

City of Tampa
Bermuda Boulevard Concept Assessments

Summary Report

May 3, 2018

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Executive Summary

Project Background

Established in 1867, Palmetto Beach is a diverse waterfront neighborhood that is rich in culture and history. Palmetto Beach is tucked away on McKay Bay, yet centrally located with access to major roadways, including the I-4/Selmon Expressway Connector. The Palmetto Beach neighborhood offers a variety of housing options, transit service, bicycle paths, and tree lined streets with sidewalks.

The primary roadway along McKay Bay is Bermuda Boulevard. Bermuda Boulevard is a two-lane local urban roadway with curb that serves as the eastern boundary of Palmetto Beach. The wide 17 foot lanes provide for on-street parking on both sides of the roadway although seldom used. The posted speed limit is 25 MPH. The roadway structure is protected from the bay by a concrete sheet pile seawall with a poured-in-place concrete pile cap.

The concrete pile cap is failing in multiple locations causing hazardous and unsafe conditions. In some limited areas, the sheet pile wall is not plum and causing erosion issues and in other areas the sheet piles have numerous cracks, spalls and delamination. Additionally, the pavement of Bermuda Blvd. is aged, shows signs of fatigue and has many patched sections. The curbs and sidewalks have many cracks, voids and areas that do not meet ADA requirements.

Project Description

The City of Tampa (CITY) project objective is to develop conceptual plans to alleviate the unsafe and undesirable conditions of the seawall while enhancing the transportation facility to include safety features for bicyclists and pedestrians as well as aesthetic attributes. The conceptual plans will be reviewed by the CITY, community and stakeholders to provide input for advancing the project.

The project is within the City of Tampa, Palmetto Beach Community and will extend along the existing alignment of Bermuda Boulevard from South of Ocean View Place to North of Linsey Street. All improvements will be within the City of Tampa right-of-way.

Concept Plan Development

Initially there were five concept plans developed (A through E) in addition to the seawall rehabilitation (See Preliminary Summary Report dated June 20, 2017). After the concept review meeting with the CITY on January 10, 2018 it was determined to limit the alternatives moving forward to two. The alternatives would be hybrids of Conceptual Plan B providing two lanes of traffic and designated Alternative A and Alternative B. For Alternative A the travel lanes will be 10-foot in each direction with a designated shared lane marking. In addition to the two travel lanes there will be 8-foot parking spaces on the east side at random locations grouped in clusters where the roadway alignment allows. For Alternative B the travel lanes would be 12-feet in width with no designated markings for bicycle or parking. For both alternatives there will be landscaping along the east side of the roadway utilizing tree wells adjacent to the curb line and an 8-12-foot trail along the reconstructed seawall.

Per the City's request, Ayres Associates conducted a structural condition survey of the Bermuda Blvd seawall on January 18, 2018. The purpose of the survey was to determine repair/replacement recommendations for the seawall. The seawall had extensive spalling with

exposed and corroded reinforcing, cracking with rust staining, and deep scaling intermittently throughout. It was determined the seawall was in poor condition overall; 35% of the structure needing replacement and 20% in need of extensive repairs.

Ayres developed two structural rehabilitation options:

Option 1 involves replacement of 2073LF of the seawall. This includes the entire length of the wall excluding the recently replaced 85LF section of wall at Davis St. and two sections protected by the mangroves from 24th St. to Elmwood Ave. (760LF) and the most southern portion of Bermuda Blvd (515LF). Refer to Sheet 1 and 2 of the Structural Concept Plans for recommended locations of seawall replacements. The estimated cost of Option 1 is \$3,882,274.00

Option 2 involves replacing 1213LF of wall intermittently and repairing 680LF of wall. The repairs include removal of unsound concrete and extensive patching of spalls. Due to the numerous amounts and varying size of the cracks, spalls, and delamination, an in-depth inspection will be required to determine exact quantity and type of repairs. Should the repairs be implemented the resultant design life would only be increased by several years considering the maintenance provided and eventually the pile would need to be replaced. Refer to Sheet 3 and 4 of the Structural Concept Plans for recommended locations of seawall replacements and repairs. The estimated cost of Option 2 is \$2,218,816.00

Ayres Associates recommends Option 1 due to the continuity, ease of constructability and lower probability of significant maintenance that would be required with Option 2.

