

San Pablo Avenue



City of San Pablo

City of Richmond

City of El Cerrito

City of Albany

City of Berkeley

City of Emeryville

City of Oakland

Caltrans

StopWaste.org

The San Francisco Estuary Partnership **SAN PABLO AVENUE GREEN STORMWATER SPINE PROJECT**

August 1st, 2012

[nev-ü-non]

Nevue | Ngan Associates

QUADRIGA
landscape architecture and planning, inc.
sacramento | santa rosa

**WILSEY
HAM**
ENGINEERING ■ PLANNING ■ SURVEYING



Key Personnel

WILSEY ■ ■
HAM ■ ■

ENGINEERING ■ PLANNING ■ SURVEYING

Jeff Peterson, Principal

*Brandon Davis,
Project Manager Lead*

Nevue | **Ngan** | Associates

*Kevin Robert Perry,
Green Street Specialist*

QUADRIGA

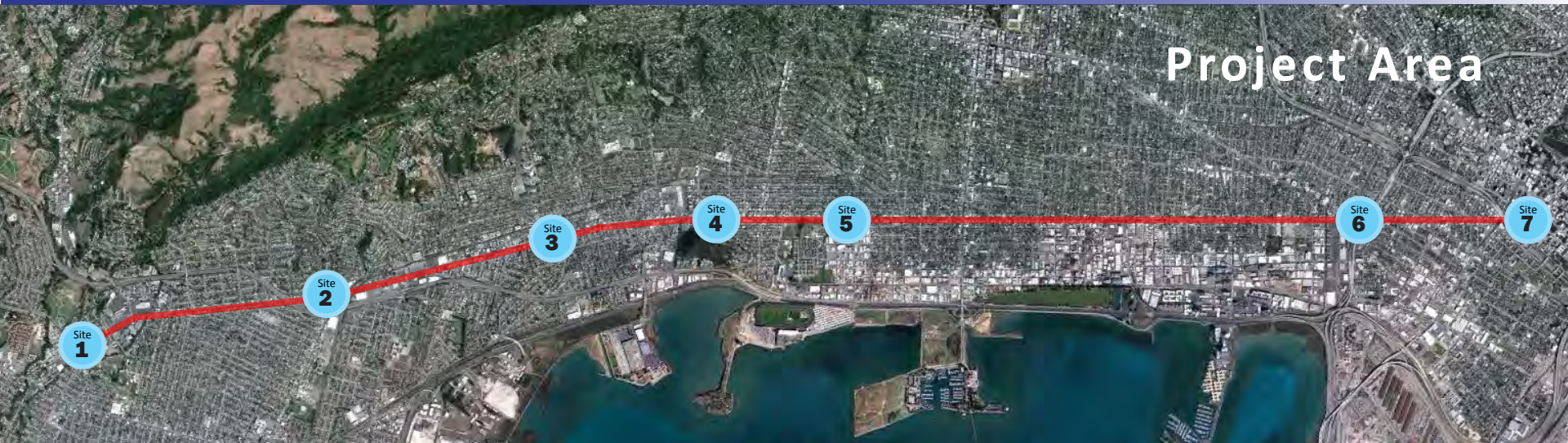
landscape architecture and planning, inc.
sacramento | santa rosa

Bill Mastick, Principal

*John Suesens,
Project Manager*

San Pablo Avenue Stormwater Spine

Initial Thoughts and Stormwater Approach



San Pablo



Richmond



El Cerrito



Albany



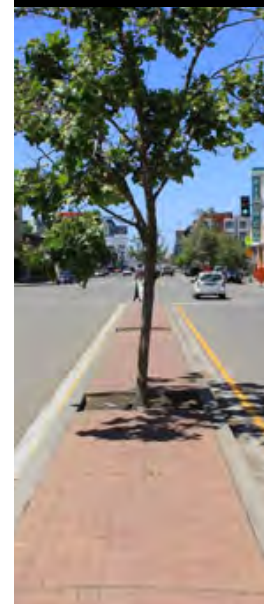
Berkeley



Emeryville

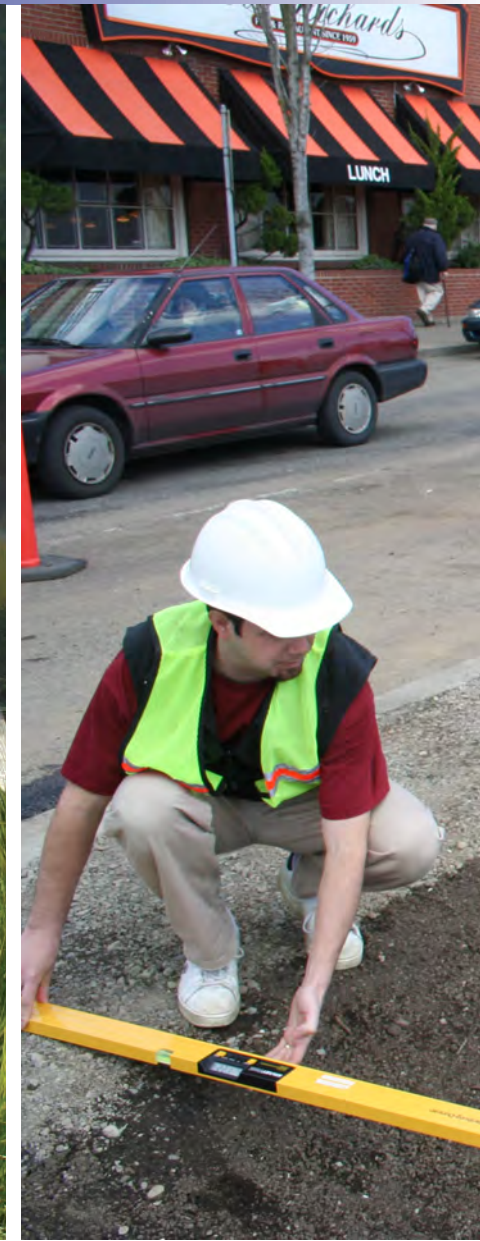
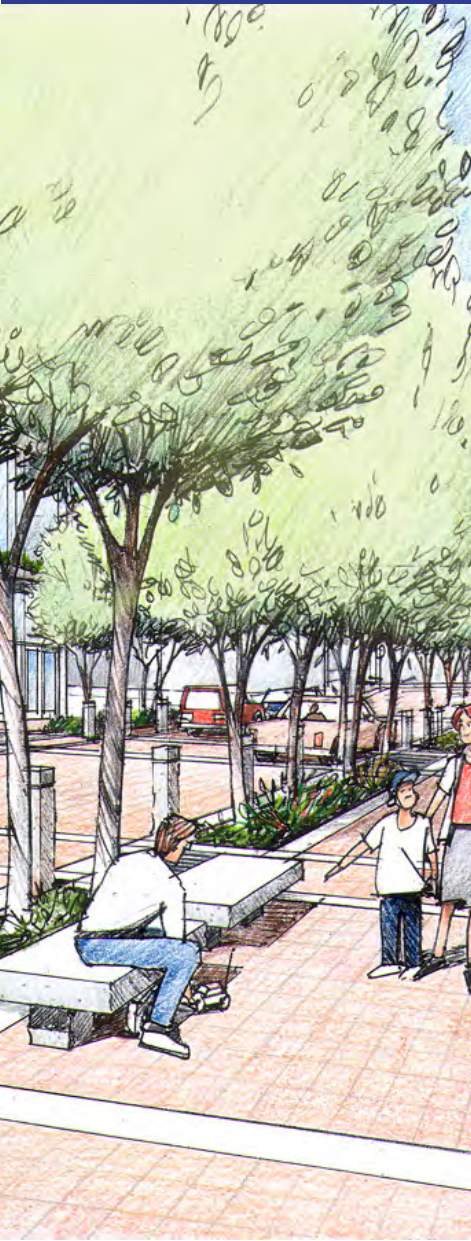


