

An aerial photograph of Hermosa Beach, California, showing the coastline, the ocean, and the city grid. The image is partially obscured by a dark teal overlay on the left side where the text is located.

# Hermosa Beach Multi-Benefit Parking Lot Greening Project (Lot D)

Infrastructure Program

Fiscal Year 2022-2023

South Santa Monica Bay Watershed Committee

City of Hermosa Beach

Presented by Douglas Krauss



# Project Overview

Multi-benefit demonstration project at Parking Lot D to include: a permeable paver system, drywell, native vegetation bioswales, and diverse community benefits

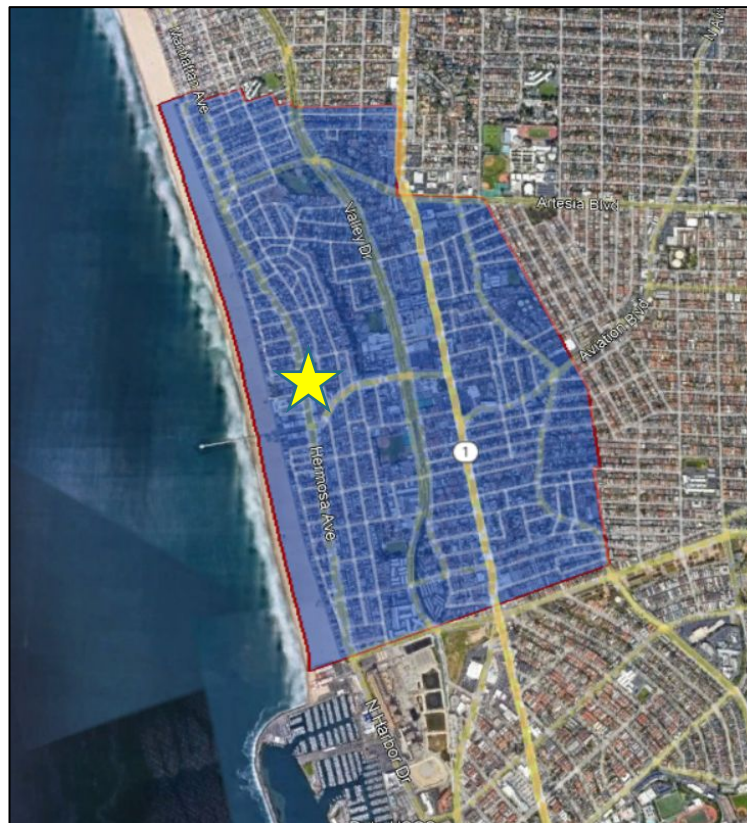
- Primary and Secondary Objectives:
  - Improve water quality within the Santa Monica Bay watershed
  - Address public health concerns and community safety at a heavily-used public parking lot adjacent to Santa Monica Bay
  - Enhance public access to the beach, The Strand (part of the California Coastal Trail), and Downtown Hermosa Beach
  - Increase native and drought tolerant vegetation and decrease the local heat island effect
- Project Status: Design complete, shovel-ready
- Total Funding Requested to Complete Construction: \$423,950.00
  - Year 1 Funding Requested: \$211,975.00
  - Year 2 Funding Requested: \$211,975.00



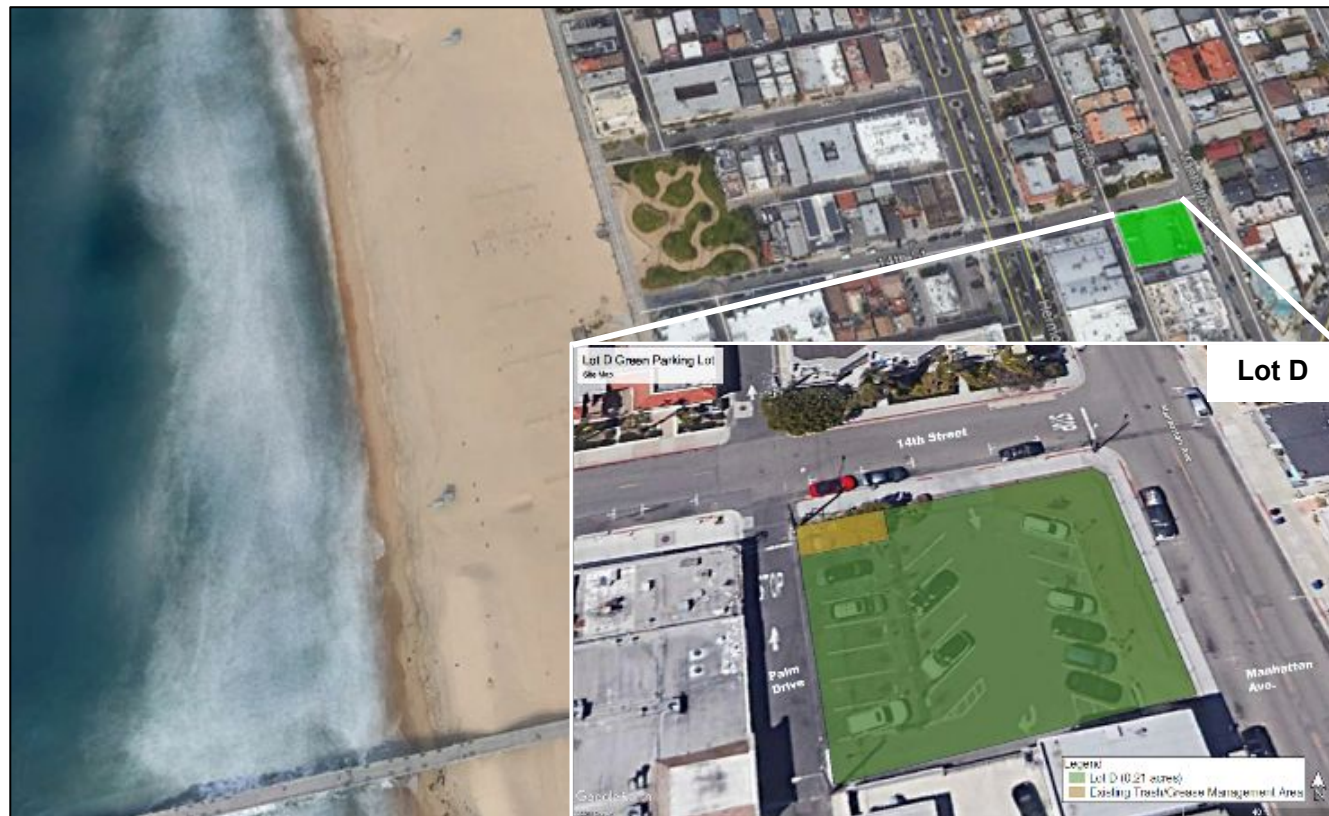




# Project Location



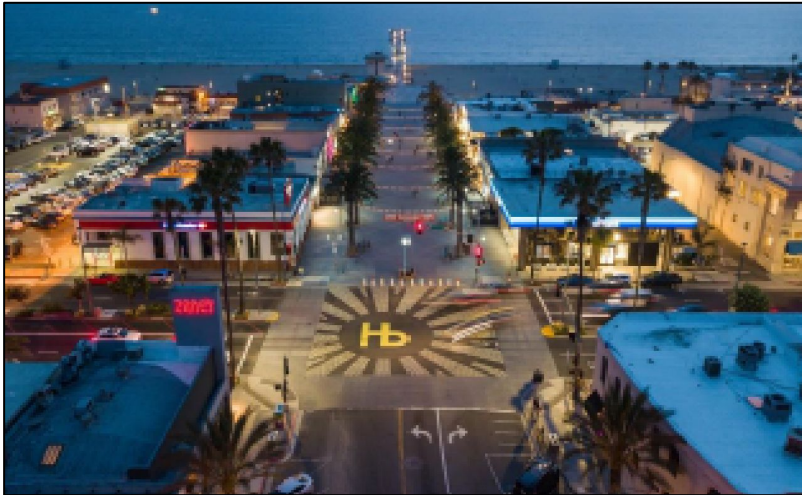
- The project is located in the City of Hermosa Beach, within the Santa Monica Bay Watershed
- City of Hermosa Beach is part of the Beach Cities (BC) Watershed Management Group



- Project site is located about 750 feet from the beach
- The project area has a high soil infiltration rate of 53 to 66 inches per hour
- The project retains wet weather runoff from a critical pollutant source and high-priority land use



# Project Background



Downtown Hermosa Beach



Current Site Conditions

- Parking Lot D is a short-term (2-hr limit) metered public parking lot operated by the City of Hermosa Beach, 1 ½ blocks from the beach.
- Lot D is heavily used by the surrounding community and tourists to access outdoor coastal activities at the beach, Downtown Hermosa Beach, and along the Strand, a section of the California Coastal Trail.
- Lot D is currently paved with impervious asphalt with no planters or areas for stormwater to infiltrate, so rainwater flows off into the ocean carrying high-priority pollutants into the Santa Monica Bay (SMB).
- Project engagement (surveys) show that many visitors come from a surrounding radius of 5-10 miles, with about 500,000 residents living in disadvantaged communities including the City of Lawndale and the City of Hawthorne for whose residents Hermosa Beach is a popular recreation destination.
- Extensive community outreach and engagement was conducted to ensure that Lot D renovation would address the needs of diverse stakeholders.
- Renovation of Parking Lot D will address the needs of the community, stormwater capture, and serve as a demonstration project from which lessons learned through design and construction will be applied in developing design plans for the remaining 20 parking lot sites in the City.

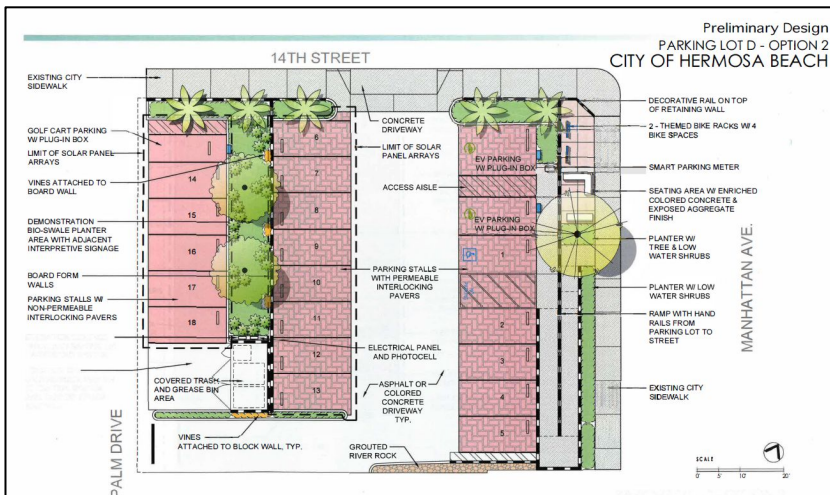




# Project Details



Project rendering



Project design

- City applied for and received \$433,650 for the project from a Coastal Conservancy grant.
- Geotechnical testing indicated that groundwater was not encountered in borings of 16.5 feet below grade; infiltration rates were observed to be 53 to 66 inches per hour.
- Hydrological analyses and a utility review have been conducted.
- A passive, low-impact development design was prioritized – including a permeable paver system, drywell, and a native vegetation bioswale without mechanical stormwater treatment components.
- The design harmoniously integrates the parking lot and native landscape and maximizes on the site's high treatment capacity (infiltration rate). The project also includes a full trash capture system installed in an adjacent catch basin.
- The diverse array of community amenities include ADA upgrades, increased parking spaces, solar panels, two charging stations each for full size electric vehicles and neighborhood electric vehicles, a bike corral, CPTED safety lighting levels & distribution, pedestrian seating, and 184 individual drought tolerant and native plants.



