reference Guide

5. Certification

By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and objectives set forth in the terms and conditions of the Federal award. I am aware that any false, fictitious, or fraudulent information, or the omission of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (U.S. Code Title 18, Section 1001 and Title 31, Sections 3729–3730 and 3801–3812).

Grantee Signature:



Name: Emily Morse

Job Title: GIS Coordinator

Date: 5/13/2022

Organization: City of Pawtucket



Remit to: For EFT/ACH:
 Fuss & O'Neill, Inc. Bank of America
 P. O. Box 412889 ABA 011900254
 Boston, MA 02241-2889 Acct 385016029253
 † 860.646.2469 FEIN: 06-0845648
 accounting@fando.com
 (Invoice # Reference Required) **INVOICE**

Emily Morse
 Pawtucket, RI
 Public Works Office
 250 Armistice Blvd.
 Pawtucket, RI 02860

March 10, 2022
 Invoice No: 0239300

Project Manager Dean Audet

Invoice Total \$3,482.30

Project 20150951.A30 Pawtucket, RI - Design of TOD District Stormwater Improvements
Professional Services through February 26, 2022

Task Description	Fee	Percent Complete	Earned	Current Fee Billing
QAPP Development	4,976.00	100.00	4,976.00	0.00
Preliminary Design Development	23,675.00	100.00	23,675.00	0.00
Detailed Design Development & Permitting	92,637.00	100.00	92,637.00	0.00
Construction Administration	43,648.00	100.00	43,648.00	0.00
GSI Installation/Maint. Doc/Visualizatio	34,823.00	100.00	34,823.00	3,482.30
Amendment No. 1	7,500.00	100.00	7,500.00	0.00
Total Fee	207,259.00		207,259.00	3,482.30
		Previous Fee Billing	203,776.70	
	Total Fee			3,482.30
		Total this Invoice		<u>\$3,482.30</u>

Outstanding Invoices as of Invoice Date

Number	Date	Balance
0238428	2/9/2022	5,223.45
Total Outstanding		5,223.45



FUSS & O'NEILL, INC.

Remit to:
Fuss & O'Neill, Inc.
P. O. Box 412889
Boston, MA 02241-2889
t 860.646.2469
accounting@fando.com
(Invoice # Reference Required)

For EFT/ACH:
Bank of America
ABA 011900254
Acct 385016029253
FEIN: 06-0845648
INVOICE

Emily Morse
Pawtucket, RI
Public Works Office
250 Armistice Blvd.
Pawtucket, RI 02860

February 09, 2022
Invoice No: 0238428

Project Manager Dean Audet

Invoice Total \$5,223.45

Project 20150951.A30 Pawtucket, RI - Design of TOD District Stormwater Improvements
Professional Services through January 29, 2022

Table with 5 columns: Task Description, Fee, Percent Complete, Earned, Current Fee Billing. Rows include QAPP Development, Preliminary Design Development, Detailed Design Development & Permitting, Construction Administration, GSI Installation/Maint. Doc/Visualizatio Amendment No. 1, Total Fee, Previous Fee Billing, and Total this Invoice.



FUSS & O'NEILL, INC.

Remit to:
Fuss & O'Neill, Inc.
P. O. Box 412889
Boston, MA 02241-2889
t 860.646.2469
accounting@fando.com
(Invoice # Reference Required)

For EFT/ACH:
Bank of America
ABA 011900254
Acct 385016029253
FEIN: 06-0845648

INVOICE

Emily Morse
Pawtucket, RI
Public Works Office
250 Armistice Blvd.
Pawtucket, RI 02860

January 13, 2022
Invoice No: 0237693

Project Manager Dean Audet

Invoice Total \$5,223.45

Project 20150951.A30 Pawtucket, RI - Design of TOD District Stormwater Improvements
Professional Services through January 1, 2022

Table with 5 columns: Task Description, Fee, Percent Complete, Earned, Current Fee Billing. Rows include QAPP Development, Preliminary Design Development, Detailed Design Development & Permitting, Construction Administration, GSI Installation/Maint. Doc/Visualizatio Amendment No. 1, Total Fee, Previous Fee Billing, Total Fee, Total this Invoice.

