

Municipal Vulnerability Preparedness Program Action Grant Case Study

Municipality: City of Fitchburg

Project Title: Generating Resiliency in Downtown Fitchburg with Nature-Based Solutions

Award Year (FY): 2023

Grant Award: \$ 109,000

Match: \$ 36,500

Match Source: Cash funding and in-kind services. The City's in-kind match includes time to collection information, support site visits, review deliverables and provide feedback, participate in and help coordinate public engagement events, and submit monthly progress reports.

One or Two Year Project: One Year

Municipal Department Leading Project: Department of Public Works

Project Website URL: [Fitchburg Downtown Nature-Based Solution Designs \(arcgis.com\)](https://storymaps.arcgis.com/stories/44895bffe1dd41cb9b949f23ca89470c)

<https://storymaps.arcgis.com/stories/44895bffe1dd41cb9b949f23ca89470c>

Community Overview:

- What is the population size of your community and where is it located?
 - *The population of Fitchburg, MA is about 41,502 (according to U.S. Census Bureau, Population Estimates Program (PEP), updated annually and specific to Vintage 2022). The town of Fitchburg is located in North Central Massachusetts in Worcester County near Leominster, off of Route 2.*
- Do you have any [Environmental Justice](#) or other Climate Vulnerable communities? (Think about both those who live and work in your town.)
 - *Fitchburg is a Gateway City, with lower household income and educational attainment than the state average, and it has a significant environmental justice (EJ) population near the project site that are lower income and from minority groups. Almost three-fourths (72.9%) or 29,679 of Fitchburg residents live in environmental justice block groups.*
- Other unique traits of your municipality like who the top employers are, geography, history, etc.
 - *Fitchburg is located in northern Worcester County, in central Massachusetts. Before colonization and associated epidemics and exiles, this land was home to the Nipmuc, Nashaway, and the Pennacook, tribes within the Algonquian Indians. After the Revolutionary war, citizens settled near the Nashua River. A dam was constructed, and the river was utilized to power mills and shops that allowed the town to prosper as an industrial community. Once a railroad was built connecting Boston to Fitchburg, rapid development and growth occurred in the manufacturing industry. Automobiles gave way to suburban development, the General Electric plant closed, and the downtown area slowly declined during the 20th century but it remains a commercial area with rich history. Top employers include Fitchburg State University and other educational institutions, healthcare and biomedical research, paper products (Avery Dennison) and metal fabrication.*

Project Description and Goals:

- Where was the project located?
 - *The project study area was located along the western edge of Downtown Fitchburg, specifically within the Combined Sewer Overflow drainage area 010. Five design concepts were developed within the CSO 010 area to be implemented as part of the ongoing Sewer System Separation project. Our project limit extends west from the intersection of Main St and Prospect St to the intersection Main St and Caldwell St and north toward View St.*
- What climate change impacts did the project address?
 - *Natural and Infrastructure Flooding, Stormwater controls retrofits, Urban Heat Island, Implementation of Nature Based Solutions*
- What were the specific goals and tasks of the project as stated in your application?
 - *Build NBS solutions into the current sewer system separation work generating resiliency for the community and water quality improvements that extend far down the North Nashua River to the Merrimack River*
 - *Conduct on-site, field investigations to assess existing drainage, data gaps, and confirm hydrological connectivity.*
 - *Identify opportunities for NBSs within the CSO 010 drainage area. The improvements were scored and prioritized for the benefits to environmental justice populations, reduction of urban heat island, and other co-benefits to the community.*
 - *Develop five (5) of the concepts design development, construction design, and construction via funding and coordination with the sewer system separation project.*
 - *Develop a suite of digital and in-person methods for gathering community input on Nature-based Solutions*

Did your project meet the goals set forth in your application in terms of:

