

# **Miami River Commission Public Meeting Minutes July 10, 2023**

The Miami River Commission's (MRC) public meeting convened at noon, July 10, 2023, in the Downtown Library Auditorium, 101 W Flagler. Sign in sheets are attached.

**Miami River Commission (MRC) Policy Committee Members and/or Designees attending:**

Horacio Stuart Aguirre, Chairman, Miami River Commission  
Jim Murley, Vice Chairman, designee for Miami-Dade County Mayor Cava  
Commissioner Eileen Higgins, Miami-Dade County Commission  
Eddie Marti Kring, designee for Miami-Dade County Commissioner Eileen Higgins  
Mercedes Librada Rodriguez, designee for City of Miami Commissioner Alex Diaz de la Portilla  
Patty Harris, designee for Governor  
Theodora Long, Neighborhood Representative appointed by Board of County Commissioners  
Eileen Broton, Neighborhood Representative Appointed by City of Miami Commission  
Gus Barrera, designee for Greater Miami Chamber of Commerce  
Alvaro Coradin, designee for Sara Babun appointed by Miami-Dade County  
Philip Everingham, designee for Marine Council  
Orin Black, designee for Miami River Marine Group

**MRC Staff:**

Brett Bibeau, Managing Director

## **I) Chair's Report**

**The MRC unanimously adopted their June 5 public meeting minutes.**

Friendly reminders that similar to the City and County the MRC will not host a public meeting in August. Due to the Labor Day Holiday, the MRC's September public meeting will be held on September 11. Then the MRC will resume the regular 1<sup>st</sup> day of the month schedule on October 2.

The "Borocho" is the largest derelict vessel in the State of Florida, and it is located on the Miami River. I would like to thank Nick Morrell and the Reef Guard Association for submitting a permit application to DERM to environmentally clean the vessel, tow it out of the Miami River to an appropriate location to sink it to become an artificial reef, at no cost to Miami-Dade County.

The Miami River Commission has been actively assisting the efforts of the City, County, State, and private sector to clean up the Miami River District. In addition to the maintenance professionals the MRC pays daily to remove litter, invasive plant species, graffiti and provide landscaping, pressure washing, vac truck, street sweeper and Scavenger Water Decontamination Vessel services along the Miami River, the MRC thanks the volunteers from Hands on Miami for picking up garbage along the public Riverwalk in Curtis Park on June 25.

**Spencer Crowley made a motion which was unanimously adopted by the MRC supporting the renewal of funding for Florida Wildlife Commission's (FWC) relatively new Vessel Turn In Program" (VTIP), with the goal of reducing abandoned derelict vessels.**

MRC Chairman Aguirre stated it is a record hot summer and Director Bibeau provides daily inspections and coordination of the various contracted Miami River clean up maintenance workers, therefore he suggested the Miami River Fund Inc provide Director Bibeau with \$400 for Gatorade, etc. Miami River Fund Inc (MRFI) President Phil Everingham replied consistent with Governor DeSantis providing 5% salary increase for state employees, the MRFI recently increased Director Bibeau's annual salary by 5%. MRC members, including Mercedes Rodriguez, expressed support for the raise, plus the \$400 for Gatorade etc, noting Director Bibeau is doing an outstanding job.

MRC Chairman Aguirre thanked County Commissioner Higgins and miami-Dade County for naming an upcoming affordable housing development after the late MRC board member Ernie Martin.

## **II) Review Plans for 600 NW 7 Ave:**

Franco Ramo and Patricio Hernandez Pons, Expanza LLC, distributed and presented the revised Temporary Use Permit (TUP) plans and a letter of intent for a Paddle Tennis Club featuring 9 courts and a small food and beverage clubhouse with "healthy" food, smoothies, beer and wine. The TUP is for 3 years, and 1-year extensions would have to be approved by the City of Miami Commission. The applicants stated they met with the City of Miami Zoning Department, and the City indicated because the subject Recreational facility is zoned D1, Miami 21 Section 3.11 does not apply, therefore no public Riverwalk is required. The applicants offered to improve the existing public on-road Greenway in the City owned public right of way along NW 7 Ave. The applicants stated they removed the roof top dining and DJ booth. The applicants agreed to close the courts closer to the homes earlier, at 9:30 PM. In addition, they stated they are trying to reach an agreement with the 4 homes on the Seybold Canal directly across from the site. The applicants stated some of those neighbors are in favor, some are not, therefore the communications continue.

Spencer Crowley stated the Florida Inland Navigation District provided grant funding to the City of Miami to restore navigation in the Seybold Canal, yet the proposal has no boats. In addition, Mr. Crowley stated he emailed the City and County about City owned sections of the Wagner Creek shoreline collapsing into the tributary.

Ms. Patty Harris stated Miami-Dade County's water quality testing results in Seybold Canal often detect water quality violations sadly significantly in excess of safe State and County water quality goals.

Me Mercedes Rodriguez suggested the applicants have an in person open community meeting with residents from the Spring Garden neighborhood, and the applicants agreed to do so.

**The MRC unanimously deferred the item to their next public meeting on September 11, noon, 101 W Flagler.**



### **III. Discuss City of Miami's Evaluation and Appraisal Report (EAR) with Potential Amendments to the Comprehensive Plan**

Ms. Sue Trone, Chief of Comprehensive Planning, City of Miami, distributed and presented the draft Evaluation and Appraisal Report (EAR) based track changed amendments to the Comprehensive Plan related to the Miami River. In addition, Ms. Trone distributed and presented a related summary memo. The memo states in part:

“Given the effort that went into the most recent update to the Miami River Sub-Element, adopted in 2010, little change is recommended at this time. The Planning Department has provided some updates that primarily address outdated information. This is to say, the updates offered recommend striking some information because some information is no longer relevant. Policies that tie to other elements for internal consistency within the MCNP are flagged below for ease of review.

A summary of the proposed amendments follows:

1. Line 84: Correction of a typo. (This is not part of the Port of Miami River Sub-Element)
2. Line 119: Objective PA-3.1: This objective references Policy LU-1.3.3 and Goal CM-3. These are listed here:

***Policy LU-1.3.3***

*Pursuant to Ch.163.3177(6)(a),F.S., the City shall maintain regulatory incentives and criteria that encourage the preservation of recreational and commercial Working Waterfronts as defined in Ch.342.07,F.S., particularly in the “Port of Miami River” Subelement to guide future development within the Miami River Corridor.*

*Pursuant to Ch.163.3177(6)(a),F.S., the City shall maintain regulatory incentives and criteria that encourage the preservation of recreational and commercial Working Waterfronts as defined in Ch.342.07,F.S., particularly in the “Port of Miami River” Subelement to guide future development within the Miami River Corridor.*

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***Goal CM-3***

*Pursuant to Section 163.3178(2)(g), F.S., The City will maintain strategies that will be used to preserve and adequate supply of land for recreational and commercial Working Waterfront uses defined in Section 342.07, F.S.1*

3. Line 133: "large scale" is stricken. "expedited state review" is underlined. This is because in 2011 the Florida Legislature replaced the Large Scale amendment process for comprehensive planning with the Expedited State Review process. This is codified in Sec. 163.3184 (3), Florida Statute.
4. Lines 139-140: "by a reviewer selected by the Planning Department" is added text. This text is recommended language to Policy PA-3.1.2 which memorializes the no-net-loss policy for Category A properties within the working waterfront. This proposed language is offered with expectation of creating an arm's length between the analyst and the reviewer. Moreover, the City's adopted fees for the the Planning Department recently were amended to charge a separate fee for this service. This is recommended for additional clarity for applicants, stakeholders to working waterfronts, and the City of Miami which is responsible for administering the policy.
5. Line 215: "and Policy IC-2.1.30" is stricken. This policy was repealed in a previous ordinance and this should have been stricken at that time.
6. Lines 260-261: This amendment addresses the outdated reference to the FL Department of Community Affairs (strike out "Community Affairs") and updates it to "Economic Opportunity".
7. Line 285: Policy PA-3.3.8: Strike entire policy. This policy refers to Enterprise Zone tax incentives which no longer exist.
8. Line 300: Renumber Policy PA-3.3.9 to 3.3.8. Strike specific policies to make the policy more generalized and less necessary to update based on state-level changes to Brownfield policies.
9. Line 324: Renumber Policy PA-3.3.10 to 3.3.9. Strike specific policies to make them more generalized.
10. Line 330: Renumber Policy PA-3.3.11 to 3.3.10
11. Line 340: Renumbered
12. Lines 357-368: Strike policies for annual reporting.
13. Line 370: Policy PA-3.4.1: Propose a new policy for monitoring on loss or gain of recreational and commercial Working Waterfront land and uses to be presented to the City Commission at a public hearing and report within one year of adoption and then in seven (7) year increments thereafter.



#### Next Steps

A legal review will commence later in July. All amendments will be brought to the Planning, Zoning, and Appeals Board (PZAB) on September 6, 2023. City Commission will be asked to vote on the amendments at a proposal hearing (first reading) by October 19, 2023. Transmittal for state coordinated review will commence no later than October 31, 2023.”

This item will be presented at the full Miami River Commission’s July 10 public meeting, noon, 101 W Flagler in the Library Auditorium.

Spencer Crowley and Mark Bailey stated the desire for the Comprehensive Plan to be enforced and implemented. Mr. Crowley stated he would like to defer the item so that he may author some additional suggested revisions to the Comprehensive Plan. **The MRC unanimously deferred the item to their next public meeting, September 11, noon, 101 W. Flagler, in the library auditorium.**

### **IV. Discuss City of Miami’s New Draft Parks Master Plan**

Carlos Perez presented a PowerPoint regarding the City of Miami’s draft new Parks Master Plan. The MRC’s previously provided advisory input was thankfully incorporated into the draft Parks Master Plan. Mr. Perez stated the City Commission is scheduled to consider the draft plan on July 27.

County Commissioner Higgins stated Miami-Dade County is starting a “Safe Routes to Parks” program, similar to the “Safe Routes to Schools” program.

**The MRC adopted a unanimous resolution recommending approval of the City of Miami’s Parks Master Plan, adding an emphasis to “improving waterfront park amenities”.**

### **V. Subcommittees**

The MRC Urban infill and Greenways Subcommittee’s June 16 public meeting minutes were distributed.

The MRC Stormwater Subcommittee’s June 7 public meeting minutes were distributed.

The Miami River Holiday Boat Parade’s June 12 public meeting minutes were distributed. MRC member Mercedes Librada Rodriguez thanked the City Commission whom on June unanimously adopted a City Commission agenda item to create the “City of Miami’s 1<sup>st</sup> Annual Miami River Holiday Boat Parade” and will be providing all needed City services.

### **V. New Business**

The public meeting adjourned.

Miami River Commission Public Meeting

July 10, 2023 - Noon

Miami-Dade County Library, 101 W Flagler ST

Name	Organization	Telephone	Email
PHIL EVERINGHAM	MRC/MARINE COUNCIL	305 951-9096	phemsdd@hotmail.com
Horacio Aguirre	MRC	305	
Patricio Hernandez P.	Expanza LLC	305-409-3936	expanzallc@gmail.com
Franco Ramo	Expanza LLC	305 904 9957	"
Mark Bevels	Miami River Marine Group	305 777-2577	markbevels@miami.river.marine.group.org
BRUCE BROWN	MRC	305/788-6911	bruce402@bellsouth.net
AGUSTIN BARRERA	MRC	786.295.1222	abarvera@bermellogiamil.com
Judith Paul	Spring Garden	305-801-7415	jpaul703@bellsouth.net
CARLOS PEREZ	PFD	404.416.0114	CPEREZ@PEREZPS.COM
Eddie Hart	DS/BCC	305 213 0118	Distress@
Eileen Haggus	DS/BCC	"	miamidade.gov
Neal Schafers	Miami DDA	305-374-6675	Schafers@
Eileen Brotan	MRC	305-790-1254	miamidda.com
ILVARD CORRADO	WILHEAN MARINE	305-606-3507	icorrado@wilhean.com
PATRICIA HARRIS	MRC	305-262-3763	PATTYKAKE@GMAIL.COM
Theodora Long	MRC	305-401-4595	Riveroak901@gmail.com
JOHN CORNELL	MRC	(580) 214-1475	johncornell@zestyinterests.com
MEGAN KELLY	MRC	786 556 5620	"



Miami River Commission Public Meeting

July 10, 2023 - Noon

Miami-Dade County Library, 101 W Flagler ST

Name	Organization	Telephone	Email
Spencer Crowley	FIND/MRC	305 982 5549	fspcrowley@aicw.org
Frank Escobedo Jr.		786 449 6508	escofrank3@gmail.com
Steve Trone	City of Miami Franklin	305-416-1445	strone@miamigov.com
Carolina Betancourt	Padel 42	305-336-6612	carolina@Permitgov.com
Carlos Salas		305 790 9240	SGCA
Mercedes L Rodriguez	City of Miami District 1 Designee	786-365-2929	merci0121@gmail.com
Luiz LAM	City of Miami	305.332-3466	LLAM@miamigov.com

**Miami River Commission's  
Urban Infill and Greenways Subcommittee  
June 16, 2023**

Miami River Commission's (MRC) Urban Infill and Greenways Subcommittee Chairman Jim Murley convened a public meeting on June 16, 2023, 1407 NW 7 ST, at 12:30 PM. The sign in sheet is attached.

**I) Discuss City of Miami's Evaluation and Appraisal Report (EAR) with Potential Amendments to the Comprehensive Plan**

Ms. Sue Trone, Chief of Comprehensive Planning, City of Miami, distributed and presented the draft Evaluation and Appraisal Report (EAR) based track changed amendments to the Comprehensive Plan related to the Miami River. In addition, Ms. Trone distributed and presented a related summary memo. The memo states in part:

“Given the effort that went into the most recent update to the Miami River Sub-Element, adopted in 2010, little change is recommended at this time. The Planning Department has provided some updates that primarily address outdated information. This is to say, the updates offered recommend striking some information because some information is no longer relevant. Policies that tie to other elements for internal consistency within the MCNP are flagged below for ease of review.

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**MRC Urban Infill and Greenways subcommittee Chairman Jim Murley suggested the full MRC recommend approval of the City Administrations proposed EAR based Amendments to the Comprehensive Plan related to the Miami River.**

## **II) Discuss City of Miami’s New Draft Parks Master Plan**

Carlos Perez presented a PowerPoint regarding the City of Miami’s draft new Parks Master Plan. The MRC’s previously provided advisory input was thankfully incorporated into the draft Parks Master Plan. This item will be presented at the full Miami River Commission’s July 10 public meeting, noon, 101 W Flagler in the Library Auditorium. **MRC Urban Infill and Greenways subcommittee Chairman Jim Murley suggested the full MRC recommend approval of the City Administrations proposed EAR based Amendments to the Comprehensive Plan related to the Miami River.**

## **III) Discuss Security along the Miami River Greenway**

MRC Urban Infill and Greenways subcommittee Chairman Jim Murley stated he requested this item be placed on the agenda. MRC Director Bibeau thanked City of Miami Police Officers Maguffey, Russell and Sarmiento and State Attorney Katherine Fernandez-Rundle’s new MRC designee David Hardin for attending the meeting and their recent excellent work in Miami River Rapids Park. The Officers stated they recently made another arrest of the illegal drug dealer whom has been selling illegal drugs and living in Miami River Rapids Park, and Mr Hardin stated they have now added a charge of selling close to the Miami Bridge which is a educational facility for



children, and will add a stay away order on sentence to ensure he doesn't return to this location again as he has done after previous arrests at this same location.

MRC Director Bibeau provided the following email from a resident of Neo Lofts, 10 SW South River Drive which he previously forwarded to the Little Havana Police Commander and NRO, "If you could be my voice at the meeting, mentioning the situation under the Bridge (Riverwalk beneath 1 ST Bridge near S. River Drive), it would be greatly appreciated. Nothing has changed since the last time we spoke, I did receive a call from the police officer you phoned with (I don't remember his name), he told me they had passed by and they saw no one in that area, he also reminded me that it is not illegal for people to be there. However, the drug dealing situation continues, and one only needs to be around for 10 mins to see how people arrive to buy drugs from the guy that made that spot his headquarters. Thank you!"

MRC Director Bibeau thanked Roman Jones whom recently started funding a security guard whom patrols 2 blocks of the City owned on-road Miami River Greenway from 450 NW North River Drive to 600 NW 7 Ave, including the area beneath the 5 ST Bridge. MRC Bibeau added the areas beneath several Miami River Bridges remains problematic and recommended the City of Miami Police Department provide Officers along the public Riverwalk patrolling on bicycles and or Segways.

#### **IV) New Business**

MRC Director Bibeau thanked and distributed the City of Miami's plans to replenish landscaping along the City of Miami owned on-road Greenway. Director Bibeau stated this month he will walk the entire route with the plans taking notes to provide to the City for consideration.

The public meeting adjourned.

**From:** brettbibeau@miamirivercommission.org  
**Sent:** Monday, June 26, 2023 10:05 AM  
**To:** 'Oscar Gonzalez'  
**Cc:** 'Brett Bibeau'  
**Subject:** NE Shoreline next 836

Hi Oscar,

Per my call this AM, are you available for a site visit on the Miami River shoreline to the NE of 836 this Friday, 6/30, at 8:30 AM?

THX

Sincerely,  
Brett



# Miami River Commission Urban Infill and Greenways Subcommittee

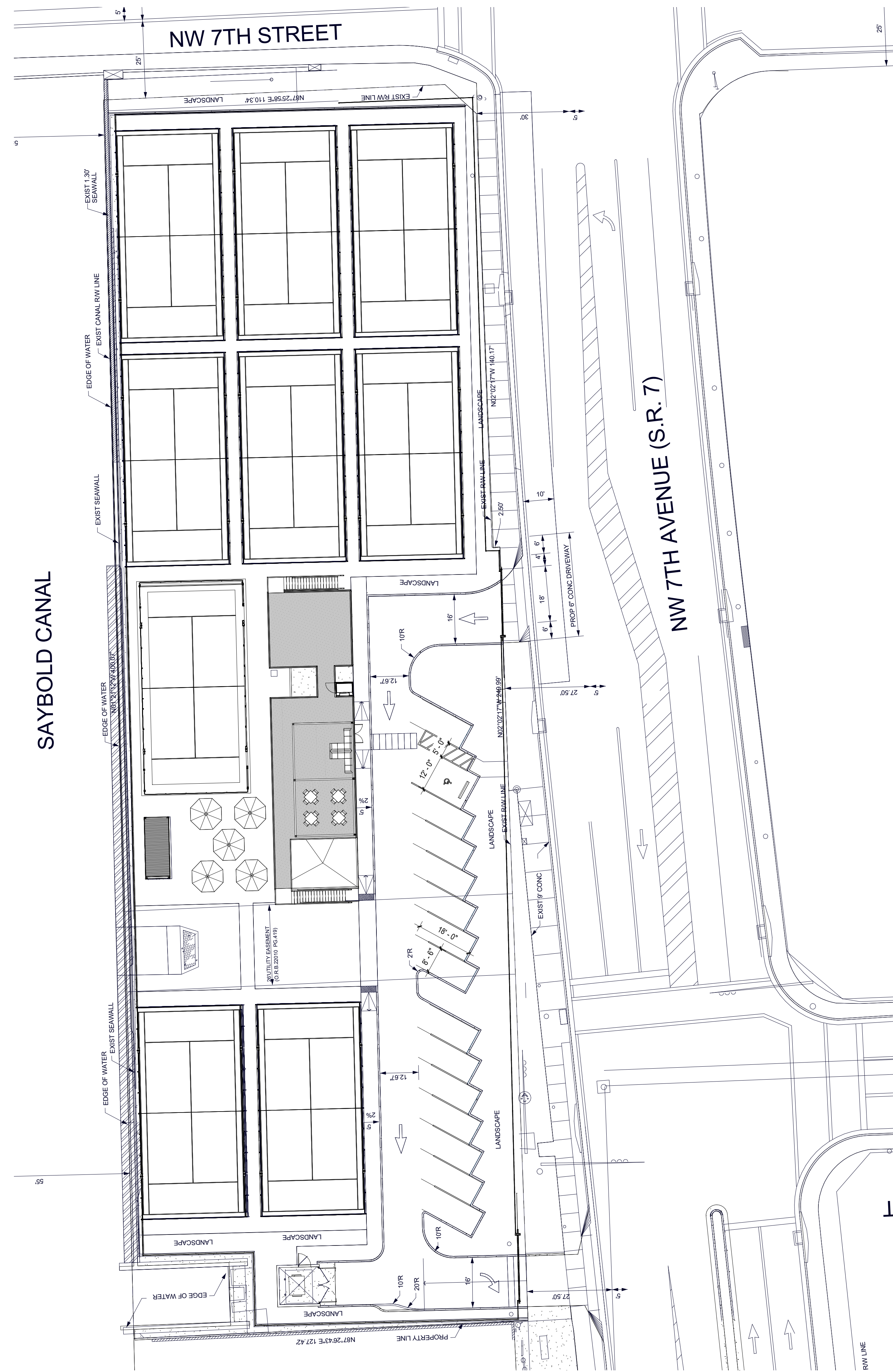
## Public Meeting

June 16, 2023 - ~~10 AM~~ 1 PM

1407 NW 7 ST, Larger Boardroom (facing Miami River)

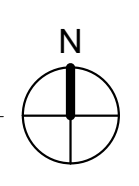
Name	Organization	Telephone	Email
Brett Bibeau	MRC	305 644 0544	brettbibeau@miami rivercommission.org
ofc. Scot Russell	MPD	954-729-1981	43718@miami-police.org
ofc. Miguel Sarmiento	MPD		45387@miami-police.org
DAVID HANSEN	MOSAD	305-629-2100	DAVIDHANSEN@miami -com
SUB TRONE	CITY OF MIAMI	305-416-1445	strone @miamigov. com
ofc. Alexia Maguffey	MPD	305 603 6991	43102@miami-police .org
Jim Murley	009/MDA	305 968 4881	James.Murley@ Miamiwater.com
Megan Kelly	MRC	305 365 6559	megan.kelly@gmail
Eileen Braton	MRC & SGCA	305-790-4284	Eileen.Braton@ peelsoa.com





PARKING SCHEDULE	
Type	#
Accessible Parking Space	1
Standard Parking Space	14
	15

1  
A100  
Architectural Site Plan  
1" = 20'-0"



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**Mariano Corral**  
Landscape Architect  
Landscape Architecture  
Golf Course Design  
Land Planning  
Urban Design  
Member of the American Society  
of Landscape Architects

IN ASSOCIATION WITH  
CHI CHI RODRIGUEZ  
GOLF COURSE DESIGN

**PROJECT**  
PADEL 42  
600 NW 7TH AVE.  
Miami, FL. 33155

**OWNER**  
PADEL 42, LLC

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Mariano Corral Landscape  
Architect, P.A. and MAY NOT be  
reproduced except with specific written  
consent FROM the Landscape Architect.

The contractor and his sub-contractors  
must check and verify all the work on the  
drawings such as; dimensions, planting  
design with the plant list, details, and  
survey of the job and is responsible for  
same and reporting any discrepancies to  
the Landscape Architect before  
commencing any work for clarification.  
No drawings shall be scale.

SCALE:	AS SHOWN
PROJECT NUMBER	50-11012022-C
DRAWN BY:	MC
CHECKED BY:	MC
DATE:	03/29/23

REVISIONS:	10
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Know what's below.  
Call before you dig.  
IT'S THE LAW!

VALID CERTIFIED DIGITAL SIGNATURE:



**Luis Clemente Architect, LLC**  
1160 NW 75th Ave, Floor 3, Suite 400, Miami, FL 33158  
(786) 557-3848 | luis@luisclm.com

SEAL:

LIC.# AR102049

SHEET NUMBER:

**A100**

OF:

PROJECT PROCESS NUMBER:

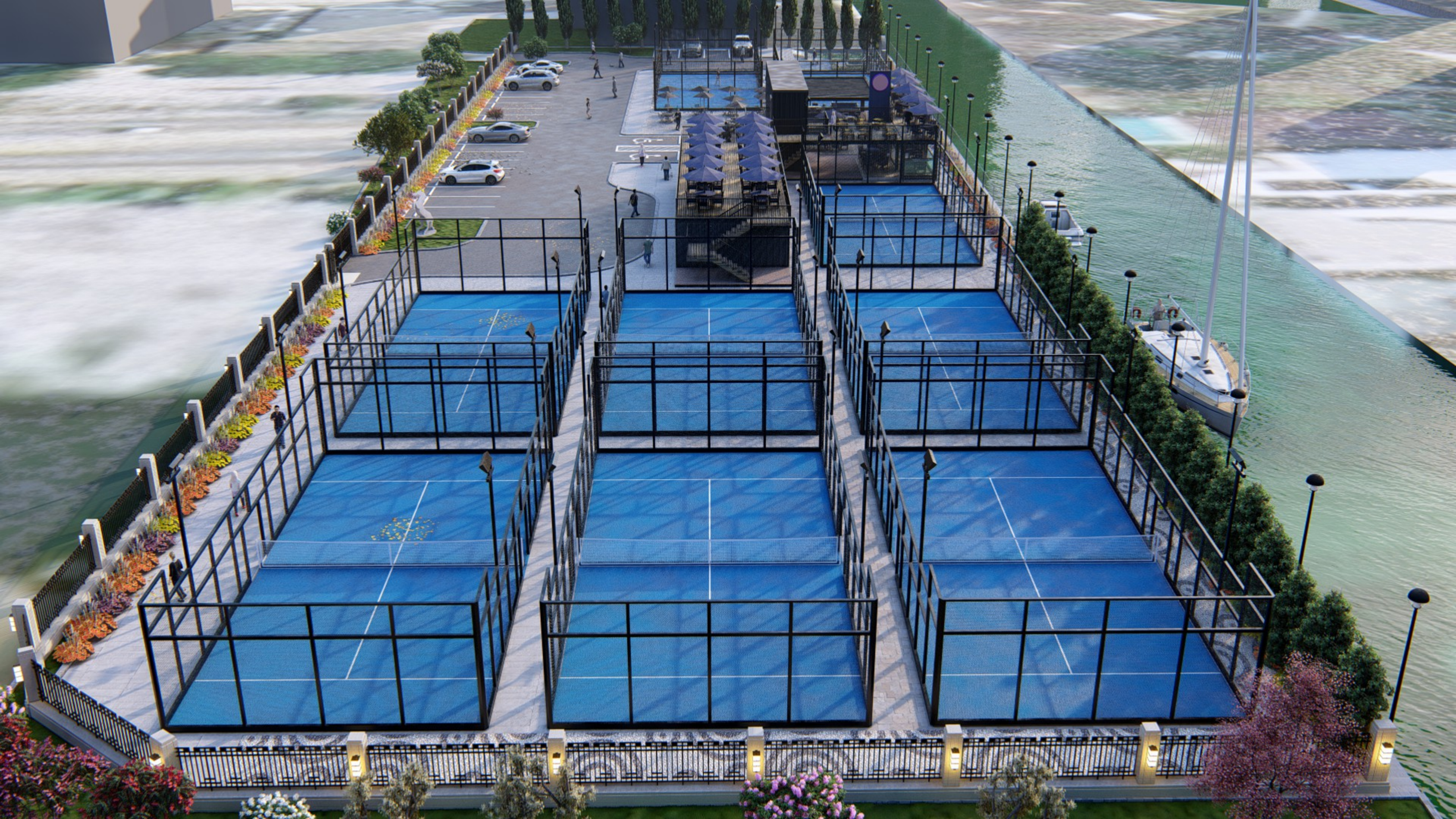
PERMIT NUMBER:

3001 SW 109 Court  
Miami, Florida 33165  
OFF: (305) 551-1262  
EMAIL: marianocorral@comcast.net











## **EXPANZA LLC / PADEL 42**

600 NW 7<sup>TH</sup> AVENUE  
MIAMI, FLORIDA 33136  
(305) 904-9957



Detailed Operational Plan for Temporary Use Permit application.

Overview: The purpose of the Operational Plan is to provide a broad overview of the club's key operational activities during regular business hours. This includes aspects such as parking, security, sanitation, restroom facilities, and other operational functions.

Applicable concept: Please see Exhibit A.

Purpose: The purpose of these structures is to function as a Padel Club. The temporary courts will be utilized as recreational padel courts and the metal temporary structure will be used as our club house and will host our locker rooms, bathrooms, proshop, reception offices, storage, and bar. They will be utilized for a period of 3 years following completion. The space will be used exclusively for Sports Club activities. The hours of operation are anticipated to be daily from 7:00am – 11:00pm.

Fees: The customers will be charge Pay to play hourly and Memberships will be available for customers for additional services.

Vendors: Will be serviced onsite. To be determined.

Hours of operation: The hours of operation are anticipated to be daily from 7:00am – 11:00pm.

Number of employees: 7-9 Employees

Permits and licenses:

Insurance and liability: Insurance and liability coverage will be provided for the use of this infrastructure.

Food trucks safety policies: N/A

Parking plan: Parking will be provided as per Exhibit B.

Landscape plan: Please see Exhibit C

Electrical plan: Please see Exhibit D

Water plan: Please see Exhibit E

Security: OMBS Security Company

Sanitary and Staffroom safety plan: MaidPro cleaning services.

Restrooms: Please see Exhibit I

Exhibit A – Applicable concept

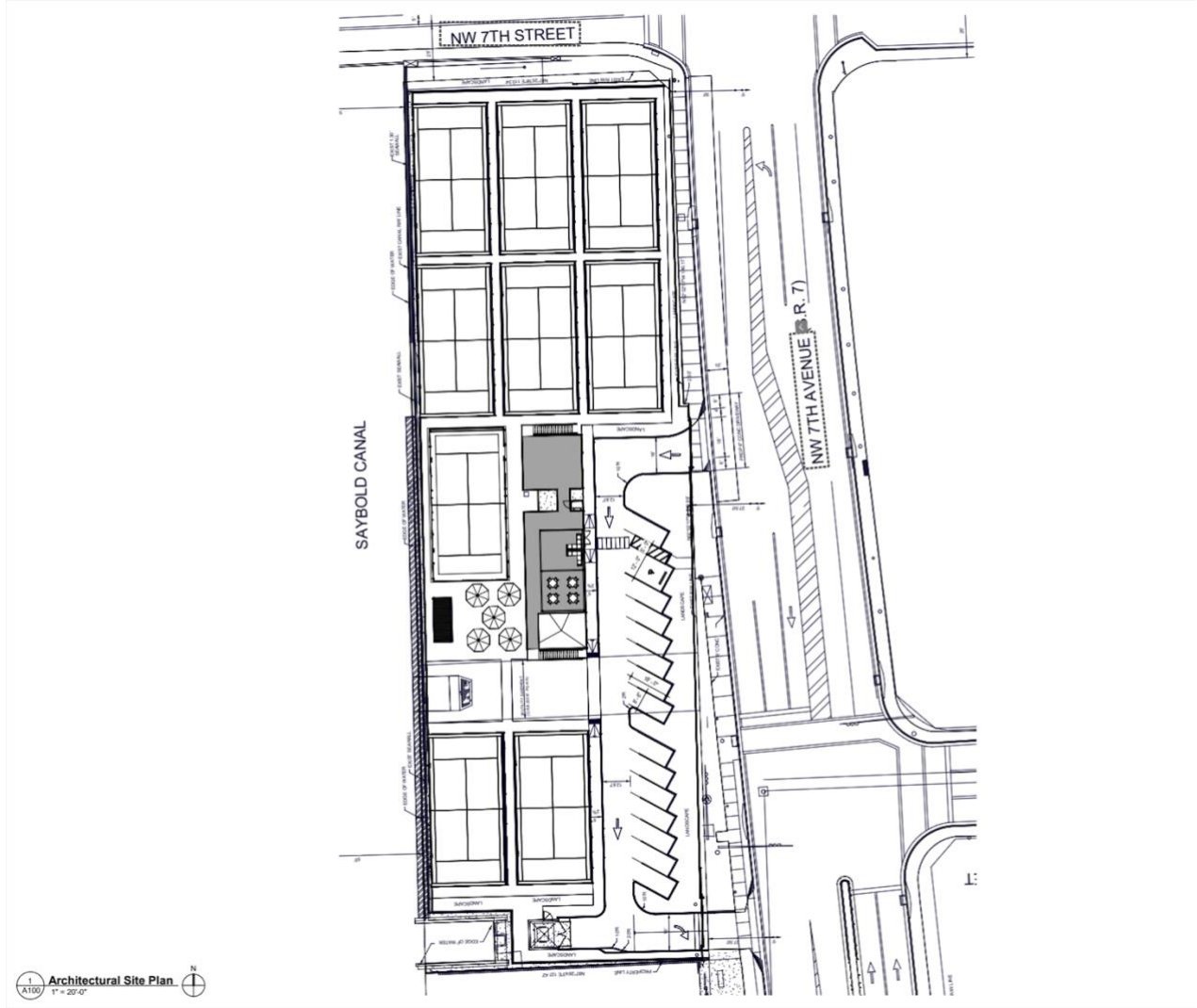
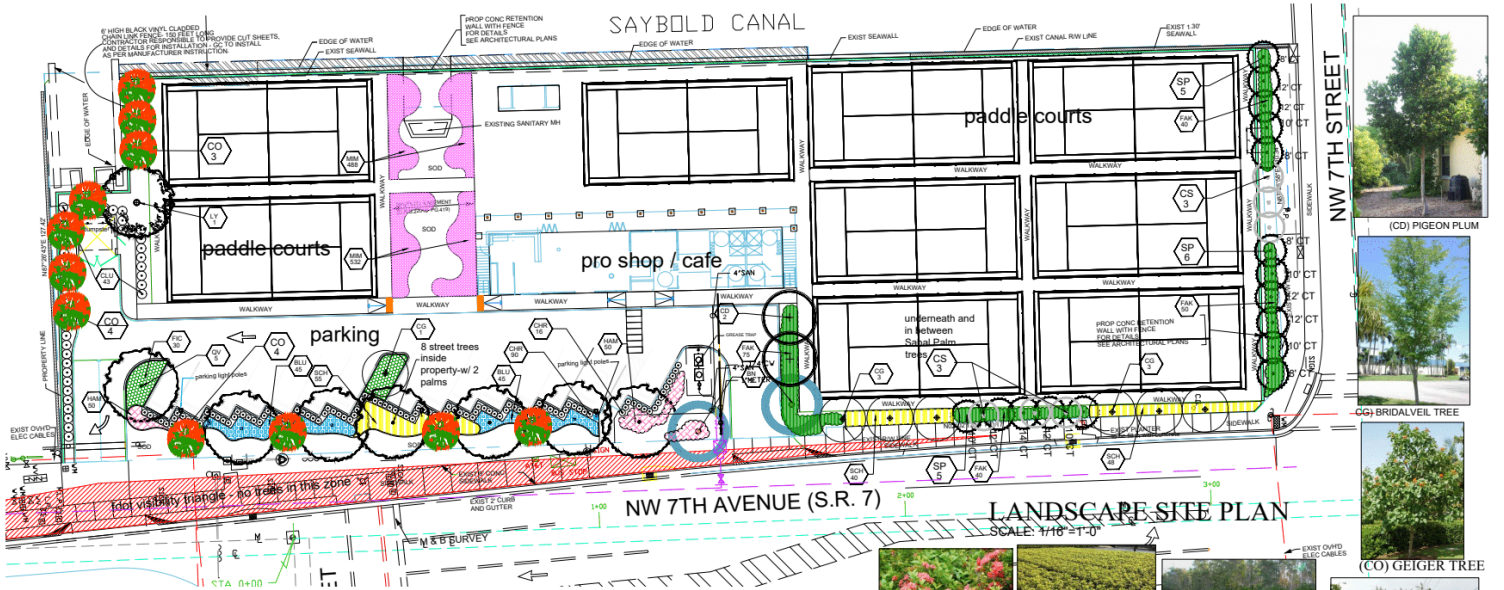






Exhibit C – Landscape Plan



PADDEL BALL COURT 42 PLANT LIST						
KEY SHEET	QUANT.	BOTANICAL NAMES/ COMMON NAMES	HGT	SPR	CALIPER	NATIVE
<b>NATIVE TREES AND PALMS</b>						
CS	6	Conocarpus e. "SERICEUS" / Silver Buttonwood Tree - Native	10'	5'	2"	YES
CD	2	Coccoloba diversifolia / Pidgeon Plum Tree	12'	5'	2"	YES
CO	11	Cordia sebestena / Orange Geiger Tree	12'	5'	2"	YES
LY	1	Lycium latifolium / False Wild Tamarind	14'	5'	3"	YES
QV	7	Quercus virginiana "CATHEDRAL" / "CATHEDRAL" Live Oak	14'	8'	4"	YES
SP	16	Sabal palmetto / Cabbage Palm	CT as shown on plan			YES
43	<b>TOTAL</b>					
<b>NON-NATIVE TREES</b>						
BN	2	Bismarkia nobilis / Bismarkia palm	18' OA		8' CT	
CG	7	Caesalpinia granadillo / Bridalveil Tree	12'	5'	2"	
9	<b>TOTAL</b>					
52	<b>TOTAL TREES AND PALMS-43% NATIVES</b>					
<b>SHRUB PLANT LIST</b>						
KEY SHEET	QUANT.	BOTANICAL NAMES/ COMMON NAMES	HGT	SPR	Spacing	NATIVE
<b>NATIVE PLANTS - SHRUBS AND GROUND COVERS</b>						
BLU	90	Iris virginica / Blue Flag Iris	12"	6"	18" oc	YES
CHR	106	Chrysobalanus icaco "RED TIP" / "RED TIP" Cocoplum	24"	24"	30"	YES
CLU	43	Clusia rosea / Pitch Apple	30"	24"	30"	YES
FAK	205	Tripsaculum dactyloides / Fakahatchee Grass	24"	24"	30"	YES
HAM	109	Hamelia patens / Firebush	20"	20"	30"	YES
544	<b>TOTAL NATIVES</b>					
<b>NON-NATIVE SHRUBS - DROUGHT TOLERANT</b>						
FIC	60	Ficus microcarpa "Green Island" / Green Island Ficus	18"	18"	24"	
IXO	240	Ixora NORA GRANT / Large Pink Ixora	18"	18"	24"	
SCH	143	Schefflera arborescens "GOLD CAPPELLA" Dwarf Schefflers GOLD CAPELLA	18"	18"	24"	
443	<b>NON NATIVES</b>					
987	<b>TOTAL COMBINE SHRUBS = 987 SHRUBS = 54% NATIVES VS NON-NATIVES</b>					
<b>Ground Covers</b>						
MIM	1020	Mimosa strigillosa / Sunshine Mimosa	12"	12"	18" oc	YES

**LANDSCAPE LEGEND**

Transsect Zone: D1 Lot Area: 47,152 SF Acres: 1.08  
 THIS IS FOR A TEMPORARY PERMIT 27,152 SF (1.08 ACRES)  
 Folio number: 1-3135-027-1400

**OPEN SPACE**

A. Square feet of required Open Space, as indicated on site plan:  
 Lot Area = 47,152 s.f. x .3% = 2357.6 SF 34,721 SF

B. Square feet of parking lot open space required by Article 9, as indicated on site plan:  
 Number of parking spaces = 14 x 10 s.f. per parking space = 140 140

C. Total square feet of landscaped open space required: A+B = 2497 SF 34,861 SF

**LANDSCAPE CALCULATION**

A. Square feet of landscaped open space required by Miami21:  
 2357.6 SF 34,861 SF

B. Maximum lawn area (sod) permitted = 20 % x 2357.6 s.f. = 471 SF 457 SF

**TREES**

A. Number of trees required per net lot acre, less existing number of trees meeting minimum requirements = 28 trees x 1.08 net lot acres = 31 44

B. % Palms allowed: Number of Palm trees provided x 30% = 7 18

C. % Natives required: Number of trees provided x 30% = 7 30 (79%)

D. % Drought tolerant and low maintenance: Number of trees provided x 20% = 1 39 (100%)

E. Street Trees (maximum average spacing of 30' o.c.): This is an FDOT Road - 350' linear feet along street / 30' = 18 18

F. Palms permitted to count towards street trees on 1:1 basis x 30%: 7 2

G. Street trees located directly beneath power lines: (maximum average spacing of 25' o.c.) - 0' linear feet along street / 25' = 2 4

**SHRUBS**

A. Number of shrubs required: Number of trees required x 10 = 50 252

B. % Native shrubs required: Number of shrubs provided x 30% = 15 138 (56%)

C. % Drought tolerant and low maintenance required: Number of shrubs provided x 20% = 10 252 (100%)



Know what Call us IT'S TI VALLEY  
 Mariano C  
 Miami, Flo  
 Mariano C  
 Landscap  
 Architect  
 2023.03.3  
 11:45:31-C

PROJECT PROGRESS  
 PROJECT NUMBER:

Exhibit D – Electrical Plan

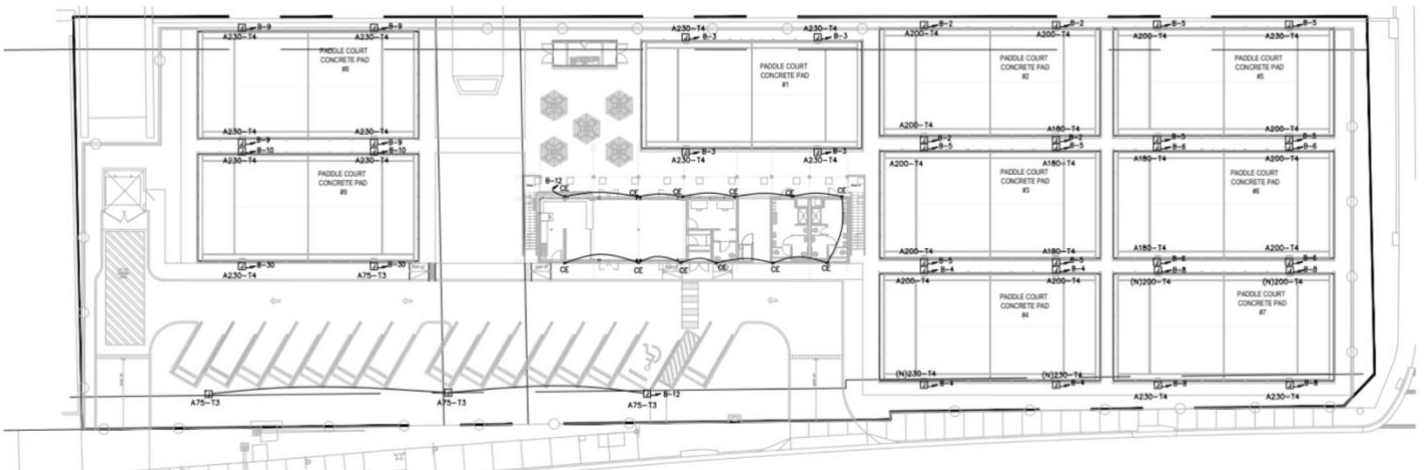
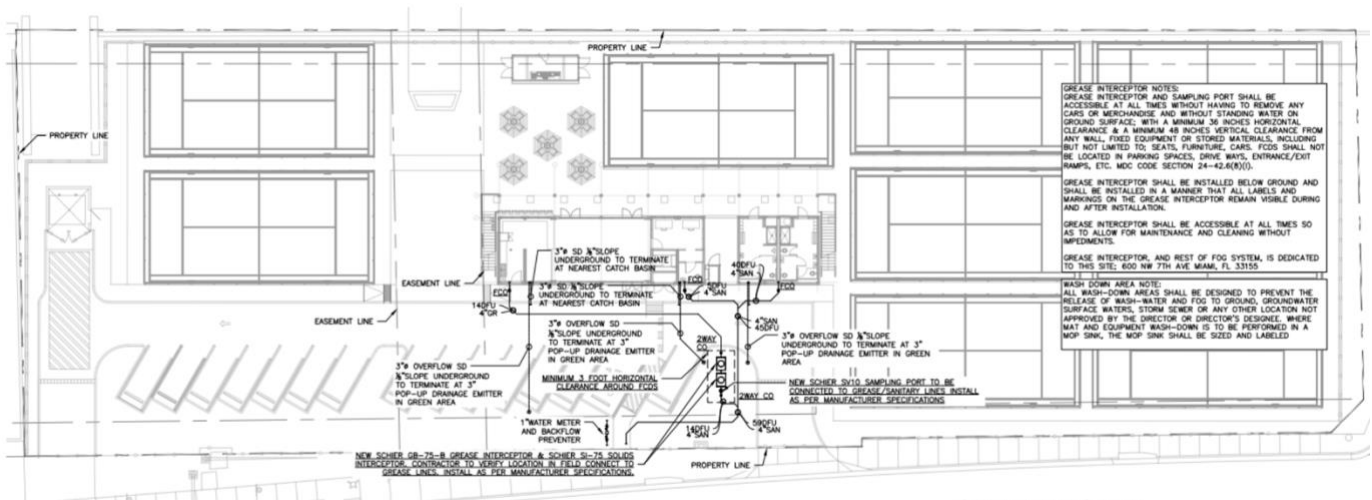




Exhibit E – Water Plan



**GREASE INTERCEPTOR NOTES:**  
 GREASE INTERCEPTOR AND SAMPLING PORT SHALL BE ACCESSIBLE AT ALL TIMES WITHOUT HAVING TO REMOVE ANY CARS OR MERCHANDISE AND WITHOUT STANDING WATER ON GROUND SURFACE. WITH A MINIMUM 36 INCHES HORIZONTAL CLEARANCE & A MINIMUM 48 INCHES VERTICAL CLEARANCE FROM ANY WALL, FIXED EQUIPMENT OR STORED MATERIALS, INCLUDING BUT NOT LIMITED TO: SEATS, FURNITURE, CARS. FGDs SHALL NOT BE LOCATED IN PARKING SPACES, DRIVE WAYS, ENTRANCE/EXIT RAMP, ETC. MDC CODE SECTION 24-42.6(R)(1).