# Cost & Schedule

Phase Costs			
Phase	Description	Cost	Completion Date
Planning	Project planning	\$ 20,000.00	06/2020
Design	Project design, project management	\$ 140,000.00	06/2021
Construction	Project construction and project management	\$ 880,600.00	10/2023
Total Funding:		\$ 1,040,600.00	

Annual Cost Breakdown	
Annual Maintenance Cost:	\$ 12,000.00
Annual Operation Cost:	\$ 0.00
Annual Monitoring Cost:	\$ 50,000.00
Project Life Span:	20 years



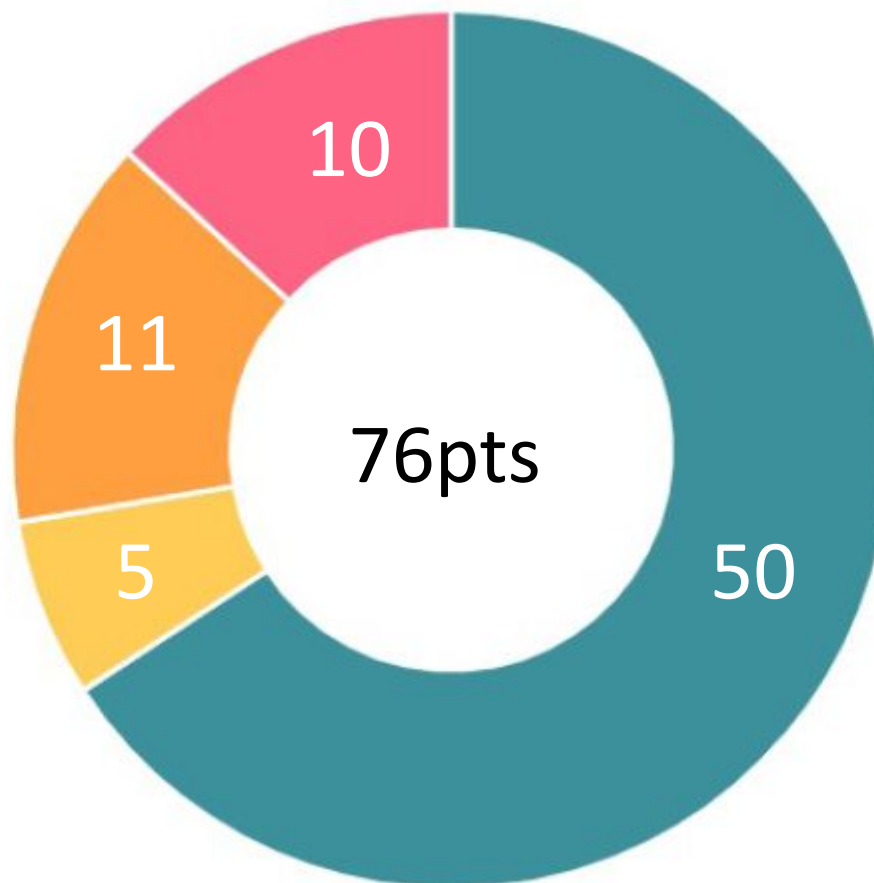


# Funding Request

Funding Requested by Year & Phase			
Year	SCW Funding Requested	Phase	Efforts during Phase and Year
Year 1	\$ 211,975.00	Construction	Construction Year 1
Total Year 1	\$ 211,975.00		
Year 2	\$ 211,975.00	Construction	Construction Year 2
Total Year 2	\$ 211,975.00		
Total Funding:	\$ 423,950.00		



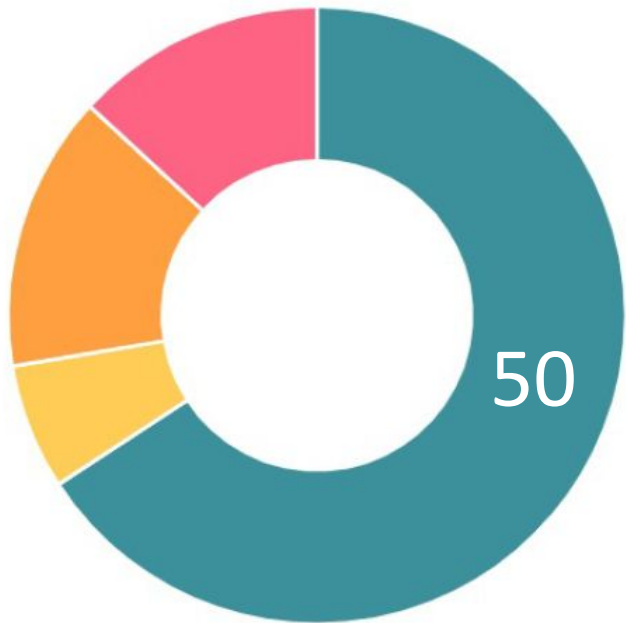
# Scoring Committee Score







# Water Quality Benefits



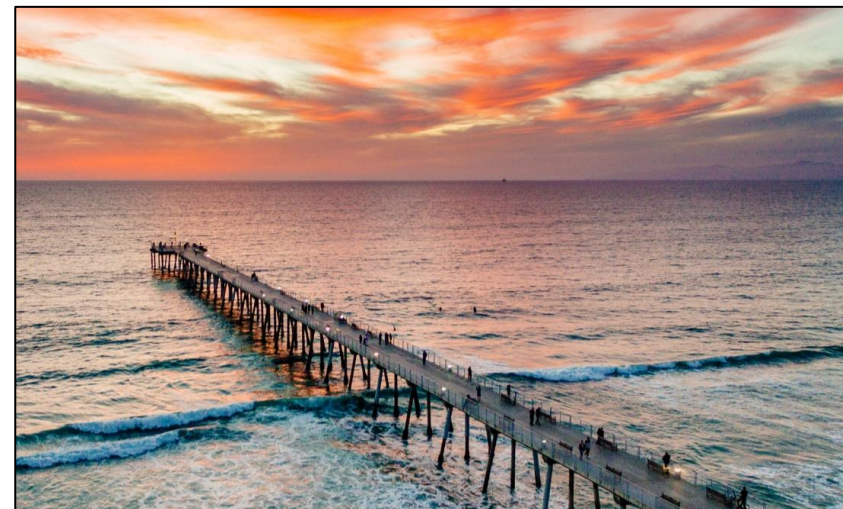
- Primary stormwater management components: runoff/pollutant capture, infiltration, and filtration.
- Geotechnical study observed a high infiltration rate of 53 to 66 inches per hour.
- The proposed permeable paver system, drywell, and native vegetation bioswales have a SCW module-generated 24-hour capacity of 10.72 acre-feet. The project also includes a full trash capture system installed in an adjacent catch basin.
- The project will capture 100% of the 85<sup>th</sup> percentile 24-hour storm event.
- The project will address bacteria (SMB Beaches Bacteria TMDL) as the primary pollutant and toxicity (SMB DDT and PCB TMDLs) as the secondary pollutant.



Bioswale



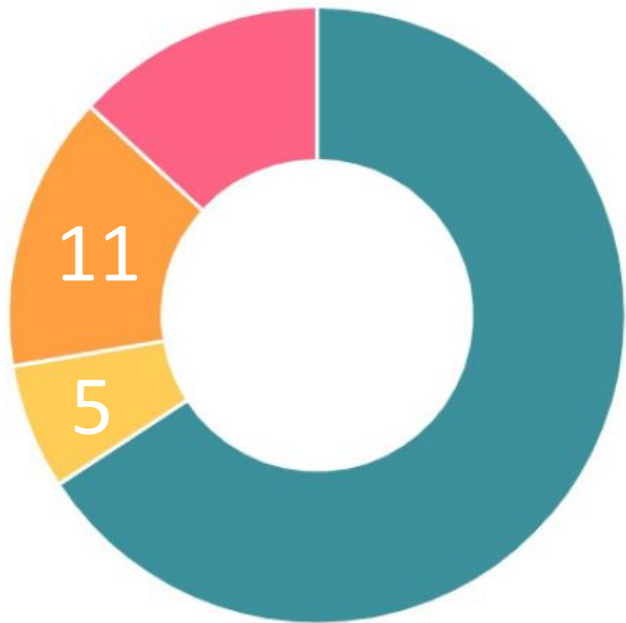
Permeable Pavers



Hermosa Beach Pier



# Community Investment Benefits and Nature-Based Solutions



*Anemopsis californica*  
Yerba Mansa



*Limonium californicum*  
California Sea Lavendar



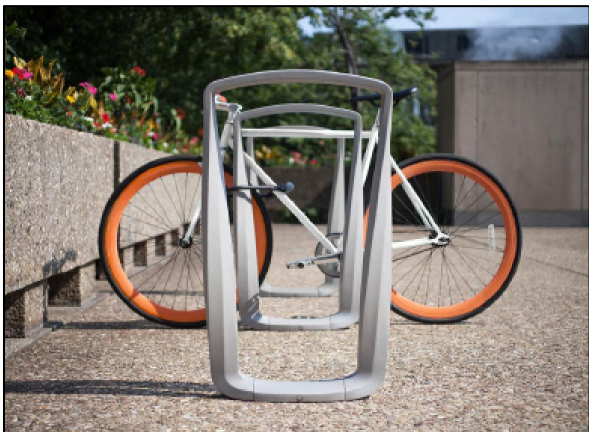
*Melaleuca leucadendra*  
Cajeput Tree

## Community Investment Benefits:

- Flood management: project will ameliorate localized flooding and stress to the storm drain system, especially the Pier Avenue storm drain.
- Enhance public access to waterways: project will improve accessibility to the beach (increased parking spaces, EV charging stations, bike corrals, pedestrian seating), and enhance the safety of Lot D (ADA upgrades, solar panels, safety lighting, native landscaping erosion control).
- Enhance recreational opportunities: project will improve visitor experience to the beach, trails, and Downtown Hermosa Beach. Parking lot will provide space for more sustainable modes of transportation, increased green space, and pedestrian friendly areas.
- Increased shade and reduced local heat-island effect: Landscape plans include a total of 6 trees and a host of drought-tolerant native plants, totaling more than 184 individual plants. Project will also explore the opportunity to employ disadvantaged youth with LA Conservation Corps to propagate and install the native and drought tolerant plants.

## Nature-Based Solutions:

- There are two key natural processes being implemented: infiltration through native soils and vegetation and utilization of native landscaping to create local habitat.



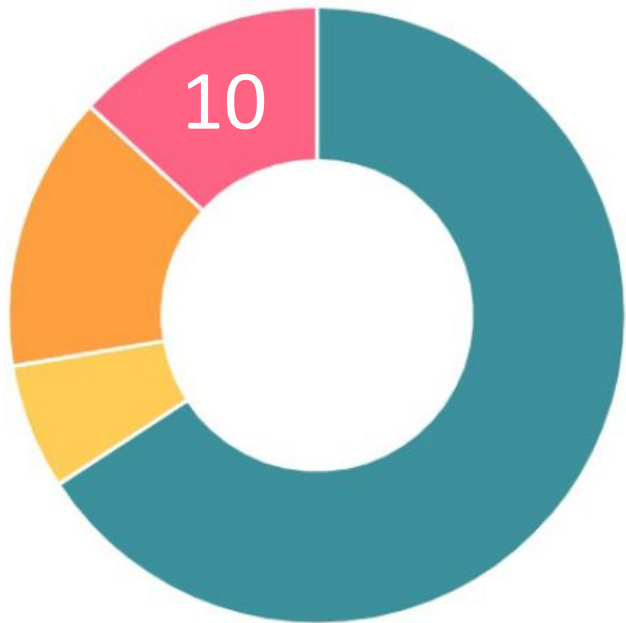
Bike Corral

Plant Palette





# Leveraging Funds and Community-Based Outreach



## Organizations that provided letters of support or grant funds:

- Beach Cities Health District
- Mayor, City of Hermosa Beach
- South Bay Surfrider Foundation
- State Coastal Conservancy

- Leveraging Funds:
  - City intends to commit a total of **\$616,650 in matching funds** (\$433,650 from a Coastal Conservancy grant and \$183,000 from the City General Fund).
- Community-Based Outreach:
  - City organized a community workshop to present the parking lot project vision and constraints, and garner community input and involvement. City also held a community education and outreach event to educate residents, and businesses regarding the multiple benefits of the project and to receive feedback.
  - Community outreach tools included on-site meetings, mailers, a dedicated project page on the City's website, information booths at City events, notices and articles in local newspapers, updates at City Council meetings and through social media platforms.
- Community Stakeholders Involved:
  - *Access Hermosa* addressed ADA accessibility issues through the City, and the South Bay Bicycle Coalition provided input on preferred bicycle options.
  - The Surfrider Foundation provided input on the stormwater elements.
  - The Police Department and Downtown Subcommittee provided input on lighting and safety.
  - The Chamber of Commerce assisted in informing businesses regarding the project.