- Employing nature-based solutions
 - *Yes, we identified over 18 NBS projects and brought 5 through design development with implementation occurring this summer/fall.*
- Improving equitable outcomes for and fostering strong partnerships with EJ and other Climate Vulnerable Populations
 - *Investment in the neighborhood will directly benefit EJ and Climate Vulnerable Populations by increasing their public safety, increasing canopy, and mitigating flooding / erosion. The reduction in impervious surface will also reduce the urban heat island effect. The entire community will benefit from the potential economic development opportunities that could be spurred by public investment. Engagement strategies included providing Spanish translated-materials and alternative*

- forms of participation (pop-up events, website) to engage a broader swath of the community.*
 - Providing regional benefits
 - *These projects mitigate flooding of and from the roadway in the west part of Downtown Fitchburg. The NBS projects are beneficial to the broader public that uses this corridor while improving water quality and air quality providing regional benefits for the North Nashua River and neighboring communities.*
 - Implementing the public involvement and community engagement plan set forth in your application
 - *We received some community feedback on the vision and design for the NBS projects and generally for downtown through the range of engagement strategies proposed, including online videos, in-person community Earth Day event, online surveys, and eblast communications.*
 - Finishing the project on time
 - *The preliminary design concepts and public engagement activities have all been completed on schedule. All reports and memos have also been completed.*

Results and Deliverables:

- Describe, and quantify (where possible) project results (e.g. square footage of habitat restored or created, increase in tree canopy coverage, etc.). Report out on the metrics outlined in your application.
 - *Collected and catalogued Field Investigations and Ecological Restoration Memo within drainage-shed including erosion, dam conditions, bank issues, blockages, debris, etc., as well as stormwater infrastructure details.*
 - *Facilitated public engagement including on-line survey, video, community event, StoryMap, stie signage, 3 social media posts, website updates and eblasts, 1 press release, flyers (door-to-door within neighborhood) and Spanish translation of all materials.*
 - *Developed Flood Storage and Nature Based Solutions (NBS) Assessment for CSO Area Report*
 - *Identified 18 NBS projects*
 - *Developed Urban Heat Island (UHI) Analysis with Memo*
 - *Developed 5 Construction-ready NBS projects within CSO area 010.*
 - *3 Bioretention Basins, 1 Bioswale with storage, and 1 Permeable Paving area*
- Provide a brief summary of project deliverables with web links, if available.
 - *See Table on last page*

Lessons Learned:

- What lessons were learned as a result of the project? Focus on both the technical matter of the project and process-oriented lessons learned.
 - *The project benefited from coordination with the CSO project, the extent of GIS data gathered, on-site context and exploration documented, and utility information. It also benefited from the CSO project being conducted in-house in the wastewater department. The drawback of building upon the CSO project was the shorter design delivery timeline. Community input needed to be incorporated within the first two months of the project, which did not leave much time to gather significant feedback.*
 - *Having an in-house team doing both the H&H study as well as the NBS process was hugely beneficial. Those two items are so closely linked that a lot of back and forth work was needed during the analysis process.*
 - *The in-person, community event (attending the Earth Day event) was a great way to reach residents and garner feedback directly for resiliency projects in Downtown Fitchburg. Some parents and kids were enthusiastic to learn about the watershed and use the stickering activity.*
 - *In an attempt to gather direct feedback from neighbors within the CSO 010 area, we delivered flyers (English / Spanish) with links to the on-line survey and video door-to-door rather than mailers. The direct approach was not successful, and we had less input / survey results than we hoped. It was suggested that many of the homes in this neighborhood are renter-occupied and there may be some mistrust of the City in this community. One way to remedy this would be to identify and work with community liaisons/ambassadors to foster participation, “spread the word” and encourage engagement.*
 - *Given the number of longer-term projects of this sort that the city has going on, it would be helpful to establish a more ongoing citizen committee who could more easily track the overall initiative and give informed input.*
 - *Similarly, given the investment the City is making in planning and implementing Nature-based Solutions, it would be useful to study the impact, performance and maintenance requirements of these systems.*
- What is the best way for other communities to learn from your project/process?
 - *Utilize the website that we have developed for the project*