GREASE INTERCEPTOR SHALL BE INSTALLED BELOW GROUND AND SHALL BE INSTALLED IN A MANNER THAT ALL LABELS AND MARKINGS ON THE GREASE INTERCEPTOR REMAIN VISIBLE DURING AND AFTER INSTALLATION.

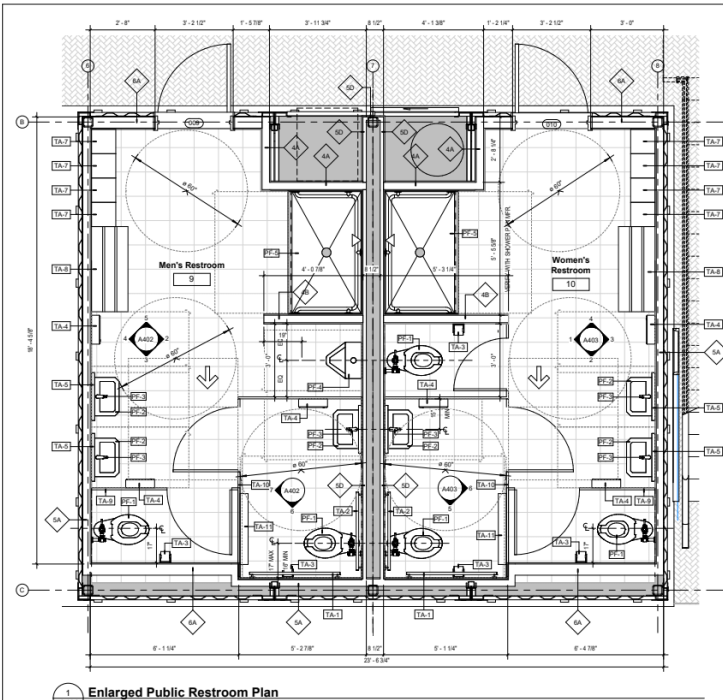
GREASE INTERCEPTOR SHALL BE ACCESSIBLE AT ALL TIMES SO AS TO ALLOW FOR MAINTENANCE AND CLEANING WITHOUT IMPEDIMENTS.

GREASE INTERCEPTOR AND REST OF FGD SYSTEM, IS DEDICATED TO THIS SITE, 600 NW 7TH AVE MIAMI, FL 33155

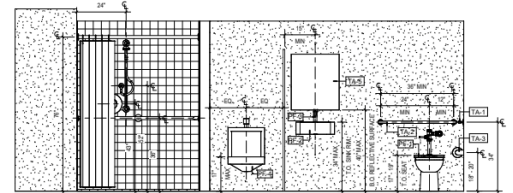
**WASH-DOWN AREA NOTE:**  
 ALL WASH-DOWN AREAS SHALL BE DESIGNED TO PREVENT THE RELEASE OF WASH-WATER AND FOG TO GROUND, GROUNDWATER SURFACE WATERS, STORM SEWER OR ANY OTHER LOCATION NOT APPROVED BY THE DIRECTOR OR DIRECTOR'S DESIGNEE. WHERE MAT AND EQUIPMENT WASH-DOWN IS TO BE PERFORMED IN A MOP SINK, THE MOP SINK SHALL BE SIZED AND LABELED

**SITE PLUMBING PLAN**

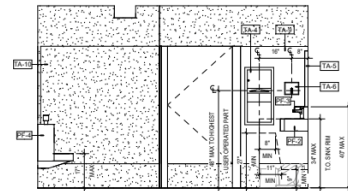
Exhibit I - Restrooms



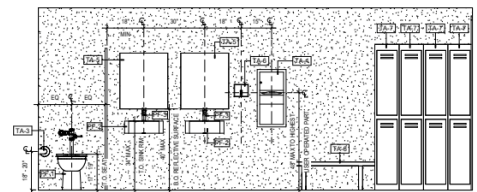
**1 Enlarged Public Restroom Plan**  
 1/2" = 1'-0"



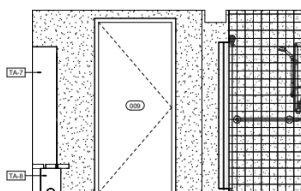
**2 Interior Elevation**  
 1/2" = 1'-0"



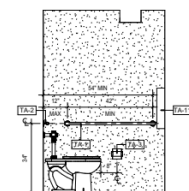
**3 Interior Elevation**  
 1/2" = 1'-0"



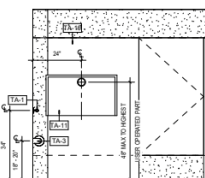
**4 Interior Elevation**  
 1/2" = 1'-0"



**5 Interior Elevation**  
 1/2" = 1'-0"



**6 Interior Elevation**  
 1/2" = 1'-0"



**7 Interior Elevation**  
 1/2" = 1'-0"

PLUMBING FIXTURES SCHEDULE	
Mark	Type
PF-1	FLOOR MOUNTED TOILET
PF-2	HC SINK - ADA
PF-3	HC FAUCET - ADA
PF-4	URINAL
PF-5	HC ROLL-IN SHOWER STALL
PF-6	THREE COMPARTMENT SINK
PF-7	MOP SINK
PF-8	MOP SINK FAUCET
PF-9	FLOOR DRAIN

SPECIALTY EQUIPMENT SCHEDULE	
Mark	Type
TA-1	42" GRAB BAR
TA-2	36" GRAB BAR
TA-3	TOILET TISSUE DISPENSER
TA-4	PAPER TOWEL DISPENSER & WASTE RECEPTACLE
TA-5	MIRROR
TA-6	SOAP DISPENSER
TA-7	LOCKER
TA-8	BENCH
TA-9	TOILET STALL
TA-10	TOILET STALL - ADA
TA-11	BABY CHANGING STATION
TA-12	REFRIGERATOR

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**PORTS, AVIATIONAND RELATED FACILITIES**

**Goal PA-1 Port of Miami**

**Ensure that the development and expansion of Miami-Dade County's Port of Miami is compatible with and furthers the physical development of Miami's greater downtown area while mitigating negative impacts to neighborhoods, yet protecting the Port's economic function, operation, and potential improvements.**

**Objective PA-1.1**

**The City of Miami, through its land development regulations, shall coordinate land use in areas of the city adjacent to the Port of Miami with the transportation related activity which occurs within the port to ensure compatibility and complementary land uses and activities while mitigating negative impacts to neighborhoods, yet protecting the Port's economic function, operation, and potential improvements.**

**Policy PA-1.1.1**

The City of Miami shall, through its land development regulations, encourage facility improvement which will further both the land development, coastal management and conservation goals and objectives of the City of Miami and the port development goals of Miami-Dade County and the Port of Miami.

**Policy PA-1.1.2**

The City shall, through its land development regulations, encourage the availability of an adequate amount of commercial and industrial land to complement planned expansions of port activity, and will establish a "free trade zone" within adequate proximity to the Port of Miami.

**Policy PA-1.1.3**

All surface transportation improvements providing access to the Port must be compatible with the needs, goals and objectives of the City of Miami as related to the development of the greater downtown area, and such improvements will be financed with an appropriate share of County, state and federal funds.



40 Policy PA-1.1.4

41 The Port shall prepare guidelines that will serve as design criteria for the construction, renovation and  
42 landscaping of its facilities and such guidelines must comply with all City of Miami Code requirements.

43  
44  
45  
46 Policy PA-1.1.5

47 The City shall, through its land development regulations, cooperate with Miami-Dade County and its Port of  
48 Miami operation to mitigate adverse structural and non-structural impacts from the Port of Miami upon  
49 adjacent natural resources and land uses.

50  
51  
52  
53 Policy PA-1.1.6

54 The City shall, through its land development regulations, cooperate with Miami-Dade County and its Port of  
55 Miami operation to protect and conserve natural resources.

56  
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58  
59 Goal PA-2 Miami International Airport

60 **Ensure that the development and expansion of Miami-Dade County's Miami International Airport is**  
61 **compatible with and furthers the physical development of the City of Miami.**

62  
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64  
65 Objective PA-2.1

66 **The City of Miami, through its land development regulations, shall coordinate land use in areas of the city**  
67 **adjacent to Miami International Airport with the transportation related activity which occurs within that**  
68 **facility to ensure compatible and complimentary land uses and activities. Through such land**  
69 **development regulations, the City will mitigate negative impacts to neighborhoods that might result from**  
70 **airport activities, while protecting the airport's economic function, operation, and potential**  
71 **improvements.**

72  
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75 Policy PA-2.1.1

76 The City of Miami shall, through its land development regulations, encourage facility improvement which will  
77 further both the land development, coastal management and conservation goals and objectives of the City of  
78 Miami and the development goals of Miami-Dade County and Miami International Airport.

79

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82 Policy PA-2.1.2

83 All surface transportation improvements providing access to Miami International Airport and

84 impacting ~~upon~~ transportation within the City of Miami must be compatible with the needs, goals and

85 objectives of the City and such improvements will be financed with the appropriate share of County,

86 state and federal funds.

87

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90 Policy PA-2.1.3

91 The City shall, through its land development regulations, ensure that zoning within the city

92 protects existing aviation flight paths.

93 **Port of Miami River Sub-Element**

94

95 Goal PA-3 Port of Miami River Sub-Element

96 **The Port of Miami River<sup>1</sup> shall be encouraged to continue operation as a valued and economically**  
97 **viable component of the City's maritime industrial base.**

98

99

100

101 <sup>1</sup>The "Port of Miami River" is a shallow draft riverine port consisting of independent, privately-owned  
102 small shipping companies, fisheries, vessel repair facilities marinas and other Recreational and  
103 Commercial Working Waterfront uses, as defined in Ch. 342.07, F.S., located along the banks of the  
104 Miami River and its tributaries and canals where Working Waterfront uses are located. The Port of  
105 Miami River is not a deepwater port as defined in Ch. 403.021(9), F.S. The Port of Miami River extends  
106 from the salinity dam in unincorporated Miami-Dade County to Biscayne Bay in the City of Miami, as  
107 identified in Appendix PA- 1.

108

109

110

111 Objective PA-3.1

112 **(PLANNING AND ZONING). The City shall protect the Port of Miami River from encroachment by**  
113 **non water-dependent or non water-related land uses, and shall regulate the Port of Miami River's**  
114 **expansion and redevelopment in coordination with applicable future land use and coastal**  
115 **management goals, objectives, policies (See Policy LU-1.3.3 and Goal CM-3).**

116

117

118

119 Policy PA-3.1.1

120 The City shall maintain a Working Waterfront Table of Properties to guide future development within  
121 the Miami River Corridor. The Table shall clearly depict the location and description of all  
122 properties of recreational and commercial working waterfront uses on the River, as defined in Ch.  
123 342.07 F.S. (hereinafter referenced as the "Working Waterfront"). The Table shall classify working  
124 waterfront properties into Categories "A" and "B". The Table shall be incorporated as supporting data  
125 and analysis within Appendix PA-1.

126

127

128

129 Policy PA-3.1.2

130 Category A

131 The City may adopt a comprehensive plan future land use map (FLUM) amendment for properties  
132 designated "Industrial" on the FLUM, along the Miami River only if the proposed amendment  
133 complies with this sub-element. The future land use designation for any of the properties identified  
134 "Industrial" therein may be amended only through the ~~large-scale~~ expedited state review  
135 comprehensive plan amendment process. Applications for such amendments shall demonstrate  
136 that either of the following conditions exists:

137



- 138 1. The Development – redevelopment as industrial is not economically feasible based on a market  
139 and site analysis using a professionally acceptable methodology that has been peer reviewed by  
140 a reviewer selected by the Planning Department; or  
141 2. The Proposal includes an equivalent transfer or expansion of industrially designated property offsite  
142 to another location on the Miami River within the City of Miami.

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Policy PA-3.1.3  
Category B

148 All Category “B” properties shall maintain a working waterfront use. Additionally, the City shall require  
149 that any residential development with a density greater than duplex residential or any mixed use  
150 development include Working Waterfront use component per Ch. 342.07, F.S. or other amenities that is  
151 accessible to the public which promotes the enjoyment of the Miami River unless prohibited by the  
152 Miami-Dade Department of Environmental Resource Management (DERM).

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155

Policy PA-3.1.4

156 The City shall encourage the establishment and maintenance of Working Waterfront uses along the  
157 banks of the Miami River, and to discourage encroachment by incompatible uses.

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Policy PA-3.1.5

163 The City shall encourage the development and expansion of the Port of Miami River Working  
164 Waterfront consistent with the future land use, coastal management and conservation elements of the  
165 City’s comprehensive plan.

166  
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168

Policy PA-3.1.6

169 The City shall encourage only those developments, rezoning, and land use amendments in the vicinity  
170 of the Working Waterfront lands designated “Industrial” on the adopted future land use map that are  
171 compatible and suitable with the existing “Industrial” use of property.

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Policy PA-3.1.7

176 The City shall, through its land development regulations, adopt and enforce appropriate setbacks and  
177 buffering requirements for Non-Working Waterfront properties along the Miami River in order to  
178 protect the existing Working Waterfront use from encroachment of incompatible and unsuitable  
179 uses.  
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Policy PA-3.1.8

185 There shall be no net loss of recreational wet-slips along the Miami River.

186

187

188

189 Policy PA-3.1.9

190 The City shall require from new residential development and redevelopment located along the Miami  
191 River a recorded covenant acknowledging and accepting the presence of the existing Working  
192 Waterfront 24-hour operations as permitted.

193

194 Policy PA-3.1.10

195 In its commitment to support the Port of Miami River, the City of Miami shall continue its support of  
196 the dredging of the River.

197

198

199 Policy PA-3.1.11

200 The City of Miami shall facilitate and expedite municipal permitting for water-dependent, water-  
201 related, commercial, industrial and recreational working waterfronts along the Miami River by  
202 expediting the application process for such uses.

203

204

205 Objective PA-3.2

206 **(TRANSPORTATION). The City shall encourage with appropriate agencies the coordination of**  
207 **surface transportation access to the Port of Miami River Working Waterfront with the traffic and**  
208 **masstransit system shown on the traffic circulation map series.**

209

210

211

212 Policy PA-3.2.1

213 The City shall through the Transportation Element of the comprehensive plan, encourage the  
214 coordination of the intermodal surface and water transportation access service to the Port of Miami  
215 River Working Waterfront (See Policy TR-2.2.12 and ~~Policy IC-2.1.30~~).

216

217 Objective PA-3.3

218 **(ECONOMIC DEVELOPMENT & COORDINATION). The City shall coordinate its Port of Miami**  
219 **River Working Waterfront planning activities with the multiple regulators and stakeholders who**  
220 **have an interest in the Miami River.**

221

222

223

224 Policy PA-3.3.1

225 Give the Miami River's multi jurisdictional and regulatory nature, the City shall coordinate with:

226

227 1. The United States Army Corp of Engineers regarding the dredging, navigation, and commerce on  
228 the Miami River; and

229 2. The United States Coast Guard regarding security and safety on the Miami river; and

230 3. The Miami-Dade County Planning Department to evaluate the interdependence and effectiveness  
231 of the County's Port of Miami River sub-element in its comprehensive plan with that of that of the

- 232 City's; and
- 233 4. The Miami-Dade County's Department of Environmental Resource Management ~~and the~~
- 234 ~~Manatee Protection Plan Committee~~ regarding the protection of manatees and establishment of
- 235 new wet and dry marine slips on or near the Miami River; and
- 236 5. The Miami-Dade County Property Appraiser to ensure that all Port of Miami River Working
- 237 Waterfront properties are assessed by the "current use" pursuant to Section 4, Article VII of the
- 238 Florida constitution and S.193.704, Fla. Stat.

239  
240  
241

242 Policy PA-3.3.2

243 The City shall remain an active member of the Miami River Commission, as established by Ch.163.06,

244 F.S. and shall continue to request and consider from the Miami River Commission written

245 recommendations related to policy, planning, development and other River issues within the scope

246 established by the Florida Legislature.

247  
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250 Policy PA-3.3.3

251 Within 18 months of adoption of this policy, the City shall consider approving a joint planning agreement

252 with the Miami River Commission and Miami-Dade County to revise and adopt the "Miami River Corridor

253 Urban Infill Plan" as the strategic plan for the Miami River.

254  
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257  
258 Policy PA-3.3.4

259 Within three years of the adoption of this policy, the City along with Miami River stakeholders,

260 property owners and businesses shall consider submitting an application to the Florida Department of

261 ~~Community Affairs~~ Economic Opportunity, Waterfronts Florida Partnership Program, for

262 assistance in protecting and promoting the Miami River traditional Working Waterfront.

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266 Policy PA-3.3.5

267 The City shall coordinate with Miami River stakeholders, property owners and businesses to

268 prepare reasonable Working Waterfront code compliance and enforcement policies to eliminate

269 unsafe, abandoned, and blighted conditions along the river banks.

270  
271  
272

273 Policy PA-3.3.6

274 The City of Miami shall provide technical assistance to Working Waterfront businesses along the

275 Miami River.

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278



## 279 Policy PA-3.3.7

280 The City shall work to improve the economic vitality of the Miami River in cooperation with other  
281 concerned public and governmental agencies and organizations. (See Miami-Dade County's  
282 Comprehensive Development Master Plan, Port of Miami River Sub-element Policy PMR-1C)

283

284

285 ~~Policy PA-3.3.8~~

286 ~~The City will work with property owners along the Miami River to secure Enterprise Zone tax  
287 incentives to businesses for creation of jobs and revitalization. Such incentives consist of the  
288 following and are based on availability:~~

289

290 ~~Enterprise Zone Incentives~~

291

292 ~~1. Jobs Tax Credit~~293 ~~2. Business Equipment Sales Tax Refund~~294 ~~3. Building Materials Sales Tax Refund~~295 ~~4. Property Tax Credit~~296 ~~5. Community Contribution Tax Credit Program~~

297

298

299

300 ~~Policy PA-3.3.9~~

301 ~~The City will continue to use Brownfield redevelopment Area strategies to stimulate  
302 economic revitalization to Working Waterfronts. Such incentives consist of the following and  
303 are based on availability:~~

304

305

306 ~~a. Financial Incentives~~307 ~~i. 35% Voluntary Cleanup Tax Credits~~308 ~~ii. \$2500 Brownfields Bonus Refund~~309 ~~iii. Low-interest loans~~310 ~~iv. Sales Tax Credit on Building Materials~~311 ~~v. Up to 5 years of State Loan Guarantees of Loan Loss Reserves~~312 ~~vi. Site-Specific Activities Grant, and National Brownfields Assessment, Revolving Loan Fund,~~

~~Cleanup Grants, and HUD Brownfield Economic Development Loans~~

313

314 ~~b. Regulatory Benefits~~315 ~~i. Risk Based Corrective Action~~316 ~~ii. Cleanup Liability Protection~~317 ~~iii. Review of Voluntary Cleanup Projects at FDEP Conducted Separately From~~

~~Enforcement Mandated Cleanups by Responsible Parties~~

318 ~~iv. Expedited Review and Response to Technical Reports and Correspondence~~319 ~~v. CERCLA Site Clearance Issued by EPA, and~~320 ~~vi. Lender Liability Protection to the extent allowed by applicable laws~~

321

322

323

324 ~~Policy PA-3.3.10~~

325 ~~The City will continue to use various economic strategies, such as the City's Enterprise Zone,~~  
326 ~~Empowerment Zone, Commercial Business Corridors, and Brownfield Redevelopment Area~~  
327 ~~strategies, or future/successor economic incentives to stimulate economic revitalization, and~~

328 encourage employment opportunities within the Port of Miami River. (Policy LU-1.3.7.).

329

330 Policy PA-3.3.104

331 The City will foster or develop and implement job training, vocational, and educational programs to  
332 assist the City's existing and future residents, and water dependent and water related businesses along  
333 the Miami River, in achieving economic self-sufficiency, and will continue to work with appropriate State  
334 and County agencies to direct training programs and other technical assistance to support minority and  
335 semi- skilled residents of the City including, without limitation, their involvement in recreational and  
336 commercial working waterfronts along the Miami River as defined by Ch.342.07, F.S. (Policy LU-1.3.8.)

337

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340 Policy PA-3.3.112

341 The City, through its Intergovernmental Coordination Policies, shall support and coordinate with  
342 other governmental agencies having jurisdiction over the River to support and enhance the Miami  
343 River's economic importance and viability. The functions of the Miami River shall be consistent with  
344 the future goals and objectives of the City's Comprehensive Plan, particularly with respect to  
345 the unique characteristics of the Miami River's location and its economic position and functioning  
346 within the local maritime industry.

347

348

349

350 Objective PA-3.4

351 **(MONITORING & EFFECTIVENESS). The City shall monitor track the effectiveness of its goals,**  
352 **objectives, and policies designated to preserve and promote the Port of Miami River as a valued**  
353 **and economically viable component of the City's maritime industrial base.**

354

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357 Policy PA-3.4.1

358 ~~City staff shall prepare, or cause to be prepared, an annual report on the status of the Planning and~~  
359 ~~Zoning, Economic Development and Coordination, and Transportation Objectives and Policies~~  
360 ~~contained in this Sub-element, which shall be presented to the City Commission at a dully noticed~~  
361 ~~public hearing.~~

362

363

364

365 Policy PA-3.4.2

366 ~~City staff shall prepare, or cause to be prepared, an annual report on the loss or gain of recreational~~  
367 ~~and commercial Working Waterfront lands and uses, which shall be presented to the City~~  
368 ~~Commission at a dully noticed public hearing.~~

369

370 Policy PA-3.4.1 City staff shall prepare, or cause to be prepared, a report on the loss or gain of  
371 recreational and commercial Working Waterfront lands and uses to be presented to the City  
372 Commission at a dully noticed public hearing within one (1) year of adoption of this policy, and in  
373 seven (7) year increments thereafter.

To: Miami River Commission  
From: Sue Trone, Chief of Comprehensive Planning  
Date: July 10, 2023  
RE: Proposed amendments to the Miami River Sub-Element of the Miami Comprehensive Neighborhood Plan (MCNP) as part of the evaluation and appraisal review (EAR)-based amendments to the comprehensive plan

Dear Director,

The City of Miami notified the Department of Economic Opportunity (DEO) that updates to the Miami Comprehensive Neighborhood Plan (MCNP) are required through the evaluation and appraisal review (EAR)-based process. The Florida Administrative Code established that this information was due to the DEO no later than November 1, 2022. To comply with all state requirements, the City submitted this information on October 31, 2022.

### **Public Outreach**

The Planning Department has been conducting public outreach in various parts of the city to solicit feedback from residents. Meetings held so far include:

- May 23 @ West End Park
- May 31 @ Shenandoah Park
- June 6 @ Hadley Park
- June 13 on Zoom
- June 26 @ Virrick Park

The Planning Department has presented this effort to the Climate Resilience Committee and asked members to provide feedback. We anticipate the opportunity to work with the public in District 1 in July.

### **Updates Relative to the Miami River Sub-Element**

Given the effort that went into the most recent update to the Miami River Sub-Element, adopted in 2010, little change is recommended at this time. The Planning Department has provided some updates that primarily address outdated information. This is to say, the updates offered recommend striking some information because some information is no longer relevant. Policies that tie to other elements for internal consistency within the MCNP are flagged below for ease of review.

A summary of the proposed amendments follows:

1. Line 84: Correction of a typo. (This is not part of the Port of Miami River Sub-Element)

2. Line 119: Objective PA-3.1: This objective references Policy LU-1.3.3 and Goal CM-3. These are listed here:

***Policy LU-1.3.3***

*Pursuant to Ch.163.3177(6)(a),F.S., the City shall maintain regulatory incentives and criteria that encourage the preservation of recreational and commercial Working Waterfronts as defined in Ch.342.07,F.S., particularly in the “Port of Miami River” Subelement to guide future development within the Miami River Corridor.*

*Pursuant to Ch.163.3177(6)(a),F.S., the City shall maintain regulatory incentives and criteria that encourage the preservation of recreational and commercial Working Waterfronts as defined in Ch.342.07,F.S., particularly in the “Port of Miami River” Subelement to guide future development within the Miami River Corridor.*

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***Goal CM-3***

*Pursuant to Section 163.3178(2)(g), F.S., The City will maintain strategies that will be used to preserve and adequate supply of land for recreational and commercial Working Waterfront uses defined in Section 342.07, F.S.1*

3. Line 133: “large scale” is stricken. “expedited state review” is underlined. This is because in 2011 the Florida Legislature replaced the Large Scale amendment process for comprehensive planning with the Expedited State Review process. This is codified in Sec. 163.3184 (3), Florida Statute.
4. Lines 139-140: “by a reviewer selected by the Planning Department” is added text. This text is recommended language to Policy PA-3.1.2 which memorializes the no-net-loss policy for Category A properties within the working waterfront. This proposed language is offered with expectation of creating an arm’s length between the analyst and the reviewer. Moreover, the City’s adopted fees for the the Planning Department recently were amended to charge a separate fee for this service. This is recommended for additional clarity for applicants, stakeholders to working waterfronts, and the City of Miami which is responsible for administering the policy.
5. Line 215: “and Policy IC-2.1.30” is stricken. This policy was repealed in a previous ordinance and this should have been stricken at that time.



6. Lines 260-261: This amendment addresses the outdated reference to the FL Department of Community Affairs (strike out "Community Affairs") and updates it to "Economic Opportunity".
7. Line 285: Policy PA-3.3.8: Strike entire policy. This policy refers to Enterprise Zone tax incentives which no longer exist.
8. Line 300: Renumber Policy PA-3.3.9 to 3.3.8. Strike specific policies to make the policy more generalized and less necessary to update based on state-level changes to Brownfield policies.
9. Line 324: Renumber Policy PA-3.3.10 to 3.3.9. Strike specific policies to make them more generalized.
10. Line 330: Renumber Policy PA-3.3.11 to 3.3.10
11. Line 340: Renumbered
12. Lines 357-368: Strike policies for annual reporting.
13. Line 370: Policy PA-3.4.1: Propose a new policy for monitoring on loss or gain of recreational and commercial Working Waterfront land and uses to be presented to the City Commission at a public hearing and report within one year of adoption and then in seven (7) year increments thereafter.

### **Next Steps**

A legal review will commence later in July. All amendments will be brought to the Planning, Zoning, and Appeals Board (PZAB) on September 6, 2023. City Commission will be asked to vote on the amendments at a proposal hearing (first reading) by October 19, 2023. Transmittal for state coordinated review will commence no later than October 31, 2023.

### **Request**

Request input on proposed updates from the Planning Department regarding the enclosed amendment.

Respectfully,

Sue Trone

# Miami River Commission Urban Infill and Greenways Subcommittee

## Public Meeting

June 16, 2023 - ~~10 AM~~ 1 PM

1407 NW 7 ST, Larger Boardroom (facing Miami River)

Name	Organization	Telephone	Email
Brett Bibeau	MRC	305 644 0544	brettbibeau@miami rivercommission.org
ofc. Scot Russell	MPD	954-729-1981	43718@miami-police.org
ofc. Miguel Sarmiento	MPD		45387@miami-police.org
DAVID HARDEN	MOSAD	305-629-2100	DAVIDHARDEN@miami -com
SUB TRONE	CITY OF MIAMI	305-416-1445	strone @miamigov. com
ofc. Alexia Maguffey	MPD	305 603 6991	43102@miami-police .org
Jim Murley	009/MDA	305 968 4881	James.Murley@ Miamiwater.com
Megan Kelly	MRC	305 365 6559	megan.kelly@gmail
Eileen Broton	MRC & SGCA	305-790-4284	Eileen.Broton@ peelsoa.com



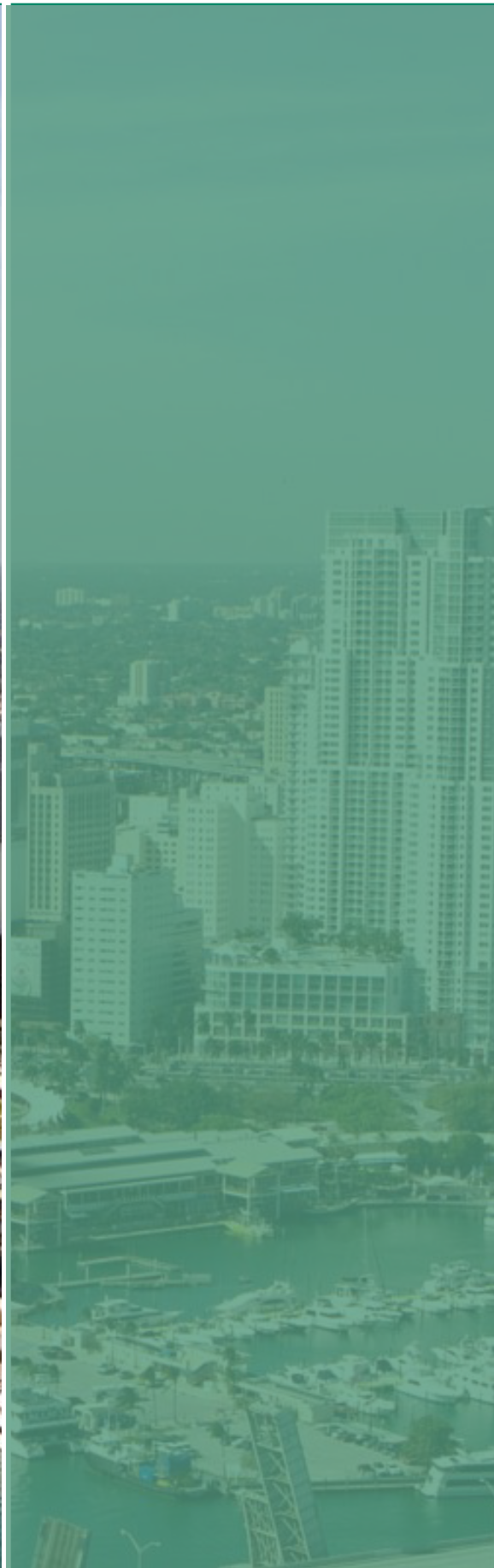


# CITY OF MIAMI

## RESILIENT WATERFRONT ENHANCEMENT PLAN









# TABLE OF CONTENTS

<b>CHAPTER 1: INTRODUCTION</b> . . . . .	<b>6</b>
1.1 Project Overview and Purpose .....	8
1.2 Conceptual Approach .....	10
1.3 Report Organization .....	12
1.4 Stakeholder Engagement .....	13
<b>CHAPTER 2: SETTING AND CONTEXT</b> . . . . .	<b>14</b>
2.1 History of Living with Water .....	16
2.2 Existing Policies, Studies, and Design Guidance .....	17
2.3 Existing Water Conditions .....	20
2.4 Observed and Projected Sea-level rise.....	21
2.5 Waterfront Characteristics and Vulnerable Shorelines .....	23
2.6 Pilot Sites .....	27
<b>CHAPTER 3: BUILDING RESILIENCE WITH NATURE-BASED SOLUTIONS</b>	<b>36</b>
3.1 Guiding Principles .....	38
3.2 Strategy Menu Development and Prioritization.....	39
<b>CHAPTER 4: DESIGN ALTERNATIVES</b> . . . . .	<b>44</b>
4.1 Typology 1: End-of-road on the Riverfront .....	46
4.2 Typology 2: End-of-road on the Bayfront .....	50
4.3 Typology 3: Park on the Riverfront .....	54
4.4 Typology 4: Park on the Bayfront .....	58
4.5 Cost/Benefit Evaluation of Design Typologies .....	65
<b>CHAPTER 5: PERMITTING REQUIREMENTS</b> . . . . .	<b>76</b>
5.1 Regulatory and Permitting Requirements .....	78
5.2 Agency Meetings .....	94
5.3 Summary of Design Considerations .....	98
<b>CHAPTER 6: IMPLEMENTATION STRATEGIES</b> . . . . .	<b>100</b>
6.1 Summary of Strategies .....	102
6.2 Conclusion .....	109
<b>CHAPTER 7: REFERENCES</b> . . . . .	<b>110</b>





# ACKNOWLEDGMENTS

**Francis Suarez**  
Mayor

## Board Of City Commissioners

**Alex Diaz de la Portilla**  
District 1

**Sabina Covo**  
District 2

**Joe Carollo**  
District 3



**Manolo Reyes**  
District 4

**Christine King**  
District 5

**Arthur Noriega**  
City Manager

**Victoria Mendez**  
City Attorney

**Todd B. Hannon**  
City Clerk

**Nzeribe (Zerry) Ihekwaba, PE, PhD**  
Assistant City Manager / Chief of  
Operations

## Interdepartmental Project Team

Alissa Farina

Timothy Kirby

Ryan Shedd

Michelle Valdes

Keith Ng

Nairobis Perez-Villalobos

Yohermo Echeverria

Diana Herrera

Clara Sidan

## Special Thanks

City of Miami Department Directors

Miami Climate Resilience Committee

The Nature Conservancy

## Consultants

AECOM







Miami's waterfront, bounded by Biscayne Bay and the Miami River, is one of the City's most treasured assets. It is a vibrant setting of parks, walkways, and marinas with a rich history as an entertainment and cultural destination for the City's residents and visitors. In addition to serving as the City's economic and cultural core, the waterfront is also the first line of defense for coastal communities to withstand impacts from coastal storm surge flooding and sea-level rise.

The City's waterfront was developed in context of historic water level conditions. Much of the existing coastal development is located within six feet of existing sea level is now at risk due to sea-level rise. To address ongoing flood vulnerabilities that threaten the City's long-term resilience, the City has developed a Resilient Waterfront Enhancement Plan. This Plan lays out conceptual shoreline enhancement alternatives that will mitigate current and future flood risks while also emphasizing nature-based features that support local ecosystems in the design. The alternatives were designed as prototypes that can easily be expanded or applied to other stretches of the shoreline with similar characteristics. The Plan was designed to supplement the implementation of the City's Waterfront Design Guidelines (Miami21, Appendix B) that will reduce flood impacts from tidal events and storm surge, provide standards for aesthetic cohesion, help the City adapt to sea-level rise over time, and enhance waterfront access.



# CHAPTER 1

## 1.1 Project Overview and Purpose

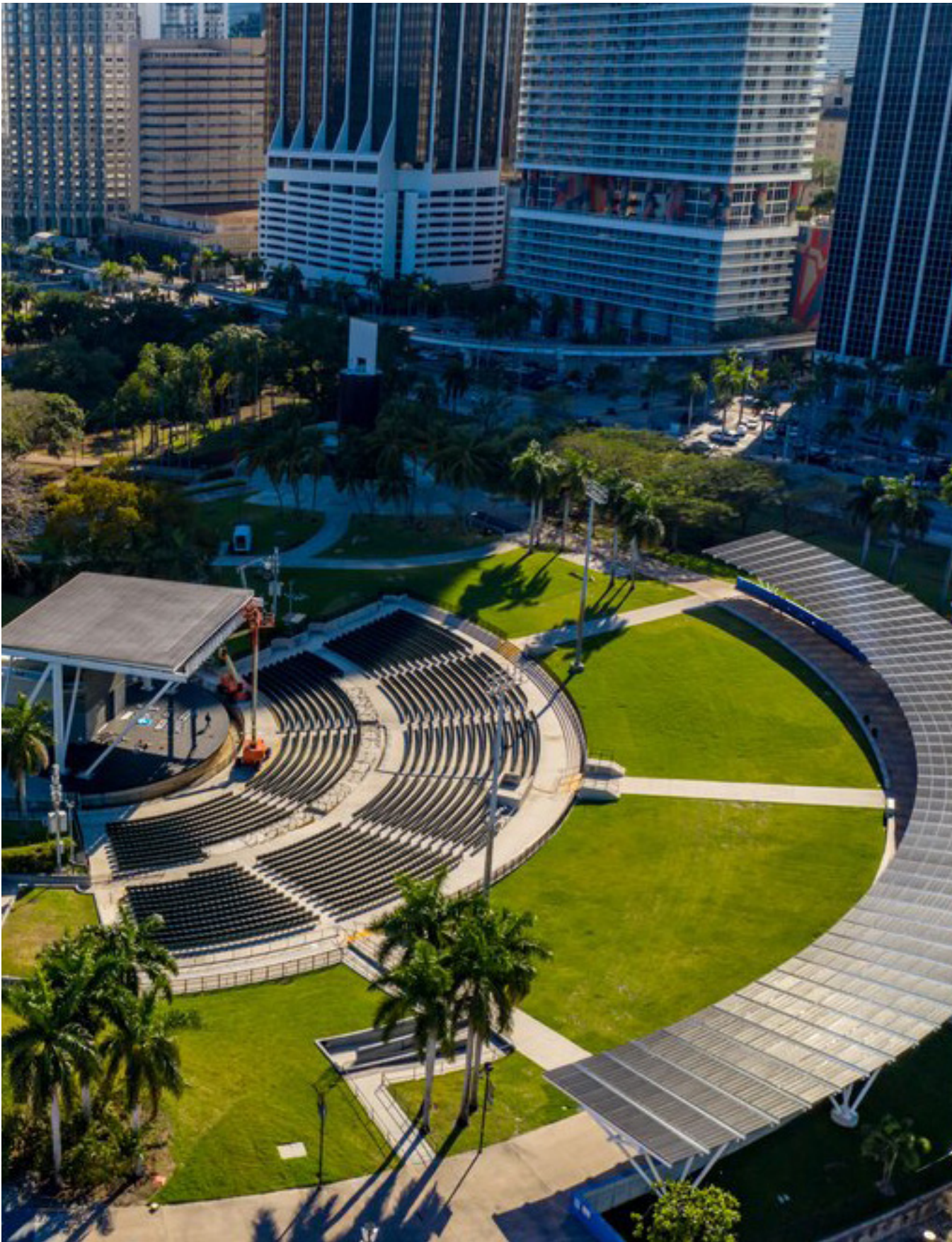
The goal of the Resilient Waterfront Enhancement Plan is to present shoreline enhancement alternatives and provide guidance for the City to finance, procure, design, permit, construct, and maintain a waterfront that emphasizes nature-based design features.