Conceptual Cost Estimate Summary

The flowing table provides a cost estimate for each alternative:

Alternative	Sea Wall Cost	Roadway Cost	Total
Sheet Pile Improvements	\$3,882,274.	0.00	\$3,882,274.
Alternative A	\$3,882,274.	\$975,503.	\$4,857,777.
Alternative B	\$3,882,274.	\$1,110,736.	\$4,993,010.

Potential for Joint Project Application

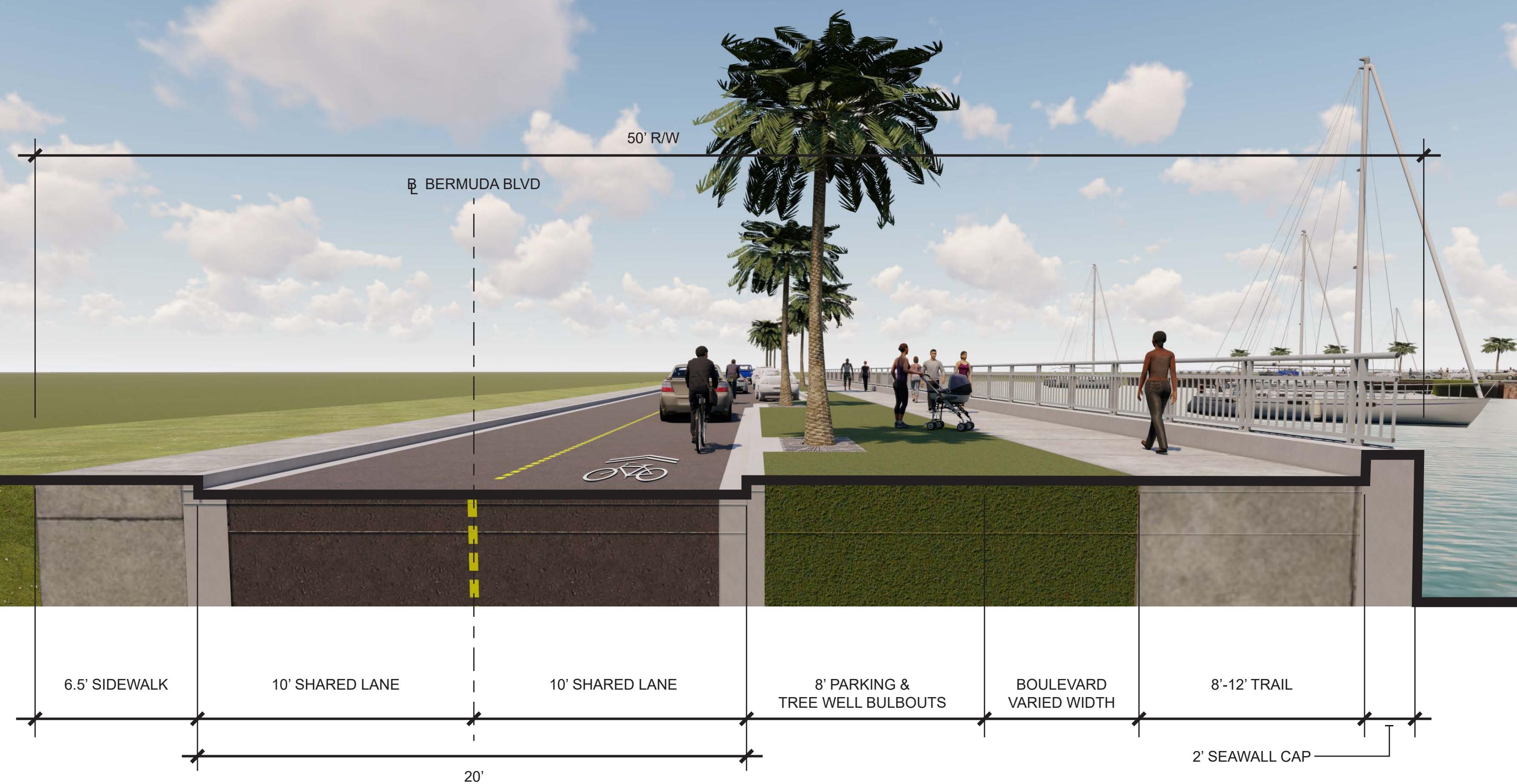
Ayres Associates has been working with TECO Peoples Gas (TECO) on the development of the Port Tampa Bay Infrastructure project. A component of the project involves the planning, design, plans development and construction of a four-inch to eight-inch gas main pipeline with the preferred alignment along Bermuda Blvd. Our discussions with TECO have been very positive regarding the opportunity to share costs with the City of Tampa both in design and construction of the improved Bermuda Boulevard. As the project continues to develop we can assist the City in the process of advancing an equitable agreement to share costs proving a win-win environment for the Palmetto Beach Community, the City and TECO.

