



CITY OF
**PALO
ALTO**

Stormwater Management Oversight Committee

Thursday, October 7, 2021
1 pm to 3 pm
Special Meeting

******BY VIRTUAL TELECONFERENCE ******

<https://zoom.us/join> Meeting ID: 990 9847 5635 Phone: 1(669)9006833

Pursuant to the provisions of California Governor's Executive Order N-29-20, issued on March 17, 2020, to prevent the spread of Covid-19, this meeting will be held by virtual teleconference only, with no physical location.

Agenda posted in accordance Government Code Section 54954.2(a) or 54956.

PUBLIC COMMENT

Members of the public who wish to participate by computer or phone can find the instructions at the end of this agenda. To ensure participation in a particular item, we suggest calling in or connecting online 15 minutes before the item you wish to speak on.

Call to Order (5 min)

Oral Communications (5 min)

Members of the public may speak to any item NOT on the agenda. A reasonable time restriction may be imposed at the discretion of the Committee Chair.

Old Business (5 min)

1. Approval of Minutes from the June 3, 2021 Stormwater Management Oversight Committee Meeting (5 min)

New Business (90 min)

1. Staff Update on CIP Projects (25 min)
2. Staff Update on GSI Implementation Project and Field Visit Site Findings (30 min)
3. Staff Update MRP Permit (25 min)

4. Rain Barrel Program (10 minutes)

Committee Member Comments and Announcements (10 min)

Tentative Agenda Items for Future Meetings and Review Action Items (5 min)

Adjournment

AMERICANS WITH DISABILITY ACT (ADA)

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2. Spoken public comments using a computer will be accepted through the teleconference meeting. To address the Council, click on the link below to access a Zoom-based meeting. Please read the following instructions carefully.
 - A. You may download the Zoom client or connect to the meeting in browser. If using your browser, make sure you are using a current, up-to-date browser: Chrome 30+, Firefox 27+, Microsoft Edge 12+, Safari 7+. Certain functionality may be disabled in older browsers including Internet Explorer.
 - B. You may be asked to enter an email address and name. We request that you identify yourself by name as this will be visible online and will be used to notify you that it is your turn to speak.
 - C. When you wish to speak on an Agenda Item, click on "raise hand." The Clerk will activate and unmute speakers in turn. Speakers will be notified shortly before they are called to speak. When called, please limit your remarks to the time limit allotted.
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CITY OF
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Stormwater Management Oversight Committee

Minutes

Thursday, June 3, 2021
1 pm to 3 pm
Special Meeting

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Agenda posted in accordance Government Code Section 54954.2(a) or 54956.

Committee Members Present: Catherine Perman, Ron Owes, David Bower, Hal Mickelson, Dena Mossar, Marilyn Keller

Committee Members Absent: Bob Wenzlau

Staff Present:

Karin North, Joanna Tran, Pam Boyle Rodriguez, Michel Jeremias, Jamie Perez, Loretta Olmos

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Call to Order (5 min) 1:01pm

Oral Communications (5 min)

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None

Old Business (5 min)

1. Approval of Minutes from the April 1, 2021 and May 6, 2021 Stormwater Management Oversight Committee Meeting (5 min)

- a. Approval of the minutes moved by Commissioner Dena Mossar and seconded by Commissioner David Bower. No objections from other Committee members.

New Business (90 min)

1. Welcome new committee members and elect Chair and Vice Chair of the committee (5 min)
 - a. Catherine Perman – Joined this committee as a pandemic project after researching information on rebates for rain barrels, later found out about the Stormwater Management Oversight Committee. Background and training in earth science and engineering with a focus in software use. Moved to California to go to Stanford University, pivoted to Software, and retired a couple years ago. She would like to give back to community. Born and raised in New York City.
 - b. Dena Mossar – Served on Palo Alto City Council for ten years and Stormwater Management Oversight Committee for four years. Interested in committee after looking for funding for stormwater upgrades while on City Council.
 - c. David Bower – Seven-year resident of Palo Alto, worked as a residential building contractor and is now retired. Became interested in stormwater after the 1998 flood that flooded his basement. He applied for this position after being on the stormwater ballot committee.
 - d. Marilyn Keller – Background in biology and environmental science at Stanford. Interested in Committee because she did not want a conflict with tree canopy group in the city. Marilyn is also on the Utilities Commission and wanted to find out how stormwater interacts with tree canopy and utilities.
 - e. Ron Owes – Background in civil and environmental engineering, went to University of Seattle and had a consulting firm, but is now retired. Work was related to surface water, design, and abatement. He has done a lot of environmental cleanups in the past. His partner has a house in Palo Alto.
 - f. Hal Mickelson – Lived in Southern California and is a Los Angeles native, came to this area in 1967 for college and stayed since.

Attorney by trade, corporate staff attorney for Hewlett Packard, labor and employment law. Has been retired for 7-8 years.

- g. Karin North – City of Palo Alto staff, acting Assistant Director for Public Works in the Environmental Services Division. Undergraduate and Master’s degrees in Environmental Science from UC Santa Barbara. Started working for Palo Alto in 2001 in the Public Works department.
- h. Election of Chair and Vice Chair – Dena Mossar nominated Hal Mickelson for Chairperson, Ron Owes seconded. David Bower nominated Dena Mossar for Vice Chair and Hal Mickelson seconded nomination. All in favor.

2. Staff Update on FY 22 Final Budget (12 min)

- a. Jamie Perez – Management Analyst for Public Works Environmental Services. Job duties include working on internal service operations for the team, budget development, and finance.
- b. Not much changed to the proposed budget since the last meeting. Office of Management and Budget presented to Finance Committee. Proposed operating and capital books are available. Accepted all proposals and adjustments, this will be going to City Council for adoption on June 21st.
- c. Recap of proposed budget: increased proposed recommendation of Stormwater Management Fee by 2% and general increases in the base program. No real changes in maintenance and Green Stormwater Infrastructure (GSI) projects, adjustment to Capital budget for stormwater budget partnership with Caltrans for a trash capture device. Encouraged to partner with local municipalities and agreed to fund \$613,000 (added as own capital project in adopted budget in FY22). No changes to the staffing allocated to the stormwater funds.
- d. Capital budget – FY22 proposed \$6.175 capital improvement total. Recycled any funds not this year to be used next year.
- e. Rinconada project will have to wait until end of Fiscal year to see if it is moving forward next year, still waiting for Council approval.

3. Staff Update on Matadero Creek Oil Spill (10 min)

- a. Karin North – Communications Office provided an update on City website. Fire Department is the lead for this effort and was the first on the scene. Background: Diesel spill due to exploding generator at Veteran’s Affair campus entered into storm drain system. CA Fish and Wildlife, Valley Water and Fire Department are working together for cleanup. Webpage will be emailed to committee.

4. Staff Update on CIP Projects (10 min)

Michel Jeremias – been with CPA for 8 years as Senior Engineer overseeing storm drain group for 4 years. Oversees Rajeev Hada and Vicki Thai. Their group handles and constructs Capital Improvement Projects within the City (13 projects approved by Stormwater Ballot Measures) in the process of designing three new projects.

a. Update on current rehab projects:

- i. Rehab and replacement project – list of locations throughout the city of pipes that need replacement. Focus is to continue to maintain the pipes currently in the ground, not to increase capacity. Goal is to make sure the pipes are continuing to function.
- ii. Pipes were identified through Public Services group when cleaning and maintaining debris. Staff verified the integrity of the pipes at this time. 60 pipes were identified by different tiers and locations. A lot of the pipes are overlapping so the goal is to target each of the 60 pipes to be replaced or lined this year. Hopefully a contract will be awarded before next rainy season.
- iii. Image of pipe shown during meeting – roots broken through the pipes, Public Services group removed debris and cleaned the pipes. Trimming device installed further upstream that cuts any roots and branches. A camera goes in during cleanup so staff can see the quality of the pipes. Installed 1940-1980s. Rust affecting integrity of the pipes. Concrete pipes also have cracks.
- iv. Staff identified a couple locations with pipes that are so severe that need replacement. Staff will check if any projects align in the area. West Charleston Arastradero Project (cost savings –

Streets group is funding the street re-pavement and Stormwater group will fund the replacement of the pipe they were already going to work on).

- v. Improvement options – when a pipe is failing, a trenchless method is used where a fabric reinforcement material is inserted into a pipe with a material that adheres to the pipe. The soft material is placed into a broken pipe and expands to take the same shape as some of the pipes. This method is great for elliptical pipes. Converting from concrete pipes to HDP pipe. Faster than full replacement. Full replacement would need trench excavation (another option if rehab doesn't work).
- vi. Rusted pipes can be rehabbed if there are no cracks or root intrusion. The liner will extend the life of the pipe (at least 20-30 years depending on the quality of the pipe), the liner will increase the velocity of the pipe.

5. Staff Update on Caltrans Trash Control Device (10 min)

Pamela Boyle Rodriguez – Stormwater Compliance Manager with Watershed Protection Group. Work responsibilities include making sure the City is compliant with the Regional Stormwater Quality requirements, including business and construction inspections, reducing trash, and trying to increase the amount of GSI at the City. Originally from the East Coast, but lived in the West Coast for the last 20 years. Received her undergraduate degree from North Carolina State in Natural Resource Management and Master's Degree in Environmental Science. Career has been focused in Watershed/Stormwater and has been with the City for ~5 years.

- a. Staff wanted to take advantage of a grant opportunity with Caltrans to form a project on Embarcadero Road but they did not offer enough funding at first, so staff delayed project due to tight budget. Caltrans is now Caltrans providing full funding, but the project must be done during this fiscal year.
- b. Background – must follow strict requirements by Regional Water Quality Control Board, every permittee in the region must reduce trash by 100% by 2025 (extended from 2022). Reduction percentage will be compared to 2014 levels of trash as baseline, or no adverse impact to receiving waters (San Francisco Bay). Currently City is at 80% trash reduction. Going from 80% to 100%

will be a large effort. This project will provide a trash reduction credit and get the City from 80% to 85% due to the drainage area that will be captured. Trash capture device must catch trash as small as 5mm.

- c. Estimate for design and installation, 2 devices will be installed for \$613k. Caltrans will fund the entire project and City will take lead. Budget includes replacing the grass and restoring the area to as it was before.
- d. Location – underground in line with the pipes by the Palo Alto Golf Course. The City’s drainage area is 189 acres, and the Caltrans right of the way is 21 acres, the project will drain into our storm drain system. Everything upstream will be captured in this device. Caltrans can receive credit for reducing trash for those 21 acres.
- e. Maintenance over 50 years (lifecycle of this device). Approximately \$272k to maintain from City and Caltrans will reimburse. This is covered by the fee for maintenance of the storm drain system.
- f. Staff will go to Council June 14th to enter an agreement with Caltrans. Agreement will need to be signed by Caltrans and this will need to be done by the end of June. We can release RFP in a couple of months. We will be contracting consulting firm to figure out best device to install. These devices are only made by a couple vendors. Designs should not take too long, construction by next summer and completed before next season in 2022.
- g. Dena Mossar, question: Will there be an annual analysis of effectiveness overtime? Will we ever know how we’re doing?
 - i. Pam Boyle Rodriguez, answer: We will be able to weigh the amount of trash and sediment over time and we can look at numbers yearly.
- h. Hal Mickelson, question: How well do we do in comparison to other cities?
 - i. Pam Boyle Rodriguez, answer: In Santa Clara County, there are some cities that are further ahead and some that are further behind. You get 100% credit with these projects, but others such as cleanups are only partial credits. San Jose has put in 8 of these devices and were able to receive a lot of

credit this way. But other cities that don't have the topographic area to install these devices need to do other things to reduce trash.