To support this effort, the Plan includes a set of design alternatives that incorporate shoreline enhancement strategies at pilot locations along the waterfront. The pilot sites are representative of four common shoreline typologies across Miami: end-of-road on Riverfront, end-of-road on Bayfront, park on Riverfront, and park on Bayfront. The goal of the design typologies is to provide inspiration and ideas for shoreline enhancement strategies that are applicable and able to be implemented for a range of waterfront settings.

The City experiences common challenges with implementing nature-based projects, including hurdles of permitting concerns and timelines, grant requirements, lack of familiarity and/or maintenance concerns. Through this enhanced waterfront plan, the City aims to address these hurdles and provide easy-to-implement protocols and design criteria.

The Resilient Waterfront Enhancement Plan will also help the City implement “Goal 3” of the Miami Forever Climate Ready Strategy, which aims to reduce the City’s risk of coastal and riverine flooding through a combination of nature-based and structural means.

# INTRODUCTION



INTRODUCTION

# CHAPTER 1

## 1.2 Conceptual Approach

The framework used for the City of Miami's Resilient Waterfront Enhancement Planning process, shown in **Figure 1-1**, is organized around four interdependent themes: Learn, Prioritize, Permit, and Communicate. Each theme is designed to build on one another, creating an actionable plan that includes shoreline enhancement strategies that are innovative yet feasible, anticipates potential permitting hurdles, analyzes key waterfront issues facing the City, and is informed by close inter-agency coordination and engagement with the public.

**Figure 1-1: Resilient Waterfront Enhancement Plan Framework**

### Learn:

#### Data Analysis and Modeling

Development of the plan began with a review of documents, policies, data, and initiatives relevant to waterfront adaptation throughout the City. The goal of this review was to identify common goals, promote alignment with existing projects, and summarize key findings of the City's shoreline flood vulnerability to guide the development of plan.

Chapter 2 describes the learning phase of the project.

### Prioritize:

#### Develop Strategies and Alternatives

Trade-offs and co-benefits were identified for all adaptation concepts. Feedback from the project team was then used to prioritize the features and designs that best suit the City's needs and enhance the overall resilience of the City's waterfront.

Chapters 3 and 4 describe the strategy prioritization and alternative development phase of the project.



## Permit:

### Identify Permitting Design Criteria

To promote strategies that are compliant with regulatory requirements, potential design alternatives were shared with Federal, State and County regulatory agencies for guidance on potential permitting and implementation needs of the waterfront enhancement conceptual designs. Findings from this step were used to develop a comprehensive permitting guide that informs design considerations and serves as the first step in developing an implementation framework.

Chapter 5 describes the permitting exercises completed during this phase of the project.

## Implement:

### Strategies for Implementation

While permitting criteria is a critical step towards implementation, additional strategies for funding, phasing, construction, operations, maintenance, and engagement are necessary for the advancement of the design alternatives. The Interdepartmental Project Team, City Department Directors, and key stakeholders were routinely engaged to help develop and review the implementation strategies.

Chapter 6 describes the implementation phase of the project.



# CHAPTER 1

## 1.3 Report Organization

The plan is organized as follows:

- **Chapter 1 – Introduction:** Provides an overview of the plan scope, purpose, and organization.
- **Chapter 2 – Setting and Context:** Provides a brief history of Miami’s evolving shoreline and waterfront development to set the context for the Plan. Criteria includes discussion of the existing and future water levels along the City’s waterfront and the implications of sea-level rise for the City’s flood vulnerability.
- **Chapter 3 – Building Resilience with Nature-Based Solutions:** Summarizes the development, evaluation, and prioritization of strategies to be considered in waterfront design alternatives.
- **Chapter 4 – Design Typologies:** Describes the development of alternatives and supporting details for each representative shore type.
- **Chapter 5 – Permitting Requirements:** Identifies key regulatory permitting requirements, agencies, and how they apply to the design alternatives .
- **Chapter 6 – Implementation Strategies:** Summarizes the considerations and next steps to advance implementation of nature-based strategies in each of the focus areas.



## 1.4 Stakeholder Engagement

Stakeholder engagement was a key element to the success of the City's Resilient Waterfront Enhancement Plan. To ensure that this plan aligns with the needs and priorities of local stakeholders and agencies involved with planning, management, and preservation of the City's waterfront, the Resilient Waterfront Enhancement Plan was developed through close collaboration with the Interdepartmental Project Team. Members of the project team included representatives from the City of Miami Departments of Resilience and Public Works, Capital Improvements, Planning, Parks and Recreation, Office of Resiliency and Sustainability, and The Nature Conservancy. Continuous engagement with this core group provided the opportunity to learn about waterfront flood protection projects, to discuss the various ways the City is vulnerable to sea-level rise and flooding and how it affects the community, natural environment, and other assets, and to develop nature-based shoreline adaption strategies.

Federal, State, and County regulatory agencies were also engaged to discuss potential permitting requirements for prioritized strategies and design alternatives. Regulatory agencies involved included the United State Army Corps of Engineers, United States Fish and Wildlife Service, South Florida Water Management District, Florida Department of Environmental Protection, and the Miami-Dade County Division of Environmental Resources Management.

A targeted key stakeholder group formed of six organizations including local government, community groups, business organizations, and universities was engaged during the final stages of plan development to provide feedback, to refine the waterfront design alternatives, and to identify opportunities for potential partnerships needed for strategy implementation. The key stakeholder group included the Climate Resilience Committee, Architecture and Engineering (A/E), Land Use Attorneys, and the Construction Industry Discussion Group.









## 2

The City of Miami's waterfront has experienced dramatic land use changes and development over the past century. Recognition of these changes and how they contribute to the City's vulnerabilities helps frame future actions that may be necessary to enhance the resilience of the waterfront.

The City is familiar with the challenges of accounting for flood risk and water management in urban design. However, living with the water today (and in the coming decades) does not look the same as it did historically. Due to climate change and associated sea-level rise, parts of Miami now regularly experience flooding during heavy rain events and King Tides. Rising water levels reduce the efficacy of gravity-fed stormwater systems which can prolong instances of urban flooding. Saltwater also continues to encroach landward, elevating coastal groundwater levels and flooding parts of the City from below.

This section describes the historical context of the City's evolving shoreline and provides a summary of existing policies and studies that influence future plans for waterfront enhancements. This section also includes analyses like existing water level conditions along the City's waterfront, observed historical changes in local sea levels, and future sea level projections. This includes mapped sea-level rise and storm surge scenarios used to identify key flood vulnerabilities along the City's shoreline.



## 2.1 History of Living with Water

Bounded by Biscayne Bay to the east, bisected by the Miami River, and underlain by a shallow groundwater aquifer, the City of Miami is shaped by its proximity to water. The City's 88 miles of waterfront that was once characterized by palmetto scrub and mangroves has since experienced a dramatic change.

These coastal wetlands once served as a sponge for excess stormwater and as a buffer against tropical storms. However, channelization of the Miami River and the draining and filling of floodplains removed many natural stretches of the shoreline while increasing access to the region.

Thus, the creation and expansion of this extensive water management system, which still operates today, led to rapid urbanization. With wetlands being drained and water channeled into a system of rivers and canals, the railroad system was extended. Subsequently, the construction of a major highway in the early 1900s soon followed, resulting in increased infrastructure investments and rapid population growth.

Floods remain one of the region's greatest water management challenges, but it is now exacerbated due to climate change, affecting the City's long-term resilience. A combination of seawalls, pumps, and drainage networks currently reduce flooding impacts to the City's waterfront. However, these gray engineered approaches to flood mitigation are increasingly challenged by rapidly changing and increasing performance needs due to sea-level rise and heavy precipitation. Historically, flood mitigation strategies have not prioritized environmental and water quality, as well as the health of aquatic ecosystems.

Over the past several decades, residents, community leaders, public officials, and agencies have increasingly recognized the role for nature-based solutions to mitigate flood risk and enhance the livability of the City. In addition to reducing the impacts of coastal hazards, nature-based features such as marshes, beaches, mangroves, and reefs have the added benefit of improving the health of adjacent waterways, increasing the aesthetics of the shoreline, and enhancing recreational opportunities.

Combined with this growing initiative to integrate more natural elements in to the City's urban fabric helps manage future climate conditions, is an increased effort to improve access to public waterfront areas. The City continues to make investments in its public waterfront areas and trails, such as the Baywalk and Riverwalk, to improve public awareness, connectivity, and safety for residents and visitors.

This story of Miami's waterfront reflects the community's complex and evolving relationship to the water's edge. Despite the significant changes that have occurred over the past century, the waterfront has continuously served as the social, cultural, historic, and economic core of the City. Recognition of the waterfront's evolution helps frame anticipated future changes in the decades ahead, such as the raising of the shoreline and buildings, using more nature-based approaches to flood protection, guiding future development, and changing land uses.

## 2.2 Existing Policies, Studies, and Design Guidance

The Resilient Waterfront Enhancement Plan was developed to create design concepts that address potential flood impacts based on existing and future sea-level conditions within the context of state and regional policies, and relevant studies. This section summarizes a review of documents, reports, and initiatives relevant to the Resilient Waterfront Enhancement Plan.

This is not an exhaustive list of waterfront planning and design studies completed in the region to date, but represents a subset of the most relevant documents and projects that were reviewed to provide local context and inform the development of the plan.

### Nature-based Solutions Design Guidance

**Table 2-1: Nature-based Solutions Design Guidance Studies Summary**

Policy or Study	Summary
<b>Waterfront Edge Design Guidelines (WEDG) Manual</b> Waterfront Alliance 2018	<ul style="list-style-type: none"> <li>• Describes a credit-based program to promote resilience, ecology, and access considerations in the planning and design of complex waterfront projects</li> <li>• Describes the point scoring for each category, the overall project certification process, and opportunities for tailoring solutions to support resilience, ecology, and access for a variety of waterfront uses (e.g., public parks, industrial)</li> </ul>
<b>Waterfront Resilience Miami, Florida: Advisory Services Panel Report</b> Urban Land Institute 2019	<ul style="list-style-type: none"> <li>• Provide strategic recommendations for addressing waterfront resilience along Biscayne Bay and the Miami River through the perspectives of design, finance, policy, and implementation</li> <li>• Recommendations include specific strategies focused on adoption of waterfront design guidelines, infrastructure financing strategies, transparent community engagement, and leveraging past plans and studies to inform actions moving forward</li> </ul>
<b>Nature-Based Solutions Guidance</b> Engineering with Nature 2021	<ul style="list-style-type: none"> <li>• Collection of 26 guidance documents authored by global experts to provide technical, policy, and economic guidance for integrating nature-based solutions into project design and management</li> </ul>

## City or Regional Initiatives / Studies

**Table 2-2: City or Regional Initiatives/ Studies Document Summary**

Policy or Study	Summary
<p><b>City of Miami Seawall Ordinance</b></p> <p>City of Miami; Chapter 20 of the City's code pertaining to flood damage prevention [June 2020]</p> <p>City of Miami 2020</p>	<ul style="list-style-type: none"> <li>• Describes citywide revised standards of seawalls and waterfront barriers</li> <li>• Requires all new construction, reconstruction, and repair of seawalls, bulkheads, living shorelines, and all other flood protection features fronting tidally influenced areas have a minimum elevation of 6.0 feet NAVD88</li> <li>• Requires the top of waterfront features fronting the Miami River or its tributaries to be constructed at a minimum elevation of 4.0 feet NAV88 with the ability to incrementally be raised at least two additional feet</li> <li>• New elevation standards were informed by seawall height analysis that showed structure elevations beyond 6.0 feet NAVD88 provide marginal benefits in the number of structures protected</li> </ul>
<p><b>Resilient305 Strategy</b></p> <p>Miami-Dade County, City of Miami, City of Miami Beach (2019)</p> <p>100 Resilient Cities 2019</p>	<ul style="list-style-type: none"> <li>• Regional resilience strategy listing 59 actions to help local municipalities prepare and respond to climate change, social issues, and economic inequalities</li> </ul>
<p><b>Citywide Stormwater Master Plan (SWMP)</b></p> <p>City of Miami 2021</p>	<ul style="list-style-type: none"> <li>• Assesses the existing condition of the City's drainage infrastructure and water management features and identifies improvements needed to address existing and future capacity and flooding issues</li> <li>• Prioritizes recommendations to be included in the City's Capital Improvement Plan, taking into consideration changing climate conditions, including future sea-level rise, rising groundwater, and combined rainfall-storm surge events</li> <li>• Creates prioritized list of capital projects needed to address flooding Citywide which informs spending for \$192 million from the Miami Forever General Obligation Bond funds for Stormwater Mitigation</li> </ul>
<p><b>Miami Forever Climate Ready</b></p> <p>City of Miami 2020</p>	<ul style="list-style-type: none"> <li>• Strategy to reduce potential impacts of climate change hazards over the next 40 years</li> <li>• Engaged residents in the process through a series of neighborhood meetings to determine priorities for adaptation</li> <li>• Closely aligns with multijurisdictional efforts for resilience, such as the Resilient305 Strategy and the Regional Climate Action Plan 2.0</li> </ul>
<p><b>Miami 21 - Appendix B: Waterfront Design Guidelines</b></p> <p>City of Miami 2009 Amended in 2010 &amp; 2021</p>	<ul style="list-style-type: none"> <li>• Provides guidelines to create a cohesive Riverwalk and Baywalk experience for the 25 feet of public walkway that is required to be built and maintained on both public and private properties along Waterways identified in the Miami 21 zoning code</li> <li>• Goals include the creation of a more resilient waterfront which provides space and opportunities to accommodate potential flooding from both stormwater and sea-level rise through sustainable practices</li> </ul>

## City Park Redesign Projects

Table 2-3: City Park Redesign Projects Summary

Policy or Study	Summary
<p><b>Morningside Park Resilient Shoreline Project</b> City of Miami/ The Nature Conservancy 2021</p>	<ul style="list-style-type: none"> <li>• Waterfront park was redesigned to reduce ongoing and future flood risks for the park and adjacent communities</li> <li>• Design focused on enhancing elements of the park’s natural waterfront for flood and erosion protection, (e.g., adding native vegetation to reduce erosion, adding a vegetated berm to raise the shoreline elevation, and expanding the intertidal zone to reduce wave energy)</li> <li>• Nature-based approach enhances the local Biscayne Bay ecosystem and increases the park aesthetic value, bolstering the park’s overall resilience</li> </ul>
<p><b>Jose Marti Adaptive Redesign Project</b> City of Miami 2020</p>	<ul style="list-style-type: none"> <li>• Design includes retrofitting portions of the existing seawall, constructing new seawall and living shoreline sections, and other coastal nature-based resilience improvements</li> <li>• Design goal of increasing the resilience of the park and the neighborhoods that surround it against flooding, natural hazards, and climate change impacts</li> <li>• The project was the first WEDG certified project in the City of Miami and includes water access enhancements such as a floating boardwalk, the addition of a water taxi slip, and maximizing waterfront viewing opportunities</li> </ul>
<p><b>Miami Coastal Alternatives Technical Memorandum</b> City of Miami/ The Nature Conservancy, 2019 Jacobs 2019</p>	<ul style="list-style-type: none"> <li>• Describes an evaluation of four proposed project sites located adjacent to Biscayne Bay and their suitability to provide nature-based coastal defense flood reduction benefits to the property</li> <li>• Sites were selected based on existing flood vulnerability and active partnerships, which increase their ability to implement recommended strategies</li> <li>• Proposed improvements included a nature-based only strategy and a hybrid of nature-based and hardened shoreline strategy</li> <li>• Study also quantified the benefit cost ratio for each of the strategies, revealing a higher ratio for the proposed coastal defense projects that use natural strategies</li> </ul>
<p><b>Sewell Park and Margaret Pace Park Master Planning Documents</b> City of Miami</p>	<ul style="list-style-type: none"> <li>• Documentation showing concept-level plan view ideas and photos of potential park amenities that will inform forthcoming Master Plans for the two park sites.</li> </ul>



## 2.3 Existing Water Conditions

The current design of the City’s waterfront is largely influenced by historically observed water level conditions. The City’s coastal water levels fluctuate naturally throughout the day due to astronomical tides produced by the gravitational pull of the moon and sun. Typical water level conditions for Miami have an average range of 2.3 feet between high and low tides.

The City also experiences higher than normal tide events several times a year. Referred to as King Tides, these predictable high tide events occur seasonally in September through November when the alignment and position of the moon and sun creates a combined gravitational pull that causes higher than usual water levels. There are typically four to five King Tide events per season with about two days of “peak tide” occurring per event. When these King Tides result in surface flooding, the phenomenon is referred to as “sunny day flooding.” During these events, coastal water can overtop low-lying areas of the shoreline and backflow through the stormwater network, temporarily flooding roadways and other infrastructure with seawater. King Tide events can also be exacerbated by easterly winds, rainfall, or storms, and high groundwater levels especially during the wet season, allowing high tides to reach farther inland and push water up into the City’s canals and rivers. This highlights the need for a comprehensive consideration of flood protection strategies, particularly at the waterfront which receive much of the excess floodwater before it drains to the bay and river.

In addition to annual high tide events, the City of Miami also experiences tropical storms and hurricanes, which primarily occur during Hurricane Season, June through November. Storm surge and large waves, and tropical storm and hurricane conditions can cause coastal water to travel several miles inland due to Miami’s low elevation and flat topography.

Resulting effects from large-scale storm flood events can damage or destroy infrastructure and property, erode shorelines, and inundate coastal assets for up to several days.

**Table 2-4** presents daily and storm tide levels affecting the City. Storm tide levels greater than a 25-year return period were modeled as part of the FEMA South Florida Storm Surge Study by simulating a large number of storm events using a coupled hydrodynamic and wave model. Storm tide elevations vary around the City’s shoreline due to spatial variations in storm surge response to winds, air pressure, bathymetry, shoreline orientation, and wave effects.

**Table 2-4: Existing daily tide levels and storm tide elevations at the City of Miami**

Water Level	Relative to: NAVD88 (ft)
100-year Storm Tide Level <sup>†</sup>	6.9 to 10.5
50-year Storm Tide Level <sup>†</sup>	6.1 to 9.0
25-year Storm Tide Level <sup>†</sup>	3.5 to 4.9
10-year Storm Tide Level <sup>†</sup>	3.1 to 4.4
King Tide (varies year to year)	1.5 to 2.0
Mean Higher High Water (MHHW)*	0.7
North American Vertical Datum of 1988 (NAVD88)	0.0
Mean Sea-level rise (MSL)*	-0.5
Mean Lower Low Water (MLLW)*	-1.6

*NOTES: \* Daily tide levels were estimated by NOAA based on analysis of observed water level data at the Virginia Key tide station (NOAA NOS #8723214) and are referenced to a 1983-2001 baseline (with a mid-point of 1992). Daily tide levels reported above have been adjusted to account for 0.43 feet of sea-level rise occurring from 1992 to 2020.*

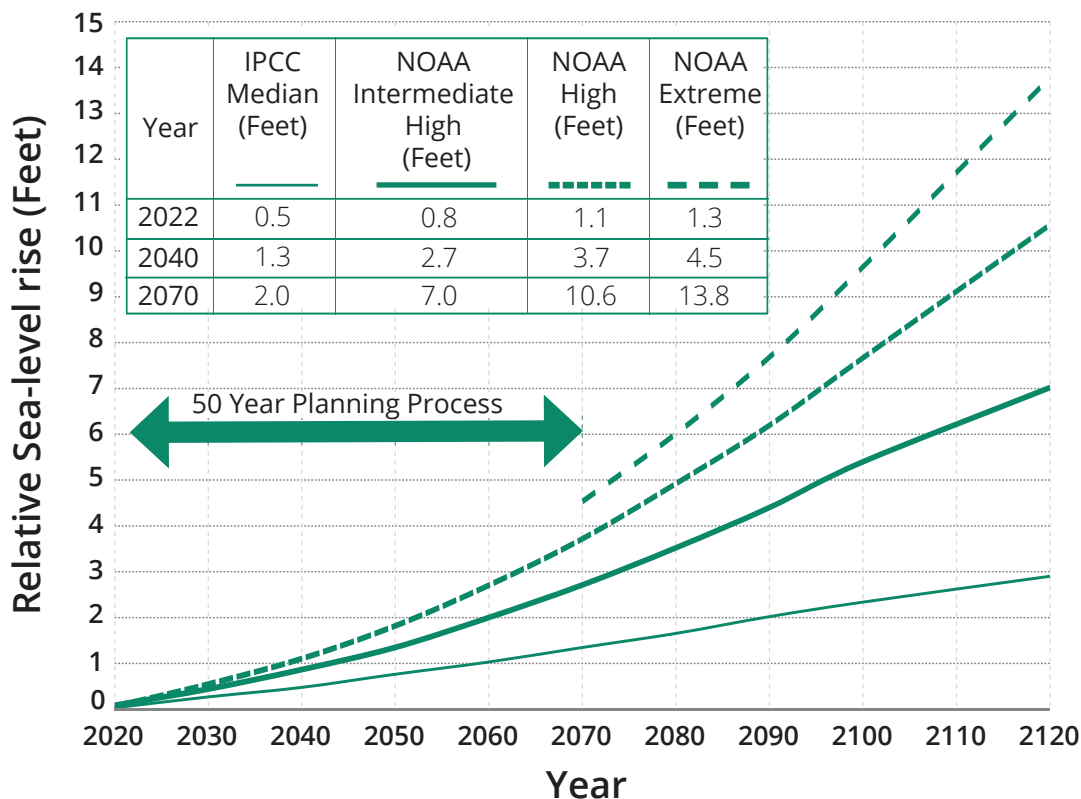
*<sup>†</sup> Storm tide elevations were estimated as part of the FEMA South Florida Storm Surge Study (FEMA 2021) and have been adjusted to account for 0.43 feet of sea-level rise occurring from 1992 to 2020.*

## 2.4 Observed and Projected Sea-level rise

Since its installation in 1931, tide measurements from the local Virginia Key tide station (NOAA NOS #8723214) show that sea levels have increased by 0.9 feet (NOAA 2021) (approximately 3 mm/year). Recent observations indicate that regional sea-level rise rates are also accelerating faster than global rates. From 2000 to 2017, sea levels in Southeast Florida increased by 3.9 inches (approximately 6mm/year) (Compact 2020). This acceleration is likely due to localized effects such as changes in the speed and thermodynamics of the Florida Current and Gulf Stream (Domingues et al. 2018; Sweet et al. 2018; Volkov et al. 2019).

In 2019, the Southeast Florida Regional Climate Change Compact (Compact) released an update of the Unified Sea-level rise Projections Guidance Report (Compact 2020), which outlines regional sea-level rise projections through the year 2120. The Compact guidance presents three curves for potential application to projects (**Figure 2-1**), depending on factors such as project lifespan, adaptability, and risk tolerance [see **Table 2-5**] (1) IPCC Median, (2) NOAA Intermediate High, and (3) NOAA High. A fourth curve, NOAA Extreme, is also included for informational purposes, representing the upper limit of sea-level rise in response to a potential massive Antarctic ice sheet collapse by the end of the century. Projections are updated every five years with the best available science. These projections are used by the City to inform stormwater capital projects.

Figure 2-1: Sea-level rise projections for Miami



Note: SLR projections are representative of the Virginia Key Tide Station (NOAA NOS #8723214) location within Biscayne Bay have been adjusted to reference a baseline year of 2020.



# CHAPTER 2

Based on these projections, sea levels are mostly likely to range between 1.3 and 4.5 feet higher over the next 50 years, and 2.9 to 10.6 feet higher over the next century. Long term projections (2070-2120) have a significant range of variability due to uncertainty in climate dynamics and future greenhouse gas emission reduction efforts.

**Table 2-5: Recommended applications of sea-level rise projections**

Application of IPCC Median Curve	
<ul style="list-style-type: none"><li>• Design life less than 50 years (&lt;2070)</li><li>• Low consequences associated with infrastructure failure</li><li>• Infrastructure can be easily replaced</li><li>• Highly adaptable</li><li>• Limited interdependencies with other infrastructure/networks</li></ul>	
Application of NOAA Intermediate High Curve	
<ul style="list-style-type: none"><li>• Design life less than 50 years, but infrastructure may be in place for longer</li><li>• Limited adaptability</li><li>• Moderate to high consequences associated with infrastructure failure</li><li>• Greater factor of safety is needed over the IPCC Median Curve</li></ul>	
Application of NOAA High Curve	
<ul style="list-style-type: none"><li>• Design life greater than 50 years (&gt;2070)</li><li>• Critical infrastructure</li><li>• Infrastructure cannot be easily replaced or removed</li><li>• Interdependencies with other infrastructure/networks</li><li>• Catastrophic consequences associated with infrastructure failure</li></ul>	

## 2.5 Waterfront Characteristics and Vulnerable Shorelines

Of the City's 88 miles of shoreline, 29 are publicly-owned and the remaining 59 miles are privately-owned. Publicly-owned areas of the waterfront are typically characterized by waterfront pedestrian trails, parks, or right-of-way areas located at the termination of roadways along the shoreline. Privately-owned waterfront typically consists of residential property, commercial development, or marinas.

The Resilient Waterfront Enhancement Plan focuses on developing design alternatives that represent common uses of publicly-owned shoreline, categorized by the following four typologies:

- **End-of-Road on Riverfront**
- **End-of-Road on Bayfront**
- **Park on Riverfront**
- **Park on Bayfront**

Pilot locations for each shoreline typology were selected.

### Water Level and Sea-level rise Scenarios

To inform the Resilient Waterfront Enhancement Plan, future sea-level rise projections based on NOAA Intermediate-High were selected for the planning time horizons of 2020 (existing), 2040, and 2070 to align with Compact recommendations for near-term infrastructure planning. Each planning time horizon was evaluated under two water level conditions: 1) Annual Nuisance Flooding/King Tide and 2) Coastal Storm Flooding (**Table 2-6**).

Annual nuisance flood conditions were represented by a King Tide elevation of 2.0 feet NAVD88. The water level elevation corresponds with typical annual maximum high tide observations that occur during predicted fall King Tide events in addition to the tidal elevations. This elevation also aligns with other City flood planning initiatives, including the Stormwater Master Plan. Coastal storm flood conditions were represented by a storm surge elevation of 6.0 feet NAVD88. This water elevation corresponds to the stillwater storm conditions (in the absence of waves) experienced during Hurricane Irma, which caused widespread flooding throughout the City in September 2017.

**Table 2-6: Planning water level and sea-level rise scenarios**

Planning Time Horizon	Sea Level Rise (ft)	Annual Nuisance Flooding/ (King Tide, ft NAVD88)	Coastal Storm Flooding (Storm Surge, ft NAVD88)
2022 (Existing)	+0.0	2.0	6.0
2040	+0.8	2.8	6.8
2070	+2.7	4.7	8.7



These water level and sea-level rise scenarios were used to evaluate the potential exposure of the City's coastal and inland riverine areas to existing and future flooding. These scenarios were also used to assist with identifying pilot sites along the shoreline suitable for nature-based solutions for flood mitigation. This informed the design and schematics for flood protection strategies and design alternatives described in Chapter 4 (Building Resilience with Nature-based Solutions).

## Key Flood Risks and Focus Areas

The sections that follow present an overview of citywide sea-level rise flood extents and the criteria used to select “pilot sites” that were evaluated for suitability of nature-based solutions for flood protection as part of the Resilient Waterfront Enhancement Plan.

### Sea-level rise Flood Mapping

Sea-level rise flood maps were created to evaluate low-lying areas of the City's shoreline that potentially exposes inland areas and assets to annual nuisance floods/King Tide and temporary storm surge events. The flood maps were created by projecting different water level and sea-level rise scenario over the City's topography to estimate an inland flood extent boundary for existing (blue), 2040 (orange), and 2070 (yellow) water level conditions (**Map 2-1** and **Map 2-2**).

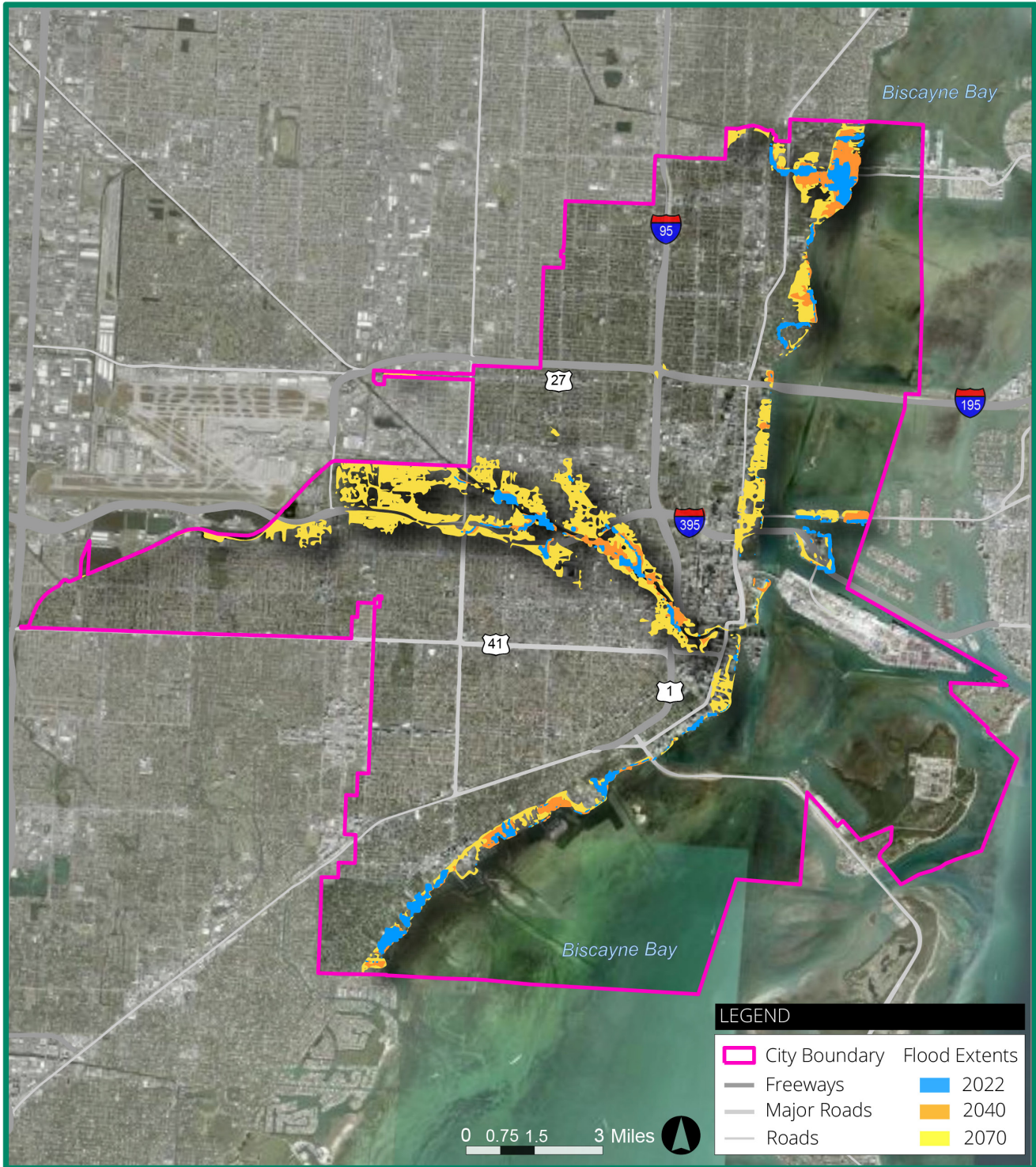
### Flood Risk Without Intervention- Nuisance Floods/King Tide

Without shoreline improvements, only the immediate shoreline is currently exposed to annual nuisance floods/King Tide events. However, by 2040, flooding could expand to include low-lying waterfront areas, particularly within 400 feet of the Riverfront and within 700 feet of the Bayfront. By 2070, much of the City's waterfront shoreline could be overtopped by annual nuisance floods/King Tide events. Flood exposure extends to include areas within 1,000 feet adjacent to the Miami River or Bayfront.

### Flood Risk Without Intervention- Storm Surge

Much of the City's waterfront is already at risk to exposure to temporary flooding during storm surge events, particularly within 3,000 feet of the Miami River and within 1,500 feet of the City's Bayfront. By 2040, areas within 3,200 feet of the Riverfront and within 1,700 feet of the Bayfront may experience storm surge flooding. By 2070, areas within 3,700 feet of the Riverfront and within 2,000 feet of the Bayfront may experience storm surge flooding.

Map 2-1: Projected Nuisance Floods/ King Tide with Sea-level rise

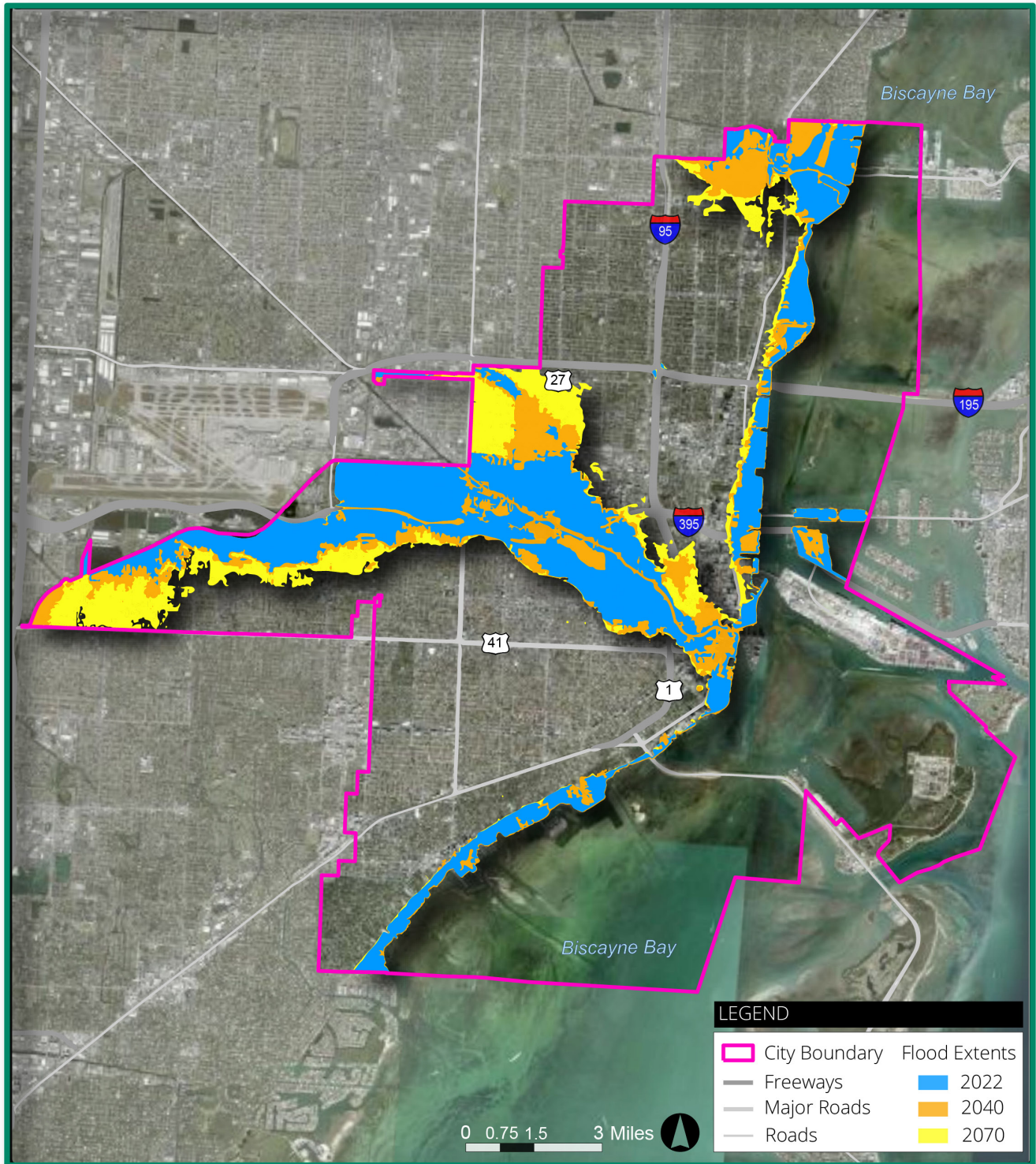


MAP DISCLAIMER: The map is intended as a planning-level tool to illustrate the potential for coastal flooding along the Miami waterfront as sea levels rise and does not represent the exact location of flooding. The map is based on model output and does account for all the complex and dynamic coastal and riverine processes that contribute to flood events.



# CHAPTER 2

Map 2-2: Projected Coastal Storm Surge Flooding with Sea-level rise



MAP DISCLAIMER: The map is intended as a planning-level tool to illustrate the potential for coastal flooding along the Miami waterfront as sea levels rise and does not represent the exact location of flooding. The map is based on model output and does account for all the complex and dynamic coastal and riverine processes that contribute to flood events.

## 2.6 Pilot Sites

Nature-based shoreline enhancements evaluated in the Resilient Waterfront Enhancement Plan were designed using the concept of “pilot sites”. Four pilot sites were identified to represent Miami’s various waterfront landscape traits, flood dynamics, and vulnerabilities.

Selection of the four representative pilot sites were based on the following conditions:

- The site is representative of a shoreline typology (end-of-road Riverfront, end-of-road Bayfront, park Riverfront, or park Bayfront)
- The site is at risk to existing or future flood conditions
- The site is publicly owned shoreline or within public right of way
- The site reflects a variety of shoreline settings (e.g., high density, urban, suburban, natural)
- There is opportunity to increase existing environmental quality at the site
- The site has potential to provide social benefits (e.g., increased waterfront access) to adjacent communities served

Based on these considerations and discussions with the Project Advisory Committee, the following locations were identified as pilot sites for evaluation of suitable nature-based shoreline flood protection strategies:

- **NE 5th Ave  
(End-of-Road on Riverfront)**
- **NE 26th St  
(End-of-Road on Bayfront)**
- **E.G. Sewell Park  
(Park on Riverfront)**
- **Margaret Pace Park  
(Park on Bayfront)**

MAP DISCLAIMER: The maps shown on the following pages illustrate the flooding extents and is intended as a planning-level tool to illustrate the potential for annual nuisance flooding/King Tide and coastal storm surge along the Riverfront and Bayfront as sea levels rise and does not represent the exact location of flooding. **Tables 2-6 through 2-9** provide the average flood depth for 2022, 2040, and 2070 at each pilot site based on available data. These flood depths are based on a model output and do not account for complex and dynamic coastal and riverine process that contribute to average flood depths.



# CHAPTER 2

## End-of-Road on Riverfront: NE 5th Ave

This site is an example of end-of-road on the Riverfront shoreline typology. It represents a sparsely developed shoreline armored by a low concrete seawall (**Figure 2-2**). Adjacent properties include a mix of low income residential housing and vacant land.