Outstanding Invoices as of Invoice Date

Table with 3 columns: Number, Date, Balance. Row: 0235391, 10/12/2021, 6,964.60. Total Outstanding: 6,964.60

Pawtucket



Rhode Island

Green Infrastructure Maintenance

QUICK REFERENCE GUIDE

prepared by  FUSS & O'NEILL



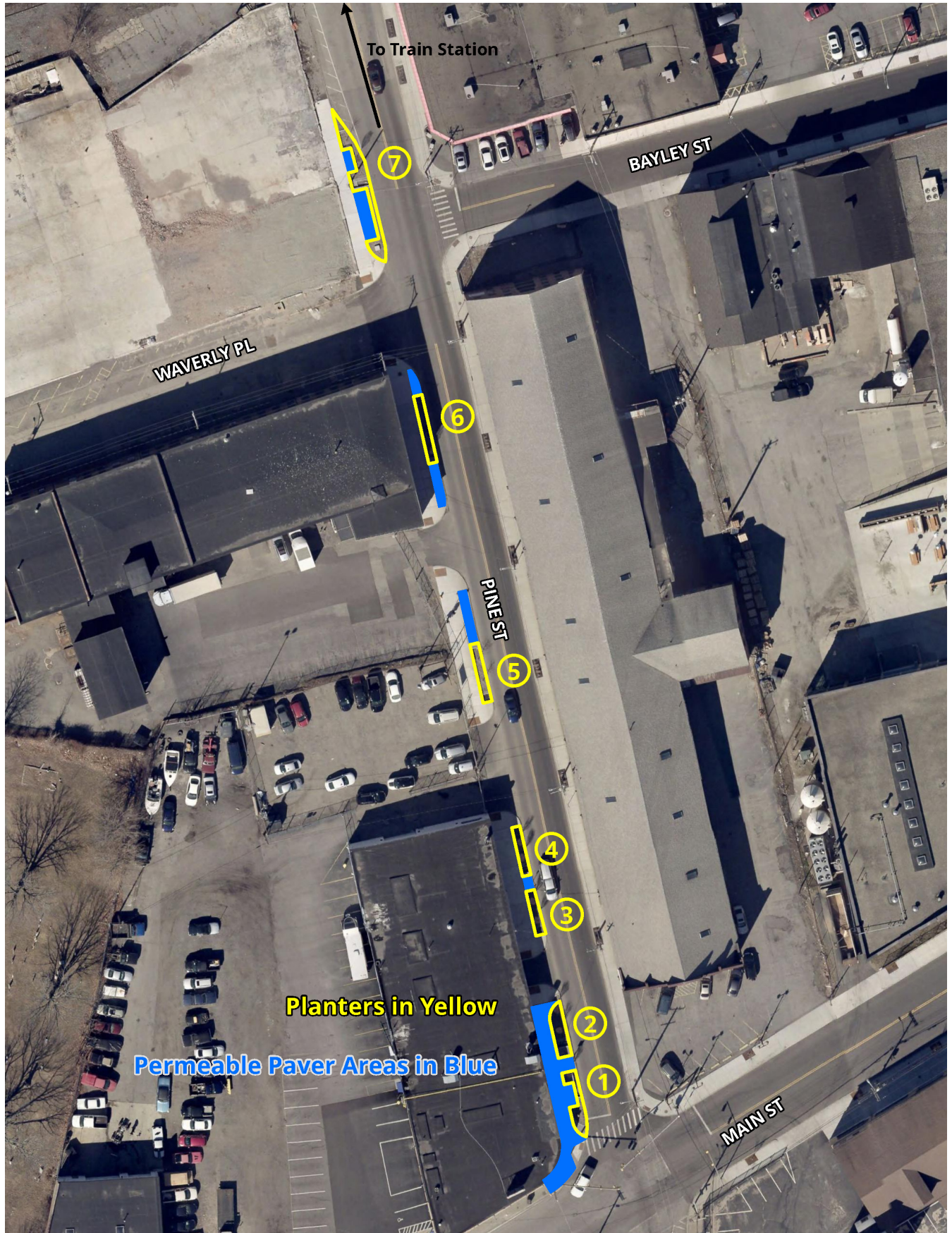
The City of Pawtucket's Green Infrastructure Installation and Maintenance Program in the Transit-Oriented District is supported by Southeast New England Program (SNEP) Watershed Grant 18-3. SNEP Watershed Grants are funded by the U.S. Environmental Protection Agency (EPA) through a collaboration with Restore America's Estuaries (RAE).