**Questions?**





# Fulton Playfield Multi-Benefit Infiltration Project

Infrastructure Program

Fiscal Year 2022-2023

South Santa Monica Bay Watershed

Geraldine Trivedi, City of Redondo Beach

Scott Struck, Curtis Fang, Geosyntec Consultants



# Project Overview

A Beach Cities EWMP Priority Project that supports MS4 compliance and creates additional community greening and recreational opportunities.

<b>Primary Objective</b>	Provide water quality benefits through capture and infiltration
<b>Secondary Objectives</b>	Infiltrate runoff into deep ground to contribute to sea water intrusion barrier Enhance recreational opportunities
<b>Phases Requested for Funding</b>	Planning, Design, Construction, O&M
<b>Total Funding Requested</b>	\$4,292,138







# Project Location & Background

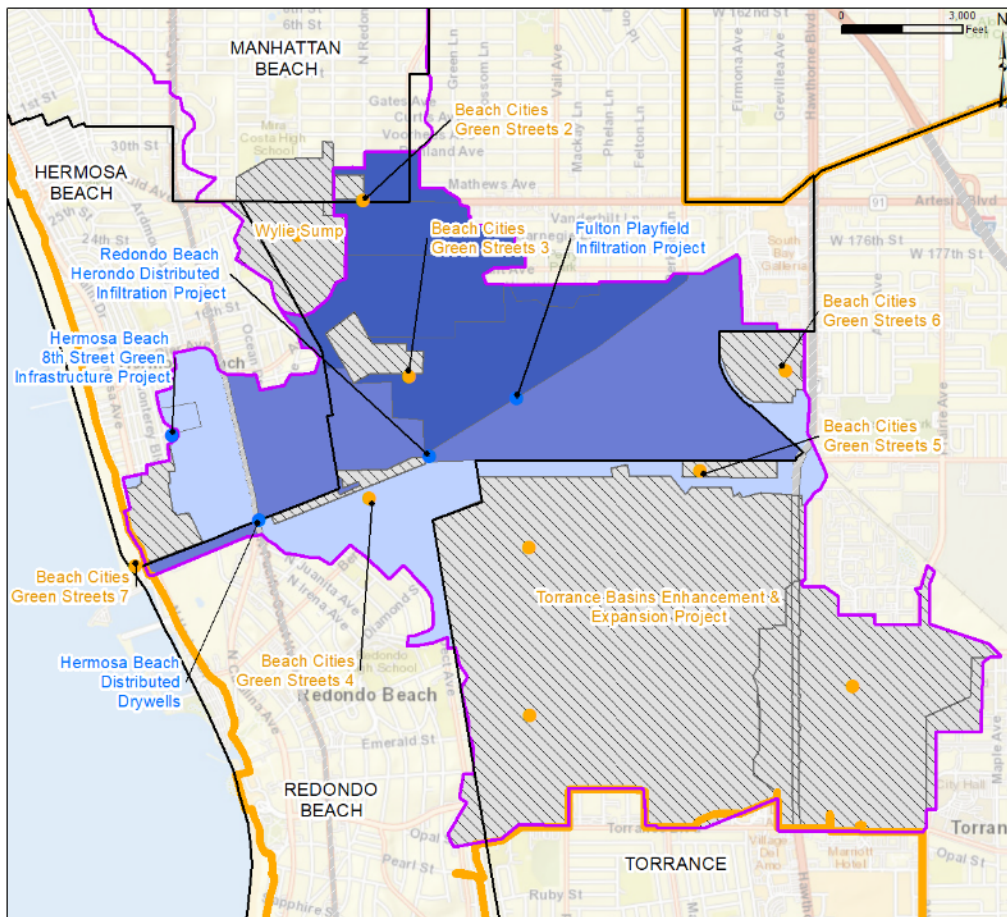


- **Project Location:**  
Fulton Playfield, City of Redondo Beach  
Beach Cities Watershed Management Group
- **Watershed:**  
South Santa Monica Bay





# Project Location & Background

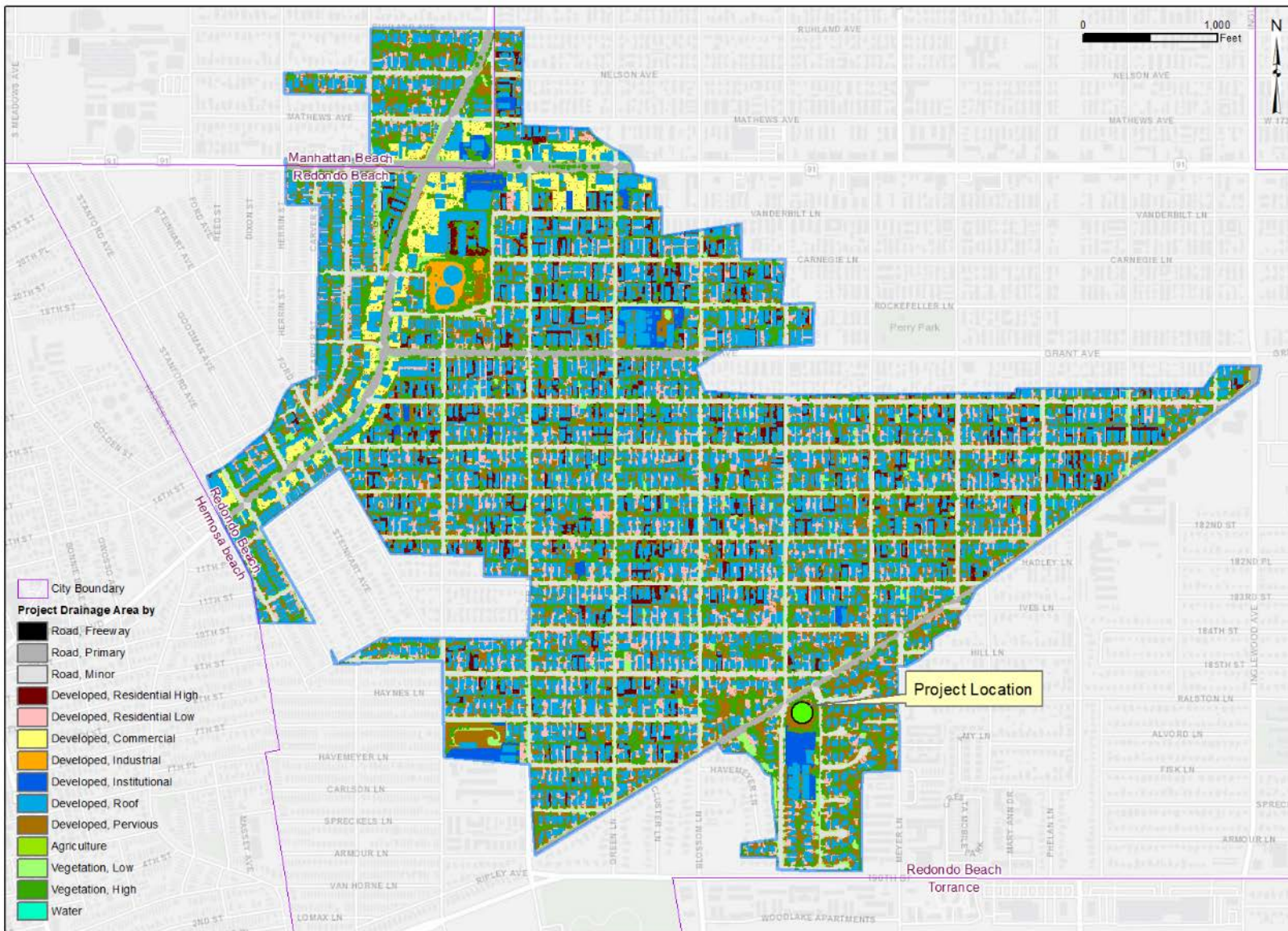


- Utilizes **existing** LACFCD 6.6 acre-ft flood control basin at Fulton Playfield – **Highly cost effective** (approximate \$10M construction cost saved)
- Divert and capture stormwater upstream of the deep Herondo Drain, thereby implementing an economically feasible project for the Watershed
- Developed in coordination with the Beach Cities WMG, LA County Flood Control District, and Valor Christian Academy
- A priority regional project developed for the Beach Cities EWMP – Critical to meet the SMBBB TMDL at SMB-6-1.





# Project Location & Background

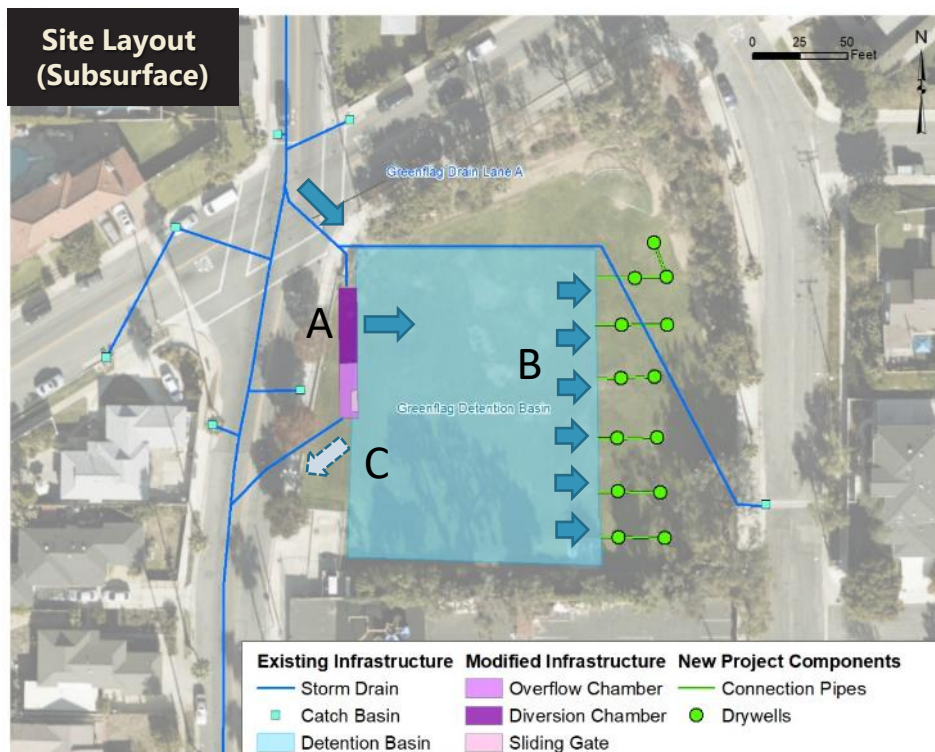


## • Capture Area by Municipality

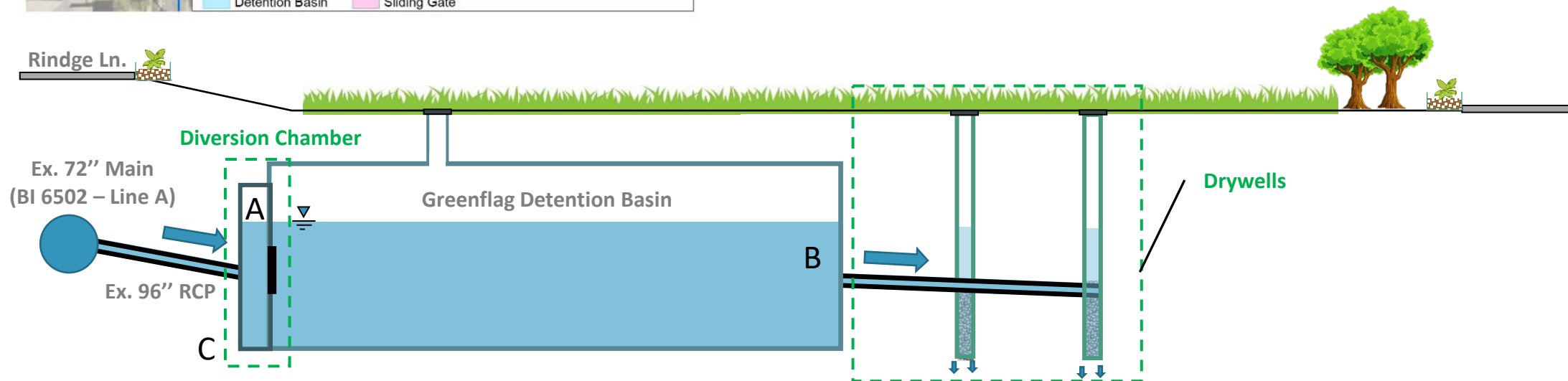
Redondo Beach (ac)	439.4
Manhattan Beach (ac)	25.1



# Project Details



- A. Diversion Chamber - existing diversion chamber will be modified to direct stormwater flow into the existing Greenflag Detention Basin.
- B. Drywells - captured stormwater is routed to approximately 13 drywells for infiltration.
- C. Bypass - during extreme storm events, excess stormwater will bypass the basin and continue downstream via the existing storm drain.