Oakland



San Pablo Avenue Approach

Project Visioning, Outreach, Implementation, and Construction Assistance

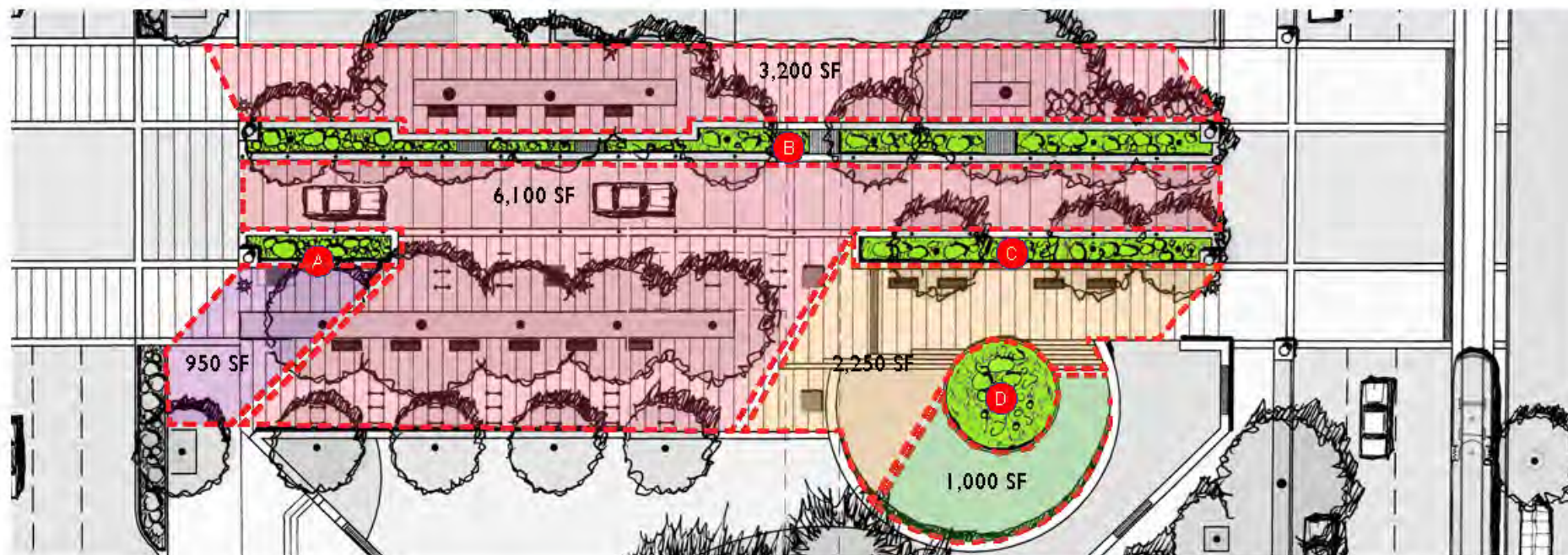


San Pablo Avenue Approach

High level of preliminary investigation

APPENDIX A:

STORMWATER ALLOCATION - SW BROADWAY TO SW 6TH AVENUE



	Contributing Impervious Area (IA)	Stormwater Planter Area	Percentage Landscape to IA*	Additional Capacity**
Catchment Area A	950 SF	140 SF	16%	650 SF
Catchment Area B	9,300 SF	760 SF	8%	0 SF
Catchment Area C	2,250 SF	350 SF	16%	1,800 SF
Catchment Area D	1000 SF	400 SF	40%	3,650 SF

* This percentage uses the BES Simplified Approach of a ratio between impervious area catchment and stormwater facility size. The minimum simplified sizing percentage is 6% for a stormwater planter based on the 2008 Stormwater Management Manual.

** Additional capacity looks at how much additional impervious area can be potentially managed in a 10-year storm event based on using the BES Presumptive Approach Calculator (PA-C).

