

Appendix F: Cost Estimate Memorandum

Memorandum

Re: Draft Pulgas Creek Watershed Cost Estimate Memorandum Rev.1
Date: December 18, 2024
To: Grace Le, P.E.
From: Camille Bandy, P.E., Freyer & Laureta, Inc.
Mark Quito, Freyer & Laureta, Inc.
Reviewed: Jeffrey Tarantino, P.E., Freyer & Laureta, Inc.

1 Introduction

The City of San Carlos (City) is vulnerable to the effects of climate change including rising sea levels, shallow groundwater rising, and increased precipitation. Most specifically the lower portion of the City along the bayshore is most prone to flooding and coastal erosion increasing the risk to life, safety, and critical infrastructure. The Pulgas Creek Watershed Management Plan identifies a variety of proposed projects, programs, and policies that the City could choose to pursue. This memorandum is to summarize potential projects that the City can consider implementing.

2 Summary of Proposed Projects

The project team developed six proposed projects that the City may consider implementing within the Pulgas Creek Watershed. Conceptual drawings for each project can be found in Appendix A, which includes a project description, justification, duration, status, future impact on operating budget and estimated budget.

2.1 Underground Detention Basin – E.R. Burton Park

The largest, feasible underground detention basin in E.R. Burton Park involves installing a 12-million-gallon underground precast concrete stormwater detention facility under the existing baseball fields to capture and manage storm flow from two parallel storm drains mains (24" and 48") on Brittan Avenue and the runoff from streets north of E.R. Burton Park. The facility will temporarily detain stormwater during peak flows and gradually release it back into the piped storm drain system via pump on Brittan Ave. after storms subside.

The proposed 12-million-gallon underground detention facility is the largest practical facility that the City could consider constructing within E.R. Burton Park. The potential underground detention facility planning requires coordination with the City's pending Park's Master Plan effort. Ultimately, a small underground detention facility may be preferred by the City such as limiting the footprint to be within the existing parking lot to minimize temporary disruption to the baseball field.

2.2 Underground Detention Basin –El Camino Real

The proposed underground detention basin involves installing a 2.5-million-gallon underground precast concrete stormwater detention facility within an unimproved parcel located between El Camino Real and Caltrain to capture

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and manage runoff from Arroyo Creek. The detention basin would be located on property owned by SamTrans, and the City would be required to either secure an easement for the proposed facility or acquire the property. The proposed underground improvements would not prohibit SamTrans from continuing to utilize the parcel for staging materials, equipment, and other maintenance activities so a subterranean easement may be the most appropriate pathway for the City. The facility will temporarily detain stormwater during peak flows and gradually release it into Pulgas Creek via pump after storms subside.

2.3 Floodplain Detention Basin – Big Canyon Park

The proposed project involves the installation of a floodplain detention basin near the entrance to Big Canyon Park on Brittan Avenue. The basin will temporarily detain stormwater during peak flows and gradually release it into public storm drain after a storm subsides. The system comprises a sediment forebay with a capacity of 500 gallons of water, located uphill from the main floodplain detention basin, which has a capacity of 2,500 gallons. The total water storage capacity is therefore 3,000 gallons. The main floodplain basin will contain a non-floatable mulch layer under laying native erosion-resistant plants, soil media mix, and a gravel layer.

2.4 Bioretention Planter – Brittan Avenue and Alameda de las Pulgas

The proposed project at Brittan Avenue and Alameda de las Pulgas involves installing bioretention in the City's right-of-way to capture and manage runoff Alameda de las Pulgas and Brittan Avenue. The facility consists of approximately 400 square feet of bioretention area and will treat stormwater at a designed ponding depth and slowly release it into the stormwater system. As part of the installation of bioretention, there is opportunities to introduce bulb outs and updated curb ramps at this intersection. The Project would include new curb, sidewalk, and storm drain infrastructure.

The proposed bioretention planter specifically identified for the intersection of Brittan Avenue and Alameda de las Pulgas can also be modified for any number of locations throughout San Carlos. The City is already implementing similar improvements as part of its annual pavement management program and the proposed improvements presented in Appendix A are also intended to provide guidance for future City projects including developing site specific budgets.

2.5 Pervious Pavement – City of San Carlos Corporation Yard

The Project involves implementing pervious pavement on a city-owned parcel, City of San Carlos Corporation Yard, to capture and manage onsite runoff. The pavement will filter pollutants and allow for water to flow through and gradually release into the ground. Pervious pavement is best suited for parking lots, walkways, and areas that don't have heavy vehicular traffic. Two options are provided (porous asphalt and pervious concrete) in Appendix A to provide guidance for future City projects for developing site specific budgets.

2.6 Native Planting – Big Canyon Park

The Project involves planting native plants, treating topsoil, irrigation, and monitoring runoff in the Big Canyon Park. The replacement and planting of native plants will help stabilize the soil through natural means and lessen the effects of erosion and soil transportation to further points downstream in the watershed. Once planted, revegetation sites should be regularly weeded and watered to ensure plant establishment. The site should be formally monitored for species composition, percent survival, and percent cover every year for five years.

3 Summary of Estimated Costs

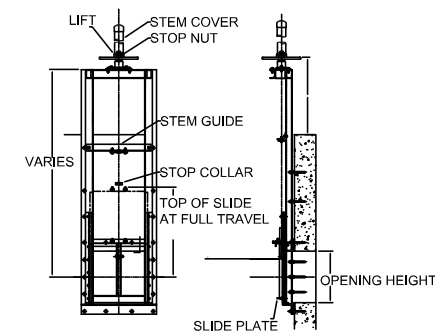
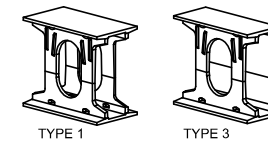
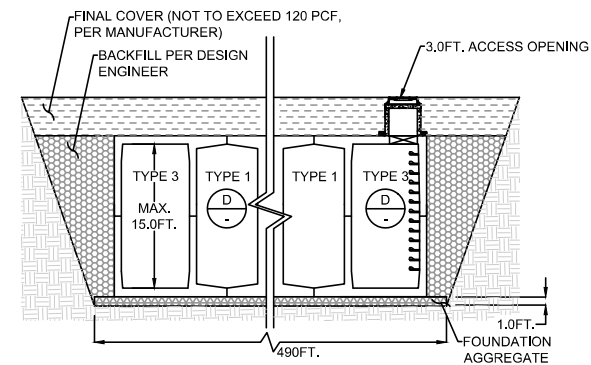
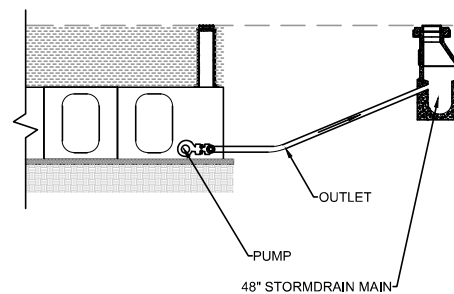
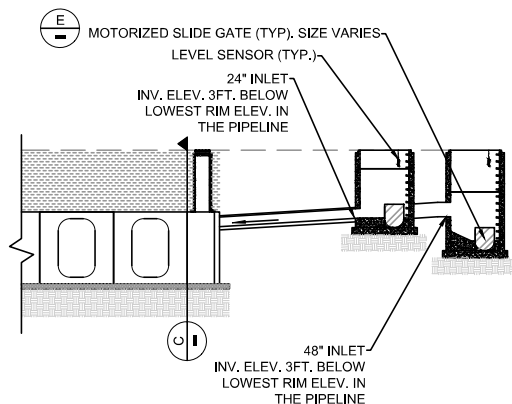
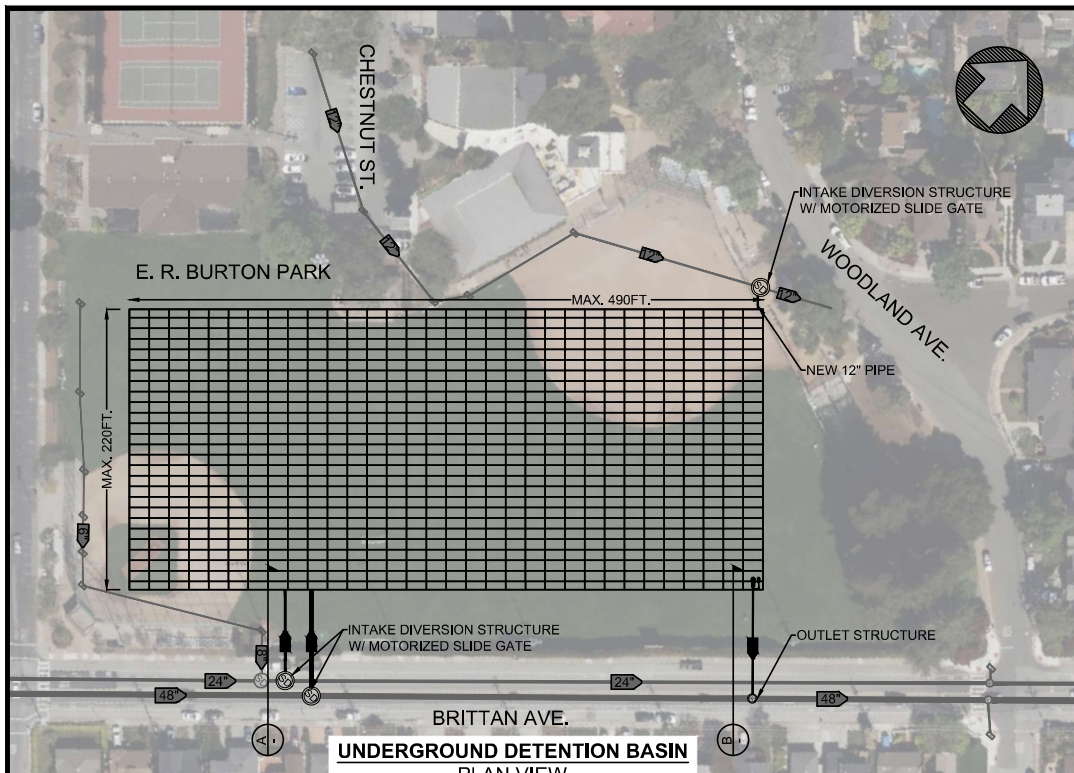
The total estimated cost of the projects includes preliminary design, permitting, construction documents, and construction with a 50% contingency. A summary of the estimated cost for each project can be found in Table 1 below.