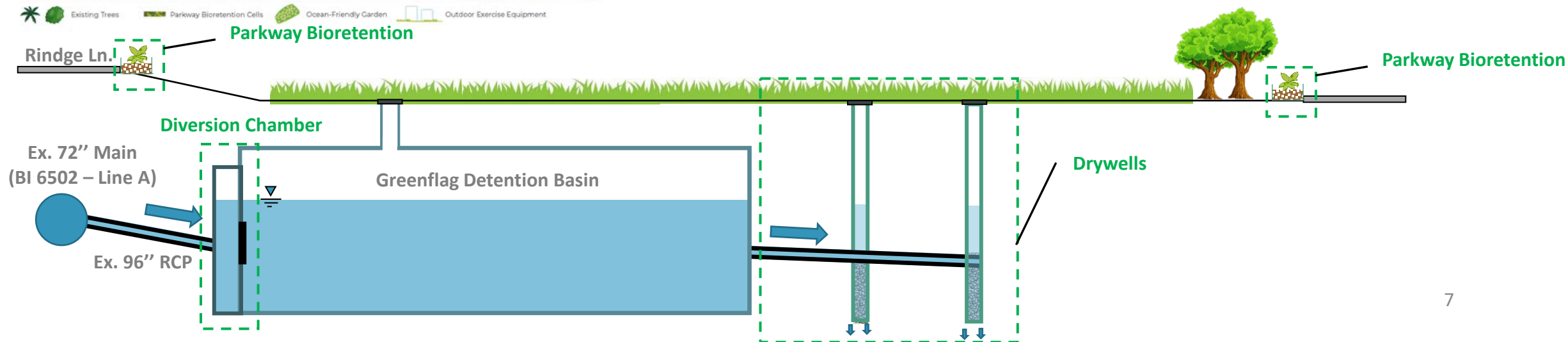




# Project Details (Cont.)



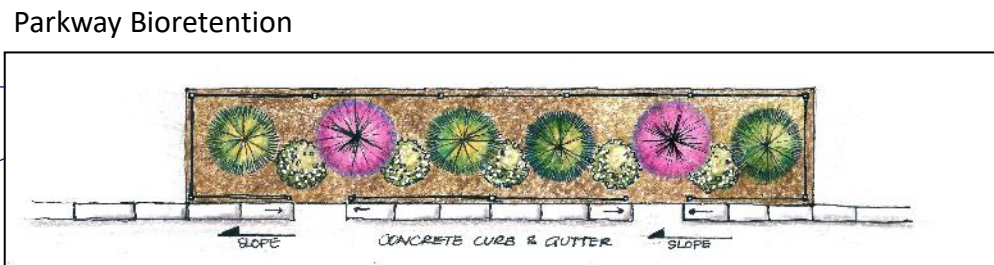
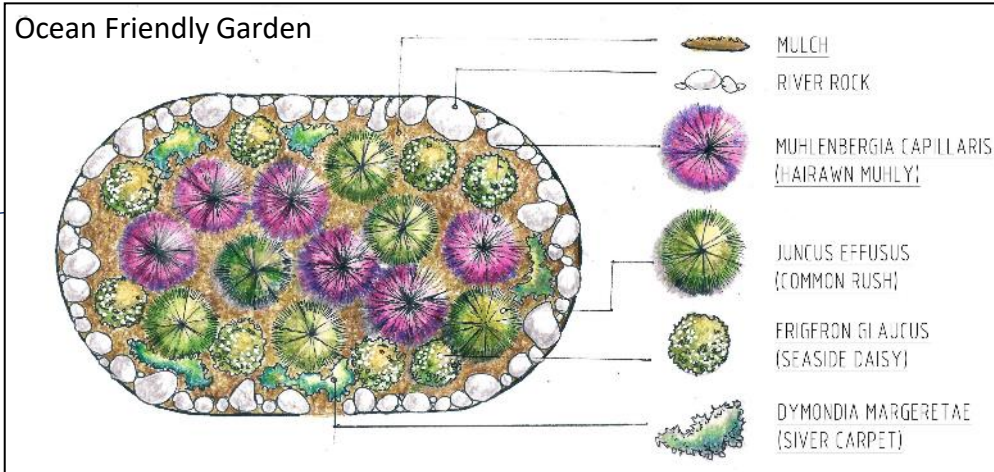
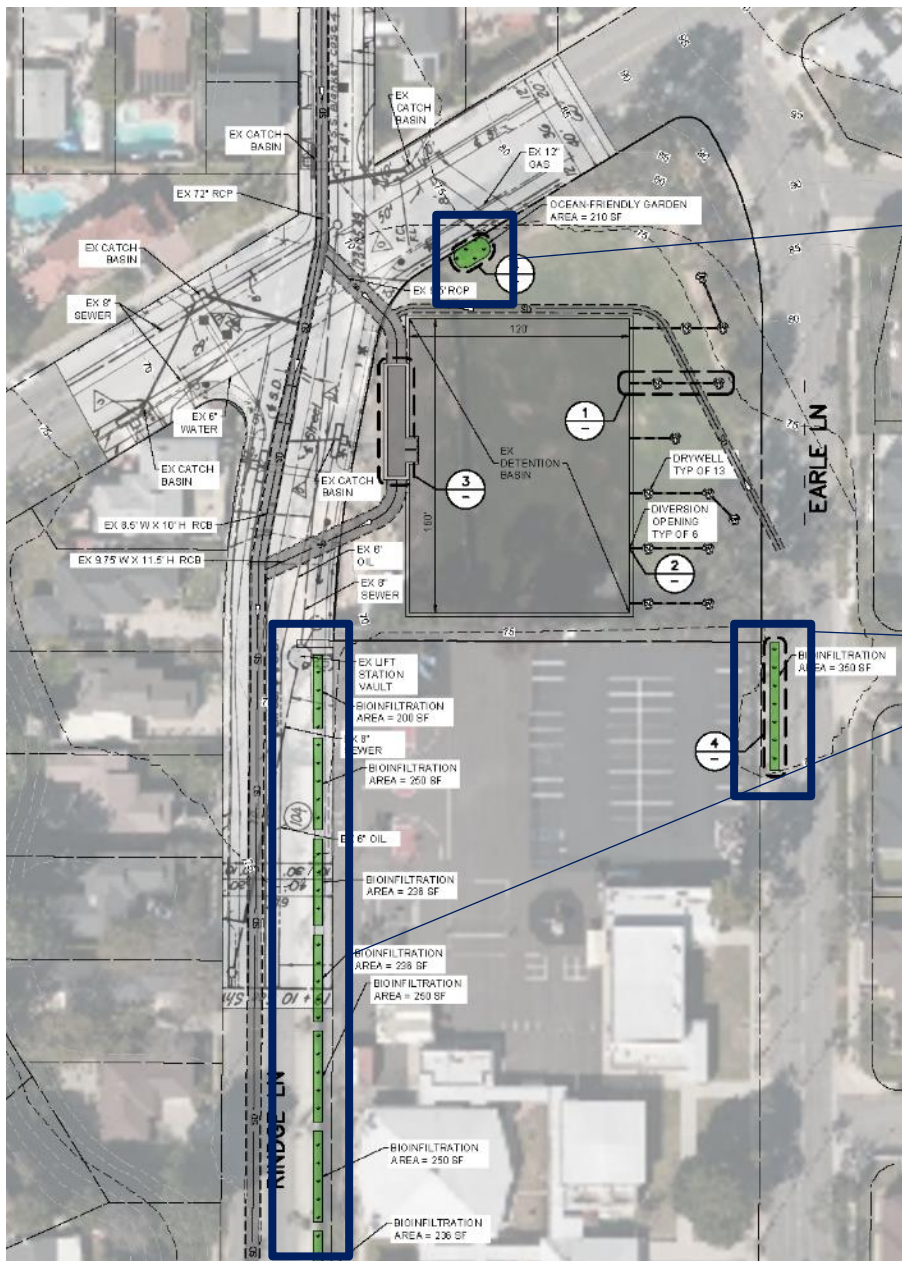
Existing Trees   Parkway Bioretention Cells   Ocean-Friendly Garden   Outdoor Exercise Equipment



- D. Additional Greening - parkway bioretention and ocean friendly gardens will intercept and treat additional surface runoff.
- E. Recreational Enhancements - Redondo Beach will install recreational equipment such as outdoor exercise and playground equipment based on community input.



# Project Details (Cont.)



Approximately **50 rain garden appropriate plants** suitable for LA Climate Zone 3 will be planted at the parkway bioretention cells and ocean friendly garden.