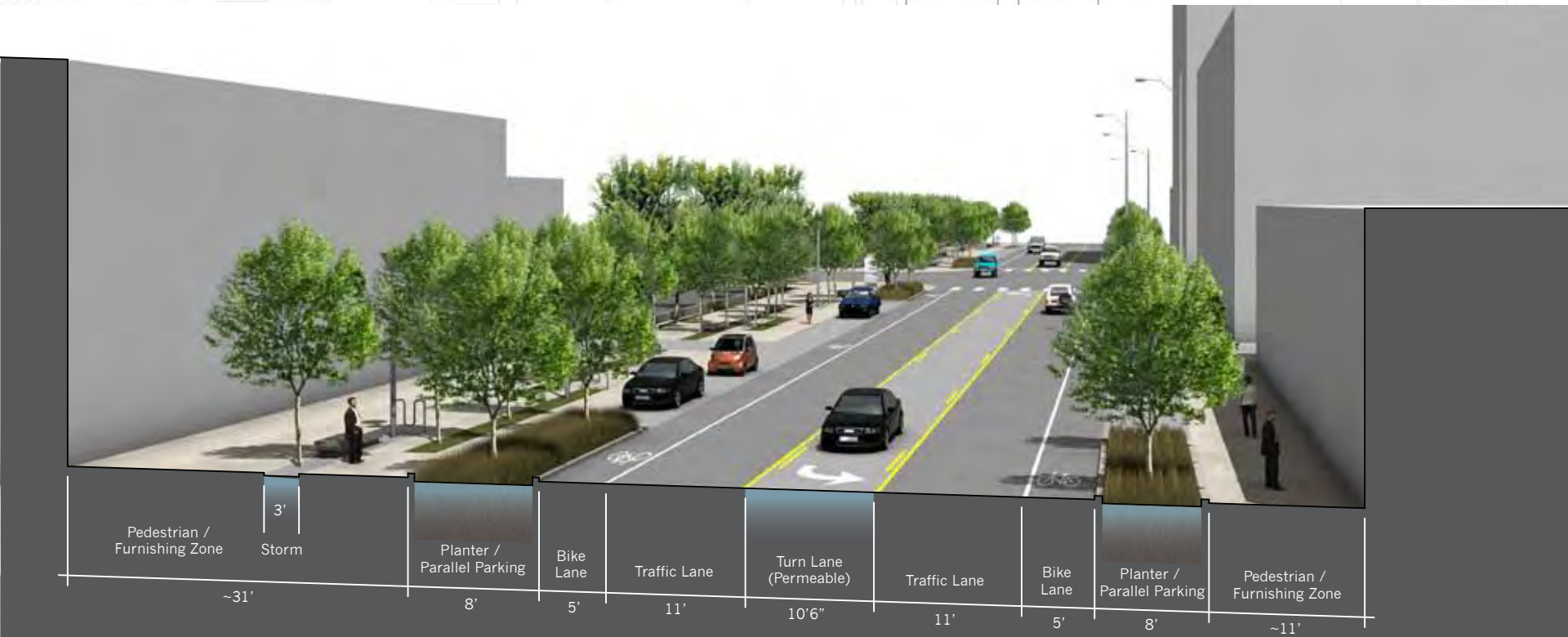
San Pablo Avenue Approach

Utilize the "Toobox" to Stormwater Management



San Pablo Avenue Approach

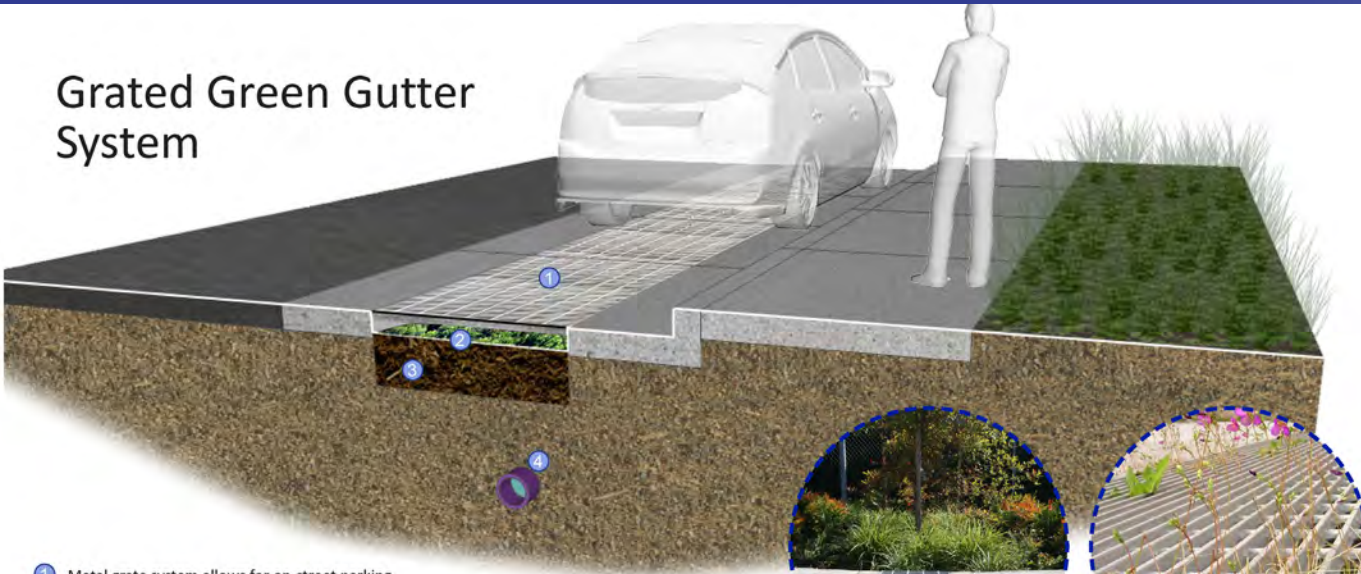
Introduce New Tools Unique to San Pablo Avenue



Green Infrastructure Leadership

Introduce New Tools Unique to San Pablo Avenue

Grated Green Gutter System



- 1 Metal grate system allows for on-street parking.
- 2 The plant material would be relatively low-growing and be required to grow in lower light conditions.
- 3 Stormwater system can be an infiltrative or flow-through condition. Over the existing water lines, 12" of imported soil is shown. In areas without a water line, the standard 18" of imported topsoil can be accommodated.
- 4 Existing water lines can be accommodated in the design.



Surface Green Gutter System



- 1 Multiple pedestrian bridges across the green gutter would be needed to provide adequate pedestrian flow across the street.
- 2 The green gutter system is a functional landscape area used to clean and absorb stormwater runoff. Providing a high-density spacing of trees, shrubs, and groundcovers maximizes the ability for plant roots to clean pollutants and absorb runoff.
- 3 There is a maximum grade change of 6-inches from the walking surface to the finish grade of the green gutter. This simple design approach eliminates the typical need for a perimeter curb around the landscape and still allows for adequate pedestrian safety.

San Pablo Avenue Approach

Respect Future Development and Planning Potential

Richmond Livable Corridors Project
(Source: Opticos Design, Inc.)



San Pablo Avenue Approach

Develop a Maintenance Approach Early the Process



Logus Road Green Street

Residents' Landscape Maintenance Plan ~ 2009

What is the Logus Road Green Street?

The Logus Road Green Street utilizes several strategies to capture, slow, filter, and infiltrate stormwater runoff from Logus Road and driveways. This green street retrofit project demonstrates how streets can be designed (or re-designed) to provide environmental benefits through on-site stormwater management. The project utilizes a series of stormwater planters, stormwater curb extensions, and pervious concrete sidewalks to achieve full on-site stormwater management on the southern half of Logus Road from Stanley Avenue to SE 49th Street. Approximately 20,000 square feet of runoff is directed into a series of stormwater facilities and is managed on-site using a landscaped approach.

The stormwater planters (aka, rain gardens) were constructed by the City of Milwaukee for a number of purposes. As with a traditional sidewalk planter strip, the new stormwater planters provide a horizontal separation between the street and the sidewalk zone and provide visual interest to the street. In addition, the stormwater planters allow for storage, treatment, and infiltration of street runoff.