Table 1. Summary of Proposed Project Costs

Proposed Project	Cost Estimate
Underground Detention Basin, E.R. Burton Park	\$33,550,000
Underground Detention Basin, El Camino Real	\$14,740,000
Floodplain Detention Basin, Big Canyon Park	\$1,150,000
Bioretention Planter, Brittan Avenue and Alameda de las Pulgas	\$870,000
Pervious Pavement, City of San Carlos Corporation Yard (Porous Asphalt)	\$1,560,000
Pervious Pavement, City of San Carlos Corporation Yard (Pervious Concrete)	\$2,230,000
Native Planting, Big Canyon Park	\$401,000

Underground Detention Basin Installation – E.R. Burton Park		
Fund Number:	Location:	900 Chestnut St, San Carlos, CA 94070
Department: DPW	Strategic Plan:	
Project Manager:	Priorities:	
Category:	Priority Rating:	
Description		
<p>The Project involves installing a 12-million-gallon underground stormwater detention facility under E.R. Burton Park to capture and manage storm flow from two, existing parallel storm drains (24” and 48”) on Brittan Ave. and the runoff from streets north of the Park. The facility will temporarily store stormwater during peak flows and gradually release it back into the piped storm drain system on Brittan Ave. after storms subside.</p> <p>The system comprises of intake structures, intake piping, a modular detention basin, and an outlet back into an existing 54” storm drain on Brittan Ave. The intake structures are designed as manholes with motorized slide gates that would allow flow diversion from the main storm drain into the detention basin. These slide gates can be fully automated and controlled based on a local level sensor, or they can be remotely operated based on rainfall predictions, allowing for proactive management of stormwater.</p> <p>Total Estimated Cost (Including Preliminary Design, Permitting, Construction Documents, and Construction with a 50% Contingency) is \$33.55M, which translates into approximately \$2.79/gallon of storage.</p>		
Justification		
<ol style="list-style-type: none"> 1. <u>Flood Mitigation</u>: The project will increase storm drain capacity, leading to an estimated 27% reduction in flooding. This will improve public safety and reduce property damage during heavy rainfall events. 2. <u>Optimized Land Use</u>: The project leverages underground storage capacity under E.R. Burton Park, within the City. 3. <u>Multi-Functional Design</u>: The top of the detention facility will be restored to its initial recreational functionality. 		
Duration		
<ul style="list-style-type: none"> • CEQA (6 months to 9 months) • Design (12 months to 15 months) • Construction (18 months to 24 months) 		
Status		
10% Design Drawings		
Future Impact on Operating Budget		
Slide Gates at Intake Structures Detention Basin Inspection Detention Basin Cleaning Pumping System Maintenance Pumping System Replacement		

Underground Detention Basin Installation – E.R. Burton Park				
Fund Number:		Location: 900 Chestnut St, San Carlos, CA 94070		
Department: DPW		Strategic Plan:		
Project Manager:		Priorities:		
Category:		Priority Rating:		
Current Strategic Plan Objective				
	Child Care			
X	Climate Change Mitigation, Adaptation & Resilience			
	Downtown			
	Housing			
	Mobility, Traffic & Transportation Infrastructure			
	Northeast Area Specific Plan			
	Recreation Services			
Capitalization Project		Non- Capitalized Project		
Budget				
Planning*		\$	2,475,000	
Design Phase		\$	2,475,000	
Advertise / Bid / Award		\$	100,000	
Construction		\$	28,500,000	
Post Construction		\$	-	
Total		\$	33,550,000	
* Includes Surveying, Geotechnical Report, Utility Investigation, Alternatives Development, Structural Engineering Report, Permitting				



MAX. DIMENSIONS OF DETENTION BASIN: 490 FT. x 220 FT.
MAX. DEPTH: 15 FT.

MAX. TOTAL VOLUME OF DETENTION BASIN: 1,620,000CF.

Table A.1
Conceptual Opinion of Probable Project Cost for Pulgas Creek Watershed
Underground Detention Basin
E.R. Burton Park, San Carlos

Item No.	Description	Units	Quantity	Unit Price	Budget
Conceptual Opinion of Probable Construction Cost					
1	Mobilization/Demobilization	%	10.00%	-	\$ 1,501,700
2	Dewatering	ls	1	\$ 100,000	\$ 100,000
3	84" Diversion Structure	ea	3	\$ 125,000	\$ 375,000
4	60" Standard Manhole	ea	1	\$ 75,000	\$ 75,000
5	Excavation (including offhaul and disposal)	cy	100000	\$ 25	\$ 2,500,000
6	StormTrap Modules	ls	1	\$ 11,000,000	\$ 11,000,000
7	48" HDPE Intake Pipe	lf	90	\$ 600	\$ 54,000
8	6" HDPE Outlet Pipe	lf	40	\$ 300	\$ 12,000
9	Flygt Pump (Flygt N 3069)	ea	2	\$ 40,000	\$ 80,000
10	Flygt Pump (Sump Pump)	ea	1	\$ 20,000	\$ 20,000
11	PG&E Connection	ls	1	\$ 50,000	\$ 50,000
12	Foundation Bedding	cy	2000	\$ 33	\$ 66,000
13	Backfill (Overexcavation and top cover)	cy	9000	\$ 30	\$ 270,000
14	36" H-20 Covers w/ grade rings	ea	9	\$ 20,000	\$ 180,000
15	48" Motorized Slide Gate	ea	1	\$ 40,000	\$ 40,000
16	24" Motorized Slide Gate	ea	1	\$ 25,000	\$ 25,000
17	12" Motorized Slide Gate	ea	1	\$ 20,000	\$ 20,000
18	Park Resurfacing	cy	750	\$ 100	\$ 75,000
19	Control Panel Cabinet	ls	1	\$ 75,000	\$ 75,000
20	Contingency	%	50%	\$ 16,518,700	\$ 8,259,350
Subtotal - Conceptual Opinion of Probable Construction Cost (1)					\$ 24,778,000
Engineering and Administration Cost					
21	Design	%	10%	\$ 24,778,000	\$ 2,477,800
22	Environmental/Permitting	%	5%	\$ 24,778,000	\$ 1,238,900
23	Advertise/Bid/Award	ls	1	\$ 100,000	\$ 100,000
24	Construction Management/ Inspection	%	15%	\$ 24,778,000	\$ 3,716,700
25	District Administration	%	5%	\$ 24,778,000	\$ 1,238,900
Subtotal - Engineering and Administration Cost (1)					\$ 8,772,000
Total Conceptual Opinion of Probable Project Cost (1)					\$ 33,550,000