- i. Marilyn Keller, comment: overflowing trashcans in local parks seem like its causing litter in the area.
 - i. Karin North: Parks department increased trash pickups over the weekends, but we will reach out to those departments to increase pickups.
- j. Dena Mossar, comment: There are trash pickups with automatic arms that also cause trash in the street.
 - i. Karin North: Zero Waste is aware of this issue and is promoting bagging of the trash to prevent stray trash from flying.
 - ii. Pam Boyle Rodriguez: Staff can share a presentation on how we reduce trash and how we can receive credits for reducing trash in the future.

6. Review Final Workplan (13 min)

- a. Loretta Olmos – Public Works Engineering Management Analyst, helps Michel Jeremias and Jamie Perez on Capital Improvement Program Projects.
- b. Hal Mickelson – highlighted updates made to workplan since last meeting and what was added in response to past inputs from committee members.
- c. Karin North – Workplan was submitted and will be approved by Council by the end of June, deadline was May. Workplan kept broad and highlighted goals and missions. This is the first workplan of the SWMOC.
- d. Hal Mickelson - Council uses these workplans as a management tool.

7. Staff Update on EPA Grant (10 min)

Pamela Boyle Rodriguez – Greening Parking Facilities for a Sustainable Community

- a. Staff processed documentation to receive a grant from EPA. Submitted application May 2020. Staff did not receive the grant at the time but was placed on a waiting list if more funding came later. EPA reached out earlier this year to let staff know more funding became available and staff received the grant.
- b. Grant submitted by Palo Alto (lead applicant), the City of Santa Clara, and San Francisco Estuary Institute (lead researcher for looking at water quality in SF Bay), Grassroots Ecology, and San Jose Conservation Corps, Stormwater Clean Water Program for Santa Clara Valley.
 - i. Goals of the project:
 1. Retrofit two parking lots with green infrastructure in both the cities of Santa Clara and Palo Alto.
 2. Create a guidebook for other cities that include the lessons learned from this project and how to do a similar project for their parking lots.
 3. How to provide maintenance and training for GSI, look at what is the best framework for City Palo Alto to create a workforce program for creating green jobs for local community and increase local experience in GSI.
 4. Community engagement and community education
 - ii. Project will monitor water quality entering the green infrastructure features and exiting it, before and after construction.
 - iii. Staff would like to involve the community in some way through education event. City of Santa Clara will be doing school education programs.

- iv. Budget for parking lot (we need to match by 50% with partners, 1.2 mil budget). Construction will be in a couple years 2023.
- c. Lot A Emerson/Lytton; Staff looked at multiple parking lots with grading/drainage and proximity to storm drain systems:
 - i. This location was chosen because troubling location to Watershed Protection Group - over 10 restaurants use trash bins here and spills in this location.
 - ii. Office of transportation would like to revamp this area. Trees need to be retrofitted. No amenities for bicycles, pedestrian friendly
- d. Ideas – proposed retrofit (preliminary)
 - i. GSI integration
 - ii. EV chargers, EV lighting
 - iii. Updates for community parking lot (like a Farmer’s Market)
 - iv. Water quality – main purpose
 - v. Sustainable parking lot
 - vi. Take concrete out and add landscaping, pervious pavement, and integrate more trees.
- e. Expensive project, Staff is not recommending making every parking lot like this, but this project was awarded a grant.
- f. Marilyn Keller, question: Trees slow down peak flows, filters the air, and makes nicer community space. Is there also any consideration for solar panels?
 - i. Pam Boyle Rodriguez, response: talked to Utility Department and that was another idea came up. Solar panels could be funded with the EPA grant if it fits in the budget.

8. Staff Update on Stormwater Rebate Program (10 min)

Joanna Tran – Program Assistant in the Watershed Protection Group and works on the Policy and Outreach team. Recently took over as the lead for the Stormwater Rebate Program as the lead from Isabel Zacharczuk. Bachelors Degree in Environmental Studies from San Jose State University and has been with the City for almost five years.

- a. Outreach campaign for the stormwater rebate program ran for the months of April and May. Campaign consisted of:
 - i. Residential and commercial Utility Bill Insert in partnership with the Utilities rebate program.
 - ii. Ads on Google, Facebook, Youtube and Palo Alto Online. These ads were in the form of images, gifs, and videos.
 - iii. Social media posts by City Managers Office on Facebook, Twitter, Instagram, and Nextdoor.
 - iv. Newsletters to Green Stormwater Infrastructure and Sustainability lists.
- b. New supporting webpage was created, “Building Resiliency to Drought with Stormwater Rebates”.
- c. Two workshops in partnership with BAWSCA: Landscape Design (rain gardens) and Pervious Pavement. Both workshops were well-attended.

9. Staff Update on GSI Program (5 min)

Pamela Boyle Rodriguez

- a. A new Utility Bill Insert will be sent out in July with the topic of “healthy creeks”
- b. Staff plan to create new yard signs for people that participate in rebate program. Slogan along the lines of “I helped protect the Bay!”
- c. GSI Program: In the Works

- i. Dena Mossar and David Bower have been working on the SWMOC Funding Adhoc Group. Figuring out new opportunities to leverage stormwater fee for additional funding to maintain and construct GSI. Will come back to the group in Sept with update
- ii. Rinconada project is pending, funding is ready for GSI but it was intended to be part of the improvement projects with Rinconada. Not determined what to do if the project is put on hold and whether staff will move forward on including drainage on Hopkins and GSI features.
- d. GSI Implementation Project Kick-off this month. Finalizing contract with consultant, will be implementing new tools from GSI Plan
- e. Staff is researching how to make rain barrels more available to Palo Alto residents without having to go through regular rebate application process.

Committee Member Comments and Announcements (10 min)

- a. Hal Mickelson – thanked and recognized Karin North for working on a lot of projects for the SWMOC.
- b. David Bower – When will meetings be back in person?
 - a. Karin North – City staff is still remote. There is discussion about potentially bringing back staff in August, but still anticipating official word from City Manager. Council will go back end of August and is looking to do a combination of Zoom and in-person meetings.
- c. Karin North – Confirm with Michel Jeremias of potential field visit for next August meeting.
 - a. Michel Jeremias – Project has not gone out to bid yet and not sure when contract will start. Group can schedule a field visit to see rehab work that happens. Realistically, Sept/Oct timeframe is more ideal to see something worth watching after project starts moving along.

Tentative Agenda Items for Future Meetings and Review Action Items (5 min)