The City of Milwaukee has planned for a 5-year establishment period for the landscape maintenance of stormwater facilities along Logus Road. The private contractor that installed the plantings will visit Logus Road regularly to perform weeding, plant trimming, plant replacement, mulching, as well as provide supplemental summer irrigation. The City of Milwaukee will be responsible for removing sediment accumulation with the stormwater facilities on an as needed basis. The residents along Logus Road are also asked to perform minor on-going maintenance responsibilities which is further described in this maintenance plan.

The following outlines the responsibilities of residents during the 5-year establishment period. After the 5-year establishment period, some of the plant maintenance responsibilities will be turned over to Logus Road residents. The City will continue to remove sediment from the rain gardens, as necessary, but the City does not anticipate extending the plant maintenance contract. However, after allowing the new plantings a 5-year establishment period, most of the plants will have reached maturity and the level of maintenance, trimming, and weeding should be significantly reduced.

Taking Care of the Green Street

The Planting Design

The plants selected for the Logus Road rain gardens are predominately evergreen and grow under three feet in height. Evergreen plants tend to grow slower and have greater drought tolerance; both characteristics will help reduce maintenance efforts. In addition, these plants help provide an evergreen "structure" to the perimeter of each stormwater facility and the help provide a visual separation between the street and the sidewalk zone. Rushes and grass-like were also planted within because their stiff structure will help slow water flow and their root zones are excellent for water absorption. The plants used in the Logus Road rain gardens are shown on the side bar on the opposite page.

Plant trimming

It is not necessary for residents to trim plants. If there is any trimming needed, the landscape contractor will be responsible for this effort.

The Rain Garden Plants



Nandina domestica
'Moon Bay'



Liriope muscari



Euonymus japonica
'Microphylla'



Polystichum maritimum



Juncus patens
'Elks Blue'



Mahonia repens

Weeding

For the initial 5-year establishment period of the rain gardens, the most significant landscape maintenance effort will be weeding. Weed control is included in the 5-year establishment contract, however, additional weeding by residents is encouraged and will improve the appearance of the rain gardens and limit the spread of nuisance plants. The plant material placed within the rain gardens is of a reasonably high enough density, but weeds will, of course, undoubtedly grow. Because the rain gardens are used to cleanse water runoff of pollutants and toxics, **under no circumstances should chemical pesticides be used to control weeds.** It is desirable that the rain gardens be hand-weeded as much as possible to keep them thriving. Once the desired plants have matured, this weeding frequency can most likely be reduced.

Mulching and Fertilizing

It is not necessary for residents to mulch the rain gardens. The initial 3" application of compost during construction should maintain plant needs for several years. No chemical or natural fertilizers are necessary.

Supplemental Irrigation

The contractor is required to provide supplemental watering during the summer months of the establishment period. It is anticipated that the landscape areas will not need additional summer water after the establishment period except in the most extreme heat conditions.

Removal of Dead Vegetation and Replacement Material

If there are instances of dead plants or plants displaying lack of vigor, please contact the City of Milwaukee so they can determine the cause and find a suitable replacement. If residents wish to add plant material to the stormwater facilities, they may do so as long as they are a nuisance plant variety, are relatively drought and wet tolerant, and do not grow over 3' tall (to maintain site visibility). Many varieties of sedges, rushes, shrubs, and perennials conform to these requirements. Ask your local plant nursery for specific recommendations.

Pervious Sidewalks

The City will periodically vacuum and/or flush the pervious concrete sidewalks, as necessary, to ensure that rainwater continues to pass through the sidewalk. Residents are encouraged to sweep or clear their sections of sidewalk, particularly during the fall season when leaves accumulate, to prevent rainwater runoff from the sidewalks.

Maintenance Responsibilities

The following charts illustrate the basic green street maintenance responsibilities residents are asked to fulfill during the 5-year establishment period.

TASKS	Calendar Year											
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Weeding (recommended)												
Plant Addition (if desired)												
Sweeping (recommended)												
Incidental Trash Removal												

Contact Information

For additional information about this landscape maintenance plan or other questions about the Logus Road Green Street, please contact Alex Campbell, City of Milwaukee, (503) 786-7608 or email at CampbellA@ci.milwaukee.or.us

San Pablo Avenue Approach

Create Projects That Have High Demonstration Value



San Pablo Avenue Approach

Make it Beautiful!



San Pablo Avenue Approach

Make it Beautiful!



San Pablo Avenue Approach

Make it Beautiful!



San Pablo Avenue Approach

Make it Beautiful!



San Pablo Avenue Approach

Make it Beautiful!