Bermuda Blvd. Conceptual Plans**AYRES**
ASSOCIATES**Alternative A****Preliminary Estimate of Probable Construction Cost**

FDOT Pay Item	Item Description	Units	Quantity	Unit Cost	Total
	Roadway Improvements				
0334-1-13	Aphaltic Concrete	TN	859	\$98.00	\$84,182.00
0327-70-5	Milling Existing Asphalt	SY	7,807	\$2.85	\$22,249.95
-	Asphalt Trail and Base	SY	3,484	\$45.35	\$157,988.06
0520-2-4	Concrete Curb, Type D	LF	6,035	\$26.25	\$158,418.75
-	Striping	LS	1	\$35,000.00	\$35,000.00
-	Signage	LS	1	\$18,000.00	\$18,000.00
0522-1	Concrete Sidewalk, 4"	SY	1,687	\$46.50	\$78,445.50
0570-1-2	Performance Turf, Sod	SY	3,294	\$3.75	\$12,352.50
-	Palm Trees	EA	49	\$3,750.00	\$183,750.00
	Sub Total				\$750,386.76
	<i>Contingincey (30%)</i>				<i>\$225,116.03</i>
	Roadway Improvement Sub Total				\$975,502.79
	Structural Improvements				
	Sheet Pile Wall Improvement	LS	1	\$3,882,274.00	\$3,882,274.00
	TOTAL				\$4,857,776.79

Bermuda Blvd. Alternative Plans**Alternative B****Preliminary Estimate of Probable Construction Cost**

Item Description	Units	Quantity	Unit Cost	Total
FDOT Pay Item				
	Roadway Improvements			
0334-1-13	Aphaltic Concrete	TN	1,120	\$98.00
0327-70-5	Milling Existing Asphalt	SY	8,471	\$2.85
-	Asphalt Trail and Base	SY	2,590	\$45.35
0520-2-4	Concrete Curb, Type D	LF	6,002	\$26.25
-	Striping	LS	1	\$35,000.00
-	Signage	LS	1	\$18,000.00
0522-1	Concrete Sidewalk, 4"	SY	1,685	\$46.50
0570-1-2	Performance Turf, Sod	SY	43,773	\$3.75
-	Palm Trees	EA	40	\$3,750.00
	Sub Total			\$854,412.60
	<i>Contingency (30%)</i>			\$256,323.78
	Roadway Improvement Sub Total			\$1,110,736.38
	Structural Improvements			
	Sheet Pile Wall Improvement	LS	1	\$3,882,274.00
	TOTAL			\$4,993,010.38