The site is currently at risk to shoreline flooding due to King Tide and storm surge events (**Map 2-3** and **Map 2-4**). In October 2020, a King Tide event with a water level elevation of approximately 2.1 feet (NAVD88) occurred, overtopped the shoreline and caused flooding of the end-of-road



Figure 2-3: October 2020 King Tide Flooding

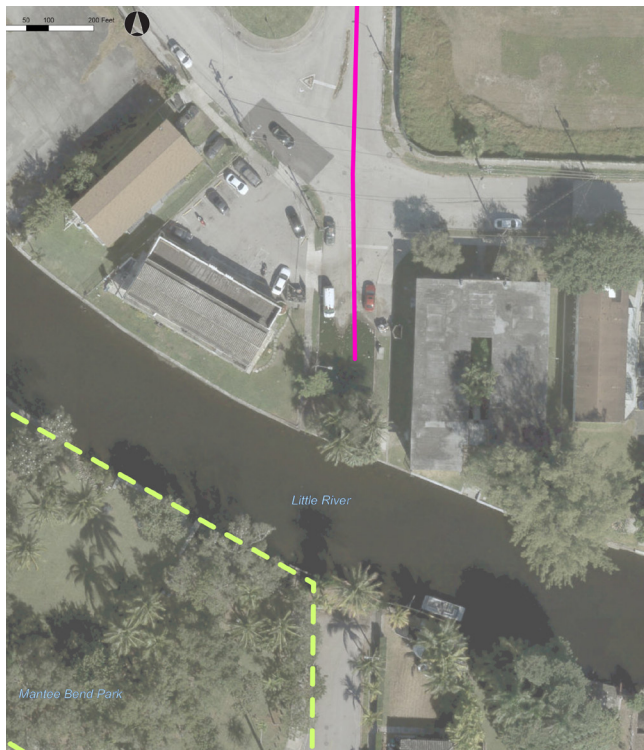


Figure 2-2: NE 5th Ave Aerial and Shoreline Conditions



Map 2-3: Projected Annual Nuisance/King Tide Flooding at NE 5th Ave Pilot Site

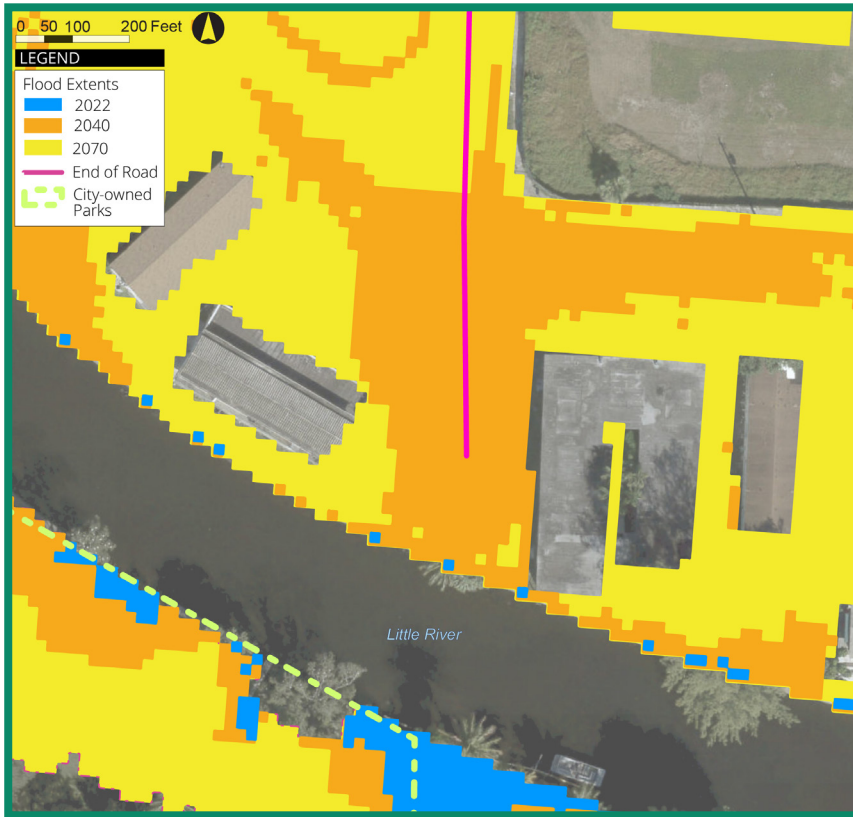
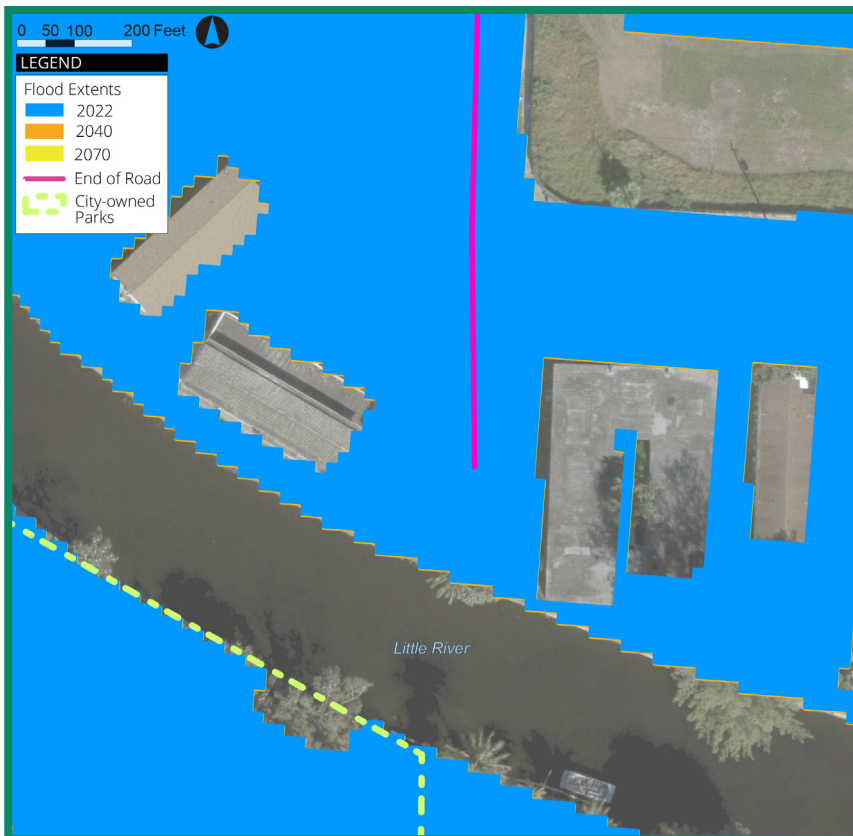


Table 2-6: Average Depth of Flooding for Sea-level Rise Scenarios - NE 5th Ave Pilot Site

Planning Time Horizon	Annual Nuisance Flooding/ (King Tide Depth, ft)
2022 (Existing)	0.0
2040	1.9
2070	2.0
Planning Time Horizon	Coastal Storm Flooding (Storm Surge Depth, ft)
2022 (Existing)	3.3
2040	4.1
2070	6.0

Map 2-4: Projected Coastal Storm Flooding at NE 5th Ave Pilot Site





# CHAPTER 2

## End-of-Road on Bayfront: NE 26th St

This site is an example of end-of-road on the Bayfront shoreline typology. It represents an urban shoreline that is hardened by a seawall. Similar to much of the Miami shoreline, the site has space constraints for large-scale shoreline enhancement projects due to a limited distance between the water edge and backshore development (**Figure 2-4**). Adjacent properties are characterized by high-density residential. Renovation and expansion of the Baywalk is currently planned for a pedestrian pathway that will cross the site. However, the modification of the seawall and water edge is not part of the existing plan.

The site is currently at risk to widespread flooding due to coastal storm surge events and heavy rainfall. Although the site does not currently experience annual nuisance flooding, the shoreline may be overtopped during King Tide events by 2070 (**Map 2-5** and **Map 2-6**).

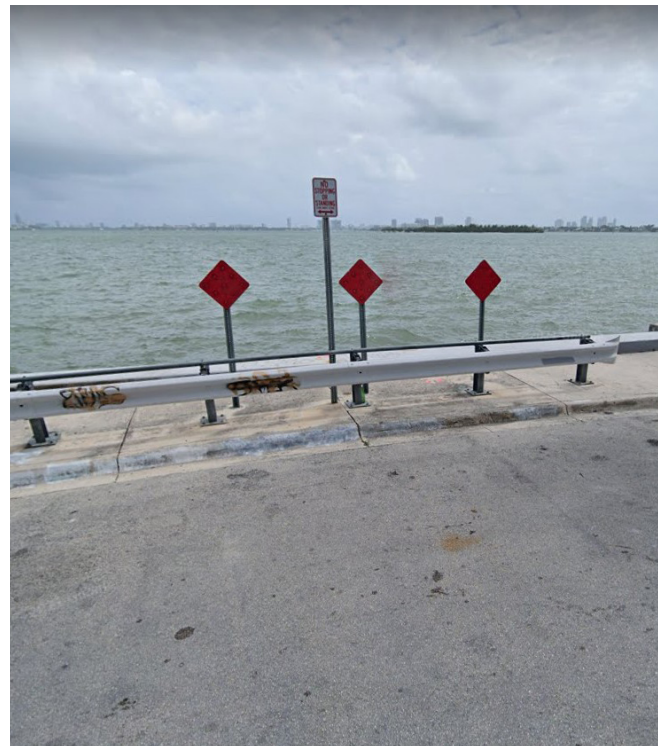
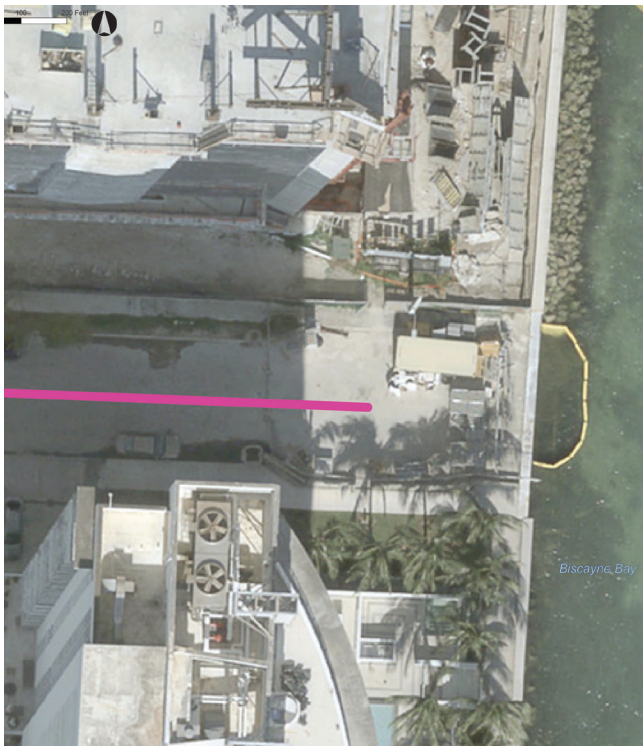


Figure 2-4: NE 26th St Aerial and Shoreline Conditions

Map 2-5: Projected Annual Nuisance/King Tide Flooding at NE 26th St Pilot Site



Table 2-7: Average Depth of Flooding for Sea-level Rise Scenarios - NE 26th St Pilot Site

Planning Time Horizon	Annual Nuisance Flooding/ (King Tide Depth, ft)
2022 (Existing)	1.0
2040	1.4
2070	2.4

Planning Time Horizon	Coastal Storm Flooding (Storm Surge Depth, ft)
2022 (Existing)	3.8
2040	4.5
2070	6.4

Map 2-6: Projected Coastal Storm Flooding at NE 26th St Pilot Site





## Park on Riverfront: E.G. Sewell Park

This site is an example of a park on the Riverfront shoreline typology. Although the full length of the shoreline is hardened by riprap, it has a natural and undeveloped grass area, providing a potentially large footprint for shoreline enhancement alternatives (**Figure 2-5**). Adjacent properties include a mix of single family and multi-family residential areas that are served by the park's amenities.

The grass area is at shoreline elevation and currently at risk to widespread flooding due to storm surge, annual King Tide events, and heavy rain fall events. There is a ridge within the park that acts as a natural berm within the 250 feet of

shoreline that helps protect extensive flooding from occurring further in the interior of the park. (**Map 2-7** and **Map 2-8**).

Shoreline enhancement strategies developed as part of the Resilience Waterfront Enhancement Plan for Sewell Park were designed with concepts already being prioritized for the park's forthcoming master plan.

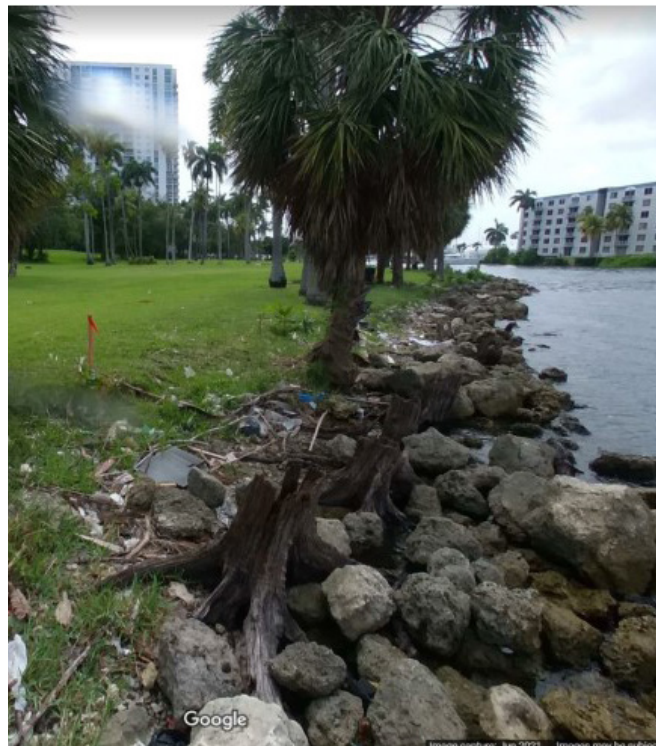


Figure 2-5: Sewell Park Aerial and Shoreline Conditions

Map 2-7: Projected Annual Nuisance/King Tide Flooding at E.G Sewell Park Pilot Site

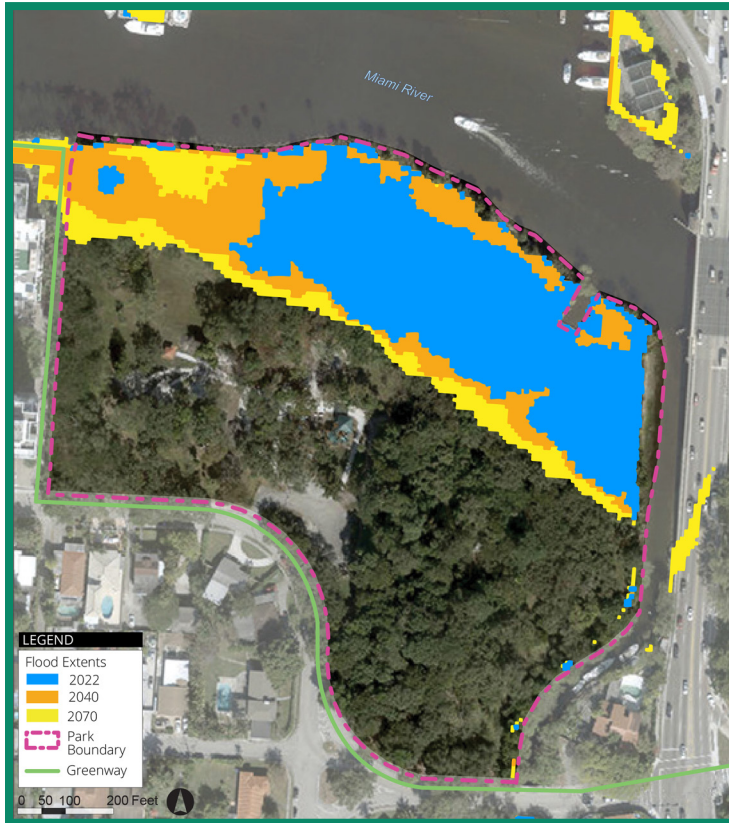
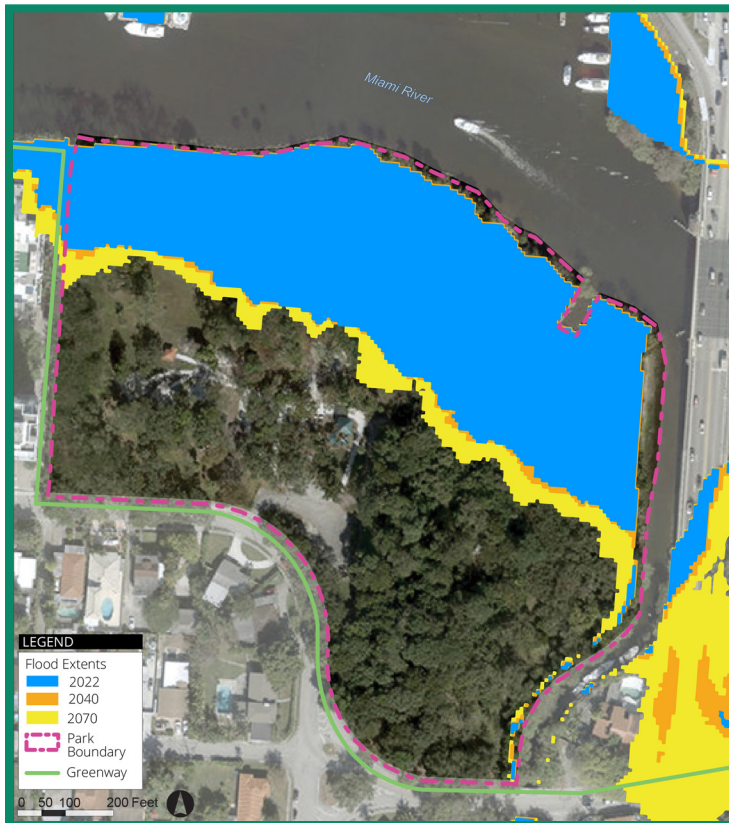


Table 2-8: Average Depth of Flooding for Sea-level Rise Scenarios - E.G. Sewell Park Pilot Site

Planning Time Horizon	Annual Nuisance Flooding/ (King Tide Depth, ft)
2022 (Existing)	0.5
2040	1.1
2070	2.8
Planning Time Horizon	Coastal Storm Flooding (Storm Surge Depth, ft)
2022 (Existing)	3.8
2040	4.5
2070	7.9

Map 2-8: Projected Coastal Storm Flooding at E.G Sewell Park Pilot Site





# CHAPTER 2

## Park on Bayfront: Margaret Pace Park

This site is an example of a park on the Bayfront shoreline typology. The park is currently experiencing shoreline erosion and is hardened by riprap along the water's edge. There are several areas of established mangroves along the northern edge of the park, (**Figure 2-6**). The park provides access to greenspace and the water for several adjacent high-density residential properties.

The park is currently at risk to widespread flooding during storm surge events and experienced flood damage along the shoreline during Hurricane Irma in 2017 (**Figure 2-7**). Although the park is not currently at risk to King Tides, the extent of flooding during these annual events is expected to become extensive by 2070 (**Map 2-9** and **Map 2-10**).

Shoreline enhancement strategies developed as part of the Resilience Waterfront Enhancement Plan for Margaret Pace Park were designed in alignment with concepts already being prioritized for the park's forthcoming master plan.



Figure 2-7: Debris line from Hurricane Irma



Figure 2-6: Margaret Pace Park Aerial and Shoreline Conditions



Map 2-9: Projected Annual Nuisance/King Tide Flooding at Margaret Pace Park Pilot Site



Table 2-9: Average Depth of Flooding for Sea-level Rise Scenarios - Margaret Pace Park Pilot Site

Planning Time Horizon	Annual Nuisance Flooding/ (King Tide Depth, ft)
2022 (Existing)	0.7
2040	1.5
2070	2.8
Planning Time Horizon	Coastal Storm Flooding (Storm Surge Depth, ft)
2022 (Existing)	2.1
2040	2.7
2070	4.1

Map 2-10: Projected Coastal Storm Flooding at Margaret Pace Park Pilot Site





# CHAPTER 3



BUILDING RESILIENCE WITH  
NATURE-BASED SOLUTIONS



# BUILDING RESILIENCE WITH NATURE-BASED SOLUTIONS



Nature-based solutions are defined by The Nature Conservancy as “project solutions that are motivated and supported by nature and that may also offer environmental, economic, and social benefits, while increasing resilience.” It is an umbrella concept that includes many terms, including:

- **Natural Infrastructure** – intentional or strategic preservation, enhancement, or restoration of a natural system or semi-natural system to provide a desired benefit (e.g., flood protection, enhanced water quality, carbon sequestration).
- **Low Impact Development** – Systems and practices that use or mimic natural processes that result in a desired benefit, which is primarily for capture and onsite treatment of stormwater runoff.
- **Ecosystem Services** – Services provided by ecological systems to support human life.

This chapter discusses the process of incorporating nature-based solutions into the City’s waterfront to address identified key flood vulnerabilities for each of the City’s pilot sites discussed in Section 2.6.



## 3.1 Guiding Principles

A key objective of the project is to develop a set of nature-based design alternatives that provide near- and long-term flood protection for the City's waterfront while promoting the ecological and social resilience of the surrounding communities. For this project, an alternative is defined as a set of individual strategies that work together to achieve the project goals.

Several guiding principles were considered during the development of the proposed alternatives:

- **Flood Protection** - One of the primary goals of the project is flood protection for the City's waterfront communities. Project alternative designs reflect shoreline heights that comply with the City's seawall ordinance, using a minimum elevation of 6.0 feet NAVD88. Alternatives may also be designed to consider phased flood protection with implementation prioritized for the water edge, followed by waterfront amenities, and inland areas.

Where possible, flood protection strategies aim to incorporate nature-based features that provide both flood protection and ecosystem services. More conventional gray infrastructure, such as elevated berms and seawalls, were also incorporated for some of the alternatives for a hybrid green-gray design to provide an enhanced level of flood protection for highly exposed locations.

- **Environmental Benefits** - Much of the City's waterfront is characterized by conventional gray infrastructure that is focused on flood and erosion protection with minimal concern for the adjacent ecosystems. Development of the design alternatives considered a number of strategies to enhance the provided environmental benefits and to create a more

resilient shoreline. Targeted environmental benefits include restoration of existing and transitional habitats, stormwater retention, and water quality treatment.

- **Community Access** - Where possible, the proposed design alternatives consider ways to improve public waterfront access, including the use of trails, parking, or viewing opportunities. Art installations and interpretive signage was also incorporated to provide opportunities for educating the community and visitors about the benefits of nature-based solutions along the City's waterfront.
- **Stakeholder input** - Stakeholder input was solicited through regular meetings and workshops with the Project Team, City of Departmental Directors, and The Nature Conservancy. Federal, State, and County regulatory agencies were also engaged to discuss potential permitting requirements of developed design alternatives. Design alternatives were also presented to the City of Miami Climate Resilience Committee and the A/E Discussion Group to provide input on consistency with waterfront priorities.

# BUILDING RESILIENCE WITH NATURE-BASED SOLUTIONS

## 3.2 Strategy Menu Development and Prioritization

The development of design alternatives was completed in multiple stages. During the first stage, the project team created an initial list or “menu” of shoreline strategies that could potentially be implemented along the City’s waterfront. Strategies ranged from strictly nature-based (e.g., tidal vegetation and mangroves) to conventional gray infrastructure (e.g., bulkhead/seawall) and included documentation of benefits, challenges, and complementary strategies that could be used for hybrid protection. **Figures 3-1 and 3-2** on the following pages show the Shoreline Strategy Enhancement Strategy Menu and the typical cross-shore placement of the strategies in the menu.

To select and prioritize shoreline strategies, members of the project team were asked to select individual strategies that were applicable for each of the pilot sites based on their

knowledge of existing priorities for the project location and what would be preferred by community members.

After selecting a subset of preferred strategies from the menu for each pilot site, participants evaluated each individual strategy using a set of criteria to score the performance of each proposed strategy (**Table 3-1**). For each strategy, participants assigned ratings ranging from very low to very high based on the criteria within each category. The goal was to qualitatively evaluate the trade-offs between the different criteria categories and select a set of strategies that were most balanced across the categories.

Preferences identified in the workshop were used to formulate different combinations of strategies to create a set of design alternatives for each pilot sight developed in Chapter 4 (Design Alternatives).

**Table 3-1: Strategy Evaluation Criteria**

Evaluation Category	Criteria
Engineering	Construction impacts (traffic disruption, environmental impacts, etc.)
	Ability to adapt over time
	Ability to be expanded to other locations
	Suitable for local site conditions
Environmental	Ability to protect, enhance, and expand ecosystem function
	Ability to improve water quality
	Ability to provide carbon sequestration benefits
Social	Improved water connection/access
	Enhances aesthetics of the site
	Ability to protect/enhance recreational opportunities
Feasibility	Capital costs
	Likelihood to obtain public support
	Strategy can be implemented within existing policies, procedures, and regulations



## Figure 3-1: Shoreline Enhancement Strategy Menu

**Softer Techniques** - Smaller Waves, Smaller Fetch, Gentler Slope, Sheltered Coast

Vegetation Only	Stormwater Retention	Edging	Sills
<p><b>Mangroves</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>• Dissipates wave energy</li> <li>• Reduces erosion</li> <li>• Provides habitat/increases biodiversity</li> <li>• Traps sediment</li> <li>• Carbon sink/sequestration</li> <li>• Water purification</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>• Requires maintenance/monitoring until established</li> <li>• Efficacy requires more space</li> <li>• Unmaintained plants may block water views</li> <li>• Limited high water protection</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>• Revetment, (Living) Breakwater, Bulkhead/Seawall, Sills, Elevated berm</li> </ul> 	<p><b>Stormwater Retention/BMPs</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>• Treatment and storage of stormwater</li> <li>• Provides habitat</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>• Vegetation may be sensitive to saltwater inundation</li> <li>• Requires maintenance/monitoring until established</li> <li>• No high water or coastal storm protection</li> <li>• Could be costly</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>• Edging, Revetment, Breakwater, Bulkhead/Seawall, Sills, Elevated Berm</li> </ul> 	<p><b>Multifunctional Wave Attenuation</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>• Dissipates wave energy</li> <li>• Reduces erosion</li> <li>• Promotes Water Access</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>• No high water protection</li> <li>• May require extension into water</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>• Bulkhead/Seawall, Elevated Berm</li> </ul>  <p><b>Bio-logs</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>• Dissipates wave energy</li> <li>• Reduces erosion</li> <li>• Provides habitat</li> <li>• Traps sediment</li> <li>• Filters stormwater runoff</li> <li>• Cost-effective</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>• Breaks down over time</li> <li>• No high water protection</li> <li>• Limited protection from large storms</li> <li>• May require routine maintenance</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>• Vegetation, Sills</li> </ul>  <p><b>Vegetated Geogrid</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>• Reduces erosion</li> <li>• Provides habitat</li> <li>• Adds aesthetic value</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>• Required maintenance until vegetation is established</li> <li>• Costly to install</li> <li>• Requires heavy equipment/intensive labor to install</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>• Sills, Breakwater, Bulkhead/Seawall</li> </ul> 	<p><b>Oyster Balls/Bags/Castles</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>• Dissipates wave energy</li> <li>• Enhances water quality</li> <li>• Supports oyster restoration efforts</li> <li>• Boosts local economy</li> <li>• Reduces erosion</li> <li>• Provides habitat/increases biodiversity</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>• No high water protection</li> <li>• Damage caused by debris/sedimentation</li> <li>• Monitoring and maintenance required</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>• Seawall/Bulkhead, Vegetation</li> </ul>  <p><b>Marsh Sills</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>• Dissipates wave energy</li> <li>• Slows inland water transfer</li> <li>• Provides habitat/increases biodiversity</li> <li>• Increases natural stormwater infiltration</li> <li>• Toe protection helps prevent wetland edge loss</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>• No high water protection</li> <li>• Requires more land area</li> <li>• Uncertainty of successful vegetation growth and competition with invasive species</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>• Seawall/Bulkhead, Vegetation, Breakwater</li> </ul> 
<p><b>Tidal Vegetation/Seagrass</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>• Dissipates wave energy</li> <li>• Reduces erosion</li> <li>• Provides habitat/increases biodiversity</li> <li>• Traps sediment</li> <li>• Carbon sink/sequestration</li> <li>• Water purification</li> <li>• Protection of seawalls</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>• Limited protection from large storms</li> <li>• Requires maintenance/monitoring until established</li> <li>• Prone to degradation from pollutants/poor water quality</li> <li>• No high water protection</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>• Revetment, (Living) Breakwater, Bulkhead/Seawall, Sills, Edging, Elevated Berm, Elevated Platform</li> </ul> 			

# BUILDING RESILIENCE WITH NATURE-BASED SOLUTIONS



Flood Protection



Water Quality



Habitat Restoration



Wave Attenuation



Erosion Control



Scenic/Recreation Value

**Harder Techniques** - Larger Waves, Larger Fetch, Steeper Slope, Open Coast

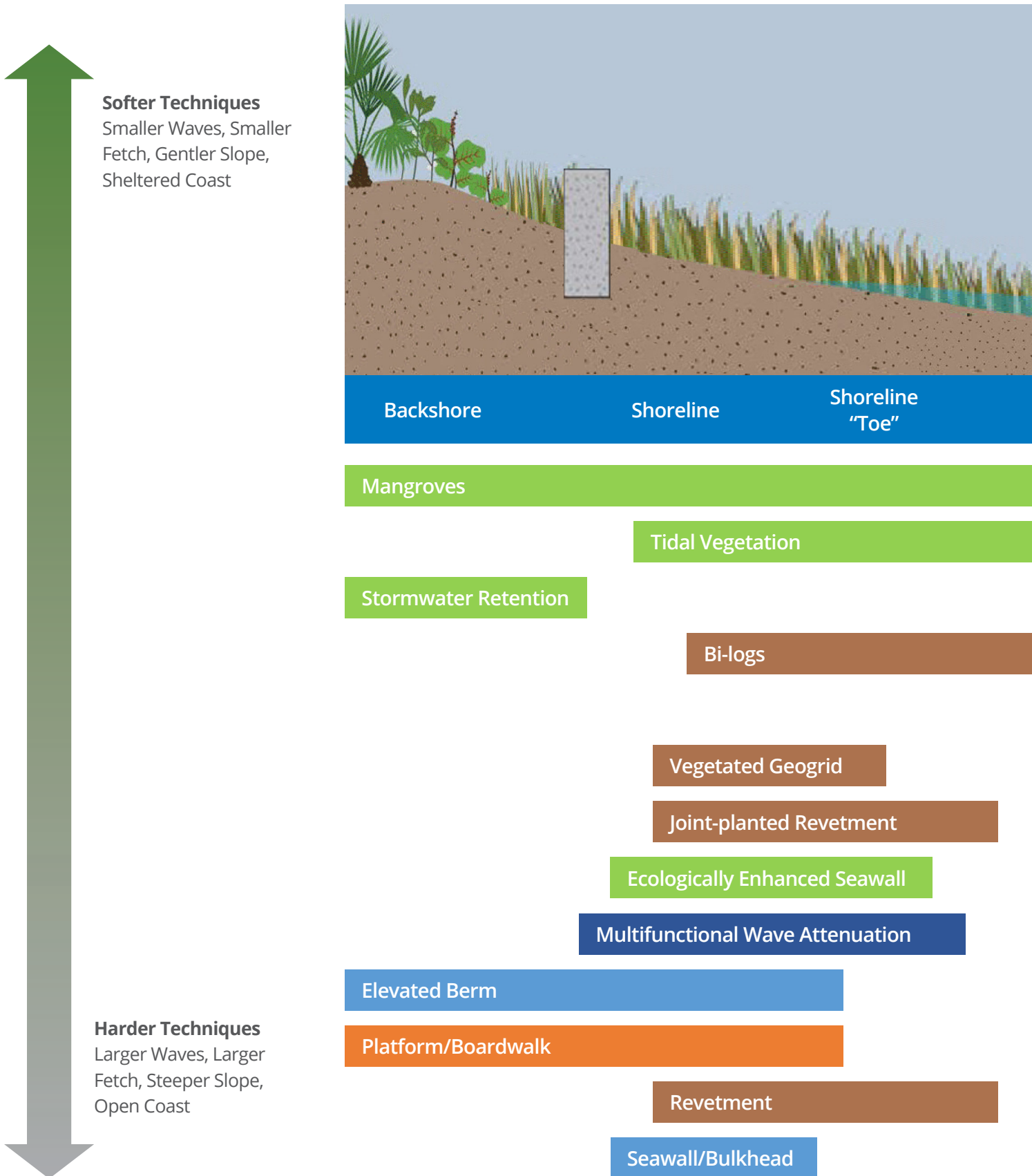
Elevated Features	Breakwater	Revetment	Bulkhead/Seawall
<p><b>Platform/Boardwalk</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>Promotes public/water access</li> <li>Aesthetically pleasing</li> <li>Increased educational opportunities</li> <li>Low environmental impacts</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>No coastal hazard protection</li> <li>Damage caused by debris</li> <li>Can shade out vegetation if used in tandem</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>Seawall/Bulkhead, Vegetation, Revetment, Edging, Sills, Vegetation</li> </ul>	<p><b>Breakwater</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>Reduces wave energy</li> <li>Reduces storm surge flood levels</li> <li>Promotes sediment accumulation</li> <li>Easy to repair if damaged</li> <li>Can provide offshore habitat</li> <li>Supports recreational opportunities</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>No high water protection</li> <li>Requires heavy equipment/intensive labor to install</li> <li>Not aesthetically pleasing</li> <li>May pose danger to watercraft</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>Vegetation only, Edging, Sills, Revetment, Bulkhead/Seawall</li> </ul>	<p><b>Revetment</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>Reduces wave energy</li> <li>Stabilize shoreline through rocks or other materials on the sloping shoreline</li> <li>Provides toe protection</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>No high water protection</li> <li>Prevents upland sediment to estuarine habitats</li> <li>Requires heavy equipment/intensive labor to install</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>Joint-planted Revetment, Edging, Seawall/Bulkhead</li> </ul>	<p><b>Seawall/Bulkhead</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>Fixes shoreline position</li> <li>Provides flood protection</li> <li>Reduces wave impacts</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>Increases erosion of adjacent areas</li> <li>Maintenance and elevation necessary over time</li> <li>Provides no ecological benefits</li> <li>Costly to install</li> <li>Requires heavy equipment/intensive labor to install</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>Revetment, mangroves, Sills, ecological enhanced seawall, oyster balls</li> </ul>
<p><b>Elevated Berm</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>Provides protection from waves and flooding</li> <li>Adaptable to higher elevations over time</li> <li>Can be designed for multipurpose use</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>Vulnerable to erosion without supplemental strategy</li> <li>Costly to install</li> <li>Requires heavy equipment/intensive labor to install</li> <li>Routine maintenance necessary</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>Revetment, Vegetation, Sills,(Living) Breakwater</li> </ul>	<p><b>Living Breakwater</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>Reduces erosion</li> <li>Enhances habitat/increases biodiversity</li> <li>Supports recreational opportunities</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>No high water protection</li> <li>Requires heavy equipment/intensive labor to install</li> <li>May pose danger to watercraft</li> <li>Requires maintenance/monitoring until established</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>Vegetation only, Edging, Sills, Revetment, Bulkhead/Seawall</li> </ul>	<p><b>Joint-planted Revetment</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>Enhanced habitat of revetment</li> <li>Increased educational opportunities</li> <li>Increased wave/current reduction and sediment trapping</li> <li>Reinforces revetment</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>Plantings may die out if they become inundated by tides</li> <li>Vegetation may be sensitive to water quality</li> <li>Requires maintenance/monitoring until established</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>Revetment</li> </ul>	<p><b>Ecologically Enhanced Seawall</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>Enhanced habitat of armored structure</li> <li>Increased wave energy dissipation</li> <li>Increased educational opportunities</li> <li>Enhanced aesthetic value</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>Success of ecosystem enhancement may depend on local water quality</li> <li>Requires maintenance/monitoring</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>Seawall/bulkhead</li> </ul>
	<p><b>Artificial Reef</b></p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>Provides habitat/increases biodiversity</li> <li>Dissipates wave energy</li> </ul> <p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>Requires maintenance/monitoring until established</li> <li>No high water protection</li> <li>May pose danger to watercraft</li> </ul> <p><b>Pairs Well With:</b></p> <ul style="list-style-type: none"> <li>Vegetation, Edging</li> </ul>		

BUILDING RESILIENCE WITH NATURE-BASED SOLUTIONS

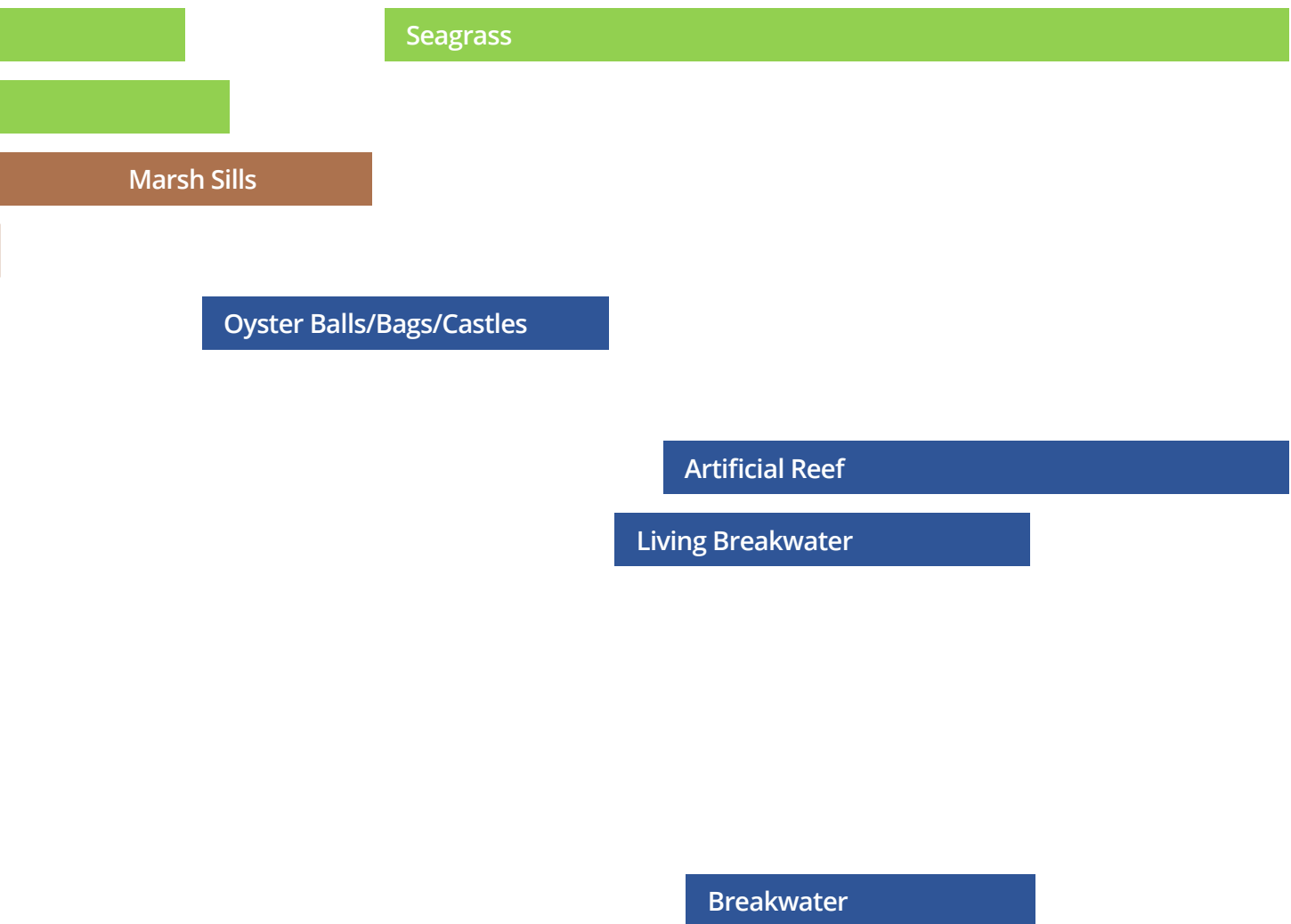
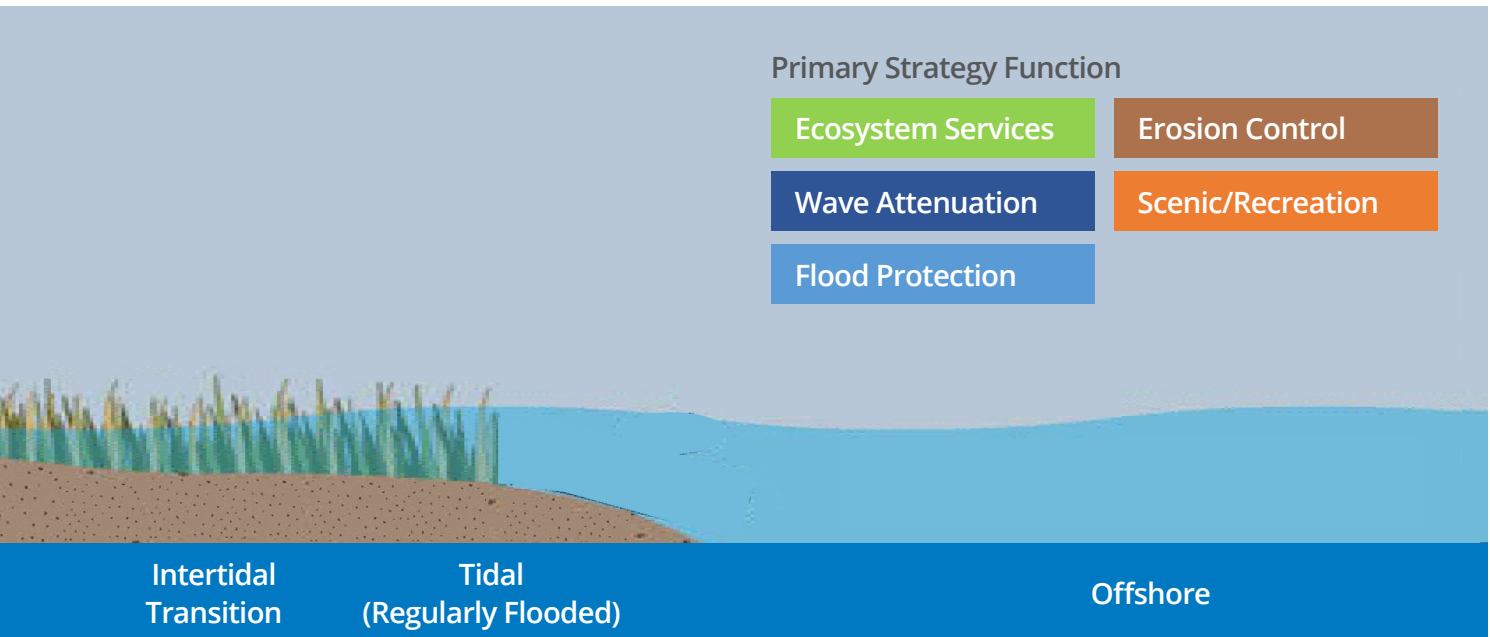


# CHAPTER 3

Figure 3-2: Typical Cross-Shore Strategy Placement



# BUILDING RESILIENCE WITH NATURE-BASED SOLUTIONS



BUILDING RESILIENCE WITH NATURE-BASED SOLUTIONS







# 4

The figures in the following pages summarize the conceptual shoreline enhancement alternatives for each waterfront typology. Elements in each alternative include features and individual strategies that will be incorporated into concept-level sketches for each alternative. Alternatives for each location range in complexity, required modification, and level of nature-based features in the design. Alternatives on the left side of the tables are associated with a lower amount of intervention, less complexity, and typically have a more gray or traditional urban design. Conversely, alternatives on the right side of the tables require more intervention at the site, a more complex design, and incorporates more nature-based features.





