Safe Routes to School and Green Streets Infrastructure Pilot Program Scope of Work

Jurisdiction: City of Brisbane

Project Title: Brisbane Safe Routes to School and Green Infrastructure Project

Scope of Work (location and description of proposed work as detailed in project proposal):

The project is located in central Brisbane and includes safe routes improvements and green infrastructure at several intersections and street segments:

- **Visitacion Avenue & Alvarado Street** – The proposed enhancement includes a mid-block crossing and a green infrastructure buffered pedestrian island. The mid-block crossing with large bulbout from the north-west corner of Visitacion Ave to the GI island will have a pedestrian walkway with a vegetated buffer on both sides. The large bulbout and GI island will shorten the distance pedestrians will have to travel and provide insulation from vehicular traffic. By increasing the area of the bulbout and decreasing the area of the GI island, C.3 sizing criteria are met for both treatment areas. Stormwater will travel east from the 500 block of Alvarado St. and enter the bulbout. Stormwater from the area south of the GI island will enter and be treated. The City also plans to incorporate educational signage into this site.
- **Visitacion Avenue & Mariposa Street** – This intersection will include four concrete bulbouts, one at each corner of the intersection, with new curb ramps and bypass drainage channels. The City proposes including stormwater curb extensions on the south-west corner (west side of Visitacion Ave) and the south-east corner (south side of Mariposa St). The City proposes to incorporate the existing rapid flashing beacons into the curb bulbouts/GI features. All GI treatment areas will meet C.3 sizing criteria.
- **San Bruno Avenue & Santa Clara Street** – This intersection will include a mid-block crossing on San Bruno Ave, with two concrete bulbouts with new curb ramps (one on the west side of San Bruno Ave and the other on the east side of San Bruno Ave and Santa Clara St). On the west side of San Bruno Ave, the City proposes to only include a curb extension on one side of the bulbout as there is a driveway for access to the athletic field on the north side. The bulbout on west side of San Bruno will include bioretention on both sides of the bulbout (south side of Santa Clara St and east side of San Bruno Ave). All treatments will meet C.3 sizing criteria.
- **Additional SRTS components** – additional SRTS components are included in the scope of work, that although do not integrate pedestrian improvements with green infrastructure, meet the overall intent of the pilot program in relationship to the complete proposal.
    - **San Francisco Ave & Inyo Street** – Concrete sidewalk extension around utility pole and fire hydrant to maintain wider clearance for pedestrians on sidewalk

- **Solano Street & San Francisco Ave –** Raised rumble strip; curb ramp at wider portion of sidewalk; restriping high visibility crossing and angle towards curb ramp; rolled curb in front of the stairway; signage for 15 MPH limit on Solano between Monterey and entrance to Lipman.
- **Humboldt Rd., Solano Street & Monterey Street –** Restripe high-visibility crossing parallel to Solano St; Larger concrete island with passageway cutouts; yellow high-visibility crossings to replace standard white crossing; curb ramp where no rolled curb exists; signage for 15 MPH limit on Solano St between Monterey St and entrance to Lipman.
- **Solano Street & Sierra Point Road/Klamath Street Intersection –** Shift white edge lines on Solano Street to the west to all more width for parked cars and clearance for sidewalk; new white high visibility crossing on the northern leg of Sierra Point/Klamath intersection.

The proposed project will include educational signage about green infrastructure features and Brisbane's stormwater management efforts. Additionally, the existing map of the city at the entrance to downtown Brisbane will include the designated Safe Routes. Paper maps of Safe Routes will be available by the City for public use.

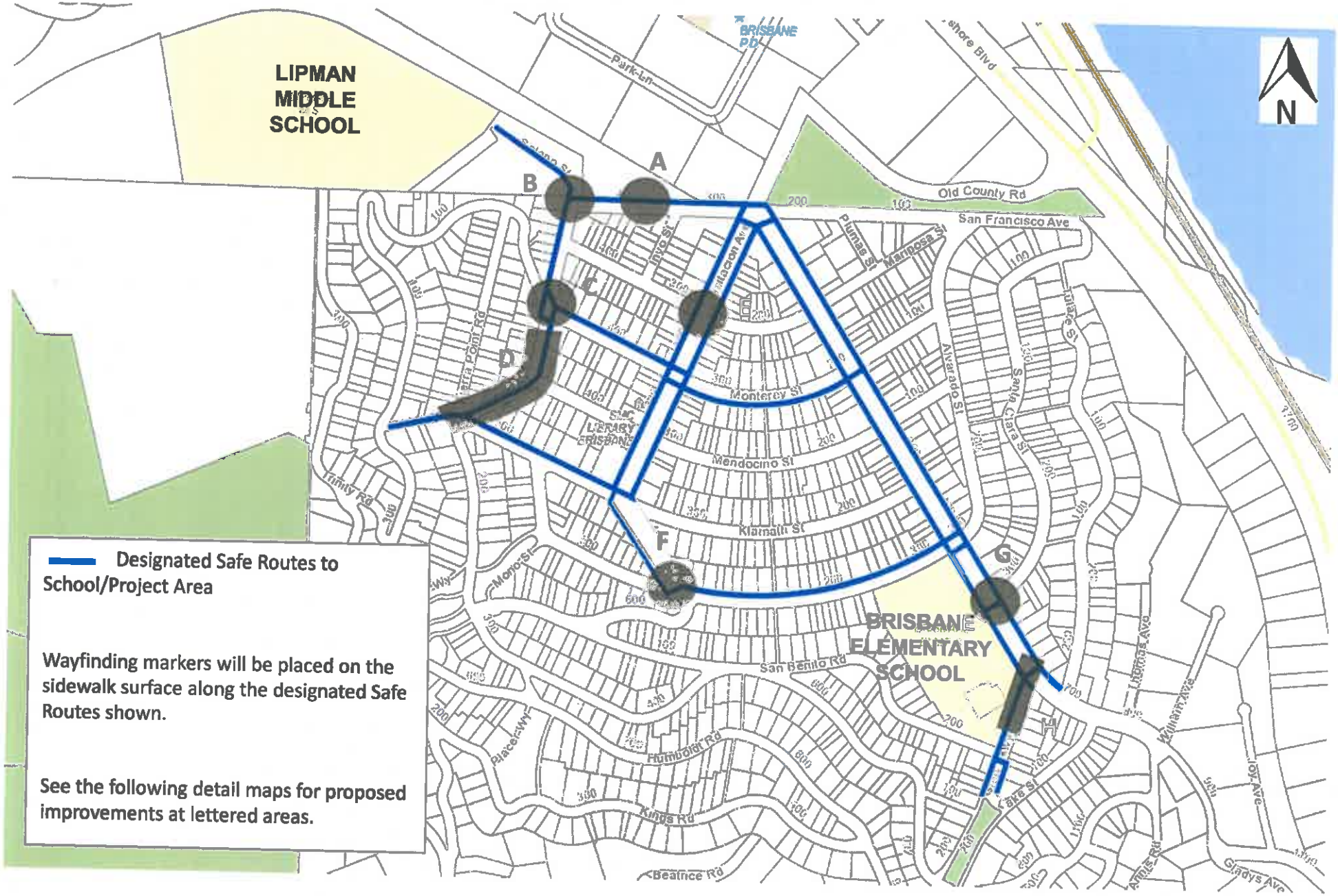
The project will be maintained according to the City's proposed plan – routine weeding, removal of trash and sediment from landscaped areas as well as routine maintenance of catch basins will be performed for proper management of improvements. Trash will be scheduled to be removed weekly, weeds monthly, and sediment quarterly. The Buildings & Grounds Maintenance Division is responsible for the upkeep of all city parks and landscaped areas. This team will maintain the planted areas as part of their regular scheduled activities. Funding will be provided via the operating fund designated for landscape maintenance. The Sewer Maintenance Division is responsible for all catch basins and drain inlets. This team will maintain the area drain as part of their regular scheduled maintenance.

Attachments (proposed project map, design concept, preliminary budget, other supporting documentation):

1. Project Area Map
2. Project Concepts
3. Preliminary Cost Timeline and Cost Breakdown

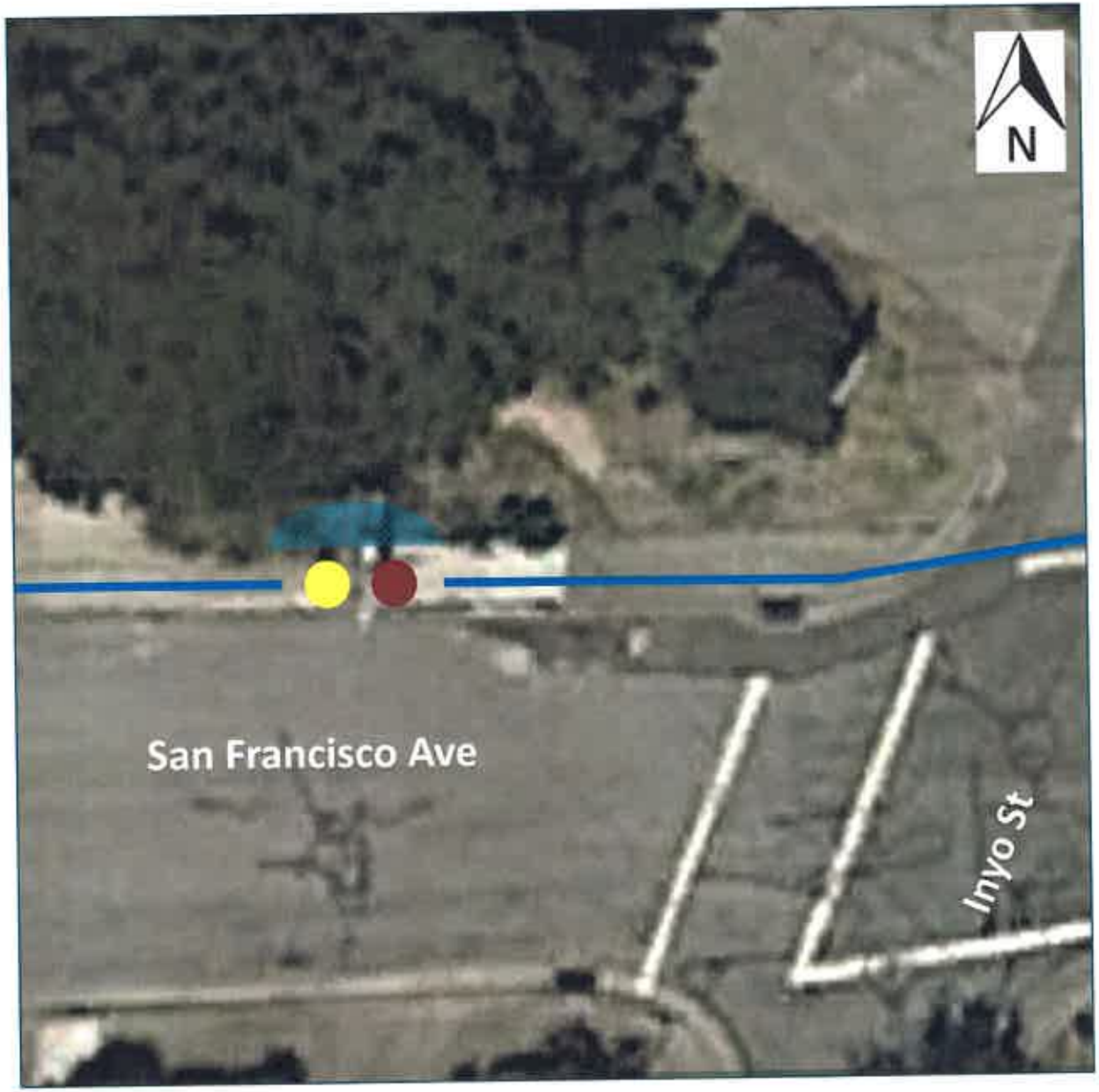
Attachment III

Project Components



Attachment III

Detail A



Proposed Improvements

1. Concrete sidewalk extension around utility pole and fire hydrant to maintain wider clearance for pedestrians on sidewalk

Safe Route to School

Area of new extension

Fire hydrant

Utility pole

Attachment III
Detail B

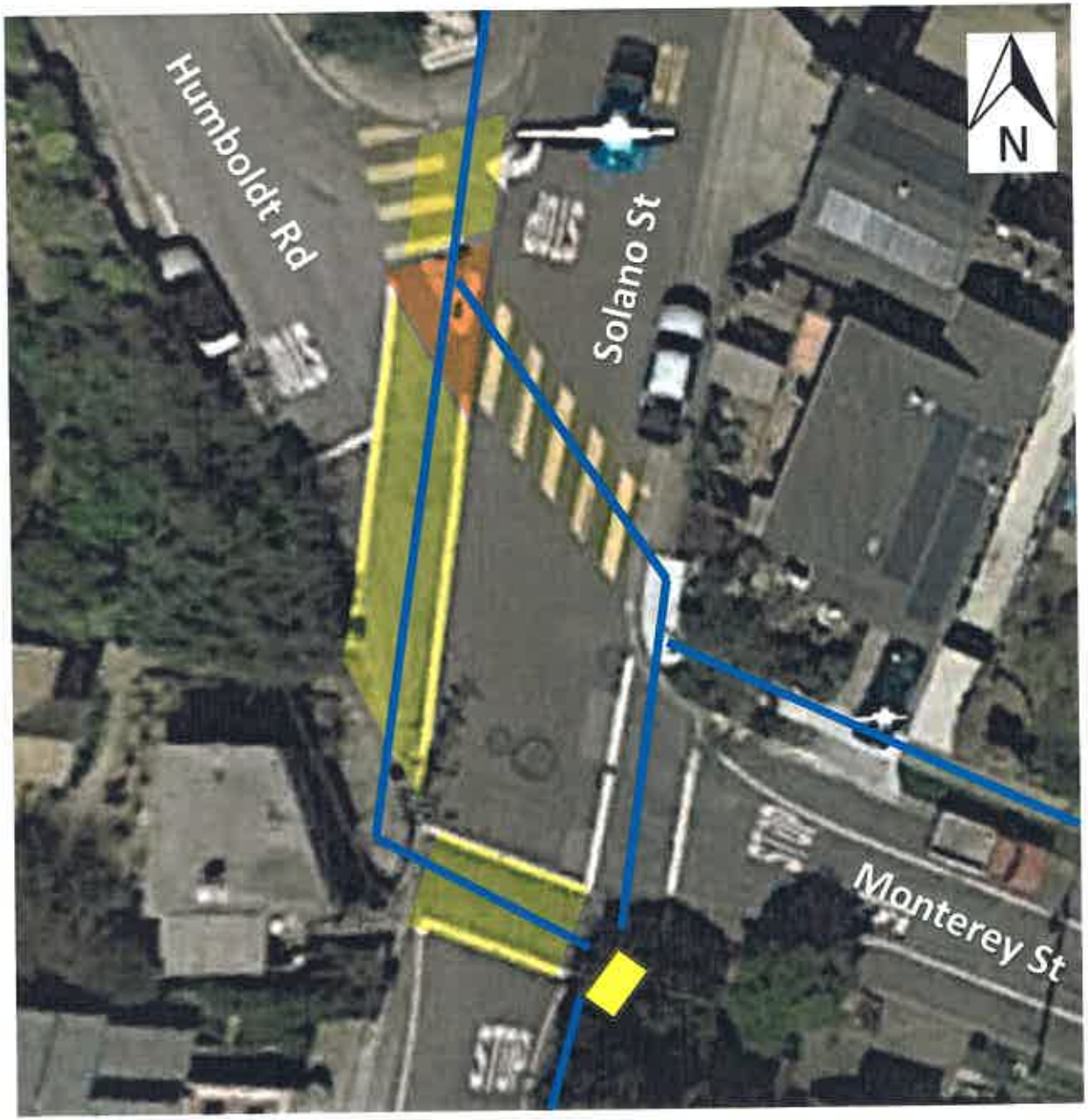
Proposed Improvements

1. Raised rumble strip
2. Curb ramp at wider portion of sidewalk
3. Restripe high-visibility crosswalk and angle towards curb ramp
4. Rolled curb in front of stairway
5. Signage for 15 MPH speed limit zone on Solano between Monterey St and entrance to Lipman

- Safe Route to School
- Existing stairway
- New curb ramp
- Area of new high visibility crosswalk
- Area of raised rumble strip
- New rolled curb

Attachment III

Detail C



Proposed Improvements

1. Restripe high-visibility crosswalk parallel to Solano St for improved visibility
2. Larger concrete island with passageway cutouts
3. Yellow high-visibility crosswalks to replace standard white crosswalk
4. Curb ramp where no rolled curb exists
5. Signage for 15 MPH speed limit zone on Solano St between Monterey St and entrance to Lipman

Safe Route to School

Area of new high visibility crosswalk

Area of new island with cutouts

New curb ramp

Attachment III

Detail D

Proposed Improvements

1. Shift white edge lines on Solano St to the west – allow more width for parked cars on eastern side to maintain wider clearance for sidewalk
2. New white high visibility crosswalk on northern leg of Sierra Point/Klamath intersection

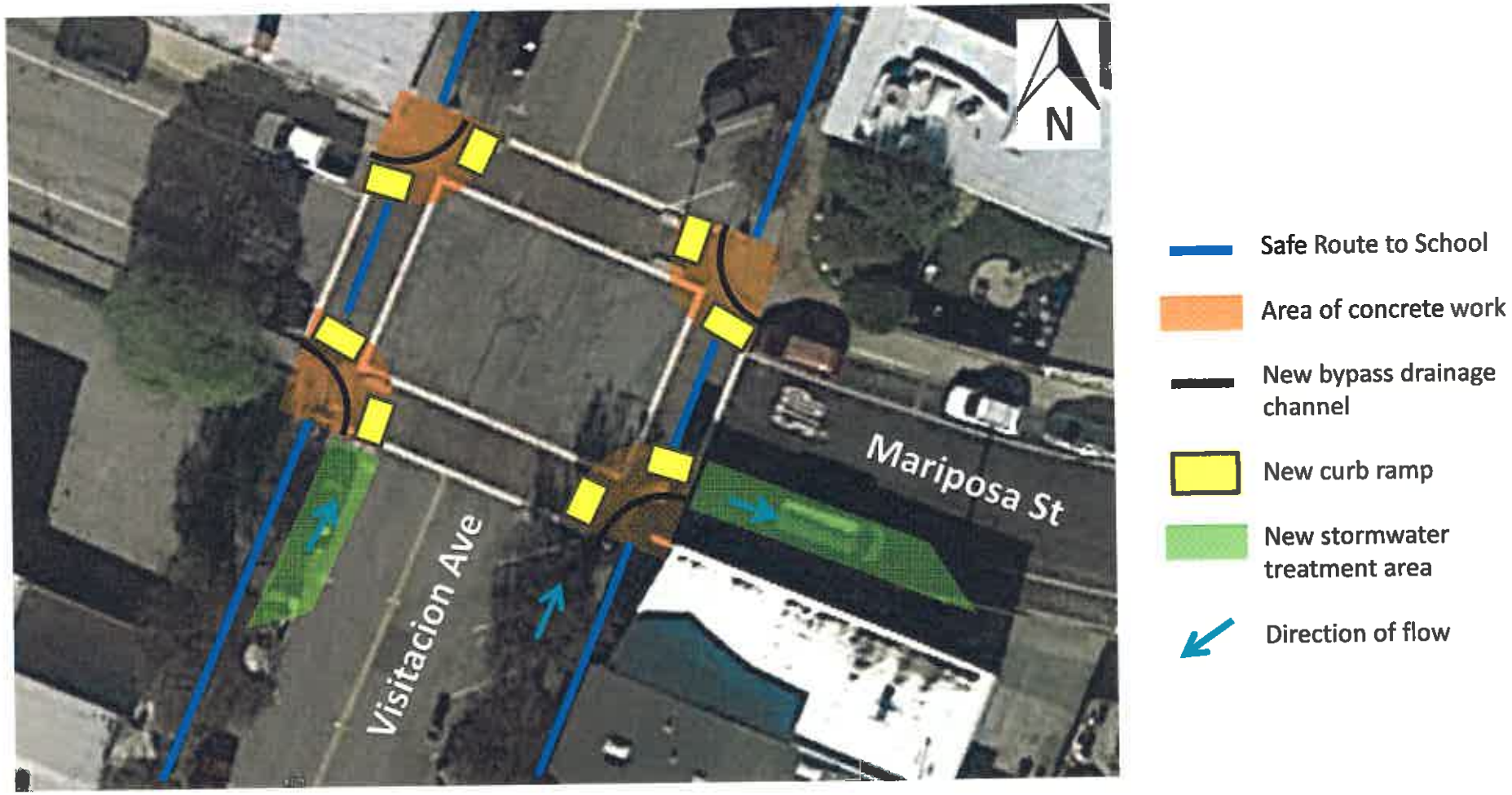
Safe Route to School

Existing stairway

Area of new high visibility crosswalk

Attachment III

Detail E – SRTS/GI Features



Proposed Improvements

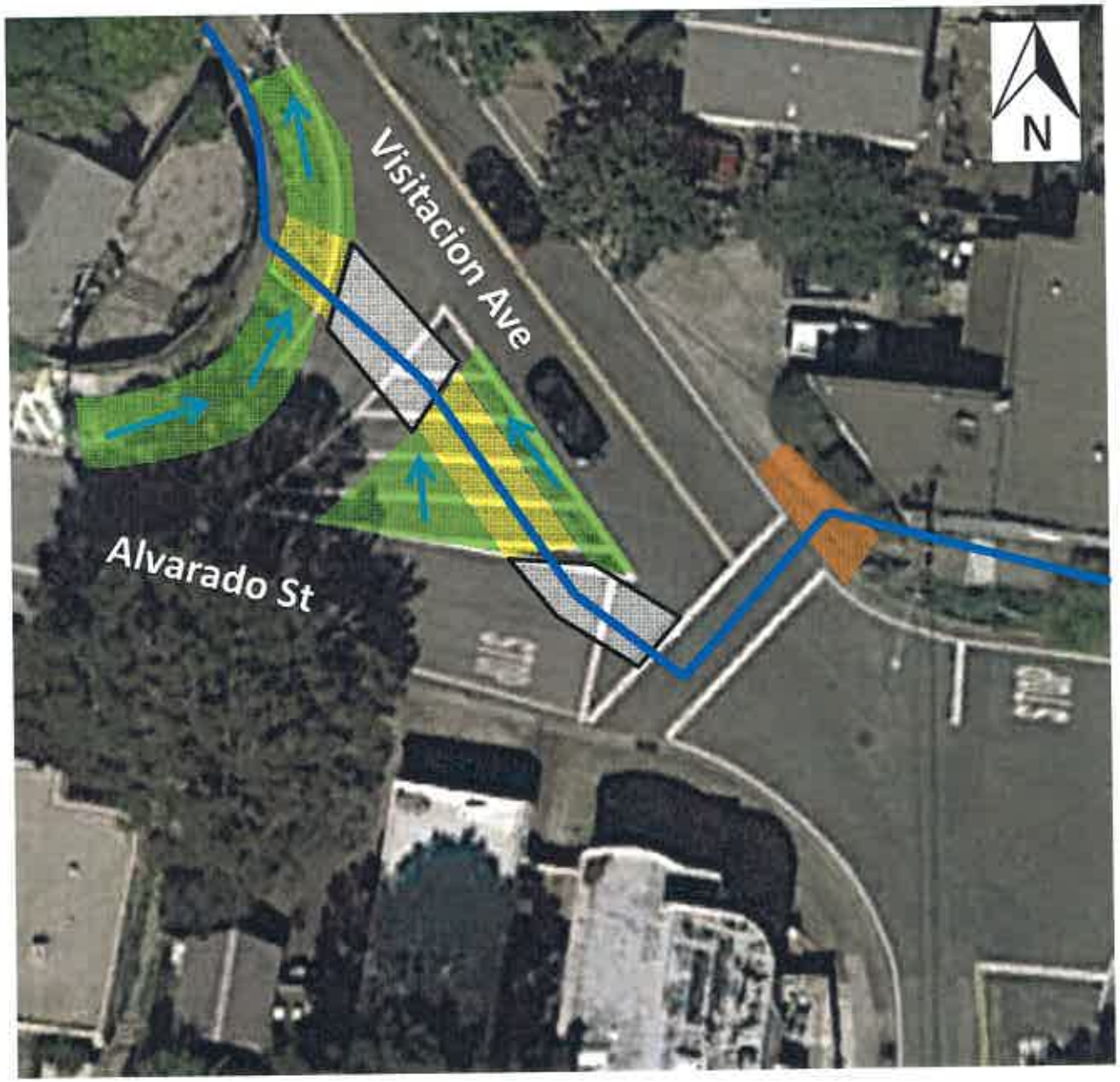
1. Concrete bulbouts at corners of intersection w/ curb ramps and bypass drainage channels – bulbouts will replace existing curb ramps and concrete islands/steel bollards at crosswalk edges
2. Stormwater curb extensions at corners

Attachment III

Detail E – Drainage Areas

Attachment III

Detail F – SRTS/GI Features



Proposed Improvements

1. Stormwater treatment areas w/ check dams and adjustable weirs to accommodate for slope in planter strip and painted island
2. Permeable paver path through bulbout and island
3. Concrete surfacing improvements at crosswalk end
4. New white crosswalk areas

Safe Route to School

Area of concrete work

Area of new crosswalk

Permeable paver walkway

New stormwater treatment area

Direction of flow

Attachment III

Detail F – Drainage Areas

Attachment III

Detail G – SRTS/GI Features

Proposed Improvements

1. Stormwater treatment areas on Santa Clara St and San Bruno Ave
2. Concrete bulbouts w/ curb ramps and bypass drainage channel

Safe Route to School

Area of concrete work

New bypass drainage channel

New curb ramp

New stormwater treatment area

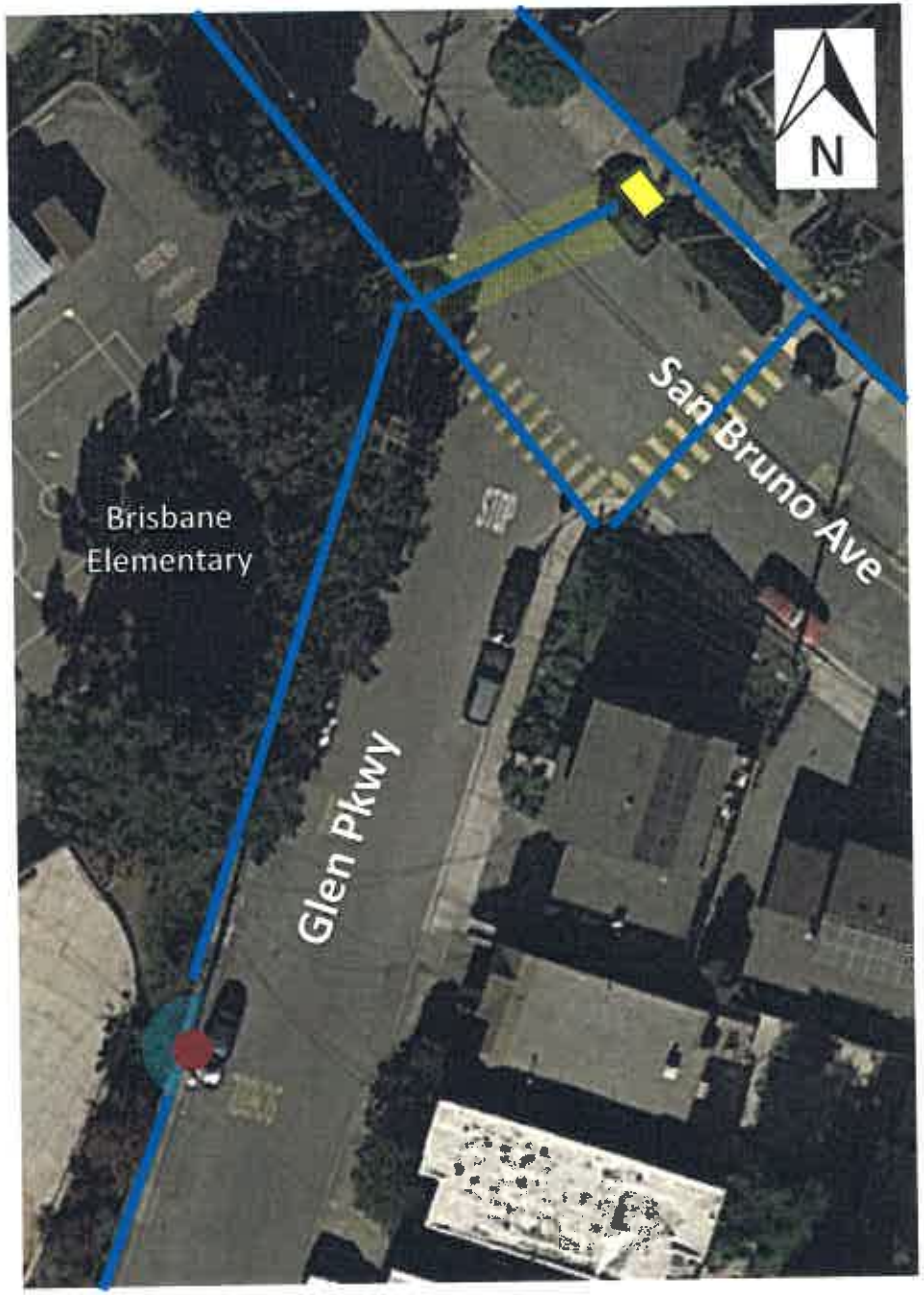
Direction of flow

Attachment III

Detail G – Drainage Areas

Attachment III

Detail H



Proposed Improvements

1. Concrete sidewalk extension around utility pole on Glen Pkwy to maintain wider clearance for pedestrians on sidewalk
2. New curb ramp and high-visibility crosswalk at northern leg of intersection
3. Signage for 15 MPH speed limit zone on portions of San Bruno Ave, Glen Pkwy, and San Benito Rd adjacent to school

Safe Route to School

Area of new high visibility crosswalk

New curb ramp

Utility pole

Section IV: Project Timeline and Budget

A. Timeline and Budget

1. Please provide in **Attachment IV** a proposed project budget and timeline, including all project deliverables. The budget should include a minimum 15% cash only local match from the project sponsor applied to the capital costs (see application guidelines for example under **Funding Details**). The proposed budget must also show a breakdown of estimated capital costs for SRTS and stormwater components with the goal of an equal cost distribution between the two program components, but no greater than a 60/40 split. For guidance on providing an estimated cost breakdown, see the example **Preliminary Cost Breakdown Table** appended to this application and linked from the Pilot Program webpage (http://ccag.ca.gov/opportunities/call-for-projects/) . Applicants may provide a different cost table if preferred. The proposed budget may include a 10% contingency for construction.