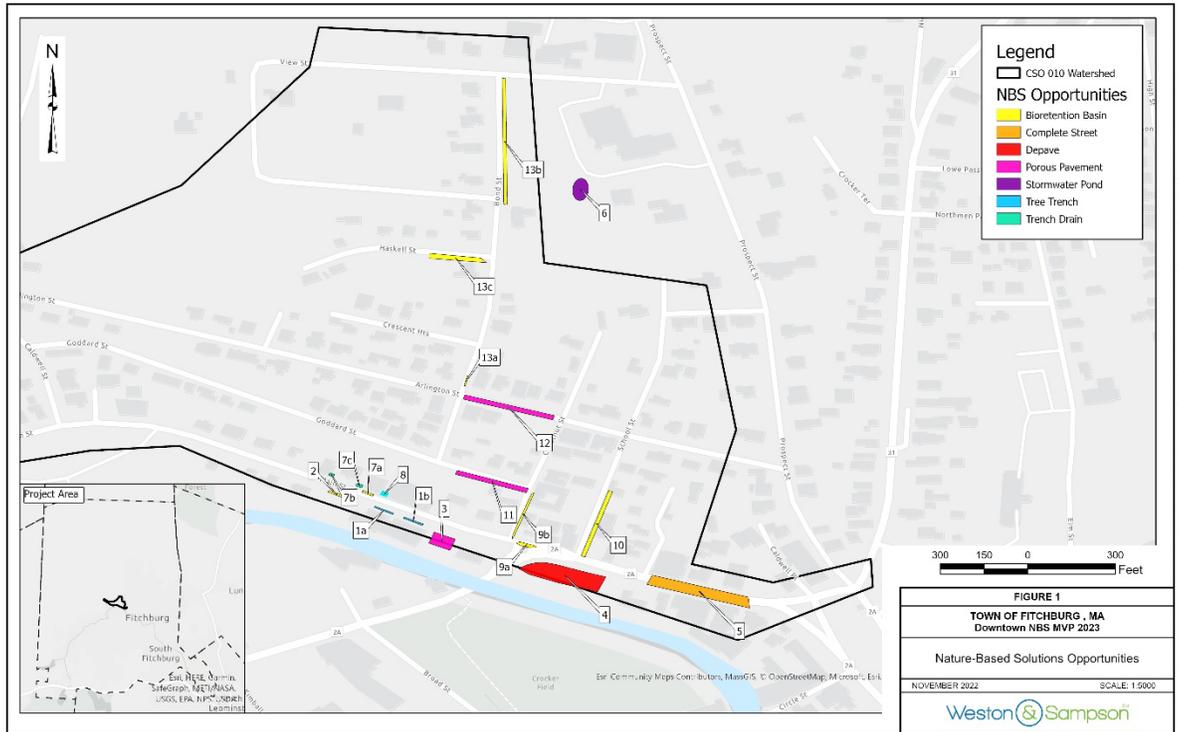
Partners and Other Support:

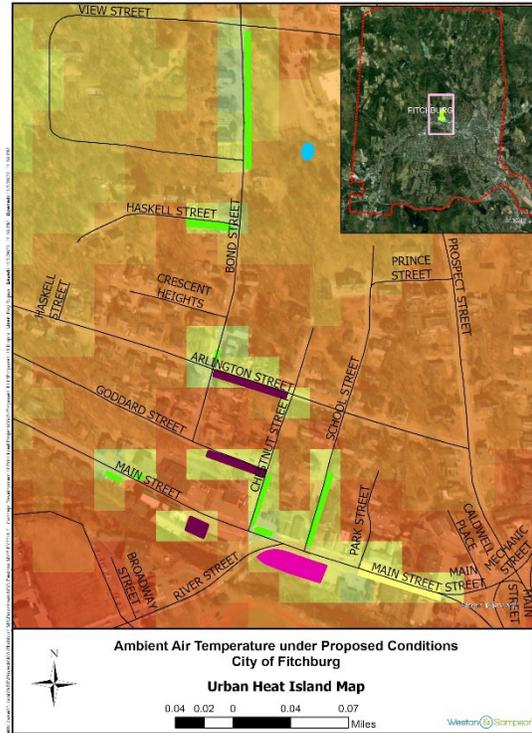
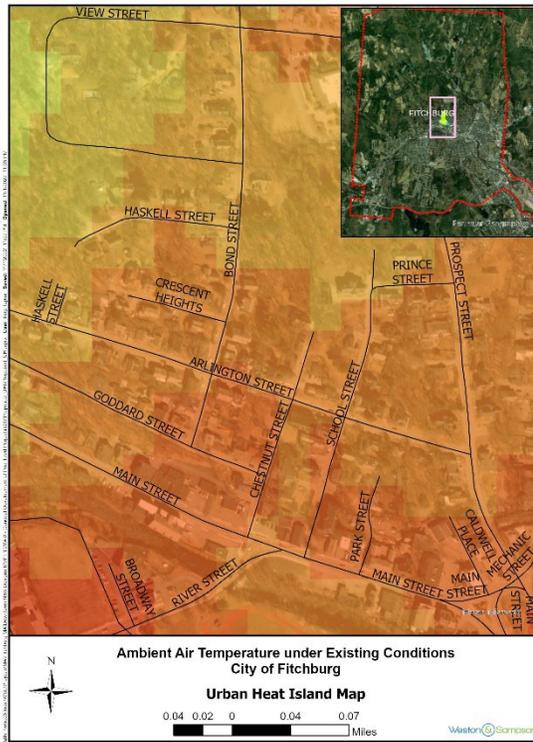
- Include a list of all project partners and describe their role in supporting/assisting in the project.
 - *Weston & Sampson Engineers*
 - *City of Fitchburg Department of Public Works*
 - *Fitchburg Redevelopment Authority*
 - *Fitchburg State University*
 - *intown Fitchburg and the ReImagine North of Main Partnership*
 - *Prime Real Estate Investment LLC*
 - *Growing Places*

- Pelletier Properties
- North Central Massachusetts Chamber of Commerce
- NewVue Communities

Project Photos:

- In your electronic submission of this report, please attach (as .jpg or .png) a few high-resolution (at least 300 pixels per inch) representative photos of the project. Photos should not show persons who can be easily identified, and avoid inclusion of any copyrighted, trademarked, or branded logos in the images. MVP may use these images on its website or other promotional purposes, so please also let us know if there is someone who should receive credit for taking the photo.





COMMUNITY INPUT NEEDED IN DEVELOPING CLIMATE RESILIENT SOLUTIONS FOR DOWNTOWN FITCHBURG

SHOW US ON THIS MAP

Use a **blue** sticker dot to show us where you have experienced **flooding** and a **red** sticker dot to show us where you have experienced **extreme heat** with Fitchburg's downtown.

Use a **green** sticker dot to show us areas you want to stay the way they are now

- FLOODING**
- EXTREME HEAT**
- STAY THE SAME**

OR PARTICIPATE ONLINE

Visit our online map to add your comments about flooding areas, extreme heat, or areas you want to stay the way they are now

Map a Comment (optional)
This map allows you to show us areas where you can identify locations of the specific concerns about flooding areas, extreme heat, or stay the same.

- Click on the map or open in a web browser to use the map.
- Click on the right side of the map to add a comment.
- When you click on a location, you can add a comment.
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Area
Area
Area

- Overlooks
- Church
- UMass Memorial
- Public Library
- City Hall
- Fire Department
- Police Department
- Hills
- Commuter Rail
- Trails
- Charter School
- Private School
- Public Elementary School
- Public Middle School

Heat felt downtown
More parking
+ Pollinators
Stream barriers on the Ave or River on park streets
Concerns about maintenance
Permaculture
Potholes are an issue in Fitchburg, MA
Gateway park is stream destination
More river access
Keep the park
Riverfront park is Fitchburg's green
Coolidge Park is Fitchburg's

MVP
This project was funded by the Massachusetts Executive Office of Energy & Environmental Affairs Regional Infrastructure Programming Study Grant program, which provides support for cities and towns to plan for climate change and to implement projects to build local resiliency.