# CHAPTER 4

## 4.1 Typology 1: End-of-Road on Riverfront - NE 5th Ave

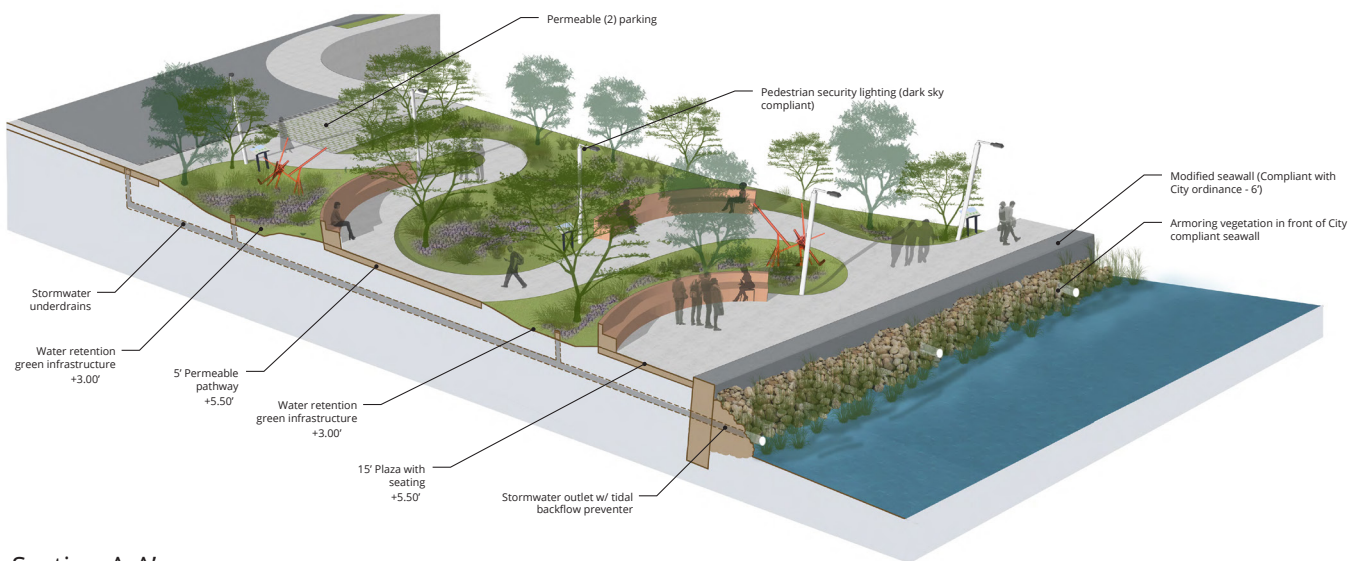


DESIGN ALTERNATIVES

Existing Site Photos



## Alternative 1



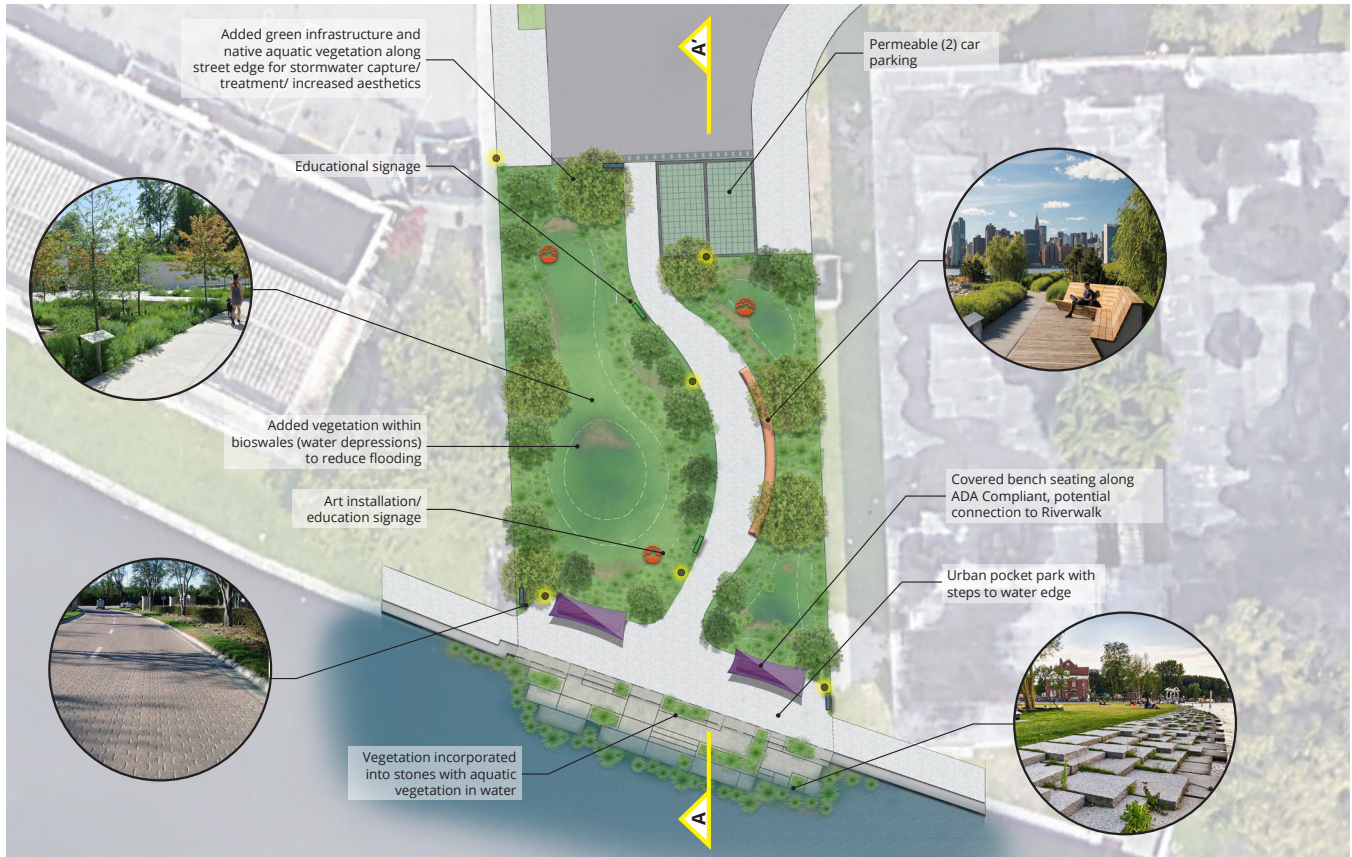
Section A-A'

Figure 4-1: End-of-Road on Riverfront - NE 5th Ave: Alternative 1

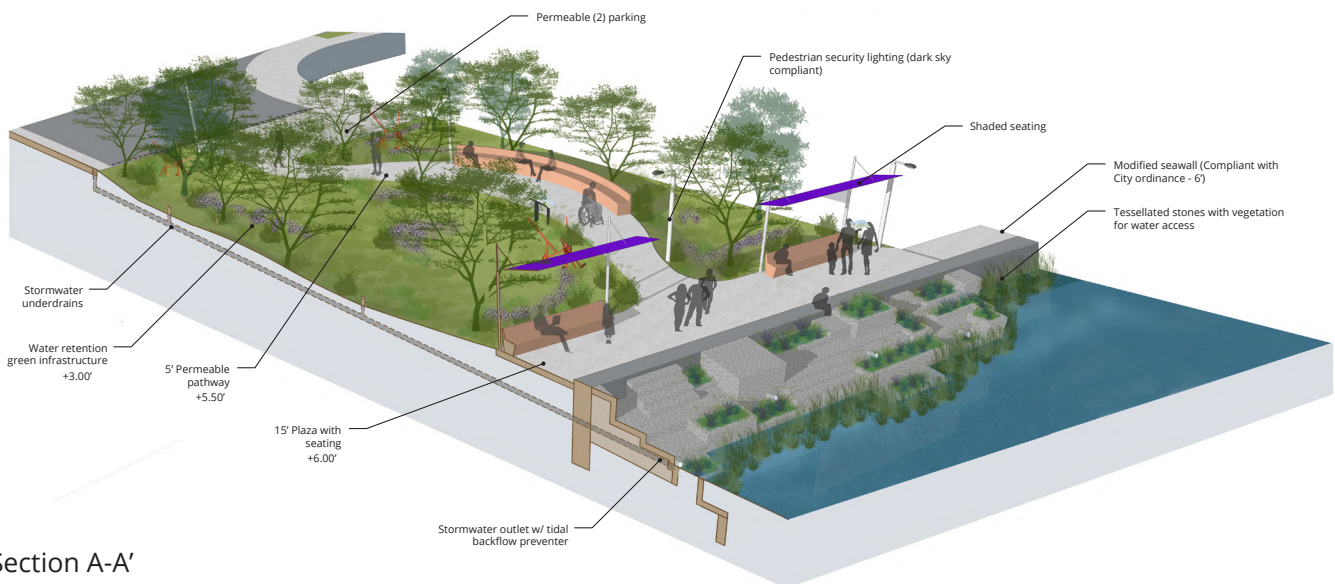


# CHAPTER 4

## Alternative 2



DESIGN ALTERNATIVES



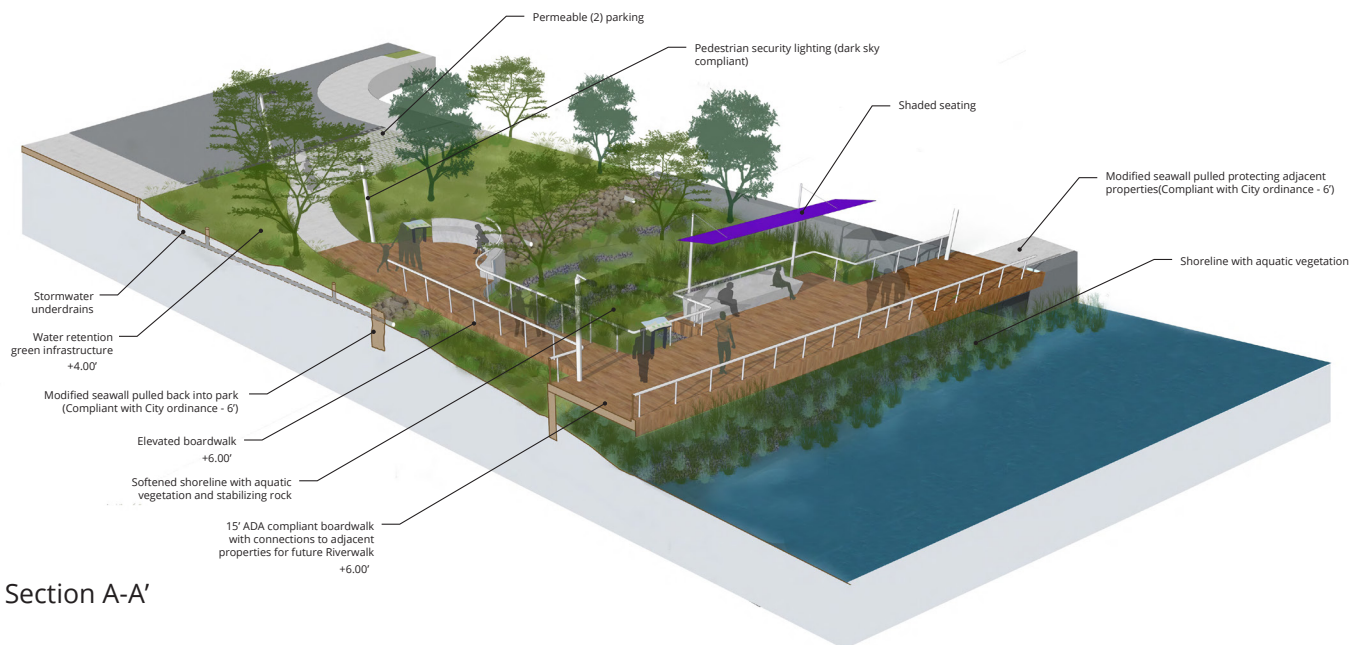
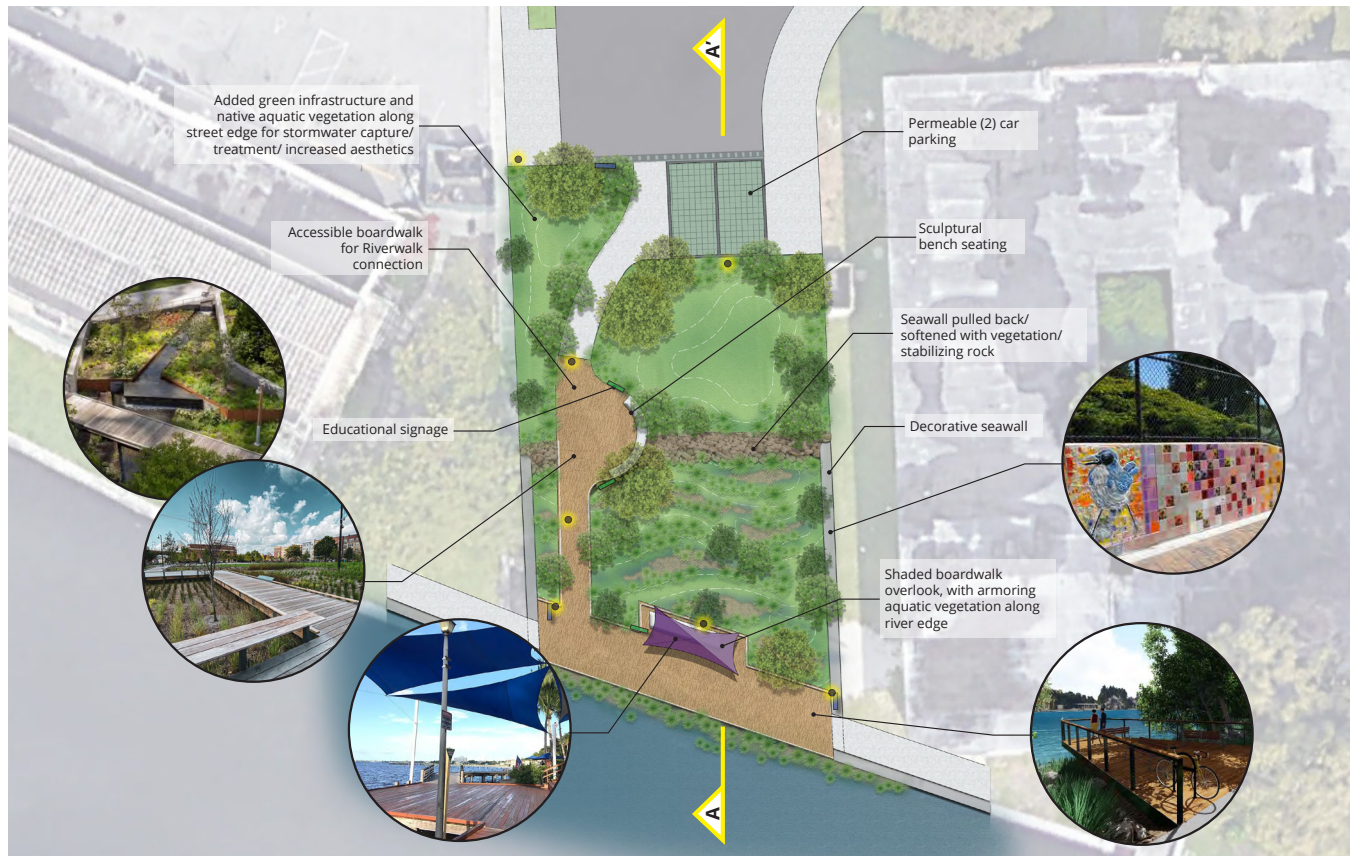
Section A-A'

Figure 4-2: End-of-Road on Riverfront - NE 5th Ave: Alternative 2



# DESIGN ALTERNATIVES

## Alternative 3



Section A-A'


Figure 4-3: End-of-Road on Riverfront - NE 5th Ave: Alternative 3

DESIGN ALTERNATIVES



# CHAPTER 4

## Alternative Summaries

Less Intervention Lower Complexity More Gray/Traditional			More Intervention Higher Complexity More Green/Nature-based		
Alternative 1		Alternative 2		Alternative 3	
<b>Theme:</b> Pocket Park with no water access; focus on elevated green space and water views		<b>Theme:</b> Pocket park with water access		<b>Theme:</b> Elevated walkway along river, soften seawall	
<ul style="list-style-type: none"> <li>• Elevated seawall to be compliant with City seawall ordinance ~ 6ft</li> <li>• Added vegetation in front of seawall</li> <li>• Added green infrastructure and native vegetation in park for stormwater capture/treatment/ increased aesthetics</li> <li>• Picnic/ seating to view water</li> <li>• Install/ incorporate shade sails/ shade trees within seating area</li> <li>• Include ADA sidewalks for future Riverwalk connectivity</li> <li>• No direct water access</li> </ul>		<ul style="list-style-type: none"> <li>• Elevated pocket park with permeable paving and green infrastructure for stormwater capture/treatment/ increased aesthetics</li> <li>• Pull seawall back and add terraced/ stepped transitional habitat and path to water edge</li> <li>• "Tessellated" stones providing water access, incorporate vegetation planters into steps to prevent illegal docking</li> <li>• Install shade sails along pocket park amenities (seating areas)</li> <li>• Include ADA sidewalks for future Riverwalk connectivity</li> </ul>		<ul style="list-style-type: none"> <li>• Elevated walkway with ADA compliance that extends beyond the site boundary (follows waterfront)                             <ul style="list-style-type: none"> <li>• Preserving navigable channel for water transportation as well as ensure future Riverwalk connectivity</li> </ul> </li> <li>• Add terraced naturalized shoreline with native vegetated river edge</li> <li>• Maintain viewshed with seating</li> <li>• Add more shade trees within site and along the street edge (species to be tolerant to flooding)</li> <li>• Include ADA sidewalks for future Riverwalk connectivity</li> <li>• Incorporate local art installation into design</li> </ul>	

# DESIGN ALTERNATIVES

## 4.2 Typology 2: End-of-Road on Bayfront - NE 26th St



Existing Site Photos

DESIGN ALTERNATIVES

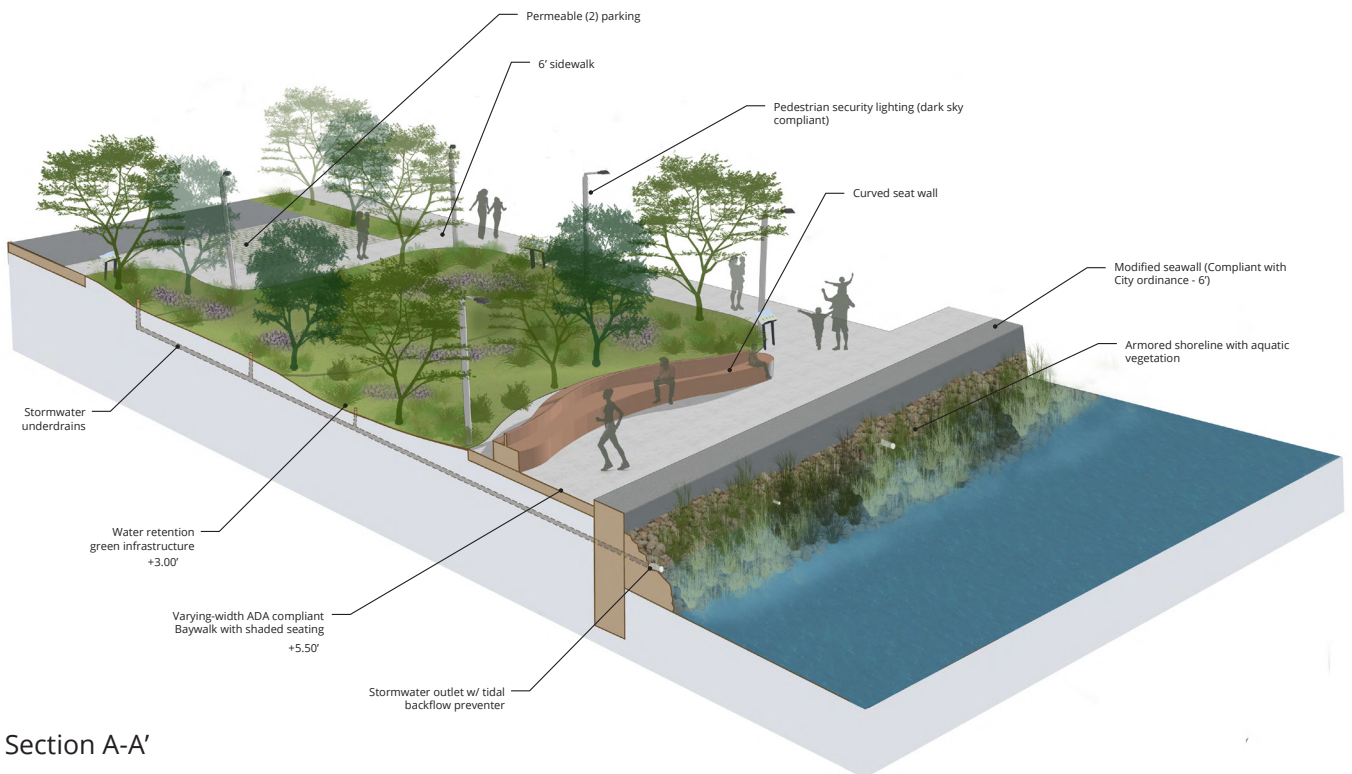


# CHAPTER 4

## Alternative 1



DESIGN ALTERNATIVES



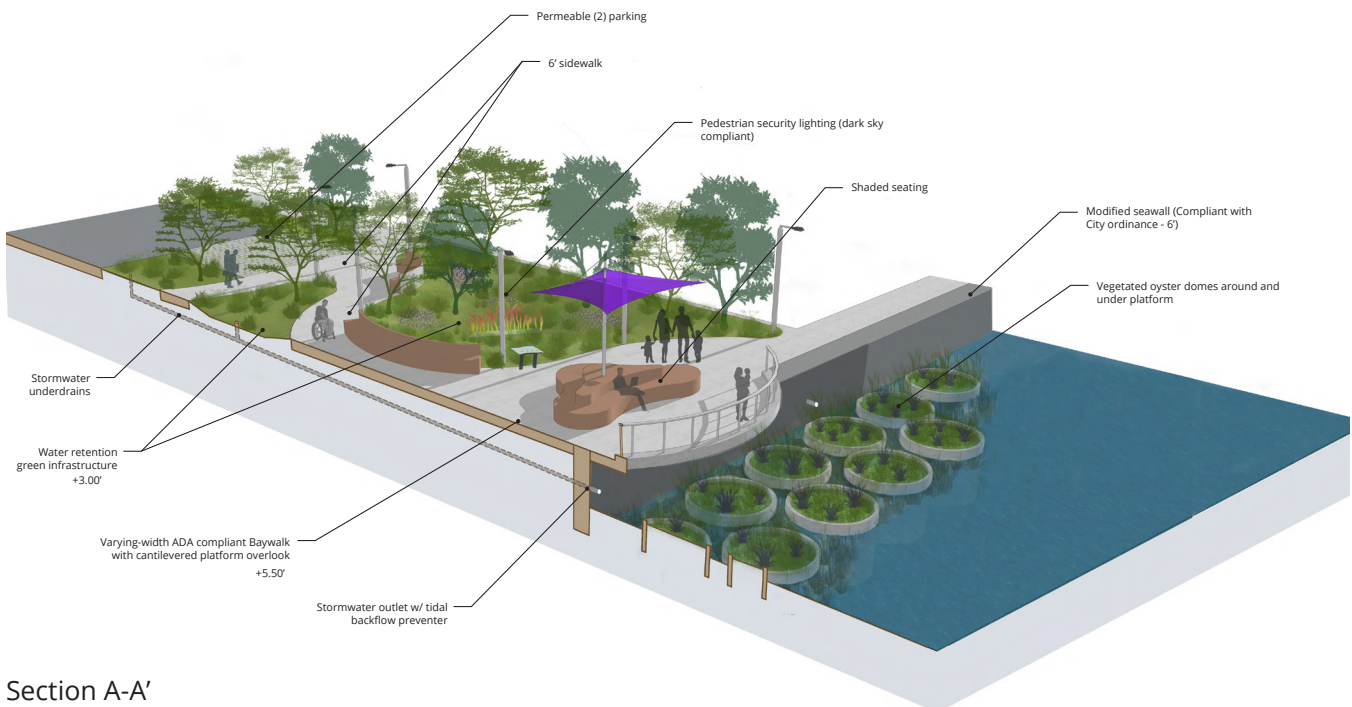
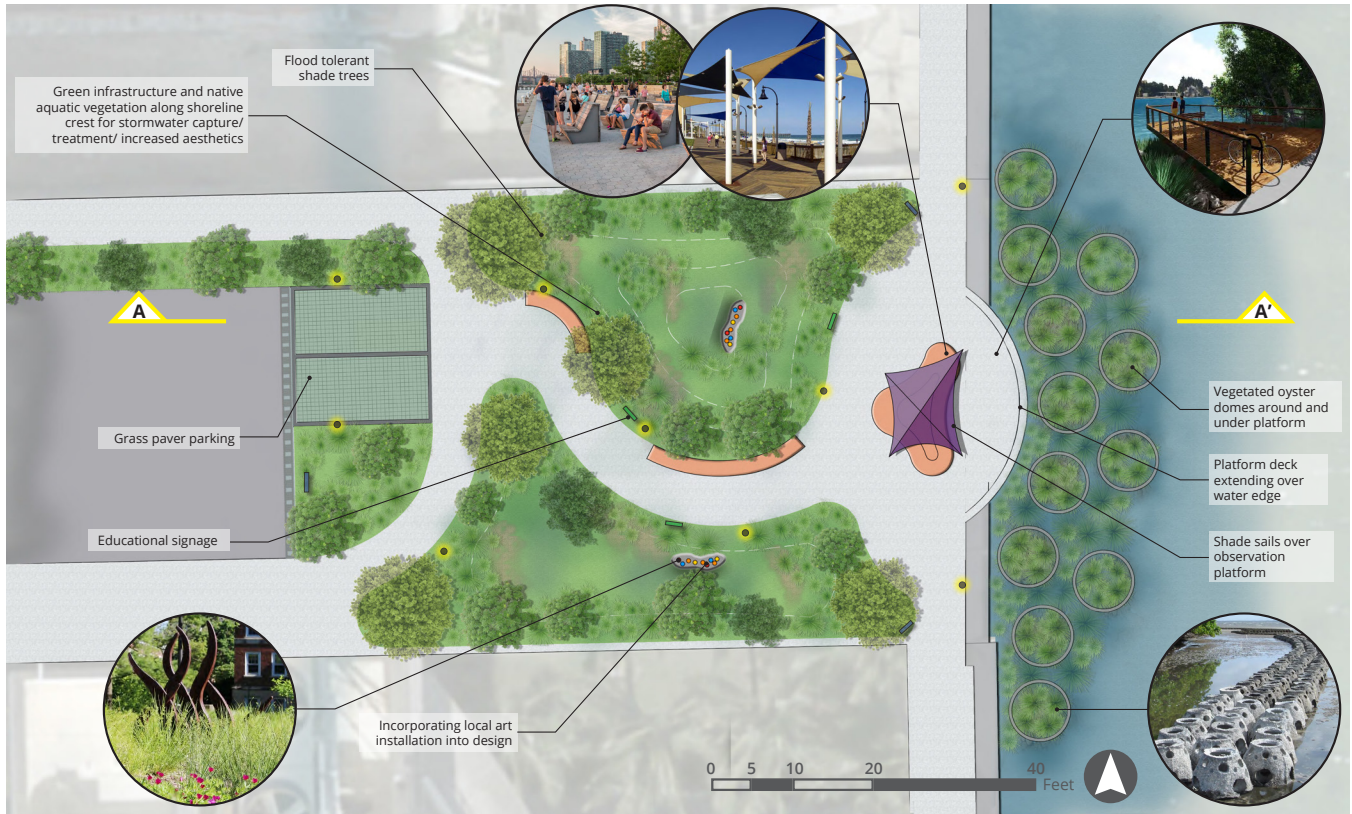
Section A-A'

Figure 4-4: End-of-Road on Bayfront - NE 26th St : Alternative 1



# DESIGN ALTERNATIVES

## Alternative 2



Section A-A'

Figure 4-5: End-of-Road on Bayfront - NE 26th St : Alternative 2



# CHAPTER 4

## Alternative 3



DESIGN ALTERNATIVES



Section A-A'

Figure 4-6: End-of-Road on Bayfront - NE 26th St : Alternative 3

# DESIGN ALTERNATIVES

## Alternative Summaries

Less Intervention Lower Complexity More Gray/Traditional		More Intervention Higher Complexity More Green/Nature-based			
Alternative 1		Alternative 2		Alternative 3	
<b>Theme:</b> Adding nature-based features to existing site		<b>Theme:</b> Observational Platform over shoreline edge		<b>Theme:</b> Pocket Park with water access	
<ul style="list-style-type: none"> <li>• Modify seawall to be compliant with City seawall ordinance ~ 6ft</li> <li>• Added aquatic vegetation planters in front of seawall</li> <li>• Added green infrastructure and native vegetation on street edge for capture/treatment/increased aesthetics</li> <li>• Add shade trees along path edge (species to be tolerant to flooding)</li> <li>• Added seating along ADA compliant Baywalk</li> </ul>		<ul style="list-style-type: none"> <li>• Platform deck extending over water edge (ties in with ADA compliant Baywalk)</li> <li>• Added vegetation around and under decking</li> <li>• Added green infrastructure and native aquatic vegetation along street edge for stormwater capture/treatment/increased aesthetics</li> <li>• Incorporate educational signage</li> <li>• Install shade sails over observational platform</li> <li>• Add shaded seating</li> </ul>		<ul style="list-style-type: none"> <li>• Urban Pocket Park with steps to water edge</li> <li>• Setback seawall to integrate steps</li> <li>• Incorporate vegetation into steps, if space allows</li> <li>• Add green infrastructure and native aquatic vegetation along shoreline crest for stormwater capture/treatment/ increased aesthetic</li> <li>• Incorporate local art installation into design</li> <li>• Install shade sails or shade trees (species tolerant to flooding)</li> <li>• Pocket Park is ADA and ties into Baywalk</li> </ul>	

DESIGN ALTERNATIVES



# CHAPTER 4

## 4.3 Typology 3: Park on Riverfront - E.G Sewell Park

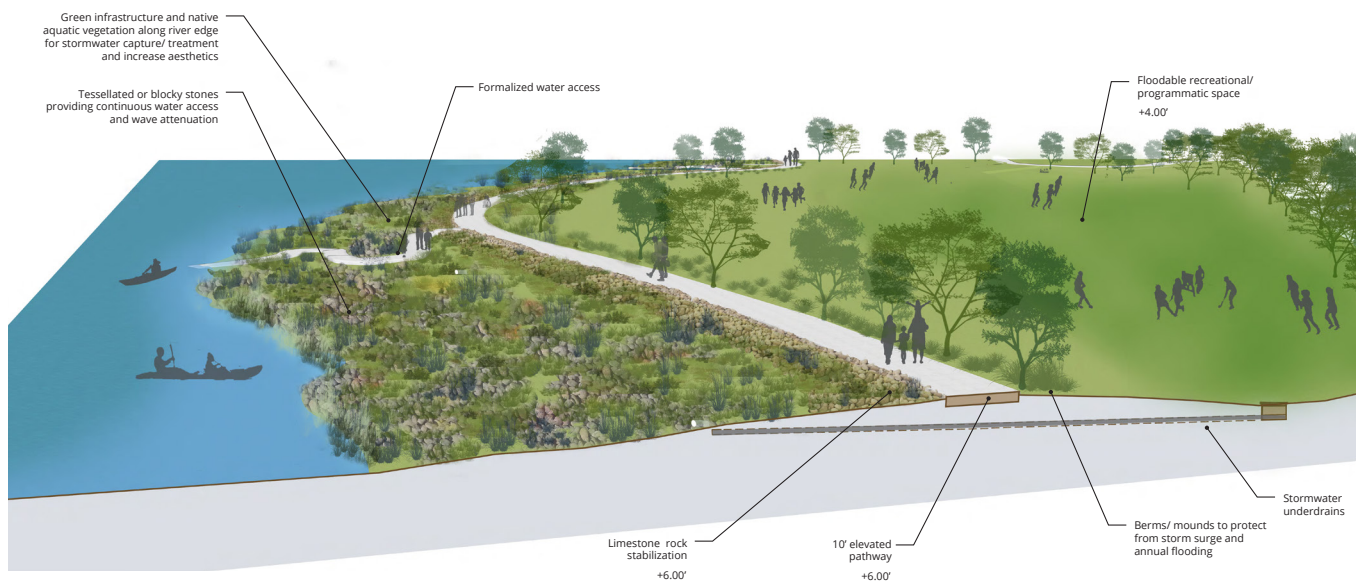


DESIGN ALTERNATIVES

Existing Site Photos



## Alternative 1



Section A-A'

Figure 4-7: Park on Riverfront - E.G Sewell Park: Alternative 1

DESIGN ALTERNATIVES



# CHAPTER 4

## Alternative 2



DESIGN ALTERNATIVES



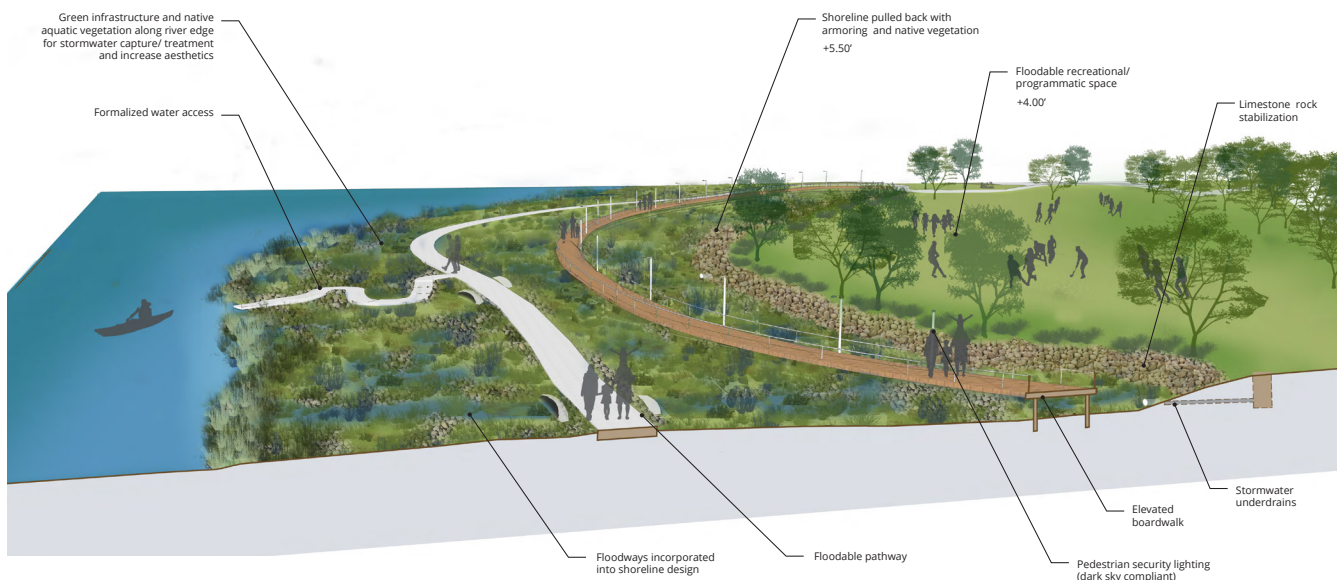
Section A-A'

Figure 4-8: Park on Riverfront - E.G. Sewell Park: Alternative 2



# DESIGN ALTERNATIVES

## Alternative 3



Section A-A'

Figure 4-9: Park on Riverfront - E.G. Sewell Park: Alternative 3

DESIGN ALTERNATIVES



# CHAPTER 4

## Alternative Summaries

Less Intervention Lower Complexity More Gray/Traditional		More Intervention Higher Complexity More Green/Nature-based			
Alternative 1		Alternative 2		Alternative 3	
<p><b>Theme:</b> Elevated shoreline with increased accessibility to programmable spaces and transitional habitat</p> <ul style="list-style-type: none"> <li>• Elevated shoreline with small berm and joint-planted armoring to tie in transitional habitats, particularly near park edges</li> <li>• Incorporate water access trail (green pavers/ permeable paving) along waterfront to maintain views and ADA access</li> <li>• Elevate and maintain open green space landward of trail to offset frequent flood risk of riverplain area</li> <li>• Include park amenities (seating, educational signage, bike racks, water fountains, trash receptacles) where applicable</li> </ul>		<p><b>Theme:</b> Layered shoreline focused on redundant protection and access to nature</p> <ul style="list-style-type: none"> <li>• Add sills and transitional habitat using native river vegetation along shoreline</li> <li>• Incorporate lower floodable permeable pathway for access during normal water level conditions</li> <li>• Elevated boardwalk landward of path to maintain access during high water events</li> <li>• Tie pathway into upland areas of park</li> <li>• Add more shade trees within the park river floodplain zone (species to be tolerant to flooding)</li> <li>• Include park amenities (seating, educational signage, bike racks, water fountains, trash receptacles) where applicable</li> </ul>		<p><b>Theme:</b> Layered shoreline focused on redundant protection with programmable space and access to nature</p> <ul style="list-style-type: none"> <li>• Add sills and transitional habitat using native river vegetation along shoreline</li> <li>• Incorporate lower floodable permeable pathway for access during normal water level conditions</li> <li>• Elevate and maintain open green space landward of trail to offset frequent flood risk of riverplain area</li> <li>• Elevated boardwalk landward of path to maintain access during high water events</li> <li>• Tie pathway into upland areas of park</li> <li>• Add more shade trees within the park river floodplain zone (species to be tolerant to flooding)</li> <li>• Include park amenities (seating, educational signage, bike racks, water fountains, trash receptacles) where applicable</li> </ul>	