San Pablo Avenue Approach

Make it Pedestrian Friendly



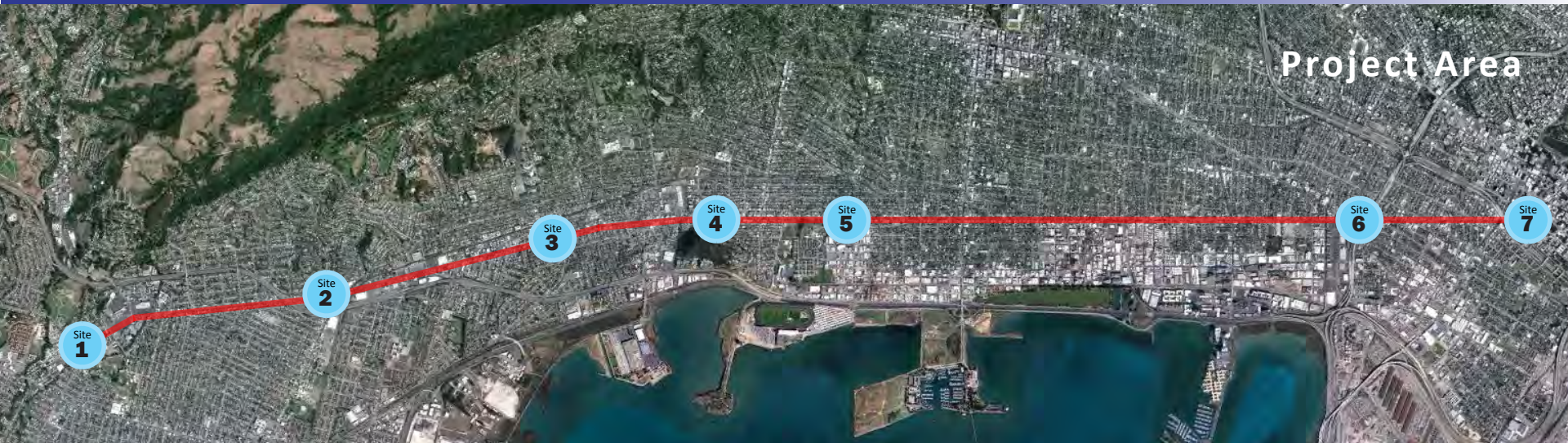
San Pablo Avenue Approach

Make it Pedestrian Friendly



San Pablo Avenue Approach

Capitalize on Multiple Opportunities



<i>Green Street Opportunity</i>	<i>San Pablo</i>	<i>Richmond</i>	<i>El Cerrito</i>	<i>Albany</i>	<i>Berkeley</i>	<i>Emeryville</i>	<i>Oakland</i>
<i>Shared street and parking lot facilities</i>	👍	👍	👍	👍	👍	👍	👍
<i>Stormwater canopies at transit stops</i>	👍	👍	👍	👍	👍		
<i>Manage parking lot and/or building runoff</i>	👍	👍	👍	👍	👍	👍	👍
<i>Create a better pedestrian environment</i>	👍	👍	👍	👍	👍	👍	👍
<i>Rearrange parking to yield landscape space</i>	👍	👍	👍	👍	👍	👍	👍
<i>Project site is near local creeks</i>		👍			👍		
<i>Project site is near potential development</i>	👍	👍			👍		👍

San Pablo Avenue Opportunities

Shared stormwater facilities with parking lots and San Pablo Avenue



El Cerrito Alternative Site

San Pablo Avenue Opportunities

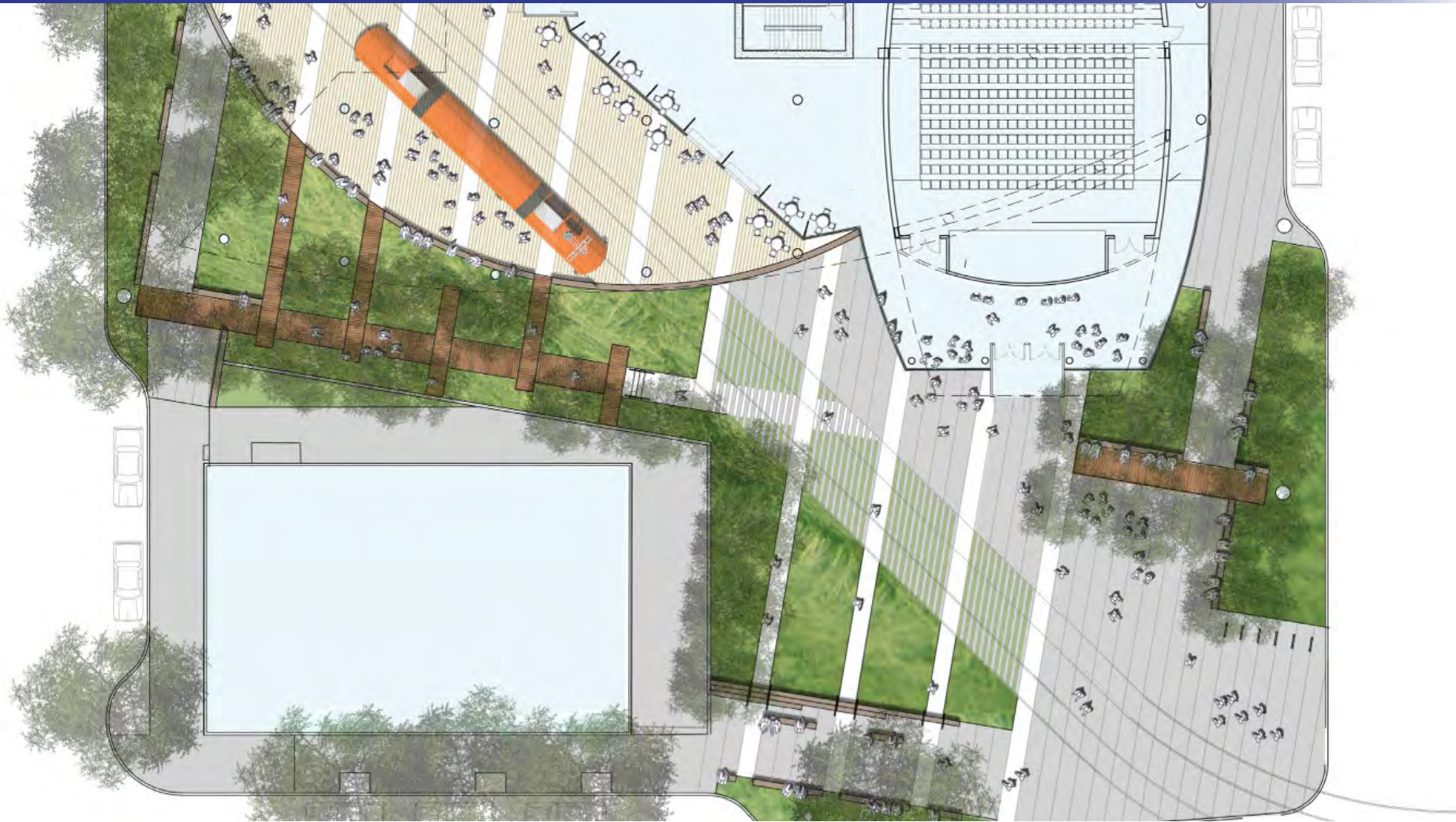
Shared stormwater facilities with parking lots and San Pablo Avenue



Donnelly Avenue
Burlingame, California

San Pablo Avenue Opportunities

Shared stormwater facilities with parking lots and San Pablo Avenue



Oregon Sustainability Center
Portland, Oregon

San Pablo Avenue Opportunities

Capture and manage stormwater runoff with enhanced transit stops

Richmond Site



San Pablo Avenue Opportunities

Capture and manage stormwater runoff with enhanced transit stops



Sandy Boulevard
Portland, Oregon

San Pablo Avenue Opportunities

Capture and manage stormwater runoff with enhanced transit stops



Tanner Springs Park
Portland, Oregon
(Not designed by Nevue Ngan)

San Pablo Avenue Opportunities

Manage rooftop and parking lot stormwater along San Pablo Avenue



Oakland Site

San Pablo Avenue Opportunities

Manage rooftop and parking lot stormwater along San Pablo Avenue



SW Montgomery Green Street
Portland, Oregon

San Pablo Avenue Opportunities

Manage rooftop and parking lot stormwater along San Pablo Avenue



Brisbane City Hall Rain Garden
Brisbane, California

San Pablo Avenue Opportunities

Create a better and "greener" pedestrian environment

San Pablo Site



San Pablo Avenue Opportunities

Create a better and "greener" pedestrian environment

El Camino Real
(Existing Conditions)