Weston & Sampson



VOTE YOUR PREFERRED GREEN SOLUTION

WHICH OF THESE SOLUTIONS WOULD YOU PREFER TO SEE INSTALLED IN FITCHBURG'S DOWNTOWN?



Bioswale/Bieretention
Benefits:
 • Reduces and treats runoff
 • Retains stormwater for future use
 • Reduces urban heat island effect
 Can be installed along sidewalks and in medians to directly treat runoff from impervious surfaces

To vote for this solution, place a sticker dot here:




Street Tree Planters
Benefits:
 • Intercepts rainfall
 • Treats runoff
 • Adds character and value to the neighborhood
 • Reduces urban heat island effect
 Can be installed on their own, or in conjunction with bioswales

To vote for this solution, place a sticker dot here:




Permeable Pavement
Benefits:
 • Reduces runoff
 • Reduces urban heat island effect
 Can be used where stable, hard surfaces are needed along streets, sidewalks, and in parking areas and can be used in conjunction with underground storage

To vote for this solution, place a sticker dot here:




Underground Storage
Benefits:
 • Stores large volumes of stormwater
 • Provides reuse, retention, detention
 • Reduces runoff
 Can be implemented with various depths and forms, i.e. chambers, vaults

To vote for this solution, place a sticker dot here:




Floodable Parks
Benefits:
 • Reduces urban heat island effect
 • Provides retention, detention, and infiltration
 Can provide combination of hydrological services including water quality improvements

To vote for this solution, place a sticker dot here:

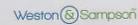


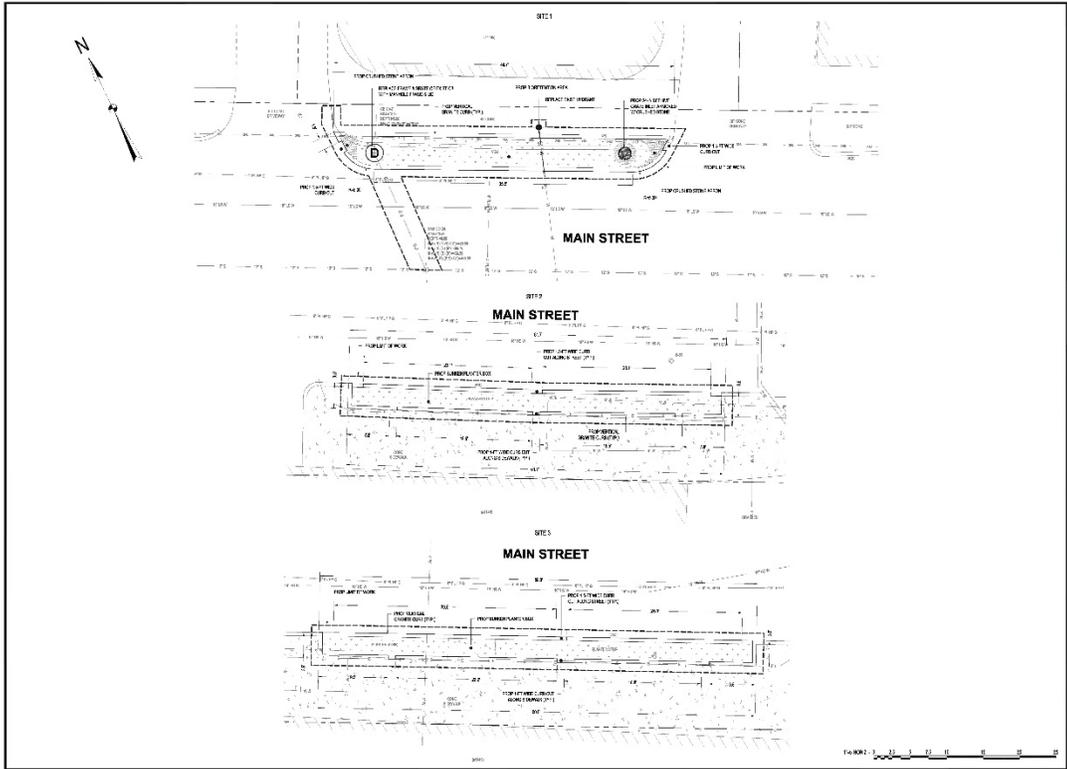

Stream Daylighting
Benefits:
 • Stores large volumes of stormwater
 • Improves water quality
 • Increases biodiversity
 • Reduces urban heat island effect
 Can involve reopening historic streams or formalizing existing streams

To vote for this solution, place a sticker dot here:




The project was funded by the Massachusetts Executive Office of Energy & Environmental Affairs Municipal Infrastructure Program/Smart Growth program, which provides support for cities and towns to plan for climate change and to implement projects to build local resiliency.