Adjournment 2:56pm

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CITY

Engineering Group
Rajeev, Vicki, and Michel

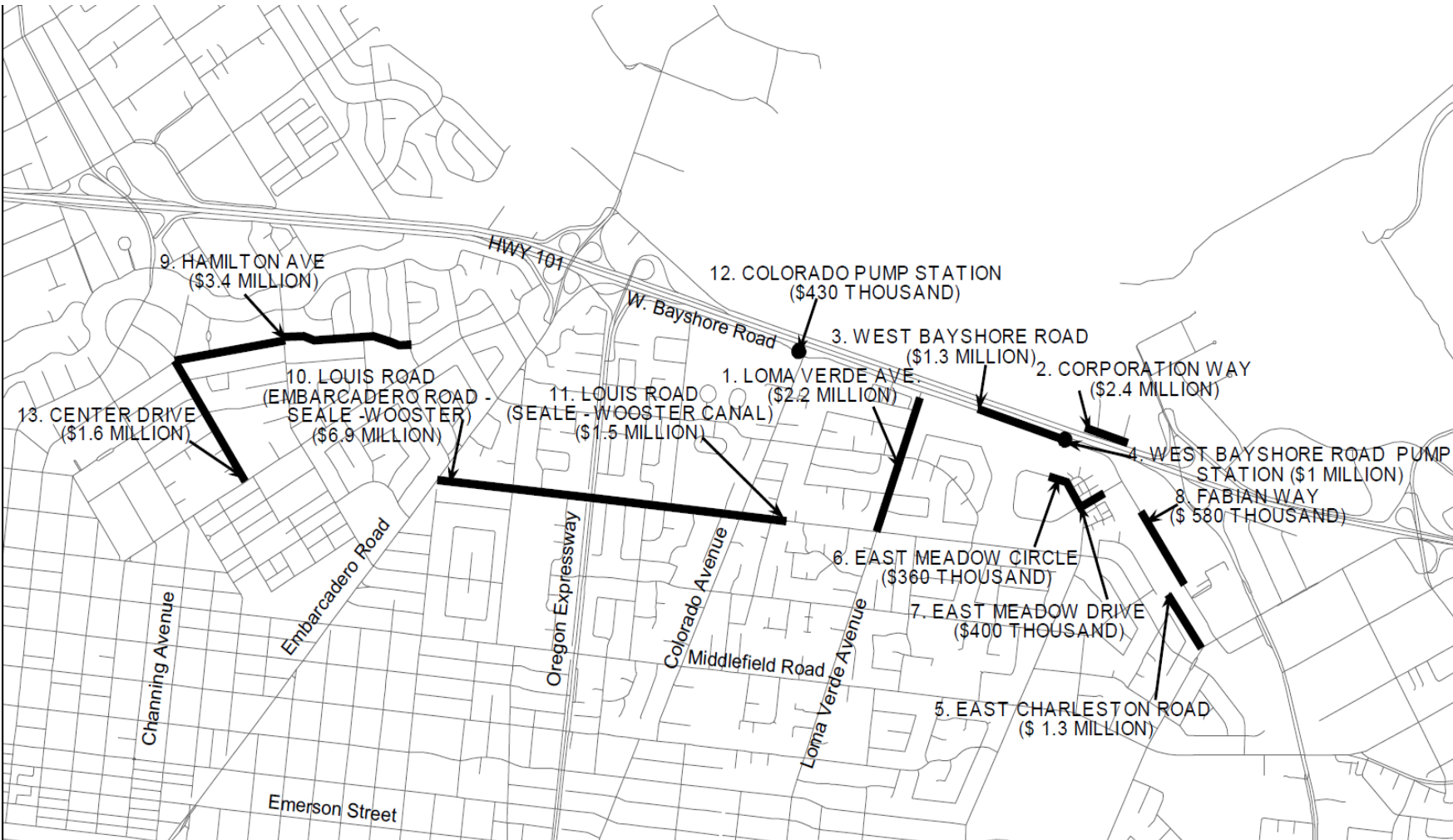
OCTOBER 7, 2021

www.cityofpaloalto.org

2017 BALLOT MEASURE CIP PROJECTS

OBJECTIVE: Implement projects that will reduce flooding risk

- 13 PROJECTS / 15 YEARS (2032)
- 9 PIPE UPGRADES
- TWO NEW PUMP STATIONS
- REMOVAL OF ONE EXISTING STATION



Storm Drain Capital Improvement Projects

Ballot Measure	SD Master Plan #	CIP Project Names (Blue Ribbon Committee's Recommended List Names)	Priority	Programmed	Budget Book #	Design Services	Construction Bid	Status	Start Date	End Date
1	11	Loma Verde Ave	High	Yes	SD-19000	In-house	FY 2021	Completed	Aug 2020	Dec 2020
2	1	Corporation Way & E Bayshore	Highest	Yes	SD-21000	Outside consultant	Bid FY 2022	In progress	Feb/Mar 2022	Nov/Dec 2022
3	3	W Bayshore & Fabian Capacity Upgrades	High	Yes	SD-23000	Outside consultant	Bid FY 2022	In progress	May 2023	Oct/Nov 2023
4	4	W Bayshore & Fabian Pump Station	High	Yes	SD-20000	In-house	Bid FY 2022	In progress	Jan/Feb 2023	Sept/Oct 2023
5	5	E Charleston Rd & Adobe Creek	High			In-house				
6	6	E Meadow Circle Connect to Adobe Pump Station	High	Yes	SD-22000	In-house	FY 2023-2024			
7	7	E Meadow Drive Capacity Upgrades	High			In-house				
8	8	Fabian Way Capacity Upgrades	High			In-house				
9	9	Hamilton Avenue & Rhodes Capacity Upgrades	High			In-house				
10	12	Louis Rd (Embarcadero to Seale-Wooster Canal Easement) Capacity Upgrades	High			In-house				
11	13	Louis Rd (Seale to Matadero Creek) Capacity Upgrades	High	Yes	SD-24000	In-house	FY 2024-2025			
12	32	Colorado Pump Station Removal	Low			In-house				
13	15	Center Drive (Hamilton to Channing) Capacity Upgrade	Moderate			In-house				

Storm Drain Recurring Projects (Replacement and Rehab)

No.	Storm Drain Recurring Project Name	Design	Construction	Note	Status	Start Date	End Date
1	Repair of Alma Street / Oregon Expressway Storm Drain Box Culvert Overpass	Outside consultant	FY 2021	1	Completed	Dec 2020	Dec 2020
2	Storm Drainage System Replacement and Rehabilitation Project	In house	FY 2022	1	In progress	Oct 2021	June 2022

Note

1 This list does not include minor rehabilitation projects that are funded by SWM Fund but completed by either Public Services or part of separate CIP.

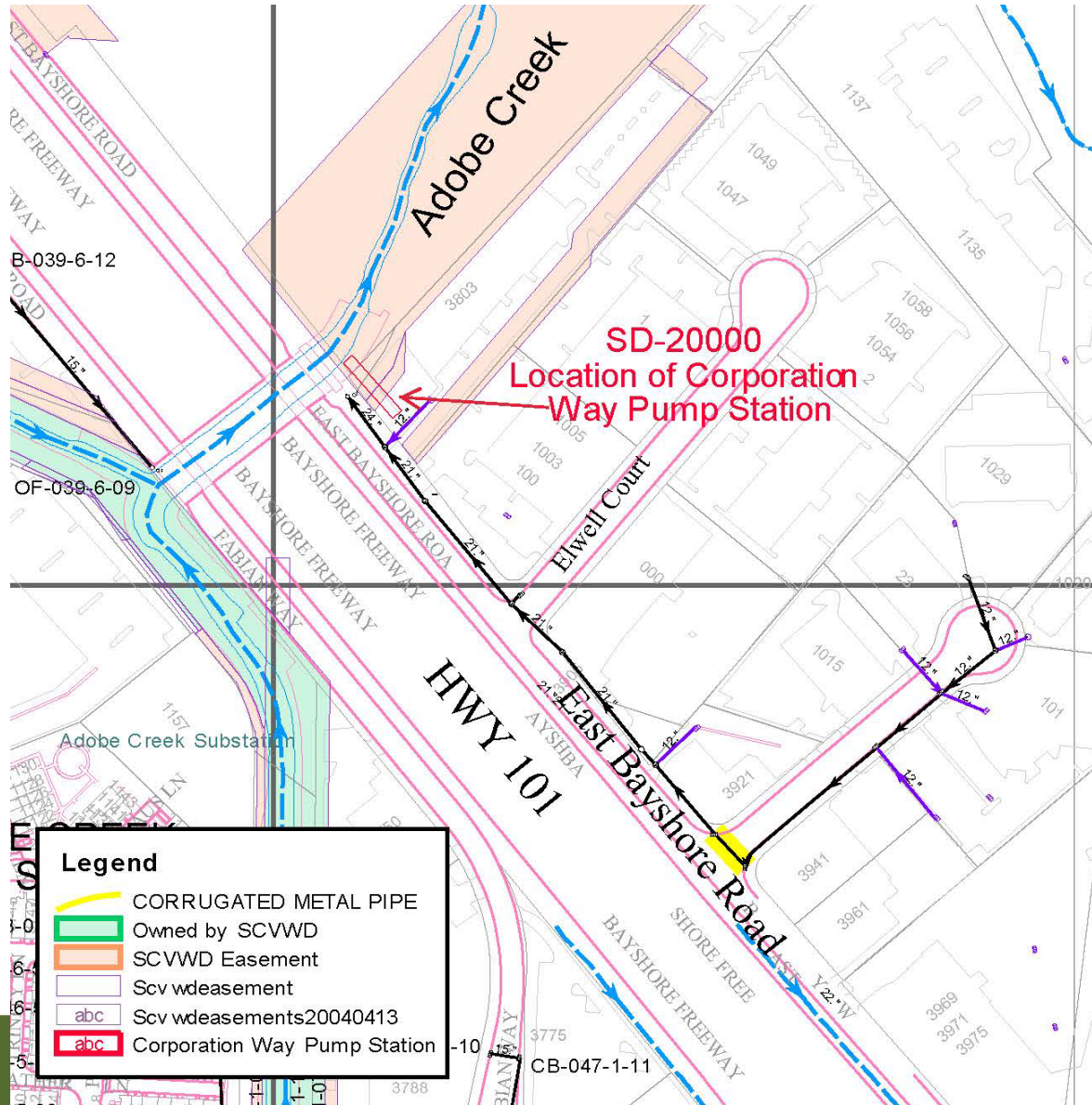


**CORPORATION WAY
AND WEST BAYSHORE
ROAD PUMP STATIONS
AND SYSTEM
UPGRADES PROJECT**

OCTOBER 7, 2021

www.cityofpaloalto.org

CORPORATION WAY PUMP STATION AND SYSTEM UPGRADES



PROJECT PURPOSE

- Install pump station to allow storm water flow into Adobe Creek.
- Prevent flooding on Corporation Way and East Bayshore Road.

PROJECT OBJECTIVES

- New 25 cfs pump station
- New fiber connectivity to City SCADA system
- Upgrade 700 LF of pipe from 21-inches to 30-inches

CORPORATION WAY PUMP STATION AND SYSTEM UPGRADES

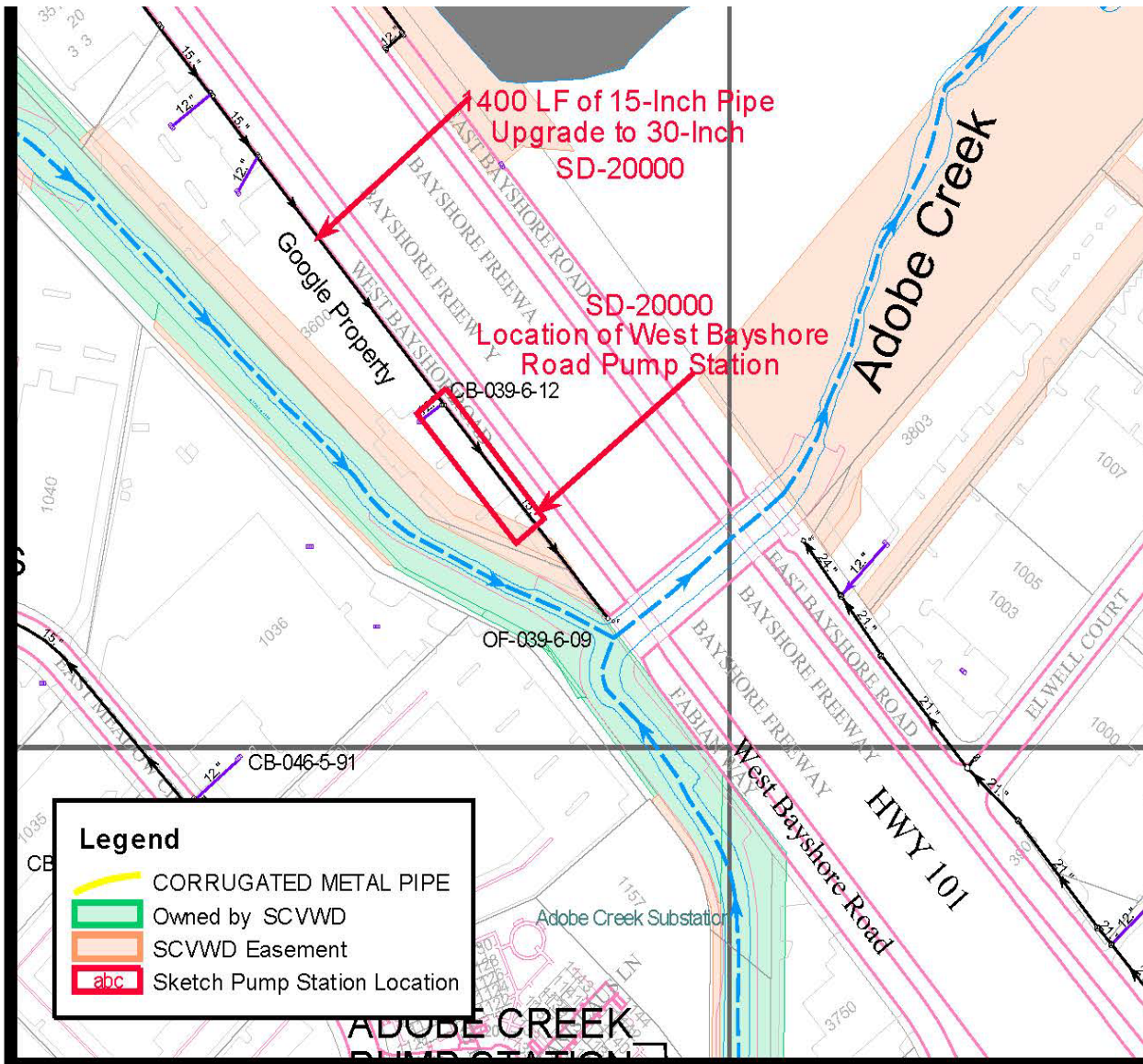


- Acquire easement from Google to install pump station facilities on their property.