## 4.4 Typology 4: Park on Bayfront - Margaret Pace Park



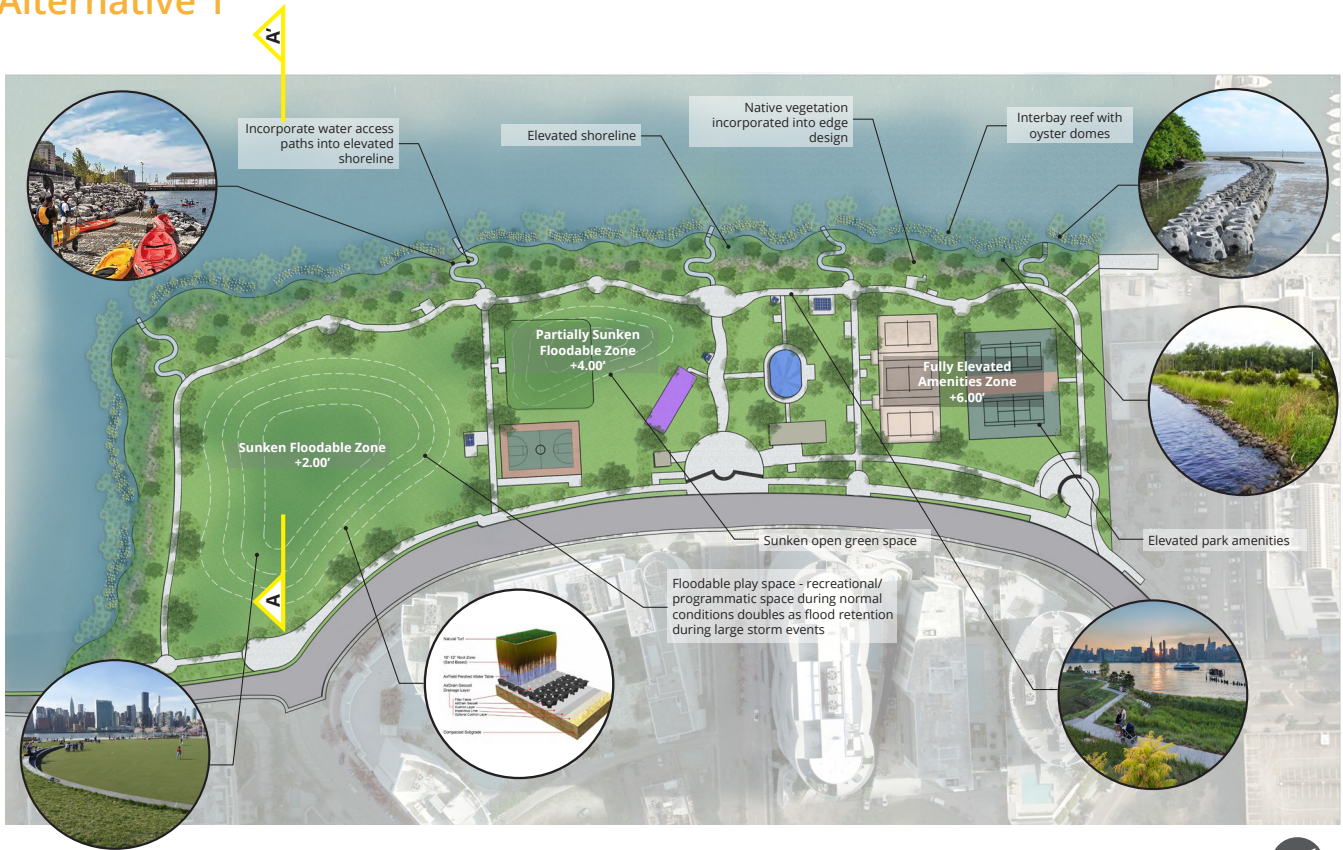
DESIGN ALTERNATIVES

Existing Site Photos

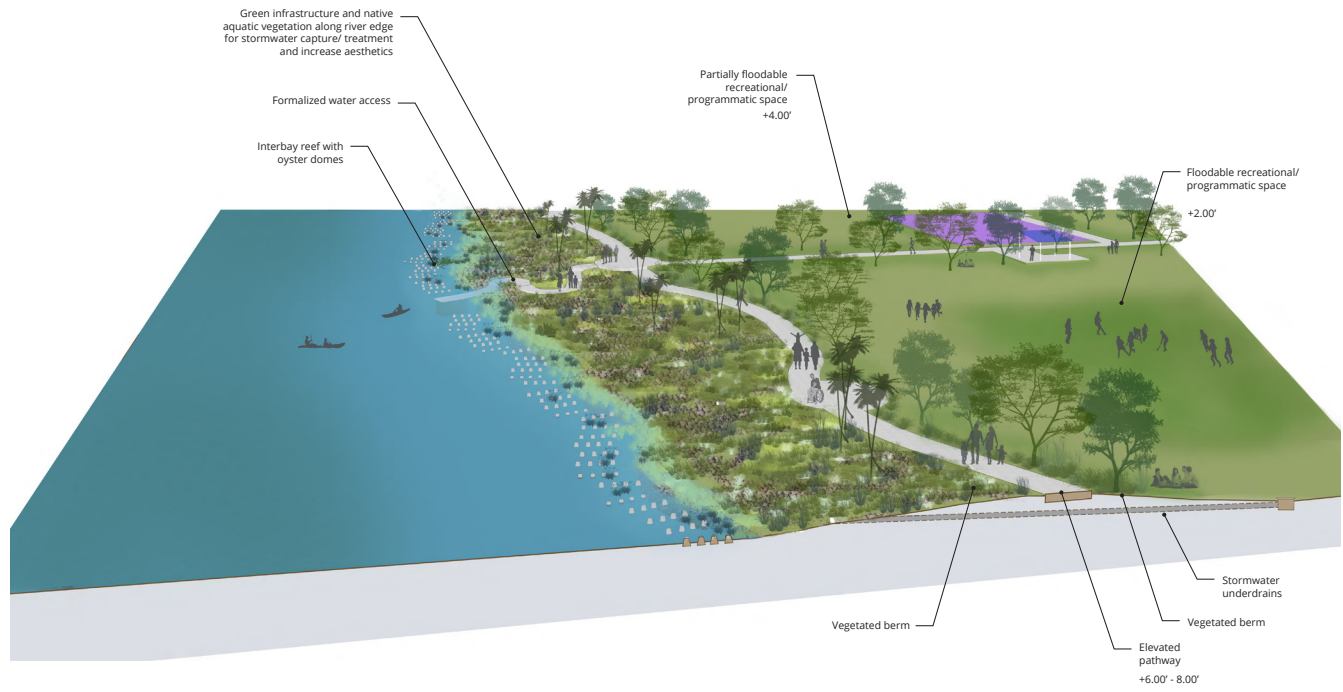


# CHAPTER 4

## Alternative 1



DESIGN ALTERNATIVES



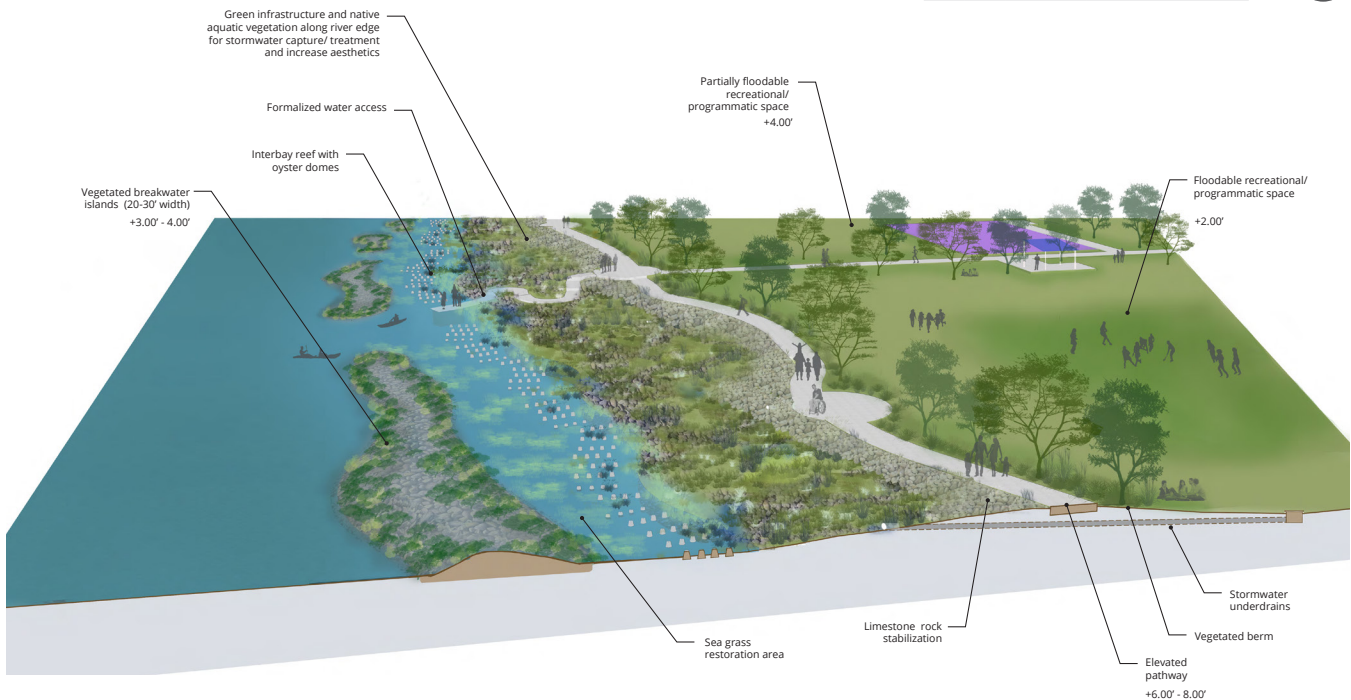
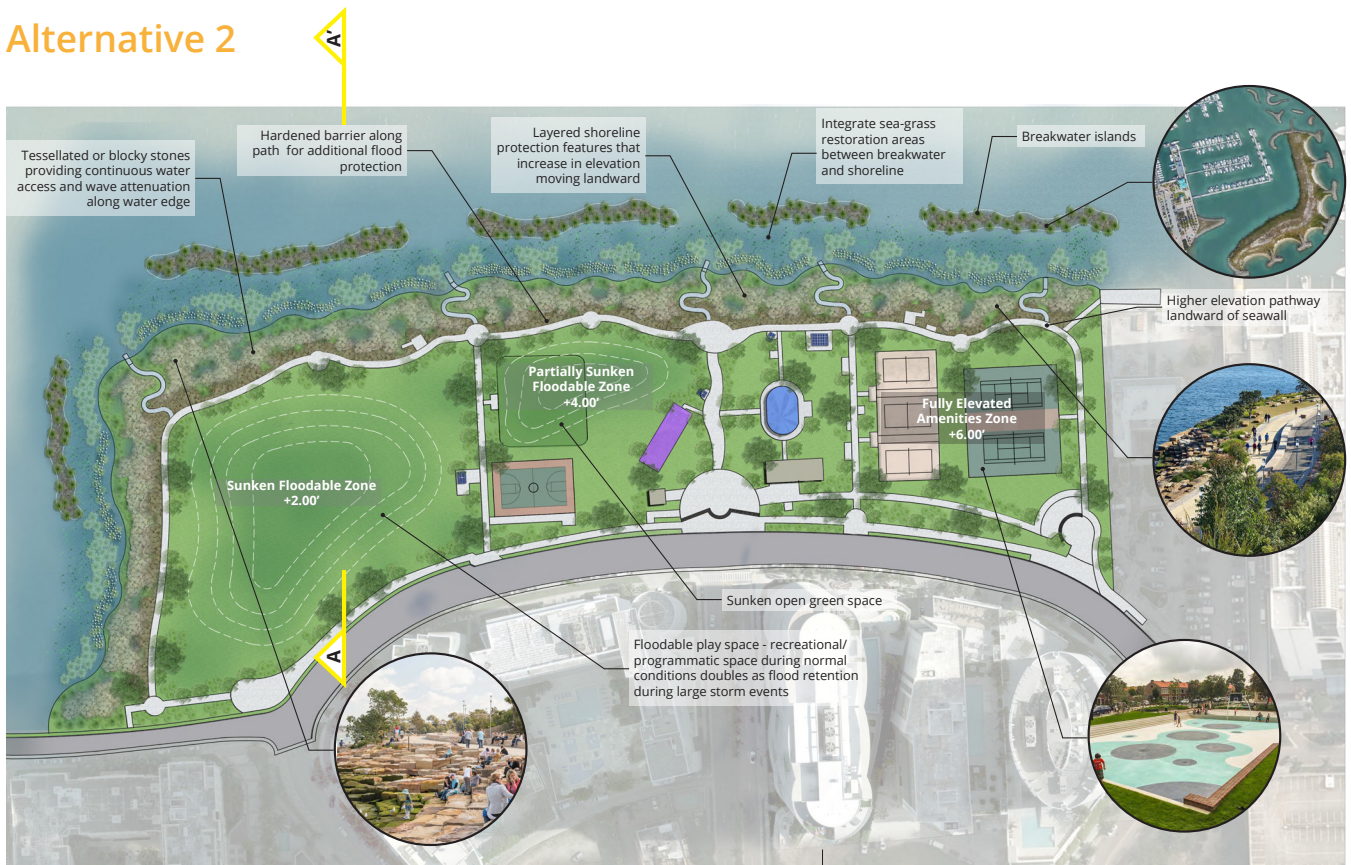
Section A-A'

Figure 4-10: Park on Bayfront - Margaret Pace Park: Alternative 1



# DESIGN ALTERNATIVES

## Alternative 2



Section A-A'


Figure 4-11: Park on Bayfront - Margaret Pace Park: Alternative 2

DESIGN ALTERNATIVES



# CHAPTER 4

## Alternative Summaries

Less Intervention Lower Complexity More Gray/Traditional 		More Intervention Higher Complexity More Green/Nature-based	
Alternative 1		Alternative 2	
<b>Theme:</b> Elevated shoreline with increased accessibility and transitional habitat			
<b>Wave Attenuation</b>			
<ul style="list-style-type: none"> <li>• Interbay Reef with Oyster Domes</li> </ul>		<ul style="list-style-type: none"> <li>• Breakwater Islands landward of navigation channel (could tie design into the Pace Picnic Islands)</li> </ul>	
<b>Elevated Shoreline</b>			
<ul style="list-style-type: none"> <li>• Elevated shoreline doubling as a walkway</li> <li>• Integrate water access paths or steps into elevated shoreline</li> <li>• Incorporate native vegetation into edge design</li> </ul>		<ul style="list-style-type: none"> <li>• Layered shoreline features and elevations that increase moving landward</li> <li>• Tessellated or blocky stones providing continuous water access and wave attenuation along water edge</li> <li>• Integrate aquatic vegetation and transitional habitats along shoreline in water edge design</li> <li>• Elevated pathway along first elevation tier of shoreline</li> <li>• Added small seawall/raised planters for additional flood protection</li> <li>• Higher elevation pathway landward of seawall/planters</li> </ul>	
<b>Floodable Space</b>			
<ul style="list-style-type: none"> <li>• Floodable open space – recreational/ programmatic space during normal conditions, but doubles as flood retention during large storm events</li> <li>• Series of elevated water storage features that doubles as art or water feature (e.g., fountains) in park</li> </ul>		<ul style="list-style-type: none"> <li>• Floodable open space – recreational/ programmatic space during normal conditions, but doubles as flood retention during large storm events</li> <li>• Series of elevated water storage features that doubles as art or water feature (e.g., fountains) in park</li> </ul>	

## 4.5 Cost/Benefit Evaluation of Design Typologies

This section presents high-level cost estimates and the varying benefits of the alternatives of each alternative for each typology. Cost estimates for each alternative took the following into account: site preparation and infrastructure, stormwater improvements, landscape improvements, shoreline improvements, as well as park structures, amenities, and signage. Studies have shown that improved community amenities, such as parks, enhanced recreational access and/or improved shoreline access can lead to several local benefits, such as public health benefits, property value increases, and avoided economic losses. The benefits have been evaluated qualitatively for each alternative presented for the typologies using FEMA's Ecosystem Service Values for "urban green open space".<sup>1</sup> These categories, or "Ecosystem Services", are:

- Aesthetic Value
- Air Quality
- Climate Regulation
- Erosion Control
- Flood Hazard Risk Reduction
- Habitat
- Pollination
- Recreation and Tourism

Each typology achieves several of these benefits. These benefits have been combined into categories for evaluation, in addition to two other benefits relating to increasing accessibility (for all typologies) and bike and pedestrian infrastructure improvements (for end-of-road typologies only). These benefits were all selected as they align with those considered for state and federal funding opportunities for green space and green and/or resilient infrastructure investments. For example, the Florida Communities Trust Parks & Open Space program looks for projects which further outdoor recreation and provide natural resource protection, while the Resilient Florida Program funds projects which address flooding and sea-level rise,

including seawall elevation, living shorelines, and drainage improvements in parks. Federal green infrastructure funding, including grants from the EPA, NFWF, FEMA, and HUD, also assess projects for public health benefits to the community, resilience to climate change and hazard mitigation, and preservation of outdoor recreation, especially in underserved neighborhoods. To further demonstrate the impact of these green spaces, each typology also includes a map showing the access level of service (5-10-minute walk). Using HUD's Low- and Moderate-Income Summary Dataset (LMISD), the proportion of residents who would be low- or moderate-income was also calculated for each walkshed.

In addition to a qualitative assessment of the benefits of each alternative for the four typologies, an estimate of the total monetized benefits was calculated at the typology-scale using the "Total Estimated Benefits" from FEMA Ecosystem Service Value Updates (2022), valued at \$15,541 per acre per year (\$2022). Across all typologies, it is possible that the benefits offered are higher or lower than the FEMA estimate calculated. This value is also a national value and has not been tailored to City of Miami conditions. Furthermore, for the typologies where urban parks already exist (typologies 3 and 4), the marginal benefit of the design update would vary depending on the benefits provided by the already existing green space there; the marginal benefit has not been calculated here. While monetized benefits per alternative have not been quantified here, it is clear that updates to the City's waterfront areas could reduce both capital and operational expenses for repairs and flood mitigation. These interventions address coastal flooding and could avoid direct physical damages as well as avoid additional operational costs to the City spent on clean-up and repair.

The discussion on cost estimates and benefit evaluation for each typology is provided in the following pages.



# CHAPTER 4

## Typology 1: End-of-Road on Riverfront (NE 5th St)

Depending on the alternative, the designs for the Riverfront end-of-road typology cost between \$1.24 and \$1.74 million. Total cost, cost per square footage of park, and total cost per linear foot of shoreline are included in the table below. All three alternatives include green space bisected by a pedestrian pathway that leads to the water's edge. The main differences among the alternatives come from the design of where the park meets the shoreline.

Alternative 1 includes an open plaza with bench seating bordered by a modified seawall, Alternative 2 includes a plaza with shaded bench seating and steps leading down to the water, while Alternative 3 features an elevated, ADA-accessible boardwalk in place of the pedestrian pathway and plaza space on previous alternatives, accompanied by shaded seating. All three alternatives provide significant public benefits. Based on FEMA Ecosystem Services' national value per acre for green space and the size of this area, the value of benefits in ecosystem services from Typology 1 estimated is approximately \$2,333 annually <sup>2</sup>.

**Table 4-1: Typology 1 - End-of-Road on Riverfront Cost Estimates and FEMA Ecosystem Benefits**

Typology 1: End-of-Road on Riverfront	Total Cost	Cost per SF of Park	Total Cost per LF of Shoreline
<b>Alternative 1</b>	<b>\$1,243,158</b>	<b>\$190</b>	<b>\$20,380</b>
<b>Alternative 2</b>	<b>\$1,371,501</b>	<b>\$210</b>	<b>\$22,484</b>
<b>Alternative 3</b>	<b>\$1,744,223</b>	<b>\$267</b>	<b>\$28,594</b>

<b>FEMA Ecosystem Services estimated annual value of benefits</b>		<b>\$2,333 per year</b>
<b>Aesthetic Value</b>	The end-of-road parklet designs create aesthetically pleasing and desirable green spaces that residents will appreciate and want to be close to.	
<b>Air Quality &amp; Climate Regulation</b>	The typology includes the planting of trees and creates green space, which sequesters carbon, helps address air pollution, and prevents urban heat islands from forming above areas of extended concrete. Seating also includes shade sails to protect park users.	
<b>Flood Hazard Risk Reduction &amp; Erosion</b>	The typology decreases runoff with permeable sidewalk and parking surfaces. Green infrastructure, bioswales and native aquatic vegetation capture and treat stormwater, while stormwater underdrains safely redirect runoff back into the water body rather than inland. The typology also includes a modified seawall and an armored shoreline with aquatic vegetation along the seawall designed to prevent rising water levels from overwhelming the park and nearby areas. The stormwater outlets also include mechanisms for tidal backflow prevention.	
<b>Habitat &amp; Pollination</b>	By replacing concrete with grass, shrubs, and trees, the typology also provides a space for pollinators and can help increase urban biodiversity.	
<b>Recreation/ Tourism</b>	The typology provides space and resources for art installation and educational signage. Depending on the alternative, the plaza, water access, and boardwalk provide an open recreational space.	

# DESIGN ALTERNATIVES

In addition to these Ecosystem Services, the typology also provides the following benefits that are aligned with state and federal grant funding criteria:

- Increasing accessibility: The typology ensures that the parking lot, pathways, seating, and plaza or boardwalk space are all ADA-accessible.

- Bike and pedestrian infrastructure: The typology adds bike racks. All walkways in the park are for pedestrians, encouraging walking and exercise.

The different alternatives for Typology 1 also provide varying levels of benefit, as shown below:

Table 4-2: Typology 1 - End-of-Road on Riverfront Benefits

Benefit	Alt. 1	Alt. 2	Alt. 3	Reasoning
<b>Aesthetic Value</b>				All three alternatives increase the aesthetic value of the area.
<b>Air Quality &amp; Climate Regulation</b>				Alternatives 3 includes more shade trees and groundcover than Alternatives 1 and 2.
<b>Flood Hazard Risk Reduction &amp; Erosion Control</b>				Alternatives 1 has fewer drainage inlets and outflows than Alternatives 2 and 3. Alternatives 3 includes a more substantial seawall alternatives than Alternatives 1 and 2.
<b>Habitat &amp; Pollination</b>				All three alternatives create green space where it previously did not exist.
<b>Recreation / Tourism</b>				Alternatives 2 includes water access and Alternatives 3 includes an elevated boardwalk.
<b>Increasing accessibility</b>				All three alternatives include the same ADA pathways, parking, and crosswalks.
<b>Bike and pedestrian infrastructure</b>				All three alternatives include the same provisions for bike and walking infrastructure.

DESIGN ALTERNATIVES

Matrix Key:

- Indicates *No* benefits
- Indicates *Moderate* or the same benefits as other alternatives
- Indicates *Fewer* benefits compared to the other alternatives
- Indicates *More* benefits than the other alternatives



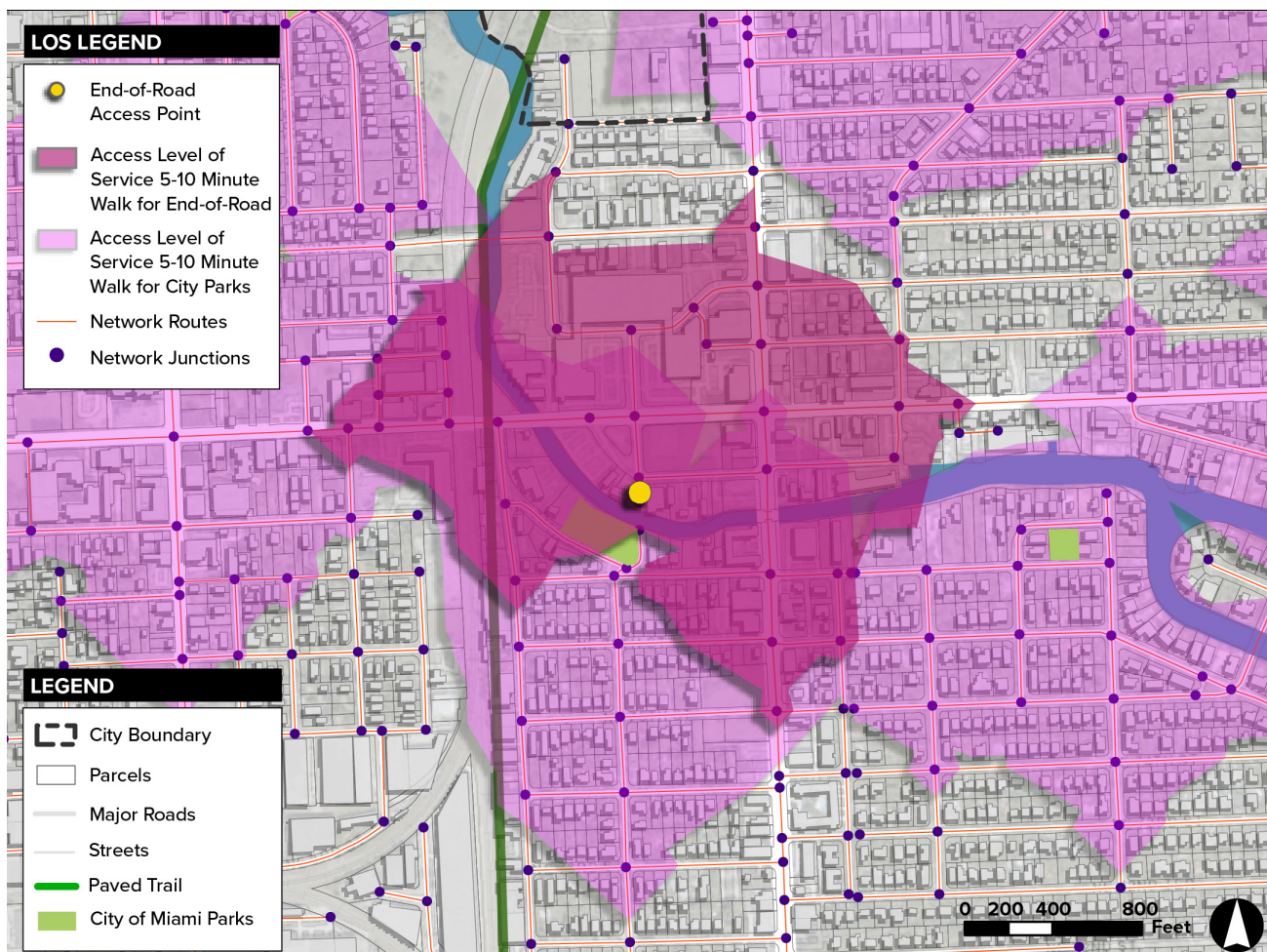
# CHAPTER 4

## Additional End-of-Road Benefits: Improved Walkable Access to Open Space

With the development of end-of-road typologies, the City of Miami has the opportunity to add public parkland and open space while improving access level of service in key areas of the City. Walkable access to open space, particularly waterfront access, is becoming increasingly important to City residents. The implementation of the design typology at the end-of-road on the Riverfront can provide waterfront access and unique recreation experiences for many residents that currently have limited access to these resources. The figure below illustrates how the end-of-road parklet improves walkable access in the adjacent neighborhoods (dark pink), expanding on the 5-10 minute level of

service walksheds currently provided by City of Miami Parks (light pink). The 5-10 minute walkshed for the end-of-road design on the Riverfront is located mostly in two different Census Tracts (13.01 and 13.02) and overlaps seven different Census Block Groups in those tracts. Of those seven Block Groups, the residents in six are majority low- and moderate-income (ranging between 62.9% of residents to 91% of residents).

Map 4-1: Access Level of Service for Typology 1 for End-of-Road on Riverfront (5-10 Minute Walk)



# DESIGN ALTERNATIVES

## Typology 2: End-of-Road on Bayfront (NE 26th St)

Depending on the alternative, the designs for the Bayfront end-of-road typology cost between \$1.24 million and \$1.43 million. Total cost, cost per square footage of park, and total cost per linear foot of shoreline are included in the table below. All three alternatives include a combination of green space and pathways leading to the water's edge. The main differences among the alternatives come from the design

where the park meets the shoreline. Alternative 1 features a pathway bordered by the seawall and aquatic vegetation, Alternative 2 includes an ADA-compliant, shaded platform deck with an observation platform and seating, and oyster domes located beneath the platform, while Alternative 3 features shaded seating along an elevated boardwalk leading to concrete steps into the water.

**Table 4-3: Typology 2 - End-of-Road on Bayfront Cost Estimates**

Typology 2: End-of-Road on Bayfront	Total Cost	Cost per SF of Park	Total Cost per LF of Shoreline
<b>Alternative 1</b>	<b>\$1,239,424</b>	<b>\$237</b>	<b>\$17,706</b>
<b>Alternative 2</b>	<b>\$1,468,170</b>	<b>\$281</b>	<b>\$20,974</b>
<b>Alternative 3</b>	<b>\$1,431,241</b>	<b>\$274</b>	<b>\$20,445</b>

<b>FEMA Ecosystem Services estimated annual value of benefits</b>		<b>\$1,866 per year</b>
<b>Aesthetic Value</b>	The end-of-road parklet designs create aesthetically pleasing and desirable green spaces that residents will appreciate and want to be close to.	
<b>Air Quality &amp; Climate Regulation</b>	The typology includes the planting of trees and creates green space, which sequesters carbon, helps address air pollution, and prevents urban heat islands from forming above areas of extended concrete. Seating also includes shade sails to protect park users.	
<b>Flood Hazard Risk Reduction &amp; Erosion</b>	The typology decreases runoff with permeable sidewalk and parking surfaces. Green infrastructure, bioswales and flood-tolerant shade trees absorb and treat stormwater, while stormwater underdrains safely redirect runoff back into the water body rather than inland. The typology also includes a modified seawall and an armored shoreline with aquatic vegetation along the seawall designed to prevent rising water levels from overwhelming the park and nearby areas. The stormwater outlets also include mechanisms for tidal backflow prevention.	
<b>Habitat &amp; Pollination</b>	By replacing concrete with grass, shrubs, and trees, the typology also provides a space for pollinators and can help increase urban biodiversity. The typology also includes an alternative for vegetated oyster domes to help restore the shoreline.	
<b>Recreation/ Tourism</b>	The typology provides space and resources for art installation and educational signage. Depending on the alternative, the walkway, observation platform deck, and elevated boardwalk with water access all offer an open recreational space.	



# CHAPTER 4

All three alternatives provide significant public benefits. Based on FEMA Ecosystem Services' national value per acre for green space and the size of this area, the value of benefits in ecosystem services from Typology 2 estimated is approximately \$1,866 per year.<sup>3</sup>

In addition to these Ecosystem Services, the typology also provides the following benefits that are aligned with state and federal grant funding criteria:

- Increasing accessibility: The typology ensures that the parking lot, pathways, seating, and walkway, platform, or boardwalk space are all ADA-accessible.
- Bike and pedestrian infrastructure: The typology adds bike racks. All walkways in the park are for pedestrians, encouraging walking and exercise.

The different alternatives for Typology 2 also provide varying levels of benefit, as shown below:

**Table 4-4: Typology 2 - End-of-Road on Bayfront Benefits**

Benefit	Alt. 1	Alt. 2	Alt. 3	Reasoning
<b>Aesthetic Value</b>				All three alternatives increase the aesthetic value of the area.
<b>Air Quality &amp; Climate Regulation</b>				Alternative three includes more shade trees and groundcover than Alternatives 1 and 2.
<b>Flood Hazard Risk Reduction &amp; Erosion Control</b>				Alternative 1 has fewer drainage inlets and outflows than Alternatives 2 and 3. All 3 alternatives include similar protections against sea-level rise.
<b>Habitat &amp; Pollination</b>				All three alternatives create green space where it did not previously exist. Alternative 2 is the only alternative with custom oyster domes.
<b>Recreation / Tourism</b>				Alternative 2 includes an observation deck and Alternative 3 includes water access.
<b>Increasing accessibility</b>				All three alternatives include the same ADA pathways, parking, and crosswalks.
<b>Bike and pedestrian infrastructure</b>				All three alternatives include the same provisions for bike and walking infrastructure.

**Matrix Key:**



Indicates *No* benefits



Indicates *Fewer* benefits compared to the other alternatives



Indicates *Moderate* or the same benefits as other alternatives



Indicates *More* benefits than the other alternatives

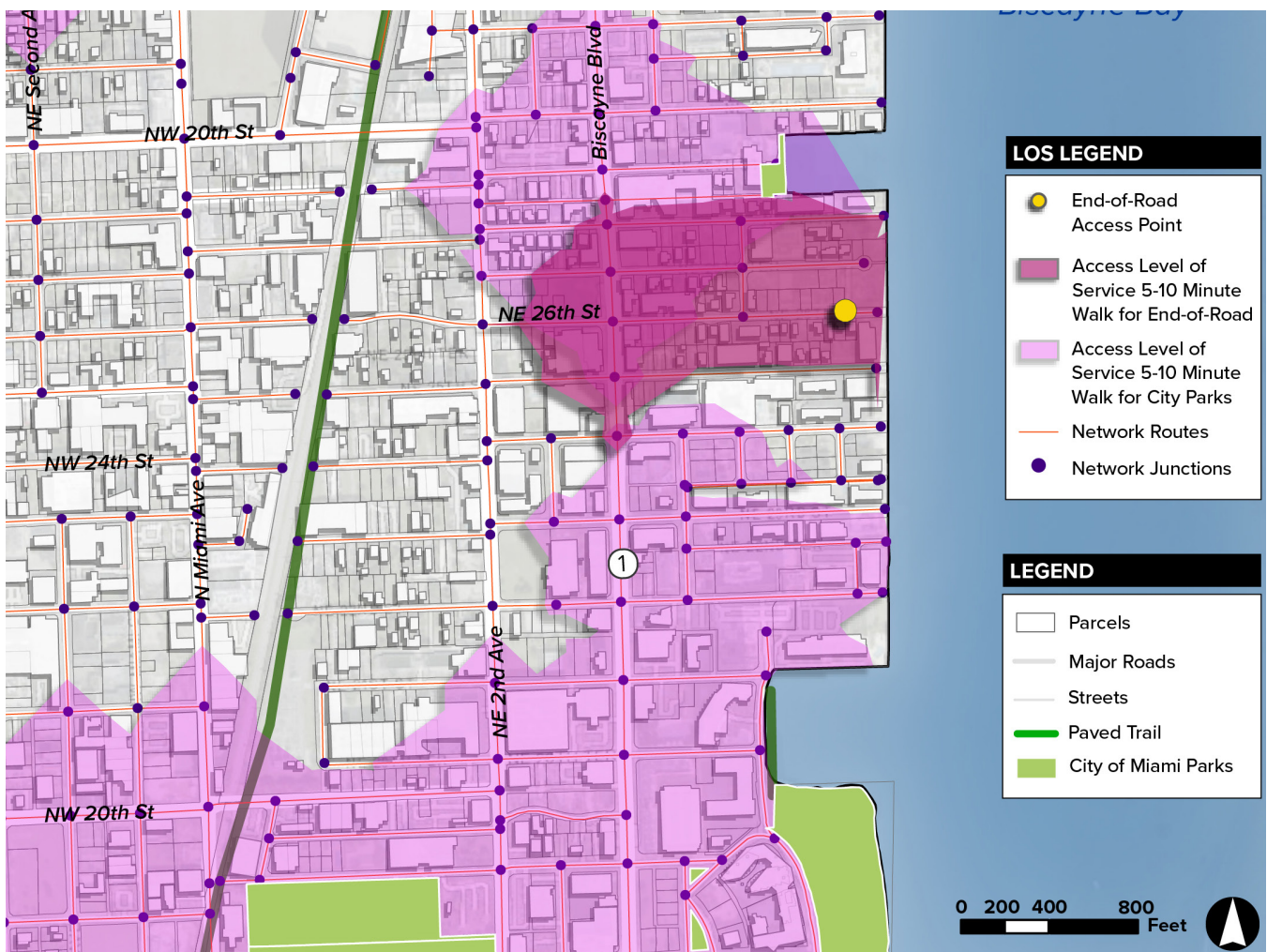
# DESIGN ALTERNATIVES

## Additional End-of-Road Benefits: Improved Walkable Access to Open Space

Similar to Typology 1, with the development of end-of-road typologies, the implementation of the design typologies at the end-of-road Bayfront can provide waterfront access and unique recreation experiences for many residents that currently have limited access to these resources. The figure below illustrates how the end-of-road parklet improves walkable access in the adjacent

neighborhoods (dark pink), expanding on the 5–10 minute level of service walksheds currently provided by City of Miami Parks (light pink). The entirety of the 5-10 minute walkshed for the end-of-road design on the Bayfront is located within one Census Block Group, in one Census Tract (27.06). HUD LMISD indicates that 57.75% of residents in this Block Group are low- and moderate-income persons.

Map 4-2: Access Level of Service for Typology 2 for End-of-Road on Bayfront (5-10 Minute Walk)



DESIGN ALTERNATIVES



# CHAPTER 4

## Typology 3: Park on Riverfront (E.G. Sewell Park)

Depending on the alternative, the designs for the Riverfront park typology cost between \$7.82 million and \$11.04 million. Total cost, cost per square footage of park, and total cost per linear foot of shoreline are included in the table below. All three alternatives are redesigns for the currently existing E.G. Sewell Park, which contains green space with a loop trail running

through the park. The main differences among the alternatives come from differences in water access, flood features and vegetation, and shoreline features. Alternative 1 features the loop trail atop a formal shoreline with water access points, including a kayak launch, and a recreational space with berms and mounds. Alternative 2 includes a pulled back shoreline, floodable loop trail, and an elevated boardwalk over a floodable area stabilized with rocks and vegetation. Alternative 3 features the same

**Table 4-5: Typology 3 - Park on Riverfront Cost Estimates**

Typology 3: Park on Riverfront	Total Cost	Cost per SF of Park	Total Cost per LF of Shoreline
<b>Alternative 1</b>	<b>\$7,817,675</b>	<b>\$1,737,261</b>	<b>\$9,090</b>
<b>Alternative 2</b>	<b>\$12,244,255</b>	<b>\$2,720,939</b>	<b>\$14,237</b>
<b>Alternative 3</b>	<b>\$11,040,844</b>	<b>\$2,453,521</b>	<b>\$12,838</b>

DESIGN ALTERNATIVES

<b>FEMA Ecosystem Services estimated annual value of benefits</b>		<b>\$69,935 per year</b>
<b>Aesthetic Value</b>	Improvements on the park will make it even more desirable of a space for residents to be close to.	
<b>Air Quality &amp; Climate Regulation</b>	The typology includes the planting of trees and improves the existing green space, which sequesters carbon, helps address air pollution, and prevents urban heat islands from forming.	
<b>Flood Hazard Risk Reduction &amp; Erosion</b>	The typology decreases runoff with permeable pathways and uses green infrastructure and native vegetation to capture stormwater. Depending on the alternative, the recreation space features berms and mounds, rocks and vegetation, or a sunken retention area to absorb stormwater. The park includes drainage inlets in retention areas, sub-surface drainage infrastructure, and outflows with tidal backflow preventers.	
<b>Habitat &amp; Pollination</b>	By increasing grass, shrubs, and trees coverage, the typology also can help increase urban biodiversity and pollination.	
<b>Recreation/ Tourism</b>	The typology includes several features for recreational use, including a trail loop across all three alternatives, a floodable recreational space in alternatives 1 and 3, an elevated boardwalk in alternatives 2 and 3, and water access pathways and a canoe and kayak launch in alternatives 1 and 2. These spaces encourage walking and outdoor exercise, beneficial to public health, and increase residents' quality of life. There are also locations for educational signage for residents to learn about the surrounding habitat.	

# DESIGN ALTERNATIVES

pulled back shoreline, floodable loop trail, and elevated boardwalk, but with a floodable recreational space that doubles as flood retention.

All three alternatives provide significant public benefits. Based on FEMA Ecosystem Services' national value per acre for green space and the size of this area, the value of benefits in ecosystem services from Typology 3 estimated is approximately \$69,935 annually.<sup>4</sup>

In addition to these Ecosystem Services, the typology also provides the following benefits that are aligned with state and federal grant funding criteria:

- Increasing accessibility: The typology also increases the accessibility of the existing park by ensuring that the loop trail and boardwalk (alternatives 2 and 3) are all ADA-accessible.

The different alternatives for Typology 3 each also provide varying levels of benefit, as shown below:

**Table 4-6: Typology 3 - Park on Riverfront Benefits**

Benefit	Alt. 1	Alt. 2	Alt. 3	Reasoning
<b>Aesthetic Value</b>				All three alternatives increase the aesthetic value of the area.
<b>Air Quality &amp; Climate Regulation</b>				All three alternatives include similar levels of green space coverage.
<b>Flood Hazard Risk Reduction &amp; Erosion Control</b>				All three alternatives appear to offer similar protections against flooding.
<b>Habitat &amp; Pollination</b>				All three alternatives offer similar potential increases in habitat and pollination.
<b>Recreation / Tourism</b>				Alternative 2 includes both an elevated boardwalk and a canoe/kayak launch.
<b>Increasing accessibility</b>				All three alternatives include similar accessibility provisions.

**Matrix Key:**



Indicates *No* benefits



Indicates *Fewer* benefits compared to the other alternatives



Indicates *Moderate* or the same benefits as other alternatives



Indicates *More* benefits than the other alternatives



# CHAPTER 4

## Typology 4: Park on the Bayfront (Margaret Pace Park)

Depending on the alternative, the designs for the Bayfront park typology cost between \$13.29 million and \$14.89 million. Total cost, cost per square footage of park, and total cost per linear foot of shoreline are included in the table below. All three alternatives are redesigns for the

currently existing Margaret Pace Park. The main differences among the alternatives are differences in infrastructure. Alternative 2 includes a stabilized shoreline, wave attenuation structure, and new high-visibility crosswalks that are left out of Alternative 1.

The value of benefits in ecosystem services from Typology 4 estimated is approximately \$124,328 annually.<sup>5</sup>

Typology 4: Park on Bayfront	Total Cost	Cost per SF of Park	Total Cost per LF of Shoreline
<b>Alternative 1</b>	<b>\$13,288,706</b>	<b>\$1,661,088</b>	<b>\$7,383</b>
<b>Alternative 2</b>	<b>\$14,886,725</b>	<b>\$1,860,841</b>	<b>\$8,270</b>

<b>FEMA Ecosystem Services estimated annual value of benefits</b>		<b>\$124,328 per year</b>
<b>Aesthetic Value</b>	Improvements on the park will make it even more desirable of a space for residents to be close to.	
<b>Air Quality &amp; Climate Regulation</b>	The typology includes the planting of trees and improves the existing green space, which sequesters carbon, helps address air pollution, and prevents urban heat islands from forming.	
<b>Flood Hazard Risk Reduction &amp; Erosion</b>	The typology implements green infrastructure and native aquatic vegetation along the shoreline for stormwater capture and includes partially floodable green space as well as a permeable pathway to decrease runoff. The designs also include stormwater infrastructure improvements: drainage inlets in retention areas, sub-surface drainage infrastructure, and outflows with tidal backflow preventers. Alternative 2 includes vegetated breakwater islands which further insure against flooding. The typology also includes an elevated shoreline and walking pathway, vegetated berms and fully elevated park amenities zone to address sea-level rise.	
<b>Habitat &amp; Pollination</b>	By increasing grass, shrubs, and trees coverage, the typology also can help increase urban biodiversity and pollination. The typology includes interbay reef with oyster domes which not only provide wave attenuation but also a habitat to revive coastal oyster and other marine populations.	
<b>Recreation/ Tourism</b>	The typology including an elevated, permeable pathway which follows the perimeter of the park, water access paths, a fully elevated amenities and the addition of a volleyball court, relocation of a dog park, and relocation of a basketball court. These provide multiple alternatives for local residents to enjoy recreation.	



# DESIGN ALTERNATIVES

In addition to these Ecosystem Services, the typology also provides the following benefits that are aligned with state and federal grant funding criteria:





- Increasing accessibility: The typology also increases the accessibility of the existing park by ensuring that permeable pathway and other park features are ADA-accessible. Alternative 2 also includes ADA-accessible new crosswalks with high-visibility markings, which also better protect pedestrians in the park vicinity.