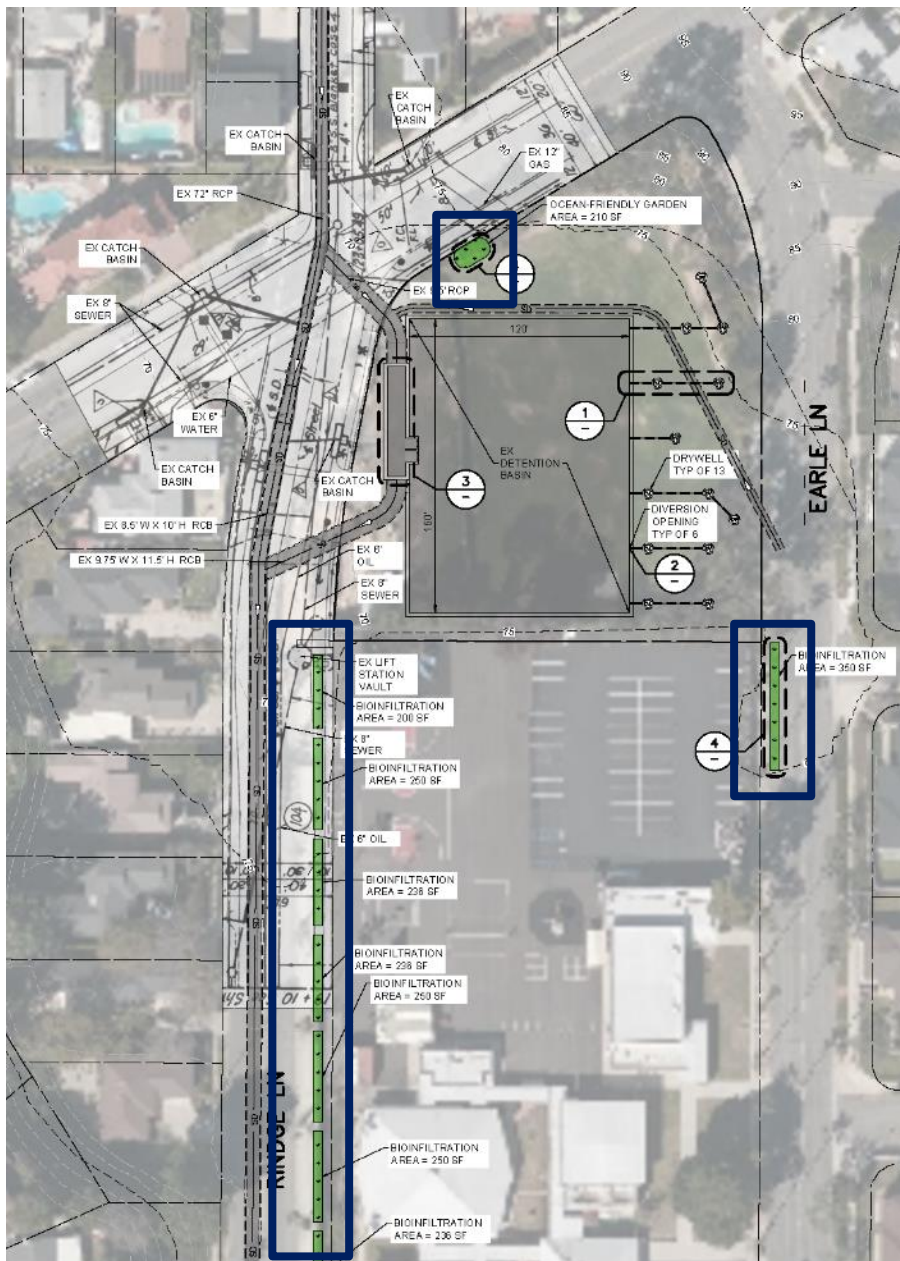
Educational plaque and information board will also be installed for outreach opportunities.

Hairwan Muhly	Common Rush	Seaside Daisy	Silver Carpet





# Project Details (Cont.)



Parkway bioretention cells are proposed to capture and treat surface stormwater runoff along the public right-of-way. A total of **1,800 sq-ft** of impervious surface will be removed and replaced with vegetated cover.



# Key Benefit Summary



<b>Water Quality</b>	13+ ac-ft 24-hour management capacity
	75% wet weather bacteria load removal
	100% trash capture removal
	Updated Beach Cities EWMP Project

<b>Auxiliary Water Supply</b>	80 Acre-Feet/ Year Captured and infiltrated into deep ground to contribute to seawater intrusion mitigation	 <p>injection well pressure gradient forms barrier</p>
	Figure credit: USGS	

<b>Community Investment</b>	 <p>Existing Proposed</p>	<ul style="list-style-type: none"> <li>✓ Flood Management</li> <li>✓ Park Enhancement</li> <li>✓ Recreational and Education Opportunities</li> <li>✓ <i>Greening of School</i></li> <li>✓ Heat Island Effect Reduction</li> <li>✓ Vegetation Increase</li> </ul>
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<b>Nature-based Solutions</b>	 <p>✓ Mimic natural process</p>	 <p>✓ Imper. surface removal</p>	 <p>✓ Native vegetation</p>
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# Cost & Schedule



Phase	Description	Cost Estimate	Completion Date
Planning	Planning includes early concept design, site investigations, and CEQA and other environmental impact studies and permitting	\$93,000	12/2022
Design	Design includes pre-project monitoring, site investigations, formal project design, intermediate and final project completion audits.	\$369,000	12/2023
Construction & Monitoring	Construction cost includes the cost of labor, equipment, material, plus overhead and contingencies. In addition, it includes the present value of 2-years post-construction monitoring.	\$3,504,000	12/2025
<b>TOTAL</b>		<b>\$3,966,000</b>	
Annual Cost Item	Description	Cost (\$/Year)	
Annual Inspection and Maintenance	Material, labor, equipment and waste disposal associated with inspecting and repairing drywells, diversion chamber and parkway bioretention units	\$35,000	
<b>TOTAL 30-YEAR LIFECYCLE COST</b>		<b>\$4,620,000</b>	



# Funding Request



Year	SCW Funding Requested	Phase	Efforts during Phase and Year
1	\$93,000	Planning	Early concept design, site investigations, and CEQA and other environmental impact studies and permitting
2	\$369,000	Design	Pre-project monitoring, site investigations, formal project design, intermediate and final project completion audits.
	\$1,704,000	Construction	Project construction will begin in Year 2
3	\$1,683,000	Construction	Project construction will complete during Year 3
4	\$17,500	O&M	Material, labor, equipment and waste disposal associated with inspection and repair.
	\$33,000	Monitoring	Wet weather project monitoring.
5	\$17,500	O&M	Material, labor, equipment and waste disposal associated with inspection and repair.
	\$33,000	Monitoring	Wet weather project monitoring.
5+	\$346,200	O&M	Project O&M from Year 6 to Year 30.
<b>TOTAL</b>	<b>\$4,292,200</b>		

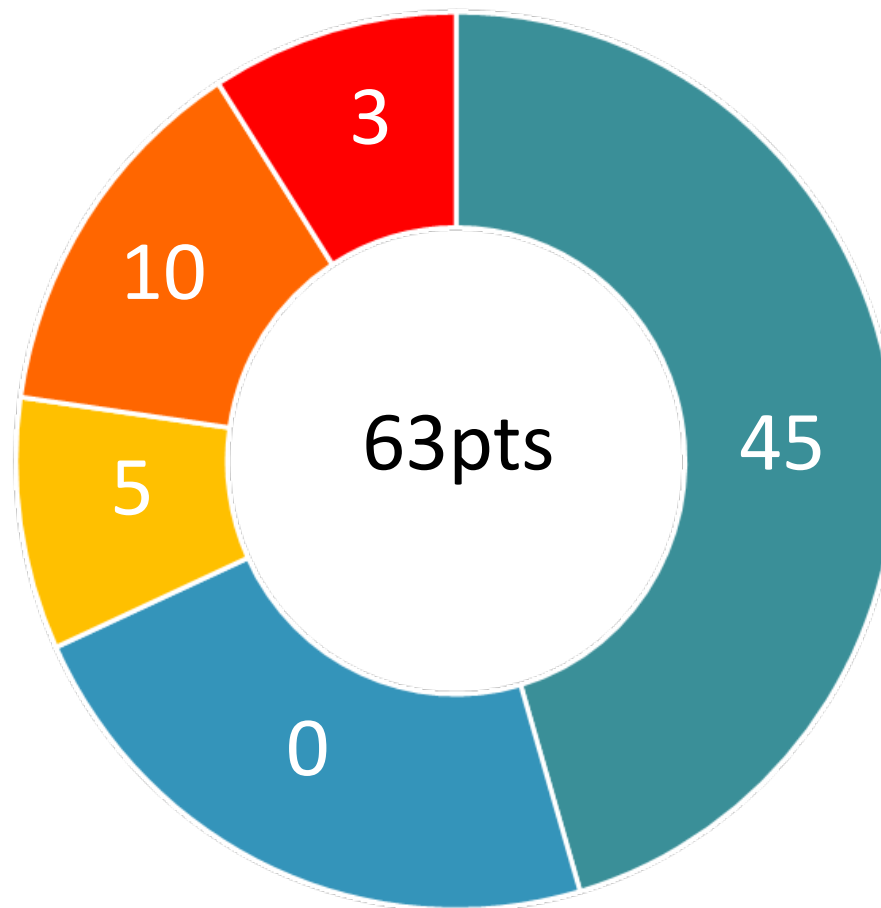
Leveraged Funding amount: \$436,000 (9% of project capital cost) to be matched by City of Redondo Beach to cover the non-stormwater project component and 50% of the project O&M.





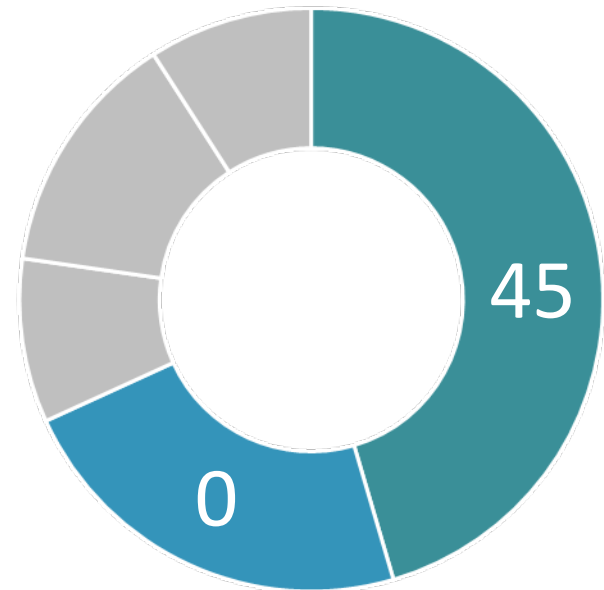
# Preliminary Score

- Water Quality
- Water Supply
- Community Investment Benefits
- Nature Based Solutions
- Leveraged Funds and Community Support





# Water Quality & Water Supply Benefits



<b>Water Quality</b>	<p>13+ ac-ft 24-hour management capacity</p> <p>75% wet weather bacteria load removal</p> <p>100% trash capture project</p> <p>Updated Beach Cities EWMP Project</p>
<b>Auxiliary Water Supply</b>	<p><b>80</b> Acre-Feet/ Year Captured and infiltrated into deep ground to contribute to seawater intrusion mitigation</p> <div> <p>The diagram shows a cross-section of the ground. An injection well is shown on the right, with arrows indicating water being pumped into the ground. A dashed line represents the pressure gradient, which forms a barrier against seawater intrusion from the left. The seawater is shown in light blue, and the fresh water being injected is in dark blue.</p> <p>Figure credit: USGS</p> </div>

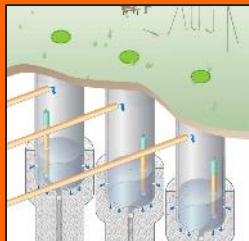




# Community Investment Benefits and Nature Based Solutions



## Nature-based Solutions



✓ Mimic natural process

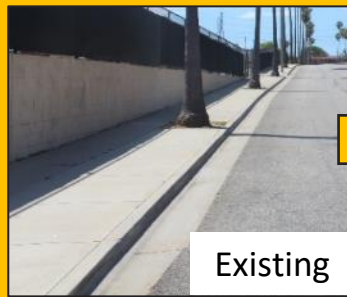


✓ Imper. surface removal

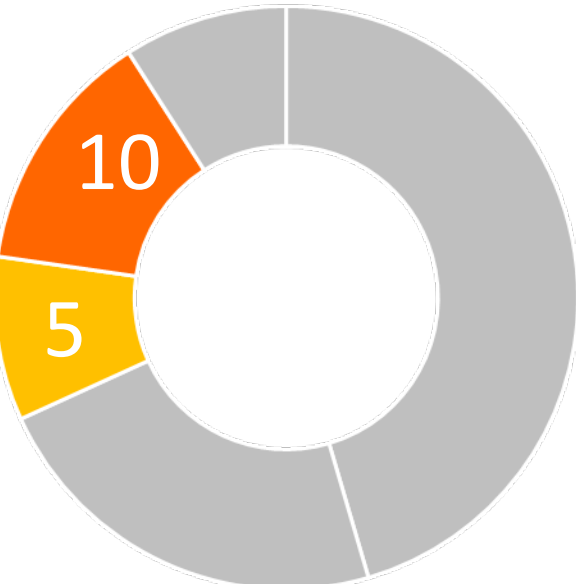


✓ Native vegetation

## Community Investment



- ✓ Flood Management
- ✓ Park Enhancement
- ✓ Recreational Opportunities
- ✓ *Greening School*
- ✓ Heat Island Effect Reduction
- ✓ Vegetation Increase

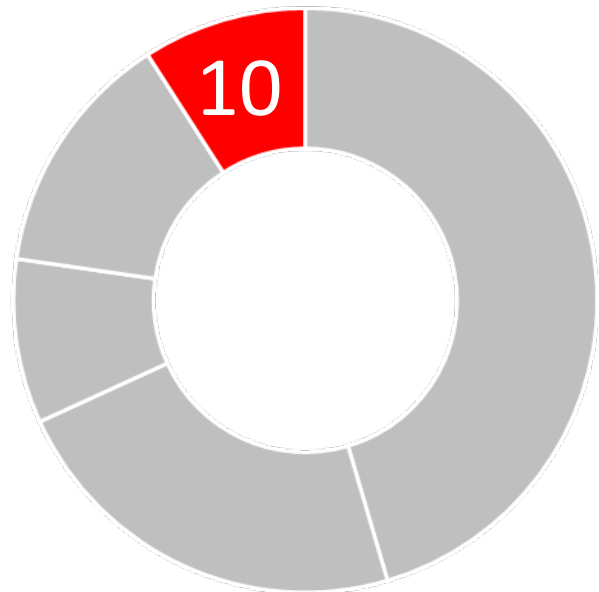


Approximately **50 rain garden appropriate plants** suitable for LA Climate Zone 3 will be planted at the proposed bioretention cells and ocean friendly garden.