See Attachment IV.

Timeline

Design phase: 6/2017 to 9/2017
Environmental phase: 1/2018 to 3/2018
(anticipated break from 10/2017 to 1/2018 for grant selection process and award)
Design completion: 3/2018 to 7/2018
Council authorization to advertise: 8/2018
Bid phase: 9/2018 to 10/2018
Construction: 4/2019 to 8/2019 (begin after rainy season)
Plant establishment period: 9/2019 to 12/2019

Section V: School and Community Support

A. School and Community Support

1. Does this project have the support from the participating school? If so, include letter(s) in **Attachment I.**

☒ Yes – Attach letter of support from school district

☐ No – School district support is mandatory, grant proposals without a letter of support will not be considered

Attachment IV

SRTS and Green Streets Infrastructure Estimated Cost Breakdown Template

Construction Element	SRTS/GI/Both	Quantity	Unit	Unit Cost	Cost	GI/Both Cost	SRTS/Both Cost	Percent GI Cost	Percent SRTS Cost
Install/Remove Crosswalk	SRTS	485	SY	$27	$13,095	$0	$13,095	45%	55%
Signing and Striping	SRTS	1	LS	$18,250	$18,250	$0	$18,250		
Remove Existing Landscaping - *Area of landscaping increased due to entire planter strip @ Visitacion Alvarado*	Both	4	EA	$300	$1,200	$600	$600		
Wayfinding Markers	SRTS	66	EA	$200	$13,200	$0	$13,200		
Concrete Removal (Sidewalk)	SRTS	685	SF	$20	$13,700	$0	$13,700		
Concrete Removal (Curb and Gutter)	Both	285	LF	$45	$12,825	$6,413	$6,413		
Minor Concrete (Curb Ramp)	SRTS	14	EA	$3,000	$42,000	$0	$42,000		
Minor Concrete (Sidewalk *and Add Bulbouts*)	SRTS	2430	SF	$6	$14,580	$0	$14,580		
Roadway excavation	Both	920	CY	$20	$18,400	$9,200	$9,200		
Sormwter Facility Soil Excavation	GI	261	CY	$20	$5,220	$5,220	$0		
Concrete Removal (curb and gutter)	GI	285	LF	$45	$12,825	$12,825	$0		
Concrete Removal (sidewalk)	SRTS	684	SF	$20	$13,680	$0	$13,680		
Minor Concrete (retaining curb)	GI	935	LF	$30	$28,050	$28,050	$0		
Modify Existing Storm Drain System	GI	1	EA	$5,000	$5,000	$5,000	$0		
Area Drain	GI	1	EA	$2,500	$2,500	$2,500	$0		
Permeable Pavers	GI	275	SF	$11	$3,025	$3,025	$0		
Metal Checkdam/Weir	GI	10	EA	$100	$1,000	$1,000	$0		
Stormwater Facility Soil Import and Prep (with underdrain)	GI	120	CY	$45	$5,400	$5,400	$0		
Landscape Area Soil Import and Prep	GI	600	CY	$35	$21,000	$21,000	$0		
1 gallon plants	GI	750	EA	$20	$15,000	$15,000	$0		
Contingency (10%)	BOTH				$28,595	$14,297	$14,297		
Total					$288,545	$129,530	$159,015		

Safe Routes to School and Green Streets Infrastructure Pilot Program Scope of Work

Jurisdiction: Colma

Project Title: Mission Road Safe Routes to School (SRTS) and Green Streets Infrastructure Pilot Program

Scope of Work (location and description of proposed work as detailed in project proposal):

The Mission Road Safe Routes to School (SRTS) and Green Streets Infrastructure Pilot Project will include the following infrastructure components, as part of a larger capital project that the Town of Colma is implementing in Fiscal Year 2018/2019 for improvements of bicycle and pedestrian facilities on Mission Road:

- A mid-block crossing located at the north end of Mission Road with stormwater curb extension on the east side of the crossing
- A mid-block crossing on Mission Road located by the Holy Cross Cemetery main entrance with single stormwater curb extensions on both sides of the crossing, and additional single stormwater feature on the east side to the north of the Cemetery main gate

Each mid-block crossing will be equipped with a high visibility crosswalk and Rectangular Rapid Flash Beacon (RRFB) that will improve the safety of pedestrian crossings.

The proposed project will incorporate bioretention/infiltration basins (Rain Gardens) incorporated into the High Visibility Crosswalks. This project consists of two stormwater management measures systems at two high visibility crosswalks and one bioretention/ infiltration basin that is adjacent to one of the crosswalks. The proposed stormwater treatment measures consist of the installation of bioretention areas which will collect and treat the surface runoff from the impervious areas to reduce the pollutants from entering the existing storm drain system. The stormwater runoff would enter the bioretention basins and filter through the bio-treatment soil mix. The treated water will then saturate the permeable drain rock section of the basin prior to infiltrating the subgrade. The addition of stormwater features with drought resistant vegetation within the various rain gardens (plant pallet) at the mid-block crosswalks, will offer both an aesthetic and sustainable enhancement feature to the Mission Road corridor.

The project concept will include an educational signage which will be installed at the southbound side of Mission Road, across from the Holy Cross Cemetery main entrance. The signage will explain the purposes and goals of the Safe Routes to School Program and Best Management Practices for Stormwater Treatment, and demonstrate how the proposed safety and green streets improvements along Mission Road will meet the SRTS and stormwater management goals.

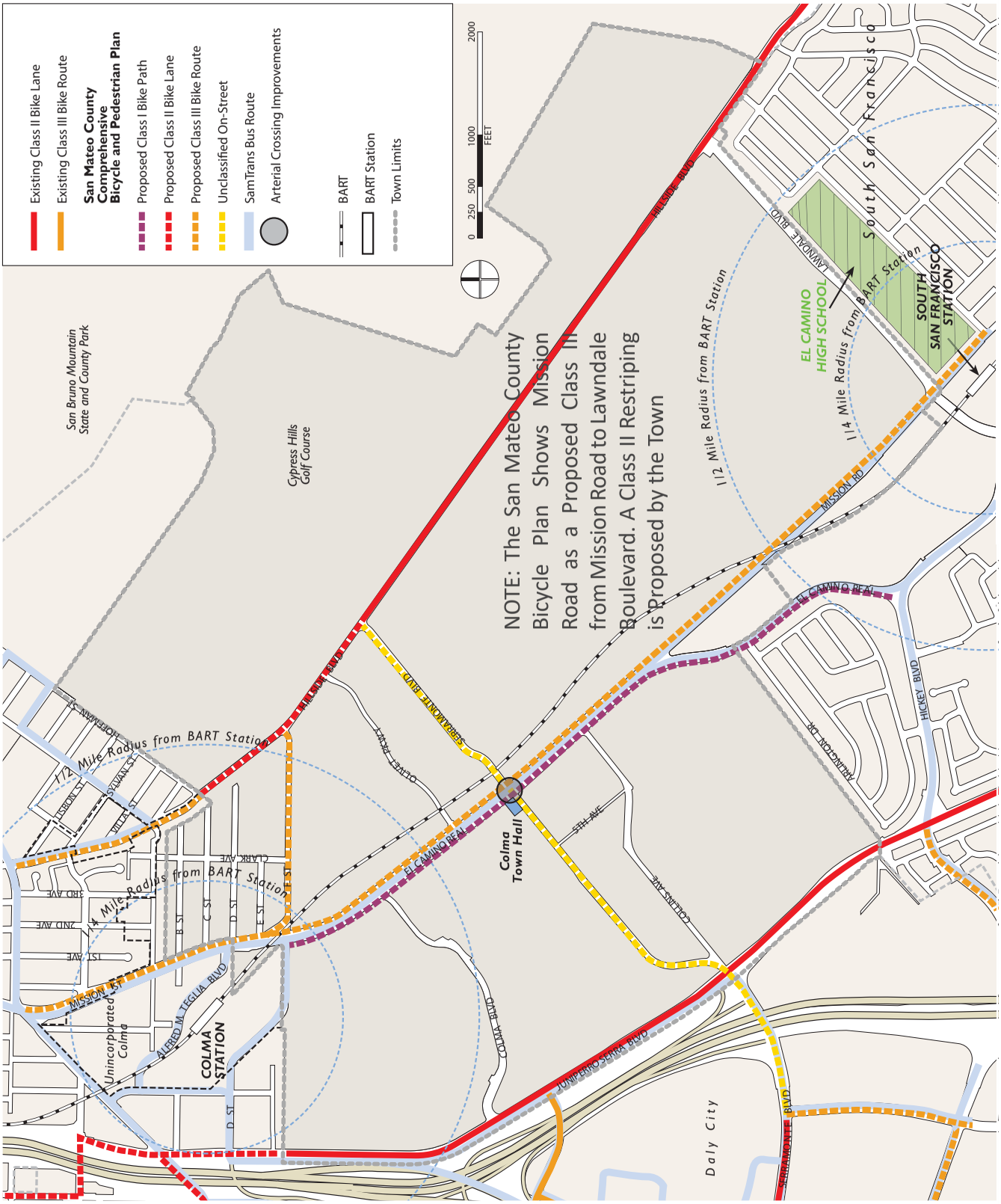
The Town of Colma public works staff will be responsible for the ongoing operations and maintenance of the completed facilities, including the bioretention areas and rectangular rapid flashing beacons along Mission Road. The costs associated with the operations and maintenance of these facilities will be annually funded by the Town's general fund. Town Staff will follow the standard bioretention facility maintenance procedures, which outlines the Best Management Practices (BMPs) and Standard Operating Procedures (SOPs) for implementation of bioretention

areas and maintenance of these facilities. In addition, Town Staff will follow the standard Stormwater Treatment Measure Operation and Maintenance Inspection Report, and Bioretention Area Inspection and Maintenance Checklist as described on the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) C.3 Technical Guidance, Appendix G, when checking the conditions of the bioretention facilities and performing the necessary follow-up activities specific to the bioretention areas during the routine maintenance. The newly installed bioretention facilities will also be added to the Town's inventory of installed Stormwater Treatment Facilities O&M Verification Program Inventory, and will receive an annual verification inspection. This will provide a check and balance to ensure that ongoing maintenance activities are occurring and be responsive to other factors that may arise (i.e. observed changes in trash accumulation, nearby construction, changes to other Town-wide street programs such as sweeping or garbage pick-up routes, etc.).

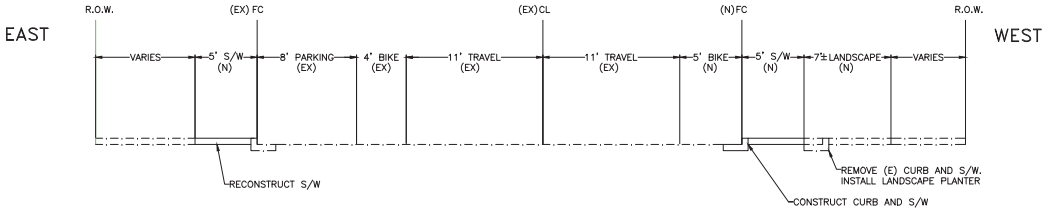
Attachments (proposed project map, design concept, preliminary budget, other supporting documentation):

1. Project Area Map
2. Project Concept
3. Preliminary Timeline and Budget

EXHIBIT C-7: Bicycle and Transit Facilities



Source: CalTrans Design Standards for Bicycle Facilities, 2011 San Mateo County Comprehensive Bicycle and Pedestrian Plan, Dyett and Bhatia, Town of Colma



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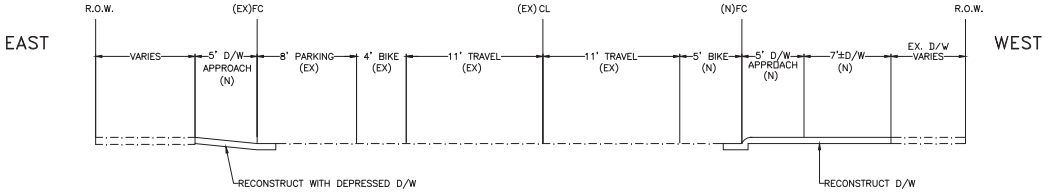
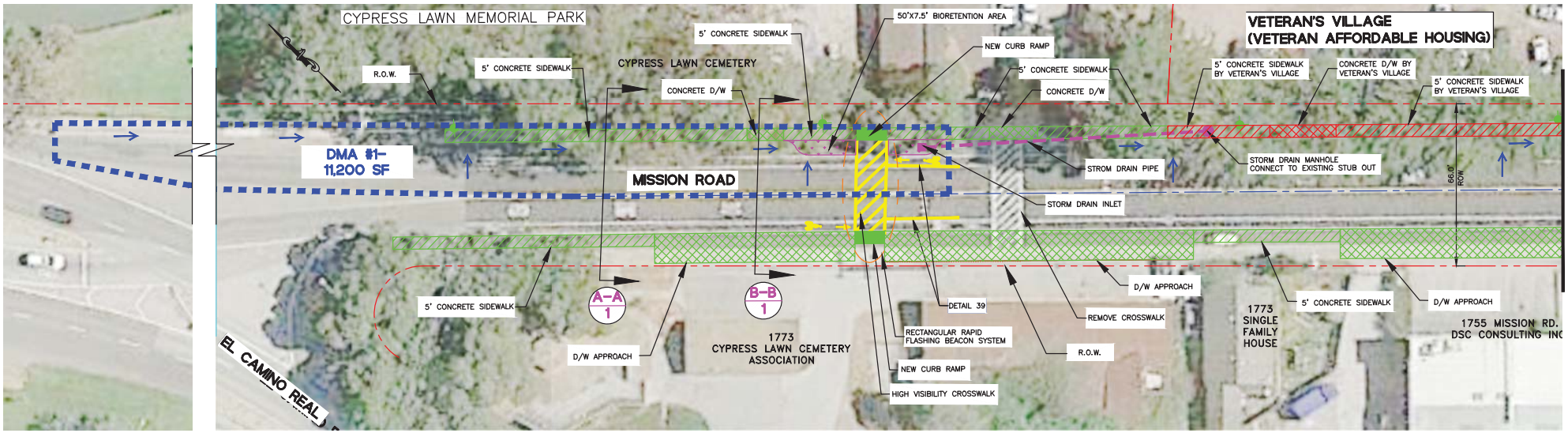


SECTION B–B
1"=5'

LEGEND

EXISTING	(EX)
NEW	(N)
PROPOSED CONCRETE SIDEWALK (S/W)	
PROPOSED CONCRETE SIDEWALK (S/W) BY VETERAN'S VILLAGE	
PROPOSED CURB RAMP	
PROPOSED CURB RAMP BY VETERAN'S VILLAGE	
PROPOSED DRIVEWAY APPROACH (D/W)	
PROPOSED DRIVEWAY APPROACH (D/W) BY VETERAN'S VILLAGE	
PROPOSED BIORETENTION AREA (SEE SHEET 5 FOR DETAIL)	
EXISTING SIDEWALK TO REMAIN	
PROPOSED STRIPING	
PAVEMENT MARKINGS	
PROPOSED RECTANGLE RAPID FLASHING BEACON SYSTEM	
PROPOSED STREET LIGHTS	
PROPOSED STORM DRAIN INLET	
EXISTING STORM DRAIN INLET	
PROPOSED STORM DRAIN MANHOLE	
PROPOSED STORM DRAIN PIPE	
EXISTING RIGHT OF WAY (R.O.W.)	
EXISTING CENTERLINE (CL)	
DRAINAGE MANAGEMENT AREA (DMA)	
STORM RUNOFF FLOW DIRECTION	



PREPARED BY:
CSG Consultants, Inc.
550 Pilgrim Drive
Foster City, CA 94404
Phone (650) 522–2500
Fax (650) 522–2599

TITLE:

MISSION ROAD IMPROVEMENTS SAFE ROUTES TO SCHOOL AND GREEN STREETS INFRASTRUCTURE

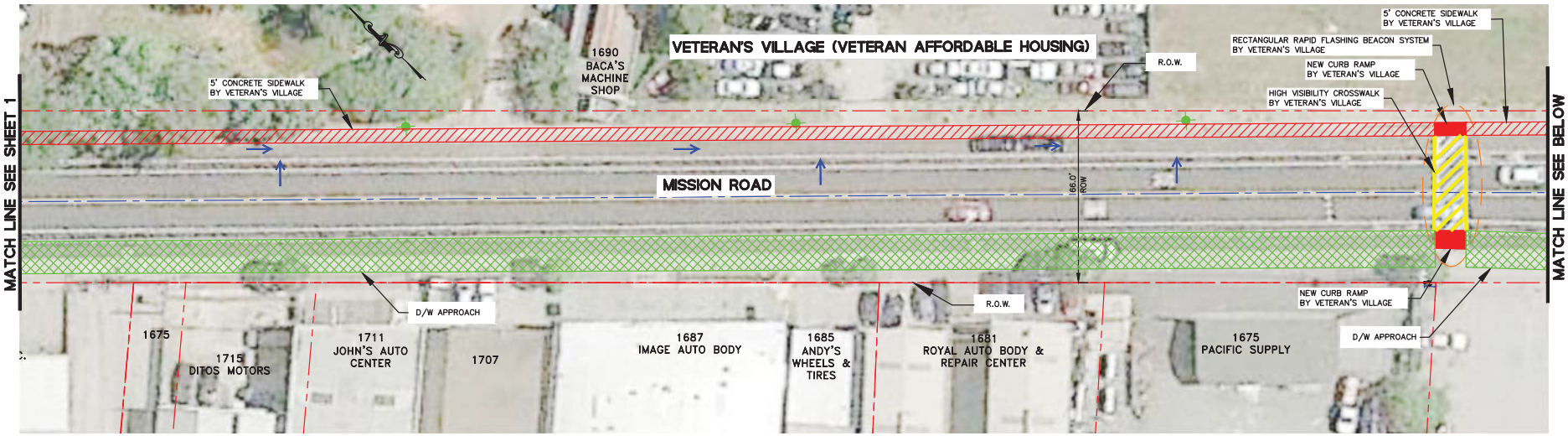
PREPARED FOR:

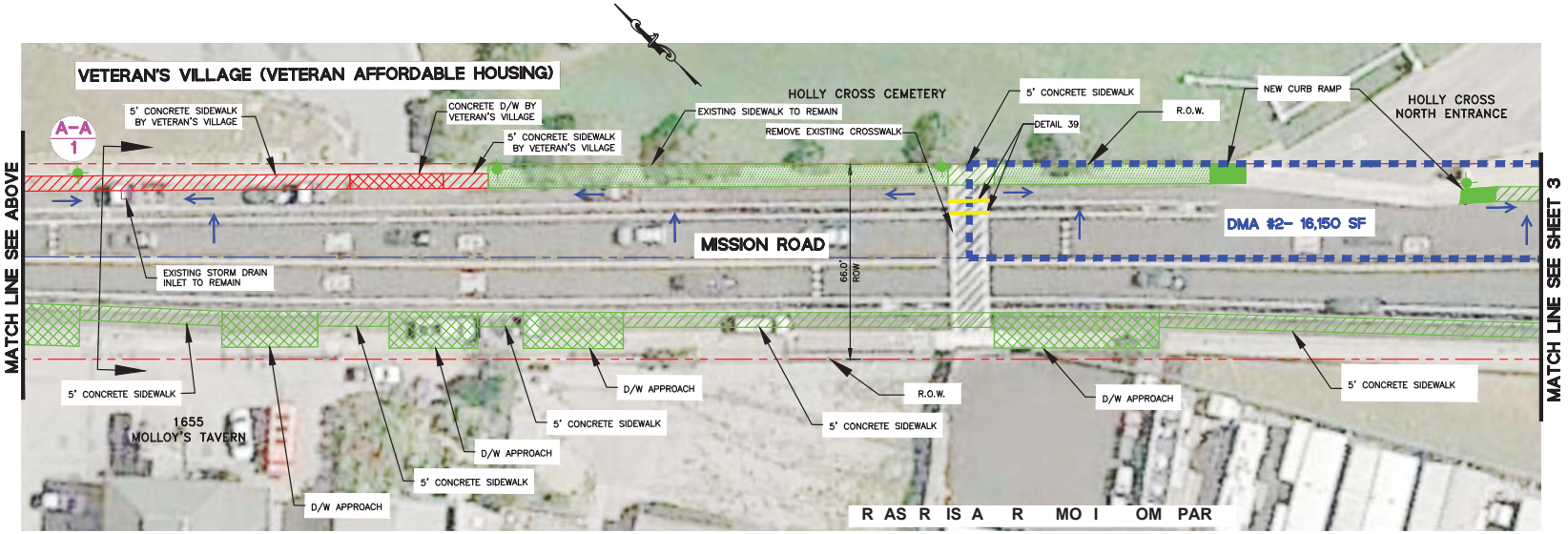
TOWN OF COLMA
1198 EL CAMINO REAL
COLMA, CA. 94014

40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

SHEET 1 OF 5

DATE: 10/20/17
JOB#: 17.380





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MISSION ROAD IMPROVEMENTS
SAFE ROUTES TO SCHOOL AND GREEN
STREETS INFRASTRUCTURE

PREPARED FOR:

TOWN OF COLMA
1198 EL CAMINO REAL
COLMA, CA. 94014

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(IN FEET)
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SHEET 2 OF 5

DATE: 10/20/17
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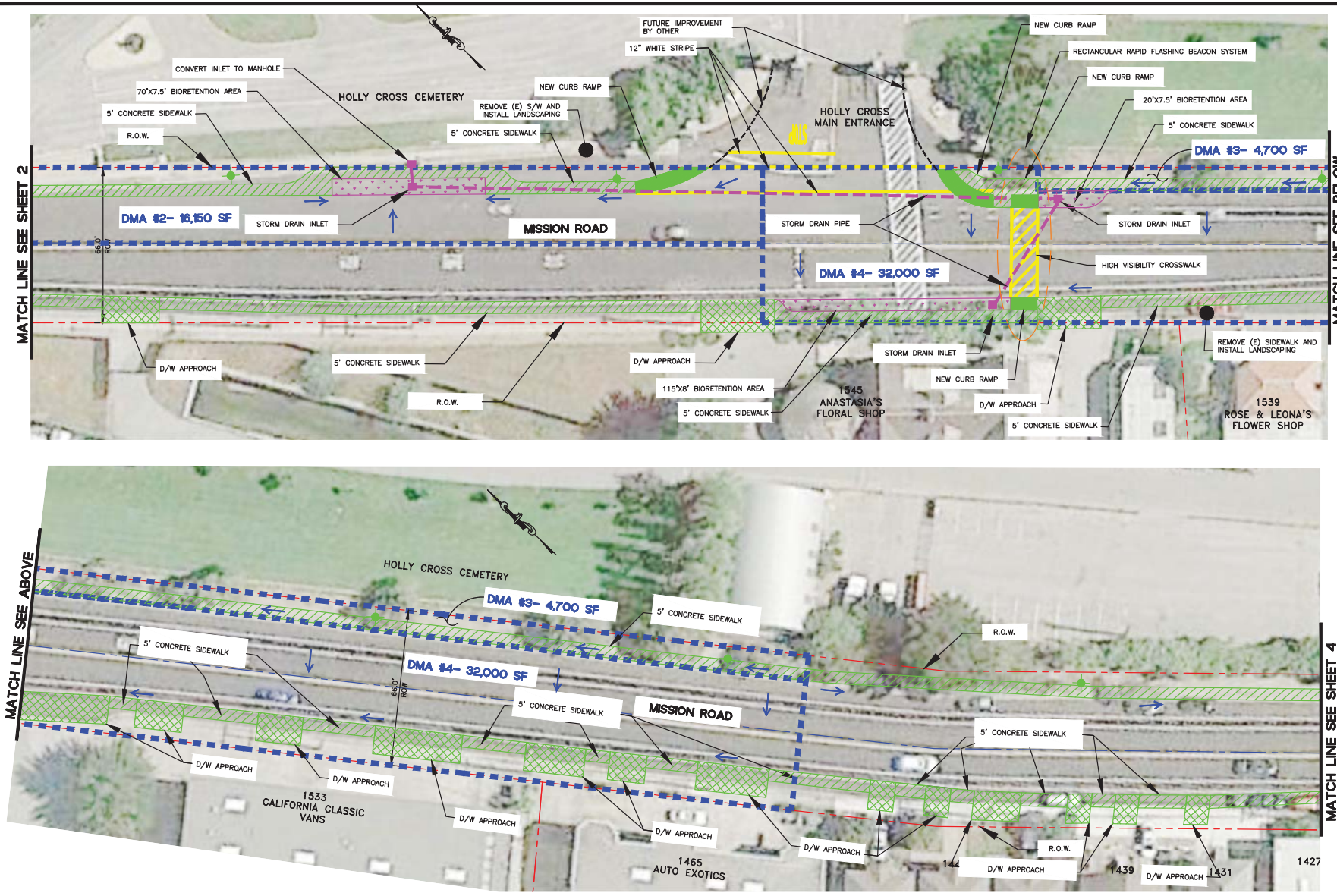

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SAFE ROUTES TO SCHOOL AND GREEN STREETS INFRASTRUCTURE

PREPARED FOR:
TOWN OF COLMA
1198 EL CAMINO REAL
COLMA, CA. 94014

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(IN FEET)
1 inch = 40 ft.

SHEET 3 OF 5

DATE: 10/20/17
JOB#: 17.380

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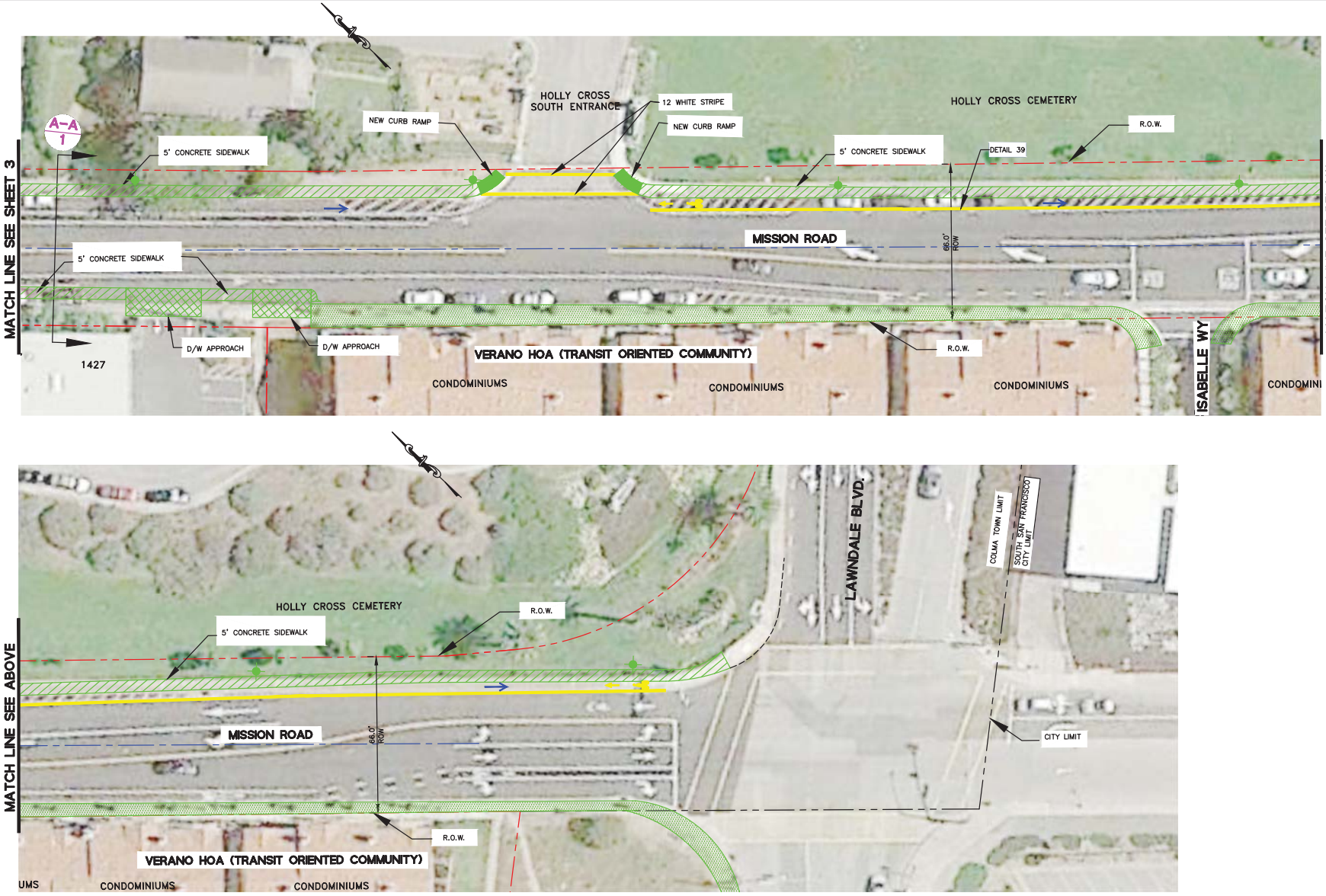

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1198 EL CAMINO REAL
COLMA, CA. 94014

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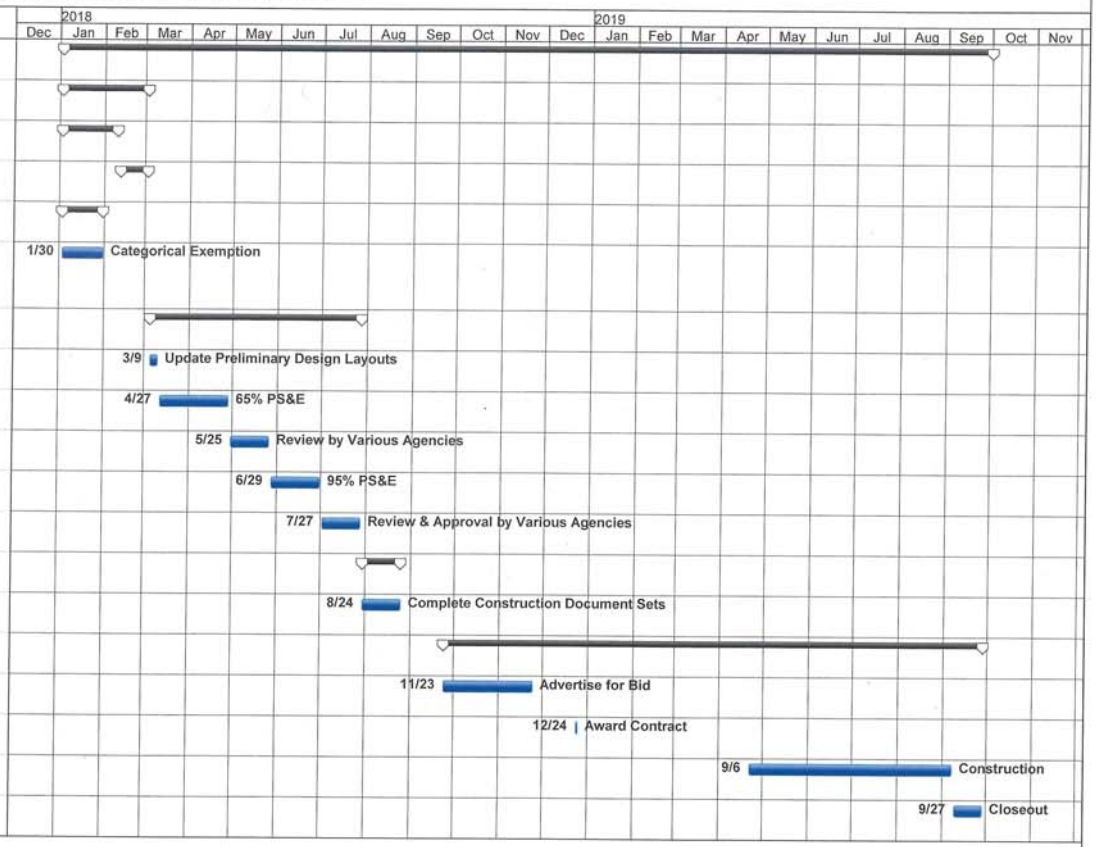
(IN FEET)
1 inch = 40 ft.