The different alternatives for Typology 4 each also provide varying levels of benefit, as shown below:

**Table 4-8: Typology 4 - Park on Bayfront Benefits**

Benefit	Alt. 1	Alt. 2	Reasoning
<b>Aesthetic Value</b>			Both alternatives increase the aesthetic value of the area.
<b>Air Quality &amp; Climate Regulation</b>			Both alternatives offer similar benefits and landscape improvements.
<b>Flood Hazard Risk Reduction &amp; Erosion Control</b>			Alternative 2 includes vegetated breakwater islands and greater shoreline improvements.
<b>Habitat &amp; Pollination</b>			Both alternatives include similar potential increases in habitat and pollination. Both alternatives also include interbay reefs with oyster domes that help to revive marine populations.
<b>Recreation / Tourism</b>			Both alternatives include similar recreational amenities.
<b>Increasing accessibility</b>			Alternative 2 includes ADA-accessible new crosswalks.

DESIGN ALTERNATIVES

Matrix Key:	
 Indicates <i>No</i> benefits	 Indicates <i>Fewer</i> benefits compared to the other alternatives
 Indicates <i>Moderate</i> or the same benefits as other alternatives	 Indicates <i>More</i> benefits than the other alternatives







# PERMITTING REQUIREMENTS

## 5

Compliance with regulatory requirements is an integral part of the design process. The following pages provides a summary of key regulatory and permitting requirements necessary to achieve the desired outcomes of this project. These requirements derive from Federal, State, County, and City agencies. The summary is based on agency insights, a desktop review of requirements, and previous experience designing and building waterfront infrastructure. These requirements inform the specifics of the design alternatives, as well as the City of Miami's next steps in the implementation process.



## 5.1 Regulatory and Permitting Requirements

### Federal Permits

#### U.S. Army Corps of Engineers Department of the Army Permits

The U.S. Army Corps of Engineers (USACE) regulates placement of structures and activities in navigable waterways, as well as the discharge of dredged and fill material into all Waters of the U.S. The USACE is responsible for issuing the following permits applicable to waterfront design alternatives:

- Section 10 Placement of Structures in Navigable Waters permits (Rivers and Harbors Act);
- Section 404 Clean Water Act (CWA) permits
- Section 408 Civil Works review and permit.

#### Section 10 / 404 Permit

The USACE issues permits by combining Section 10 of the Rivers and Harbors Act of 1899 and Section 404(e) of the CWA. Depending on the size and scope of the project, the USACE will authorize a Letter of Permission (LOP), Nationwide Permit (NWP), or a Standard or

Individual Permit (IP). If a project does not qualify for either a LOP or NWP, the project will be permitted through an IP.

#### Letter of Permission

LOPs may be used where, in the opinion of the district engineer, the proposed work would be minor, would not have significant individual or cumulative impacts on environmental values, and should encounter no appreciable opposition. In such situations, the proposal is coordinated with Federal and State resource agencies, and in most cases, adjacent property owners who might be affected by the proposal. However, the public at large is not notified. The public interest review process is central to the decision-making process for LOP. The type of permit application and process suited to the project will be discussed with the USACE during pre-application meetings. There are no fees associated with a LOP, and the estimated duration for permit receipt is approximately 6 months after a complete application is accepted. Taken together, the design elements in each design alternative under each typology likely will not qualify for a LOP.



# REGULATORY AND PERMITTING REQUIREMENTS

## Nationwide Permit 13 Bank Stabilization

NWPs authorize a category of activities throughout the nation and is valid only if the conditions applicable to the permit are met. Nationwide 13 allow bank stabilization activities necessary for erosion control or prevention, such as vegetative stabilization, bioengineering, sills, rip rap, revetment, gabion baskets, stream barbs, and bulkheads, or combinations of bank stabilization techniques. NWP 13 is subject to restrictions, some of which include:

- No material is placed in excess of minimum needed for erosion protection;
- The activity is no more than 500 feet in length along the bank;
- The activity will not exceed an average of one cubic yard per running foot;
- Does not authorize dredge and fill material into special aquatic sites; and
- Native plants appropriate for current site conditions, must be used for bioengineering or vegetative bank stabilization.

If the project meets the restrictions the project can proceed under a NW permit. Additionally, NWPs satisfy public notice requirements. There are no fees associated with NWPs, and the estimated duration for receipt of permit verification is approximately 9 months to 12 months after a complete pre-construction notification is accepted.

## Nationwide Permit 54 Living Shorelines

NWP 54 allows the construction of living shorelines. Use of NWP 54 is subject to the following restrictions:

- The structures and fill areas, including sand fills, sills, breakwaters, or reefs, cannot extend into the waterbody more than 30 feet from the mean low water line in tidal waters;
- The activity is no more than 500 feet in length along the bank;
- Coir logs, coir mats, stone, native oyster shell, native wood debris, and other

structural materials must be adequately anchored, of sufficient weight, or installed in a manner that prevents relocation in most wave action or water flow conditions, except for extremely severe storms;

- Discharges of dredged or fill material into waters of the U.S., and oyster or mussel reef structures in navigable waters, must be the minimum necessary for the establishment and maintenance of the living shoreline; and
- Native plants appropriate for current site conditions, must be used.

Similar to NWP 13, there are no fees associated with NWP 54 and the estimated duration for receipt of permit verification is approximately 9 months to 12 months after a complete pre-construction notification is accepted.

Where applicable, the advancement of the design elements in the alternatives through more detailed design and engineering may wish to take the conditions for NWPs into consideration. This will help ensure that estimated durations remain within the typical time limits and reduce the risk for design revisions. This may be particularly beneficial on projects with budget limitations and tight schedules.

## Individual Permit

Should project impacts exceed the restrictions for the NWP 13 and 54 the project will require an IP. IPs are required to undergo a 30-day Public Notice period. This process includes listing the project on USACE's website and sending notice to adjacent property owners of the delineated project boundary. Review time of an IP would be approximately 12-18 months from submittal of a complete application. The USACE may request additional information until an application is deemed complete. There is a \$100 fee required once the permit is issued.

In light of the unique nature of the projects considered, an IP may be preferable for authorization, as it would not have the same set of limiting conditions and restrictions that the



# CHAPTER 5

NWPs would have. An IP also grants a project-specific permit authorization period (5 years from issuance) and can be modified if needed, unlike an NWP.

## Public Notice

Under an IP review, the project will undergo a 30-day Public Notice period. This includes listing the project on USACE's website and sending notice to adjacent property owners of the delineated project boundary, federal consulting agencies, State Historic Preservation Office (SHPO), Native American tribes of Florida, and other interested parties that have requested notifications.

## Section 408 Authorization

Section 408 review may be required if the project will alter, occupy, or use a USACE federally authorized Civil Works Project. There are no fees associated with this permit and permit application review may take up to a year. In South Florida, numerous large canals (including much of the C-7/Little River Canal and C-6/Miami River Canal) require 408 authorization as

part of the Central and Southern Florida Flood Control Project (CSFFC), as do any projects within 100 feet of the Intra Coastal Waterway (ICWW). Applications are usually submitted by the State (described below) on behalf of the applicant as the State and the USACE have overlapping jurisdiction. Section 408 authorization will be required for all design alternatives under typologies 1 and 3.

## Federal Consultation

### ESA Section 7 Consultation (NOAA PRD)

The Endangered Species Act (ESA), as amended (16 U.S. Code [U.S.C.] 1532 et. seq.), provides designation and protection of endangered and threatened species and their critical habitat. An endangered species is a species in danger of extinction throughout all, or a significant portion, of its range. A threatened species will likely become endangered within the foreseeable future throughout all, or a significant portion, of its range. Critical habitat as defined by the ESA is a specific geographic area with physical and/or biological features that are essential for the



# REGULATORY AND PERMITTING REQUIREMENTS

conservation of endangered and threatened species and may require special management considerations or protection. If a project has the potential to affect a federally listed species, or their habitat, consultation is required.

The federal agency tasked with protecting marine threatened and endangered species is the National Oceanic and Atmospheric Administration (NOAA) Protected Resource Division (PRD). The USACE must consult with the PRD when any action the agency carries out, funds, or authorizes activities that may affect either a species listed as threatened or endangered under the ESA, or any designated critical habitat. If the Federal agency taking the action (USACE) determines the project is Not Likely to Adversely Affect (NLAA) listed species and/or critical habitat, they submit an informal consultation request to NOAA PRD (referred to as the “Consulting Agency” under section 7) for concurrence. NOAA PRD will provide a Letter of Concurrence to the action agency if it agrees with the action agency’s NLAA determination. NOAA PRD will provide written concurrence or non-concurrence with the Federal agency’s

determination typically within 60 days (or longer based on workload) once they receive enough information to make a determination. Once the concurrence letter is issued, the consultation process is terminated, and no further action is necessary. If consultation cannot be concluded informally due to adverse effects anticipated to listed species, the action agency must request formal consultation.

To initiate formal consultation, USACE must provide information to NOAA Fisheries PRD specified in 50 Code of Federal Regulation (CFR) 402.14(c) and (d); this includes information regarding the proposed project and species, or critical habitat likely affected, generally included in a Biological Assessment (BA). If NOAA PRD determines the species or critical habitat may be adversely affected, it will prepare a BA that analyzes the effects of the proposed project on a listed species or critical habitat, and states whether the USACE has ensured the proposed project will not likely jeopardize the continued existence of that listed species and/or result in destruction or adverse modification of critical habitat (Section 7 of ESA). A BA includes





# CHAPTER 5

conservation recommendations to further the recovery of listed species, and may include reasonable and prudent measures, as needed, to minimize any “take” (harassment) of listed species.

## USACE Jacksonville’s District Programmatic Biological Opinion (JaxBO)

NOAA PRD has issued a programmatic BO for certain routine activities within the USACE Jacksonville District of JaxBO allows the USACE to make determinations for frequently occurring or routine activities, without additional consultation with NOAA PRD, if projects meet certain impact thresholds. A project is required to meet specific criteria outlined in the JaxBO to satisfy consultation with NOAA PRD under the programmatic BO. These criteria are known as project design criteria (PDC), and specify how a project must be sited, constructed, or otherwise carried out to avoid or minimize adverse effects to ESA-listed species or designated critical habitat.

There are both general and specific PDC’s for shoreline stabilization (Activity 1) required by JaxBO. General PDC’s include instructions for all construction personnel to be aware of species that could be encountered, responsibility of all vessel operators to watch for ESA species in the area, reporting requirements, and BMP’s to be used to control turbidity. Specific PDC’s for shoreline stabilization include:

- A limitation of 500 feet of shoreline;
- The repair, and replacement of seawalls and footers cannot extend any further waterward than 1.5 ft (18 in) from the wet face of the existing seawall or mean high water (MHW) unless necessary to align with 1 or more adjacent seawalls.
- Shoreline stabilization materials may consist of riprap, articulating blocks or mats, and sand cement, geotextile/ filter fabric and mattresses. Installation of new shoreline stabilization materials where none

previously existed may not extend more than 10 ft waterward of MHW (including the toe of the riprap).

Activity 7 provides PDC’s for Aquatic Habitat Enhancement, Establishment, and Restoration Activities including living shorelines. Specific PDC’s for Activity 7 include:

- Only native plants can be planted;
- Oyster reef materials shall be placed and constructed in a manner that ensures that materials will remain stable and that prevents movement of materials to surrounding areas (e.g., oysters will be contained in bags or attached to mats and loose cultch must be surrounded by contained bagged oysters or another stabilizing feature);
- Oyster reef materials must be placed in designated locations only (i.e., the materials shall not be indiscriminately or randomly dumped or allowed to spread outside of the reef structure);
- Living shorelines can only be constructed in unvegetated, nearshore water along shorelines to create tidal marshes or mangrove habitat for the purpose of shoreline erosion control or aquatic habitat enhancement. Native plants can be placed along the shoreline or between the shoreline and the living shoreline structure; and
- Both living shoreline and oyster reefs must have 5-foot gaps at least every 75 feet in length, as measured parallel to the shoreline and at the sea floor, to allow for tidal flushing and species movement.

In addition, JaxBO does not apply to projects that may affect, directly or indirectly, ESA-listed corals. The applicability of utilizing JaxBO to satisfy Section 7 consultation with NOAA PRD will be reviewed during the planning phase of any project and once ESA involvement is better understood through data review and site-specific surveys.

# REGULATORY AND PERMITTING REQUIREMENTS

## ESA Section 7 Consultation (U.S. Fish and Wildlife Service)

As described above under consultation with NOAA PRD, the USACE will also consult with USFWS for federally listed wildlife species or designated critical habitat under ESA Section 7. This includes nesting sea turtles, shore/coastal birds, and manatees. A BA would be required if the project could not be designed to fit within the Activity 1 or Activity 7 PDC and if formal consultation is required, USFWS will prepare a BO regarding the project's potential impact on listed species or their habitat. Early consultation with lead agencies is important to confirm timeframes and expectations under specific project circumstances.

## Magnuson-Stevens Act Consultation for EFH (NOAA HCD)

The Magnuson-Stevens Act sets forth several mandates for NOAA Fisheries Habitat Conservation Division (HCD) to identify and protect important marine and fish habitat, and

to delineate Essential Fish Habitat (EFH) for all managed species. The U.S. Congress has defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802[10]).

Section 303(a)(7) of the amended Magnuson-Stevens Act directs NOAA HCD, under the authority of the Secretary of Commerce, to describe EFH and identify EFH in each fishery management plan; minimize to the extent practicable, the adverse effects of fishing on EFH; and identify other actions to encourage the conservation and enhancement of EFH. NOAA HCD and its eight regional fisheries management councils are responsible for the management and protection of fisheries and habitat essential for the survival of managed species. The U.S. Secretary of Commerce, acting through NOAA Fisheries and in coordination with the South Atlantic Fishery Management Council (SAFMC) has been delegated this authority under the provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). The SAFMC is responsible for the management





# CHAPTER 5

of fish stocks and EFH within U.S. territorial waters. Federal agencies must consult with the Secretary of Commerce on any action that may adversely affect EFH.

The EFH definition includes:

- Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate;
- Substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities;
- Necessary means that the habitat required to support a sustainable fishery and the managed species contribution to a healthy ecosystem; and
- Spawning, breeding, feeding, or growth to maturity covers a species' full life cycle.

The entire coast of Florida has designated EFH. The EFH consultation process is as follows:

- The USACE provides notification of the action to NOAA HCD.
- The USACE submits an EFH Assessment (typically prepared by the Applicant) to NOAA HCD.
- NOAA HCD reviews the EFH Assessment, and, if necessary, provides EFH conservation recommendations to the USACE within 30-60 days, or longer based on workload.
- The USACE responds to NOAA HCD within 30 days with information on how it will proceed with the action.

An EFH Assessment would document the project activities, baseline conditions in the action area, and protective measures proposed to avoid or reduce impacts to EFH. Early consultation with NOAA HCD during project planning and design is recommended.

## Historical Resources

Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to consider the impacts of their undertakings on historic properties and archaeological resources. The Florida State Historic Preservation Office (SHPO), through the Florida Division of Historical Resources (FDHR), is the state agency that identifies and protects historic buildings, districts, structures, and archaeological sites in the state of Florida. Consultation with SHPO will occur during the USACE and state permitting process.

Historic properties may include prehistoric or historic districts, sites, buildings, structures, objects (including shipwrecks), sacred sites, and traditional cultural places, that are included in, or eligible for inclusion in, the National Register for Historic Places. The SHPO may require an analysis (i.e. survey) of known and potential cultural resources near the project area if other cultural resources have been previously identified on or near the project area.

## State Permitting

### Statewide Environmental Resource Permit

Chapter 62-330, Florida Administrative Code (FAC), establishes the types of activities that require a permit, activities that do not require a permit, the procedures for processing a permit, the conditions for issuance of a permit, general permit conditions, and the forms associated with applications, notices, and permits. Under 62-330 the state provides an exemption for repair and replacement of seawalls. In addition, there are general permits for placement of rip-rap (62-330.431) and a general permit for Restoration, Establishment and Enhancement of Low Profile Oyster Habitat (62-330.632).

The applicant must meet all the conditions of an exemption or a general permit for the project to be reviewed and approved. The general permit contains conditions for specific activities and

# REGULATORY AND PERMITTING REQUIREMENTS

restricting impacts. If the project cannot comply with all of the general permit conditions, the project will require an Individual Permit from the South Florida Water Management District (SFWMD). Taken in conjunction with other improvements, such as stormwater treatment facilities, an individual permit for each design alternative under each typology is likely to be required.

The review process will analyze project direct, secondary, and cumulative impacts. Mitigation will be required for impacts to protected resources that cannot be avoided. The SFWMD adheres to detailed timeframes for the review of permits. Once an SWERP application is received, the department has up to 30 days to determine if the application is complete, or to issue a Request for Additional Information (RAI) if more information is needed. When the application is deemed complete, the department has 60 days to either issue a permit (or a Notice of Intent to Issue) if the activity meets the SWERP permitting criteria or issue a Notice of Denial (or Notice of Intent to Deny) if the activity does not. The estimated duration for permit review is approximately 6 months to 9 months after a complete application is accepted. An Individual Permit likely required for all alternatives and typologies under consideration. Individual permit fees from SFWMD are \$2,000 for projects less than 10 acres in size that do not include boat slips.

## Sovereignty Submerged Lands (SSL)

Activities located on SSL also require a proprietary authorization from the Board of Trustees. Review of proprietary authorization occurs concurrently with the Statewide Environmental Resource Permitting (SWERP) process and review. The approval or denial of an individually processed SWERP application is linked with the approval or denial of any required state-owned submerged lands application under Section 373.427, F.S. Under 18-21.004(C) (5), F.A.C., construction, or replacement, of bulkheads, seawalls, or other such shoreline stabilization structures that extend no more

than three feet waterward of the line of mean or ordinary high water are exempt. Should any activity extend beyond 3 feet of the mean-high water line (MHWL), SSL authorization may be required.

Activities that require an individually processed ERP cannot become complete until all required state-owned submerged lands information has been submitted as part of the permit application. In addition, the ERP cannot be issued unless a determination has been made that the related state-owned submerged lands application also can be issued. If an activity meets all the requirements for issuance of an ERP but does not meet all the requirements for issuance of





# CHAPTER 5

the state-owned submerged lands authorization, the ERP must be denied. Authorization to use SSL will include an easement fee assessed by the Board of Trustees.

The USACE and the Florida Department of Environmental Protection (FDEP) have an Operating Agreement to coordinate the exchange of information between these agencies (and the State's water management districts) regarding permitting, compliance, and enforcement of activities regulated under Part IV of Chapter 373, F.S. The operating agreement details how issuance of an SWERP (including a general permit) also constitute a water quality certification under the CWA (Section 401) for the required USACE permit.

## CWA Section 401 Water Quality Certification

The USACE and the Florida Department of Environmental Protection (FDEP) have an Operating Agreement to coordinate the exchange of information between these agencies (and the State's water management districts) regarding permitting, compliance, and enforcement of activities regulated under Part IV of Chapter 373, F.S. The operating agreement details how issuance of an SWERP (including a general permit) also constitute a water quality certification under the CWA (Section 401) for the required USACE permit.

## South Florida Water Management District Right-of-Way Permit

The SFWMD defines right of way (ROW) as those properties or facilities that have been designated as "Works of the SFWMD" by the SFWMD's Governing Board. The most common ROW are those lands associated with canals and levees and in which the SFWMD has a fee (outright ownership) or easement (subject to someone else owning the property) interest. Use of SFWMD ROW is subject to the ROW Occupancy Permitting Program pursuant to Chapter 40E-6, FAC. The Miami River (C-6 canal) and the Little River Canal (C-7 canal) are works of the SFWMD. Permit applications, typically require very specific engineering drawings (permit sketches) showing only the work proposed in SFWMD ROW. In addition, once an application for a ROW Occupancy Permit has been deemed complete, including submission of any information required for the USACE to perform the Section 408 review, the SFWMD will submit a copy of the application and supporting documents to the USACE. All alternatives under typologies 1 and 3 will require authorization from the SFWMD ROW Office, due to their location on SFWMD ROW canals.

The proposed work would fall under SFWMD ROW permit fee category "SP-3," which carries a fee of \$625.00. SFWMD ROW Permit review typically ranges from 6 to 9 months.



# REGULATORY AND PERMITTING REQUIREMENTS

## Local Permits

### Miami-Dade County Department of Environmental Resources Management

Miami-Dade County Department of Environmental Resources Management (DERM) implements a regulatory program to protect water quality and natural resources within the County. Two separate permits would likely be required from DERM.

A Class I permit is required for any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County (Miami-Dade County Code of Ordinances Section 24-48). This permit is likely required for all design alternatives under all typologies due to the location of the proposed work. Application and permitting fees are based on estimated construction costs. Application fees can be as high as \$28,750 for projects with construction costs of \$1,000,000 or more. A separate permit fee (approximately equivalent in magnitude to the application fee) is typically waived for public projects under Miami-Dade County Code of Ordinances Section 24-48.8. Class I permit review time is widely variable, ranging from 3 to 12 months and is largely dependent on project complexity.

A Class II permit is needed to control stormwater discharge to any surface water in Miami-Dade County. If a project is designed in such a way that 100% of the stormwater is retained on-site it may be possible to avoid the need for this permit. Class II fees are also based on estimated construction costs. Class II permits have a lower application fee (typically \$490) than Class I permit applications. As with the Class I, the Class II permit fee can be high depending on construction cost estimates, but local governments are able to request a waiver of the permit fee under Sec 24-48.8. Class II permit turnaround is typically 30-60 days but may be held back from issuance until the issuance of the Class I permit.

## Planning and Zoning

Any landscaping plans must comply with the Miami-Dade County Landscaping Ordinance (Chapter 18A). Under the landscaping ordinance, the County requires landscaping buffers and the use of Florida friendly landscaping principles. This requirement would be for all design alternatives under each typology.





# CHAPTER 5

## City Permits

Considering the amenities and facilities featured in the design alternatives, several city departments might be involved in the permitting process. These departments include the Buildings Department, Planning Department, Department of Resilience and Public Works, and Parks and Recreation Department. Permits are obtained by submitted the scope of work to the ePlan permit portal and generating a process number. This then generates a list of departments that need to review the plans, as well as where the project stands in the permitting process. The following is a summary of potential departments involved and their scope of review:

- The Building Department enforces code and regulations related to the construction, alteration, and maintenance of buildings and structures, which would be relevant for the construction of recreation facilities, among other structures.
- The Planning Department is made up of several distinct divisions that might play a role in the regulation process, including Arts in Public Places (AIPP), Historic Preservation, Land Development, and Urban Design. These divisions may be involved in certain projects where amenities and facilities in a project need to conform certain standards.
- The Department of Resilience and Public Works oversees the infrastructure, maintenance, and construction activities in the City's public right-of-way, which might influence the environmental restoration element of the designs, among others. This department would be the primary reviewer in the case of most EOR projects.
- The Parks and Recreation Department manages the 100+ parks in the City, and they will likely have a role in the regulation and permitting requirements, particularly at projects involving parks or sites that may be converted parks.





# REGULATORY AND PERMITTING REQUIREMENTS



PERMITTING REQUIREMENTS



# CHAPTER 5

Table 5-1: Permitting Summary Matrix			AGENCIES				
			COUNTY			STATE	
Typology	Location	Alternative	Miami-Dade Division of Environmental Resource Management Class I	Miami-Dade Division of Environmental Resource Management Class II	Planning and Zoning	SFWMD Environmental Resource Permit	SFWMD District Right-of-Way
Typology 1 End-of-road on Riverfront	NE 5th Ave	Design Alternative 1	Required for any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required to control stormwater discharge to any surface water in Miami-Dade County	Landscaping Requirements	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	Required for work within and adjacent to SFWMD ROW (C-7/ Little River Canal)
		Design Alternative 2	Required for any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required to control stormwater discharge to any surface water in Miami-Dade County	Landscaping Requirements	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	Required for work within and adjacent to SFWMD ROW (C-7/ Little River Canal)
		Design Alternative 3	Required for any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required to control stormwater discharge to any surface water in Miami-Dade County	Landscaping Requirements	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	Required for work within and adjacent to SFWMD ROW (C-7/ Little River Canal)
Typology 2 End-of-road on Bayfront	NE 26th Ave	Design Alternative 1	Required for any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required to control stormwater discharge to any surface water in Miami-Dade County	Landscaping Requirements	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	N/A
		Design Alternative 2	Required for any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required to control stormwater discharge to any surface water in Miami-Dade County	Landscaping Requirements	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	N/A
		Design Alternative 3	Required for any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required to control stormwater discharge to any surface water in Miami-Dade County	Landscaping Requirements	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	N/A

# REGULATORY AND PERMITTING REQUIREMENTS

	AGENCIES					
STATE	FEDERAL					
Sovereign Submerged Lands	US Army Corps of Engineers 404 (Dredge and Fill)	US Army Corps of Engineers Section 408	US Fish and Wildlife Services	National Marine Fisheries Protected Resources Division	National Marine Fisheries Essential Fish Habitat Division	State Historic Preservation Office, Florida Division of Historical Resources
Review of use of all submerged lands. Completed in conjunction with ERP review	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13	Engineering review conducted by the USACE to confirm that a proposed work will not adversely affect civil works of the District. Required for work in Little River Canal	Review of potential impacts to threatened and endangered species: West Indian Manatee. Consultation through USACE permitting process	Review of potential impacts to marine threatened and endangered species. Consultation through USACE permitting process	Identify and protect Essential Fish Habitat: waters and substrate providing habitat. Consultation through permitting process	Review of potential effects of the project on historic properties and archaeological resources. Consultation through USACE permitting process
	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13	Engineering review conducted by the USACE to confirm that a proposed work will not adversely affect civil works of the District. Required for work in Little River Canal	Review of potential impacts to threatened and endangered species: West Indian Manatee. Consultation through USACE permitting process	Review of potential impacts to marine threatened and endangered species. Consultation through USACE permitting process	Identify and protect Essential Fish Habitat: waters and substrate providing habitat. Consultation through permitting process	Review of potential effects of the project on historic properties and archaeological resources. Consultation through USACE permitting process
Review of use of all submerged lands. Completed in conjunction with ERP review	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13	Required for work in Little River Canal	Review of potential impacts to threatened and endangered species: West Indian Manatee. Consultation through USACE permitting process	Review of potential impacts to marine threatened and endangered species. Consultation through USACE permitting process	Identify and protect Essential Fish Habitat: waters and substrate providing habitat. Consultation through permitting process	Review of potential effects of the project on historic properties and archaeological resources. Consultation through USACE permitting process
Review of use of all submerged lands. Completed in conjunction with ERP review	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13	N/A	Review of potential impacts to threatened and endangered species: West Indian Manatee. Consultation through USACE permitting process	Review of potential impacts to marine threatened and endangered species. Consultation through USACE permitting process	Identify and protect Essential Fish Habitat: waters and substrate providing habitat. Consultation through permitting process	Review of potential effects of the project on historic properties and archaeological resources. Consultation through USACE permitting process
	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13	N/A	Review of potential impacts to threatened and endangered species: West Indian Manatee. Consultation through USACE permitting process	Review of potential impacts to marine threatened and endangered species. Consultation through USACE permitting process	Identify and protect Essential Fish Habitat: waters and substrate providing habitat. Consultation through permitting process	Review of potential effects of the project on historic properties and archaeological resources. Consultation through USACE permitting process
Review of use of all submerged lands. Completed in conjunction with ERP review	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13	N/A	Review of potential impacts to threatened and endangered species: West Indian Manatee. Consultation through USACE permitting process	Review of potential impacts to marine threatened and endangered species. Consultation through USACE permitting process	Identify and protect Essential Fish Habitat: waters and substrate providing habitat. Consultation through permitting process	Review of potential effects of the project on historic properties and archaeological resources. Consultation through USACE permitting process

PERMITTING REQUIREMENTS



# CHAPTER 5

			AGENCIES				
			COUNTY			STATE	
Typology	Location	Alternative	Miami-Dade Division of Environmental Resource Management Class I	Miami-Dade Division of Environmental Resource Management Class II	Planning and Zoning	South Florida Water Management District Environmental Resource Permit	South Florida Water Management District Right-of-Way
Typology 3 Park on Riverfront	Sewell Park	Design Alternative 1	Required for any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required to control stormwater discharge to any surface water in Miami-Dade County	Landscaping Requirements	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	Required for work within and adjacent to SFWMD ROW (C-6/ Miami River Canal)
		Design Alternative 2	Required for any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required to control stormwater discharge to any surface water in Miami-Dade County.	Landscaping Requirements	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	Required for work within and adjacent to SFWMD ROW (C-6/ Miami River Canal)
		Design Alternative 3	Required for any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required for drainage into surface waters.	Landscaping Requirements	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	Required for work within and adjacent to SFWMD ROW (C-6/ Miami River Canal)
Typology 4 Park on Bayfront	Margaret Park	Design Alternative 1	Required for any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required to control stormwater discharge to any surface water in Miami-Dade County	Landscaping Requirements	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	N/A
		Design Alternative 2	N/A	Required to control stormwater discharge to any surface water in Miami-Dade County	Landscaping Requirements	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	N/A

# REGULATORY AND PERMITTING REQUIREMENTS

	AGENCIES					
STATE	FEDERAL					
Sovereign Submerged Lands	US Army Corps of Engineers 404 (Dredge and Fill)	US Army Corps of Engineers Section 408	US Fish and Wildlife Services	National Marine Fisheries Protected Resources Division	National Marine Fisheries Essential Fish Habitat Division	State Historic Preservation Office, Florida Division of Historical Resources
Review of use of all submerged lands. Completed in conjunction with ERP review	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13	Engineering review conducted by the USACE to confirm that proposed work will not adversely affect civil works of the District. Required for work in Miami River	Review of potential impacts to threatened and endangered species: West Indian Manatee. Consultation through USACE permitting process	Review of potential impacts to marine threatened and endangered species. Consultation through USACE permitting process	Identify and protect Essential Fish Habitat: waters and substrate providing habitat. Consultation through permitting process	Review of potential effects of the project on historic properties and archaeological resources. Consultation through USACE permitting process
N/A	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13	Engineering review conducted by the USACE to confirm that proposed work will not adversely affect civil works of the District. Required for work in Miami River	Review of potential impacts to threatened and endangered species: West Indian Manatee. Consultation through USACE permitting process	Review of potential impacts to marine threatened and endangered species. Consultation through USACE permitting process	Identify and protect Essential Fish Habitat: waters and substrate providing habitat. Consultation through permitting process	Review of potential effects of the project on historic properties and archaeological resources. Consultation through USACE permitting process
Review of use of all submerged lands. Completed in conjunction with ERP review	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13	review conducted by the USACE to confirm that proposed work will not adversely affect civil works of the District. Required for work in Miami River	Review of potential impacts to threatened and endangered species: West Indian Manatee. Consultation through USACE permitting process	Review of potential impacts to marine threatened and endangered species. Consultation through USACE permitting process	Identify and protect Essential Fish Habitat: waters, substrate, vegetation. Consultation through permitting process	Review of potential effects of the project on historic properties and archaeological resources. Consultation through USACE permitting process
Review of use of all submerged lands. Completed in conjunction with ERP review	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13	N/A	Review of potential impacts to threatened and endangered species: West Indian Manatee. Consultation through USACE permitting process	Review of potential impacts to marine threatened and endangered species. Consultation through USACE permitting process	Identify and protect Essential Fish Habitat: waters and substrate providing habitat. Consultation through permitting process	Review of potential effects of the project on historic properties and archaeological resources. Consultation through USACE permitting process
Review of use of all submerged lands. Completed in conjunction with ERP review	Required for dredge and fill within tidal surface waters (riprap). Likely to require a Standard Permit	N/A	Review of potential impacts to threatened and endangered species: West Indian Manatee. Consultation through USACE permitting process	Review of potential impacts to marine threatened and endangered species. Consultation through USACE permitting process	Identify and protect Essential Fish Habitat: waters and substrate providing habitat. Consultation through permitting process	Review of potential effects of the project on historic properties and archaeological resources. Consultation through USACE permitting process

PERMITTING REQUIREMENTS



## 5.2 Agency Meetings

Four regulatory agencies provided insight and feedback regarding the permitting requirements for the alternative design solutions. The four agencies are Miami-Dade County's Department of Environmental Resources Management/Regulatory & Economic Resources, the City of Miami, South Florida Water Management District, and the United States Army Corps of Engineers.

### Miami-Dade County Department of Environmental Resources Management/Regulatory & Economic Resources

Miami-Dade County's Department of Environmental Resources Management (DERM) oversees the restoration, monitoring, education, regulatory, and land management programs aimed at protecting the County's natural resources. The County's Department of Regulatory & Economic Resources (RER) manages regulatory strategies and business expansion efforts.

In a pre-application permitting meeting, the County had comments related to water control and coastal resources. First, in terms of water control, the elevation of proposed project elements needs to be at or about the current levels of County flood data. Furthermore, any dry retention areas need to be above the high-water table. The grading and drainage design of these dry retention areas needs to follow County flood criteria, as well as water quality requirements. The County will meet again to discuss elevations in grading and drainage plans once designs are advanced to include engineering drawings. Also, any outfalls will require both a Class II permit and manatee grates. Considering the amount of green infrastructure in most of the designs, however, it is unlikely outfalls will be required in the project scope.

In terms of coastal resources, all proposed designs involve wetland areas that discharge into tidal

waters. The County advises that the project team determines whether the designs will be filled with riprap or organic material to support plantings. If the project team pursues riprap to fill the designs, all riprap should not exceed 10 feet waterward and they need to be greater than one foot in diameter at a minimum.

Also, the designs need to meet wetland management requirements, including dredge and fill criteria. Dredge and fill is reviewed by the Environmental Quality Control Board, and if a variance is needed, then the County Commission needs to approve it. Mitigation is required for any fill, and filling waterward of the mean water line is considered filling of tidal waters. Designs should end at the edge of the existing sea wall and the project team should grade back into the site for infrastructure improvements like steps or oyster domes.

If pursuing oyster domes, then the design requires a variance from the County Commission, as oyster domes would be considered filled tidal waters. These variances typically extend the application process by an additional 60 days. The Sewell Park kayak launch proposed oyster domes but ultimately removed them from the application because of the needed BOCC approval and extended timeline.

For constructed wetlands, the project team needs to create barriers between neighbors to prevent flooding and wetland encroachment on adjacent properties. Transitioning an area to a wetland is subject to County jurisdiction and will require a Class I permit. A Class I permit is also needed for maintenance (i.e., Mowing, construction, etc.) of any areas that flood with tidal waters, as they are considered wetlands. Ultimately, the limit on what is considered a wetland is determined by the wetland delineation rule (62-340) established by Florida's Department of Environmental Protection.

# REGULATORY AND PERMITTING REQUIREMENTS

In terms of living shorelines and proposed plantings, the County will provide a list of suggested and preferred plant material and grasses. The County particularly prefers the use of mangroves for living shorelines. Generally, mangrove trimming would require additional permitting and red mangroves require a +1' elevation for planting. The smallest mangroves are 6' but that is likely not ideal for the project scope, so the size will be dependent on the nature of the project.

On the other hand, planting landward of a seawall would not be considered fill. The Virginia Key Beach Park project provided native plantings landward of a seawall. While it was designed to flood, it was not considered filling in tidal waters nor a wetland because the plants were planted in planters.

Generally, seawalls require a 6" grade change landward. Concrete seawalls, however, are limited to 12" water face and steel seawalls are limited to 18" water face. Although the County can review some projects for the State and some projects for the Army Corps of Engineers, the County does not have the authority to review or issue a permit for a project that involves any filling waterward of a seawall. The County also does not have the authority to issue a permit for the Army Corps for projects within 100 feet of a federal channel.

## City of Miami

Although there is no existing checklist of needed permits, the City of Miami provided insight into departments and contacts potentially needed for the projects moving forward. In many cases where County permits are needed, the City facilitates the submission and processing of files between the project team and the County.

The City also noted that the various departments across the City's government has different requirements, rules, and regulations. First, all designs must obtain a master permit from the City of Miami's Building Department. The master permit includes requirements related to structural and floodplain management, mechanical and plumbing,

electrical, fire, trees, and public right-of-way permits. The Parks and Recreation Department needs to also review all plans.

Also, the City has an Archaeological division that is mandated by the City and backed by the City and the State; a review process with this division is dependent on the severity of the findings. This division differs from the City's Historic Preservation division, which has different requirements and prerequisites. The City's Planning Department can determine if the project area falls under a historic area or an archaeological area; thus, they can indicate which division the project team needs to work with moving forward.

The City's Planning Department can also assist in tree preservation plans, and it can explain how the designs and projects relate to any existing master plan. The Planning Department and the Zoning Office can also replat and rezone land as park and public use. They can help define the steps for rezoning and clearly outline what would need to happen for the EOR pilot sites. This is relevant because the interior of the park and the Riverwalk would be zoned differently because of these projects.

## South Florida Water Management District

The South Florida Water Management District (SFWMD) is a regional governmental agency that oversees Miami's water resources. In a pre-application permit meeting with SFWMD representatives, they advised that when pursuing a permit for a project, it is prudent to ensure that there are no existing permits on the site already. Also, rather than a conceptual permit for multiple sites, they recommend permitting each project individually. With each permit, there are three different reviewers, so the project team should be prepared for the three different perspectives upon review.

SFWMD also provided more targeted insights related to engineering, water, and property. In terms of engineering, SFWMD advised that



# CHAPTER 5

implementing permeable pavement would require an O&M (Operations and Management) plan, and engineering would be more interested in stormwater work on upland portions of the sites.

From a water perspective, although SFWMD does not see anything in the project plan that is not permissible, they advise the project team confirms that the project aligns with the regulations for the Biscayne Aquatic Preserve. Also, the project team should ensure the designs, particularly breakwaters, do not impact the Sovereign Submerged Lands. The breakwaters would have the greatest potential impact, but the project could still be achieved with an easement. An easement, however, is a lengthy process. The projects should also implement signage and/or barriers to discourage boat access to the tessellated stones at the EORs.

Also, a site visit would be required to identify and assess the impacts the projects could have on seagrasses, mangroves, and wetlands. Creating wetlands would require a monitoring and maintenance plan; Section 10 of the Applicant's handbook provides more detailed information on that plan. Relatedly, the project team would need to coordinate with the FWC to evaluate the impacts to manatees and sea turtles in the area.

With reference to property, SFWMD advises that if there are any city-owned properties impacted by the projects, the project team will need to acquire the deed for the property, obtain a boundary survey, and identify any easements on the property.

## United States Army Corps of Engineers

In a pre-application permitting meeting with the United States Army Corps of Engineers (USACE), they recommended that any projects moving toward implementation should start with an existing resource survey. This survey will help the project team understand how the existing resources would either be enhanced or negatively impacted by projects and designs.

For example, the USACE indicated that because most of the proposed designs impede into the water, there are potential negative impacts to navigable waterways. USACE's mandate is to protect the navigable waterways. All projects impeding into the waterway will need justification for how the proposed design elements, like riprap and vegetation, will improve the waterway and its resources. From the USACE's perspective, examples of improvements include maintaining and creating habitats.



# REGULATORY AND PERMITTING REQUIREMENTS

The project team can avoid issues regarding impeding waterways by pulling the shoreline back from its current position. If this solution is pursued, however, the USACE would need more details because pulling the shoreline landward would create a new mean higher high water (MHHW) area. This could still trigger the need for a permit.

There have been similar living shoreline projects in Miami-Dade County, including City of Miami Beach's Brittany Bay Park and Jose Marti Park, that have had limited extension into the water and involved pulling back the shoreline. These projects have been reviewed and approved by the USACE. Brittany Bay Park has an overlook in the design, but it was pulled more landward to reduce impacts on the navigable waterways.

Another design element that could affect existing water resources is the current configuration of the tessellated stones. All the designs should strike a balance between ensuring navigable waterways and improving the shoreline.

The USACE also had site-specific feedback regarding the design alternatives. They noted that any projects in the Little River would need a consultation to evaluate impacts to manatees.

Also, the USACE has not seen many examples of implementing oyster reefs as shoreline protection, and they suggest that this element may not be very successful. Instead, they recommend mangroves planted into riprap or in PVC pipes as an alternative. Also, they note that Margaret Pace Park will have a lot of permitting restrictions because of the existing seagrasses within Biscayne Bay. Breakwater islands may be difficult to permit in Biscayne Bay, and would require extensive resource evaluation and analysis of potential benefits.