PROJECT SCHEDULES

- Design Complete 2020/2021
- Construction Bid Feb. 2022
- Construction FY 2022/FY 2023
- Project webpage
www.cityofpaloalto.org/NewSDPumps

WEST BAYSHORE ROAD PUMP STATION AND SYSTEM UPGRADES



PROJECT PURPOSE

- Install pump station to allow storm water flow into Adobe Creek
- Prevent flooding on West Bayshore Road

PROJECT OBJECTIVES

- New 15 cfs pump station
- New fiber connectivity to City SCADA System
- Upgrade 400 LF of pipe from 15-inches to 30-inches

WEST BAYSHORE ROAD PUMP STATION AND SYSTEM UPGRADES



- Acquire easement from Google to install pump station facilities on their property.

PROJECT SCHEDULES

- Design Complete 2020/2021
- Construction Bid Feb. 2022
- Construction FY 2023/FY 2024



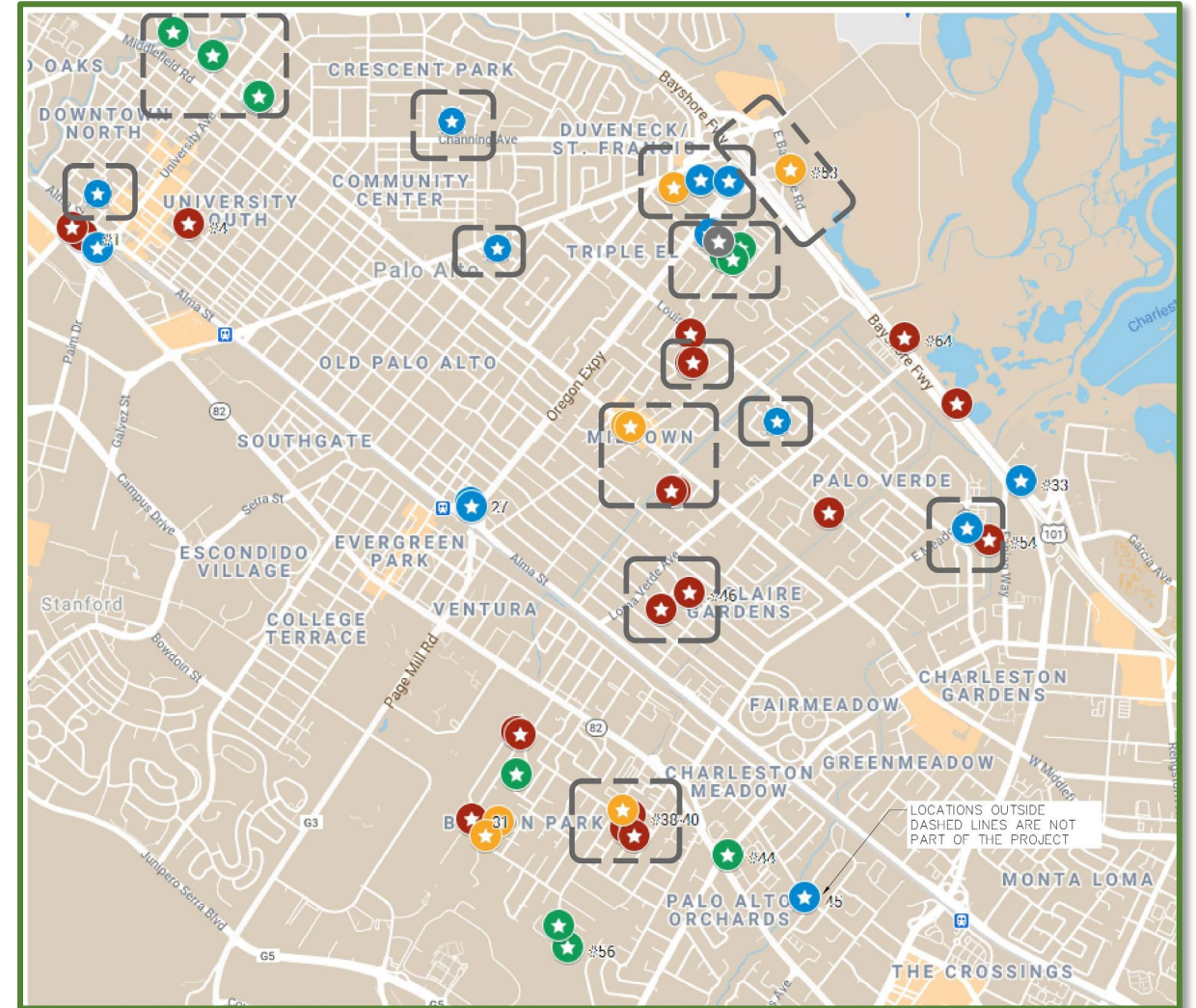
2680 Middlefield Rd
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Storm Drain System Replacement and Rehabilitation Project

October 7, 2021

Overview

- Pipes replacement and lining in 13 different locations throughout the city.
- Purpose
 - Intends to preserve and improve integrity of storm system
- Public Outreach
 - Project signs, flyers, website
 - City Website:
<http://cityofpaloalto.org/stormrehab>



Project Update

Project Timeline

- Bid Opening Date: July 30, 2021
- Bid Closing Date: August 24, 2021
 - 5 bids received
 - Awarded to Golden Bay Construction, Inc.
- Council Approval Date: September 27, 2021
- Construction Start date – October 2021

Project Budget

- Project Base Bid: \$1,250,923
- Project Contingency: \$125,093
- Street Cut Fees: \$32,000
- West Charleston Road: \$58,300
- Total Cost: \$1,466,316



CITY OF PALO ALTO

STORM DRAIN CAPITAL IMPROVEMENT PROJECTS LIST

STORMWATER MANAGEMENT OVERSIGHT COMMITTEE MEETING - OCTOBER 2021

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9	9	Hamilton Avenue & Rhodes Capacity Upgrades	High			In-house				
10	12	Louis Rd (Embarcadero to Seale-Wooster Canal Easement) Capacity Upgrades	High			In-house				
11	13	Louis Rd (Seale to Matadero Creek) Capacity Upgrades	High	Yes	SD-24000	In-house	FY 2024-2025			
12	32	Colorado Pump Station Removal	Low			In-house				
13	15	Center Drive (Hamilton to Channing) Capacity Upgrade	Moderate			In-house				

No.	Storm Drain Reccuring Project Name	Design	Construction	Note	Status	Start Date	End Date
1	Repair of Alma Street / Oregon Expressway Storm Drain Box Culvert Overpass	Outside consultant	FY 2021	1	Completed	Dec 2020	Dec 2020
2	Storm Drainage System Replacement and Rehabilitation Project	In house	FY 2022	1	In progress	Oct 2021	June 2022

Note

1 This list does not include minor rehabilitation projects that are funded by SWM Fund but completed by either Public Services or part of separate CIP.



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CITY OF PALO ALTO GSI IMPLEMENTATION PROJECT

Stormwater Management Oversight Committee Meeting

October 7, 2021

New Business, Item #2



GSI Plan Implementation Project Agenda

1. Project Background and Overview
 - a. Team Introduction
 - b. Project Introduction
2. Project Tasks and Deliverable Schedule
 - a. Three Year Schedule
 - b. Questions
3. Findings of Existing GSI Field Visits and Recommendations
 - a. Questions

Consultant Team Introduction



Kelly Havens, P.E., Geosyntec, Project Manager – Senior Engineer with 13 years experience in Green Stormwater Infrastructure (GSI) technical guidance.



Lisa Austin, P.E., Geosyntec, Project Director – Principal with 30 years experience with stormwater management and GSI



Brian Rowley, P.E., Geosyntec GSI Design Technical Advisor – Senior Engineer with 20 years experience in GSI and geotechnical design.

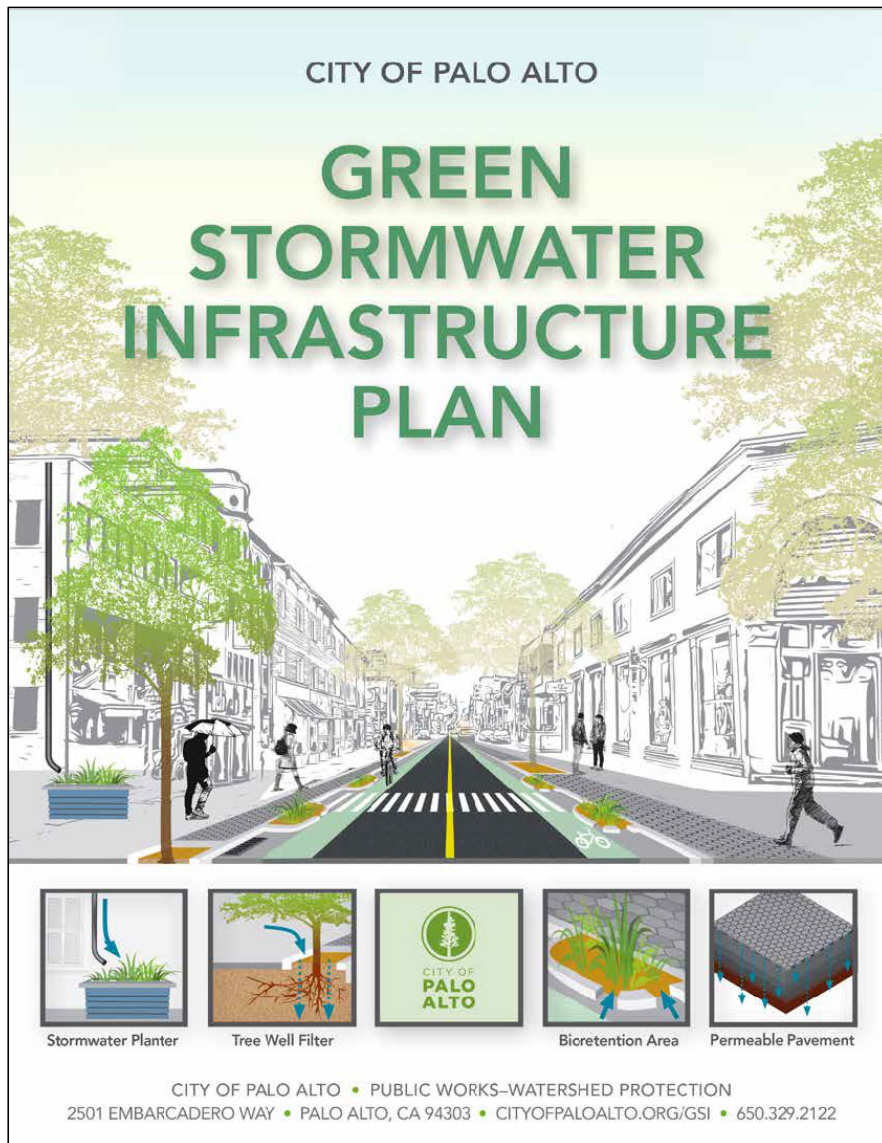


Karen Ashby, CPSWQ, LWA, Maintenance and Inspection Tasks – Vice President with 30 years of experience in stormwater management programs, program effectiveness and training.