San Pablo Avenue Opportunities

Create a better and "greener" pedestrian environment

El Camino Real
(Proposed Arterial Retrofit)



San Pablo Avenue Opportunities

Rearrange On-Street Parking to Yield Landscape Space



Oakland Site

San Pablo Avenue Opportunities

Rearrange On-Street Parking to Yield Landscape Space



Indianapolis
(Existing Conditions)

San Pablo Avenue Opportunities

Rearrange On-Street Parking to Yield Landscape Space



Indianapolis
(Proposed Retrofit)

San Pablo Avenue Opportunities

Rearrange On-Street Parking to Yield Landscape Space

Covington, Kentucky
(Existing Conditions)



San Pablo Avenue Opportunities

Rearrange On-Street Parking to Yield Landscape Space



Covington, Kentucky
(Proposed Arterial Retrofit)

Questions and Answers



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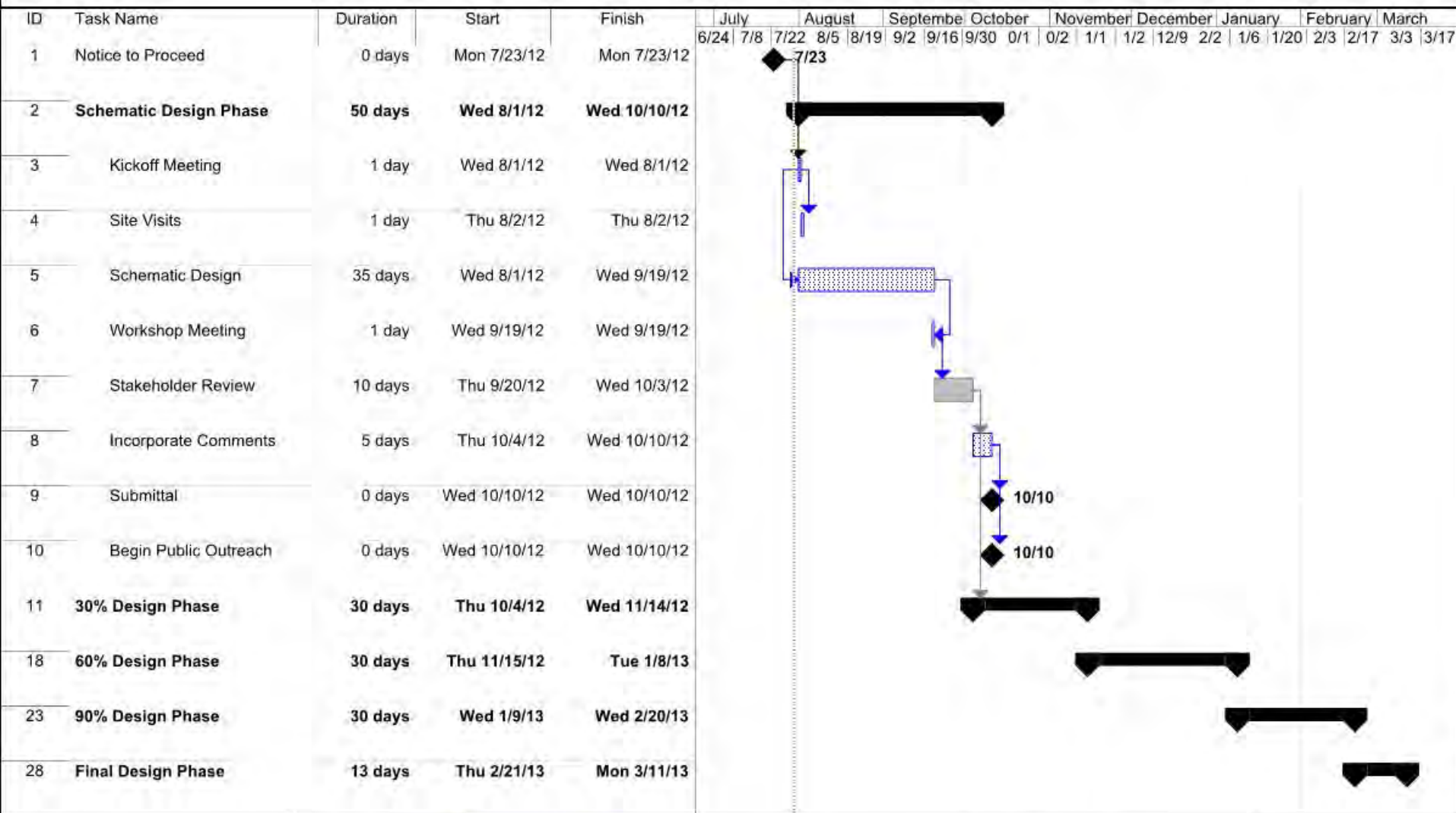
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Preliminary Design Schedule