Notes

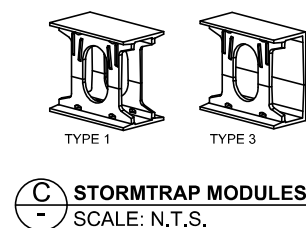
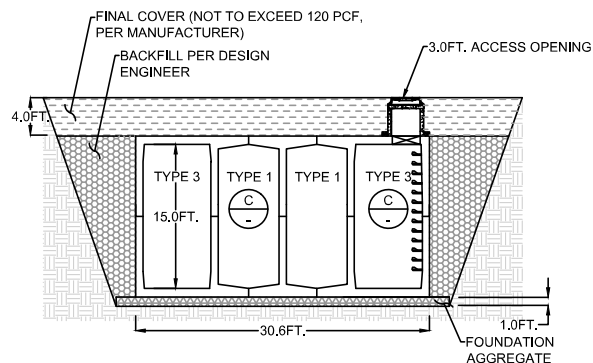
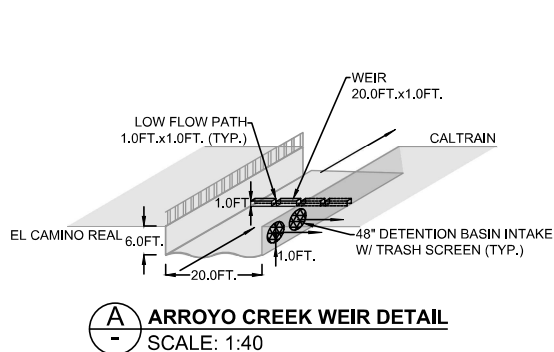
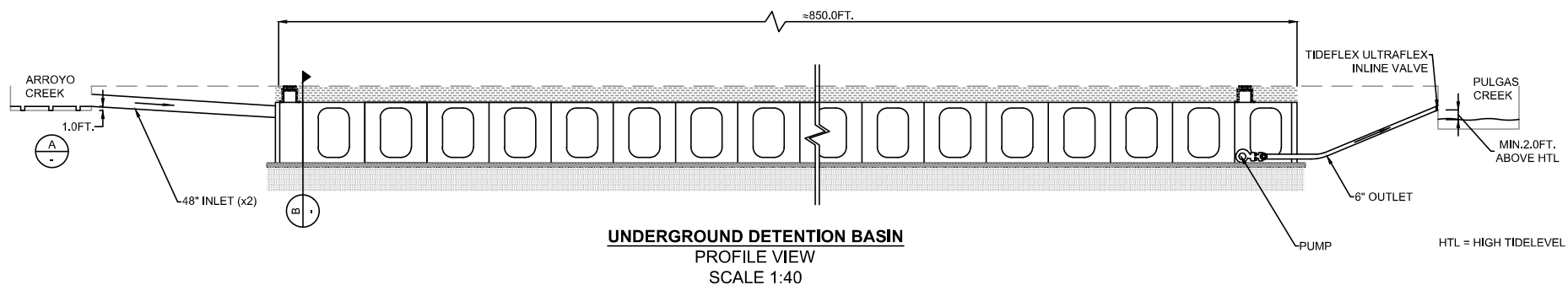
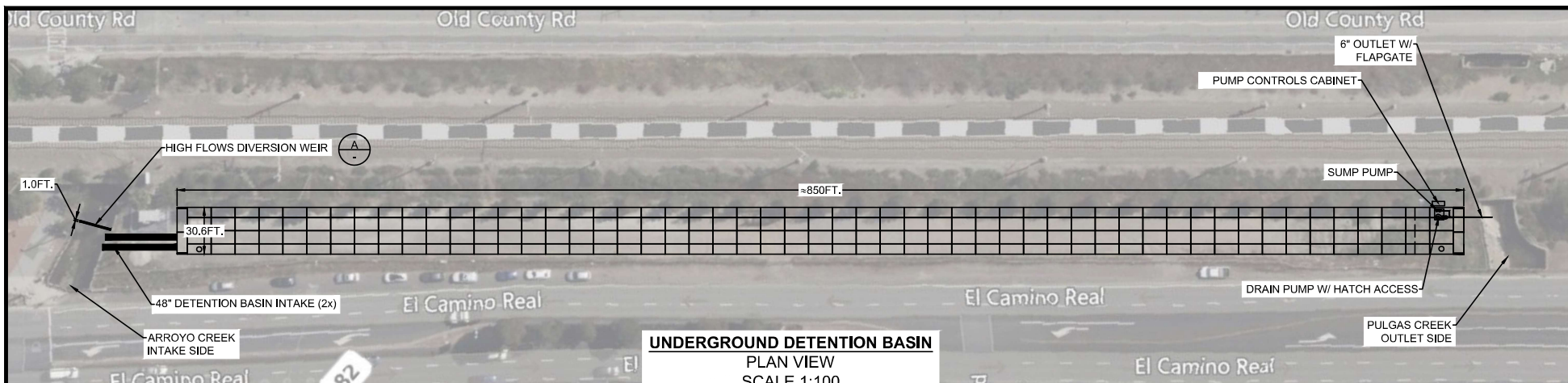
(1) Subtotals and total rounded to the nearest \$1,000

Abbreviations

ls Lump Sum
lf Linear Foot
ea Each
sf Square Foot

Underground Detention Basin Installation – El Camino Real	
Fund Number:	Location: 237 CA-82, San Carlos
Department: DPW	Strategic Plan:
Project Manager:	Priorities:
Category:	Priority Rating:
Description	
<p>The Project involves installing a 2.5-million-gallon underground precast concrete stormwater detention facility within an unimproved parcel located between El Camino Real and Caltrain to capture and manage runoff from Arroyo Creek. The detention basin would be located on property owned by SamTrans, and the City would be required to either secure an easement for the proposed facility or acquire the property. The proposed underground improvements would not prohibit SamTrans from continuing to utilize the parcel for staging materials, equipment, and other maintenance activities so a subterranean easement may be the most appropriate pathway for the City. The facility will temporarily store stormwater during peak flows and gradually release it into Pulgas Creek via pump after storms subside.</p> <p>The system comprises an intake structure in Arroyo Creek, intake piping, a modular detention basin, and a new outfall structure in Pulgas Creek.</p> <p>Total Estimated Cost (Including Preliminary Design, Permitting, Construction Documents, and Construction with a 50% Contingency) is \$14.74 M, which translates into approximately \$5.90/gallon of storage.</p>	
Justification	
<ol style="list-style-type: none"> 1. <i>Flood Mitigation:</i> The project will increase storm drain capacity, leading to an estimated 5% reduction in flooding. This will improve public safety and reduce property damage during heavy rainfall events. 2. <i>Optimized Land Use:</i> The project leverages an underutilized location within the City. 3. <i>Multi-Functional Design:</i> The top of the detention facility can be repurposed to serve the community's needs, potentially as a parking lot or other public amenity as determined by the City, hence maximizing the value of existing public land. 	
Duration	
<ul style="list-style-type: none"> • CEQA (6 months to 9 months) • Design (12 months to 15 months) • Construction (18 months to 24 months) 	
Status	
10% Design Drawings	
Future Impact on Operating Budget	
Intake at Arroyo Creek Inspection and Maintenance Detention Basin Inspection Detention Basin Cleaning Pumping System Maintenance Pumping System Replacement Outlet at Pulgas Creek Inspection and Maintenance TideFlex CheckMate Valve Replacement	

Underground Detention Basin Installation – El Camino Real				
Fund Number:		Location: 237 CA-82, San Carlos		
Department: DPW		Strategic Plan:		
Project Manager:		Priorities:		
Category:		Priority Rating:		
Current Strategic Plan Objective				
	Child Care			
X	Climate Change Mitigation, Adaptation & Resilience			
	Downtown			
	Housing			
	Mobility, Traffic & Transportation Infrastructure			
	Northeast Area Specific Plan			
	Recreation Services			
Capitalization Project		Non- Capitalized Project		
Budget				
Planning*		\$	1,085,000	
Design Phase		\$	1,085,000	
Advertise / Bid / Award		\$	100,000	
Construction		\$	12,470,000	
Post Construction		\$	-	
Total		\$	14,740,000	
* Includes Surveying, Geotechnical Report, Utility Investigation, Alternatives Development, Structural Engineering Report, Permitting				



LENGTH OF DETENTION BASIN: 850 FT.
USABLE CROSS SECTION AREA: 397 SF.

TOTAL VOLUME OF DETENTION BASIN: 337,450 CF.