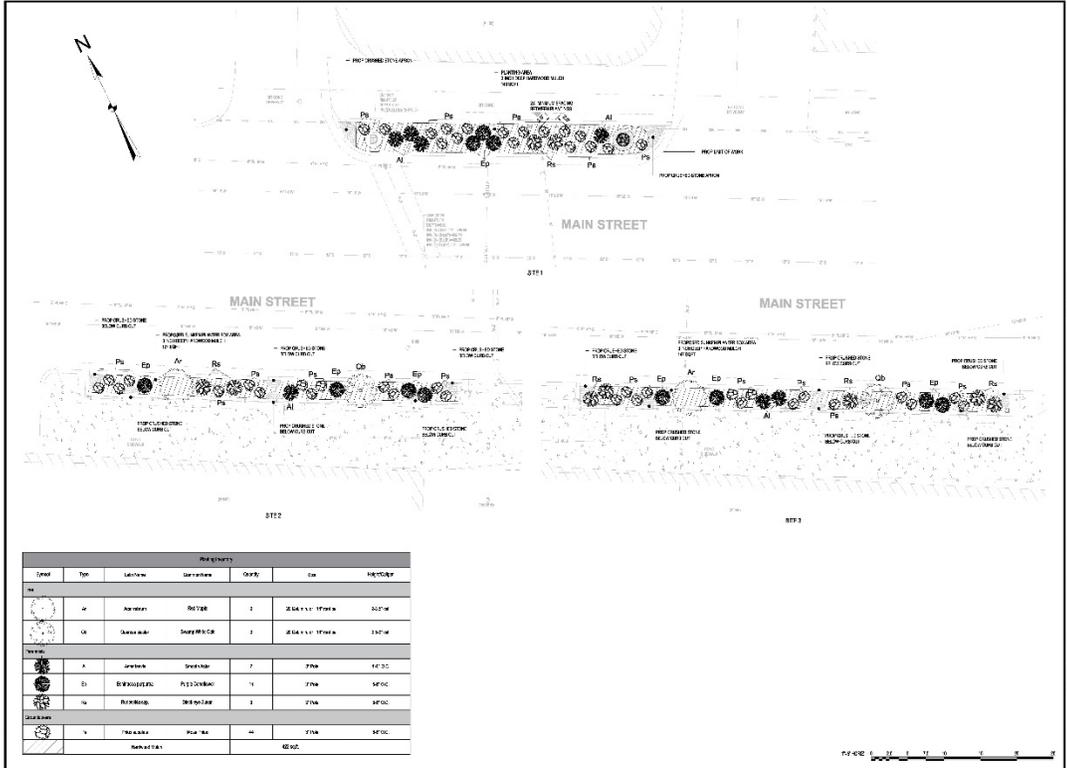
CITY OF CHICAGO
 DEPARTMENT OF PUBLIC WORKS
 DIVISION OF ENGINEERING
 312 N. LAUREL STREET, CHICAGO, IL 60602
 (773) 329-3300
 www.cityofchicago.org

WESTON & SAMPOSON
 100 WEST WASHINGTON STREET, SUITE 1000
 CHICAGO, IL 60604
 (312) 467-1000
 www.westonandsampson.com