SHEET 4 OF 5

DATE: 10/20/17
JOB#: 17.380

Town of Colma
Preliminary Capital Project Timeline for
Mission Road Improvements
Safe Routes to School and Green Streets Infrastructure*

ID	Task Name	Duration	Start	Finish
1	**Task 1 - Project Management**	**454 days**	**Wed 1/3/18**	**Mon 9/30/19**
4	**Task 2 - Existing Condition Review**	**43 days**	**Wed 1/3/18**	**Fri 3/2/18**
5	**Utility Requests**	**28 days**	**Wed 1/3/18**	**Fri 2/9/18**
8	**Topographic Survey**	**15 days**	**Mon 2/12/18**	**Fri 3/2/18**
10	**Task 3 - Environmental Studies**	**20 days**	**Wed 1/3/18**	**Tue 1/30/18**
11	Categorical Exemption	20 days	Wed 1/3/18	Tue 1/30/18
12	**Task 4 - Plans, Specifications & Estimate (PS&E) Design**	**105 days**	**Mon 3/5/18**	**Fri 7/27/18**
13	Update Preliminary Design Layouts	5 days	Mon 3/5/18	Fri 3/9/18
14	65% PS&E	35 days	Mon 3/12/18	Fri 4/27/18
15	Review by Various Agencies	20 days	Mon 4/30/18	Fri 5/25/18
16	95% PS&E	25 days	Mon 5/28/18	Fri 6/29/18
17	Review & Approval by Various Agencies	20 days	Mon 7/2/18	Fri 7/27/18
18	**Task 5 - Final PS&E**	**20 days**	**Mon 7/30/18**	**Fri 8/24/18**
19	Complete Construction Document Sets	20 days	Mon 7/30/18	Fri 8/24/18
20	**Task 6 - Bid & Construction**	**265 days**	**Mon 9/24/18**	**Fri 9/27/19**
21	Advertise for Bid	45 days	Mon 9/24/18	Fri 11/23/18
22	Award Contract	1 day	Mon 12/24/18	Mon 12/24/18
23	Construction	100 days	Mon 4/22/19	Fri 9/6/19
24	**Closeout**	**15 days**	**Mon 9/9/19**	**Fri 9/27/19**



*Safe Routes to School (SRTS) and Green Streets Infrastructure (GI) is part of a larger capital project for Mission Road Improvements. The timeline of SRTS/GI project falls within the above Preliminary Capital Project Timeline.

Town of Colma

Mission Road Improvements

Safe Routes to School (SRTS) and Green Streets Infrastructure

Cost Estimate Breakdown Table

							GI/Both Cost		SRTS/Both Cost	
No.	**Construction Element**	**SRTS/GI/Both**	**Quantity**	**Unit**	**Unit Cost**	**Cost**	**Quantity**	**Cost**	**Quantity**	**Cost**
1	Conceret Removal (sidewalk, curb & gutter)	Both	144	SY	$ 40.00	$ 5,760.00	72	$ 2,880.00	72	$ 2,880.00
2	Roadway Excavation	GI	76	CY	$ 50.00	$ 3,800.00	76	$ 3,800.00	0	$ -
3	Remove Trees	GI	1	LS	$ 3,000.00	$ 3,000.00	1	$ 3,000.00	0	$ -
4	New Inlet	GI	4	EA	$ 6,000.00	$ 24,000.00	4	$ 24,000.00	0	$ -
5	18" Pipe	GI	460	LF	$ 70.00	$ 32,200.00	460	$ 32,200.00	0	$ -
6	Storm Drain Manhole	GI	1	EA	$ 8,000.00	$ 8,000.00	1	$ 8,000.00	0	$ -
7	Modify Inlet/Convert Inlet to Manhole	GI	1	EA	$ 3,000.00	$ 3,000.00	1	$ 3,000.00	0	$ -
8	Minor Concrete (5' sidewalk)	Both	144	SY	$ 90.00	$ 12,960.00	72	$ 6,480.00	72	$ 6,480.00
9	Minor Concrete (curb ramp)	SRTS	4	EA	$ 4,000.00	$ 16,000.00	0	$ -	4	$ 16,000.00
10	Minor Concrete (cut-off curb and gutter)	Both	256	LF	$ 65.00	$ 16,640.00	128	$ 8,320.00	128	$ 8,320.00
11	Minor Concrete (cut-off curb)	Both	256	LF	$ 55.00	$ 14,080.00	128	$ 7,040.00	128	$ 7,040.00
12	Hot Mix Asphalt for 1' sawcut along curb & gutter	Both	18	TON	$ 160.00	$ 2,880.00	9	$ 1,440.00	9	$ 1,440.00
13	Stormwater Facility Soil Excavation	GI	143	CY	$ 50.00	$ 7,150.00	143	$ 7,150.00	0	$ -
14	Stormwater Facility Import and Preparation	GI	74	CY	$ 45.00	$ 3,330.00	74	$ 3,330.00	0	$ -
15	Landscape Area Soil Import and Preparation	GI	108	CY	$ 40.00	$ 4,320.00	108	$ 4,320.00	0	$ -
16	Compost Mulch, 3"	GI	1990	SF	$ 6.00	$ 11,940.00	1990	$ 11,940.00	0	$ -
17	1 gallon plant	GI	1990	EA	$ 15.00	$ 29,850.00	1990	$ 29,850.00	0	$ -
18	Rectangular Rapid Flashing Beacon System	SRTS	2	LS	$ 40,000.00	$ 80,000.00	0	$ -	2	$ 80,000.00
19	Striping - 12" White High Visibility Crosswalk	SRTS	345	LF	$ 3.00	$ 1,035.00	0	$ -	345	$ 1,035.00
20	Contingency (10%)	Both	1	LS	$ 28,000.00	$ 28,000.00	0.5	$ 14,000.00	0.50	$ 14,000.00
					TOTAL	**$ 307,945.00**		**$ 170,750.00**		**$ 137,195.00**
							Percent GI Cost	**55%**	**Percent SRTS Cost**	**45%**

* GI/Both and SRTS/Both columns include GI and SRTS costs respectively with 1/2 of "Both" costs distributed equally to each category

Safe Routes to School and Green Streets Infrastructure Pilot Program Scope of Work

Jurisdiction: City of Daly City

Project Title: Westlake Elementary School Pilot Green Streets Improvements Project

Scope of Work (location and description of proposed work as detailed in project proposal):

The proposed project includes new stormwater pedestrian bulbouts at the southeast and northeast corners at the intersection of Fieldcrest Drive and Westlawn Avenue.

The proposed stormwater curb extensions at the NE and SE corners of Fieldcrest Drive and Westlawn Avenue will receive stormwater runoff from impervious surfaces from the public street and sidewalk. Bioswales will use native plantings with soils designed to slow and filter the impervious surfaces. The bioswales could also potentially provide an opportunity for the school to incorporate into future lesson plans pertaining to stormwater treatment.

Southeast corner: There is an existing catch basin at this corner that will need to be either relocated or removed and replaced as a result of the pedestrian bulb-out improvement pushing the catch basin further into the street. Additionally, an overflow structure will be provided in each bioretention area at this corner.

Northeast corner: There is an existing catch basin at the northeast corner that will need to be either relocated or removed and replaced as a result of the pedestrian bulb-out improvement.

The City will maintain the new stormwater curb extension/pedestrian bulb-outs with in-house maintenance staff consistent with other existing green infrastructure and traffic enhancements in the City.

Attachments (proposed project map, design concept, preliminary budget, other supporting documentation):

1. Project Area Map
2. Project Concept
3. Preliminary Timeline
4. Preliminary Budget

ATTACHMENT II

CITY OF DALY CITY

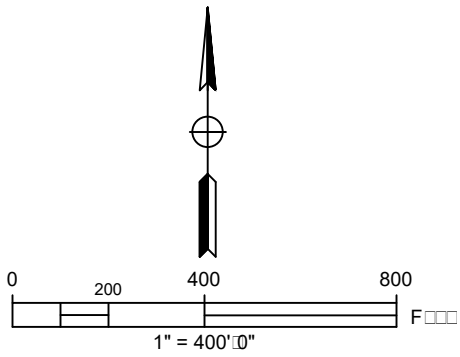
SAN MATEO COUNTY, CALIFORNIA

WESTLAKE ELEMENTARY SCHOOL PILOT GREEN STREETS IMPROVEMENTS

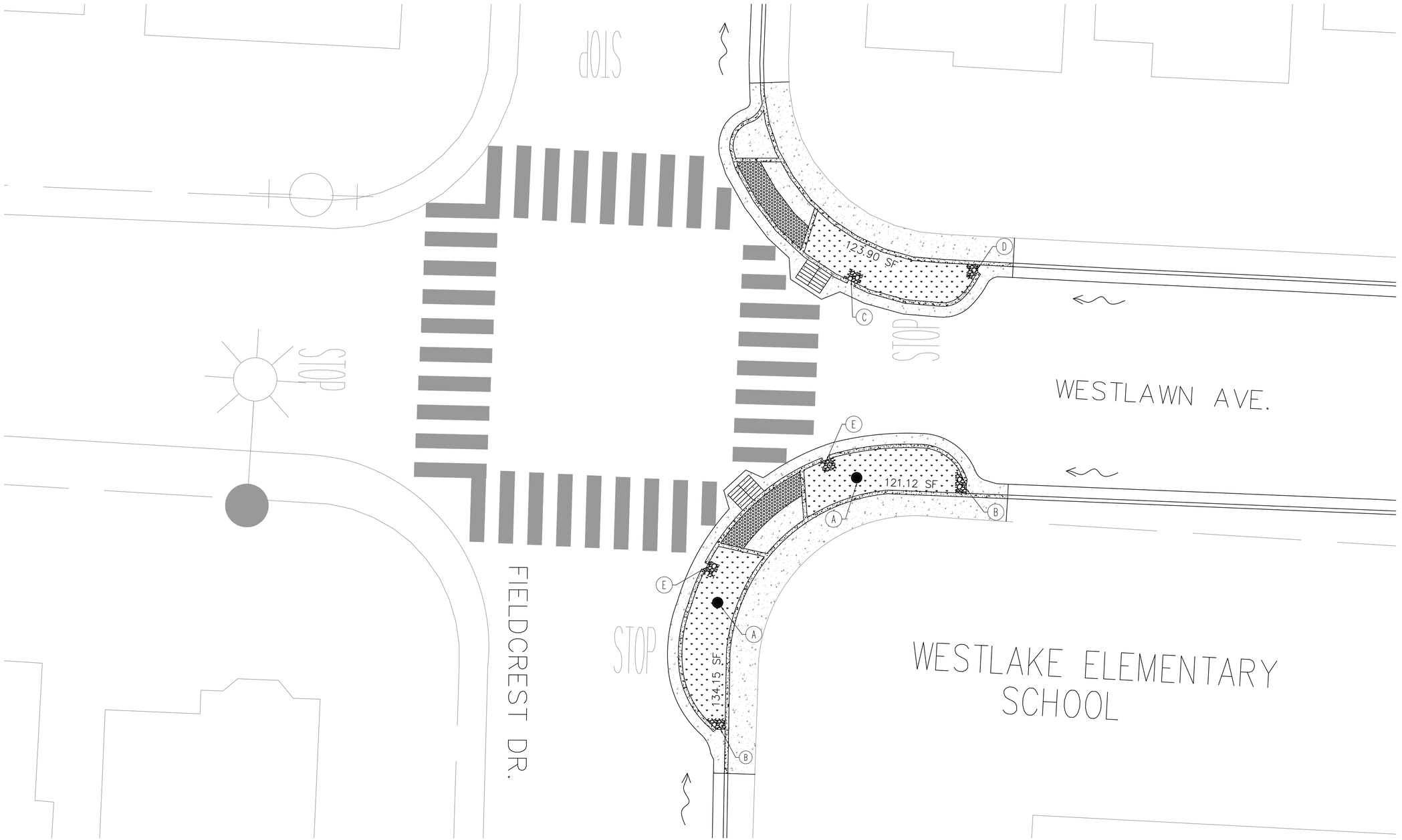
PROJECT LOCATION

LEGEND:

VEGETATED CURB EXTENSIONS



ATTACHMENT III



CONCEPT PLAN

THE CITY OF DALY CITY
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

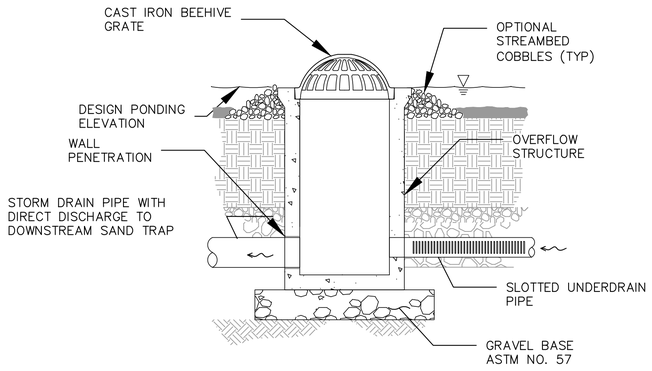
WESTLAKE ELEMENTARY SCHOOL
PILOT GREEN STREETS IMPROVEMENTS
SIDEWALK IMPROVEMENT PLAN

DRAWN	DA	DATE	10/17
CHECKED	RC	SCALE	NTS
DESIGNED	SCY	SURVEY NO.	

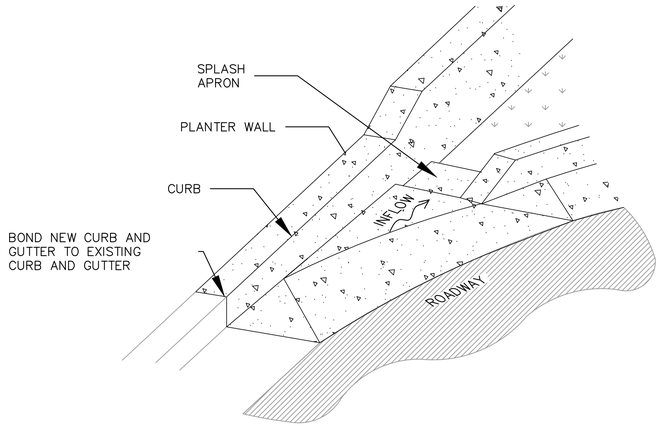
APPROVED_____
CITY ENGINEER

SHEET NO. 1 OF 2 | DRAWING NUMBER | REV.

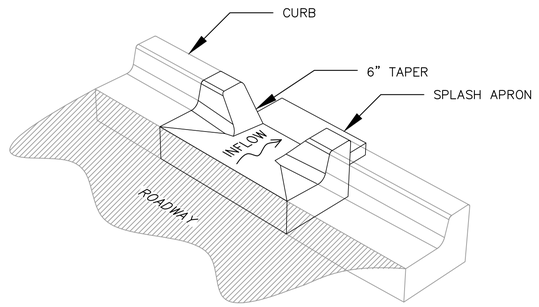
FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3



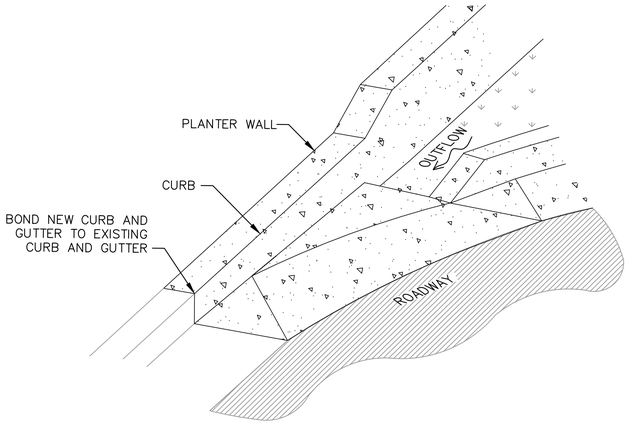
A OVERFLOW STRUCTURE
NTS



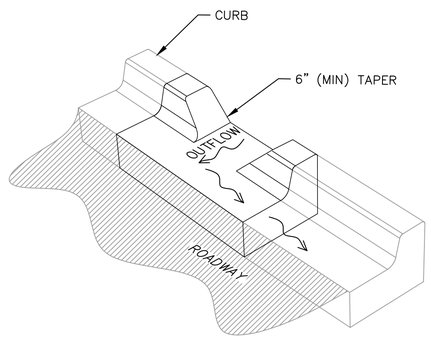
B INLET - CURB CUT TYPE 1
NTS



C INLET - CURB CUT TYPE 2
NTS



D OUTLET - CURB CUT TYPE 1
NTS



E OUTLET - CURB CUT TYPE 2
NTS

CONCEPT PLAN

THE CITY OF DALY CITY
CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

WESTLAKE ELEMENTARY SCHOOL
PILOT GREEN STREETS IMPROVEMENTS
DETAILS

DRAWN DA	DATE 10/17	APPROVED _____ CITY ENGINEER	
CHECKED RC	SCALE NTS		
DESIGNED SCY	SURVEY NO.	SHEET NO. 2 OF 2	DRAWING NUMBER / REV.

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

PRELIMINARY PROJECT SCHEDULE

PROJECT TITLE: Westlake Elementary School Pilot Green Streets Improvements

PROJECT SPONSOR: City of Daly City

Project Management:	April 1, 2018 - October 1, 2019
Submit 35% Submittal:	June 2018
Submit 65% Submittal:	August 2018
Submit 90% Submittal:	October 2018
Submit 100% Final Design:	December 2018
Advertise:	January 2019
Open Bid:	February 2019
Award Project:	February 2019
Notice to Proceed:	March 2019
Construction:	April 2019 - July 2019
Punchlist:	August 2019 - September 2019
Substantial Completion:	Septemeber 2019

Westlake Elementary School Pilot Green Streets Improvments Project
SRTS and Green Streets Infrastructure Estimated Cost Breakdown

Construction Element	SRTS/GI/Both	Quantity	Unit	Unit Cost	Cost	GI/Both Cost	SRTS/Both Cost	Percent GI Cost	Percent SRTS Cost
Temporary Traffic Control	BOTH	1	LS	$15,000	$15,000	$7,500	$7,500	44%	56%
Concrete Removal (sidewalk)	BOTH	750	SF	$25	$18,750	$9,375	$9,375		
Concrete Removal (curb and gutter)	BOTH	150	LF	$45	$6,750	$3,375	$3,375		
AC Removal (Street)	BOTH	600	SF	$10	$6,000	$3,000	$3,000		
Roadway Excavation and Export	GI	80	CY	$150	$12,000	$12,000	$0		
Minor Concrete (sidewalk)	SRTS	750	SF	$18	$13,500	$0	$13,500		
Minor Concrete (curb and gutter)	GI	25	LF	$75	$1,875	$1,875	$0		
Minor Concrete (retaining curb)	GI	130	LF	$40	$5,200	$5,200	$0		
Minor Concrete (curb ramp)	SRTS	2	EA	$7,000	$14,000	$0	$14,000		
Curb Ramp Detectable Warning Surface	SRTS	2	EA	$500	$1,000	$0	$1,000		
Hot Mix Asphalt (Type A)	Both	12	TON	$150	$1,800	$900	$900		
Curb Opening Catch Basin	GI	2	EA	$6,000	$12,000	$12,000	$0		
Area Drain/Overflow	GI	2	EA	$3,500	$7,000	$7,000	$0		
Modify Existing Storm Drain System	GI	2	EA	$5,000	$10,000	$10,000	$0		
4" PVC Underdrain System	GI	100	LF	$35	$3,500	$3,500	$0		
Splash Apron	GI	3	EA	$150	$450	$450	$0		
Stormwater Facility Soil Import and Prep	GI	60	CY	$100	$6,000	$6,000	$0		
Rock Checkdam	GI	6	EA	$200	$1,200	$1,200	$0		
1 gallon plants	GI	300	EA	$25	$7,500	$7,500	$0		
Irrigation	GI	600	SF	$2	$1,200	$1,200	$0		
Irrigation Controller	GI	1	EA	$2,000	$2,000	$2,000	$0		
Moisture Barrier	GI	300	LF	$12	$3,600	$3,600	$0		
Contingency (10%)	BOTH				$15,033	$7,516	$7,516		
Total					$165,358	$105,191	$60,166		

Enter "SRTS", "GI", or "Both" in column B - "Both" applies to costs that could be distributed equally to SRTS and GI elements
Enter the quantity of the units in column C
Enter the unit cost in column E
The resulting costs per element and breakdown for "GI/Both" and "SRTS/Both" will be calculated automatically

Safe Routes to School and Green Streets Infrastructure Pilot Program Scope of Work

Jurisdiction: City of East Palo Alto

Project Title: Addison Avenue SRTS and Green Street

Scope of Work (location and description of proposed work as detailed in project proposal):

The project is located in East Palo Alto on Addison Avenue between East Bayshore Road (south end) and Bay Road (north end). The project encompasses the entire length of Addison Avenue (2,000 feet).

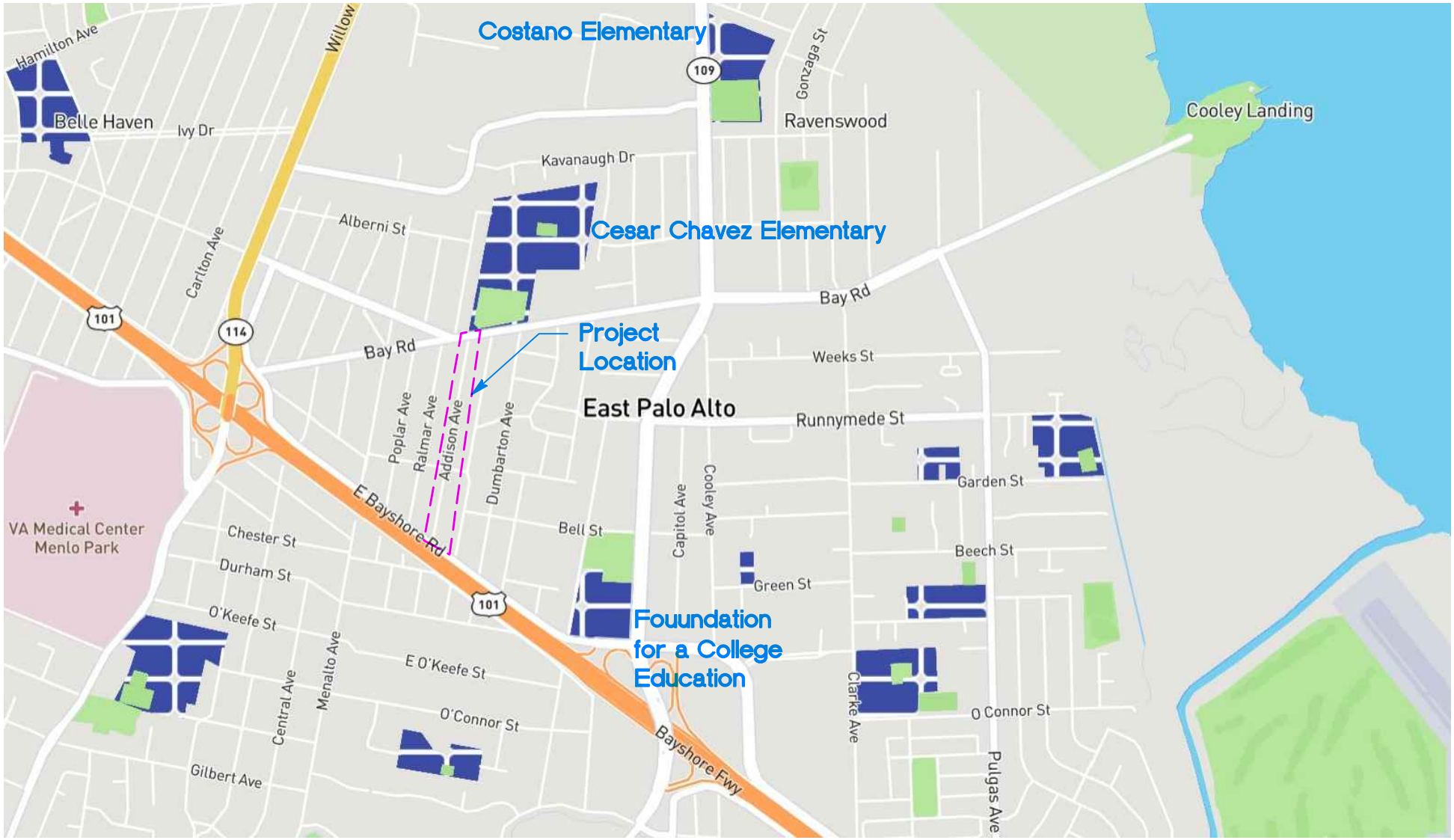
The project will improve pedestrian safety by building sidewalks along both sides of Addison Avenue. Curb ramps that meet current ADA standards will be provided at all corners. Pavement marking and signage will be provided to designate the road as a Class III bike route. Curb extensions will be incorporated at intersection corners as well as at intermediate mid-block locations. These will replace the speed humps that currently exist. The curb extensions will enhance pedestrian safety by improving pedestrians' visibility to approaching vehicles as well as by slowing vehicles on Addison Avenue.

Project will include educational signage. At the two termini of the corridor, signs will be installed that demonstrate the stormwater and pedestrian safety benefits of the improvements along the corridor.

City of East Palo Alto Public Works will be responsible for maintaining the improvements, including bioretention/biofiltration areas. Maintenance activities will include sediment and trash removal, removing dead vegetation, replenishing mulch where needed, and other necessary measures. Monthly litter abatement will be ongoing maintenance throughout the life span of these systems. Upon installation, inspections of the systems functioning capacity during a storm event of over 0.25 inches will occur to ensure functioning as designed. Thereafter, ongoing monthly visual observations of the measures will occur until such a time as the vegetation is fully established (typically within the first two years), and quarterly inspections thereafter to ensure the system is functioning and vegetation is thriving. Funding for maintaining these systems will be managed through the City's stormwater fund or other related funds.