ALTERNATE A
(2) 10-FOOT LANES WITH PARKING
BAYS WHERE APPROPRIATE

50' R/W

BERMUDA BLVD



6.5' SIDEWALK

12' SHARED LANE

12' SHARED LANE

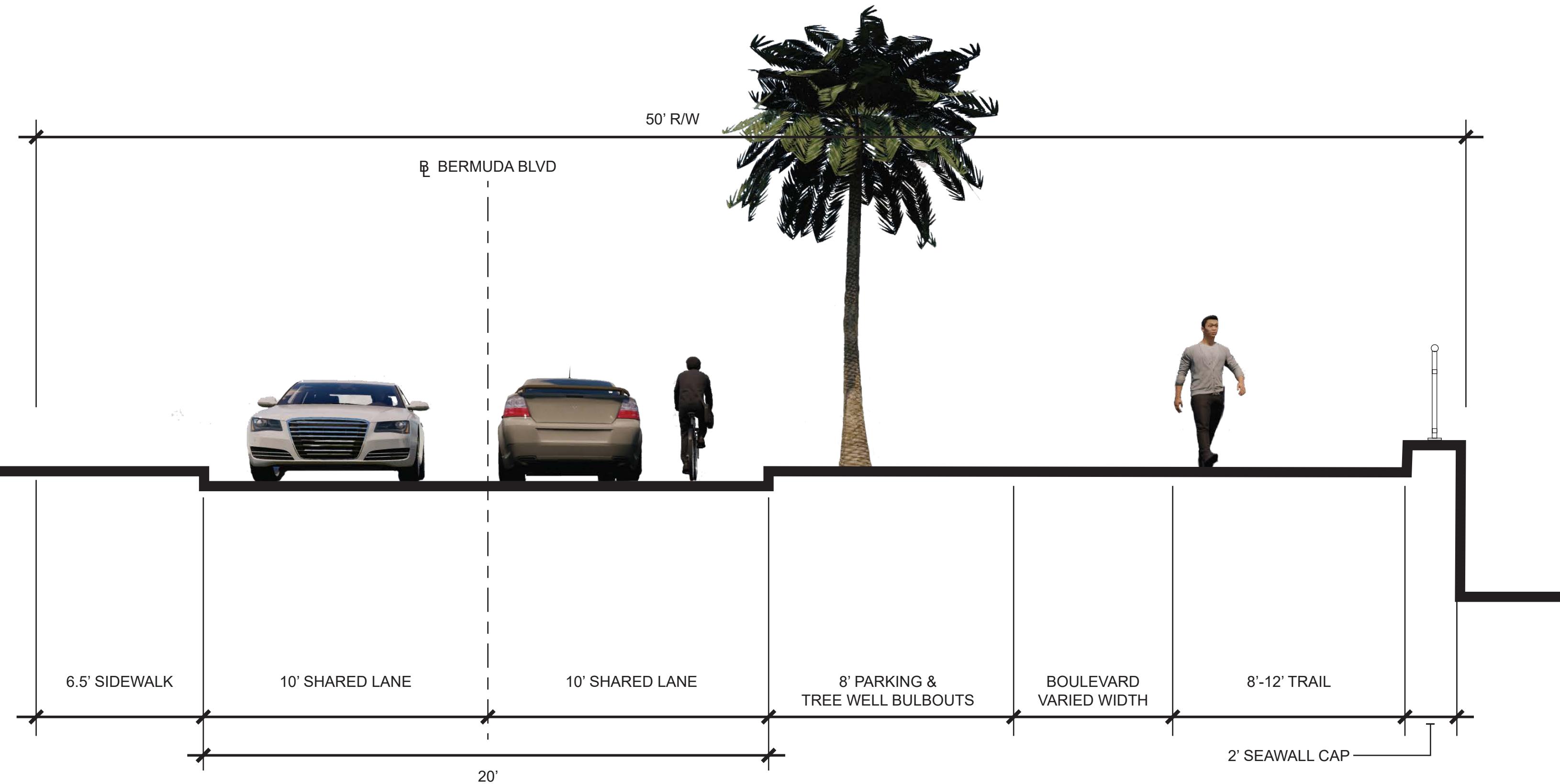
BOULEVARD WITH
TREE WELLS
VARIED WIDTH

8'-12' TRAIL

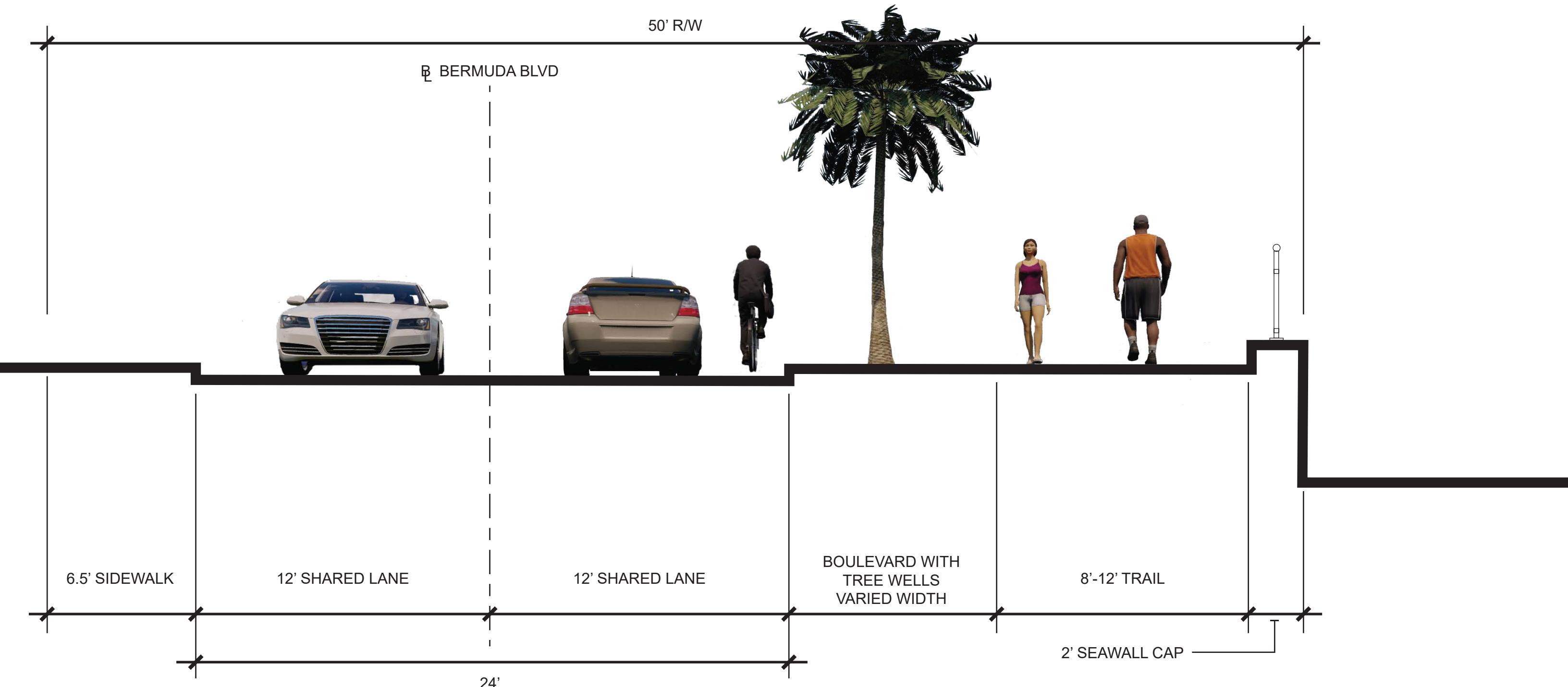
2' SEAWALL CAP

24'