San Pablo Avenue Green Stormwater Spine

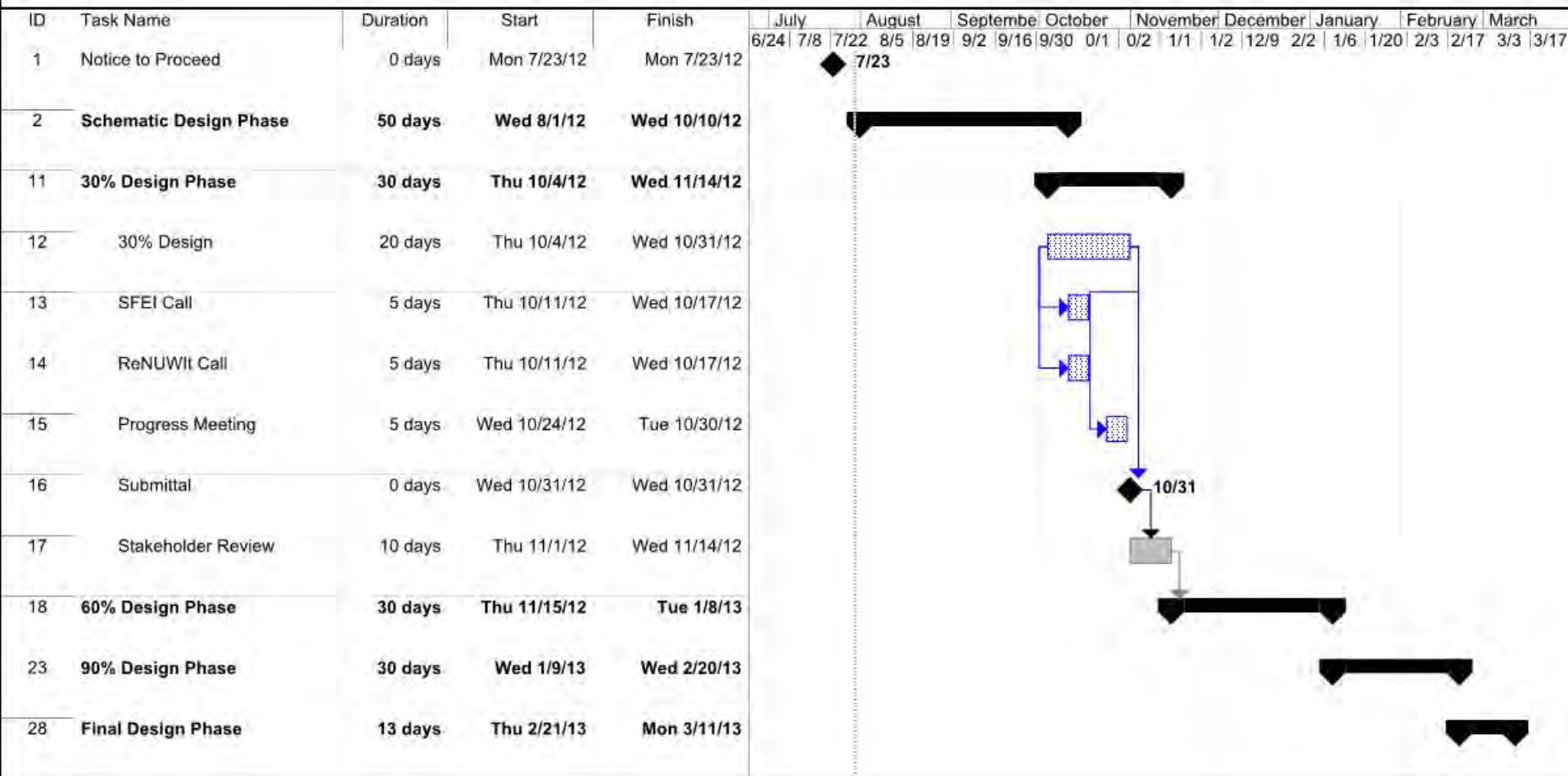


Project: Prelim Design Schedule.mpp
Date: Mon 7/30/12

Task		Milestone		External Tasks	
Split		Summary		External Milestone	
Progress		Project Summary		Deadline	