Alina Constantinescu, P.E., QSD, LWA, Maintenance and Inspection Tasks – Project Engineer with 17 years experience in GSI inspections, training, and evaluations.

Green Stormwater Infrastructure



- GSI is engineered infrastructure that is **based on natural processes to manage stormwater runoff**
- GSI is an alternative to “gray” infrastructure, **providing a pathway for stormwater to:**
 - **infiltrate,**
 - **reduce and/or treat pollutants, and**
 - **provide water use opportunities**



GSI Types



Vegetated Swale

Infiltration Facility



Bioretention



Permeable Pavement



Green Roof



Tree Well Filter , a.k.a. Suspended Pavement System



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GSI Installations/Inspiration





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GSI Installations/Inspiration

South Station Street in Etobicoke-York is a City of Toronto green streets demonstration site. It features trees, landscaping and stormwater retention components.





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GSI Installations/Inspiration



Porous concrete parking lane, VENTURA
City of Ventura, CA



SE Division Street, PORTLAND
Metro



osyntec
consultants



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Three Year GSI Plan Implementation Project Scope

Task	YEAR #1 (June 21-Dec 21)	YEAR #2 (Jan 22-Dec 22)	YEAR #3 (Jan 23-Dec 23)
City-specific GSI Design Handbook	Index of Standard Conditions Flow Chart	Draft and Final City Handbook	<i>No deliverables</i>
	Handbook Outline		
Lessons Learned (for existing GSI)	Field visits; Compendium of Lessons Learned	<i>No deliverables</i>	<i>No deliverables</i>
Maintenance & Monitoring Manual	Maintenance Lessons Learned Compendium	Draft and Final Manual	<i>No deliverables</i>
	Manual Outline		
Inspection Guidance and Training	<i>No deliverables</i>	Inspection Program Evaluation and Memo	Inspection Guidance Manual
			Train the Trainer instruction.
Performance Metric(s) and Evaluation Tool	<i>No deliverables</i>	<i>No deliverables</i>	GSI Performance Metrics and Evaluation Tool



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Three Year GSI Plan Implementation Project Scope

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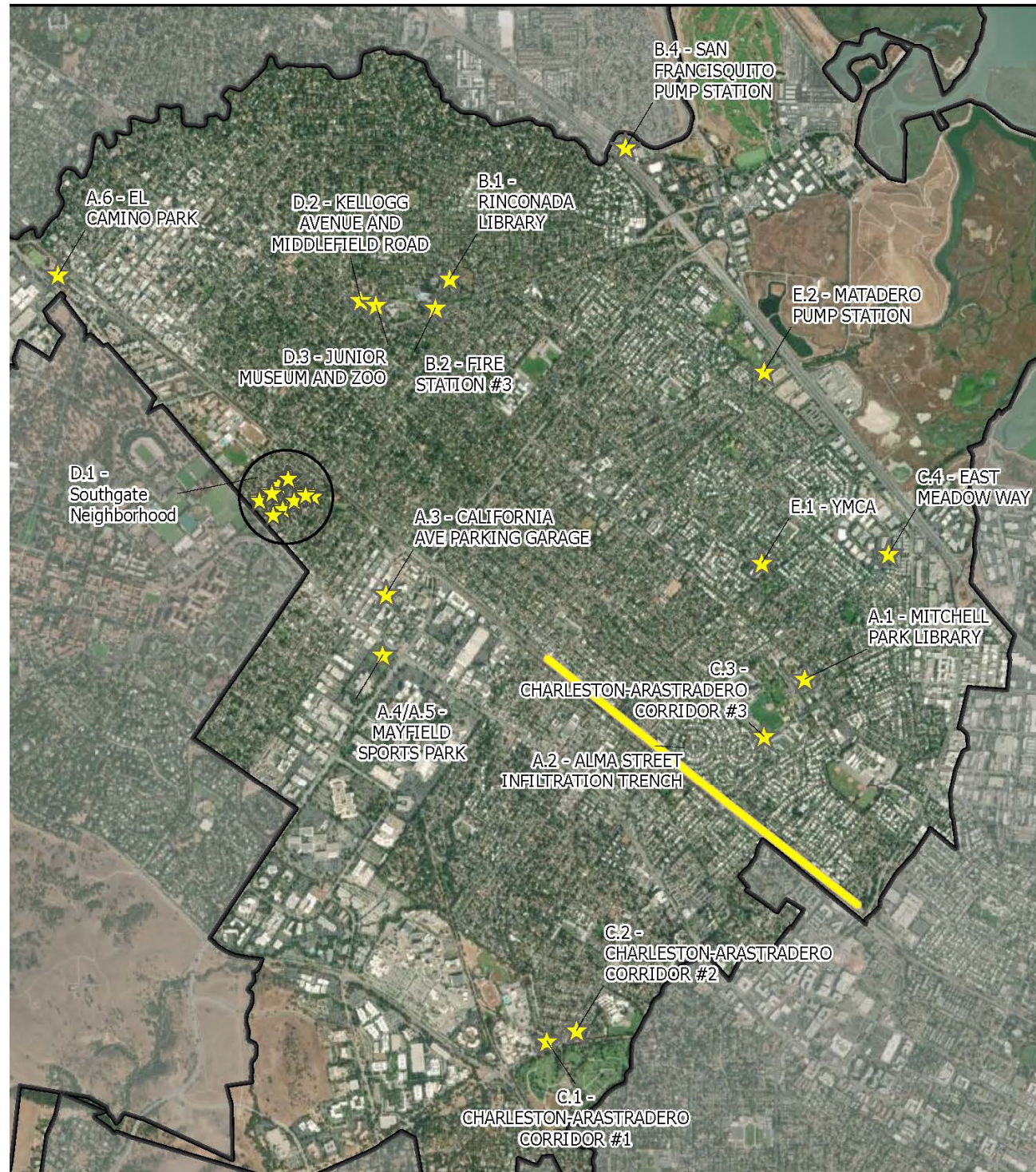
Task 2 Compendium of Lessons Learned

- The Project Team visited seventeen existing GSI facilities over two field days (June 29 and July 8)
- City staff from Stormwater Compliance, Maintenance, Community Services, Forestry, and Public Works attended visits, along with Grassroots Ecology
- A total of 26 GSI measures were visited (sometimes multiple at the same site)



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Sites Visited



Task 2 Compendium of Lessons Learned – Bioretention Design



Mitchell Park Library

Inlet and Overflow

Vegetation blocking inlet



Southgate Neighborhood

Inlet size and location allows for cars to back into bioretention

Overflow lower than inlet



Mitchell Park Library



Task 2 Compendium of Lessons Learned – Bioretention Design

Health and Safety



Drop next to sidewalk

Charleston Arastradero #2



Curb installed

Charleston Arastradero #3

Limited Pedestrian Pathways



Mitchell Park Library

Task 2 Compendium of Lessons Learned – Other Facility Design



Mitchell Park Library

Impractical maintenance access to green roof

Green Roof, Permeable Pavement Suspended Pavement

Cracks where heavy equipment had been driven on permeable pavement



San Fransiquito Pump Station



East Meadow Way

Soil slumping at Suspended Pavement Installation

- Most City permeable pavement was in very good condition



Task 2 Compendium of Lessons Learned – Bioretention/Bioswales

Vegetation, Irrigation, and Mulch



Rinconada Library

Dead/dying plants due to inappropriate plant palette, no mulch



YMCA

Sparse plants, no irrigation, no mulch



Healthy, thriving vegetation, with mulch

Fire Station #3

- Invasive species and/or those that could clog inlets should not be planted in vegetated GSI measures or carefully controlled



Task 2 Compendium of Lessons Learned – Bioretention/Bioswales

Other Maintenance



Excessive leaf litter

Kellogg Avenue and Middlefield Road



Excessive leaf litter

Charleston-Arastradero #1

- Recommend maintenance tasks and frequency be customized based on site needs
- Recommend staff/contractor training
- More frequent inspections of GSI measures



Palo Alto GSI Handbook

- GSI Measure Selection and Siting Tools
- City-specific GSI Guidance
- GSI Measure Details and Specifications
- GSI Design Checklist and Plan Check Review Checklist

Goal: Provide simplified, useable, City-specific guidance to assist City staff in GSI implementation

Examples of Existing Resources

C.3 Stormwater Handbook

Guidance for Implementing Stormwater Requirements for New Development and Redevelopment Projects

June 2016

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

Green Stormwater Infrastructure Handbook

Guidance for Implementing Green Stormwater Infrastructure in Public Streetscapes, Parking Lots and Parks

September 2019

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

Green Stormwater Infrastructure Handbook Part 2

Guidance for Integrating Green Stormwater Infrastructure in Public Streetscapes, Parking Lots and Parks

SEPTEMBER 2019

Prepared for the
Santa Clara Valley Urban Runoff
Pollution Prevention Program
by EOA, Inc.

Jill Bicknell, P.E.
Kristin Kerr, P.E.
Peter Schultze-Allen, CPSWQ, BFGP
Liesbeth Masini, M.S.
Courtney Siu, P.E.
Quan Lu

CONSTRUCTION NOTES:

1. CHECK DRAIN SPACING TO PROVIDE FLOODING PER SITE SPECIFIC DESIGN.
2. SLOPE TOP OF PLANTER WALL TO MATCH LONGITUDINAL SLOPE OF ADJACENT SURFACE.
3. LAY OUT DRAINAGE NOTCHES TO PREVENT FLOODING BEHIND PLANTER WALL WITH 8" MAXIMUM SPACING BETWEEN NOTCHES.
4. PROVIDE ONE CLEANOUT PER PLANTER (MIN) FOR FACILITIES WITH UNDERDRAINS.
5. MINIMUM SPACING BETWEEN AND PROTECTION MEASURES MUST CONFORM TO CURRENT BEST PRACTICE PRODUCTION STANDARDS. COORDINATE WITH ENGINEER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.

WITH	COLLECTOR	AS SHOWN	AS SHOWN	AS NOTED	AS NOTED	AS NOTED	AS NOTED	AS NOTED	AS NOTED	AS NOTED	AS NOTED
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

GREEN INFRASTRUCTURE TYPICAL DETAILS
SAN FRANCISCO PUBLIC UTILITIES COMMISSION

BIORETENTION PLANTER
ROADSIDE PLANTER WITH PARKING PLAN

BP 2.1

NOT FOR CONSTRUCTION - REFER TO USER GUIDE

GREEN INFRASTRUCTURE CONSTRUCTION GUIDE BOOK

CITY OF SFRAFFI'S
STORMWATER MANUAL
AUGUST 2017

SEWER SYSTEM
WATER POWER SEWER
Grey, Green, Clean.