Table A.2
Conceptual Opinion of Probable Project Cost for Pulgas Creek Watershed
Underground Detention Basin
El Camino Real, San Carlos

Item No.	Description	Units	Quantity	Unit Price	Budget
Conceptual Opinion of Probable Construction Cost					
1	Mobilization/Demobilization	%	10.00%	-	\$ 657,202
2	Dewatering	ls	1	\$ 100,000	\$ 100,000
3	Weir Structure	ls	1	\$ 100,000	\$ 100,000
4	Excavation (including offhaul and disposal)	cy	29000	\$ 25	\$ 725,000
5	StormTrap Modules	ls	1	\$ 4,500,000	\$ 4,500,000
6	48" HDPE Intake Pipe	lf	90	\$ 600	\$ 54,000
7	6" HDPE Outlet Pipe	lf	40	\$ 300	\$ 12,000
8	Flygt Pump (Flygt N 3069)	ea	2	\$ 40,000	\$ 80,000
9	Flygt Pump (Sump Pump)	ea	1	\$ 20,000	\$ 20,000
10	PG&E Connection	ls	1	\$ 50,000	\$ 50,000
11	Foundation Bedding	cy	551	\$ 20	\$ 11,019
12	Final Cover Backfill	cy	300	\$ 10	\$ 3,000
13	Backfill	cy	16000	\$ 10	\$ 160,000
14	36" H-20 Covers w/ grade rings	ea	9	\$ 20,000	\$ 180,000
15	12" TideFlex CheckMate Inline Valve	ea	1	\$ 2,000	\$ 2,000
16	Pavement Resurfacing	cy	10000	\$ 50	\$ 500,000
17	Control Panel Cabinet	ls	1	\$ 75,000	\$ 75,000
18	Contingency	%	50%	\$ 7,229,220	\$ 3,614,610
Subtotal - Conceptual Opinion of Probable Construction Cost (1)					\$ 10,844,000
Engineering and Administration Cost					
19	Design	%	10%	\$ 10,844,000	\$ 1,084,400
20	Environmental/Permitting	%	5%	\$ 10,844,000	\$ 542,200
21	Advertise/Bid/Award	ls	1	\$ 100,000	\$ 100,000
22	Construction Management/ Inspection	%	15%	\$ 10,844,000	\$ 1,626,600
23	District Administration	%	5%	\$ 10,844,000	\$ 542,200
Subtotal - Engineering and Administration Cost (1)					\$ 3,895,000
Total Conceptual Opinion of Probable Project Cost (1)					\$ 14,739,000

Notes

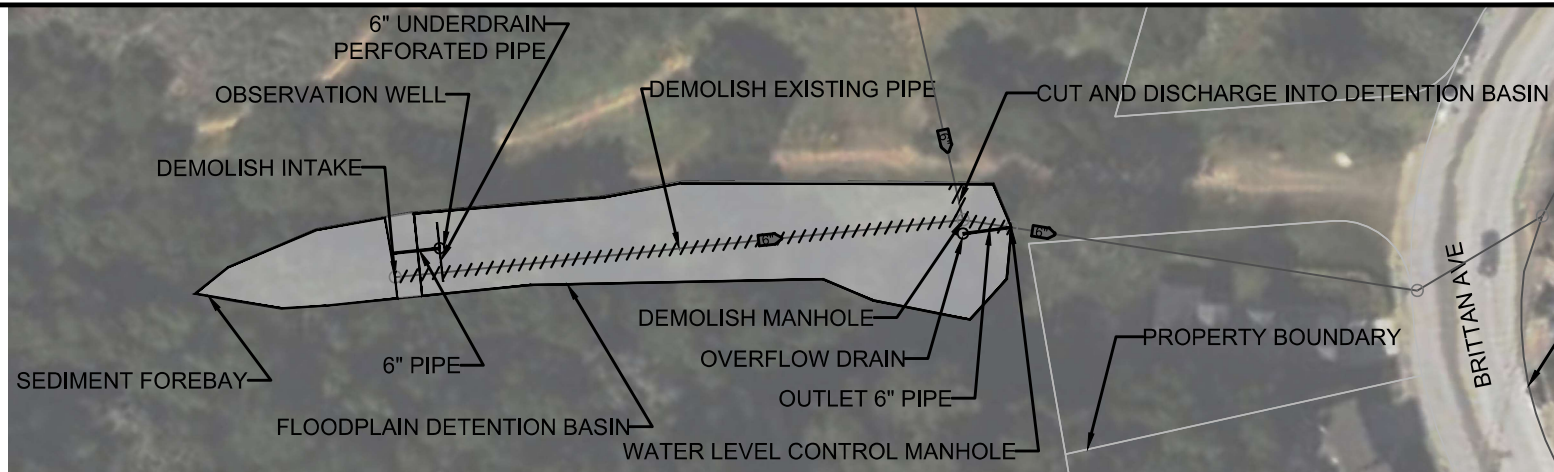
(1) Subtotals and total rounded to the nearest \$1,000

Abbreviations

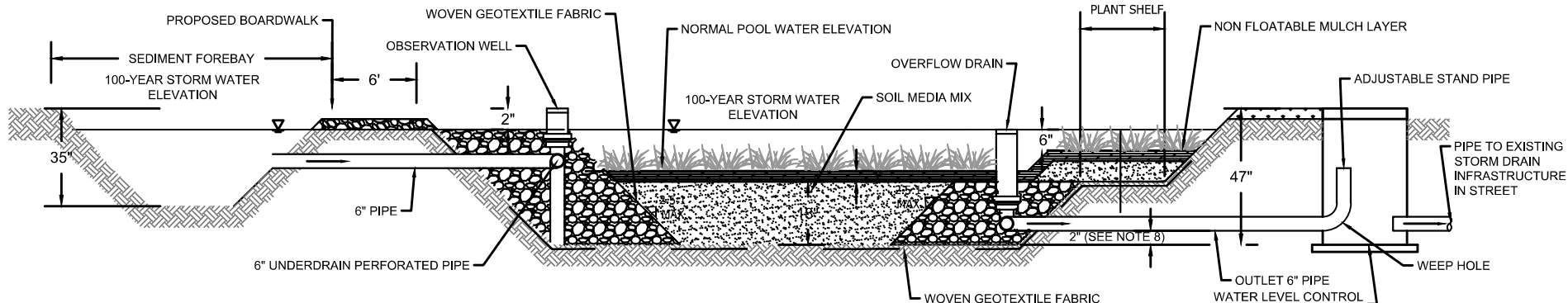
ls Lump Sum
lf Linear Foot
ea Each
sf Square Foot

Floodplain Detention Basin Installation – Big Canyon Park	
Fund Number: Department: Project Manager Category:	Location: Big Canyon Park Strategic Plan: Priorities: Priority Rating:
Description	
<p>The Project involves the installation of a floodplain detention basin in the Pulgas Creek Watershed region of San Carlos at Big Canyon. The basin will temporarily store stormwater during peak flows and gradually release it into public storm drain after a storm subsides.</p> <p>The system comprises a sediment forebay with a capacity of 500 gallons of water, located uphill from the main floodplain detention basin, which has a capacity of 2,500 gallons. The total water storage capacity is therefore 3,000 gallons. The main floodplain basin will contain a non-floatable mulch layer under laying native erosion-resistant plants, soil media mix, and a gravel layer.</p> <p>The total estimated cost (Including preliminary design, permits, construction documents, and construction with 50% contingency) is \$1.15M, which is approximately \$380/gallon of storage.</p>	
Justification	
<p>1. <u>Flood Mitigation</u>: The project will increase storm drain capacity downstream by reduction in the peak discharge of approximately 22%. This will improve public safety and reduce property damage during heavy rainfall events.</p> <p>2. <u>Optimized Land Use</u>: The project leverages an underutilized location within the City.</p> <p>3. <u>Multi-Functional Design</u>: The floodplain detention facility can include education signage and upgraded trail access for the community.</p>	
Duration	
<ul style="list-style-type: none"> • CEQA (6 months to 9 months) • Design (12 months to 15 months) • Construction (15 months to 18 months) 	
Status	
10% Design Drawings	
Future Impact on Operating Budget	
<p>Floodplain Detention Basin Inspection</p> <p>Floodplain Detention Basin Cleaning</p>	

Floodplain Detention Basin Installation – Big Canyon Park			
Fund Number:		Location: Big Canyon Park	
Department:		Strategic Plan:	
Project Manager		Priorities:	
Category:		Priority Rating:	
Current Strategic Plan Objective			
	Child Care		
x	Climate Change Mitigation, Adaptation & Resilience		
	Downtown		
	Housing		
	Mobility, Traffic & Transportation Infrastructure		
	Northeast Area Specific Plan		
	Recreation Services		
Capitalization Project		Non- Capitalized Project	
Budget			
Planning*		\$	80,000
Design Phase		\$	80,000
Advertise / Bid / Award		\$	100,000
Construction		\$	890,000
Post Construction		\$	-
Total		\$	1,150,000
* Includes Surveying, Geotechnical Report, Utility Investigation, Alternatives Development, Structural Engineering Report, Permitting			



FLOOD PLAIN DETENTION BASIN
PLAN VIEW 1:80



FLOOD PLAIN DETENTION BASIN
PROFILE VIEW NTS

NOTES:

1. AVOID INSTALLATION ON SLOPES GREATER THAN 3.00%. AVOID COMPACTING NATIVE SOILS. SCARIFY ANY COMPACTED SOIL.
2. LENGTH TO WIDTH RATIO SHOULD RANGE FROM 2 TO 3.
3. STONE STORAGE OPTIONS ARE CALTRANS CLASS 2 PERMEABLE MATERIAL, OR SIMILARLY MUNICIPALITY-APPROVED MATERIAL. NO RECYCLED MATERIALS.
4. MINIMUM DISTANCE OF 2 FEET BETWEEN BOTTOM OF BMP AND SEASONALLY HIGH GROUNDWATER LEVEL.
5. UNDERDRAINS ARE REQUIRED IN TYPICAL CLAYEY SOILS WHERE INFILTRATION RATES ARE LESS THAN 0.5 INCH/HOUR. MAXIMUM OF 1 UNDERDRAIN PER 30 FEET. PROVIDE A SOIL REPORT DOCUMENTING NATIVE INFILTRATION RATE TO FOREGO UNDERDRAINS.
6. MINIMUM UNDERDRAIN BEDDING OF TWO INCHES, MAXIMUM OF 12 INCHES.