ALTERNATE B
(2) 12-FOOT LANES WITH RANDOM
ON-STREET PARKING



ALTERNATE A
(2) 10-FOOT LANES WITH PARKING
BAYS WHERE APPROPRIATE



ALTERNATE B
(2) 12-FOOT LANES WITH RANDOM
ON-STREET PARKING





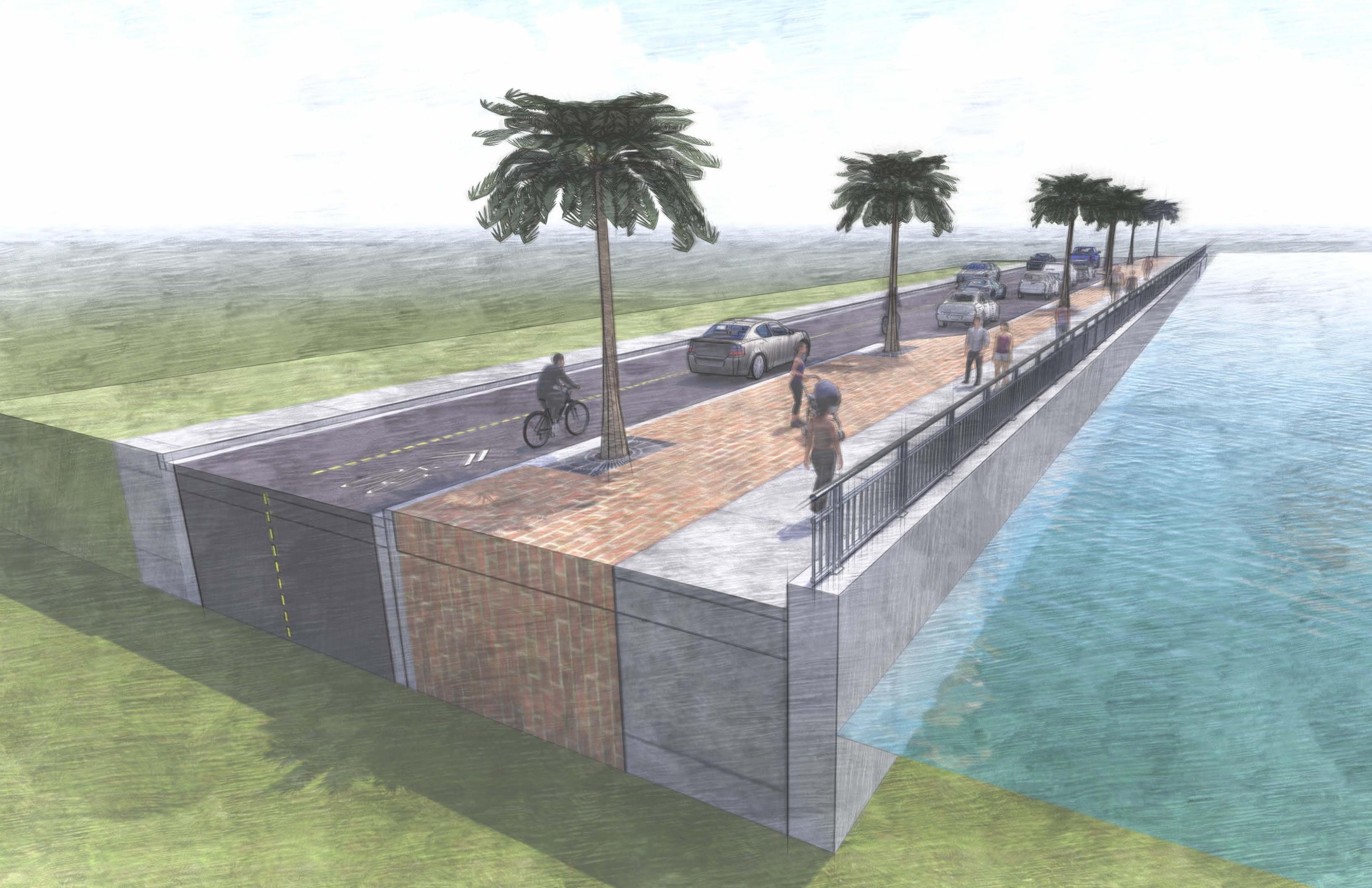














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 Checked By : HSN 5-17
 Designed By : CJA 5-17
 Checked By : HSN 5-17
 Designed By : HSN 5-17

REVISIONS				CITY OF TAMPA			SHEET PILE WALL PLAN OPTION 1		SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID			
					HILLSBOROUGH				1

AYRES ASSOCIATES
 8875 Hidden River Parkway
 Suite 200
 Tampa, Florida 33637
 (813) 978-8688
 Certificate of Authorization
 No. 4356
 Engineer of Record: Hisham N. Sunna, PE #52114

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 Designed By : CJA 5-17
 Checked By : HNS 5-17

REVISIONS				AYRES ASSOCIATES 8875 Hidden River Parkway Suite 200 Tampa, Florida 33637 (813) 978-8688 Certificate of Authorization No. 4356 Engineer of Record: Hisham N. Sunna, PE #52114	CITY OF TAMPA			SHEET PILE WALL PLAN OPTION 1	SHEET NO. 2
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
						HILLSBOROUGH			



REVISIONS				CITY OF TAMPA			SHEET PILE WALL PLAN OPTION 2			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID				
					HILLSBOROUGH					3
AYRES ASSOCIATES 8875 Hidden River Parkway Suite 200 Tampa, Florida 33637 (813) 978-8688 Certificate of Authorization No. 4356 Engineer of Record: Hisham N. Sunna, PE #52114										



REVISIONS				AYRES ASSOCIATES 8875 Hidden River Parkway Suite 200 Tampa, Florida 33637 (813) 978-8688 Certificate of Authorization No. 4356 Engineer of Record: Hisham N. Sunna, PE #52114	CITY OF TAMPA			SHEET PILE WALL PLAN OPTION 2	SHEET NO. 4
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						HILLSBOROUGH			
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Bermuda Boulevard
Estimated Construction Costs for Sheet Pile Wall Improvement