Protecting Seattle's Waterways

Volume 3: Project Stormwater Control

CITY OF SFRAFFI'S
STORMWATER MANUAL
AUGUST 2017

CITY OF GRESHAM Stormwater Management Manual

An Implementation Guide for Development Projects
October 2019

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1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
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GREEN INFRASTRUCTURE TYPICAL DETAILS
SAN FRANCISCO PUBLIC UTILITIES COMMISSION

BIORETENTION PLANTER
ROADSIDE PLANTER WITH PARKING PLAN

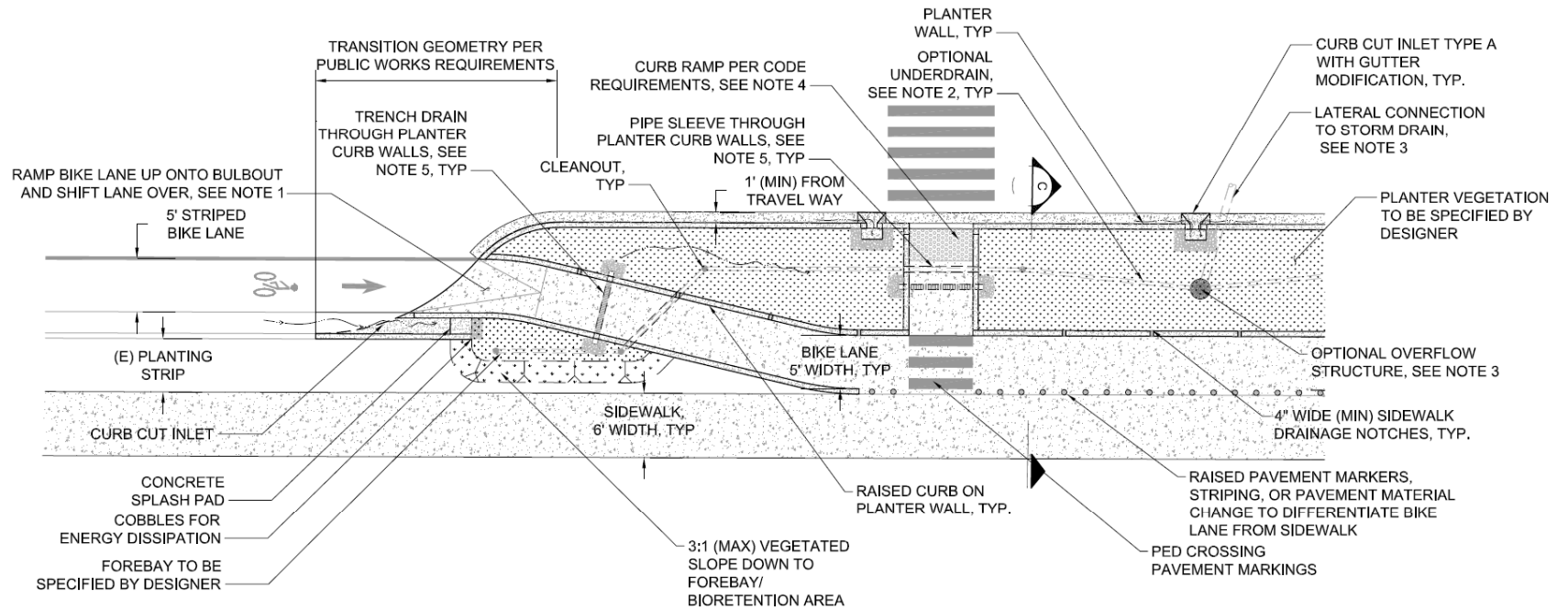
BP 2.1

NOT FOR CONSTRUCTION - REFER TO USER GUIDE

Preview of what GSI Details Look Like

NOTES:

1. FOR HORIZONTAL BIKE LANE SHIFT, PROVIDE MAXIMUM 1:5 TRANSITION RATE.
2. PROVIDE UNDERDRAIN WHERE REQUIRED TO MEET THE MINIMUM SURFACE WATER DRAWDOWN TIME. LONGITUDINAL SLOPE OF PIPE SHALL BE 0.5% MINIMUM. PROVIDE CLEANOUT AT UPSTREAM END AND ANGLE POINTS EXCEEDING 45 DEGREES.
3. DESIGNER TO SPECIFY OVERFLOW STRUCTURE SIZE AND MATERIAL. WHERE FEASIBLE, CONNECT TO THE EXISTING STORM DRAIN LATERAL SERVING THE CORNER CATCH BASIN BEING REMOVED, IF ANY.
4. ADHERE TO ALL LOCAL AND FEDERAL ACCESSIBILITY REQUIREMENTS FOR THE SIDEWALK AND CURB RAMP DESIGNS.
5. PROVIDE TRENCH DRAINS THROUGH PLANTER CURB WALLS TO ALLOW FOR THE HYDRAULIC CONNECTION OF SEPARATED BIORETENTION PLANTERS AND PIPE SLEEVES FOR THE PASSING OF SOLID UNDERDRAIN CONNECTOR PIPES.



BASMAA URBAN GREENING TYPICAL GI DETAILS BULBOUT ALTERNATIVE 4

MIDBLOCK BULBOUT WITH RAISED BIKE LANE AND PEDESTRIAN CROSSING

SCALE:
1"=10'