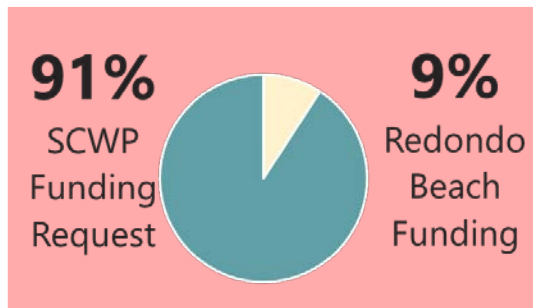
Parkway bioretention cells will replace the existing impervious pavement. A total of **1,800 sq-ft** of impervious surface will be removed and replaced with vegetated cover



# Leveraging Funds and Community Support

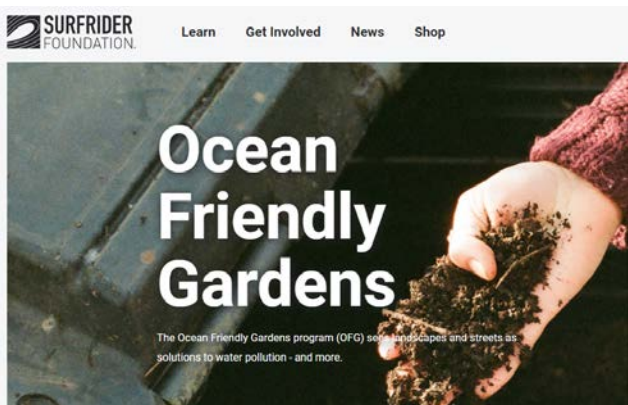


**Funds and Community Support**



**Community Support**

- Leveraging Funds
  - City of Redondo will cover 50% of the O&M cost and 100% of the non-stormwater project component.
- Community Support
  - Received three letters of support
    - Redondo Council Member Christian Horvath
    - The Bay Foundation
    - Valor Christian Academy
  - Presented the project concept at city council meetings at Redondo Beach Unified School District Board meeting and received positive feedback.
- Collaboration with the Surfrider Foundation’s Ocean Friendly Garden Program.







# Questions?

**Geraldine Trivedi, City of Redondo Beach**

**[Geraldine.Trivedi@redondo.org](mailto:Geraldine.Trivedi@redondo.org)**

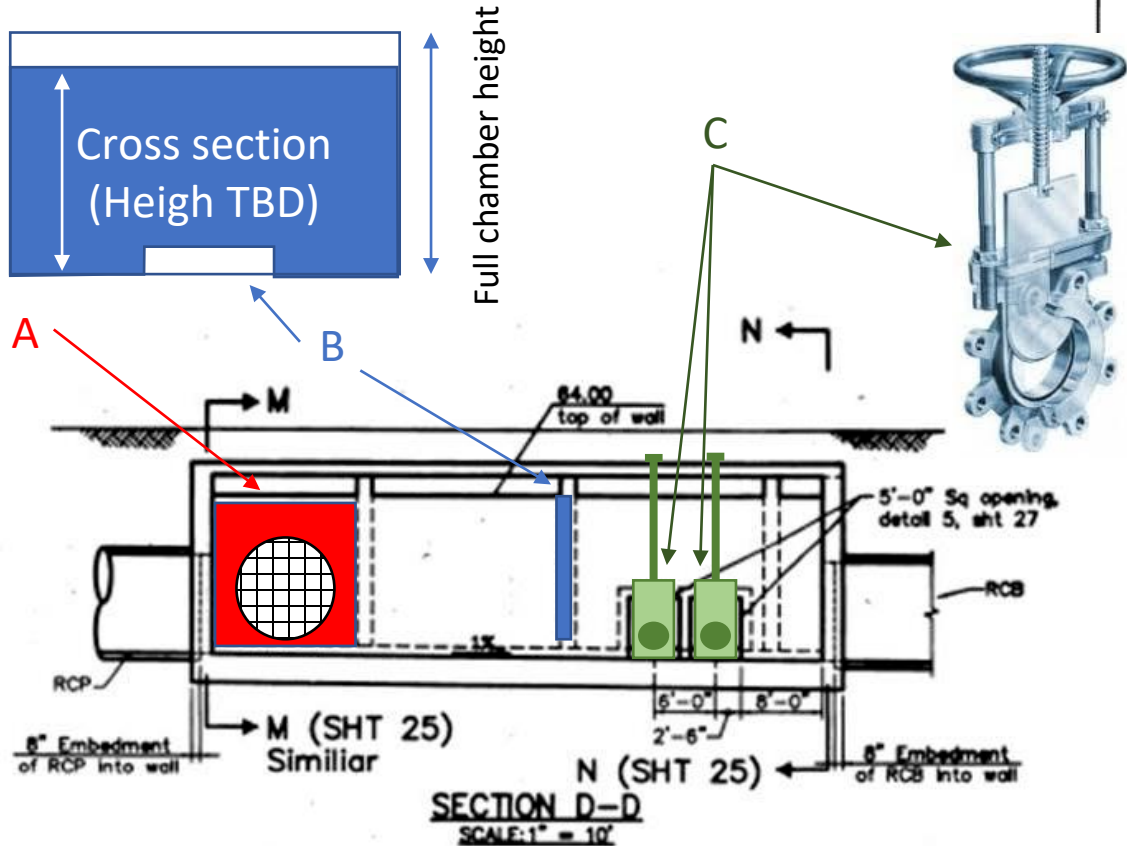


**Additional Slides**



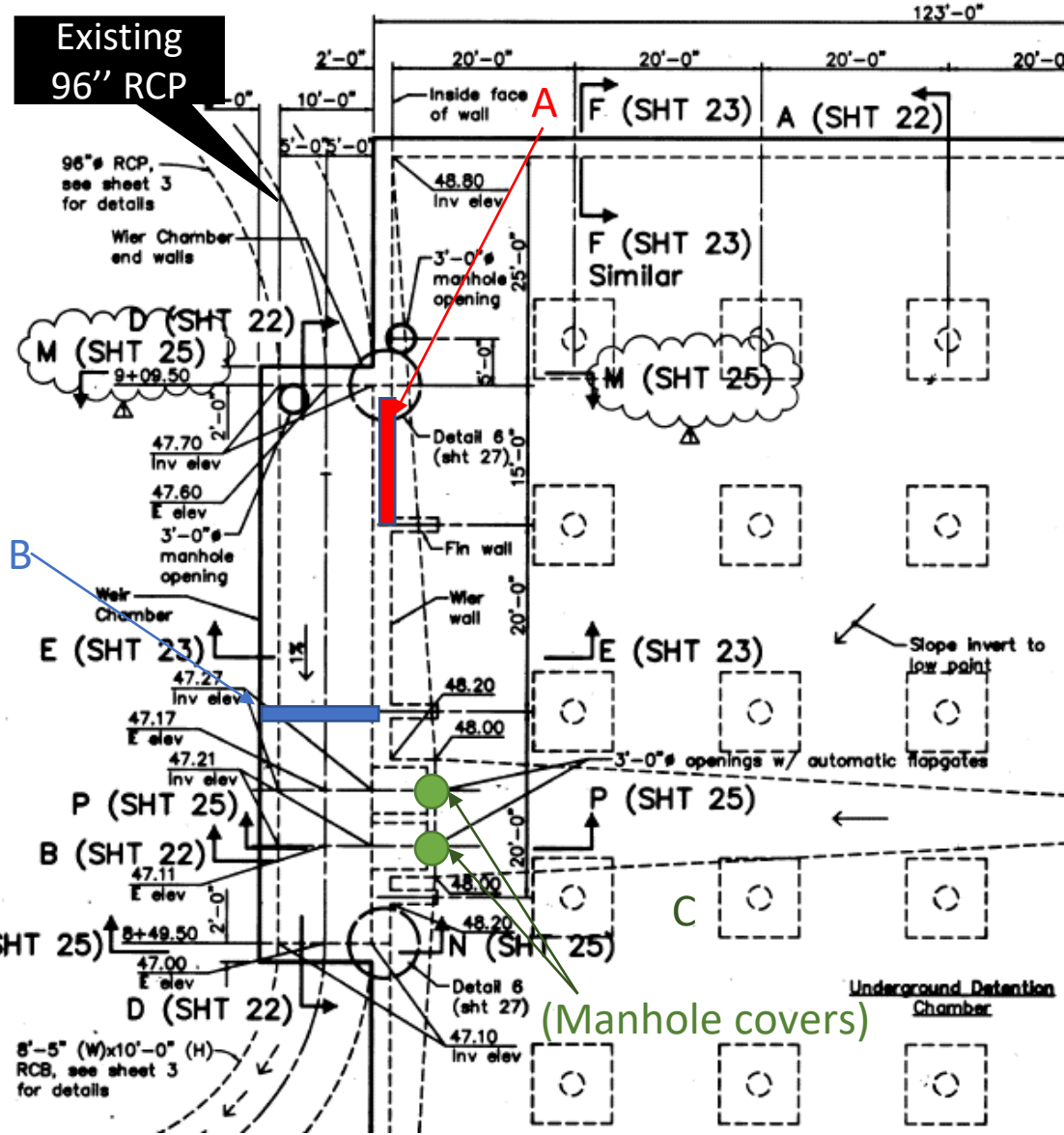


# Diversion Structure Modification



Diversion Chamber      Bypass Chamber

- A: Open a 96" inlet (or equivalent TBD based on structural design) on the existing concrete wall. Install screen bars.
- B: Build a weir wall with a low flow bypass orifice.
- C: Replace the two existing flap gates with sliding gate valves.
- D: Build two concrete walls in the basin to form a sedimentation forebay. Wall height TBD.