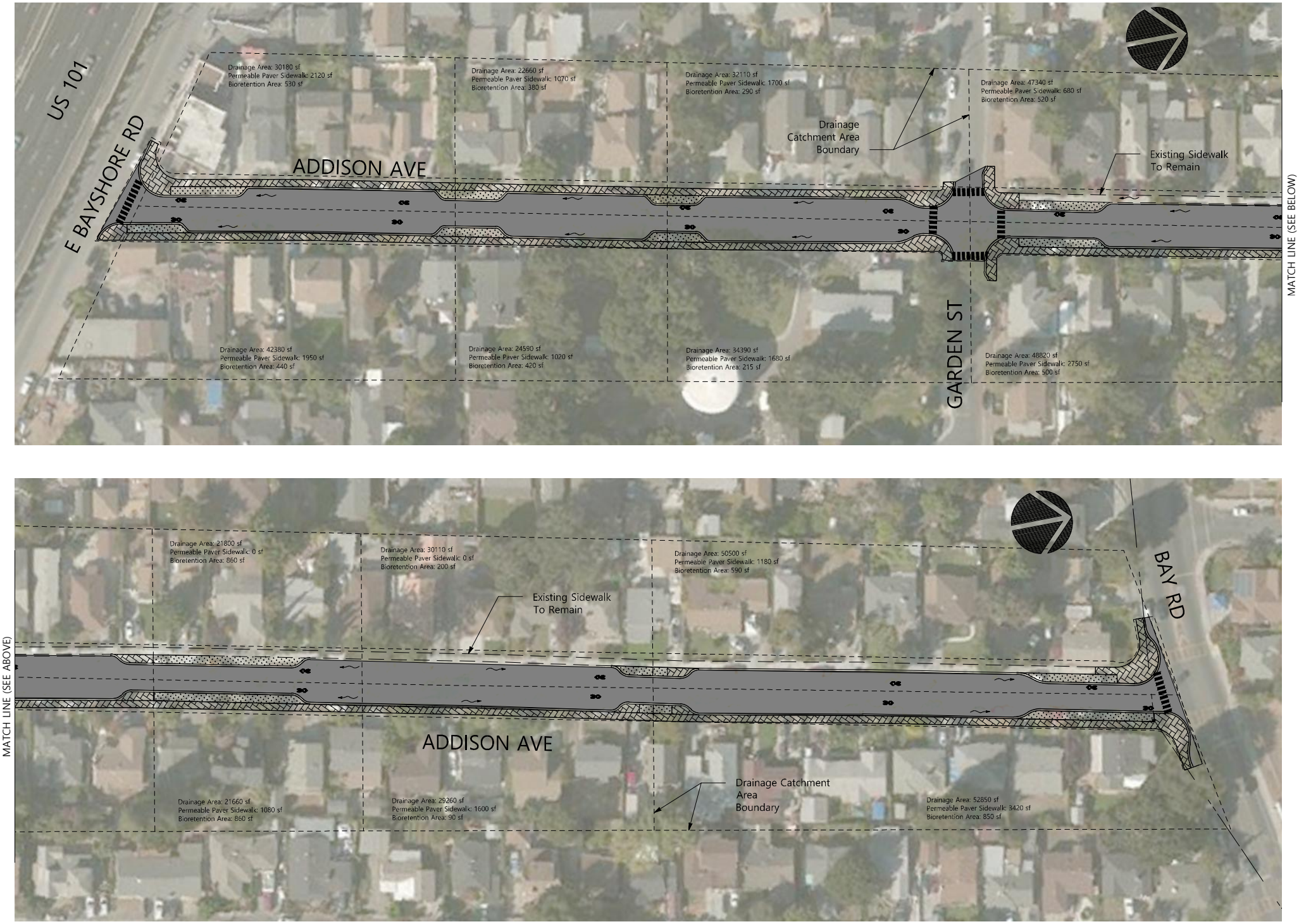
Attachments (proposed project map, design concept, preliminary budget, other supporting documentation):

1. Project Area Map
2. Project Concept and Sizing Calculations
3. Preliminary Timeline and Cost Breakdown



ATTACHMENT II – PROJECT LOCATION MAP

ATTACHMENT III - PROJECT CONCEPT SIZING CALCULATIONS



ATTACHMENT III - Project Concept

Permeable Paver Sidewalk

Bioretention Area

Grind and Overlay Pavement (2" HMA)

Existing Storm Drain System

Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1	Project Name:	Addison Avenue
1-2	City application ID:	
1-3	Site Address or APN:	Addison Avenue/Garden Street
1-4	Tract or Parcel Map No:	
1-5	Rainfall Region	4
1-6	Region Mean Annual Precipitation (MAP)	14.60
1-7	Site Mean Annual Precipitation (MAP)	16

The calculations presented here are based on the combination flow and volume sizing method provided in the Countywide Program's C.3 Technical Guidance, Version 4.0. The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named "Guidance from Chapter 5".

Click here for map

1-8 ***MAP adjustment factor is automatically calculated as:*** **1.10**

(The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, showin in Table 5-3, below.)
Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.

2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **Addison Avenue**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft.)	Adjust Pervious Surface	Effective Impervious Area
2-2	Impervious surface	249,127	1.0	249,127
2-3	Pervious surface	220,924	0.1	22,092
	Total DMA Area (square feet) =	470,050		

2-4 ***Total Effective Impervious Area (EIA)*** **271,219** **Square feet**

3.0 Calculate Unit Basin Storage Volume in Inches

Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient

Region	Station, and Mean Annual Precipitation (Inches)	Runoff Coefficient of 1.0
1	Boulder Creek, 55.9"	2.04"
2	La Honda, 24.4"	0.86"
3	Half Moon Bay, 25.92"	0.82"
4	Palo Alto, 14.6"	0.64"
5	San Francisco, 21.0"	0.73"
6	San Francisco airport, 20.1"	0.85"
7	San Francisco Oceanside, 19.3"	0.72"

3-1 ***Unit basin storage volume from Table 5-3:*** **0.64**

(The coefficient for this method is always 1.0, due to the conversion of any landscaping to effective impervious area.)

3-2 ***Adjusted unit basin storage volume:*** **0.70** **Inches**

(The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].)

3-3 ***Required Capture Volume (in cubic feet):*** **15,852** **Cubic feet**

(The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet)

4.0 Calculate the Duration of the Rain Event

4-1	Rainfall intensity	0.2	Inches per hour
4-2	Divide Item 3-2 by Item 4-1	3.51	Hours of Rain Event Duration

5.0 Preliminary Estimate of Surface Area of Treatment Measure

5-1	4% of DMA EIA (Item 2-4)	10,849	Square feet
5-2	Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA)	8,137	Square feet
5-3	Volume of treated runoff for area in Item 5-2	11,889	Cubic feet (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2)

4.0% of Drainage Management Area

6.0 Initial Adjustment of Depth of Surface Ponding Area

6-1	Subtract Item 5-3 from Item 3-3	3,963	Cubic feet (Amount of runoff to be stored in ponding area)
6-2	Divide Item 6-1 by Item 5-2	0.49	Feet (Depth of stored runoff in surface ponding area)
6-3	Convert Item 6-2 from feet to inches	5.84	Inches (Depth of stored runoff in surface ponding area)

6-4 If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

7.0 Optimize Size of Treatment Measure

7-1	Enter an area larger than Item 5-2	6500	**Sq.ft.** (enter larger area if you need less ponding depth.)
7-2	Volume of treated runoff for area in Item 7-1	9,498	**Cubic feet** (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2)
7-3	Subtract Item 7-2 from Item 3-3	6,354	**Cubic feet** (Amount of runoff to be stored in ponding area)
7-4	Divide Item 7-3 by Item 7-1	0.98	**Feet** (Depth of stored runoff in surface ponding area)
7-5	Convert Item 7-4 from ft. to inches	11.73	**Inches** (Depth of stored runoff in surface ponding area)

7-6 If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

8.0 Surface Area of Treatment Measure for DMA

8-1	Final surface area of treatment	6,500	**Square feet** (Either Item 5-2 or final amount in Item 7-1)

ATTACHMENT IV - PRELIMINIARY TIMELINE
BUDGET WITH COST BREAKDOWN TABLE

ATTACHMENT IV - PRELIMINARY TIMELINE AND BUDGET WITH COST BREAKDOWN TABLE

Addison Avenue SRTS and Green Streets Infrastructure Project

Estimated Construction Cost Breakdown

Construction Element	SRTS/GI/Both	Quantity	Unit	Unit Cost	Cost	GI/Both Cost	SRTS/Both Cost	Percent GI Cost	Percent SRTS Cost
Concrete Removal (sidewalk)	SRTS	1212.4	SF	$5	$6,062	$0	$6,062	47%	53%
Concrete Removal (curb and gutter)	BOTH	191.47	LF	$10	$1,915	$957	$957		
Permeable Concrete (sidewalk)	BOTH	18953.65	SF	$20	$379,073	$189,537	$189,537		
Minor Concrete (curb and gutter)	BOTH	3168.95	LF	$75	$237,671	$118,836	$118,836		
Minor Concrete (curb ramp)	SRTS	14	EA	$7,000	$98,000	$0	$98,000		
Modify Existing Storm Drain System	GI	1	EA	$5,000	$5,000	$5,000	$0		
Sormwater Facility Soil Excavation	GI	680	CY	$25	$17,000	$17,000	$0		
Stormwater Facility Soil Import and Prep (with underdrain)	GI	680	CY	$100	$68,000	$68,000	$0		
Landscape Area Soil Import and Prep	GI	8	CY	$35	$280	$280	$0		
1 gallon plants	GI	1600	EA	$40	$64,000	$64,000	$0		
Irrigation	GI	7400	SF	$2	$14,800	$14,800	$0		
AC Milling and Off-Haul (2" depth)	SRTS	390	CY	$50	$19,500	$0	$19,500		
HMA Overlay (2" depth)	SRTS	790	TON	$130	$102,700	$0	$102,700		
Signing and Striping	SRTS	3	LS	$1,500	$4,500	$0	$4,500		
Interpretive Signs	BOTH	2	EA	$500	$1,000	$500	$500		
Contingency	BOTH				$101,950	$47,891	$50,975		
Total					$1,121,451	$526,800	$591,567		

SUMMARY OF PROJECT COSTS

Category	Cost
Construction (See Table above)	$1,122,000
Planning and Design (20% of Construction)	$224,000.00
Construction Administration (15% of Construction)	$168,300.00
TOTAL PROJECT COST	**$1,514,300**

PROJECT SCHEDULE

TASK	BEGIN DATE	END DATE
Execute Funding Agreement	12/14/2017	4/1/2018
Select Design Consultant	4/2/2018	6/1/2018
Prepare Plans, Specifications, and Estimate	6/4/2018	12/20/2018
Bidding and Construction Award	12/21/2018	2/21/2019
Construction	2/22/2019	8/15/2019
Request for Reimbursement	9/15/2019	-

Safe Routes to School and Green Streets Infrastructure Pilot Program Scope of Work

Jurisdiction: City of Half Moon Bay

Project Title: Half Moon Bay Safe Routes to Cunha School Project

Scope of Work (location and description of proposed work as detailed in project proposal):

The project is located in San Mateo County in the City of Half Moon Bay at the intersection of Purissima St and Correas St, between Church St and Main St.

The site is located adjacent to the new Half Moon Bay Library and one block from Manuel F. Cunha Intermediate School.

The City proposes four new high visibility crossings at the intersection of Purissma St and Correas St. with three new concrete bulb-outs on the south-west, south-east and north-east corners. The City proposes green four stormwater curb extensions associated with the pedestrian bulb-outs (two on the south-west bulb-out, one on the south-east bulb-out on the east side of Purissima St and one on the north-east bulbout on the north side of Correas St).

The proposed design promotes the goals of the SRTS program by facilitating a safe walking atmosphere for students trying to reach Cunha Intermediate School. The bulb-outs make for better visibility of pedestrians and shorter walking distance across the road, which is an identified problem at this location.

This design also promotes the stormwater goals of this pilot program by including four stormwater curb extensions that feature bioretention/bioswales to capture and treat stormwater as it travels downhill towards sports fields and Highway 1, where it is known to collect and cause flooding.

The proposed project will include educational signage.

The long-term operations and maintenance for the completed facilities will be conducted by the City of Half Moon Bay Public Works Department.

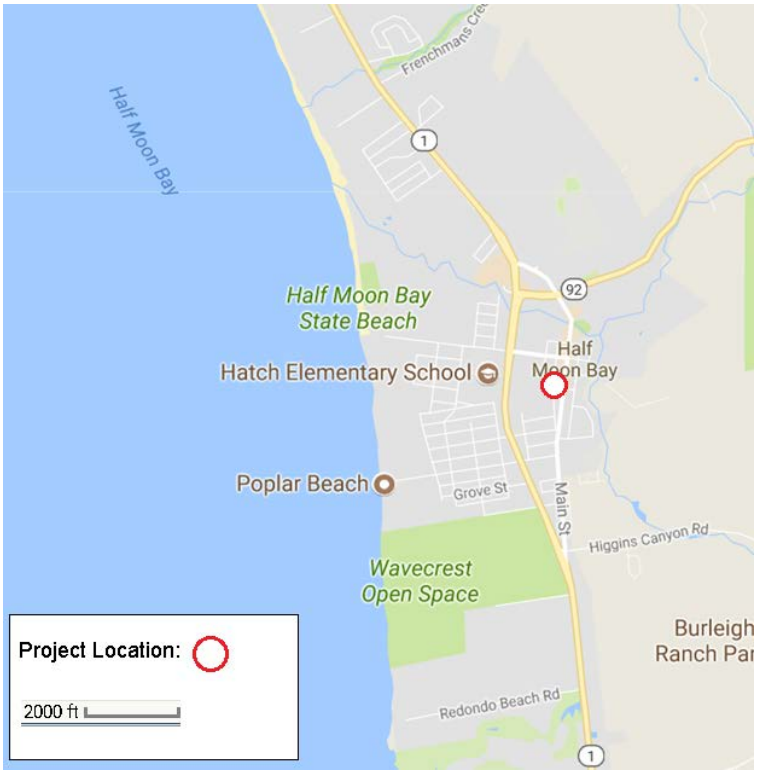
Attachments (proposed project map, design concept, preliminary budget, other supporting documentation):

1. Project Area Map
2. Project Concepts and Sizing Calculations
3. Preliminary Timeline and Cost Breakdown

Attach ent II

Half Moon Bay: Safe Routes to Cunha School Project

Project Area Ma



st n ond t ons

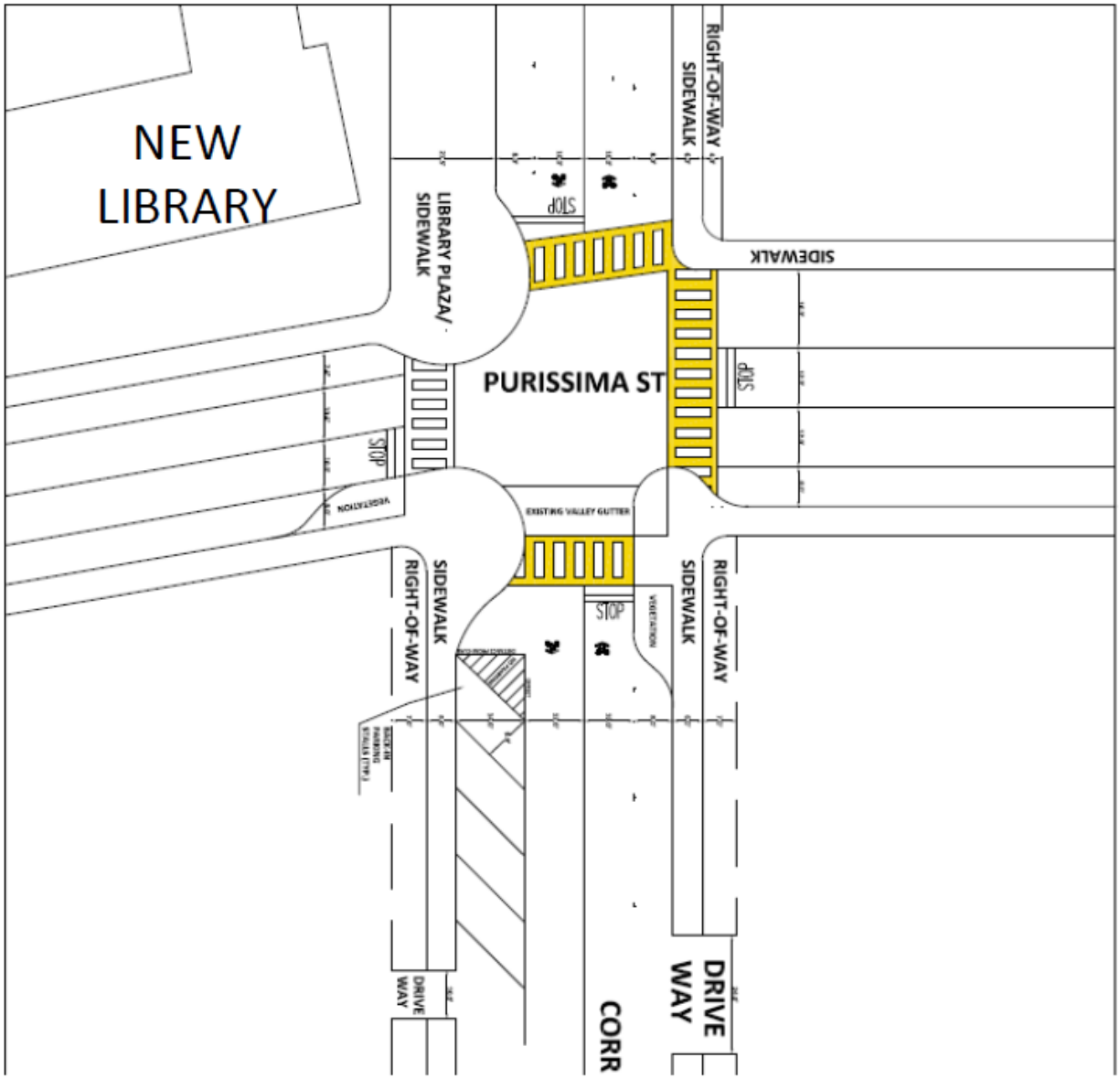
Google Maps Satellite View (2017)

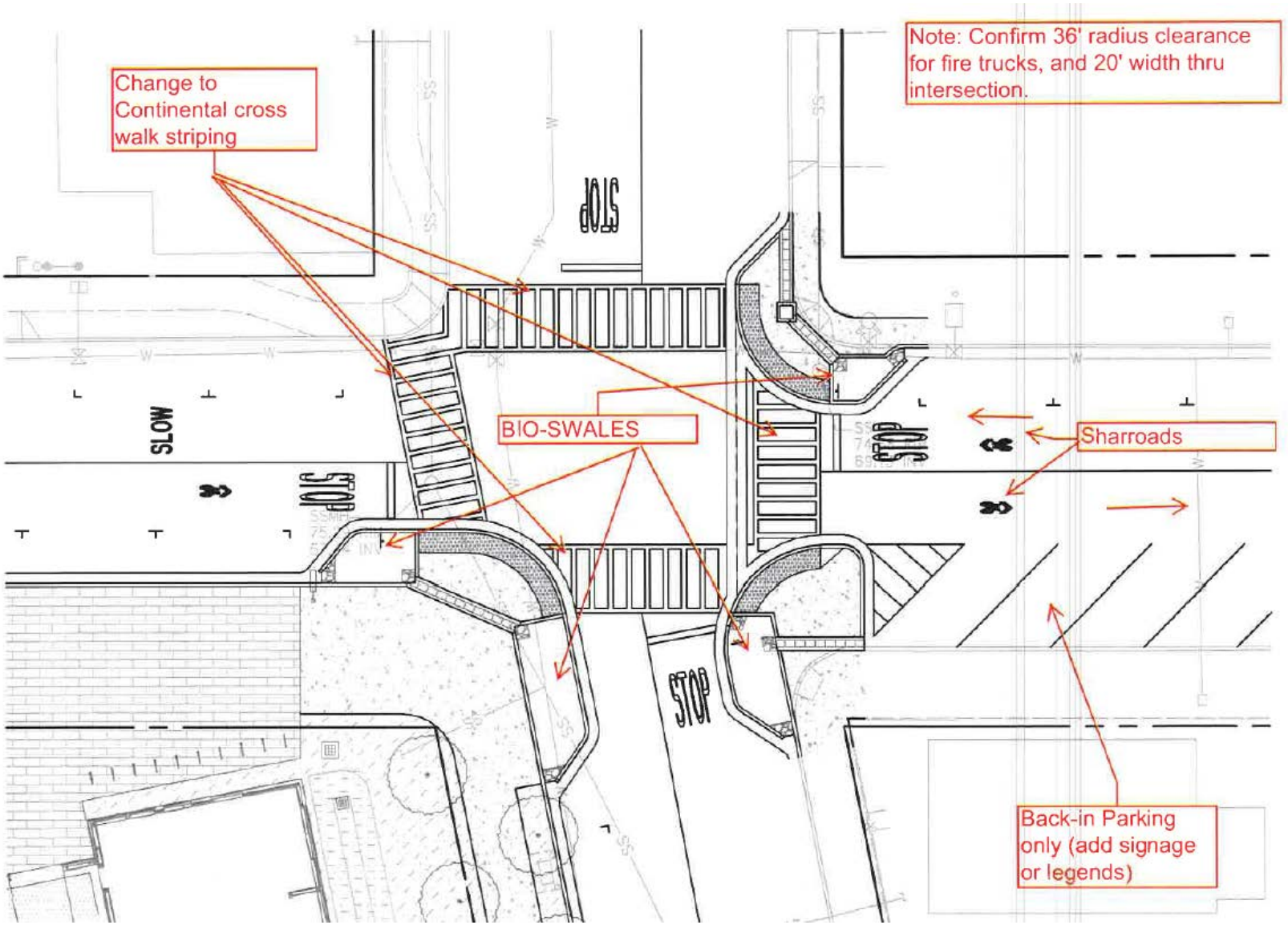
View of intersections looking North from Purissima Street

Attach ent III

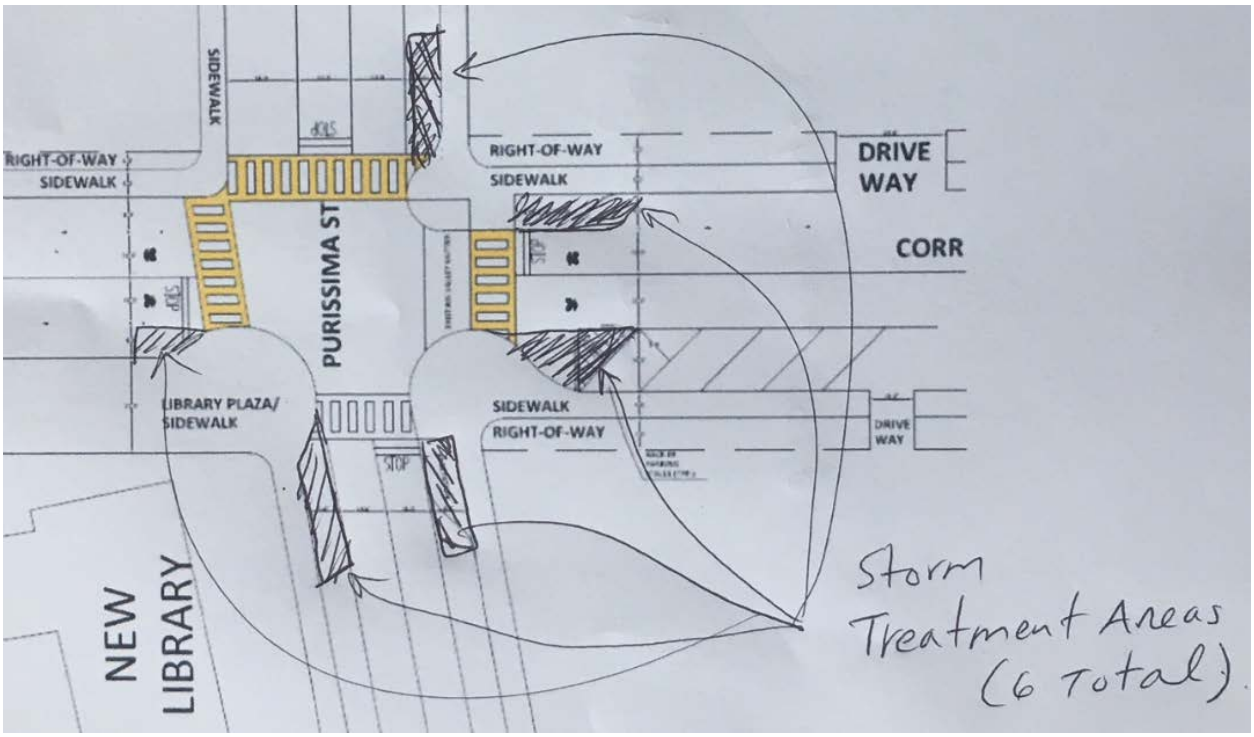
Half Moon Bay: Safe Routes to Cunha School Project

Project once t




Change to Continental cross walk striping
Note: Confirm 36' radius clearance for fire trucks, and 20' width thru intersection.
BIO-SWALES
Sharroads
Back-in Parking only (add signage or legends)
STOP
SLOW


Half Moon
Bay Veterinary
Bank of America
Financial Center
Purísima St
Main St
Correas St
Correas St
Drainage Area 1
CENTURY 21
Sunset Properties
Alexa Alborzi,
Alborzi..
Main St
ARK North
Indian Cuisine
Main St
Sacrilege Brewery
+ Kitchen
Amesport Landing
Drainage Area 2



Drainage Area 1 = 200 ft x 40 ft= 8,000 sf
Drainage Area 2 = 330 ft x 40 ft= 13,200 sf

Total Drainage = 8,000 ft + 13,200= 21,200 sf

Total Treatment Area Needed = 21,200 x 0.04= 848 sf

Area Needed per Treatment Area = 848/6= **141 sf**

More detailed calculations will done to determine the size of each area during final design

Attach ent I

Half Moon Bay: Safe Routes to Cunha School Project

Project Timeline

ask	Start ate	o let on ate
Award Date		April 2018
Construction (Bulbouts, Bioswales)	Summer 2018	Winter 2018
Final Construction (Sign Installation, Plantings)	Winter 2018	Spring 2019
Project Completion	Spring 2019	

Project Budget

onstruct on le ent	SR S GI oth ost	GI oth ost	SR S oth ost
Bulbouts	Both	$80,000	$40,000	$40,000
High visibility ladder cross walk	SRTS	$20,000	$0	$20,000
Bioretention/bioswale	GI	$55,000	$55,000	$0
Signage	Both	$5,000	$2,500	$2,500
Contingency	Both	$20,000	$10,000	$10,00
otal ost	$180,000	$180,000	$107,500	$72,500
otal Percenta e	100%		60%	40%

Safe Routes to School and Green Streets Infrastructure Pilot Program Scope of Work

Jurisdiction: City of Menlo Park

Project Title: Oak Grove Safe Routes to School and Green Infrastructure Improvements Project

Scope of Work (location and description of proposed work as detailed in project proposal):

The project limits extend along Oak Grove Avenue in Menlo Park from Rebecca Lane at the Town of Atherton and Menlo Park border, to about 150 feet east of Pine Street. This Project would complete gaps in the pedestrian network along both sides of Oak Grove resulting in improved safety, accessibility, and connectivity to and from Nativity Catholic School, Menlo Atherton High School and other destinations across the City. The project would provide:

- A curb-separated pedestrian path on the south side of Oak Grove between Rebecca Ln and Marcussen Drive, about 200 feet,
- A path between the Church of the Nativity and Nativity Catholic School on the north side of Oak Grove, about 800 feet, to complete the existing pedestrian gaps.
- Interfaced with the pedestrian path will be green infrastructure in the form of stormwater curb extensions on the north and south sides of Oak Grove as shown in the attached concepts

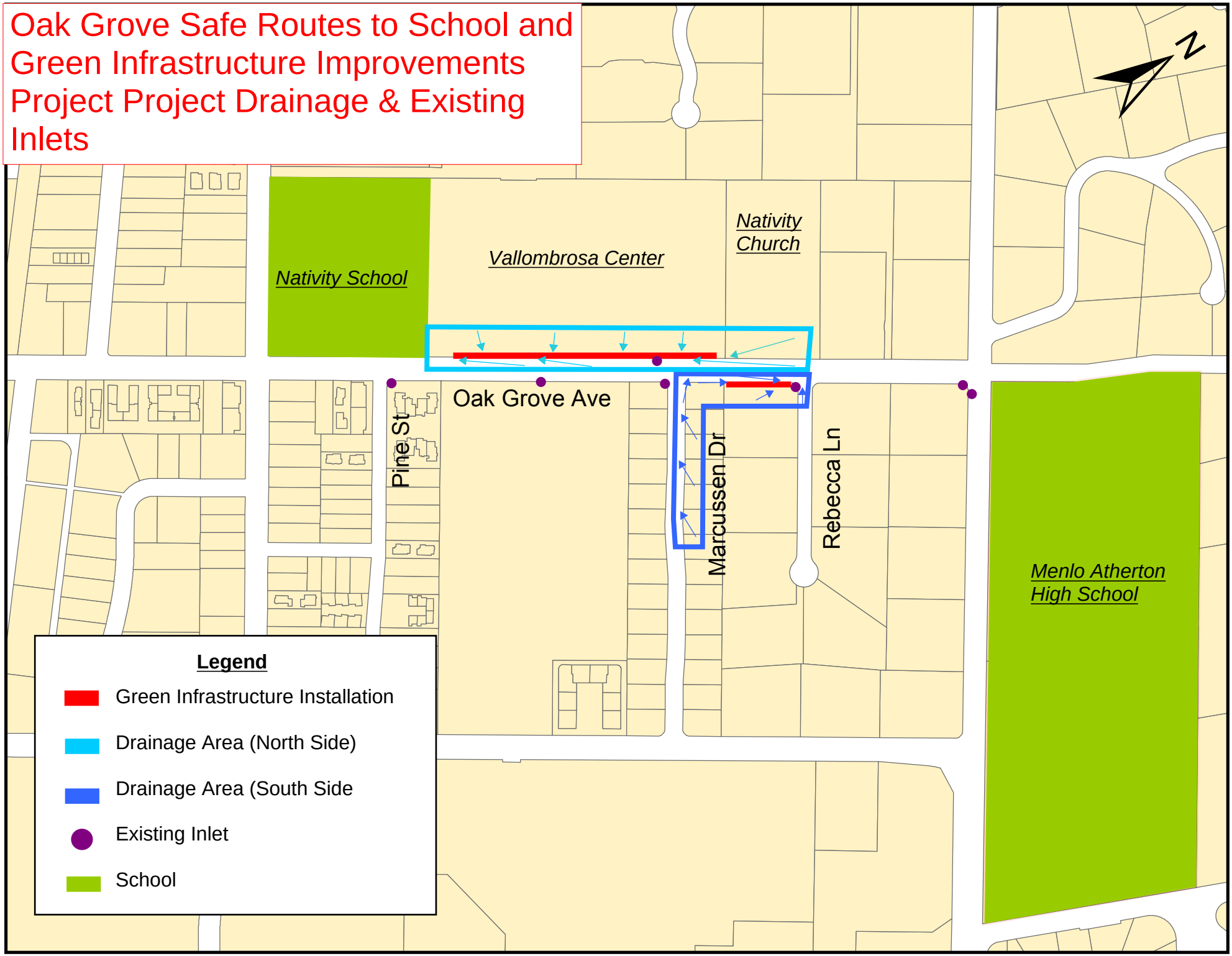
The proposed project will include educational signage.