DRAWN BY:
BF

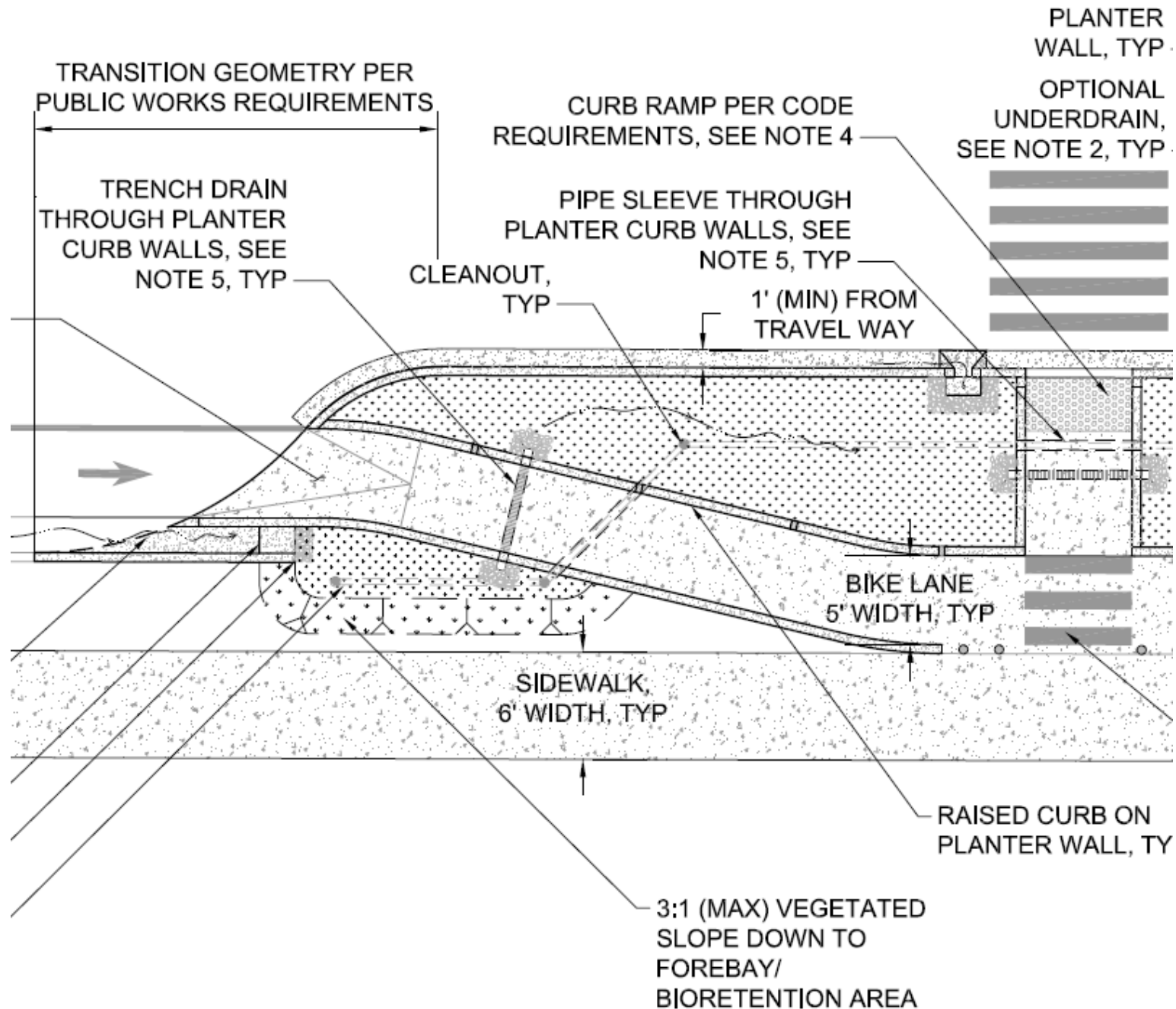
CHECKED BY:
SD

DATE :
APRIL 14, 2017

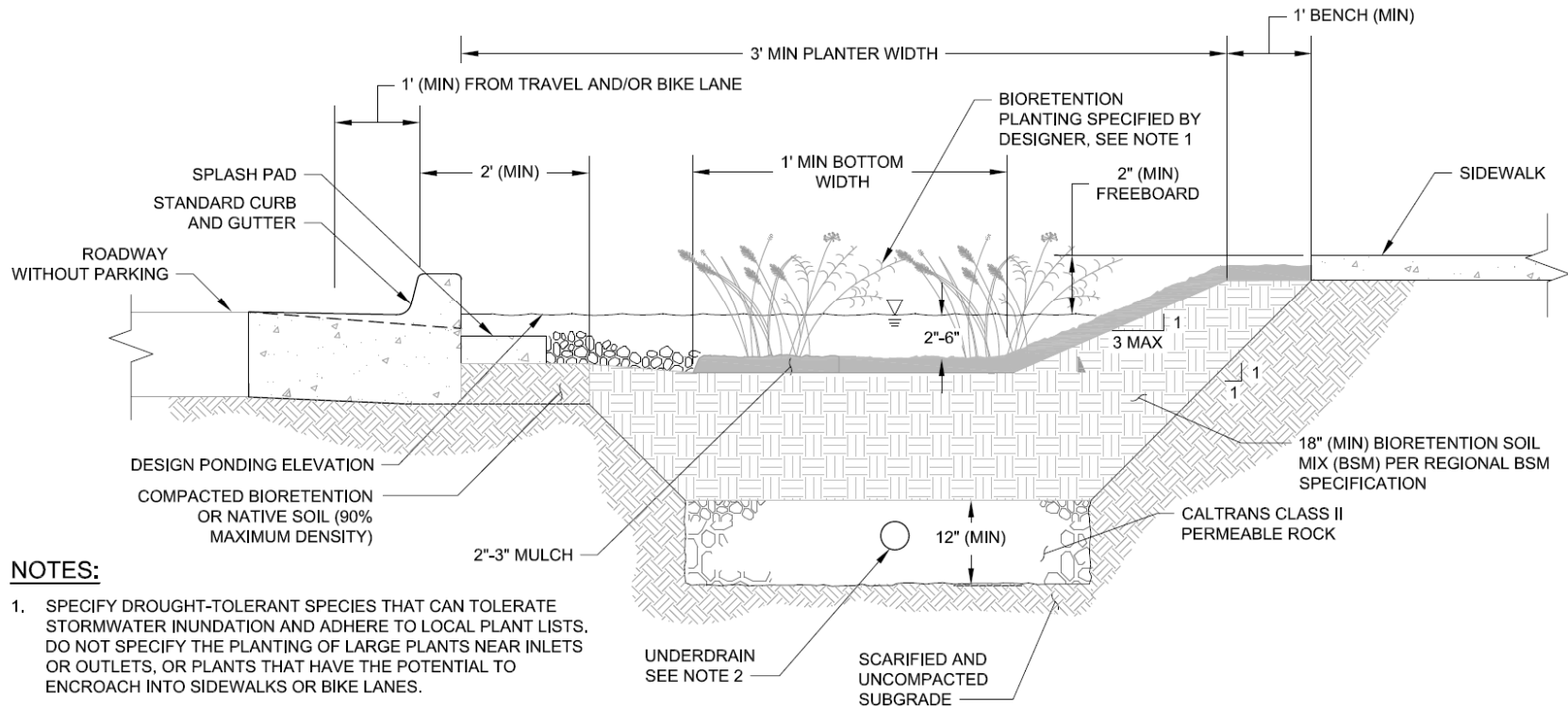
SHEET NUMBER

C-1.4

Preview of what GSI Details Look Like – Zoomed In



Preview of what GSI Details Look Like



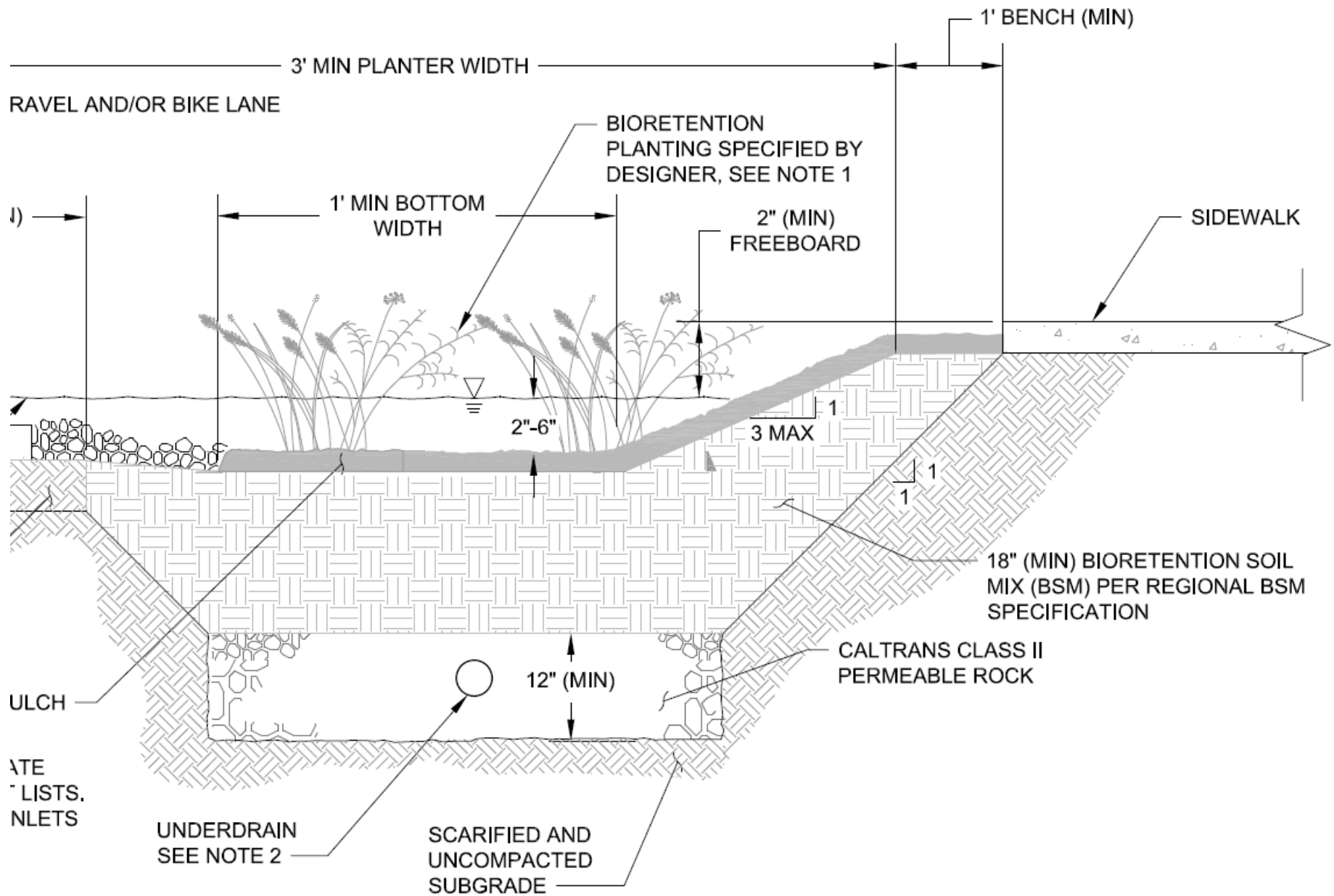
NOTES:

1. SPECIFY DROUGHT-TOLERANT SPECIES THAT CAN TOLERATE STORMWATER INUNDATION AND ADHERE TO LOCAL PLANT LISTS. DO NOT SPECIFY THE PLANTING OF LARGE PLANTS NEAR INLETS OR OUTLETS, OR PLANTS THAT HAVE THE POTENTIAL TO ENCROACH INTO SIDEWALKS OR BIKE LANES.
2. UNDERDRAIN PLACEMENT IS DEPENDENT ON SUBGRADE SOIL CONDITIONS. FOR TYPE B/C SOILS, THE UNDERDRAIN MAY BE ELEVATED TOWARDS THE TOP OF THE AGGREGATE STORAGE LAYER, APPROXIMATELY 3" BELOW BOTTOM OF BIORETENTION SOIL. FOR TYPE D SOILS, THE UNDERDRAIN SHALL BE PLACED 2" ABOVE THE SUBGRADE.

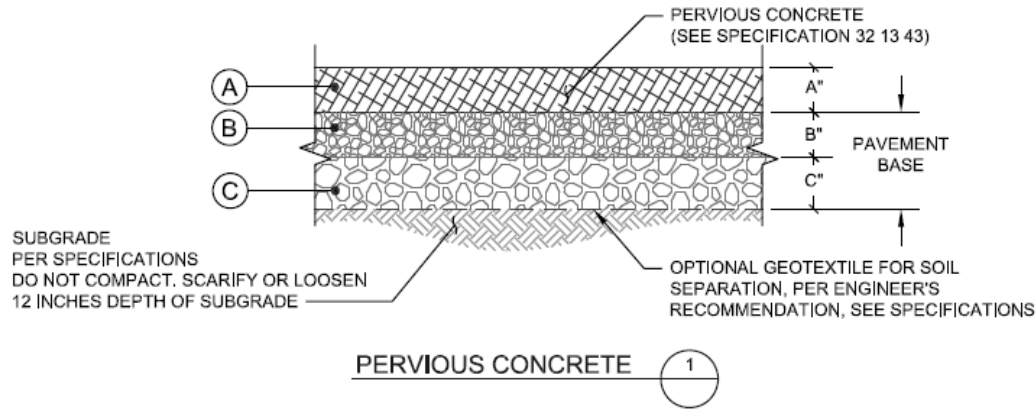
BIORETENTION BULBOUT SECTION (A)

<p>BASMAA URBAN GREENING TYPICAL GI DETAILS SECTION A-A <i>SLOPED SIDES / NO CURB WALLS</i></p>	<p>SCALE: 3/4"=1'</p>	<p>DATE : APRIL 14, 2017</p>
	<p>DRAWN BY: BF</p>	<p>SHEET NUMBER</p>
	<p>CHECKED BY: SD</p>	<p>S-A-A</p>

Preview of what GSI Details Look Like – zoomed in



Preview of what GSI Details Look Like



MINIMUM MATERIAL THICKNESS (IN) GUIDANCE:

LAYER	MATERIAL TYPE*	MODERATE VEHICULAR		LIGHT VEHICULAR		PEDESTRIAN	
		GOOD SOILS**	POOR SOILS**	GOOD SOILS**	POOR SOILS**	GOOD SOILS**	POOR SOILS**
Ⓐ	PERVIOUS CONCRETE	9	9.5	6.5	7	4.5	5
Ⓑ	BASE COURSE ASTM NO. 3 OR 57	6	6	6	6	6	6
Ⓒ	OPTIONAL RESERVOIR COURSE ASTM NO. 2, 3, OR 57	-	-	-	-	-	-

* MATERIAL FINER THAN NO. 100 SIEVE SHALL NOT EXCEED 2 PERCENT FOR ANY AGGREGATE LAYER (LICENSED PROFESSIONAL TO SELECT AGGREGATE).

** "GOOD" AND "POOR" SOIL CLASSIFICATIONS BASED ON AASHTO GUIDE FOR DESIGN OF PAVEMENT STRUCTURES. SEE DESIGNER NOTES FOR SUBGRADE ASSUMPTIONS. (LICENSED PROFESSIONAL MUST CALCULATE REQUIRED DEPTH BASED ON SITE CONDITIONS).

***FOR HEAVY VEHICLE TRAFFIC LICENSED PROFESSIONAL MUST CALCULATE REQUIRED DEPTH BASED ON EXPECTED LOAD AND SITE CONDITIONS.

CONSTRUCTION NOTES:

1. SEE PERVIOUS CONCRETE SPECIFICATIONS FOR WEARING COURSE, PAVEMENT BASE, SUBGRADE, AND OTHER REQUIREMENTS FOR PERVIOUS CONCRETE FACILITIES.
2. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO MUNICIPAL UTILITY STANDARDS AND OTHER UTILITY PROVIDER REQUIREMENTS. COORDINATE WITH ENGINEER IN THE EVENT OF UTILITY CROSSINGS AND UTILITY CONFLICTS.
3. IF UNDERDRAIN IS REQUIRED, DESIGN AND PLACEMENT IS PER ENGINEER'S RECOMMENDATION. SEE PC 3.1-3.4.
4. SEE PC 1.1-1.6 FOR EDGE TREATMENT.