(Manhole covers)



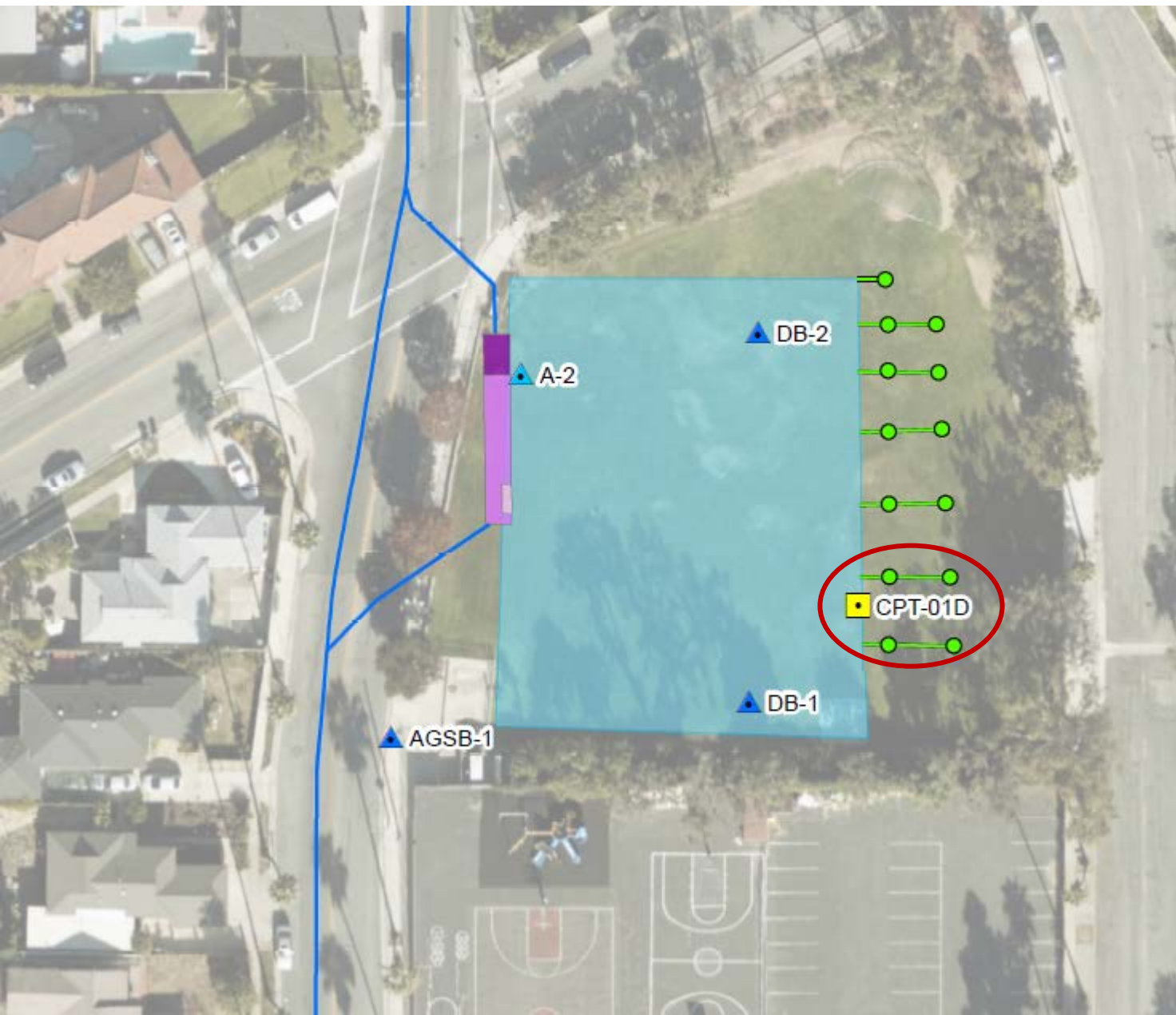
# Geotechnical Investigation



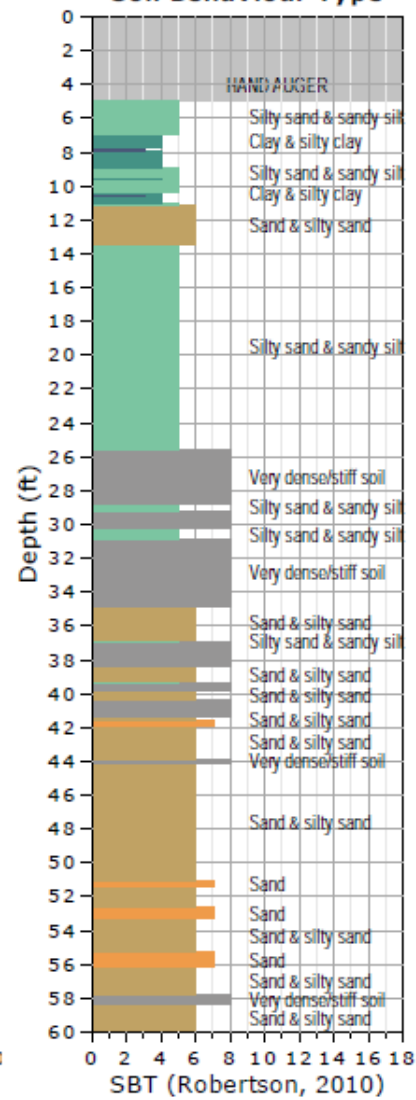
## CPT: CPT-01D

### FIELD REP: REHAN

Total depth: 60.04 ft, Date: 5/13/2021



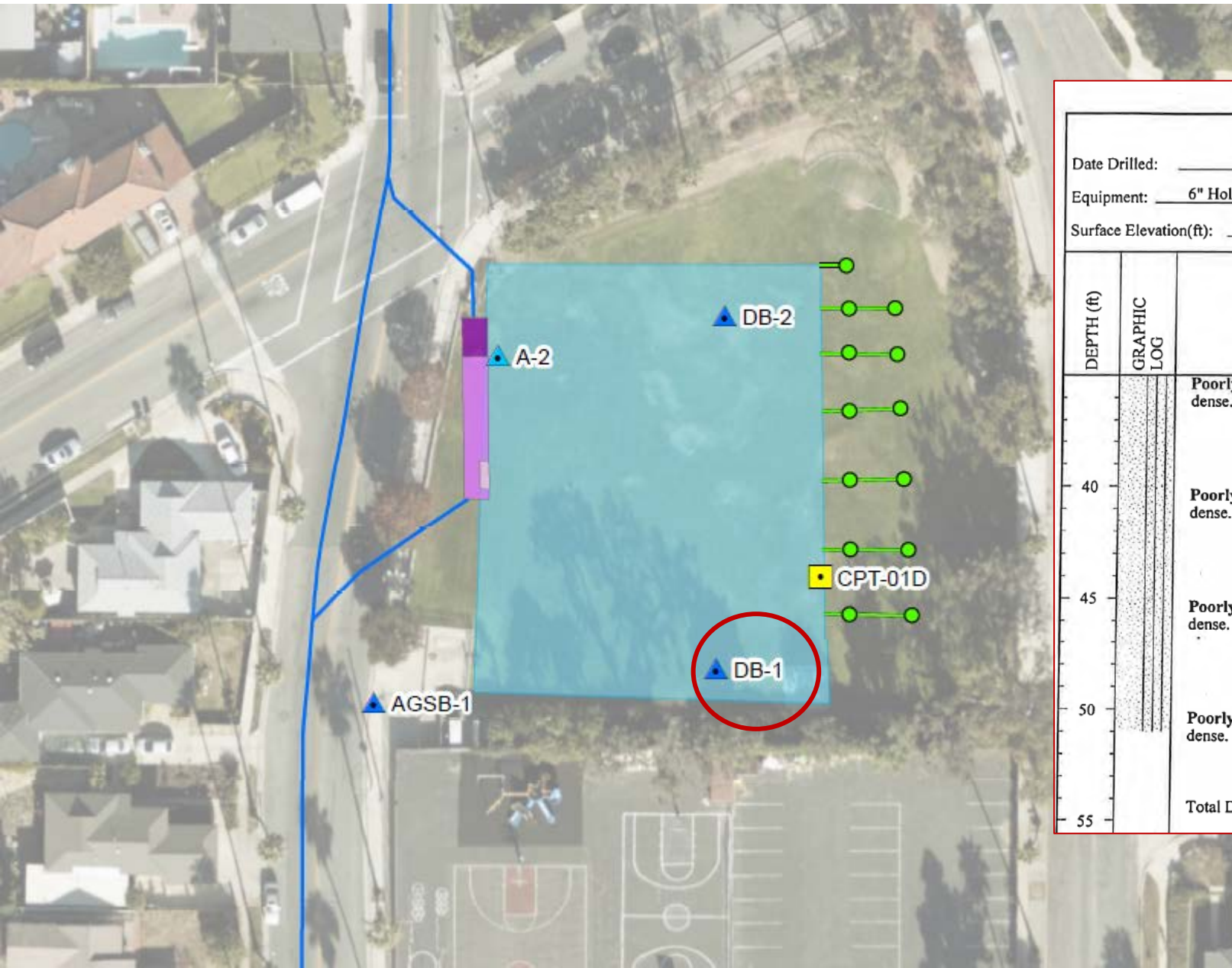
### Soil Behaviour Type







# Geotechnical Investigation

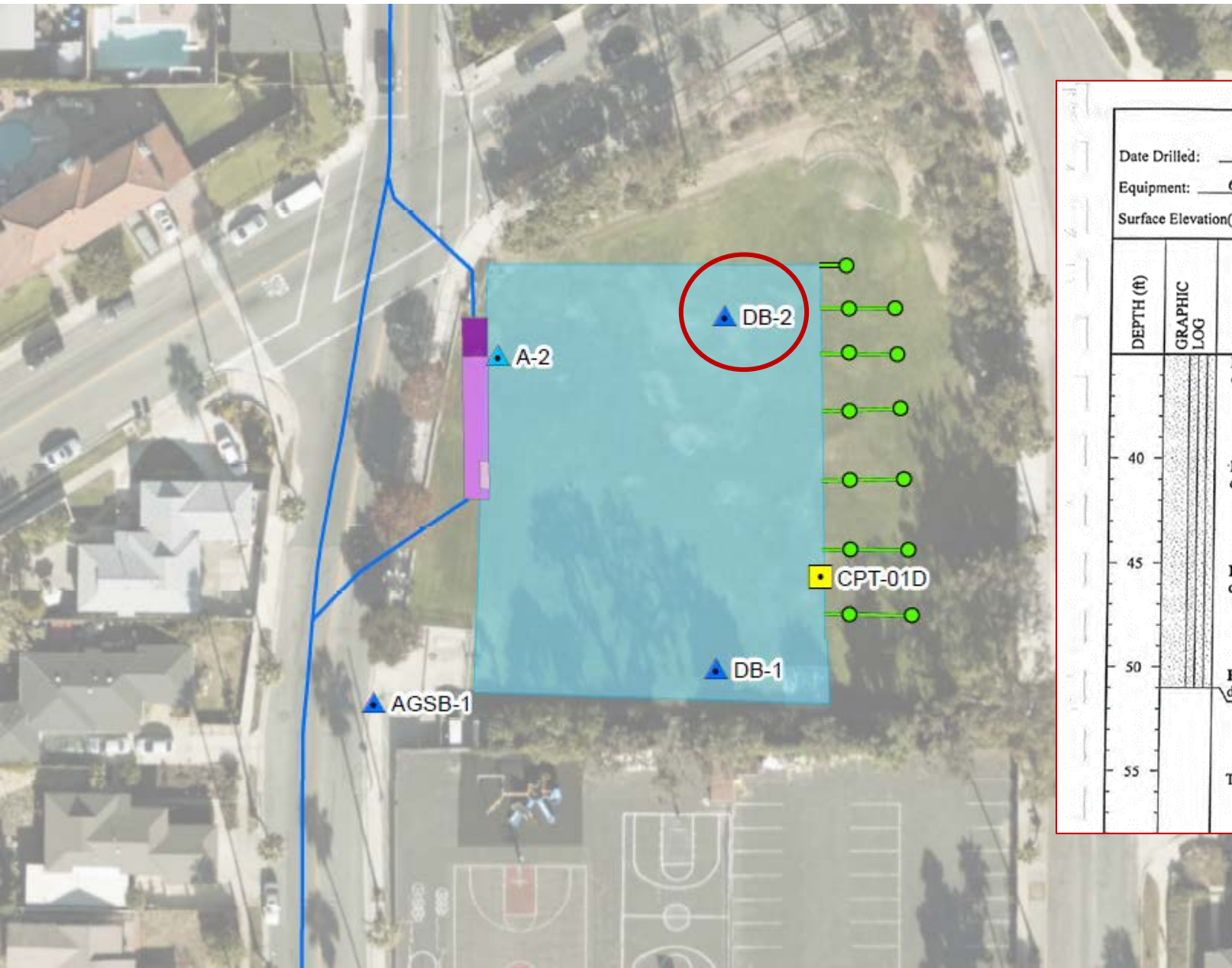


LOG OF BORING NO. DB-1						
Date Drilled: 12/6/99		Logged by: JM		Project Manager: JM		
Equipment: 6" Hollow-Stem Auger		Driving Weight and Drop: 140 LB/ 30"				
Surface Elevation(ft): 69.0		Depth to Water(ft): Not Encountered				
DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS		SAMPLES		LABORATORY TESTS
		DRIVE	BULK	BLOWS/FOOT	MOISTURE (%)	
0 - 38	[Stippled pattern]	Poorly Graded Sand with Silt (SP-SM) Red brown, moist, very dense. Interbedded with sandy silt.	X	50/5"	6.1	93.4
38 - 42	[Stippled pattern]	Poorly Graded Sand with Silt (SP-SM) Red brown, moist, very dense. Interbedded with sandy silt.	X	50/4"	9.0	79.9
42 - 48	[Stippled pattern]	Poorly Graded Sand with Silt (SP-SM) Red brown, moist, very dense. Interbedded with sandy silt.	X	50/5"	10.6	96.0
48 - 51	[Stippled pattern]	Poorly Graded Sand with Silt (SP-SM) Red brown, moist, very dense. Interbedded with sandy silt.	X	50/3"	9.4	91.2
Total Depth 51 Feet, No Water, Bottom of hole caved to 42 Feet.						