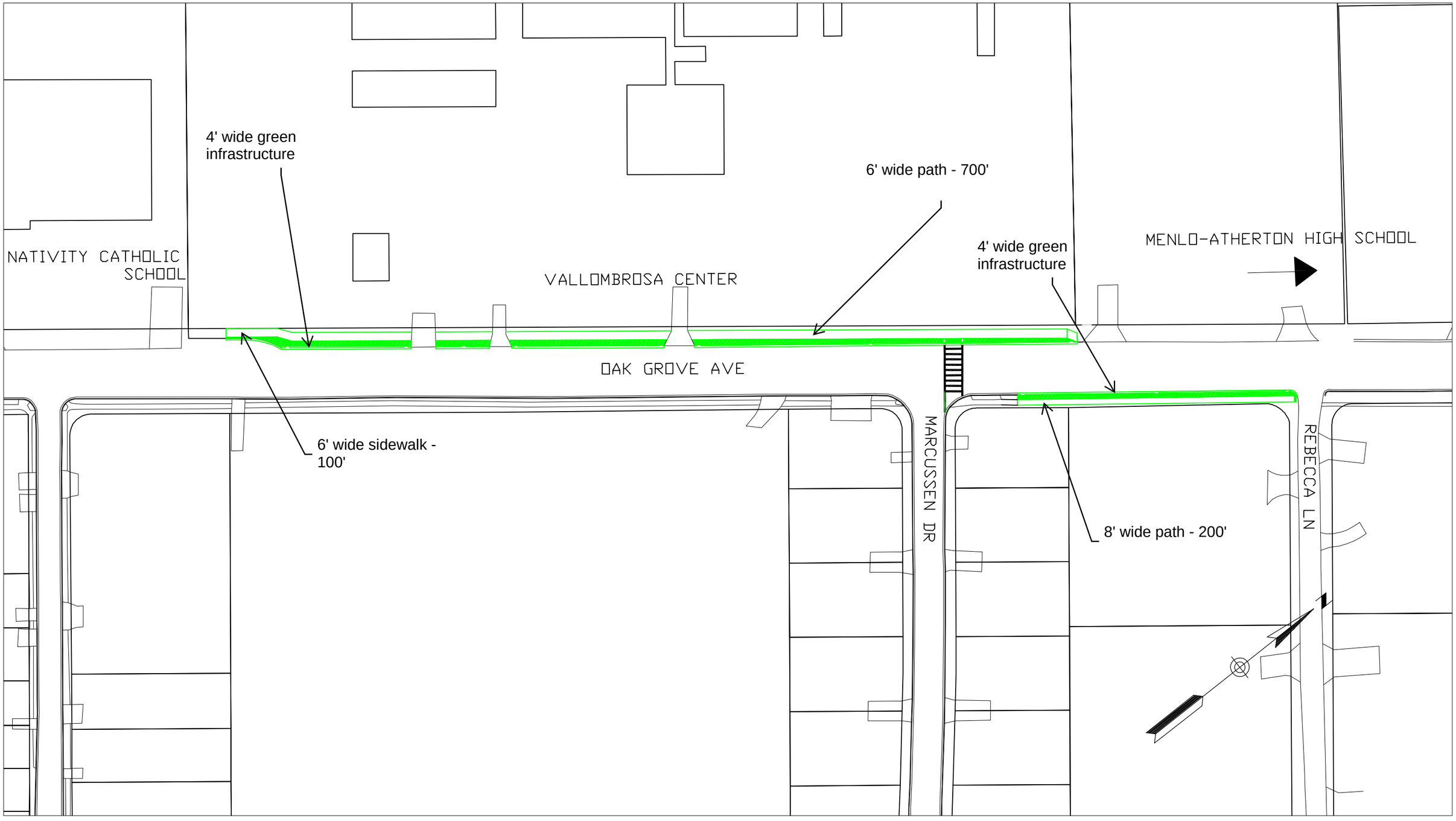
The City of Menlo Park Public Works Department tracks all facilities and maintenance operations to ensure full functionality. The new facilities will be regularly maintained by the Public Works Department to ensure long-term operations are maintained at an acceptable level. The City keeps records of areas where there are complaints by residents, or problems noted by maintenance crews. As part of the best management practices and stormwater program, the City regularly cleans storm drains to prevent trash from getting into the drains and from flowing into the Bay and prevent flooding.

Attachments (proposed project map, design concept, preliminary budget, other supporting documentation):

1. Project Area Map
2. Project Concepts and Sizing Calculations
3. Preliminary Timeline and Cost Breakdown

Oak Grove Safe Routes to School and Green Infrastructure Improvements Project Project Drainage & Existing Inlets





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SCALE: SCALE
DRAWN BY: INITIALS
DRAWING NAME: DRAWING
DESIGNED BY: DSGN-NAME
CHECKED BY: CHK-NAME1
SURVEYED BY: SUR-NAME

APPROVED:

DATE

XXXXX
R.C.E. #

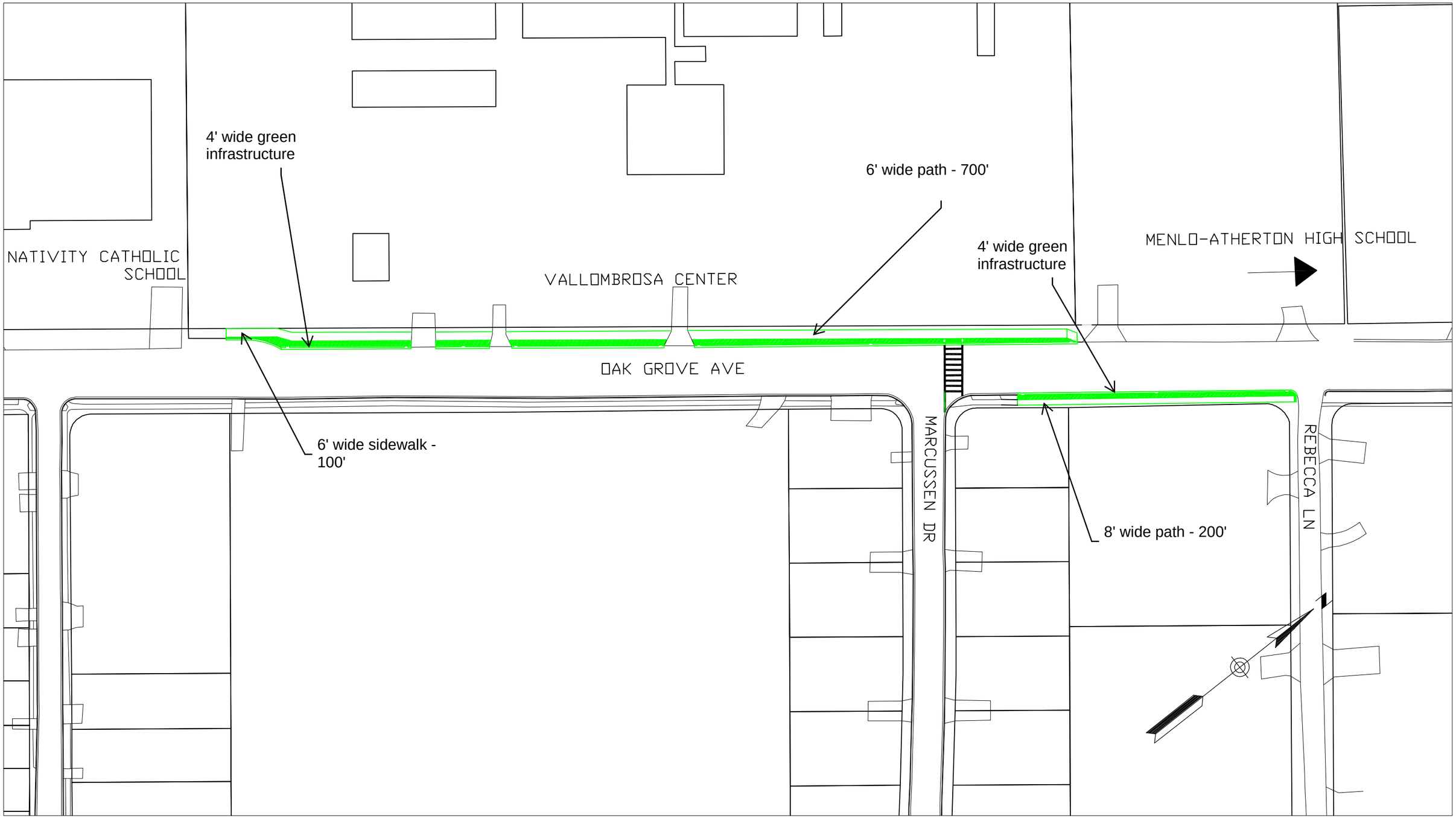
NO.	BY	DATE	REVISIONS
REV-D-8			REV-N-8
REV-D-7			REV-N-7
REV-D-6			REV-N-6
REV-D-5			REV-N-5
REV-D-4			REV-N-4
REV-D-3			REV-N-3
REV-D-2			REV-N-2
REV-D-1			REV-N-1

CITY OF MENLO PARK
TRANSPORTATION DIVISION
701 LAUREL STREET, MENLO PARK, CA 94025-3483
PHONE (650) 330-6740 FAX (650) 327-5497

Oak Grove Avenue Safe Routes to School and Green Infrastructure Project

SHEET
SHTNO
OF SHTOTAL SHEETS
PROJ. NAME
PROJ.NAME
CKDATE

ACAD_FILE
XREFS REF_FILES



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DRAWING NAME: DRAWING
DESIGNED BY: DSGN-NAME
CHECKED BY: CHK-NAME1
SURVEYED BY: SUR-NAME

APPROVED:

DATE

XXXXX
R.C.E. #

NO.	BY	DATE	REVISIONS
REV-D-8			REV-N-8
REV-D-7			REV-N-7
REV-D-6			REV-N-6
REV-D-5			REV-N-5
REV-D-4			REV-N-4
REV-D-3			REV-N-3
REV-D-2			REV-N-2
REV-D-1			REV-N-1

CITY OF MENLO PARK
TRANSPORTATION DIVISION
701 LAUREL STREET, MENLO PARK, CA 94025-3483
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Oak Grove Avenue Safe Routes to School and Green Infrastructure Project

SHEET
SHTNO
OF SHTOTAL SHEETS
PROJ. NAME
PROJ.NAME
CKDATE

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XREFS REF_FILES

Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1	Project Name:	Oak Grove Ave Pedestrian and Stormwater Management Project
1-2	City application ID:	
1-3	Site Address or APN:	Oak Grove Ave
1-4	Tract or Parcel Map No:	
1-5	Rainfall Region	4
1-6	Region Mean Annual Precipitation (MAP)	14.60
1-7	Site Mean Annual Precipitation (MAP)	15

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 4.0. The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named "Guidance from Chapter 5".

Click here for map

1-8 ***MAP adjustment factor is automatically calculated as:*** **1.00**

(The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, showin in Table 5-3, below.)
Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.

2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **Oak Grove Avenue (North Side)**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft.)	Adjust Pervious Surface	Effective Impervious Area
2-2	Impervious surface	32,909	1.0	32,909
2-3	Pervious surface	8,606	0.1	861
	Total DMA Area (square feet) =	41,515		

2-4 ***Total Effective Impervious Area (EIA)*** **33,770** **Square feet**

3.0 Calculate Unit Basin Storage Volume in Inches

Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient

Region	Station, and Mean Annual Precipitation (Inches)	Runoff Coefficient of 1.0
1	Boulder Creek, 55.9"	2.04"
2	La Honda, 24.4"	0.86"
3	Half Moon Bay, 25.92"	0.82"
4	Palo Alto, 14.6"	0.64"
5	San Francisco, 21.0"	0.73"
6	San Francisco airport, 20.1"	0.85"
7	San Francisco Oceanside, 19.3"	0.72"

3-1 ***Unit basin storage volume from Table 5-3:*** **0.64**
(The coefficient for this method is always 1.0, due to the conversion of any landscaping to effective impervious area.)

3-2 ***Adjusted unit basin storage volume:*** **0.64** **Inches**
(The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].)

3-3 ***Required Capture Volume (in cubic feet):*** **1,801** **Cubic feet**
(The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet)

4.0 Calculate the Duration of the Rain Event

4-1	Rainfall intensity	0.2	**Inches per hour**
4-2	Divide Item 3-2 by Item 4-1	3.20	**Hours of Rain Event Duration**

5.0 Preliminary Estimate of Surface Area of Treatment Measure

5-1	4% of DMA EIA (Item 2-4)	1,351	**Square feet**
5-2	Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA)	1,013	**Square feet**
5-3	Volume of treated runoff for area in Item 5-2	1,351	**Cubic feet** (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2)

6.0 Initial Adjustment of Depth of Surface Ponding Area

6-1	Subtract Item 5-3 from Item 3-3	450	**Cubic feet** (Amount of runoff to be stored in ponding area)
6-2	Divide Item 6-1 by Item 5-2	0.44	**Feet** (Depth of stored runoff in surface ponding area)
6-3	Convert Item 6-2 from feet to inches	5.33	**Inches** (Depth of stored runoff in surface ponding area)

6-4 If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

7.0 Optimize Size of Treatment Measure

7-1	Enter an area larger than Item 5-2	900	**Sq.ft.** (enter larger area if you need less ponding depth.)
7-2	Volume of treated runoff for area in Item 7-1	1,200	**Cubic feet** (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2)
7-3	Subtract Item 7-2 from Item 3-3	601	**Cubic feet** (Amount of runoff to be stored in ponding area)
7-4	Divide Item 7-3 by Item 7-1	0.67	**Feet** (Depth of stored runoff in surface ponding area)
7-5	Convert Item 7-4 from ft. to inches	8.01	**Inches** (Depth of stored runoff in surface ponding area)

7-6 If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

8.0 Surface Area of Treatment Measure for DMA

8-1	Final surface area of treatment	900	**Square feet** (Either Item 5-2 or final amount in Item 7-1)

Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1	Project Name:	Oak Grove Ave Pedestrian and Stormwater Management Project
1-2	City application ID:	
1-3	Site Address or APN:	Oak Grove Ave
1-4	Tract or Parcel Map No:	
1-5	Rainfall Region	4
1-6	Region Mean Annual Precipitation (MAP)	14.60
1-7	Site Mean Annual Precipitation (MAP)	15

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 4.0. The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named "Guidance from Chapter 5".

Click here for map

1-8 ***MAP adjustment factor is automatically calculated as:*** **1.00**

(The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, showin in Table 5-3, below.)

Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.

2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **Oak Grove Avenue (South Side)**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft.)	Adjust Pervious Surface	Effective Impervious Area
2-2	Impervious surface	12,727	1.0	12,727
2-3	Pervious surface	9,400	0.1	940
	Total DMA Area (square feet) =	22,127		

2-4 ***Total Effective Impervious Area (EIA)*** **13,667** **Square feet**

3.0 Calculate Unit Basin Storage Volume in Inches

Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient

Region	Station, and Mean Annual Precipitation (Inches)	Runoff Coefficient of 1.0
1	Boulder Creek, 55.9"	2.04"
2	La Honda, 24.4"	0.86"
3	Half Moon Bay, 25.92"	0.82"
4	Palo Alto, 14.6"	0.64"
5	San Francisco, 21.0"	0.73"
6	San Francisco airport, 20.1"	0.85"
7	San Francisco Oceanside, 19.3"	0.72"

3-1 ***Unit basin storage volume from Table 5-3:*** **0.64**

(The coefficient for this method is always 1.0, due to the conversion of any landscaping to effective impervious area.)

3-2 ***Adjusted unit basin storage volume:*** **0.64** **Inches**

(The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].)

3-3 ***Required Capture Volume (in cubic feet):*** **729** **Cubic feet**

(The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet)

4.0 Calculate the Duration of the Rain Event

4-1	Rainfall intensity	0.2	**Inches per hour**
4-2	Divide Item 3-2 by Item 4-1	3.20	**Hours of Rain Event Duration**

5.0 Preliminary Estimate of Surface Area of Treatment Measure

5-1	4% of DMA EIA (Item 2-4)	547	**Square feet**
5-2	Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA)	410	**Square feet**
5-3	Volume of treated runoff for area in Item 5-2	547	**Cubic feet** (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2)

6.0 Initial Adjustment of Depth of Surface Ponding Area

6-1	Subtract Item 5-3 from Item 3-3	182	**Cubic feet** (Amount of runoff to be stored in ponding area)
6-2	Divide Item 6-1 by Item 5-2	0.44	**Feet** (Depth of stored runoff in surface ponding area)
6-3	Convert Item 6-2 from feet to inches	5.33	**Inches** (Depth of stored runoff in surface ponding area)

6-4 If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1.

(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

7.0 Optimize Size of Treatment Measure

7-1	Enter an area larger than Item 5-2	500	**Sq.ft.** (enter larger area if you need less ponding depth.)
7-2	Volume of treated runoff for area in Item 7-1	667	**Cubic feet** (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2)
7-3	Subtract Item 7-2 from Item 3-3	62	**Cubic feet** (Amount of runoff to be stored in ponding area)
7-4	Divide Item 7-3 by Item 7-1	0.12	**Feet** (Depth of stored runoff in surface ponding area)
7-5	Convert Item 7-4 from ft. to inches	1.49	**Inches** (Depth of stored runoff in surface ponding area)

7-6 If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

8.0 Surface Area of Treatment Measure for DMA

8-1	Final surface area of treatment	500	**Square feet** (Either Item 5-2 or final amount in Item 7-1)

Menlo Park - Oak Grove Avenue Safe Routes to School and Green Infrastructure Project

Construction Element		SRTS/GI/Both	Quantity	Unit	Unit Cost	Cost	GI/Both Cost	SRTS/Both Cost	Percent GI Cost	Percent SRTS Cost
B/w Rebecca & Marcusser	8' Path (Asphalt)	SRTS	1600	CF	$18.00	$28,800.00		$28,800.00	48.00%	52.00%
	6" Curb	Both	200	LF	$55.00	$11,000.00	$5,500.00	$5,500.00		
	ADA Truncated Domes	SRTS	1	EA	$500.00	$500.00		$500.00		
	Curb Opening Catch Basin	GI	1	EA	$5,000.00	$5,000.00	$5,000.00			
	Modify Existing Storm Drain System	GI	1	EA	$5,000.00	$5,000.00	$5,000.00			
	4" PVC Underdrain System	GI	200	LF	$25.00	$5,000.00	$5,000.00			
	Stormwter Facility Soil Excavation	GI	267	CY	$20.00	$5,333.33	$5,333.33			
	Stormwater Facility Soil Import and Prep (with underdrain)	GI	267	CY	$45.00	$12,000.00	$12,000.00			
	1 Gallon Plants	GI	100	EA	$20.00	$2,000.00	$2,000.00			
	Moisture Barrier	GI	200	LF	$10.00	$2,000.00	$2,000.00			
From Vallombrosa to Nativity	6' Path (Asphalt)	SRTS	4800	CF	$18.00	$86,400.00		$86,400.00		
	Sidewalk	SRTS	600	CF	$20.00	$12,000.00		$12,000.00		
	6" Curb	Both	800	LF	$55.00	$44,000.00	$22,000.00	$22,000.00		
	ADA Ramp	SRTS	1	EA	$7,500.00	$7,500.00		$7,500.00		
	ADA Truncated Domes	SRTS	4	EA	$500.00	$2,000.00		$2,000.00		
	Water Utility Box Relocation	Both	2	EA	$1,200.00	$2,400.00	$2,400.00	$2,400.00		
	Fire Hydrant Relocation	Both	1	EA	$4,000.00	$4,000.00	$4,000.00	$4,000.00		
	Curb Opening Catch Basin	GI	1	EA	$5,000.00	$5,000.00	$5,000.00			
	Modify Existing Storm Drain System	GI	1	EA	$5,000.00	$5,000.00	$5,000.00			
	4" PVC Underdrain System	GI	800	LF	$25.00	$20,000.00	$20,000.00			
	Stormwter Facility Soil Excavation	GI	800	CY	$20.00	$16,000.00	$16,000.00			
	Stormwater Facility Soil Import and Prep (with underdrain)	GI	800	CY	$45.00	$36,000.00	$36,000.00			
	1 Gallon Plants	GI	400	EA	$20.00	$8,000.00	$8,000.00			
	Moisture Barrier	GI	600	LF	$10.00	$6,000.00	$6,000.00			
					Total	$330,933.33	$166,233.33	$171,100.00		

Estimated Project Schedule

April 2018 - Receive Funding
June 2018 - Execute Agreement
July - Begin Final Design and Bid Document Preparation
October - Advertise Project
January 2019 - Award Project
June 2019 - Complete Construction

Safe Routes to School and Green Streets Infrastructure Pilot Program Scope of Work

Jurisdiction: Millbrae

Project Title: Taylor Middle School SRTS and GSIPP

Scope of Work (location and description of proposed work as detailed in project proposal):

Two street intersections near Taylor Middle School in the City of Millbrae to be upgraded with safe traffic features and green street infrastructure measures such as stormwater curb extensions. One of the intersections is located on the southwest corner of Richmond Drive and Laurel Ave. Another intersection to be upgraded is located on the south corner of Almenar Street and Taylor Blvd. Due to high vehicular traffic volume along Richmond Drive, upgrading this intersection with safety features such as illuminated crosswalk and flash beacons is essential. The median planter within the PG&E right of way can be fixed by modifying the existing median, and/or installation of new bulb-outs to shift the crosswalk away from the median to create proper walking space. The two stormwater curb extensions will also be accompanied by two pedestrian bulb-outs.

The safety at the Almenar Street/Taylor Blvd intersection can be significantly improved with addition of signage and crosswalk striping. Addition of the stormwater curb extension will also reshape the problematic corner at Almenar Street entering Taylor Blvd to create a more functional and safe intersection.

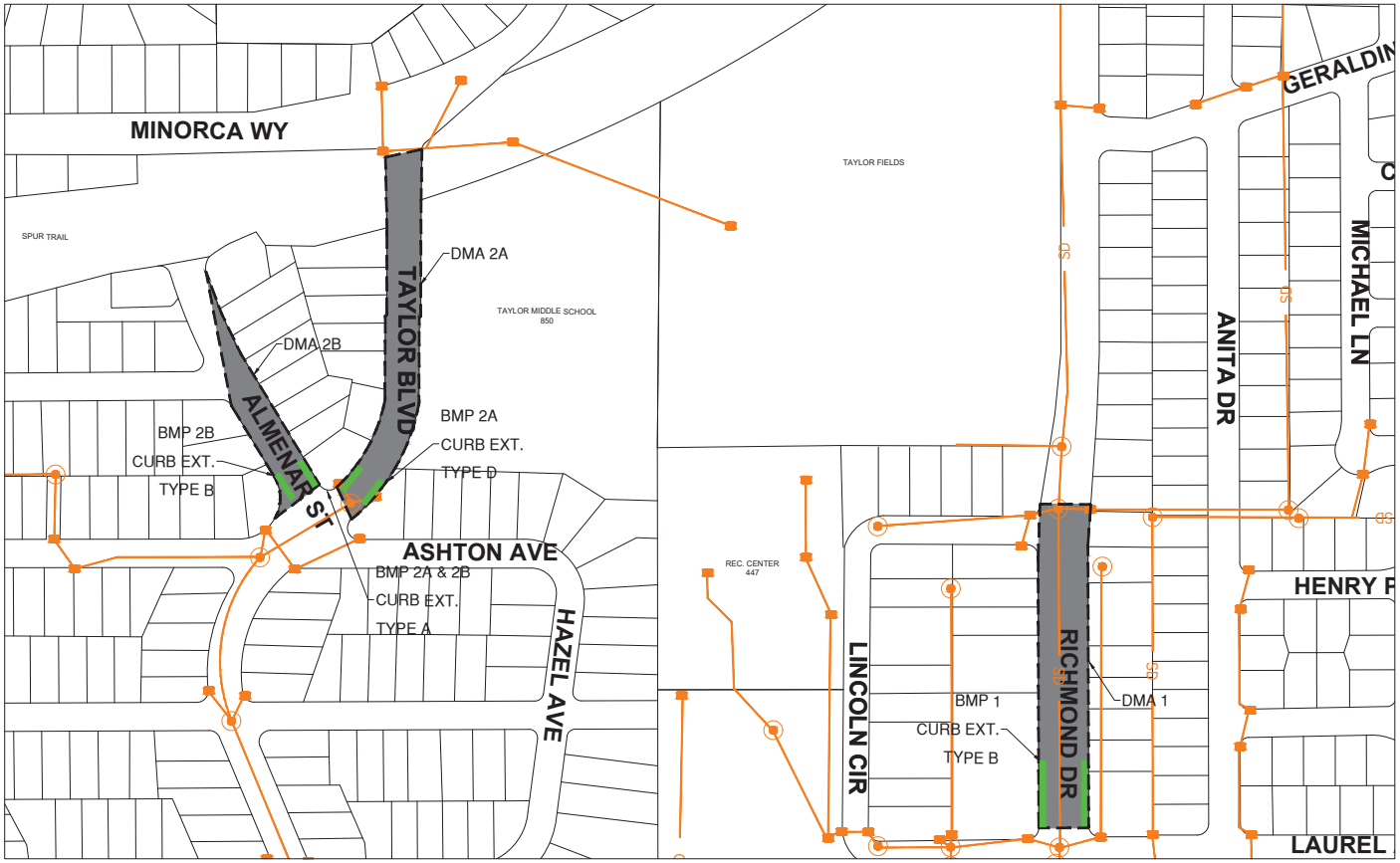
Stormwater curb extensions will be installed at both intersections to intercept storm water runoff. Approximately 85,000 square feet of street impervious pavement will be diverted into these curb extensions to remove pollutants such as PCB and mercury from entering the San Francisco Bay.

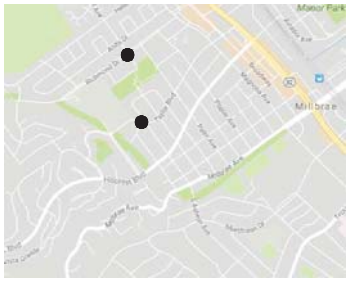
Educational signage will be provided at both proposed intersections. The signage will bring awareness to the general public regarding stormwater management benefits, and safe route to school goals that the City of Millbrae staff are determined to achieve.

The City of Millbrae public works staff will be responsible for the ongoing maintenance of the stormwater curb extensions. Funding for maintenance will be included as part of the City's facilities maintenance program. City staff will follow the procedures outlined in the O&M Plan Template for a bio-retention area, as provided in the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) C.3 Technical Guidance, Appendix H. The newly installed stormwater curb extensions will also be added the City's inventory of installed Stormwater Treatment Facilities, and will be inspected regularly to ensure that maintenance procedures are adequate.