NOTES		KEY MAP	SECTIONS		
PP 1.1	PP 1.2	PP 1.3	PP 2.1	PP 3.1	PP 4.1



GREEN INFRASTRUCTURE TYPICAL DETAILS

DETAIL ADAPTED FROM SAN FRANCISCO PUBLIC UTILITIES COMMISSION PP 3.1

DATE
SEPTEMBER 2019

VERSION
1.0

REVISED

PERVIOUS PAVEMENT MATERIAL SECTIONS PERVIOUS CONCRETE

DWG NO.

PP
3.1

NOT FOR CONSTRUCTION - BEED TO HICKED GUIDE



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Facility Selection Considerations

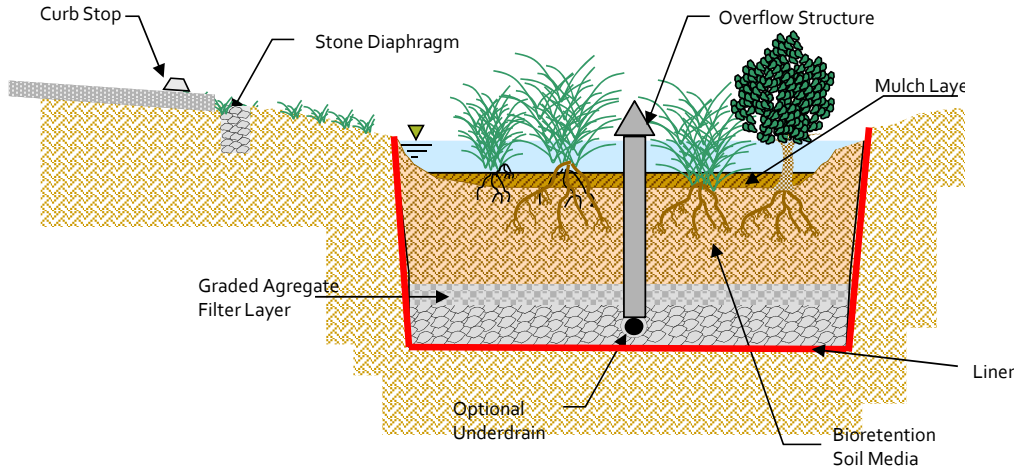
- Preferred GSI Measure Type
- Drainage Area Considerations (grade, direction of flow, size, etc.)
- Infiltration Feasibility (including underlying contamination, SLR)
- Site Type (Roadway, Park, Parking Lot, etc.)
- Space Constraints/ Site Use Constraints
 - Pavement surface needs
 - Proximity to buildings/foundations
 - Available space to site GSI
 - Utility conflicts
- Integration of GSI into Site Features

→ *Potential to incorporate some of these into City-wide Feasibility Maps*



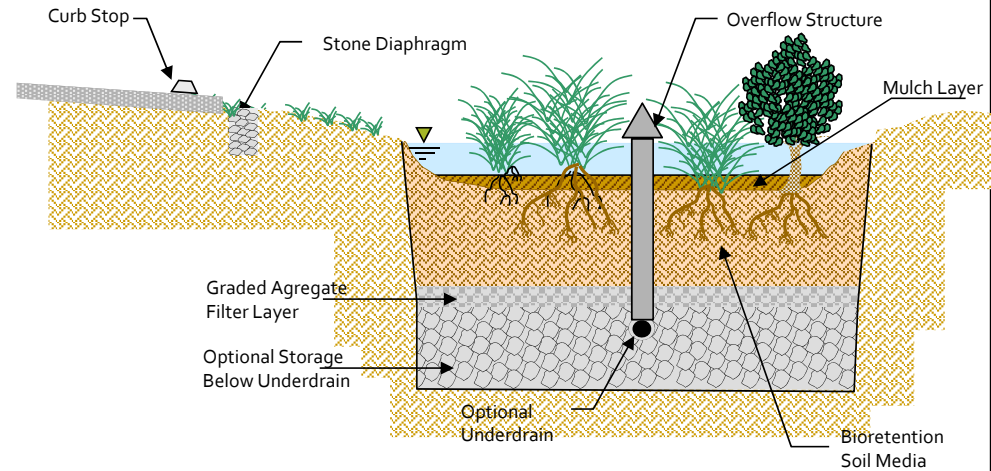
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Lined Bioretention

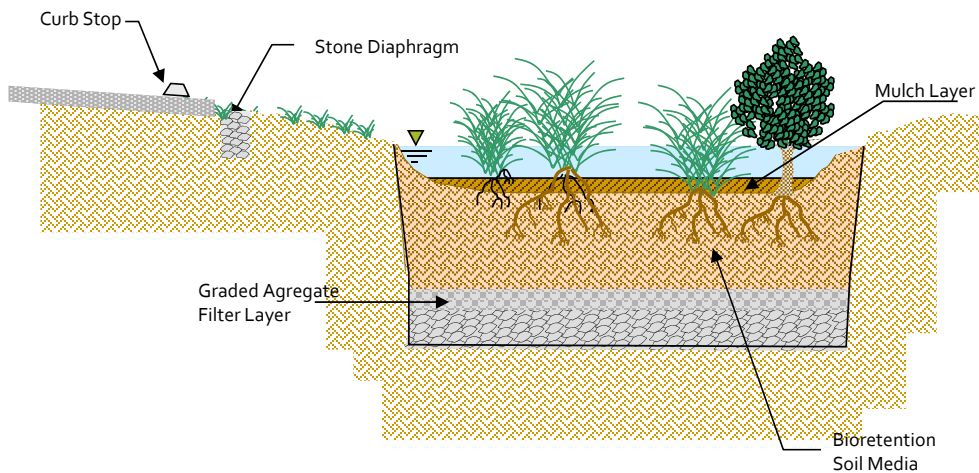


Overview of Infiltration Feasibility

Unlined Bioretention



Infiltrating Bioretention





**DRAFT SF Bay
Area Municipal
Regional
Stormwater
Permit
(AKA MRP 3.0)**

SWMOC Meeting

Oct. 7, 2021

New Business, Item #3

	Schedule	Review Period
Administrative draft release (not public)	January 2021	60-day (city staff only) No staff response
Tentative Order release (public)	Sept. 10, 2021	60-day (open to public) Staff responds
Board testimony hearing(s)	Oct. 12-13, 2021	Open to everyone
Written Comments	Due Nov. 9	County and City, (TBD)
Board adoption hearing	Feb. 2021	Date not confirmed
Permit effective date	July 1, 2022	

Current Schedule

Permit Overview

- Tentative Order (2nd draft) very similar to Administrative Draft (1st draft) with minor revisions
- Cumulative impact of many new/enhanced requirements has significant resource implications:
 - GSI numeric targets
 - Impervious surface thresholds
 - Road requirements
 - New monitoring requirements
 - Trash
 - PCBs
 - Cost reporting
 - Asset management
 - Additions to "core" requirements

New/Redevelopment (impervious surface impacts)

- Required stormwater treatment
 - 5,000 SF for most projects; 10,000 SF for residential
 - 5,000 SF (contiguous) road projects and some pavement maintenance
- Long-term GSI numeric goal to be developed during MRP 3.0
- Short-term goal – 3 acres treated per 50,000 population (prorated)
 - Palo Alto: 3.92 (65,364 population)
 - Projects constructed/funded between 1/1/21 and 6/30/27 count
 - Can be met on a countywide basis
 - Projects can be used to meet PCB requirements if in older industrial areas

Trash Reduction

- **Enforceable trash load reductions**
 - 90% reduction by June 30, 2023
 - 100% reduction by June 30, 2025
 - Includes addressing trash on private properties
- **Source Control Credits**
 - No credit for existing source control actions, only new actions
 - Credits only allowed towards 90% target, not 100%

PCBs & Mercury Reduction

- **Source Property ID & Abatement**
 - Acreage to be treated 913 acres
- **Control Measure Implementation in Old Industrial Areas**
 - Acreage to be treated 664 acres or load reduction of 121 gm/yr. of PCBs
 - GSI counts toward reduction target

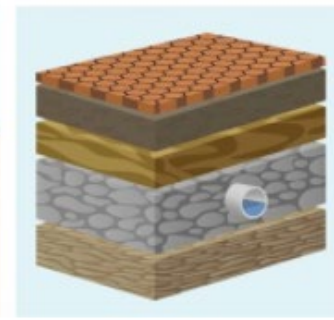
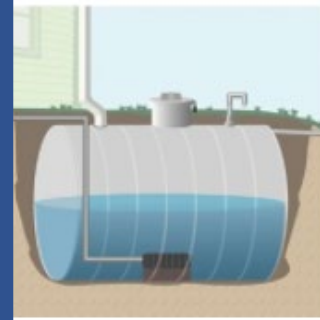
Other Requirements

- Bacteria Controls
 - Applies to Mtn.View and Sunnyvale (for now)
- Discharges associated with unsheltered populations
- NEW:
 - Cost tracking
 - Asset Management

CPA Stormwater Rebate Program

SWMOC Meeting
Oct. 7, 2021

New Business, Item #4



Rain Barrel	Cisterns	Pervious Pavement	Rain Gardens
Total Rebate Amount*: \$70/barrel	Total Rebate Amount*: \$1.00/gallon	Total Rebate Amount*: \$1.50/square foot	Total Rebate Amount*: \$2/square foot of roof diverted up to \$600
Size Requirement: 40-199 gallons	Size Requirement: ≥200 gallons	Size Requirement: 100 square foot minimum	Size Requirement: Minimum of 100 square foot diverted
Installation Requirement: Can be self-installed	Installation Requirement: Must be installed by a licensed contractor	Installation Requirement: Must be installed by a licensed contractor	Installation Requirement: Must be installed by a licensed contractor

Goals for Rain Barrel Program

1. To provide rain barrels to residents in an easy, accessible, and cost-effective way.
2. To increase rain barrel rebate applications.



How it will work

1. WPG MOU with Rain Water Solutions (RWS)
 - 6-wk pilot (10/1-11/14)
 - Residents, businesses, and CPA employees
2. RWS e-commerce website
rainbarrelprogram.org/paloalto
3. WPG ad campaign: newsletters, social media, PA Online, etc.
4. Purchases shipped at one time to MSC
5. Dec. 4th distribution event

Ad Example

Limited Time Offer on Discounted Rain Barrels!

\$80* per barrel or

\$10 per barrel

after qualifying rebate applied



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**40% savings from retail value*



Sales close Nov. 14, 2021. Click for more details!



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PALO ALTO

Barrel Details



- Meets City's rain barrel rebate requirements
- 50-gallon
- 100% recycled plastic
- Dimensions: 42.5" H, 22.5" diameter
- Weight: Empty: 16 lbs. | Full: 424 lbs.
- Allows for daisy chaining
- Included: barrel, 3/4" valve, screen on top, overflow hose
- Cost: \$80 (pre-tax) per barrel vs \$134 Wayfair