For more on SNEP Watershed Grants, see www.snepgrants.org

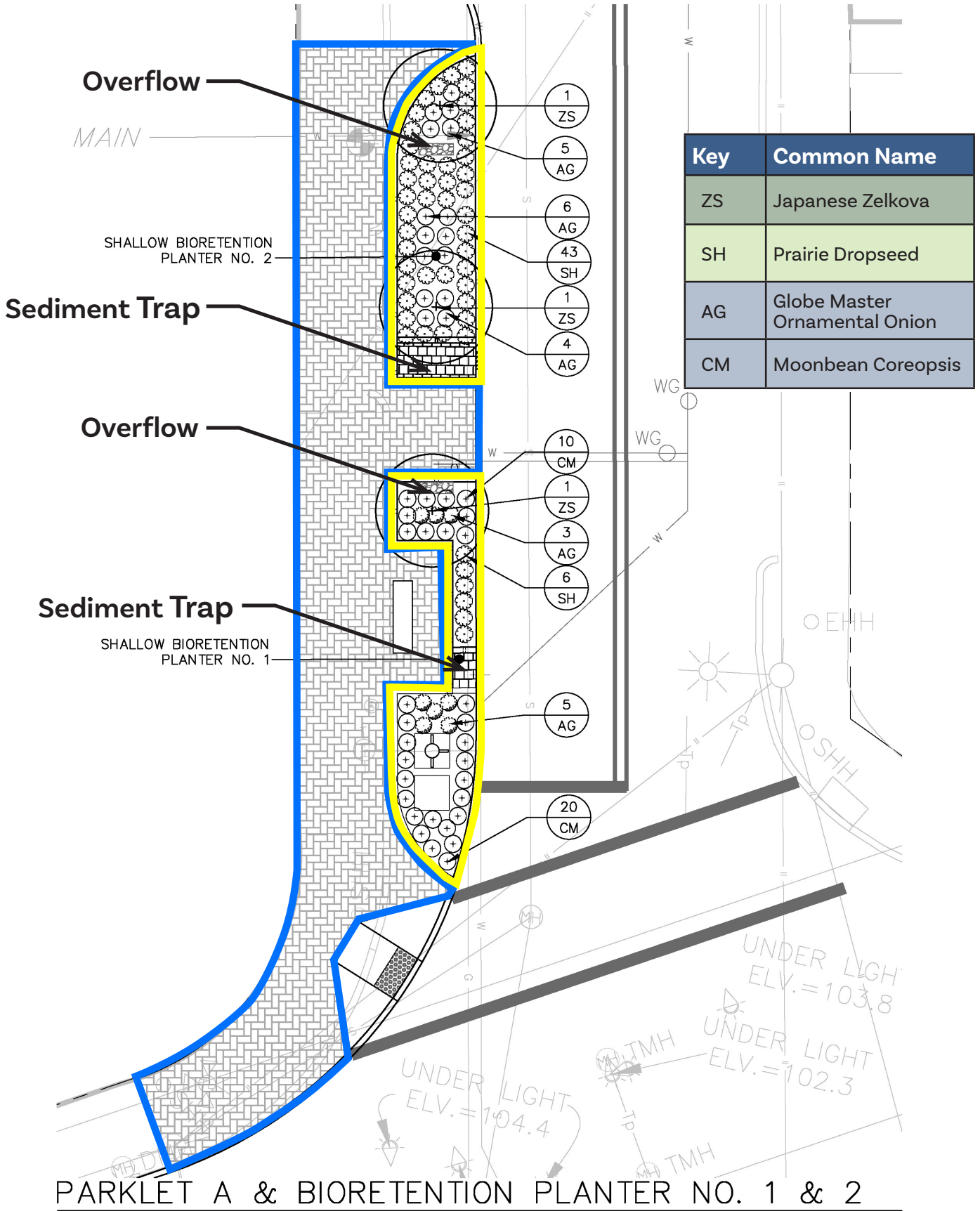


SITE MAP