Preliminary Design Schedule

San Pablo Avenue Green Stormwater Spine

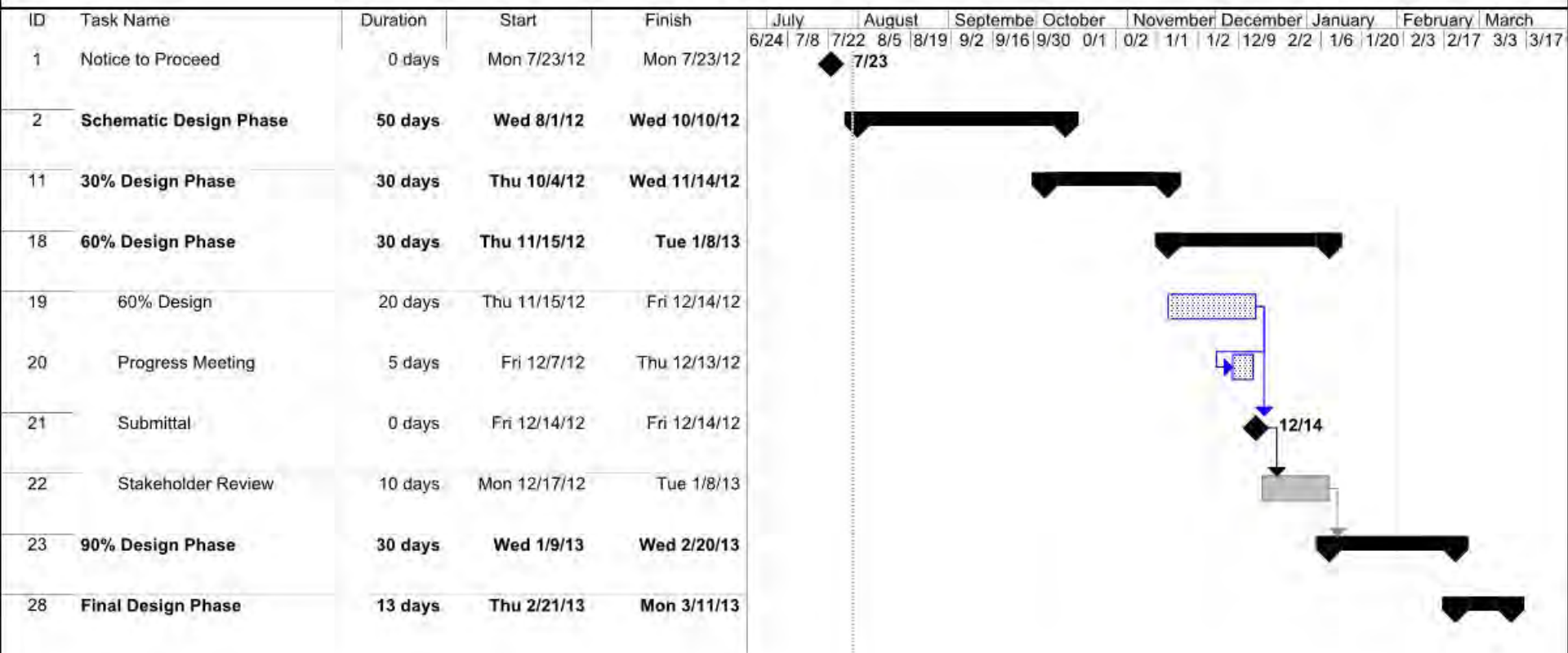


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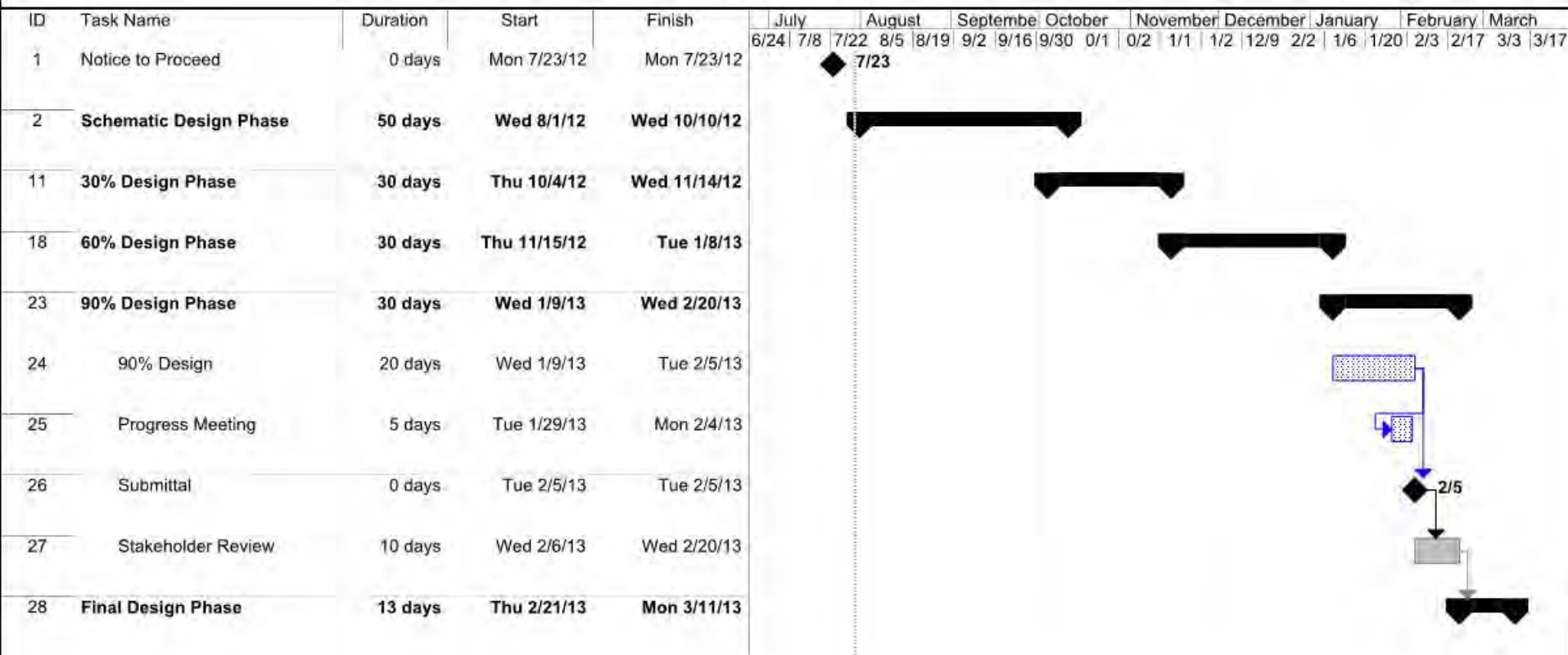


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Preliminary Design Schedule

San Pablo Avenue Green Stormwater Spine

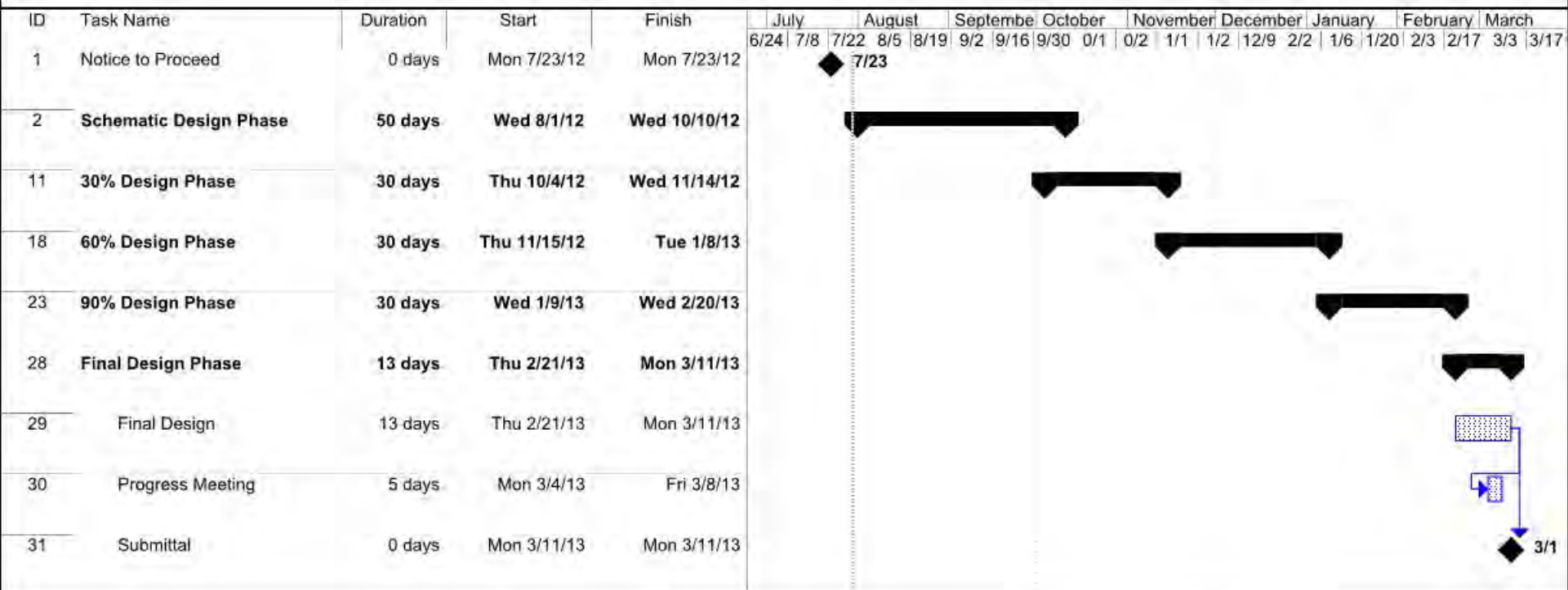


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Preliminary Design Schedule

San Pablo Avenue Green Stormwater Spine



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Split		Summary		External Milestone	
Progress		Project Summary		Deadline	

Site Visits

San Pablo Avenue Green Stormwater Spine

Wednesday 8/1

~~9:30 am – 10:30 am Oakland site visit~~

~~11:00 am – 12:00 pm Emeryville site visit~~

4:00 pm – 5:00 pm (or at close of Kick-off) Albany Site Visit

Thursday 8/2

8:30 am - 9:30 am Berkeley site visit

10:00 am – 11:00 am El Cerrito site visit

11:30 am - 12:30 pm Richmond site visit

1:00 pm – 2:00 pm San Pablo site visit

Data/Information Needed

San Pablo Avenue Green Stormwater Spine

- Record Information
 - Improvement plans
 - Utility plans: Drainage maps, other facilities
 - Studies/Reports: Geotechnical, hydrology, hydraulics
 - Mapping
- Design Standards
 - Ordinance
 - Standard Details
 - Specifications
 - Bay Friendly Landscaping