Table A.3
Conceptual Opinion of Probable Project Cost for Pulgas Creek Watershed
Floodplain Detention Basin
Big Canyon Park, San Carlos

Item No.	Description	Units	Quantity	Unit Price	Budget
Conceptual Opinion of Probable Construction Cost					
1	Mobilization/Demobilization	%	10.00%	-	\$ 46,935
2	Excavation	cy	1,170	\$ 75	\$ 87,750
3	Trench Backfill	cy	40	\$ 10	\$ 400
4	Woven geotextile fabric	sf	7,580	\$ 3	\$ 23,650
5	Observation well (6" PVC)	ea	1	\$ 300	\$ 300
7	Soil Media mix	ls	100	\$ 125	\$ 12,500
8	Gravel (river rocks)	cy	500	\$ 36	\$ 18,000
9	Landscape Materials (plants, irrigation, etc.)	ls	1	\$ 100,000	\$ 100,000
10	Overflow Drain (6" pvc)	ea	3	\$ 48	\$ 144
11	6" HDPE SDR17	lf	50	\$ 300	\$ 15,000
12	Precast Concrete Manhole	ea	1	\$ 137,000	\$ 137,000
13	Non floatable mulch layer	cy	90	\$ 729	\$ 65,610
14	Underdrain perforated pipe 6" HDPE	lf	30	\$ 300	\$ 9,000
15	Contingency	%	50%	\$ 516,289	\$ 258,144
Subtotal - Conceptual Opinion of Probable Construction Cost (1)					\$ 774,000
Engineering and Administration Cost					
16	Design	%	10%	\$ 774,000	\$ 77,400
17	Environmental/Permitting	%	5%	\$ 774,000	\$ 38,700
18	Advertise/Bid/Award	ls	1	\$ 100,000	\$ 100,000
19	Construction Management/ Inspection	%	15%	\$ 774,000	\$ 116,100
20	District Administration	%	5%	\$ 774,000	\$ 38,700
Subtotal - Engineering and Administration Cost (1)					\$ 371,000
Total Conceptual Opinion of Probable Project Cost (1)					\$ 1,145,000

Notes

(1) Subtotals and total rounded to the nearest \$1,000

Abbreviations

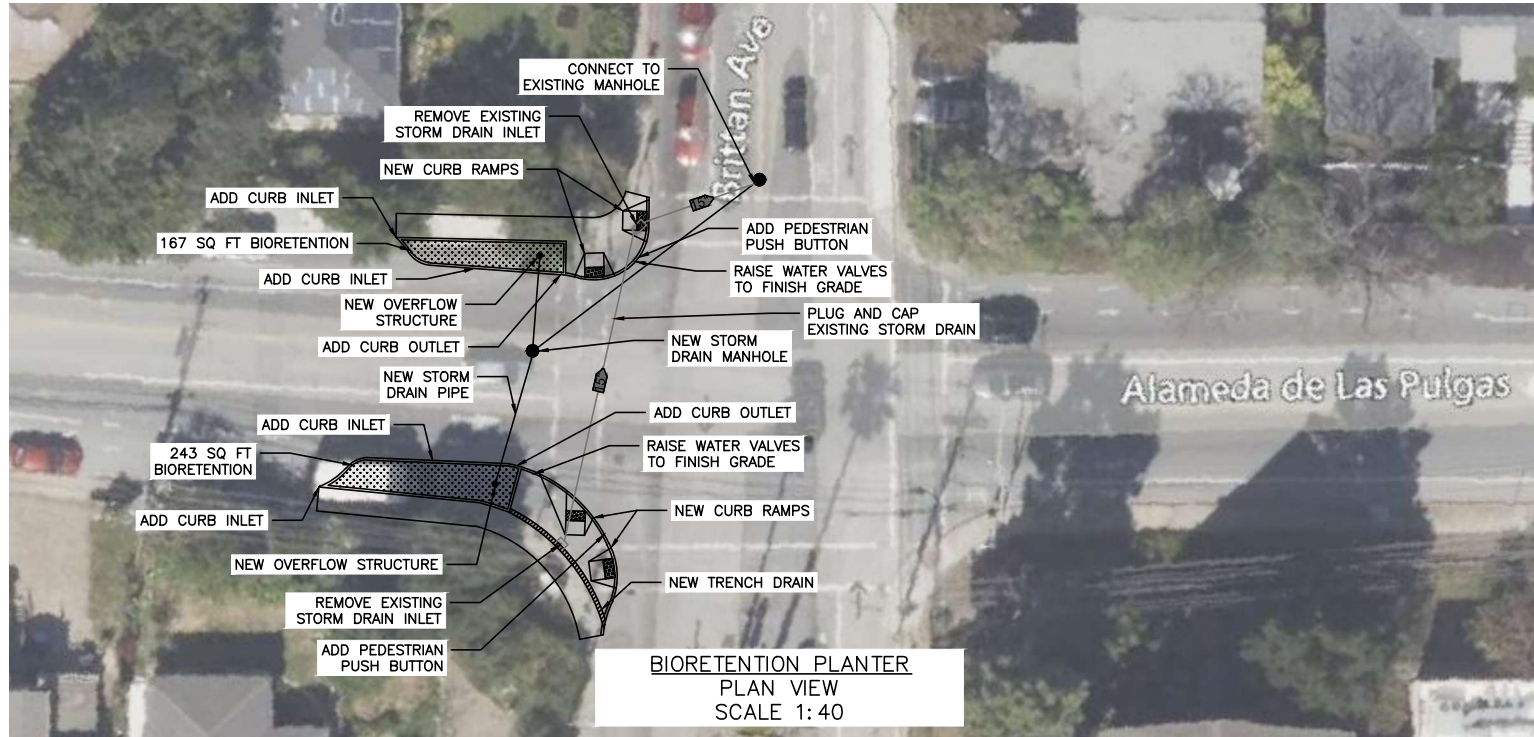
ls Lump Sum
lf Linear Foot
ea Each
sf Square Foot

Bioretention Planter Installation – Alameda de las Pulgas				
Fund Number:		Location: Alameda de las Pulgas/Brittan Avenue		
Department: DPW		Strategic Plan:		
Project Manager:		Priorities:		
Category:		Priority Rating:		
Description				
<p>The Project involves installing bioretention in the City’s right-of-way to capture and manage runoff Alameda de las Pulgas and Brittan Avenue. The facility consists of approximately 400 square feet of bioretention area and will treat stormwater at a designed ponding depth and slowly release it into the stormwater system. As part of the installation of bioretention, there is opportunities to introduce bulb outs and updated curb ramps at this intersection. The Project would include new curb, sidewalk, and storm drain infrastructure.</p> <p>Total Estimated Cost (Including Preliminary Design, Permitting, Construction Documents, Construction with 50% Contingency) is \$870,000.</p>				
Justification				
<p>1. <u>Flood Mitigation</u>: The project will increase storm drain capacity.</p> <p>2. <u>Optimized Land Use</u>: The project leverages an underutilized location within the City.</p>				
Duration				
<ul style="list-style-type: none"> • CEQA (6 months to 9 months) • Design (9 months to 12 months) • Construction (12 months to 18 months) 				
Status				
10% Design Drawings				
Future Impact on Operating Budget				
Bioretention planter Inspection				
Bioretention planter Cleaning				
Current Strategic Plan Objective				
	Child Care			
X	Climate Change Mitigation, Adaptation & Resilience			
	Downtown			
	Housing			
	Mobility, Traffic & Transportation Infrastructure			
	Northeast Area Specific Plan			
	Recreation Services			
Capitalization Project		Non- Capitalized Project		

Bioretention Planter Installation – Alameda de las Pulgas		
Fund Number:	Location:	Alameda de las Pulgas/Brittan Avenue
Department: DPW	Strategic Plan:	
Project Manager:	Priorities:	
Category:	Priority Rating:	

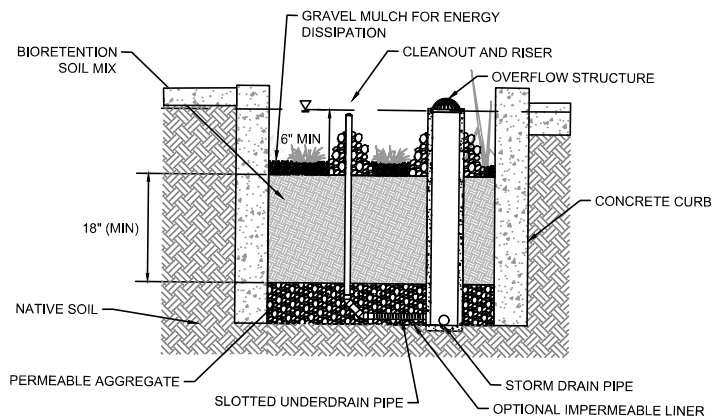
Budget		
Planning*	\$	65,000
Design Phase	\$	65,000
Advertise / Bid / Award	\$	20,000
Construction	\$	720,000
Post Construction	\$	-
Total	\$	870,000