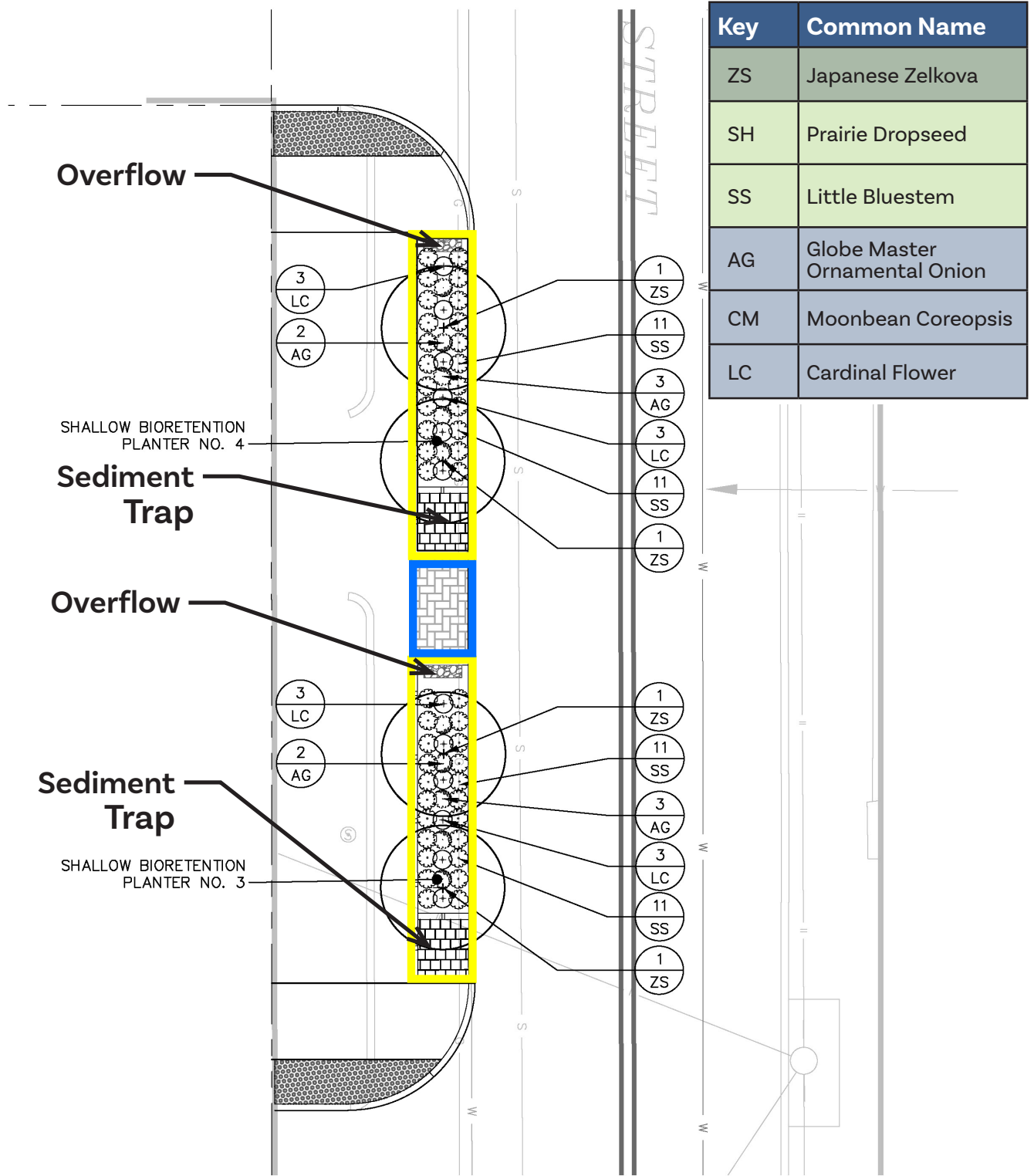
Planters are numbered sequentially from the intersection with Main Street