Attachments (proposed project map, design concept, preliminary budget, other supporting documentation):

1. Project Area Map and Concept
2. Preliminary Timeline and Budget





VICINITY MAP

BMP LEGEND:

- DRAINAGE BOUNDARY
- STORM DRAIN PIPE
- PARCEL
- CURB EXTENSION
- IMPERVIOUS AREA
- STORM MANHOLE
- CATCH BASIN

BMP NUMERIC SIZING CALCULATION

AREA ID	SURFACE	TOTAL AREA (S.F.)	BMP TYPE	DESIGN FACTOR	BMP ID	TREATMENT AREA REQUIRED (S.F.)	TREATMENT AREA PROVIDED (S.F.)
DMA 1 – RICHMOND	STREET	40,000	CURB EXT. TYPE B (2)	0.04	BMP 1	1,600	1,600
DMA 2A – TAYLOR	STREET	30,000	CURB EXT. TYPE A, D	0.04	BMP 2A	1,200	1,200
DMA 2B – ALMENAR	STREET	15,000	CURB EXT. TYPE A, B		BMP 2B	600	600
TOTAL		85,000				3,400	3,400

0 50 100 200
SCALE: 1" = 100'

CITY OF MILLBRAE
621 MAGNOLIA AVE
MILLBRAE, CA 94030

10/16/2017

REVISION
DATE
MARK

TAYLOR MIDDLE SCHOOL
MILLBRAE, CA

Project Number
PW-17001

Sheet Name
GREEN STREET INFRASTRUCTURE EXHIBIT

Sheet Number
C1

GI Taylor

	Task Name	Q4			Q1			Q2		
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	Planning Phase									
2	Design Phase									
3	QA/QC Approval Phase									
4	Bidding Process									
5	Construction Phase									

Example Cost Breakdown Table

Construction Element	SRTS/GI/Both	Quantity	Unit	Unit Cost	Cost	GI/Both Cost	SRTS/Both Cost	Percent GI Cost	Percent SRTS Cost
Roadway excavation	Both	800	CY	$20	$16,000	$8,000	$8,000	60%	40%
Concrete Removal (sidewalk)	SRTS	600	SF	$20	$12,000	$0	$12,000		
Concrete Removal (curb and gutter)	GI	750	LF	$45	$33,750	$33,750	$0		
Minor Concrete (sidewalk)	SRTS	550	SF	$6	$3,300	$0	$3,300		
Minor Concrete (curb and gutter)	Both	150	LF	$45	$6,750	$3,375	$3,375		
Minor Concrete (tack on curb)	GI	50	LF	$20	$1,000	$1,000	$0		
Minor Concrete (valley gutter)	GI	250	SF	$50	$12,500	$12,500	$0		
Minor Concrete (curb ramp)	SRTS	6	EA	$3,000	$18,000	$0	$18,000		
Minor Concrete (retaining curb)	GI	350	LF	$30	$10,500	$10,500	$0		
Curb Ramp Detectable Warning Surface	SRTS	6	EA	$500	$3,000	$0	$3,000		
Hot Mix Asphalt (Type A)	Both	25	TON	$100	$2,500	$1,250	$1,250		
Mounted Curb System	Both	35	LF	$50	$1,750	$875	$875		
Curb Opening Catch Basin	GI	2	EA	$5,000	$10,000	$10,000	$0		
Area Drain	GI	1	EA	$2,500	$2,500	$2,500	$0		
Modify Existing Storm Drain System	GI	1	EA	$5,000	$5,000	$5,000	$0		
Metal Checkdam/Weir	GI	6	EA	$100	$600	$600	$0		
4" PVC Underdrain System	GI	800	LF	$25	$20,000	$20,000	$0		
Sormwter Facility Soil Excavation	GI	80	CY	$20	$1,600	$1,600	$0		
Stormwater Facility Soil Import and Prep (with underdrain)	GI	80	CY	$45	$3,600	$3,600	$0		
Landscape Area Soil Import and Prep	GI	6	CY	$35	$210	$210	$0		
1 gallon plants	GI	100	EA	$20	$2,000	$2,000	$0		
Irrigation	GI	3000	SF	$2	$6,000	$6,000	$0		
Moisture Barrier	GI	1500	LF	$10	$15,000	$15,000	$0		
Signing and Striping	SRTS	1	LS	$40,000	$40,000	$0	$40,000		
Contingency (10%)	Both				$22,756.0	$11,378	$11,378		
Total					$250,316	$149,138	$101,178		

*GI/Both and SRTS/Both columns include GI and SRTS costs respectively with 1/2 of "Both" costs distributed equally to each category

Safe Routes to School and Green Streets Infrastructure Pilot Program Scope of Work

Jurisdiction: City of Pacifica

Project Title: Cabrillo School Pedestrian Crossing Improvement Project

Scope of Work (location and description of proposed work as detailed in project proposal):

The project location is on Crespi Drive in the City of Pacifica, between Ladera Way and Roberts Road. The proposed project will install vegetated curb extensions at the midblock crossing directly in front of the school, and will include additional pedestrian improvements outlined below:

- New ADA access ramps on both sides of the mid-block crossing
- Stormwater curb extensions on the north and south side of Crespi Drive
- New thermoplastic crosswalk
- Update existing crosswalk traffic light

The proposed project will include educational signage to inform the public about stormwater management and SRTS goals.

Long-term and routine maintenance activities will be conducted by the City of Pacifica Public Works Department staff at a frequency specified in the attached Bioretention Maintenance Plan. Funding for City PW staff will be included in the City's Annual Budget. The City is in discussion to partner with Cabrillo School on regular clean-up and maintenance of the planted vegetation.

Attachments (proposed project map, design concept, preliminary budget, other supporting documentation):

1. Project Area Map
2. Project Concepts and Sizing Calculations
3. Preliminary Timeline and Cost Breakdown
4. Operations and Maintenance Plan and Inspection Form

DATE ISSUED: 10-3-17
SCALE: NTS
DRAWN BY: RDD
DESIGNED BY: RDD
CHECKED BY: RDD

APPROVED BY:

VAN DOMINIC OCAMPO, P.E.
CITY ENGINEER

DATE
R.C.E. NO.: 59601
EXPIRES: 12-31-17

NO.	DATE	REVISION	BY

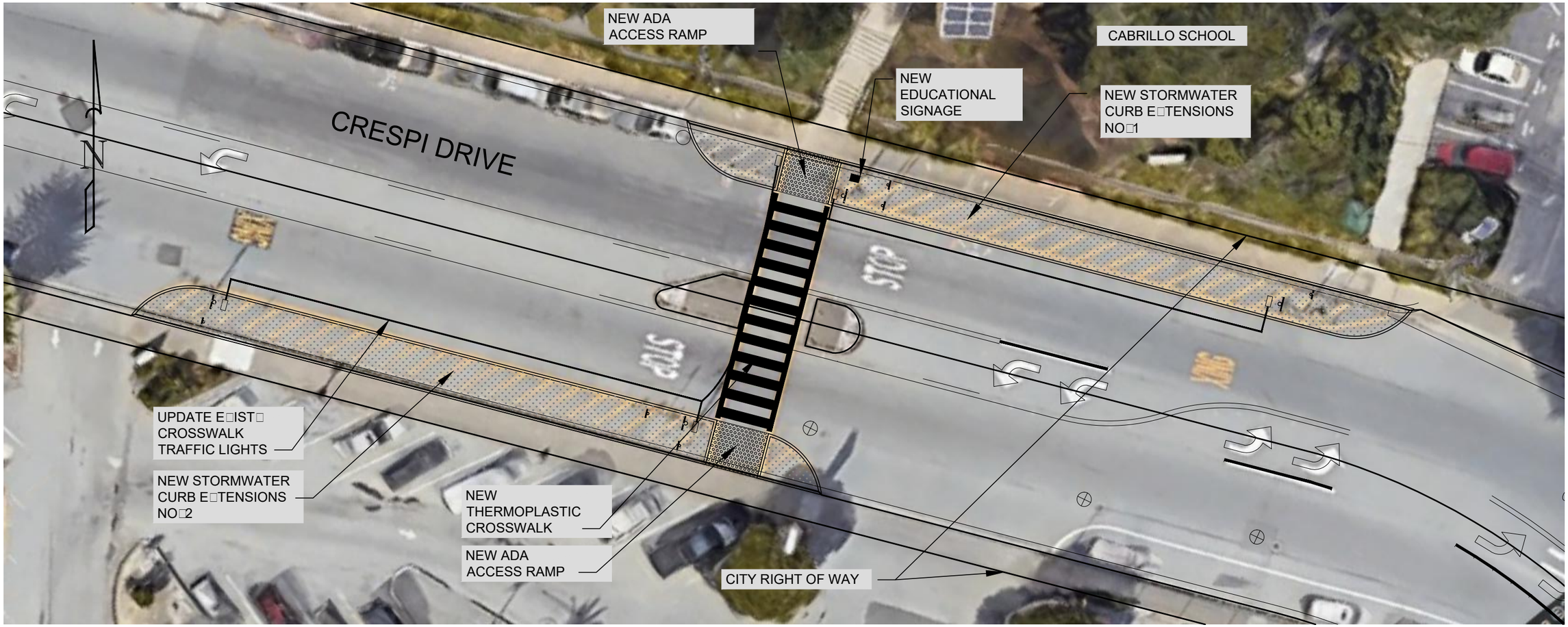
CITY OF PACIFICA

DEPARTMENT OF PUBLIC WORKS
170 SANTA MARIA BOULEVARD
PACIFICA CALIFORNIA 94044

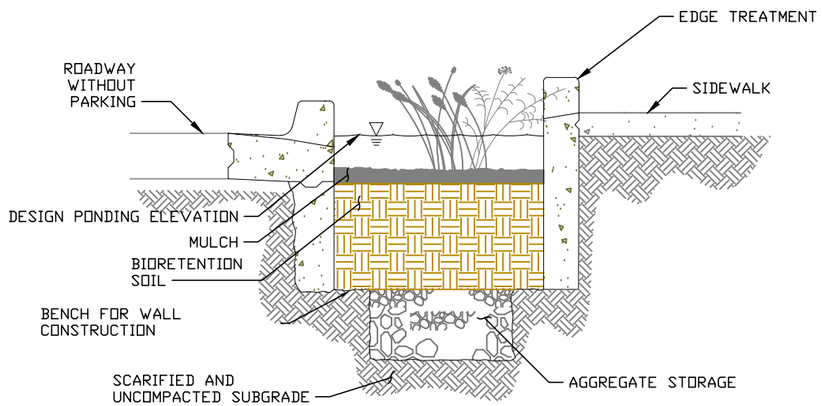
SAFE ROUTES TO SCHOOLS/GREEN STREETS INFRASTRUCTURE PILOT PROGRAM

CABRILLO SCHOOL PROJECT AREA MAP/LAND USE

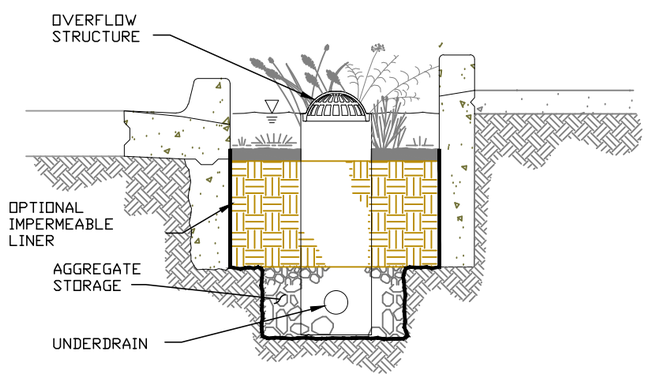
SHEET 1 OF 1 SHEETS



CABRILLO SCHOOL SITE PLAN



BIORETENTION SECTION □NO UNDERDRAIN



BIORETENTION SECTION □WITH UNDERDRAIN

DATE ISSUED: 10-3-17
SCALE: NTS
DRAWN BY: RDD
DESIGNED BY: RDD
CHECKED BY: RDD

APPROVED BY:

VAN DOMINIC OCAMPO, P.E.
CITY ENGINEER

DATE
R.C.E. NO.: 59601
EXPIRES: 12-31-17

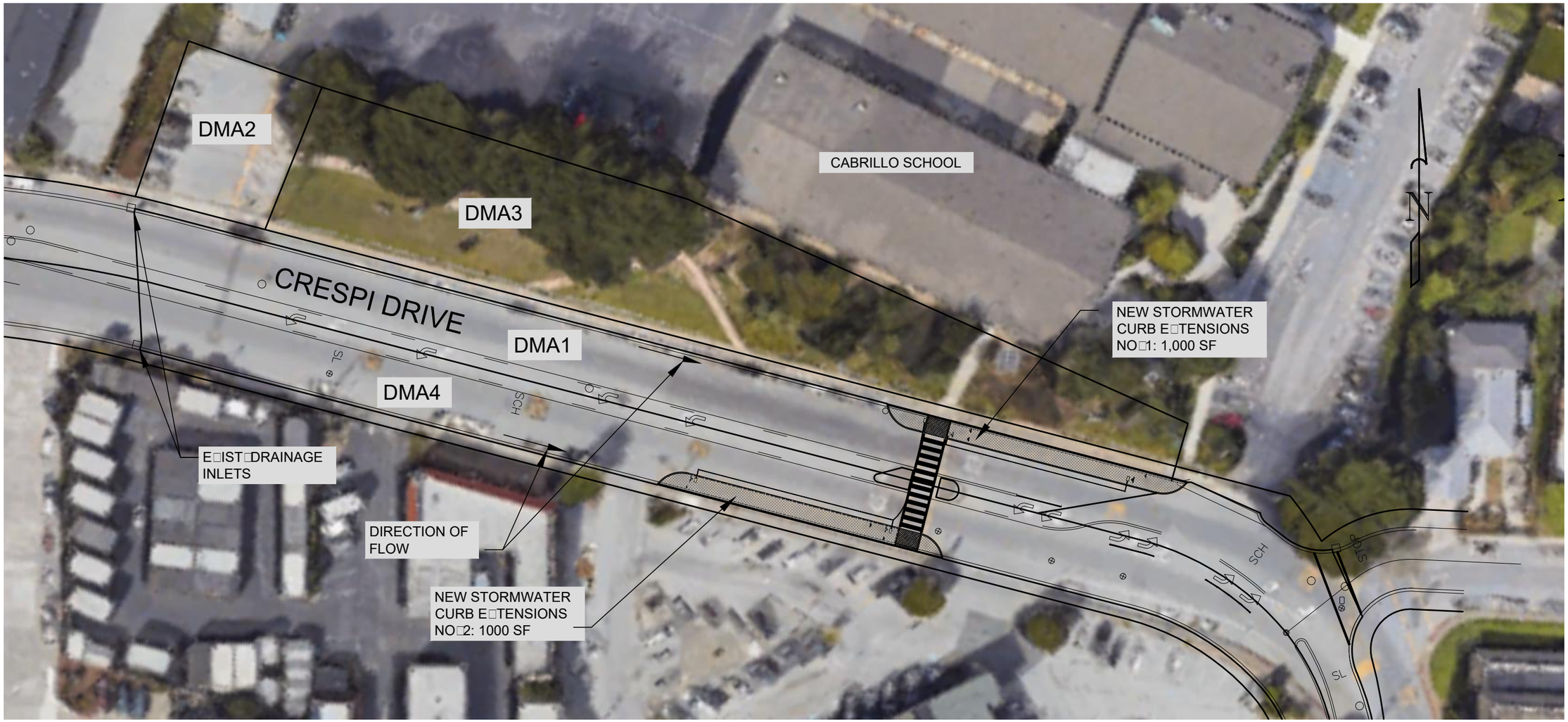
NO.	DATE	REVISION	BY

CITY OF PACIFICA
DEPARTMENT OF PUBLIC WORKS
170 SANTA MARIA BOULEVARD
PACIFICA CALIFORNIA 94044

SAFE ROUTES TO SCHOOLS/GREEN STREETS INFRASTRUCTURE PILOT PROGRAM

CABRILLO SCHOOL PROJECT CONCEPT

SHEET 1
OF 1 SHEETS



CABRILLO SCHOOL DRAINAGE MANAGEMENT AREAS

DMA	AREA, SF	BIORETENTION, SF
DMA1	19,985	1,000
DMA2	5,742	
DMA3	26,345	
DMA4	16,171	1,000

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APPROVED BY:

VAN DOMINIC OCAMPO, P.E.
CITY ENGINEER
DATE
R.C.E. NO.: 59601
EXPIRES: 12-31-17

NO.	DATE	REVISION	BY

CITY OF PACIFICA
DEPARTMENT OF PUBLIC WORKS
170 SANTA MARIA BOULEVARD
PACIFICA CALIFORNIA 94044

SAFE ROUTES TO SCHOOLS/GREEN STREETS INFRASTRUCTURE PILOT PROGRAM
CABRILLO SCHOOL DRAINAGE MANAGEMENT AREAS

SHEET 1
OF 1 SHEETS

Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1	Project Name:	Cabrillo School 1
1-2	City application ID:	Pacifica
1-3	Site Address or APN:	601 Crespi Drive
1-4	Tract or Parcel Map No:	
1-5	Rainfall Region	7
1-6	Region Mean Annual Precipitation (MAP)	19.30
1-7	Site Mean Annual Precipitation (MAP)	30

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 4.0. The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named "Guidance from Chapter 5".

Click here for map

1-8 ***MAP adjustment factor is automatically calculated as:*** 1.53

(The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, showin in Table 5-3, below.)
Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.

2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: Cabrillo 1

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft.)	Adjust Pervious Surface	Effective Impervious Area
2-2	Impervious surface	25,727	1.0	25,727
2-3	Pervious surface	26,345	0.1	2,635
	Total DMA Area (square feet) =	52,072		

2-4 ***Total Effective Impervious Area (EIA)*** 28,362 **Square feet**

3.0 Calculate Unit Basin Storage Volume in Inches

Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient

Region	Station, and Mean Annual Precipitation (Inches)	Runoff Coefficient of 1.0
1	Boulder Creek, 55.9"	2.04"
2	La Honda, 24.4"	0.86"
3	Half Moon Bay, 25.92"	0.82"
4	Palo Alto, 14.6"	0.64"
5	San Francisco, 21.0"	0.73"
6	San Francisco airport, 20.1"	0.85"
7	San Francisco Oceanside, 19.3"	0.72"

3-1 ***Unit basin storage volume from Table 5-3:*** 0.72

(The coefficient for this method is always 1.0, due to the conversion of any landscaping to effective impervious area.)

3-2 ***Adjusted unit basin storage volume:*** 1.10 **Inches**

(The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].)

3-3 ***Required Capture Volume (in cubic feet):*** 2,601 **Cubic feet**

(The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet)

4.0 Calculate the Duration of the Rain Event

4-1	Rainfall intensity	0.2	**Inches per hour**
4-2	Divide Item 3-2 by Item 4-1	5.50	**Hours of Rain Event Duration**

5.0 Preliminary Estimate of Surface Area of Treatment Measure

5-1	4% of DMA EIA (Item 2-4)	1,134	**Square feet**
5-2	Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA)	851	**Square feet**
5-3	Volume of treated runoff for area in Item 5-2	1,951	**Cubic feet** (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2)

6.0 Initial Adjustment of Depth of Surface Ponding Area

6-1	Subtract Item 5-3 from Item 3-3	650	**Cubic feet** (Amount of runoff to be stored in ponding area)
6-2	Divide Item 6-1 by Item 5-2	0.76	**Feet** (Depth of stored runoff in surface ponding area)
6-3	Convert Item 6-2 from feet to inches	9.17	**Inches** (Depth of stored runoff in surface ponding area)

6-4 If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

7.0 Optimize Size of Treatment Measure

7-1	Enter an area larger than Item 5-2	1000	**Sq.ft.** (enter larger area if you need less ponding depth.)
7-2	Volume of treated runoff for area in Item 7-1	2,293	**Cubic feet** (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2)
7-3	Subtract Item 7-2 from Item 3-3	308	**Cubic feet** (Amount of runoff to be stored in ponding area)
7-4	Divide Item 7-3 by Item 7-1	0.31	**Feet** (Depth of stored runoff in surface ponding area)
7-5	Convert Item 7-4 from ft. to inches	3.70	**Inches** (Depth of stored runoff in surface ponding area)

7-6 If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

8.0 Surface Area of Treatment Measure for DMA

8-1	Final surface area of treatment	1,000	**Square feet** (Either Item 5-2 or final amount in Item 7-1)

Worksheet for Calculating the Combination Flow and Volume Method

Instructions: After completing Section 1, make a copy of this Excel file for each Drainage Management Area within the project. Enter information specific to the project and DMA in the cells shaded in yellow. Cells shaded in light blue contain formulas and values that will be automatically calculated.

1.0 Project Information

1-1	Project Name:	Cabrillo School 2
1-2	City application ID:	Pacifica
1-3	Site Address or APN:	601 Crespi Drive
1-4	Tract or Parcel Map No:	
1-5	Rainfall Region	7
1-6	Region Mean Annual Precipitation (MAP)	19.30
1-7	Site Mean Annual Precipitation (MAP)	30

The calculations presented here are based on the **combination flow and volume sizing method** provided in the Countywide Program's C.3 Technical Guidance, Version 4.0. The steps presented below are explained in Section 5.1 of the Guidance, applicable portions of which are included in this file, in the sheet named "Guidance from Chapter 5".

Click here for map

1-8 ***MAP adjustment factor is automatically calculated as:*** **1.53**

(The "Site Mean Annual Precipitation (MAP)" is divided by the MAP for the applicable rain gauge, showin in Table 5-3, below.)
Refer to the map in Appendix C of the C.3 Technical Guidance to identify the Rainfall Region for the site.

2.0 Calculate Percentage of Impervious Surface for Drainage Management Area (DMA)

2-1 Name of DMA: **Cabrillo 2**

For items 2-2 and 2-3, enter the areas in square feet for each type of surface within the DMA.

	Type of Surface	Area of surface type within DMA (Sq. Ft.)	Adjust Pervious Surface	Effective Impervious Area
2-2	Impervious surface	16,171	1.0	16,171
2-3	Pervious surface		0.1	0
	Total DMA Area (square feet) =	16,171		

2-4 ***Total Effective Impervious Area (EIA)*** **16,171** **Square feet**

3.0 Calculate Unit Basin Storage Volume in Inches

Table 5-3. Unit Basin Storage Volumes in Inches for 80 Percent Capture Using 48-Hour Drawdowns, based on runoff coefficient

Region	Station, and Mean Annual Precipitation (Inches)	Runoff Coefficient of 1.0
1	Boulder Creek, 55.9"	2.04"
2	La Honda, 24.4"	0.86"
3	Half Moon Bay, 25.92"	0.82"
4	Palo Alto, 14.6"	0.64"
5	San Francisco, 21.0"	0.73"
6	San Francisco airport, 20.1"	0.85"
7	San Francisco Oceanside, 19.3"	0.72"

3-1 ***Unit basin storage volume from Table 5-3:*** **0.72**

(The coefficient for this method is always 1.0, due to the conversion of any landscaping to effective impervious area.)

3-2 ***Adjusted unit basin storage volume:*** **1.10** **Inches**

(The unit basin storage volume [Item 3-1] is adjusted by applying the MAP adjustment factor [Item 1-8].)

3-3 ***Required Capture Volume (in cubic feet):*** **1,483** **Cubic feet**

(The adjusted unit basin sizing volume [Item 3-2] is multiplied by the DMA EIA [Item 2-4] and converted to cubic feet)

4.0 Calculate the Duration of the Rain Event

4-1	Rainfall intensity	0.2	**Inches per hour**
4-2	Divide Item 3-2 by Item 4-1	5.50	**Hours of Rain Event Duration**

5.0 Preliminary Estimate of Surface Area of Treatment Measure

5-1	4% of DMA EIA (Item 2-4)	647	**Square feet**
5-2	Area 25% smaller than Item 5-1 (i.e., 3% of DMA EIA)	485	**Square feet**
5-3	Volume of treated runoff for area in Item 5-2	1,112	**Cubic feet** (Item 5-2 * 5 inches per hour * 1/12 * Item 4-2)

6.0 Initial Adjustment of Depth of Surface Ponding Area

6-1	Subtract Item 5-3 from Item 3-3	371	**Cubic feet** (Amount of runoff to be stored in ponding area)
6-2	Divide Item 6-1 by Item 5-2	0.76	**Feet** (Depth of stored runoff in surface ponding area)
6-3	Convert Item 6-2 from feet to inches	9.17	**Inches** (Depth of stored runoff in surface ponding area)

6-4 If ponding depth in Item 6-3 meets your target depth (recommend 6"), skip to Item 8-1. If not, continue to Step 7-1.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

7.0 Optimize Size of Treatment Measure

7-1	Enter an area larger than Item 5-2	1000	**Sq.ft.** (enter larger area if you need less ponding depth.)
7-2	Volume of treated runoff for area in Item 7-1	2,293	**Cubic feet** (Item 7-1 * 5 inches per hour * 1/12 * Item 4-2)
7-3	Subtract Item 7-2 from Item 3-3	(810)	**Cubic feet** (Amount of runoff to be stored in ponding area)
7-4	Divide Item 7-3 by Item 7-1	-0.81	**Feet** (Depth of stored runoff in surface ponding area)
7-5	Convert Item 7-4 from ft. to inches	-9.72	**Inches** (Depth of stored runoff in surface ponding area)

7-6 If the ponding depth in Item 7-5 meets target, stop here. If not, repeat Steps 7-1 through 7-5 until you obtain target depth.
(Note: Overflow outlet elevation should be set based on the calculated ponding depth.)

8.0 Surface Area of Treatment Measure for DMA

8-1	Final surface area of treatment	1,000	**Square feet** (Either Item 5-2 or final amount in Item 7-1)

Safe Routes to School (SRTS) and Green Streets Infrastructure Pilot Program

City of Pacifica

Cabrillo School Pedestrian Crossing Improvement Project

Preliminary Timeline

Description	Date
Planning Complete	5/1/2018
Environmental Studies	6/1/2018
Environmental Approval	8/1/2018
Complete PS&E	1/1/2019
Advertise	1/16/2019
Contract Award	2/25/2019
Construction	6/19/2019
Notice of Completion	9/9/2019
Final Reimbursement Requests Due	10/31/2019

Safe Routes to School (SRTS) and Green Streets Infrastructure Pilot Program

City of Pacifica
Cabrillo School Pedestrian Crossing Improvement Project

SRTS and Green Streets Infrastructure Estimated Cost Breakdown Template

Construction Element	SRTS/GI/Both	Quantity	Unit	Unit Cost	Cost	GI/Both Cost	SRTS/Both Cost	Percent GI Cost	Percent SRTS Cost
Roadway excavation	Both	418	CY	$100	$41,800	$20,900	$20,900	53%	47%
Concrete Removal (sidewalk)	SRTS	130	SF	$40	$5,200	$0	$5,200		
Concrete Removal (curb and gutter)	GI	308	LF	$25	$7,700	$7,700	$0		
Minor Concrete (sidewalk)	SRTS	130	SF	$75	$9,750	$0	$9,750		
Minor Concrete (curb and gutter)	Both	0	LF	$50	$0	$0	$0		
Minor Concrete (tack on curb)	GI	0	LF	$20	$0	$0	$0		
Minor Concrete (valley gutter)	GI	0	SF	$50	$0	$0	$0		
Minor Concrete (curb ramp)	SRTS	2	EA	$6,000	$12,000	$0	$12,000		
Minor Concrete (retaining curb)	GI	624	LF	$75	$46,800	$46,800	$0		
Curb Ramp Detectable Warning Surface	SRTS	2	EA	$600	$1,200	$0	$1,200		
Hot Mix Asphalt (Type A)	Both	50	TON	$150	$7,500	$3,750	$3,750		
Mounted Curb System	Both	0	LF	$50	$0	$0	$0		
Curb Opening Catch Basin	GI	0	EA	$5,000	$0	$0	$0		
Area Drain	GI	0	EA	$2,500	$0	$0	$0		
Modify Existing Storm Drain System	GI	0	EA	$5,000	$0	$0	$0		
Metal Checkdam/Weir	GI	0	EA	$100	$0	$0	$0		
4" PVC Underdrain System	GI	100	LF	$25	$2,500	$2,500	$0		
Sormwater Facility Soil Excavation	GI	0	CY	$20	$0	$0	$0		
Stormwater Facility Soil Import and Prep (with underdrain)	GI	418	CY	$25	$10,450	$10,450	$0		
Landscape Area Soil Import and Prep	GI	0	CY	$35	$0	$0	$0		
1 gallon plants	GI	200	EA	$20	$4,000	$4,000	$0		
Irrigation	GI	0	SF	$2	$0	$0	$0		
Moisture Barrier	GI	0	LF	$10	$0	$0	$0		
Signing and Striping	SRTS	1	LS	$30,000	$30,000	$0	$30,000		
Contingency	Both	1	LS	$17,890	$17,890	$8,945	$8,945		
Total					$196,790	$105,045	$91,745		

Bioretention Area Maintenance Plan for
Cabrillo School Vegetated Curb Extensions
September 28, 2017

The Cabrillo School Vegetated Curb Extensions are located along Crespi Drive and as described below and as shown in the attached site plan.

Project Address and Cross Streets: 600 Block Crespi Drive, Pacifica, CA
Assessor's Parcel No.: N/A, Within City Right of Way
Property Owner: City of Pacifica
Phone No.: (650) 738-3767
Designated Contact: Raymund Donguines
Phone No.: (650) 738-3768
Mailing Address: 170 Santa Maria Avenue, Pacifica, CA 94044

I. Routine Maintenance Activities

The principal maintenance objective is to prevent sediment buildup and clogging, which reduces pollutant removal efficiency and may lead to bioretention area failure. Routine maintenance activities, and the frequency at which they will be conducted, are shown in Table 1.

Table 1
Routine Maintenance Activities for Bioretention Areas

No.	Maintenance Task	Frequency of Task
1	Remove obstructions, debris and trash from bioretention area and dispose of properly.	Monthly or as needed after storm events
2	Inspect bioretention area to ensure that it drains between storms and within five days after rainfall. If ponded water does not drain within five days, check if drains are clogged or consider removing the surface biotreatment soil and replacing with the approved soil mix and replant	Monthly or as needed after storm events
3	Inspect inlets for channels, soil exposure or other evidence of erosion. Clear obstructions and remove sediment.	Monthly or as needed after storm events
4	Remove and replace all dead and diseased vegetation.	Twice a year
5	Maintain vegetation and the irrigation system. Prune andweed to keep bioretention area neat and orderly in appearance.	Before wet season begins, or as needed
6	Inspect and, if needed, add mulch before the wet season begins. It is recommended that composted arbor mulch be applied once a year to maintain a 3" depth of mulch over all bare soil areas except within six inches of tree trunks.	Before wet season begins, or as needed
7	Inspect bioretention area using the attached inspection checklist.	Monthly, or after large storm events, and after removal of accumulated debris or material

II. Prohibitions
Do not use pesticides or other chemical applications to treat diseased plants, control weeds or removed unwanted growth. Employ non-chemical controls (biological, physical and cultural controls) to treat a pest problem. Prune plants properly and at the appropriate time of year.
Provide adequate irrigation for landscape plants. Do not over water.

III. Mosquito Abatement
Standing water should not remain in the treatment measures for more than five days, to prevent mosquito generation. Should any mosquito issues arise, contact the San Mateo County Mosquito Abatement District (SMCMAD), as needed for assistance. Mosquito larvicides should be applied only when absolutely necessary, as indicated by the SMCMAD, and then only by a licensed professional or contractor. Contact information for SMCMAD is provided below.

San Mateo County Mosquito Abatement District
1351 Rollins Road
Burlingame, CA 94010
PH: (650) 344-8592
FAX: (650) 344-3843
Email: info@smcmad.org

IV. Inspections
The attached Bioretention Area Inspection and Maintenance Checklist should be used to conduct inspections monthly (or as needed), identify needed maintenance, and record maintenance that is conducted.