Description	Cost Estimate
Full Wall and Cap Replacement - Option 1	\$ 3,882,274.00
Partial Wall and Cap Replacement - Option 2	\$ 2,218,816.00

Bermuda Boulevard
Estimated Construction Costs for Sheet Pile Wall Improvement

Full Wall and Cap Replacement - Option 1					
FDOT Pay Item	Description	Quantity	Unit	Unit Price	Amount
104-11	Floating Turbidity Barrier	600.00	LF	\$ 7.60	\$ 4,560.00
110-4-10	Removal of Existing Concrete - Sheet Pile Cap	572.00	SY	\$ 19.78	\$ 11,315.00
110-73	Removal of Existing Bulkhead	2073.00	LF	\$ 107.00	\$ 221,811.00
400-4-8	Concrete Class IV, Bulkhead	508.44	CY	\$ 1,000.00	\$ 508,445.00
415-1-8	Reinforcing Steel - Bulkhead	63555.56	LB	\$ 1.36	\$ 86,436.00
451-70	Prestressed Soil Anchor	259.13	EA	\$ 3,000.00	\$ 777,375.00
455-14-3	Concrete Sheet Piling	9121	LF	\$ 164.00	\$ 1,495,877.00
ALTERNATIVE SUBTOTAL =					\$ 3,105,819.00
101-1	MOBILIZATION (15% SUBTOTAL)	1	LS	\$ 465,872.85	\$ 465,873.00
	CONTINGENCY (10% SUBTOTAL)	1	EA	\$ 310,581.90	\$ 310,582.00
ALTERNATIVE TOTAL =					\$ 3,882,274.00

Bermuda Boulevard
Estimated Construction Costs for Sheet Pile Wall Improvement

Partial Wall and Cap Replacement - Option 2					
FDOT Pay Item	Description	Quantity	Unit	Unit Price	Amount
104-11	Floating Turbidity Barrier	600.00	LF	\$ 7.60	\$ 4,560.00
110-4-10	Removal of Existing Concrete - Sheet Pile Cap	227.33	SY	\$ 19.78	\$ 4,497.00
110-73	Removal of Existing Bulkhead	1213.00	LF	\$ 107.00	\$ 129,791.00
400-4-8	Concrete Class IV, Bulkhead	202.07	CY	\$ 1,000.00	\$ 202,075.00
401-70-2	Restore Spalled Areas	139.20	CF	\$ 500.00	\$ 69,600.00
415-1-8	Reinforcing Steel - Bulkhead	25259.26	LB	\$ 1.36	\$ 34,353.00
451-70	Prestressed Soil Anchor	151.63	EA	\$ 3,000.00	\$ 454,875.00
455-14-3	Concrete Sheet Piling	5337	LF	\$ 164.00	\$ 875,301.00
ALTERNATIVE SUBTOTAL =					\$ 1,775,052.00
101-1	MOBILIZATION (15% SUBTOTAL)	1	LS	\$ 266,257.80	\$ 266,258.00
	CONTINGENCY (10% SUBTOTAL)	1	EA	\$ 177,505.20	\$ 177,506.00
ALTERNATIVE TOTAL =					\$ 2,218,816.00

OPTION 1		
Total Length of Wall Replacement	2073	LF
Total Length of Cap Replacement	3432	LF
Existing Cap Width	1.5	FT
Proposed Cap Width	2	FT
Proposed Cap Height	2	FT
Avg. Weight of Steel/CY Conc	125	LB
Proposed Conc. Pile Width	2.5	FT
Proposed Wall Height	11	FT
Prestressed Soil Anchor Spacing	8	FT

OPTION 2.		
Total Length of Wall Replacement	1213	LF
Total Length of Wall Repair	680	LF
Total Length of Cap Replacement	1364	LF
Total Length of Cap Repair	712	LF
Avg. Spall Repair for Wall	0.1	CF/LF
Avg. Spall Repair for Cap	0.1	CF/LF
Total Spall Repair	139.2	CF
Existing Cap Width	1.5	FT
Proposed Cap Width	2	FT
Proposed Cap Height	2	FT
Avg. Weight of Steel/CY Conc	125	LB
Proposed Conc. Pile Width	2.5	FT
Proposed Wall Height	11	FT
Prestressed Soil Anchor Spacing	8	FT