PLANTING PLAN 1 & 2

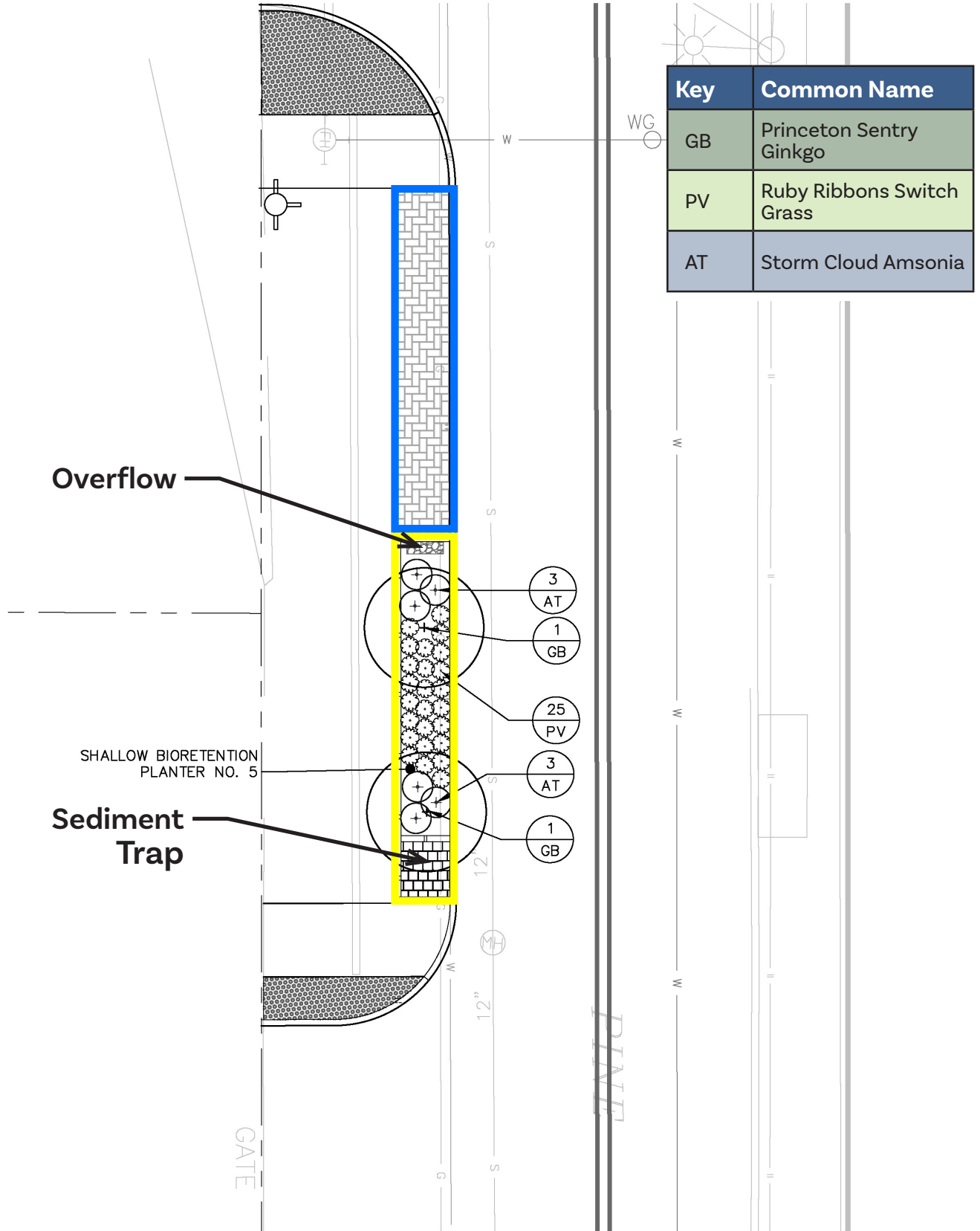


PLANTING PLAN 3 & 4



BIORETENTION PLANTER NO. 3 & 4