Bioretention Area
Inspection and Maintenance Checklist

Property Address: _____ Property Owner: _____

Treatment Measure No.: _____ Date of Inspection: _____

Inspector(s) _____ Type of Inspections: Monthly
After heavy runoff
Pre-Wet Season
End of Wet Season
Other

Defect	**Conditions When Maintenance Is Needed**	**Maintenance Needed? (Y/N)**	**Comments** (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)	**Results Expected When Maintenance Is Performed**
1. Standing Water	When water stands in the bioretention area between storms and does not drain within five days after rainfall.			There should be no areas of standing water once inflow has ceased. Any of the following may apply: sediment or trash blockages removed, improved grade from head to foot of bioretention area, or added underdrains.
2. Trash and Debris Accumulation	Trash and debris accumulated in the bioretention area.			Trash and debris removed from bioretention area and disposed of properly.
3. Sediment	Evidence of sedimentation in bioretention area.			Material removed so that there is no clogging or blockage. Material is disposed of properly.
4. Erosion	Channels have formed around inlets, there are areas of bare soil, and/or other evidence of erosion.			Obstructions and sediment removed so that water flows freely and disperses over a wide area. Obstructions and sediment are disposed of properly.
5. Vegetation	Vegetation is dead, diseased and/or overgrown.			Vegetation is healthy and attractive in appearance.
6. Mulch	Mulch is missing or patchy in appearance. Areas of bare earth are exposed, or mulch layer is less than 3 inches in depth.			All bare earth is covered, except mulch is kept 6 inches away from trunks of trees and shrubs. Mulch is even in appearance, at a depth of 3 inches.
7. Miscellaneous	Any condition not covered above that needs attention in order for the bioretention area to function as designed.			Meet the design specifications.

Safe Routes to School and Green Streets Infrastructure Pilot Program Scope of Work

Jurisdiction: City of Redwood City

Project Title: Taft Community School-Safe Routes to School /Green Infrastructure Improvements

Scope of Work (location and description of proposed work as detailed in project proposal):

The project is located directly adjacent to Taft Community School and KIPP Excelencia Community Prep School (located on the Taft campus) in Redwood City. The project area is bounded by 5th Avenue on the north, 10th Avenue on the south, Page Street to the west and Bay Road to the east. The project includes improvements at the intersections of 5th Avenue and Page Street, 10th Avenue and Page Street, and 10th Avenue and Bay Road.

The storm water and infrastructure features of the project are concentrated at the intersection of 5th Avenue and Page Street. The project proposes four bulb-outs at each corner of 5th Avenue and Page Street in combination with five bio-retention areas (see Project Concepts and Sizing Calculations in Attachment II.) serving Drainage Management Areas 1-4 (see Project Concepts and Sizing Calculations in Attachment II). Treatment calculations are also shown in Attachment II. The drainage management areas 1-4 are color-coded as described below:

- Drainage Management Area 1 (red) is treated by a bio-retention area on the eastside of Page Street north of Fifth Avenue with a drainage inlet as marked by arrow on site plan. This drainage area is approximately 16,953 square feet.
- Drainage Management Area 2 (blue) is treated by a bio-retention area on the westside of Page Street north of 5th Avenue with a drainage inlet as marked by arrow on site plan. This drainage area is approximately 71,860 square feet.
- Drainage Management Area 3 (orange) is treated by a bio-retention area to the north side of 5th Avenue south of Page Street with a drainage inlet as marked with arrow. This drainage area is approximately 17,874 square feet.
- Drainage Management Area 4 (green) is treated by a bio-retention area to the south side of 5th Avenue west of Page Street and on the west side of Page Street south of 5th Avenue with a drainage inlet as marked with arrow. This drainage area is approximately 16,627 square feet.

The additional SRTS enhancements identified in the project proposal include:

- 10th Ave and Page Street – four high-visibility crosswalks
- 10th Ave and Bay Road – Rectangular Rapid Flashing Beacon
- 8th Ave and Bay Street – new high-visibility crosswalk and Rectangular Rapid Flashing Beacon

The proposed Project Timeline is based on a design package to be awarded by March 2018 and completed by November 2018 via the Livable Neighborhood Street Enhancement Program, from which the 15 percent local match will be derived for this project. This will be followed by a construction contract with construction to be complete by September 2019.

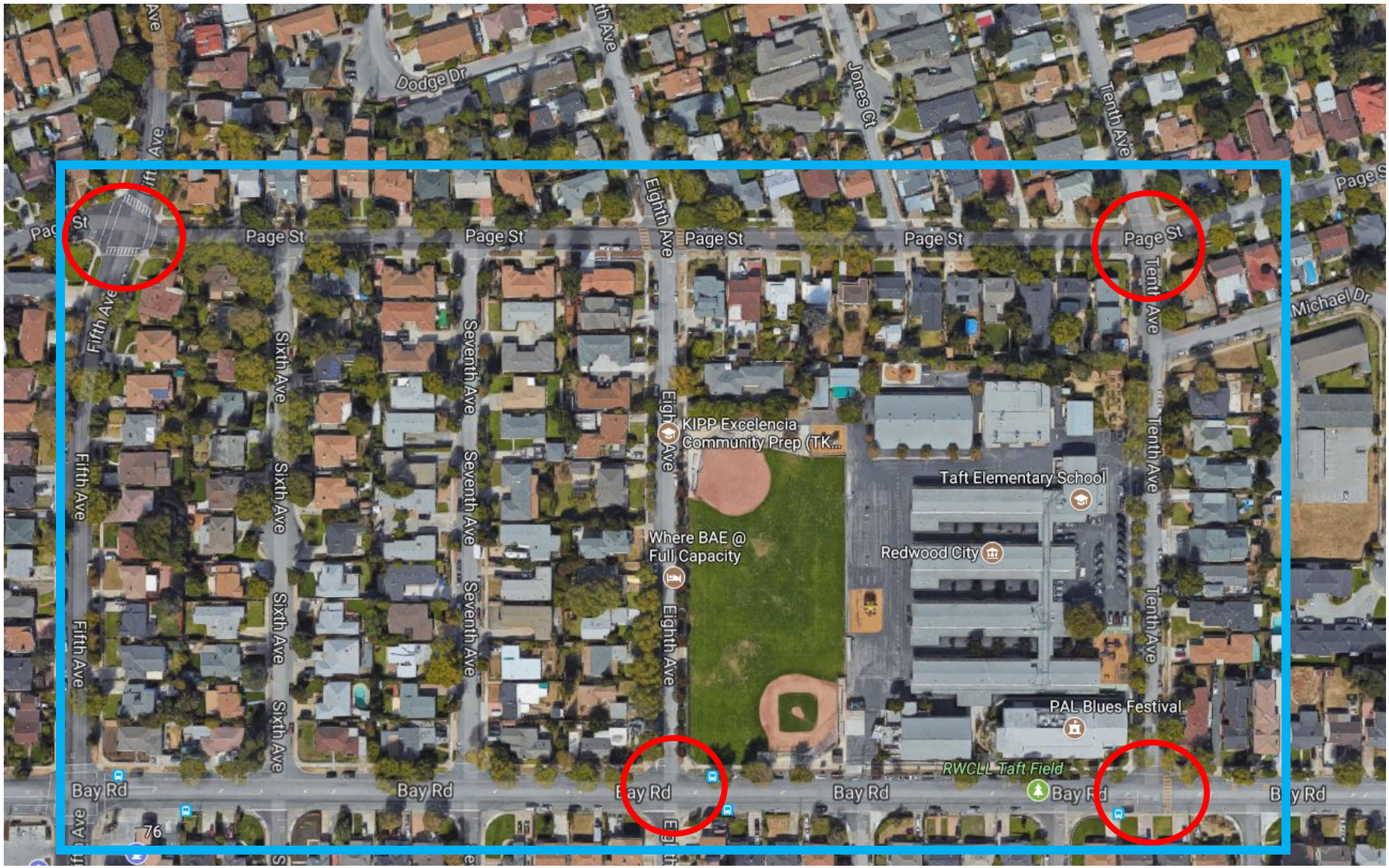
The project concept does include educational signage to be placed at four locations near the intersection of 5th Avenue and Page Street where green infrastructure is planned. A sample educational sign is attached in Attachement IV. The educational signs used would reflect the specific project green infrastructure details and call out the Safe Routes to School features as well that could be read by students en-route to school.

The bio-retention areas would be maintained along with existing bio-retention areas, green spaces and public right-of- way by a combination of staff from the Parks, Recreation and Community Services and Public Works Departments; these departments presently maintain similar features at other City facilities and these items would be included as part of general operations and maintenance. Safe Route to School features would be maintained by Public Works.

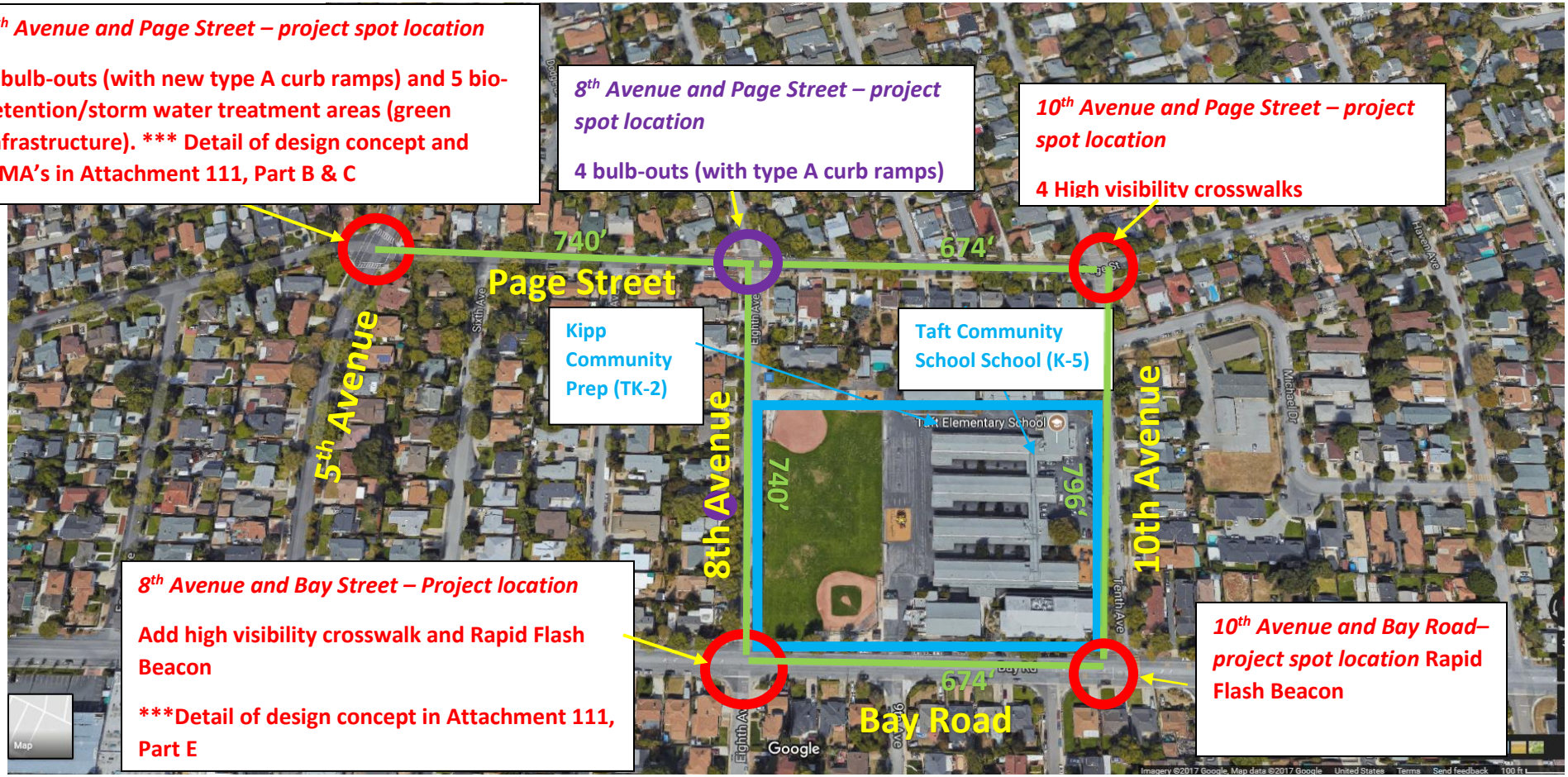
Attachments (proposed project map, design concept, preliminary budget, other supporting documentation):

1. Project Area Map
2. Project Concepts and Sizing Calculations
3. Preliminary Timeline and Cost Breakdown
4. Educational Signage

Project Area Map



Project Concept – Taft Community School Safe Routes to School and Green Infrastructure Pilot Program Project

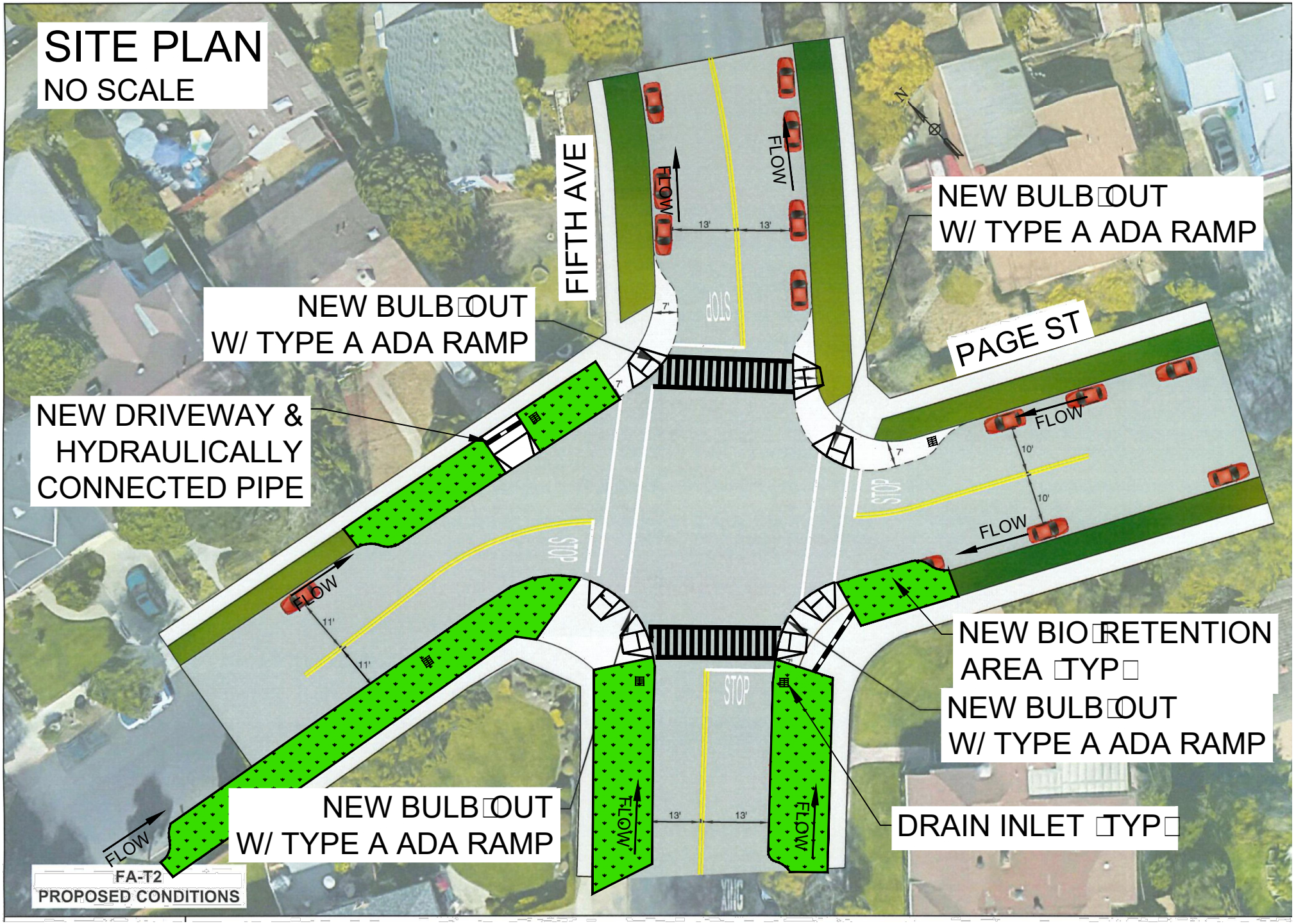


Possible walking or biking routes with distances shown each block

Safe Route to School/Green Infrastructure grant application project intersections and projects descriptions

School site (Taft Community School and Kipp Charter School)

Future Project


SITE PLAN
NO SCALE
FIFTH AVE
PAGE ST
NEW BULB-OUT
W/ TYPE A ADA RAMP
NEW BULB-OUT
W/ TYPE A ADA RAMP
NEW DRIVEWAY &
HYDRAULICALLY
CONNECTED PIPE
NEW BIO-RETENTION
AREA (TYP.)
NEW BULB-OUT
W/ TYPE A ADA RAMP
NEW BULB-OUT
W/ TYPE A ADA RAMP
DRAIN INLET (TYP.)
FLOW
STOP
13'
11'
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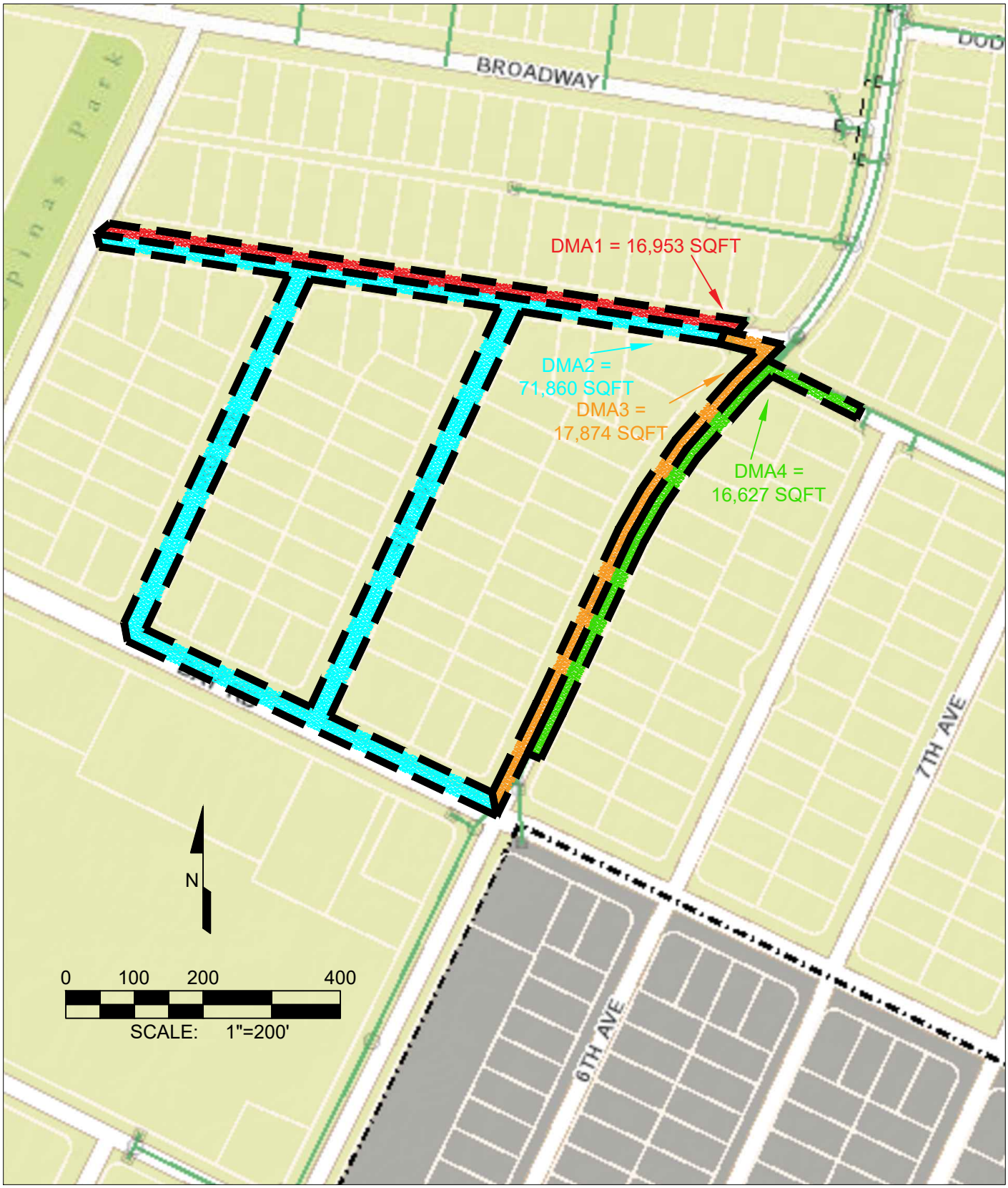
FA-T2
PROPOSED CONDITIONS



Redwood City California Founded 1867	DRAINAGE MANAGEMENT AREAS 5TH AND PAGE SAFE ROUTES TO SCHOOL & GREEN INFRASTRUCTURE GRANT FUNDING	SCALE: AS SHOWN
		DATE: 10/16/2017
		SHEETS: 1 OF 1
	CITY OF REDWOOD CITY COMMUNITY DEVELOPMENT DEPARTMENT 1017 MIDDLEFIELD ROAD, REDWOOD CITY, CA 94063	DWG BY: JKO

Treatment Sizing Calculations

Safe Routes to School and Green Infrastructure Grant

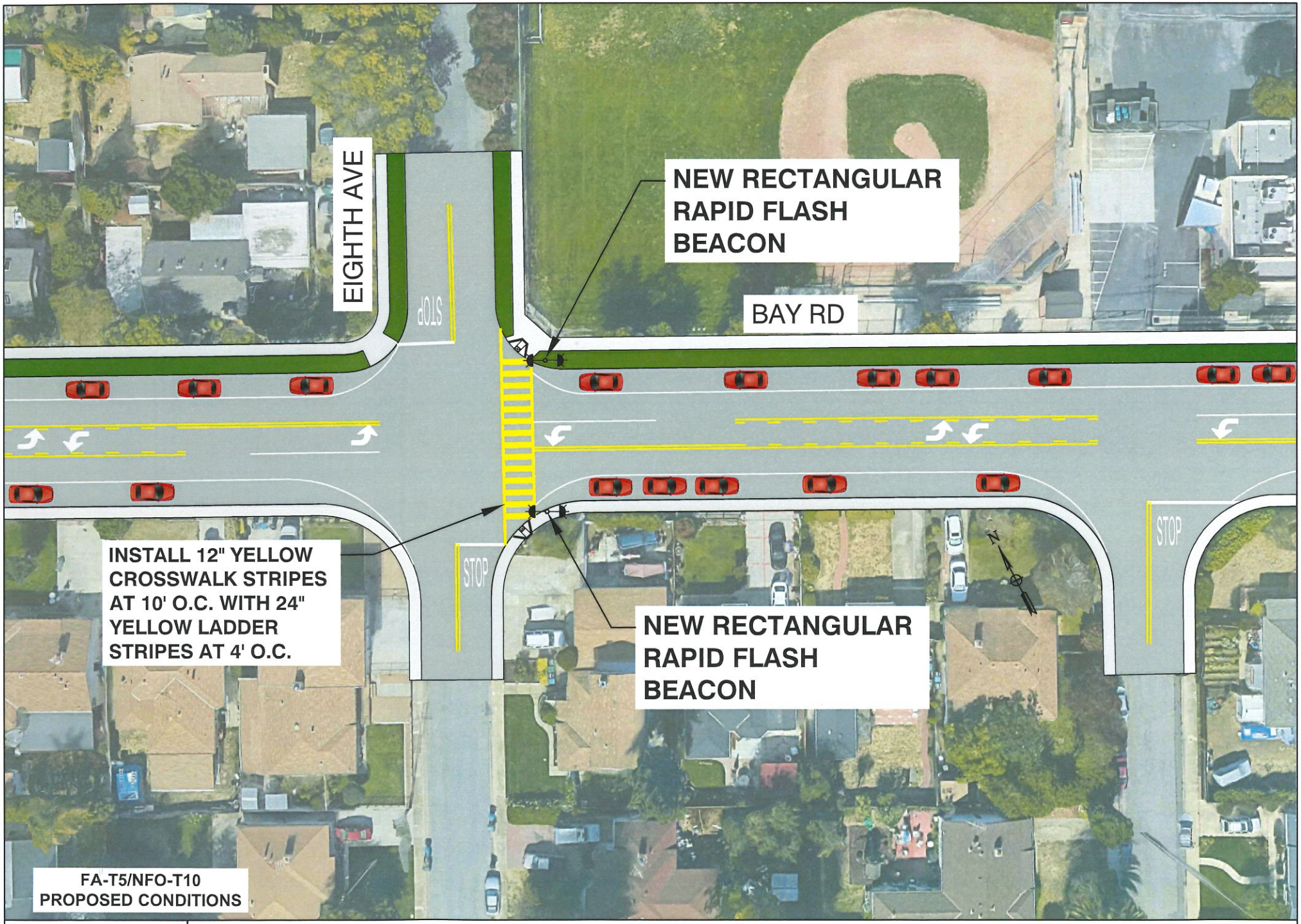
October 16, 2017

Drainage Area	Total Area (ft^2)	Total Area (acres)	Hardscape Area (ft^2)	Runoff Coef. "C" [(a)]	4% Sizing Method (ft^2)	% Impervious (%)	Unit Basin Storage Vol. [(b)] (in)	Req. Capture Vol. (ft^3)	Dur. of Storm Event (hr)	Actual Bio Area (ft^2)	Filtered Volume [(c)] (ft^3)	Remaining Vol. Req. Capture (ft^3)	Req. Height of Ponding (ft)	Height of Ponding (ft)	Height of Ponding (in)	
DA1	16953	0.39	16953	0.9	678.1	100%	0.64	904.2	3.2	390	520.0	384.2	0.99	1.00	12	
DA2	71860	1.65	71860	0.9	2874.4	100%	0.64	3832.5	3.2	1250	1666.7	2165.9	1.73	1*	12	*Not all Runoff can be treated
DA3	17874	0.41	17874	0.9	715.0	100%	0.64	953.3	3.2	410	546.7	406.6	0.99	1.00	12	
DA4	16627	0.38	16627	0.9	665.1	100%	0.64	886.8	3.2	385	513.3	373.4	0.97	0.97	11.7	

[(a)] Runoff Coefficient from Table 5-2 of the San Mateo C.3 Technical Guidance

[(b)] Unit Basin Storage Volume from Table 5-3 of the San Mateo C.3 Technical Guidance for Criteria Region 4

[(c)] Volume filtered through the bioretention area at a rate of 5 in/hr



TJKM
4305 Hacienda Drive, Suite 550
Pleasanton, CA 94588
tjkm@tjkm.com

BAY ROAD AND EIGHTH AVENUE CONCEPT

Attachment IV –Proposed Budget with Cost Breakdown Table and Preliminary Timeline

- **Attachment IV -Part A – Proposed Budget**

- **Attachment IV Part B- Cost Breakdown Table (5th Avenue and Page Street)**

- **Attachment IV- Part C – Preliminary Timeline**

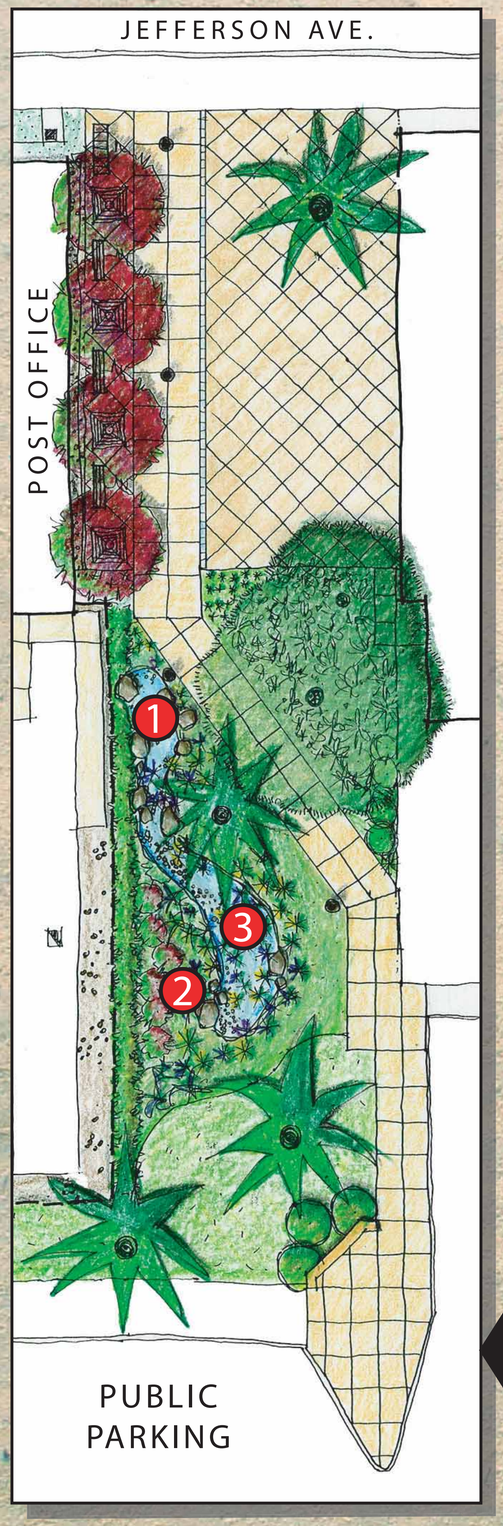
PROPOSED PROJECT BUDGET: TAFT COMMUNITY SCHOOL SAFE ROUTES TO SCHOOL/ GREEN-INFRASTRUCTURE C/CAG GRANT APPLICATION												
	Sub categories	Locations	What is included in this category (can be broken down further)	Cost per unit	Quantity	Construc tion Capital Cost	Design Cost (assume 20% of construction)	Total Capital Cost	Local Match (15% or more of Capital Cost)	Grant Request=Construct ion Capital Cost-Local Match	% by category	
Green Infrastructure	Bio retention area 1 and 2-5th and Page	5th Avenue and Page Street	Concrete extended curb and gutter, demolition, paving, treatment facilities, landscaping, and irrigation	$37,000	4	$148,000.00	$29,600.00	$177,600.00	$30,400.00	$147,200.00	55.60%	58.11%
	Educational signage explaining purpose of bio retention (split 50/50)	5th Avenue and Page Street	Education Sign, post, and installation	$2,000	4	$8,000.00		$8,000.00	$2,000.00	$6,000.00	2.50%	
Safe Route to School projects	Educational signage explaining purpose of bio retention (split 50/50)	5th Avenue and Page Street	Education Sign, post, and installation	$2,000	4	$8,000.00		$8,000.00	$2,000.00	$6,000.00	2.50%	41.89%
	Bulb-outs	5th Avenue and Page Street	Concrete curbs, gutter, and sidewalk, demolition, paving, and ADA ramps	$12,000	4	$48,000.00	$10,000.00	$58,000.00	$15,000.00	$43,000.00	18.16%	
	high visibility crosswalks	1. 10th Avenue and Page Street (4) 2. 8th Avenue and Bay Street (1)	Thermoplastic	$2,000.00	5	$10,000.00		$10,000.00	$5,000.00	$5,000.00	3.13%	
	Rapid Flashing Beacons	1. 8th and Bay Street 2. 10th and Bay Street	Installation of complete system	$26,400	2	$52,800.00	$5,000.00	$57,800.00	$15,000.00	$42,800.00	18.10%	
Total Costs						$274,800.00	$44,600.00	$319,400.00	$69,400.00	$250,000.00	100.00%	