* Includes Surveying, Geotechnical Report, Utility Investigation, Alternatives Development, Structural Engineering Report, Permitting

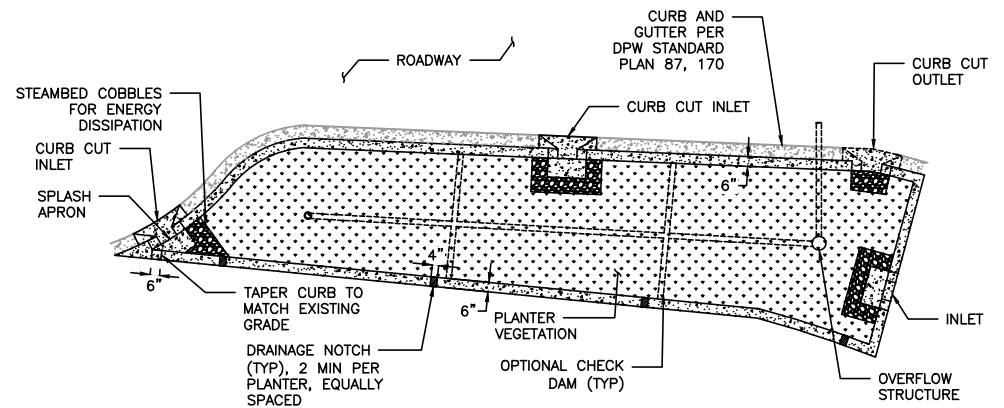


NOTES:

1. BIORETENTION AREAS TO CONFORM TO COUNTY OF SAN MATEO C-3 REGULATED PROJECTS GUIDE



1 BIORETENTION PLANTER SECTION DETAIL
NTS



2 CURB SECTION DETAIL
NTS

Table A.4
Conceptual Opinion of Probable Project Cost for Pulgus Creek Watershed
Curb Ramp and Bioretention Construction
Alameda de las Pulgas, San Carlos

Item No.	Description	Units	Quantity	Unit Price	Budget
Conceptual Opinion of Probable Construction Cost					
1	Mobilization/Demobilization	%	10.00%	-	\$ 38,150
2	Traffic Control	ls	1	\$ 30,000	\$ 30,000
3	Demolition	ls	1	\$ 13,500	\$ 13,500
4	New Trench Drain	ls	1	\$ 3,000	\$ 3,000
5	Bioretention Construction	ls	1	\$ 165,000	\$ 165,000
6	Curb Ramps and Sidewalk	ls	1	\$ 100,000	\$ 100,000
7	Pedestrian Push Buttons	ls	1	\$ 10,000	\$ 10,000
8	New Stormwater Infrastructure	ls	1	\$ 50,000	\$ 50,000
9	Stormwater Pollution Prevention & Control	ls	1	\$ 10,000	\$ 10,000
10	Contingency	%	50%	\$ 419,650	\$ 209,825
Subtotal - Conceptual Opinion of Probable Construction Cost (1)					\$ 629,000
Engineering and Administration Cost					
11	Design	%	10%	\$ 629,000	\$ 62,900
12	Environmental/Permitting	%	5%	\$ 629,000	\$ 31,450
13	Advertise/Bid/Award	ls	1	\$ 20,000	\$ 20,000
14	Construction Management/ Inspection	%	15%	\$ 629,000	\$ 94,350
15	District Administration	%	5%	\$ 629,000	\$ 31,450
Subtotal - Engineering and Administration Cost (1)					\$ 240,000
Total Conceptual Opinion of Probable Project Cost (1)					\$ 869,000

Notes

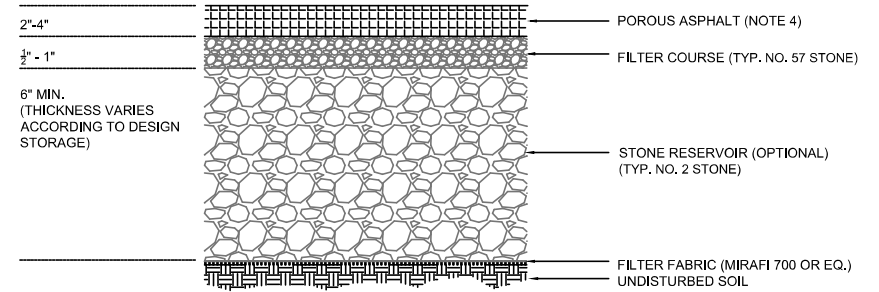
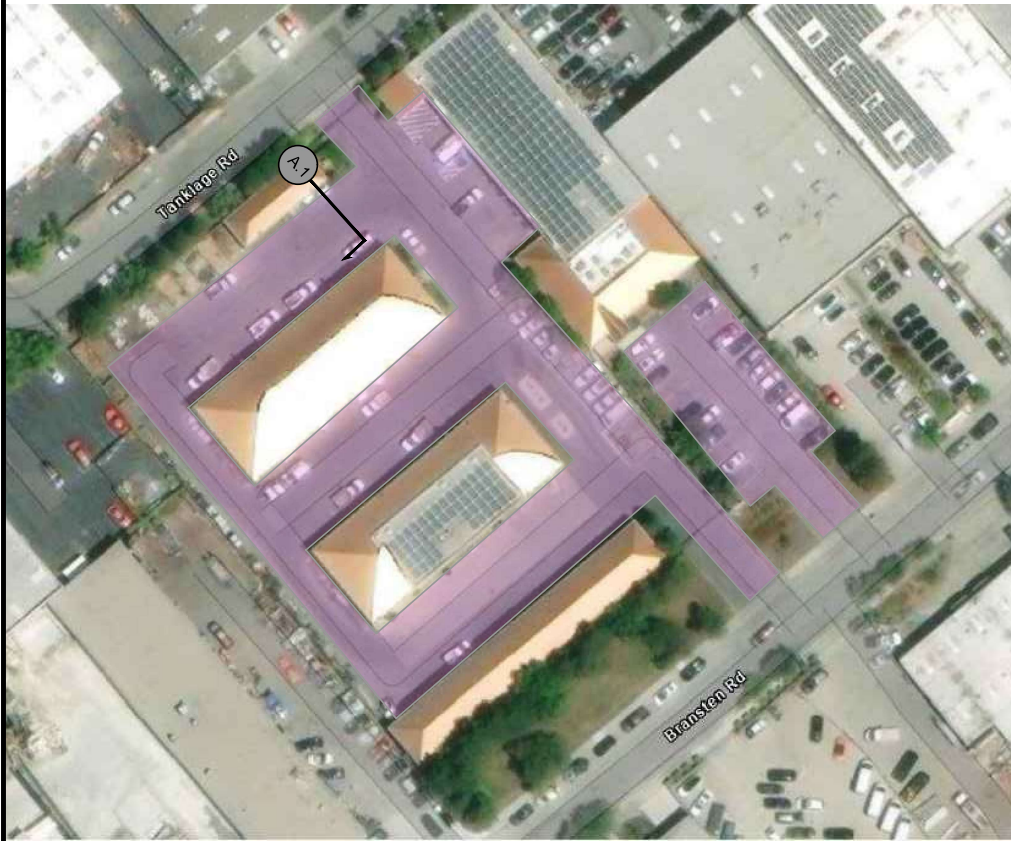
(1) Subtotals and total rounded to the nearest \$1,000

Abbreviations

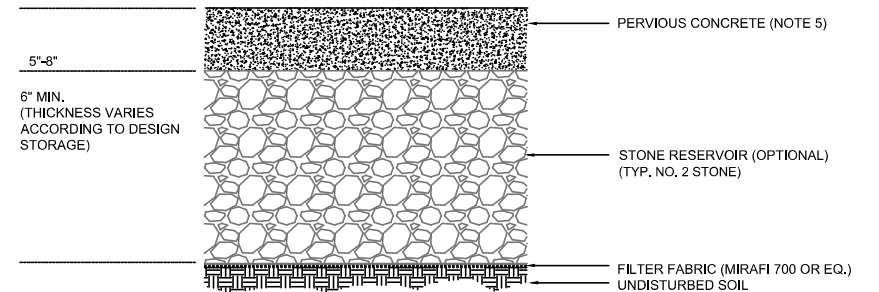
ls Lump Sum
lf Linear Foot
ea Each
sf Square Foot