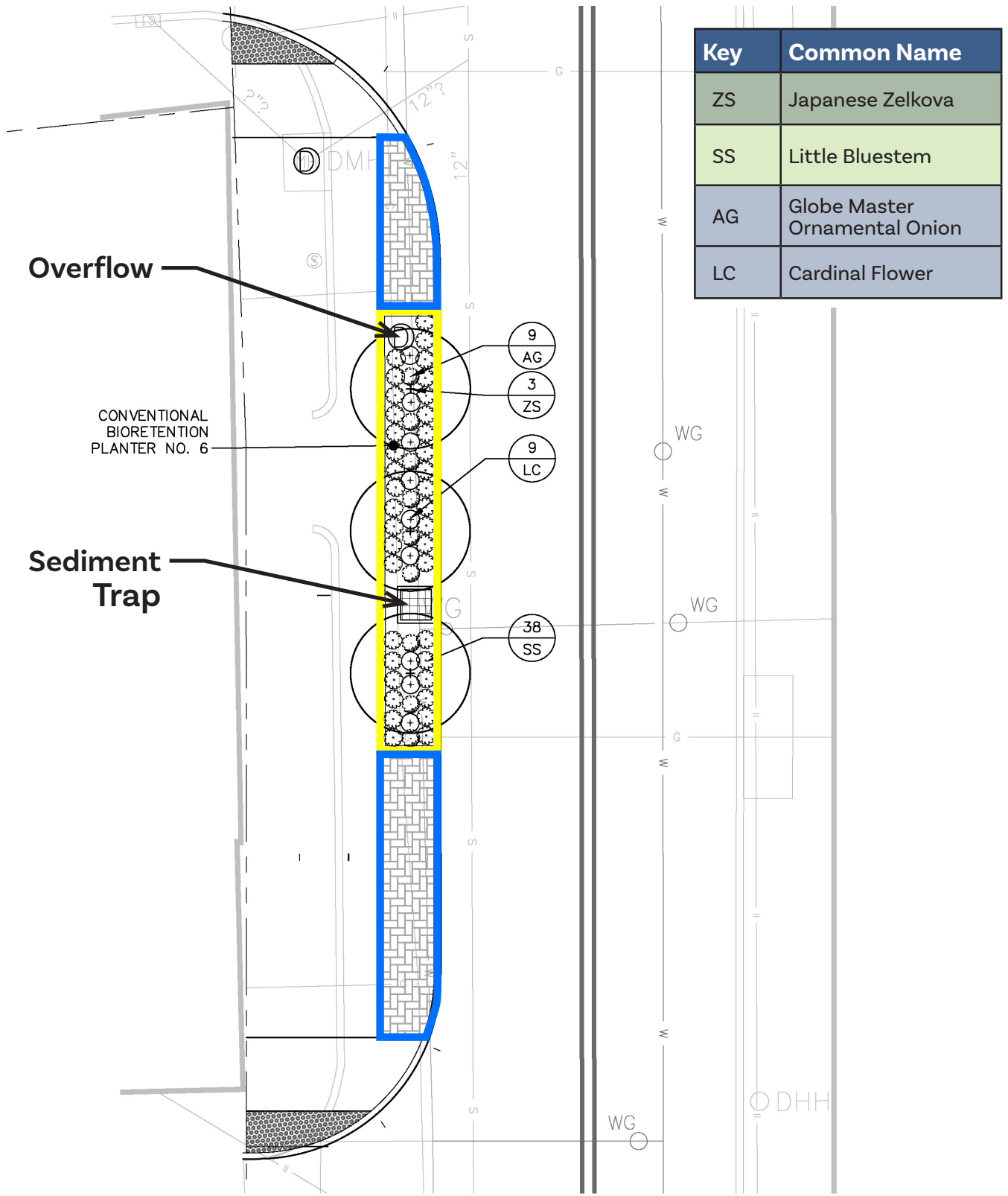
PLANTING PLAN 5



Key	Common Name
GB	Princeton Sentry Ginkgo
PV	Ruby Ribbons Switch Grass
AT	Storm Cloud Amsonia