PROJECT NO. 15-00000000000000000000
 SHEET NO. C201

DATE: 08/14/2015
 DRAWN BY: JAC
 CHECKED BY: JAC
 SCALE: AS SHOWN
 PROJECT NO.: 15-00000000000000000000
 SHEET NO.: C201

SITES 1, 2, & 3
 LAYOUT & MATERIALS PLAN
 C201



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 100 WEST WASHINGTON STREET, SUITE 1000
 CHICAGO, IL 60604
 (312) 467-1000
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PROJECT NO. 15-00000000000000000000
 SHEET NO. L201

DATE: 08/14/2015
 DRAWN BY: JAC
 CHECKED BY: JAC
 SCALE: AS SHOWN
 PROJECT NO.: 15-00000000000000000000
 SHEET NO.: L201

SITES 1, 2, & 3
 PLANTING PLAN
 L201

Symbol	Type	Latin Name	Common Name	Qty/Sp	Size	Height
(Symbol)	Ar	Arbutus	DOGWOOD	1	24" x 12" x 12" in	30'-0"
(Symbol)	CR	Crataegus	DOGWOOD	1	24" x 12" x 12" in	30'-0"
(Symbol)	A	Asplenium	DOGWOOD	2	12" in	14'-0"
(Symbol)	Et	Epiphyllum	DOGWOOD	4	12" in	14'-0"
(Symbol)	Pa	Panicum	DOGWOOD	1	12" in	14'-0"
(Symbol)	V	Vallisneria	DOGWOOD	1	12" in	14'-0"

Project Task # and Description (from Att. B):	Deliverables (from Att. B):	Progress Description:	Estimated % Complete
Task 0: MVP Requirements			
Sub-task 0.1 Project Kickoff Meeting	Meeting notes, sign-in sheet	Uploaded Agenda Kickoff Meeting and Meeting Notes	100%
Sub-task 0.2 Monthly Reports	Monthly reports	Uploaded Monthly Reports from September 2022 - June 2023	100%
Sub-task 0.3 Case Study Report	Grant Summary in MVP Case Study	Uploaded to Sharepoint	100%
Task 1: Field Data Collection			
Sub-task 1.1 Field Investigations for Ecological Restoration	Field Investigations and Ecological Restoration Memo	Uploaded Ecological Restoration Map and Field Investigation and Ecological Restoration Memo	100%
Sub-task 1.2 Filling Data Gaps	Field Notes and Updated Drainage Maps	Uploaded Field Notes and Site Photos	100%
Task 2: Public Engagement			
Sub-task 2.1 Building a GI Vision	Survey, pop-up event or video, summary of survey results	Uploaded MapIt Survey, Video (link), and Summary of Survey Results.	100%
Sub-task 2.2 Delivering the Designs	Community meeting, Storymap, Site signage, Translation of sign	Uploaded Earth Day Event (Community Meeting) Press Release, Map and Voting Boards, Event Summary and Photos. Link to StoryMap also uploaded.	100%
Sub-task 2.3 Spreading the Word	Social media posts, website updates, eblast, press release, flyers, mailing to residents, translation of video, survey and social media	Uploaded English and Spanish Social Media Posts, Images, Eblasts and Flyers. Went door-to-door to deliver flyers in place of mailing. Provided translation of engagement materials and video.	100%
Task 3: Climate Resilience Assessment			
Sub-task 3.1 Upstream Flood Storage and Nature-based Solutions Assessment	Flood Storage and Nature-based Solutions Assessment Report	Uploaded Flood Storage and NBS Assessment with Appendix A. Nineteen (19) opportunities within the CSO 010 Drainage Area were identified, modeled and ranked based on a prioritization matrix emphasizing flood reduction benefits and public realm co-benefits.	100%
Sub-task 3.2 Urban Heat Island Assessment	Urban Heat Island Assessment Memo	Uploaded UHI Memo	100%
Task 4: Concept Development of Prioritized Projects			
Sub-task 4.1 Selection & Development of CSO 010 Area Concept Designs	5 High Value Concepts, Supporting Plans and Graphics for each site	Uploaded PDF of Five (5) Concept Designs within the CSO 010 Area including: Main St Bioretention Area, 2 Main St Tree Planter retrofits, Chestnut St Bioretention and Storage Chambers, and Arlington St Pervious Pavement	100%