Pervious Pavement Installation – Bransten Road				
Fund Number:		Location: 1000 Bransten Road		
Department: DPW		Strategic Plan:		
Project Manager:		Priorities:		
Category:		Priority Rating:		
Description				
<p>The Project involves implementing pervious pavement on a city-owned parcel, City of San Carlos Corporation Yard, to capture and manage onsite runoff. The pavement will filter pollutants and allow for water to flow through and gradually release into the ground. Pervious pavement is best suited for parking lots, walkways, and areas that don't have heavy vehicular traffic. Two options have been provided: Porous Asphalt and Pervious Concrete.</p> <p>Total Estimated Cost (Including Preliminary Design, Permitting, Construction Documents, Construction with 50% Contingency) is \$1,560,000 (Porous Asphalt) and \$2,230,000 (Pervious Concrete).</p>				
Justification				
<ol style="list-style-type: none"> 1. <u>Improve Water Quality</u>: Reduce runoff and the amount of pollutants that enter creeks and the bay. 2. <u>Optimized Land Use</u>: The project leverages an underutilized location within the City. 3. <u>Multi-Functional Design</u>: The pavement can be integrated as parking lots and areas, maximizing the function of existing public land. 				
Duration				
<ul style="list-style-type: none"> • CEQA (6 months to 9 months) • Design (6 months to 9 months) • Construction (6 months to 9 months) 				
Status				
10% Design Drawings				
Future Impact on Operating Budget				
Pervious Pavement Maintenance				
Current Strategic Plan Objective				
	Child Care			
X	Climate Change Mitigation, Adaptation & Resilience			
	Downtown			
	Housing			
	Mobility, Traffic & Transportation Infrastructure			
	Northeast Area Specific Plan			
	Recreation Services			
Capitalization Project		Non- Capitalized Project		

Pervious Pavement Installation – Bransten Road			
Fund Number:		Location:	1000 Bransten Road
Department:	DPW	Strategic Plan:	
Project Manager:		Priorities:	
Category:		Priority Rating:	
Budget			
	Porous Asphalt Option	Pervious Concrete Option	
Planning*	\$ 110,000	\$ 160,000	
Design Phase	\$ 110,000	\$ 160,000	
Advertise / Bid / Award	\$ 100,000	\$ 100,000	
Construction	\$ 1,240,000	\$ 1,810,000	
Post Construction	\$ -	\$ -	
Total	\$ 1,560,000	\$ 2,230,000	
* Includes Surveying, Geotechnical Report, Utility Investigation, Alternatives Development, Permitting			



A.1 POROUS ASPHALT SECTION DETAIL
- NTS



A.2 PERVIOUS CONCRETE SECTION DETAIL
- NTS

POROUS ASPHALT PROPOSED LOCATION PLAN VIEW

(FOR PERVIOUS PAVEMENT ALTERNATIVES SEE DETAILS A.2)

NOTES:

1. DEPENDING ON LOCATION AND DESIRED LANDSCAPE DESIGN, PERMEABLE PAVEMENT CAN BE POROUS ASPHALT, PERVIOUS CONCRETE, PERMEABLE PAVERS OR PERVIOUS PAVERS.
2. IN ORDER TO AVOID CONTAMINATION OF GROUNDWATER, THE BOTTOM OF THE BASE OF THE PERVIOUS PAVEMENT SYSTEM MUST BE AT LEAST 5 FT. ABOVE THE HIGH GROUNDWATER LEVEL AT THE PROPOSED LOCATION, UNLESS A DIFFERENT SEPARATION METHOD IS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
3. THE SUBGRADE BELOW THE PERVIOUS PAVEMENT SYSTEM MUST BE RELATIVELY FLAT (MAX. 2% SLOPE), TO PROMOTE INFILTRATION ACROSS THE ENTIRE AREA.
4. SURFACE VOID CONTENT FOR POROUS ASPHALT SHALL BE 12-20%.
5. SURFACE VOID CONTENT FOR PERVIOUS CONCRETE SHALL BE 15-25%.
6. SITE TESTS SHOULD BE PERFORMED TO DETERMINE SOIL CONDITIONS INCLUDING: PERCOLATION RATE, INFILTRATION CAPABILITIES, DEPTH TO SEASONAL HIGH WATER TABLE, DEPTH TO BEDROCK, AND SOIL CONTAMINATION. AN UNDERDRAIN MAY BE USED IN SOILS WITH LOWER INFILTRATION RATE IN ORDER TO OBTAIN THE MINIMUM PERMEABILITY RATE. PERCOLATION TESTING TO IDENTIFY THE INFILTRATION RATE OF THE NATIVE SOIL WILL DETERMINE THE DEPTH OF BASE ROCK FOR THE STORAGE OF STORMWATER, AND WHETHER AN UNDERDRAIN SYSTEM IS NECESSARY.



**FREYER &
LAURETA, INC.**

CIVIL ENGINEERS • SURVEYORS • CONSTRUCTION MANAGERS
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PERVIOUS PAVEMENT
PULGAS CREEK WATERSHED
SAN CARLOS, CA

SHEET
1
OF
1

Table A.5
Conceptual Opinion of Probable Project Cost for Pulgus Creek Watershed
Pervious Asphalt Replacement
1000 Bransten Road, San Carlos

Item No.	Description	Units	Quantity	Unit Price	Budget
Conceptual Opinion of Probable Construction Cost					
1	Mobilization/Demobilization	%	10.00%	-	\$ 65,351
2	Traffic Control	ls	1	\$ 15,000	\$ 15,000
3	Demolition	cy	462	\$ 550	\$ 254,100
4	Excavation (including offhaul and disposal)	cy	1,845	\$ 78	\$ 143,910
5	New Ashphalt Porous	ls	1	\$ 230,497	\$ 230,497
6	Stormwater Pollution Prevention & Control	ls	1	\$ 10,000	\$ 10,000
7	Contingency	%	50%	\$ 718,858	\$ 359,429
Subtotal - Conceptual Opinion of Probable Construction Cost (1)					\$ 1,078,000
Engineering and Administration Cost					
8	Design	%	10%	\$ 1,078,000	\$ 107,800
9	Environmental/Permitting	%	5%	\$ 1,078,000	\$ 53,900
9	Advertise/Bid/Award	ls	1	\$ 100,000	\$ 100,000
10	Construction Management/ Inspection	%	15%	\$ 1,078,000	\$ 161,700
11	District Administration	%	5%	\$ 1,078,000	\$ 53,900
Subtotal - Engineering and Administration Cost (1)					\$ 477,000
Total Conceptual Opinion of Probable Project Cost (1)					\$ 1,555,000

Notes

(1) Subtotals and total rounded to the nearest \$1,000

Abbreviations

ls Lump Sum
lf Linear Foot
ea Each
sf Square Foot

Table A.6
Conceptual Opinion of Probable Project Cost for Pulgus Creek Watershed
Pervious Concrete Replacement
1000 Bransten Road, San Carlos

Item No.	Description	Units	Quantity	Unit Price	Budget
Conceptual Opinion of Probable Construction Cost					
1	Mobilization/Demobilization	%	10.00%	-	\$ 95,387
2	Traffic Control	ls	1	\$ 15,000	\$ 15,000
3	Demolition	cy	462	\$ 550	\$ 254,100
4	Excavation (including offhaul and disposal)	cy	1,845	\$ 78	\$ 143,910
5	New Concrete Pervious	ls	1	\$ 530,859	\$ 530,859
6	Stormwater Pollution Prevention & Control	ls	1	\$ 10,000	\$ 10,000
7	Contingency	%	50%	\$ 1,049,256	\$ 524,628
Subtotal - Conceptual Opinion of Probable Construction Cost (1)					\$ 1,574,000
Engineering and Administration Cost					
8	Design	%	10%	\$ 1,574,000	\$ 157,400
9	Environmental/Permitting	%	5%	\$ 1,574,000	\$ 78,700
9	Advertise/Bid/Award	ls	1	\$ 100,000	\$ 100,000
10	Construction Management/ Inspection	%	15%	\$ 1,574,000	\$ 236,100
11	District Administration	%	5%	\$ 1,574,000	\$ 78,700
Subtotal - Engineering and Administration Cost (1)					\$ 651,000
Total Conceptual Opinion of Probable Project Cost (1)					\$ 2,225,000