BIORETENTION PLANTER NO. 5

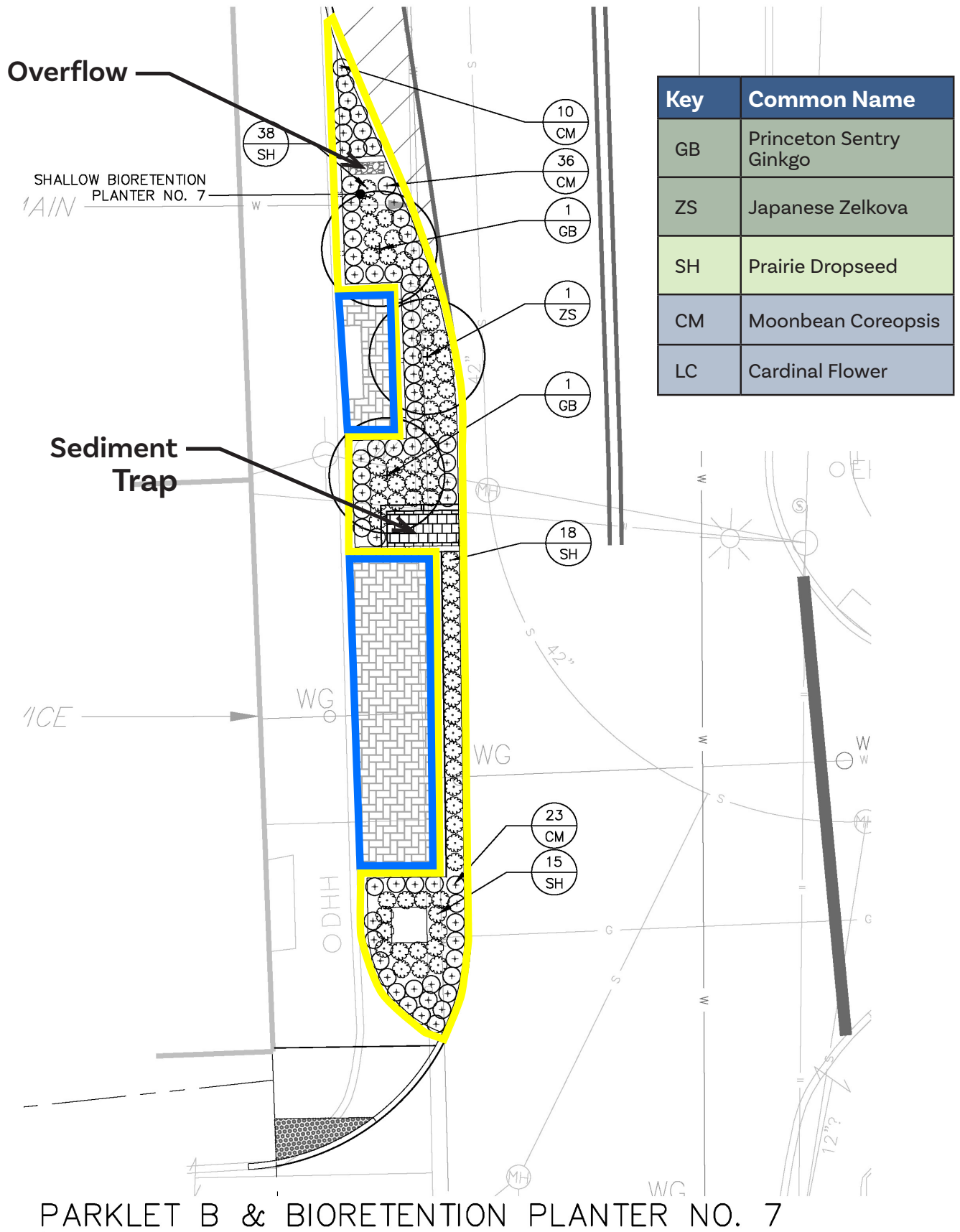
PLANTING PLAN 6



Key	Common Name
ZS	Japanese Zelkova
SS	Little Bluestem
AG	Globe Master Ornamental Onion
LC	Cardinal Flower

BIORETENTION PLANTER NO. 6

PLANTING PLAN 7



PLANTING LIST

The plants listed below have been selected specifically for their suitability on Pine Street. They tolerate the shade conditions, the overall climate, and the dry and wet conditions that occur in the curb inlet planters.

Key	Common Name
Street Trees	
GB	Princeton Sentry Ginkgo
ZS	Japanese Zelkova
Ornamental Grasses	
PV	Ruby Ribbons Switch Grass
SS	Little Bluestem
SH	Prairie Dropseed
Perennial Flowers	
AG	Globe Master Ornamental Onion
AT	Storm Cloud Amsonia
CM	Moonbean Coreopsis
LC	Cardinal Flower

Let your supervisor know if you see any of the following in the plants:

- Center die out
- Smaller flowers
- Less flowering
- Top heavy growth

They will let Parks Department staff know that additional maintenance to divide the plants is needed.

STREET TREES

GB = PRINCETON SENTRY GINKGO



STREET TREES

ZS = JAPANESE ZELKOVA



ORNAMENTAL GRASSES

PV = RUBY RIBBONS SWITCH GRASS

Summer



Fall/Winter



ORNAMENTAL GRASSES

SS = LITTLE BLUESTEM

Summer



Fall/Winter



ORNAMENTAL GRASSES

SH = PRAIRIE DROPSEED

Summer



Fall/Winter



PERENNIAL FLOWERS

AG = ALLIUM GLOBEMASTER ONION



Spring/Summer

Fall



PERENNIAL FLOWERS

AT = STORM CLOUD AMSONIA

Spring



Summer



Fall



PERENNIAL FLOWERS

CM = COREOPSIS MOONBEAM

Spring



Summer



Fall



Winter



PERENNIAL FLOWERS

LC = CARDINAL FLOWER

Spring



Early Summer



Summer



Fall/Winter



CURB INLET PLANTER MAINTENANCE & INSPECTION CHECKLIST

BMP: Planter # 6

Inspector	Date	Start Time	End Time

Inspections:

Inlet Grate Damage:	Yes	No
Planter Bed Erosion:	Yes	No
Weeds/Dead Plants:	Yes	No
Standing Water in Planter:	Yes	No

Inspection & Maintenance Activity	Circle Inspection Type		
	Spring	Summer	Fall
Inlet Grate	Check off boxes when complete		
Check for and repair damage			
Remove trash/debris/sediment			
Sediment Trap			
Remove Trash from Grate and Openings*			
Vacuum Sediment from Sump		As needed	
Planter Cell			
Remove trash and debris*			
Check for and repair soil erosion gullies			
Remove Weeds/Leaf Litter			
Replant Dead Vegetation & Trim grasses to 4-6"			
Prune Trees as directed by City Forester			
Outlet			
Remove Debris/Leaf Litter*			
Repair Damage		As needed	

* To be disposed of offsite, in accordance with RIDEM regulations

Equipment needed:

- Personal Protective Equipment
 - ~ *Hi-Vis Vest*
 - ~ *Safety Glasses*
 - ~ *Traffic Cones*
 - ~ *Steel-Toed Shoes/Boots*
 - ~ *Work Gloves*
- Pry Bar or Magnetic Grate Lifter
- Small Hammer
- Vac Truck
- Shovel
- Rake
- Trash Bags/Barrel

See the Quick Reference Guide for a chart of where the good plants are located.

Before



After



CURB INLET PLANTER MAINTENANCE & INSPECTION CHECKLIST

BMP: (circle one) Planter # 1 2 3 4 5 7

Inspector	Date	Start Time	End Time

Inspections:

Inlet Grate Damage:	Yes	No
Planter Bed Erosion:	Yes	No
Weeds/Dead Plants:	Yes	No
Standing Water in Planter:	Yes	No

Circle Inspection Type

Inspection & Maintenance Activity	Spring	Summer	Fall
Inlet Grate	Check off boxes when complete		
Check for and repair damage			
Remove trash/debris/sediment*			
Sediment Trap			
Remove trash/debris*			
Vacuum sediment from grouted cobbles*		As needed	
Vacuum weepholes*			
Planter Cell			
Remove trash and debris*			
Check for and repair erosion gullies			
Remove weeds/leaf litter			
Replant dead vegetation & Trim grasses to ~4"			
Prune Trees as directed by City Forester			
Outlet			
Remove trash/debris/leaf litter*			
Check for and repair damage		As needed	

* To be disposed of offsite, in accordance with RIDEM regulations

Equipment needed:

- Personal Protective Equipment
 - ~ *Hi-Vis Vest*
 - ~ *Safety Glasses*
 - ~ *Traffic Cones*
 - ~ *Steel-Toed Shoes/Boots*
 - ~ *Work Gloves*
- Vac Truck
- Shovel
- Rake
- Trash Bags/Barrel

See the Quick Reference Guide for a chart of where the good plants are located.

Before



After



PERMEABLE PAVER MAINTENANCE & INSPECTION CHECKLIST

Inspector	Date	Start Time	End Time

Inspections:

Slow Draining Water:	Yes	No
Surface Crusting:	Yes	No
Weeds in Joints:	Yes	No

Maintenance Type	Circle Inspection Type			
	After Winter	Late Spring	Late Summer	Late Fall
Normal	Check off boxes when complete			
Sweep/Blow sand and sediment from surface sidewalk				
Collect and dispose material				
Replenish joint material as needed with clean 3/8" stone				
Restoring Infiltration	As Needed			
Use pressure washer to remove sediment, weeds, and top 1/4" of joint material				
Collect material with shop vac				
Replenish joint material with clean 3/8" stone				

Equipment needed:

- Personal Protective Equipment
 - ~ *Hi-Vis Vest*
 - ~ *Safety Glasses*
 - ~ *Traffic Cones*
 - ~ *Steel-Toed Shoes/Boots*
 - ~ *Work Gloves*
- Push Broom to replenish 3/8" gravel
- Jug of Water for Infiltration Test
- Normal Maintenance
 - ~ *Leaf Blower (minimum velocity 120mph)*
- Restoring Infiltration
 - ~ *Pressure Washer (1,400 - 1,800 psi)*
 - ~ *Shop Vac*

Common Maintenance Issues



Ponding (more than an hour after rain) – Restore infiltration



Covered joint material – Normal maintenance and replenish joint material