5th and Page Cost Breakdown Table

Construction Element	SRTS/GI/Both	Quantity	Unit	Unit Cost	Cost	GI/Both Cost	SRTS/Both Cost	Percent GI Cost	Percent SRTS Cost
Roadway excavation	SRTS	10	CY	$25	$250	$0	$250	58%	42%
Roadway excavation	GI	90	CY	$25	$2,250	$2,250	$0		
Concrete Removal (sidewalk)	SRTS	100	SF	$20	$2,000	$0	$2,000		
Concrete Removal (curb and gutter)	GI	200	LF	$45	$9,000	$9,000	$0		
Minor Concrete (sidewalk)	SRTS	200	SF	$6	$1,200	$0	$1,200		
Minor Concrete (curb and gutter)	SRTS	30	LF	$45	$1,350	$0	$1,350		
Minor Concrete (curb ramp)	SRTS	7	EA	$3,000	$21,000	$0	$21,000		
Minor Concrete (retaining curb)	GI	220	LF	$50	$11,000	$11,000	$0		
Curb Ramp Detectable Warning Surface	SRTS	8	EA	$500	$4,000	$0	$4,000		
Hot Mix Asphalt (Type A)	SRTS	15	TON	$150	$2,250	$0	$2,250		
Hot Mix Asphalt (Type A)	GI	40	TON	$150	$6,000	$6,000	$0		
Curb Opening Catch Basin	SRTS	1	EA	$5,000	$5,000	$0	$5,000		
Area Drain	GI	4	EA	$2,500	$10,000	$10,000	$0		
Modify Existing Storm Drain System	GI	4	EA	$7,500	$30,000	$30,000	$0		
Metal Checkdam/Weir	GI	4	EA	$100	$400	$400	$0		
4" PVC Underdrain System	GI	200	LF	$25	$5,000	$5,000	$0		
Sormwter Facility Soil Excavation	GI	300	CY	$20	$6,000	$6,000	$0		
Stormwater Facility Soil Import and Prep (with underdrain)	GI	225	CY	$45	$10,125	$10,125	$0		
Landscape Area Soil Import and Prep	GI	50	CY	$35	$1,750	$1,750	$0		
1 gallon plants	GI	500	EA	$20	$10,000	$10,000	$0		
Irrigation	GI	2435	SF	$2	$4,870	$4,870	$0		
Moisture Barrier	GI	500	LF	$15	$7,500	$7,500	$0		
Contingency	SRTS				$11,115		$11,115		
Contingency	GI				$34,169	$34,169	$0		
Total					$196,229	$148,064	$48,165		

*GI/Both and SRTS/Both columns include GI and SRTS costs respectively with 1/2 of "Both" costs distributed equally to each category

SRTS/GI Taft Community School Pilot Project Timeline	
Milestone	**Date**
C/CAG SRTS-GI Grant Application Due	**10/20/2017**
Complete Streets Advisory Committee recommends LNS Implementation Plan	**12/12/2017**
City Council Approves LNS Implementation Plan	**1/30/2018**
City awards Final Design Package Contract for LNS Implementation Plan	**Mar-18**
C/CAG Executes Funding Agreement with Project sponsors awarded projects	**Apr-18**
Final Design LNS package design complete	**Nov-18**
SRTS/GI Grant construction starts	**Jan-19**
SRTS/GI Grant construction complete	**Sep-19**



Learn How to Improve Our Water Quality

Why is stormwater management important?

In nature, rainwater filters slowly through soil, removing pollutants. The small amount of rainwater that does not infiltrate becomes "runoff," and moves over the ground at a slow pace, allowing particles and sediment to settle out. In an urban environment, non-porous or "impervious" surfaces like streets, sidewalks, parking lots, and rooftops increase the amount of runoff and prevent water from filtering through soil. Even a small amount of water quickly runs off these hard surfaces, collecting oil, pesticides, gasoline, and other pollutants as it flows into the storm-water drains and directly out to the San Francisco Bay.

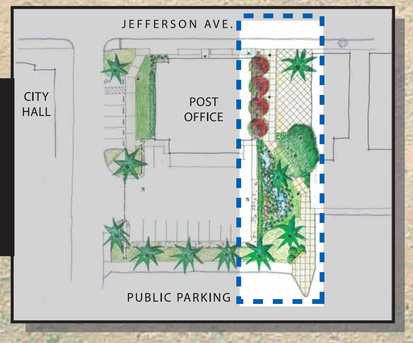
1 BIOSWALE

In an urban environment, we can introduce nature's method of preventing storm-water runoff by including a few simple landscape design details. Bioswales are landscaped slopes and channels designed to move water slowly over plants, so that sediment and other particulates filter through the soil. This process removes pollutants and reduces the amount of water runoff. Bioswales are most effective when the drainage course is wide with gently sloped sides. Choose plants that can survive periodic inundation during storms, as well as periods of drought. Plants that are good choices for bioswales include Iris, Ryegrass, Carex, Lupine, and the Tupelo Tree. Redtwig Dogwood and Sweet Bay trees are also good options.

DRY CREEK

A "dry creek"– a slightly concave or depressed landscaped area and also a type of bioswale – serves as a temporary basin during rainstorms, catching the stormwa-ter and allowing it to slowly filter into the ground. Use attractive stones of varying shapes and sizes to create a dry creek, as shown in this demonstration garden. It doubles as an attractive landscape feature during dry or wet periods.

SITE DETAIL



What can you do to help reduce runoff pollution?

Simple solutions can be used in your own garden to help rainwater filter through the soil and reduce pollutants in stormwater runoff:

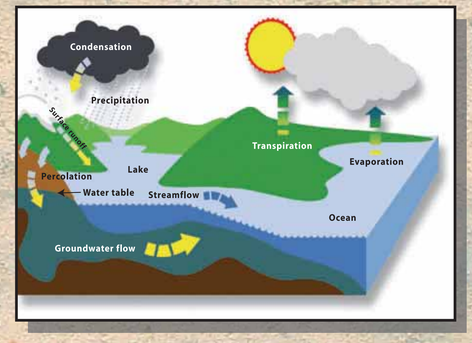
- Concave (lowered) rather than convex (raised) planting areas
- Infiltration basins at the end of downspouts, sloped away from buildings
- Vegetation planted at the roof drip line, sloped away from buildings
- Pavers on sand bases, in patios and pathways
- Gravel driveways with concrete wheel tracks

2 PLANT SELECTION

Choosing the right plants can improve the ability of your landscape to filter stormwater. Deep-rooted plants help keep soil porous and increase water ab-sorption into the dirt. Plants with large leaf surfaces collect rainwater before it lands on the soil, improving the water-retaining capacity of the land. Many plants are well suited to surviving periodic heavy rain storms as well as drought. Choose pest-resistant plants to eliminate the need for chemical treatments.

3 FILTRATION SYSTEM

Open filtration basins, such as ponds and swales, are usually landscaped, and the plants themselves maintain the porous soil structure and reduce erosion. Closed filtration basins can be constructed underground. Beneath the bioswale in this garden, an underground detention device stores an even larger amount of water. After the bioswale naturally filters the water, the clean stormwater flows into the detention device and is slowly released into the storm drain system. If you don't have a lot of space, you can build an underground closed filtration system, and cover it with gravel or crushed stones, leaving the surface area free for parking or other uses.



THE HYDROLOGIC CYCLE

The transfer of water from precipitation to surface and ground water, then to storage and runoff, and eventually back to the atmos-phere, is an ongoing cycle. In this cycle, stormwater is absorbed into the soil, where pollutants and particles are filtered naturally.

Redwood City California founded 1867

SAN MATEO COUNTYWIDE Water Pollution Prevention Program Clean Water. Healthy Community.

Bay Area Stormwater Management Agencies Association

BASMAA'S Stormwater Protection Design Guidance Manual *"Start at the Source"* was used as a reference in the design of this project.

Safe Routes to School and Green Streets Infrastructure Pilot Program Scope of Work

Jurisdiction: San Mateo County

Project Title: Fair Oaks Community School Green Infrastructure and SRTS Improvements

Scope of Work (location and description of proposed work as detailed in project proposal):

The project is located at Fair Oaks Community School in unincorporated San Mateo County in North Fair Oaks. Project improvements include:

- A biotreatment area and pedestrian improvements at the corner of Oakside Avenue and Fair Oaks Avenue, and
- Pedestrian improvements at a mid-block crossing on Oakside Avenue.

Location 1: The proposed improvement at the intersection of Oakside Avenue and Fair Oaks Avenue upgrades an existing crosswalk to a high visibility ladder-style crosswalk, improving visibility of pedestrians and slowing vehicle traffic through the intersection. The County proposes to relocate the biotreatment areas behind the sidewalk to minimize ponding at the crosswalk. Stormwater will infiltrate the surrounding areas below the playground. During heavy storms water will flow to the roadway after the pond fills up. The biotreatment area is ideally located here as it will not remove any parking or block any driveways. The crosswalk will be restriped.

Location 2: The proposed improvement on Oakside Avenue relocates an existing mid-block crosswalk that currently feeds directly into the school's driveway. Improvements also include installation of a Rectangular Rapid Flashing Beacon (RRFB) to alert drivers when pedestrians are using the crosswalk, advance yield teeth to decrease vehicle encroachment into the crosswalk, and installation of ADA curb ramps. This project proposes not to remove street parking, as North Fair Oaks has very limited street parking. Therefore, the County proposes to place the stormwater treatment facility at Location 1, further downstream of this location. Pedestrian improvements will be made at this location. Currently, the crosswalk is located in the school's driveway, which has high volumes of traffic after school and is sometimes blocked by parked cars. The crosswalk and existing ramp will be relocated approximately ten feet away from the current location. We are proposing to add an ADA ramp and RRFB lighted signs with a pedestrian button. A water valve will also be relocated, as it is currently where the new ADA ramp will be installed.

The project includes educational signage in English and Spanish on stormwater management/SRTS goals. A sign will be installed at the bioretention area explaining these goals.

County Road Maintenance can provide maintenance for the biotreatment areas as part of their routine maintenance and vegetation management efforts. The County has developed resources for County staff to operate and maintenance green infrastructure features at County sites, including maintenance and inspection checklists of bioretention areas.

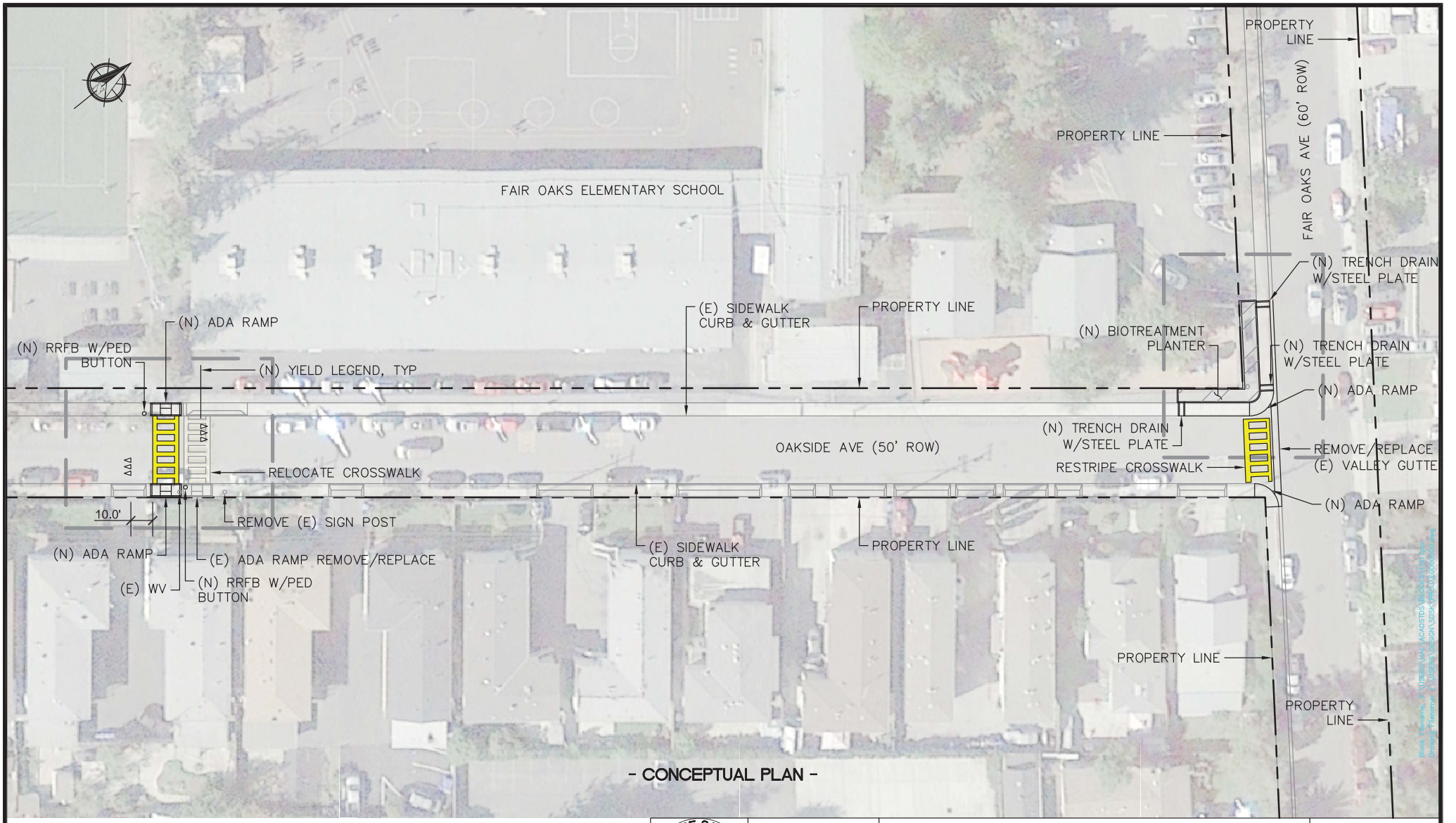
Attachments (proposed project map, design concept, preliminary budget, other supporting documentation):

1. Project Area Map
2. Project Concept
3. Drainage Areas
4. Preliminary Timeline and Budget

Student Distribution and Walking Distances

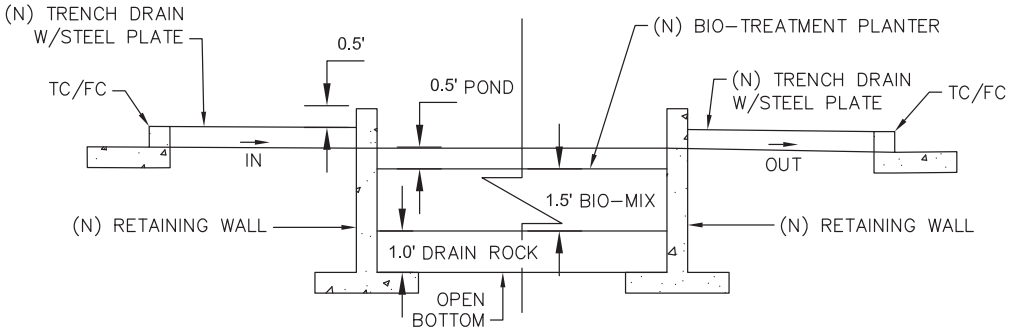
Fair Oaks Elementary School

Redwood City School District



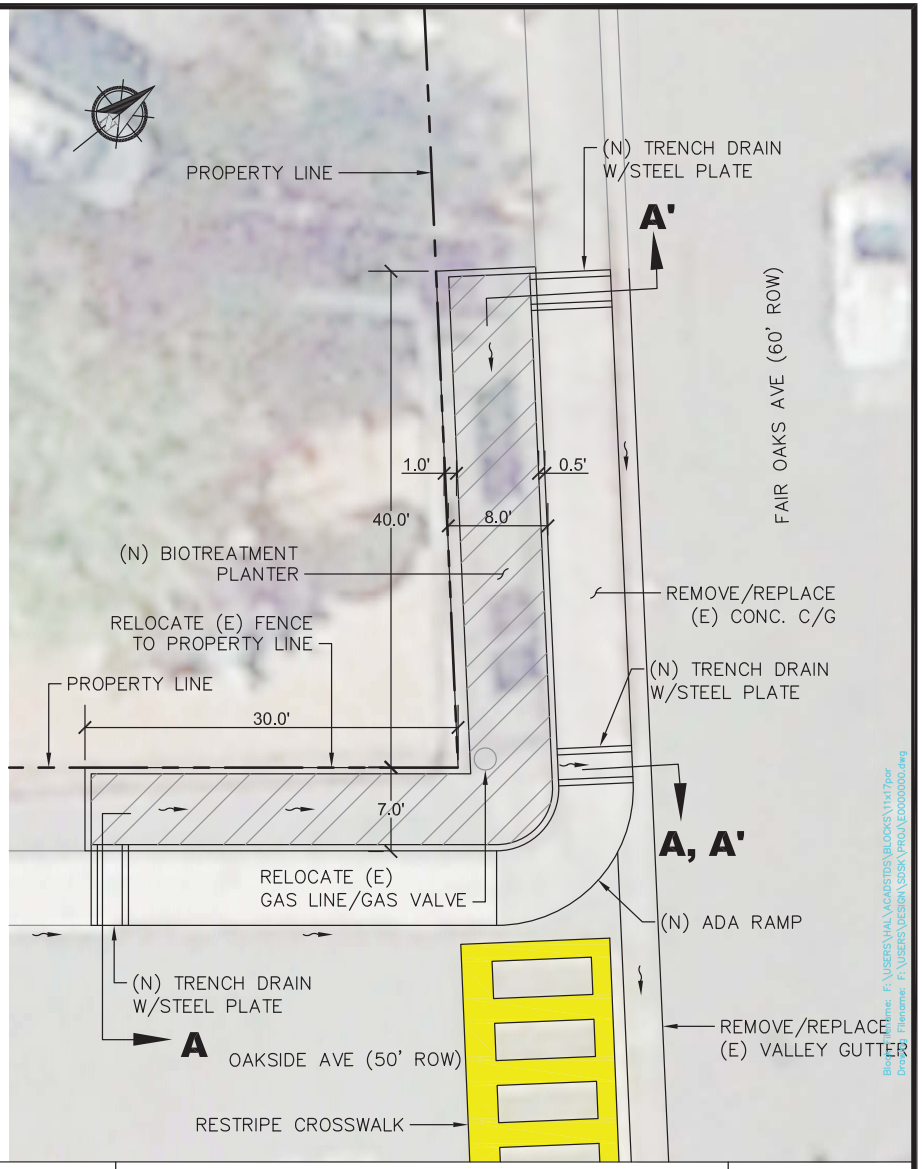
- CONCEPTUAL PLAN -

COUNTY OF SAN MATEO PUBLIC WORKS	DESIGNED BY: DS/AV CHECKED BY: DS DRAWN BY: AV	FAIR OAKS AVE AND OAKSIDE AVE BIO-TREATMENT PLANTER AND X-WALK RELOCATION GREEN STREETS SRTS PROJECT	SCALE: 1: 40 DATE: 10/11/17 FILE NO:
	JIM PORTER, DIRECTOR OF PUBLIC WORKS SAN MATEO COUNTY		555 COUNTY CENTER, 5TH FLOOR REDWOOD CITY, CALIFORNIA 94063-1665

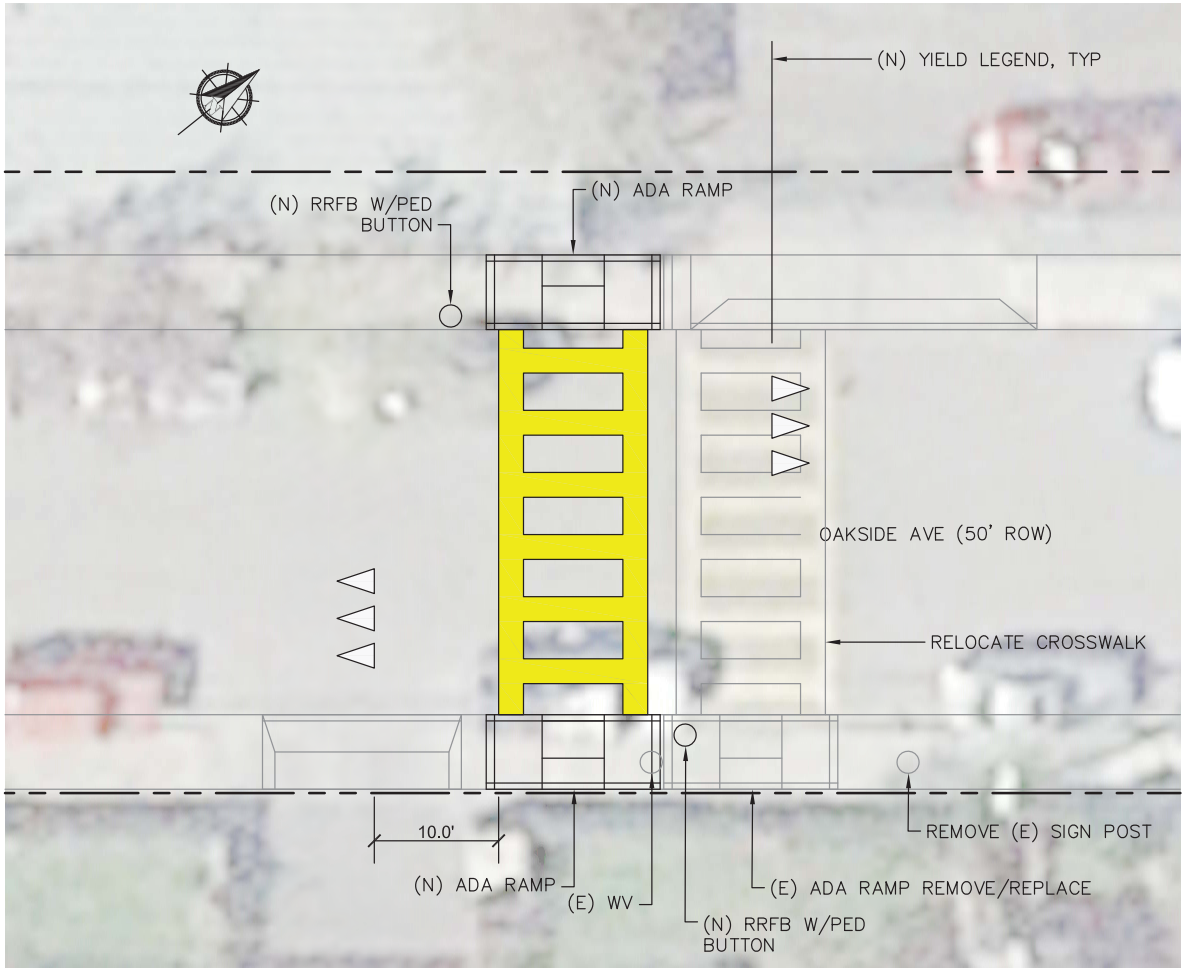


SECTION A-A

SECTION A'-A'



COUNTY OF SAN MATEO PUBLIC WORKS	DESIGNED BY: DS/AV CHECKED BY: DS DRAWN BY: AV	FAIR OAKS AVE AND OAKSIDE AVE BIO-TREATMENT PLANTER AND X-WALK RELOCATION GREEN STREETS SRTS PROJECT	SCALE: 1:10 DATE: 10/11/17 FILE NO:
JIM PORTER, DIRECTOR OF PUBLIC WORKS SAN MATEO COUNTY		555 COUNTY CENTER, 5TH FLOOR REDWOOD CITY, CALIFORNIA 94063-1665	



COUNTY OF SAN MATEO PUBLIC WORKS	DESIGNED BY: DS/AV CHECKED BY: DS DRAWN BY: AV	FAIR OAKS AVE AND OAKSIDE AVE X-WALK RELOCATION GREEN STREETS SRTS PROJECT	SCALE: 1:10 DATE: 10/11/17 FILE NO:
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Map of drainage areas contributing flows to the biotreatment area.

Direction of stormwater flow in existing concrete gutters. →

Approximate area of watershed being treated. ▭

SRTS and Green Streets Infrastructure Estimated Cost Breakdown Template

County of San Mateo - Estimate for Fair Oaks Elementary School Improvements 2017

Item	Section	Construction Element	SRTS/GI/Both	Quantity	Unit	Unit Cost	Cost	GI/Both Cost	SRTS/Both Cost	Percent GI Cost	Percent SRTS Cost
1	10	Construction Waste Management	Both	1	LS	$1,000	$1,000	$500	$500	58%	42%
2	11	Mobilization	Both	1	LS	$15,000	$15,000	$7,500	$7,500		
3	11-1	Water Pollution Control	Both	1	LS	$5,000	$5,000	$2,500	$2,500		
4	12	Maintaining Traffic	Both	1	LS	$5,000	$5,000	$2,500	$2,500		
5	15-1	Remove Portland Cement Concrete Sidewalk, Curb Gutter	Both	200	LF	$50	$10,000	$5,000	$5,000		
6	15-2	Pothole existing facilities	Both	2	EA	$500	$1,000	$500	$500		
7	19	Roadway Excavation	Both	250	CY	$120	$30,000	$15,000	$15,000		
8	26	Aggregate Base	Both	20	CY	$300	$6,000	$3,000	$3,000		
9	39-2	Hot Mix Asphalt (Type A)	SRTS	25	SY	$500	$12,500	$0	$12,500		
10	51	Class 3 concrete - retaining wall	GI	16	CY	$1,600	$25,600	$25,600	$0		
11	51-1	Class 3 concrete - sidewalk, curb, gutter	SRTS	20	CY	$1,000	$20,000	$0	$20,000		
12	51-2	Curb Painting	Both	100	LF	$300	$30,000	$15,000	$15,000		
13	56	Signs remove and relocate	SRTS	2	EA	$200	$400	$0	$400		
14	56-1	RRFB signs	SRTS	2	EA	$10,000	$20,000	$0	$20,000		
15	56-2	Stormwater/Bioretention Educational Sign	GI	1	EA	$1,000	$1,000	$1,000	$0		
16	68-1	Class II permeable material	GI	20	CY	$120	$2,400	$2,400	$0		
17	68-4	Subdrain observation pipe	GI	100	LF	$500	$50,000	$50,000	$0		
18	72	Stream bed cobbles	GI	0.2	CY	$1,700	$340	$340	$0		
19	80	Remove and relocate fence	GI	100	LF	$200	$20,000	$20,000	$0		
20	82	Curb Ramp Detectable Warning Surface	SRTS	4	EA	$500	$2,000	$0	$2,000		
21	84-1	Yellow Crosswalk Markings - Thermalplastic	SRTS	220	SF	$10	$2,200	$0	$2,200		
22	99	Utility relocation	Both	2	EA	$10,000	$20,000	$10,000	$10,000		
23	100	Construction staking	Both	1	LS	$5,000	$5,000	$2,500	$2,500		
24	101	Bioretention Soil	GI	22	CY	$160	$3,520	$3,520	$0		
25	102	Gravel Mulch	GI	50	Sqft	$10	$500	$500	$0		
26	103-1	1 gallon plants	GI	7	EA	$30	$210	$210	$0		
27	103-2	5 gallon plants	GI	7	EA	$50	$350	$350	$0		
		Total					$289,020	$167,920	$121,100		
		Contingency 10%					$ 28,902	$ 16,792	$ 12,110		
		Grand total					**$ 317,922**				
		Grant requested					$ 250,000	79%			
		County Portion					$ 67,922	21%			

Enter "SRTS", "GI", or "Both" in column B - "Both" applies to costs that could be distributed equally to SRTS and GI elements
Enter the quantity of the units in column C
Enter the unit cost in column E
The resulting costs per element and breakdown for "GI/Both" and "SRTS/Both" will be calculated automatically

Project timeline

Grant approval – 2017 winter

Start final design – 2018 spring

Bid project – 2019 spring

Begin Construction – 2019 summer while school is on summer break