Notes

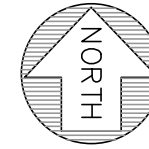
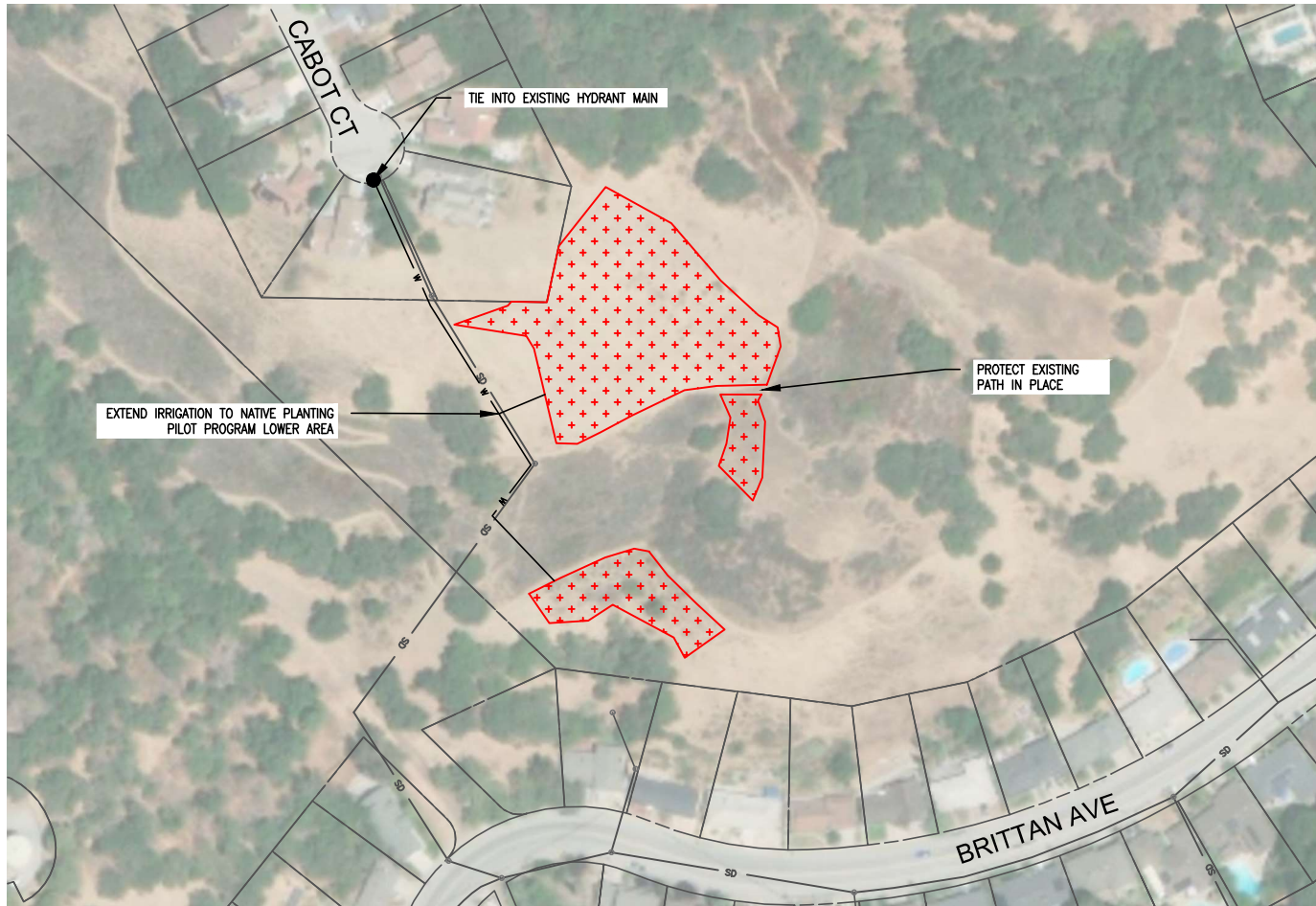
(1) Subtotals and total rounded to the nearest \$1,000

Abbreviations


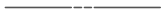


ls Lump Sum
lf Linear Foot
ea Each
sf Square Foot

Native Plant Pilot Program – Big Canyon Park	
Fund Number:	Location: Big Canyon Park
Department:	Strategic Plan:
Project Manager	Priorities:
Category:	Priority Rating:
Description	
<p>The project involves installing and replacing native plants, treating topsoil, irrigation, and monitoring runoff in the Pulgas Creek Watershed region of San Carlos at Big Canyon Park. The replacement and planting of native plants will help stabilize the soil through natural means and lessen the effects of erosion and soil transportation to further points downstream in the watershed.</p> <p>Site preparation includes minor grading, topsoil preparation, and incorporation of soil amendments. Planting basins are flagged and excavated, and irrigation is laid out. Cages and wire fencing can be installed to prevent herbivore damage to young plants. Planting will occur in winter through mid-spring to take advantage of water availability. Once planted, revegetation sites are regularly weeded and watered to ensure plant establishment. Dead or dying plants are removed and replaced within the first year. The site should be formally monitored for species composition, percent survival, and percent cover every year for five years.</p> <p>The total estimated cost (including preliminary design, permits, construction documents, and construction with a 50% contingency) is \$401,000.</p>	
Justification	
<p>1. <u>Landslide Mitigation</u>: The project will increase vegetation and ground cover, reducing soil erosion. This will improve public safety and reduce property damage during heavy rainfall events.</p> <p>2. <u>Optimized Land Use</u>: The project leverages an underutilized location within the City, providing habitat for wildlife and enhancing the aesthetic appeal of an existing park.</p>	
Duration	
<ul style="list-style-type: none"> • CEQA (6 months to 9 months) • Design (4 months to 6 months) • Construction (4 months to 6 months) • Monitoring and replanting (5 years) 	
Status	
10% Design Drawings	
Future Impact on Operating Budget	
<p>Native Plant Revegetation Inspection</p> <p>Native Plant Revegetation Replacement and Monitoring</p>	

Native Plant Pilot Program – Big Canyon Park			
Fund Number:		Location: Big Canyon Park	
Department:		Strategic Plan:	
Project Manager		Priorities:	
Category:		Priority Rating:	
Current Strategic Plan Objective			
	Child Care		
x	Climate Change Mitigation, Adaptation & Resilience		
	Downtown		
	Housing		
	Mobility, Traffic & Transportation Infrastructure		
	Northeast Area Specific Plan		
	Recreation Services		
Capitalization Project		Non- Capitalized Project	
Budget			
Planning*	\$	55,700	
Design Phase	\$	22,300	
Advertise / Bid / Award	\$	100,000	
Construction	\$	223,000	
Post Construction	\$	-	
Total	\$	401,000	
* Includes Surveying, Geotechnical Report, Utility Investigation, Alternatives Development, Structural Engineering Report, Permitting			



LEGEND:

-  NATIVE PLANTING AREA
-  PARCEL LINE
-  NEW WATER LINE
-  EXISTING STORM WATER INFRASTRUCTURE

APPROXIMATE NATIVE PLANTING AREA:

62,122-SQFT
1.43-ACRES

NATIVE PLANTING DESIGN PLAN VIEW 1:200

NOTES:

1. ONLY WATER MAIN LINES SHOWN. IRRIGATION LATERALS AND LAYOUT TO BE DESIGNED BY IRRIGATION CONSULTANT/LANDSCAPE ARCHITECT.
2. NATURAL PLANTING REVEGETATION SITES WILL BE REGULARLY WEEDED AND WATERED TO ENSURE PLANT ESTABLISHMENT.
3. DYING PLANTS ARE TO BE REPLANTED WITHIN THE FIRST YEAR.
4. SITES ARE FORMALLY MONITORED FOR SPECIES COMPOSITION, PERCENT SURVIVAL, AND PERCENT COVER EVERY YEAR FOR FIRST FIVE YEARS.
5. EASEMENT MAYBE NEEDED TO CONNECT TO EXISTING HYDRANT.

Table A.7
Conceptual Opinion of Probable Project Cost for Pulgas Creek Watershed
Native Planting Pilot Program
Big Canyon Park, San Carlos

Item No.	Description	Units	Quantity	Unit Price	Budget
Conceptual Opinion of Probable Construction Cost					
1	Mobilization/Demobilization	%	10.00%	-	\$ 13,539
2	Weeding	sy	6,960	\$ 1	\$ 6,960
3	Minor grading and topsoil preperation	ea	1	\$ 3,554	\$ 3,554
4	Weed/soil fabric	sy	6,960	\$ 3	\$ 20,880
5	Excavation Planting Pit	cy	330	\$ 158	\$ 52,140
6	Irrigation layout	lf	7,500	\$ 2	\$ 15,000
7	Plant protection (Cages)	ea	200	\$ 80	\$ 16,000
8	Replanting	ea	132	\$ 158	\$ 20,856
9	Contingency	%	50%	\$ 148,929	\$ 74,465
Subtotal - Conceptual Opinion of Probable Construction Cost (1)					\$ 223,000
Engineering and Administration Cost					
10	Design	%	10%	\$ 223,000	\$ 22,300
11	Environmental/Permitting	%	5%	\$ 223,000	\$ 11,150
18	Advertise/Bid/Award	ls	1	\$ 100,000	\$ 100,000
19	Construction Management/ Inspection	%	15%	\$ 223,000	\$ 33,450
20	District Administration	%	5%	\$ 223,000	\$ 11,150
Subtotal - Engineering and Administration Cost (1)					\$ 178,000
Total Conceptual Opinion of Probable Project Cost (1)					\$ 401,000

Notes

(1) Subtotals and total rounded to the nearest \$1,000

Abbreviations

ls Lump Sum
lf Linear Foot
ea Each
sf Square Foot
sy Square Yard
cy Cubic Yard