# Geotechnical Investigation

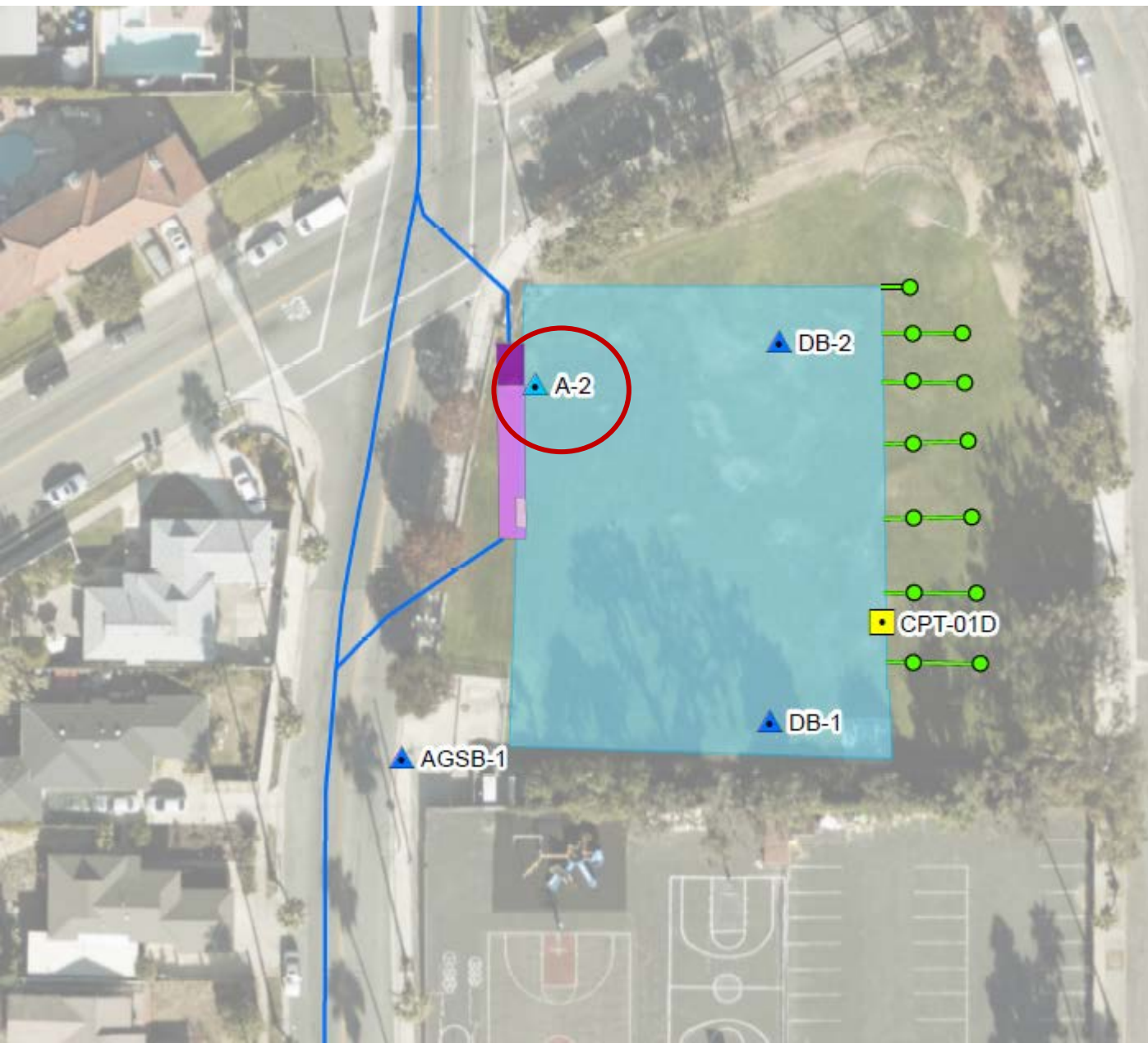


LOG OF BORING NO. DB-2							
Date Drilled: 12/6/99		Logged by: JM		Project Manager: JM			
Equipment: 6" Hollow-Stem Auger		Driving Weight and Drop: 140 LB/ 30"					
Surface Elevation(ft): 71.0		Depth to Water(ft): Not Encountered					
DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS			SAMPLES		LABORATORY TESTS
		DRIVE	BULK	BLOWS/FOOT	MOISTURE (%)	DRY UNIT WT. (pcf)	
0							
40							
45							
50							
55							
Total Depth 51 Feet, No Water, Bottom of hole caved to 42 Feet.							





# Geotechnical Investigation

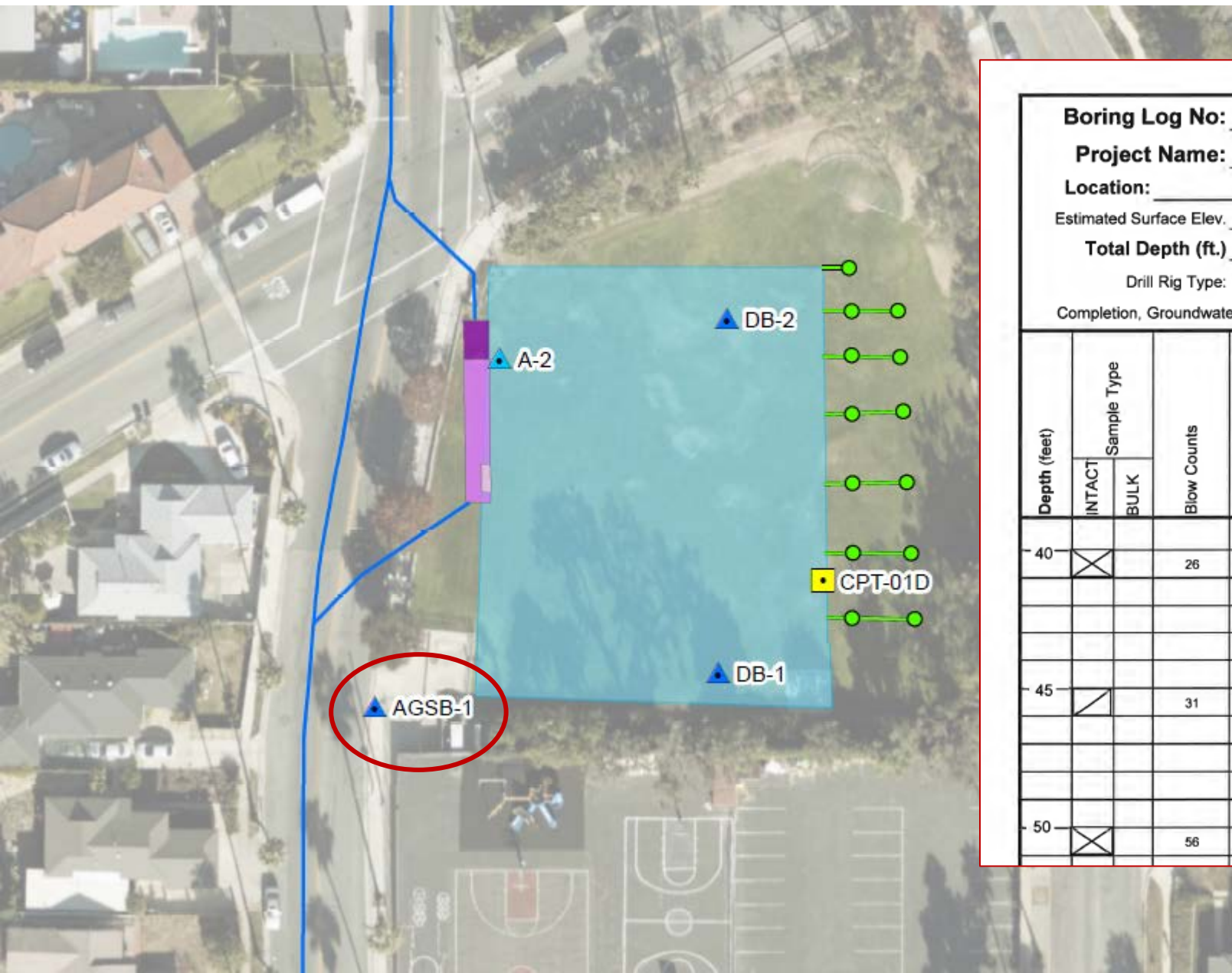


LOG OF BORING NO. A-2								
Date Drilled: 12/6/99		Logged by: JM		Project Manager: JM				
Equipment: 6" Hollow-Stem Auger		Driving Weight and Drop: 140 LB/ 30"						
Surface Elevation(ft): 67.0		Depth to Water(ft): Not Encountered						
DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			DRIVE	BULK				
		GRASS/TOPSOIL (~1 foot)						
		Artificial Fill						
		Silty Sand (SM) Red Brown, moist, loose. Interbedded with sandy silt layers						
5		ALLUVIUM						
		Silty Sand (SM) Red Brown, slightly moist, loose. Interbedded with sandy silt layers	X		8	3.1	105.9	
10		Silty Sand (SM) Red Brown, moist, medium dense.	X		20	10	109.6	
15		Silty Sand (SM) Red brown, moist, medium dense.	X		24	11.5	86.5	
20		Invert Depth						
		Silty Sand (SM) Light Brown, moist, very dense	X		>80	9.4	84.6	
25		Silty Sand (SM) Light Brown, moist, very dense.	X		>80	8.4	89.1	
30		Silty Sand (SM) Light Brown, moist, very dense.	X		66	10.0	85.0	





# Geotechnical Investigation



## FIELD BORING LOG

**Boring Log No:** AGSB-1 **FN:** 5697-01  
**Project Name:** City of Redondo Beach **Sheet:** 3 of 3  
**Location:** Rindge Lane **Start:** 1/26/2017  
**Estimated Surface Elev.** 80 +/- feet **End:** 1/26/2017  
**Total Depth (ft.)** 51 +/- feet **Initials:** JP  
**Drill Rig Type:** (hammer, drop, etc.) CME 75 - 140lb. Hammer - 30" drop  
**Completion, Groundwater, etc.** No groundwater

Depth (feet)	Sample Type		Blow Counts	Dry Unit Wt (PCF)	Moisture Content (%)	Laboratory Tests	Field Description	
	INTACT	BULK					USCS Symbol	Graphic Log
40	X		26				SM	Surface Condition: Asphalt Concrete  Subsurface Conditions: FORMATION; Color, Classification, Moisture content, density/stiffness, etc.
45	/		31	93.1	10			
50	X		56					