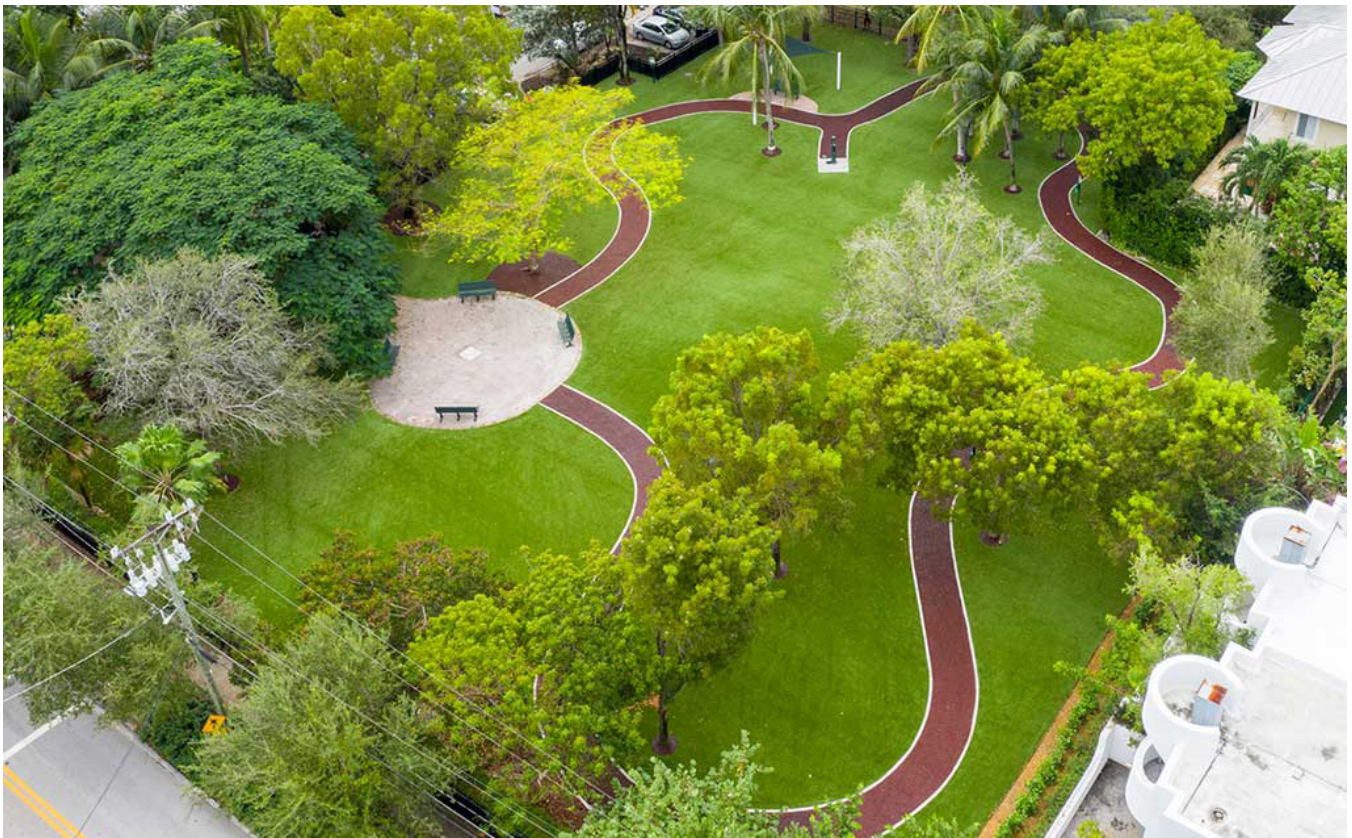


# CHAPTER 5

## 5.3 Summary of Design Considerations

Based on the discussions during the permitting, several design considerations would need to be integrated into the alternatives during the next phase of design.

- Stormwater underdrains may not be necessary on sites where impervious surfaces are reduced and on-site mitigation is present
- In most cases, designs should not encroach waterward of the mean high-water line
- Seawalls adjacent to neighboring properties would likely be needed when constructed wetlands are included in the sites
- Resource surveys would be needed at most projects
- Waterward strategies such as oyster domes or breakwater islands may not necessarily be discouraged, however, substantial justification for benefits would be needed





# REGULATORY AND PERMITTING REQUIREMENTS



PERMITTING REQUIREMENTS







# IMPLEMENTATION STRATEGIES

## 6

Effective implementation is a critical component to carrying forward the design alternatives presented in this plan. While permitting requirements are the primary focus of the previous chapter, the Implementation Chapter provides additional considerations and strategies that will help ensure that the planning, design, development, and maintenance of shoreline enhancements will continue to be at the forefront of sustainable and resilient design.

The considerations and strategies included in the Implementation Chapter are intended to provide achievable steps for the realization of the ideas developed through the project process. In order to maintain continuity with this process, this chapter was developed through an Implementation Workshop with the project team and City staff, as well as additional feedback from City Department Directors and external stakeholders.



## 6.1 Summary of Strategies

### Additional Considerations

While the permitting analysis provides many of the regulatory requirements for projects of this nature, there are additional regulatory considerations that should be noted. End-of-road projects would typically be implemented in areas that are currently public right-of-way (ROW). Once developed, these sites would either remain public ROW, or the ROW would be closed and vacated, with the land use and zoning designation potentially changing. This transfer would also have implications on the future maintenance of the property. The City should develop guidelines for these decisions that help address these issues on a case-by-case basis.

Environmental remediation and potential contamination are also common concerns in large cities, particularly in urban waterfront areas. Typical contamination includes industrial discharge, vehicular discharge, residential/commercial wastewater, polluted stormwater, and solid waste. Recent projects at Gerry Curtis Park and Jose Marti Park have revealed contamination issues similar to those listed above. Additionally, a recent survey of all City-owned properties indicated that 11 to 15 of them may have some level of contamination. Due to these developments, a Phase 1 environmental assessment of all potential projects along the waterfront is recommended prior to design and construction.

### Phasing

When considering waterfront properties, as well as some of the more complex solutions presented in the design alternatives, projects incorporating these elements will likely require significant financial resources to implement. Phasing projects such as these are often necessary from a funding standpoint, but also provides constructability benefits by allowing the City to utilize multiple design and construction methodologies at one site.

The City of Miami has completed several waterfront parks that implemented the following phasing strategies:

- **Water's edge:** The portion of the project that impacts the water and/or immediate shoreline. This typically includes any shoreline stabilization, seawall replacement, or plantings.
- **Shoreline:** Improvements and amenities immediately landward of the waterline or seawall. This typically includes baywalk, riverwalk, seating areas, shade, signage and public art.
- **Interior:** Improvements located throughout the remaining areas of the site. These vary depending on the site selected and the intended use of the space.

Additional phases could also be implemented at larger park sites to maintain the functionality of some areas of the park while others are under construction. For EOR projects, it is recommended that water's edge improvements always be implemented first, and other improvements be phased in as needed.

# IMPLEMENTATION STRATEGIES

## Design and Construction Methodologies

Given the complex nature of many of the elements in the design alternatives, utilizing the most applicable design and construction methodologies will help ensure projects are implemented successfully and efficiently. The City typically uses a range of options for design and construction depending on the cost, complexity, and specialization needed for a project. For small projects under a certain cost threshold and with relatively simple scopes, a Job Order Contract (JOC) can be issued. This could be applied to phased portions of small parks or EORs using a design criteria package to obtain competitive bids from contractors for the project. For larger and more complex projects, the City typically issues an RFQ for a development plan and goes through a full design process. This begins with additional public engagement and finalization of the

concept. The project would then proceed through a design-build route, or a design-bid-build route. In a design-build project, the contractor building the project is also the designer. The City has historically used this option for specialized areas of projects that require particular expertise in design or construction. This approach is likely to be applicable to many of the concepts in the design alternatives, particularly along the waterfront. For other areas of the projects, particularly on the interior, projects are more likely to follow the design-bid-build route. In this case, the project is designed by a design team, and the construction work is competitively bid before a contractor is selected.

All three of these methodologies could potentially be utilized in projects incorporating the design alternatives, and the approach should be evaluated on a case-by-case basis.





# CHAPTER 6

## Funding

A variety of funding mechanisms are available for waterfront projects that help improve resilience and conserve open space. Historically, the City has been successful in implementing projects through general fund appropriations, general obligation bonds, grants, impact fees, and private funds. These funding sources will continue to be viable alternatives for additional projects that focus on parks, sustainability, conservation, and resilience. Below is a table highlighting funding sources for recent City of Miami Projects.

In recent years, grants for projects that promote conservation, improve sustainability and resilience, and help mitigate impacts from climate change have become more available. There are a variety of grants available at the local, state, and federal levels that can be applied to the projects that incorporate concepts in the plan. A summary of potential grants can be found below:

## Resilient Florida Program (state funds)

Selected grants are awarded to public entities to address impacts of flooding and sea-level rise. Eligible participants receiving funds can use them for planning studies as well as project implementation for adaption and mitigation strategies.

- Administered by the Florida Department of Environmental Protection 's (FDEP) Office of Resilience and Coastal Projection
- More information here: <https://floridadep.gov/Resilient-Florida-Program/Grants>



# IMPLEMENTATION STRATEGIES

## Florida Communities Trust: Parks & Open Space program (state funds)

Funded projects are intended to further outdoor recreation and provide natural resource protection. An emphasis is placed on funding projects in low-income, disadvantaged neighborhoods and providing areas for direct water access that are open to the public

- Administered by the FDEP's Division of State Lands
- No explicit Cost-Benefit Analysis (CBA) requested in application
- Allows projects an area to mention "project excellence" not included in evaluation criteria already, such as if the project has strong community-based support
- Application: [https://floridadep.gov/sites/default/files/FCT\\_Grant\\_Application\\_Instructions\\_Final\\_2020.9-22.pdf](https://floridadep.gov/sites/default/files/FCT_Grant_Application_Instructions_Final_2020.9-22.pdf)
- Annual report: <https://floridadep.gov/lands/land-and-recreation-grants/content/parks-and-open-space-florida-forever-grant-program-0>

## Florida Communities Trust: Working Waterfronts program (state funds)

Projects funded are meant to restore and preserve working waterfronts used for commercial fishermen, aquaculturists, or business entities, or for facilities that provide waterfront access to these entities, or land for exhibitions, educational venues, civic events, and other purposes that educate the public about Florida's heritage and traditional working waterfronts

- Administered by the Florida Department of Economic Opportunity and funded by FDEP, Florida Coastal Management Program, and the National Oceanic and Atmospheric Administration
- Application: [https://floridadep.gov/sites/default/files/SMWW.APP\\_GUIDE\\_2022-2023\\_web.pdf](https://floridadep.gov/sites/default/files/SMWW.APP_GUIDE_2022-2023_web.pdf)

## Florida Recreation Development Assistance Program (state funds)

Grants provide financial assistance to public agencies to develop or acquire land for public outdoor recreation. Participants awarded funding are responsible for offering outdoor recreation for the general public.

- Administered by the FDEP's Division of State Lands
- No explicit CBA requested in application
- Funded projects are meant for public outdoor recreation use or the construction of recreational trails
- More information here: <https://floridadep.gov/lands/land-and-recreation-grants/content/frdap-assistance>

## Land and Water Conservation Fund (LWCF) (federal funds)

Projects funding through the LWCF provide assistance for acquisition or development of land for public outdoor recreation. The goal of this fund is to promote natural, cultural, wildlife, and recreational management throughout the US.

- Administered by the US Department of the Interior's Bureau of Land Management
- Applicants may not submit the same application to FRDAP, LWCF, and RTP in the same cycle. If an entity has already received funds from one of the three, they cannot apply to the others
- More information here: <https://www.nps.gov/subjects/lwcf/index.htm>



# CHAPTER 6

## Recreational Trails Program (federal funds)

The US Department of Transportation utilizes this program to provide funding for projects that promote the development of recreational trails and further improve non-motorized connectivity in a variety of community contexts.

- Administered by Florida Department of Environmental Protection in coordination with DOT FHWA
- Funds are meant for development or maintenance of recreational trails, trail construction or maintenance, or trailhead and trailside facilities
- No explicit CBA, but project is asked to address how:
  - It is related to or addresses issues and goals identified in the State Comprehensive Outdoor Recreation Plan
  - How it addresses issues and goals in the State Greenways and Trails Plan
  - How the project improves accessibility and use for persons with disabilities
  - How the project provides access to or between public parks, recreational lands/facilities, existing intermodal transportation corridors, residential populated areas, and areas of historic cultural, or other significance
  - Whether it supports both motorized / nonmotorized use + mixed-use recreational trail opportunities
- More information here: [https://floridadep.gov/sites/default/files/FY2023-24%20OGT-10.RTP23.Application\\_0.pdf](https://floridadep.gov/sites/default/files/FY2023-24%20OGT-10.RTP23.Application_0.pdf)

## Outdoor Recreation Legacy Partnership Program (federal funds)

Funded projects provide support for urban communities that are economically disadvantaged with little to no access to public open space for recreational activities. Matching grants can be utilized for all manners of outdoor recreation activities.

- Administered by the National Park Service
- Support the creation of significant renovation of state / locally-owned parks and outdoor recreation spaces. Funds are meant to help the public access / re-connect with the outdoors, specifically targeting economically disadvantaged neighborhoods that lack adequate parks and recreational opportunities
- More information here: <https://www.nps.gov/subjects/lwcf/outdoor-recreation-legacy-partnership-grants-program.htm>

## Miami-Dade County GREEN Grants

The Growing Roots for Environmentally Equitable Neighborhoods (GREEN) program provides funding to encourage native planting on public lands to help reach the goal of 30 percent urban tree canopy in Miami-Dade County.

- Administered by Miami-Dade County Parks, Recreation and Open Spaces
- Funds are for planting native / Florida-friendly trees on public land, including parks; goal is to make investments on public land. Grant applications are judged on (1) existing tree canopy and income level, (2) project enhancements, (3) resiliency/impact, and (4) community outreach
- More information here: [https://www.miamidade.gov/global/service.page?Mduid\\_service=ser1540844322968915](https://www.miamidade.gov/global/service.page?Mduid_service=ser1540844322968915)

# IMPLEMENTATION STRATEGIES

## National Fish & Wildlife Foundation (funding varies by grant and partnerships)

Provides grants for projects that protect and conserve fish, wildlife and plant habitats across the United States through a variety of programs. This funding helps build partnerships between private corporations and government agencies, nonprofits, and individuals that promote environmental resiliency.

- Grants are funded through various partnerships and administered by the National Fish and Wildlife Foundation
- Potential applicable programs include the Five Star and Urban Waters Restoration Grant Program, and the National Coastal Resilience Fund
- Rejuvenating coastal areas, enhancing water quality, and improving community resilience
- More information here: <https://www.nfwf.org/apply-grant>

## Policy and Practice Updates

The Resilient Waterfront Enhancement Plan is intended to work in conjunction with the suite of planning and design documents evaluated in Chapter 2. These documents, along with parks design criteria, stormwater guidelines, and recently adopted WEDG guidelines, should be considered when implementing any components of the design alternatives.

As stated in the Regulatory and Permitting Requirements section, the primary policy needed for successful implementation of the design alternatives is a formal selection and improvement evaluation process for potential sites. The sites selected for the typologies in this plan were four of many candidates owned by the City of Miami. The large percentage of waterfront owned by the City of Miami provides the potential for significant redundancy of resilient infrastructure, strengthening the City's ability to mitigate the impacts from climate change. The City should

develop a protocol for selecting and prioritizing sites for improvements, determining the level of strategies and amenities that are included, assessing land use or ownership changes, and identifying maintenance responsibilities. This decision-making process will help streamline the implementation process moving forward.

## Operations and Maintenance Considerations

The long-term success of nature-based solutions relies on proper operation and maintenance. Many of the strategies incorporated in the design alternatives are intended to help reduce certain maintenance issues caused by flooding, storm surge and other climate-related impacts on the potential sites and surrounding context. However, some of the strategies utilized require specialized, intensive maintenance to ensure they retain their functionality and viability. This is particularly true with native plantings, constructed wetlands, living shorelines, bioretention areas, and permeable pavement. Many of the strategies also will require specialized maintenance practices that go beyond the typical responsibilities of City staff. These services will likely need to be contracted out to a specialist, a practice the City is already utilizing for waterfront areas.

An additional concern expressed by City staff was the tendency for waterfront projects with green infrastructure to become capture areas for trash and marine debris. This factor, coupled with staffing shortages, is straining the City's ability to keep waterfront areas clear of debris. Any new projects that incorporate nature-based resilient shoreline strategies will need to have maintenance plans that identify the potential need for specialized, contract maintenance, as well as the level of additional maintenance required by City staff. Projects should also undergo a thorough evaluation of projected maintenance costs, as well as a funding plan to ensure that providing the necessary maintenance for these improvements. These steps will help ensure that green



# CHAPTER 6

infrastructure is well-maintained, highly functional, and aesthetically beneficial for the community.

## Potential Stakeholder Engagement

Much like the policy and practice updates, stakeholder engagement is intended to ensure consistent collaboration across the City.

### Elected Officials

Elected officials serve as the primary decision-makers and public policy developers for the City. The City's officials, as well as their staff, will be made familiar with the main components of the plan and how the strategies are intended to be incorporated into potential projects. Collaboration with elected officials will be critical to the incorporation of resilient design strategies into potential projects, as well as generating support for these projects with the community.

### Private Developers

While the plan focuses on strategies that can be implemented at City-owned properties, comprehensive resilience along the waterfront will require coordination with private developers. This can be achieved by implementing policies and ordinances that encourage sustainable and resilient design in private development projects, as well as emphasizing the benefits of nature-based, resilient design strategies. This will advance the ideas from the plan and encourage a cohesive waterfront that provides City-wide resilience.

### Local Organizations

The sites that were selected to represent the typologies, as well as many other potential sites, fall within areas that would require coordination with local organizations such as the Miami River Commission and the Downtown Development Authority (DDA). Any project on the rivers would require review and coordination with the Miami River Commission to ensure they meet aesthetic guidelines. The same is true for the DDA with any projects on the bay, as the DDA serves as the stewards of the baywalk.





## 6.2 CONCLUSION

The City of Miami has taken great strides in planning for a resilient future by recognizing that waterfront enhancements provide unique opportunities for resilient infrastructure and meaningful public spaces. Through the process of demonstrating potential strategies at the selected pilot sites, the City has developed practical alternatives that serve as guides for future development. Implementation off the Resilient Waterfront Enhancement Plan will prepare the City for future climate conditions, conserve natural areas, provide new parks and open spaces, and enhance the overall resilience of Miami.



IMPLEMENTATION  
CONSIDERATIONS











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## Chapter 5

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<sup>2</sup>Calculated using FEMA's 2022 Total Estimated Benefits value for Urban Green Open Space (\$15,541 per acre) and the assumption that the parklet is approximately 6,540 square feet or 0.15 acres.

<sup>3</sup>Calculated using FEMA's 2022 Total Estimated Benefits value for Urban Green Open Space (\$15,541 per acre) and the assumption that the parklet is approximately 5,230 square feet or 0.12 acres.

<sup>4</sup> Calculated using FEMA's 2022 Total Estimated Benefits value for Urban Green Open Space (\$15,541 per acre) and the assumption that Sewell Park is approximately 4.5 acres. Note that, because Sewell Park does offer some pre-existing greenspace, the marginal benefit of the design updates alone may be lower than this value.

<sup>5</sup> Calculated using FEMA's 2022 Total Estimated Benefits value for Urban Green Open Space (\$15,541 per acre) and the assumption that Margaret Pace Park is approximately 8 acres. Note that, because Margaret Pace Park does offer some pre-existing urban open green space, the marginal benefit of the design updates alone may be lower than this value.

## Cost Estimates

City of Miami Waterfront Resilience Enhancement Plan				
Waterfront Typologies - Benefit/Cost Analysis Costs (2022)				
Typology 1: End of Road on Riverfront				
Location: NE 5th Ave				
	Unit	Quantity	Unit Cost	Subtotal
<b>Typology 1: Alternative 1</b>				
<b>Site Prep and Infrastructure</b>				
Vacant Lot / Easement Acquisition where necessary	Acre	0.25	\$500,000	\$125,000
Sitework and Preparation	Acre	0.15	\$100,000	\$15,000
New Crosswalks (ADA accessible, high-visibility)	Each	1	\$30,000	\$30,000
Modified Seawall	LF	61	\$1,000	\$61,000
ADA Permeable Pathway	SF	1895	\$60	\$113,700
ADA Permeable Car Parking	SF	450	\$75	\$33,750
Utility Upgrades	Allowance	1	\$50,000	\$50,000
<b>Stormwater Improvements</b>				
Drainage inlets in retention areas	Each	3	\$5,000	\$15,000
Sub-surface drainage infrastructure	LF	100	\$100	\$10,000
Outflows with tidal backflow preventers	Each	1	\$3,000	\$3,000
<b>Landscape Improvements</b>				
Shade Trees	Each	23	\$400	\$9,200
Shrubs	Each	50	\$150	\$7,500
Grasses and Groundcover	SF	3240	\$12	\$38,880
<b>Shoreline Improvements</b>				
Aquatic Vegetation	SF	610	\$20	\$12,200
Stabilizing Rocks	SF	305	\$10	\$3,050
<b>Park Structures and Amenities</b>				
Sculptural bench seating	Each	3	\$5,000	\$15,000
New Trash cans	Each	2	\$1,500	\$3,000
Dog stations	Each	2	\$800	\$1,600
Pedestrian level security lighting	Each	7	\$7,500	\$52,500
Art Installations	Allowance	1	\$25,000	\$25,000
Additional Signage (Wayfinding, educational)	Allowance	1	\$40,000	\$40,000
<b>Enhanced Park Entry</b>				
Bike racks (including pad)	Each	1	\$1,500	\$1,500
Park entry sign	Each	1	\$20,000	\$20,000
<b>Total Direct Cost</b>				
				\$685,880
Mobilization and General Conditions	ls	10%		\$68,588
Bonds, Insurance and Overhead	ls	5%		\$34,294
Profit	ls	10%		\$68,588
Contingency	ls	20%		\$137,176
<b>Total Direct Construction Cost</b>				
				\$994,526
Planning, Design, Permitting, and CA/CM Fees	ls	25%		\$248,632
<b>Total Cost</b>				<b>\$1,243,158</b>
<b>Total Cost per SF of Park</b>				<b>\$190.26</b>
<b>Total Cost per LF of Shoreline</b>				<b>\$20,379.63</b>



<b>Typology 1: Alternative 2</b>				
<b>Site Prep and Infrastructure</b>				
Vacant Lot / Easement Acquisition where necessary	Acre	0.25	\$500,000	\$125,000
Sitework and Preparation	Acre	0.15	\$150,000	\$22,500
New Crosswalks (ADA accessible, high-visibility)	Each	1	\$30,000	\$30,000
Modified Seawall	LF	61	\$1,000	\$61,000
ADA Permeable Pathway	SF	1421	\$60	\$85,260
ADA Permeable Car Parking	SF	450	\$75	\$33,750
Tessellated Stone Steps	SF	745	\$40	\$29,800
Utility Upgrades	Allowance	1	\$50,000	\$50,000
<b>Stormwater Improvements</b>				
Drainage inlets in retention areas	Each	4	\$5,000	\$20,000
Sub-surface drainage infrastructure	LF	100	\$100	\$10,000
Outflows with tidal backflow preventers	Each	1	\$3,000	\$3,000
<b>Landscape Improvements</b>				
Shade Trees	Each	23	\$400	\$9,200
Shrubs	Each	50	\$150	\$7,500
Grasses and Groundcover	SF	3240	\$12	\$38,880
<b>Shoreline Improvements</b>				
Aquatic Vegetation	SF	610	\$20	\$12,200
<b>Park Structures and Amenities</b>				
Sculptural bench seating	Each	3	\$5,000	\$15,000
Shade Structure for Seating	Each	2	\$30,000	\$60,000
New Trash cans	Each	2	\$1,500	\$3,000
Dog stations	Each	2	\$800	\$1,600
Pedestrian level security lighting	Each	7	\$7,500	\$52,500
Art Installation	Allowance	1	\$25,000	\$25,000
Additional Signage (Wayfinding, educational)	Allowance	1	\$40,000	\$40,000
<b>Enhanced Park Entry</b>				
Bike racks (including pad)	Each	1	\$1,500	\$1,500
Park entry sign	Each	1	\$20,000	\$20,000
<b>Total Direct Cost</b>				
				\$756,690
Mobilization and General Conditions	ls	10%		\$75,669
Bonds, Insurance and Overhead	ls	5%		\$37,835
Profit	ls	10%		\$75,669
Contingency	ls	20%		\$151,338
<b>Total Direct Construction Cost</b>				
				\$1,097,201
Planning, Design, Permitting, and CA/CM Fees	ls	25%		\$274,300
<b>Total Cost</b>				
				\$1,371,501
<b>Total Cost per SF of Park</b>				
				\$209.90
<b>Total Cost per LF of Shoreline</b>				
				\$22,483.62

<b>Typology 1: Alternative 3</b>				
<b>Site Prep and Infrastructure</b>				
Vacant Lot / Easement Acquisition where necessary	Acre	0.25	\$500,000	\$125,000
Sitework and Preparation	Acre	0.15	\$250,000	\$37,500
New Crosswalks (ADA accessible, high-visibility)	Each	1	\$25,000	\$25,000
Modified Seawall (Decorative)	LF	95	\$1,200	\$114,000
Modified Seawall (Naturalized)	LF	55	\$650	\$35,750
ADA Permeable Pathway	SF	273	\$60	\$16,380
ADA Boardwalk	SF	1203	\$200	\$240,600
ADA Permeable Car Parking	SF	450	\$50	\$22,500
Utility Upgrades	Allowance	1	\$30,000	\$30,000
<b>Stormwater Improvements</b>				
Drainage inlets in retention areas	Each	2	\$5,000	\$10,000
Sub-surface drainage infrastructure	LF	100	\$100	\$10,000
Outflows with tidal backflow preventers	Each	2	\$5,000	\$10,000
<b>Landscape Improvements</b>				
Shade Trees	Each	25	\$400	\$10,000
Shrubs	Each	50	\$150	\$7,500
Grasses and Groundcover	SF	3400	\$12	\$40,800
<b>Shoreline Improvements</b>				
Aquatic Vegetation	SF	610	\$20	\$12,200
Stabilizing Rocks	SF	650	\$10	\$6,500
<b>Park Structures and Amenities</b>				
Sculptural bench seating	Each	3	\$5,000	\$15,000
Shade Structure for Seating	Each	1	\$50,000	\$50,000
New Trash cans	Each	2	\$1,500	\$3,000
Dog stations	Each	2	\$800	\$1,600
Pedestrian level security lighting	Each	7	\$7,500	\$52,500
Art Installation	Allowance	1	\$25,000	\$25,000
Additional Signage (Wayfinding, educational)	Allowance	1	\$40,000	\$40,000
<b>Enhanced Park Entry</b>				
Bike racks (including pad)	Each	1	\$1,500	\$1,500
Park entry sign	Each	1	\$20,000	\$20,000
<b>Total Direct Cost</b>				
				<b>\$962,330</b>
Mobilization and General Conditions	Is	10%		\$96,233
Bonds, Insurance and Overhead	Is	5%		\$48,117
Profit	Is	10%		\$96,233
Contingency	Is	20%		\$192,466
<b>Total Direct Construction Cost</b>				
				<b>\$1,395,379</b>
Planning, Design, Permitting, and CA/CM Fees	Is	25%		\$348,845
<b>Total Cost</b>				<b>\$1,744,223</b>
<b>Total Cost per SF of Park</b>				<b>\$266.95</b>
<b>Total Cost per LF of Shoreline</b>				<b>\$28,593.82</b>



## City of Miami Waterfront Resilience Enhancement Plan

Waterfront Typologies - Benefit/Cost Analysis Costs (2022)

<b>Typology 2: End of Road on Bayfront</b>				
<b>Location: NE 26th St</b>				
	<b>Unit</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Subtotal</b>
<b>Typology 2: Alternative 1</b>				
<b>Site Prep and Infrastructure</b>				
<i>Vacant Lot / Easement Acquisition where necessary</i>	Acre	0.25	\$500,000	\$125,000
<i>Sitework and Preparation</i>	Acre	0.12	\$200,000	\$24,000
<i>Modified Seawall</i>	LF	70	\$1,000	\$70,000
<i>ADA Permeable Pathway</i>	SF	2060	\$60	\$123,600
<i>ADA Permeable Car Parking</i>	SF	450	\$75	\$33,750
<i>Utility Upgrades</i>	Allowance	1	\$75,000	\$75,000
<b>Stormwater Improvements</b>				
<i>Drainage inlets in retention areas</i>	Each	2	\$500	\$1,000
<i>Sub-surface drainage infrastructure</i>	LF	90	\$100	\$9,000
<i>Outflows with tidal backflow preventers</i>	Each	1	\$3,000	\$3,000
<b>Landscape Improvements</b>				
<i>Shade Trees</i>	Each	20	\$400	\$8,000
<i>Shrubs</i>	Each	40	\$150	\$6,000
<i>Grasses and Groundcover</i>	SF	2360	\$12	\$28,320
<b>Shoreline Improvements</b>				
<i>Aquatic Vegetation</i>	SF	650	\$20	\$13,000
<i>Stabilizing Rocks</i>	SF	305	\$10	\$3,050
<b>Park Structures and Amenities</b>				
<i>Sculptural bench seating</i>	Each	1	\$7,500	\$7,500
<i>New Trash cans</i>	Each	2	\$1,500	\$3,000
<i>Dog stations</i>	Each	2	\$800	\$1,600
<i>Pedestrian level security lighting</i>	Each	9	\$7,500	\$67,500
<i>Additional Signage (Wayfinding, educational)</i>	Allowance	1	\$60,000	\$60,000
<b>Enhanced Park Entry</b>				
<i>Bike racks (including pad)</i>	Each	1	\$1,500	\$1,500
<i>Park entry sign</i>	Each	1	\$20,000	\$20,000
<b>Total Direct Cost</b>				<b>\$683,820</b>
<i>Mobilization and General Conditions</i>	Is	10%		\$68,382
<i>Bonds, Insurance and Overhead</i>	Is	5%		\$34,191
<i>Profit</i>	Is	10%		\$68,382
<i>Contingency</i>	Is	20%		\$136,764
<b>Total Direct Construction Cost</b>				<b>\$991,539</b>
<i>Planning, Design, Permitting, and CA/CM Fees</i>	Is	25%		\$247,885
<b>Total Cost</b>				<b>\$1,239,424</b>
<b>Total Cost per SF of Park</b>				<b>\$237.11</b>
<b>Total Cost per LF of Shoreline</b>				<b>\$17,706.05</b>

<b>Typology 2: Alternative 2</b>				
<b>Site Prep and Infrastructure</b>				
Vacant Lot / Easement Acquisition where necessary	Acre	0.25	\$500,000	\$125,000
Sitework and Preparation	Acre	0.12	\$200,000	\$24,000
Modified Seawall	LF	70	\$1,000	\$70,000
ADA Permeable Pathway	SF	1525	\$60	\$91,500
ADA Platform Deck	SF	385	\$75	\$28,875
ADA Permeable Car Parking	SF	450	\$75	\$33,750
Utility Upgrades	Allowance	1	\$75,000	\$75,000
<b>Stormwater Improvements</b>				
Drainage inlets in retention areas	Each	2	\$5,000	\$10,000
Sub-surface drainage infrastructure	LF	90	\$100	\$9,000
Outflows with tidal backflow preventers	Each	2	\$3,000	\$6,000
<b>Landscape Improvements</b>				
Shade Trees	Each	22	\$400	\$8,800
Shrubs	SF	40	\$150	\$6,000
Grasses and Groundcover	SF	3500	\$12	\$42,000
<b>Shoreline Improvements</b>				
Aquatic Vegetation	SF	650	\$20	\$13,000
Custom Oyster Domes	Each	12	\$500	\$6,000
<b>Park Structures and Amenities</b>				
Sculptural bench seating	Each	3	\$7,500	\$22,500
Shade Structure for Seating	Each	1	\$50,000	\$50,000
New Trash cans	Each	2	\$1,500	\$3,000
Dog stations	Each	2	\$800	\$1,600
Pedestrian level security lighting	Each	9	\$7,500	\$67,500
Art Installation	Allowance	1	\$35,000	\$35,000
Additional Signage (Wayfinding, educational)	Allowance	1	\$60,000	\$60,000
<b>Enhanced Park Entry</b>				
Bike racks (including pad)	Each	1	\$1,500	\$1,500
Park entry sign	Each	1	\$20,000	\$20,000
<b>Total Direct Cost</b>				
				\$810,025
Mobilization and General Conditions	ls	10%		\$81,003
Bonds, Insurance and Overhead	ls	5%		\$40,501
Profit	ls	10%		\$81,003
Contingency	ls	20%		\$162,005
<b>Total Direct Construction Cost</b>				
				\$1,174,536
Planning, Design, Permitting, and CA/CM Fees	ls	25%		\$293,634
<b>Total Cost</b>				<b>\$1,468,170</b>
<b>Total Cost per SF of Park</b>				<b>\$280.87</b>
<b>Total Cost per LF of Shoreline</b>				<b>\$20,973.86</b>



<b>Typology 2: Alternative 3</b>				
<b>Site Prep and Infrastructure</b>				
Vacant Lot / Easement Acquisition where necessary	Acre	0.25	\$500,000	\$125,000
Sitework and Preparation	Acre	0.12	\$300,000	\$36,000
Modified Seawall w/ Concrete Path	LF	70		\$0
ADA Permeable Pathway	SF	980	\$60	\$58,800
ADA Boardwalk (low)	SF	710	\$120	\$85,200
Stone Steps	SF	450	\$150	\$67,500
ADA Permeable Car Parking	SF	450	\$75	\$33,750
Utility Upgrades	Allowance	1	\$75,000	\$75,000
<b>Stormwater Improvements</b>				
Drainage inlets in retention areas	Each	2	\$5,000	\$10,000
Sub-surface drainage infrastructure	LF	90	\$100	\$9,000
Outflows with tidal backflow preventers	Each	2	\$3,000	\$6,000
<b>Landscape Improvements</b>				
Shade Trees	Each	25	\$400	\$10,000
Shrubs	Each	40	\$150	\$6,000
Grasses and Groundcover	SF	3400	\$12	\$40,800
<b>Shoreline Improvements</b>				
Aquatic Vegetation	SF	650	\$20	\$13,000
<b>Park Structures and Amenities</b>				
Sculptural bench seating	Each	2	\$7,500	\$15,000
Shade Structure for Seating	Each	2	\$30,000	\$60,000
New Trash cans	Each	2	\$1,500	\$3,000
Dog stations	Each	2	\$800	\$1,600
Pedestrian level security lighting	Each	7	\$7,500	\$52,500
Art Installation	Allowance	0	\$35,000	\$0
Additional Signage (Wayfinding, educational)	Allowance	1	\$60,000	\$60,000
<b>Enhanced Park Entry</b>				
Bike racks (including pad)	Each	1	\$1,500	\$1,500
Park entry sign	Each	1	\$20,000	\$20,000
<b>Total Direct Cost</b>				
				\$789,650
Mobilization and General Conditions	Is	10%		\$78,965
Bonds, Insurance and Overhead	Is	5%		\$39,483
Profit	Is	10%		\$78,965
Contingency	Is	20%		\$157,930
<b>Total Direct Construction Cost</b>				
				\$1,144,993
Planning, Design, Permitting, and CA/CM Fees	Is	25%		\$286,248
<b>Total Cost</b>				<b>\$1,431,241</b>
<b>Total Cost per SF of Park</b>				<b>\$273.81</b>
<b>Total Cost per LF of Shoreline</b>				<b>\$20,446.29</b>

City of Miami Waterfront Resilience Enhancement Plan				
Waterfront Typologies - Benefit/Cost Analysis Costs (2022)				
Typology 3: Park on Riverfront				
Location: Sewell Park				
	Unit	Quantity	Unit Cost	Subtotal
<b>Typology 3: Alternative 1</b>				
<b>Site Prep and Infrastructure</b>				
Sitework and Preparation	Acre	4.5	\$100,000	\$450,000
Stabilized Shoreline	LF	860	\$450	\$387,000
ADA Permeable Pathway	SF	23000	\$45	\$1,035,000
Water Access Pathways	Each	3	\$10,000	\$30,000
Canoe, Kayak Launch	Each	1	\$50,000	\$50,000
Utility Upgrades	Allowance	1	\$150,000	\$150,000
<b>Stormwater Improvements</b>				
Drainage inlets in retention areas	Each	6	\$5,000	\$30,000
Sub-surface drainage infrastructure	LF	1500	\$100	\$150,000
Outflows with tidal backflow preventers	Each	4	\$3,000	\$12,000
<b>Landscape Improvements</b>				
Shade Trees	Each	40	\$400	\$16,000
Shrubs	SF	250	\$150	\$37,500
Grasses and Groundcover	SF	90000	\$12	\$1,080,000
<b>Shoreline Improvements</b>				
Aquatic Vegetation	SF	11000	\$20	\$220,000
Additional Rock Features	SF	11000	\$10	\$110,000
<b>Park Structures and Amenities</b>				
Seating	Each	10	\$5,000	\$50,000
New Trash cans	Each	5	\$1,500	\$7,500
Dog stations	Each	4	\$800	\$3,200
Pedestrian level security lighting	Each	50	\$7,500	\$375,000
Additional Signage (Wayfinding, educational)	Allowance	1	\$120,000	\$120,000
<b>Total Direct Cost</b>				<b>\$4,313,200</b>
Mobilization and General Conditions	ls	10%		\$431,320
Bonds, Insurance and Overhead	ls	5%		\$215,660
Profit	ls	10%		\$431,320
Contingency	ls	20%		\$862,640
<b>Total Direct Construction Cost</b>				<b>\$6,254,140</b>
Planning, Design, Permitting, and CA/CM Fees	ls	25%		\$1,563,535
<b>Total Cost</b>				<b>\$7,817,675</b>
<b>Total Cost per Acre of Park</b>				<b>\$1,737,261.11</b>
<b>Total Cost per LF of Shoreline</b>				<b>\$9,090.32</b>



<b>Typology 3: Alternative 2</b>				
<b>Site Prep and Infrastructure</b>				
Sitework and Preparation	Acre	4.5	\$100,000	\$450,000
ADA Permeable Pathway	SF	23000	\$45	\$1,035,000
ADA Boardwalk	SF	8500	\$150	\$1,275,000
Water Access Pathways	Each	3	\$10,000	\$30,000
Canoe, Kayak Launch	Each	1	\$50,000	\$50,000
Utility Upgrades	Allowance	1	\$250,000	\$250,000
<b>Stormwater Improvements</b>				
Drainage inlets in retention areas	Each	6	\$5,000	\$30,000
Sub-surface drainage infrastructure	LF	1500	\$100	\$150,000
Outflows with tidal backflow preventers	Each	4	\$3,000	\$12,000
<b>Landscape Improvements</b>				
Shade Trees	Each	10	\$400	\$4,000
Shrubs	Each	300	\$150	\$45,000
Grasses and Groundcover	SF	150000	\$12	\$1,800,000
<b>Shoreline Improvements</b>				
Aquatic Vegetation	SF	11000	\$20	\$220,000
Stabilizing Rocks	SF	100000	\$10	\$1,000,000
<b>Park Structures and Amenities</b>				
Seating	Each	10	\$5,000	\$50,000
New Trash cans	Each	5	\$1,500	\$7,500
Dog stations	Each	4	\$800	\$3,200
Pedestrian level security lighting	Each	62	\$7,500	\$465,000
Additional Signage (Wayfinding, educational)	Allowance	1	\$120,000	\$120,000
<b>Total Direct Cost</b>				<b>\$6,996,700</b>
Mobilization and General Conditions	ls	10%		\$699,670
Bonds, Insurance and Overhead	ls	5%		\$0
Profit	ls	10%		\$699,670
Contingency	ls	20%		\$1,399,340
<b>Total Direct Construction Cost</b>				<b>\$9,795,380</b>
Planning, Design, Permitting, and CA/CM Fees	ls	25%		\$2,448,845
<b>Total Cost</b>				<b>\$12,244,225</b>
<b>Total Cost per Acre of Park</b>				<b>\$2,720,938.89</b>
<b>Total Cost per LF of Shoreline</b>				<b>\$14,237.47</b>

<b>Typology 3: Alternative 3</b>				
<b>Site Prep and Infrastructure</b>				
Sitework and Preparation	Acre	4.5	\$10,000	\$45,000
Stabilized Shoreline	LF	850	\$450	\$382,500
ADA Permeable Pathway	SF	23000	\$45	\$1,035,000
ADA Boardwalk	SF	8500	\$150	\$1,275,000
Utility Upgrades	Allowance	1	\$30,000	\$30,000
<b>Stormwater Improvements</b>				
Drainage inlets in retention areas	Each	6	\$10,000	\$60,000
Sub-surface drainage infrastructure	LF	1500	\$100	\$150,000
Outflows with tidal backflow preventers	Each	4	\$3,000	\$12,000
<b>Landscape Improvements</b>				
Shade Trees	Each	40	\$400	\$16,000
Shrubs	SF	250	\$150	\$37,500
Grasses and Groundcover	SF	120000	\$12	\$1,440,000
<b>Shoreline Improvements</b>				
Aquatic Vegetation	SF	10640	\$20	\$212,800
Stabilizing Rocks	SF	75000	\$10	\$750,000
<b>Park Structures and Amenities</b>				
Seating	Each	10	\$5,000	\$50,000
New Trash cans	Each	5	\$1,500	\$7,500
Dog stations	Each	4	\$800	\$3,200
Pedestrian level security lighting	Each	62	\$7,500	\$465,000
Additional Signage (Wayfinding, educational)	Allowance	1	\$120,000	\$120,000
<b>Total Direct Cost</b>				<b>\$6,091,500</b>
<b>Mobilization and General Conditions</b>				
Mobilization and General Conditions	Is	10%		\$609,150
Bonds, Insurance and Overhead	Is	5%		\$304,575
Profit	Is	10%		\$609,150
Contingency	Is	20%		\$1,218,300
<b>Total Direct Construction Cost</b>				<b>\$8,832,675</b>
<b>Planning, Design, Permitting, and CA/CM Fees</b>				
Planning, Design, Permitting, and CA/CM Fees	Is	25%		\$2,208,169
<b>Total Cost</b>				<b>\$11,040,844</b>
<b>Total Cost per Acre of Park</b>				<b>\$2,453,520.83</b>
<b>Total Cost per LF of Shoreline</b>				<b>\$12,838.19</b>



## City of Miami Waterfront Resilience Enhancement Plan

Waterfront Typologies - Benefit/Cost Analysis Costs (2022)

City of Miami Waterfront Resilience Enhancement Plan				
Waterfront Typologies - Benefit/Cost Analysis Costs (2022)				
Typology 4: Park on Bayfront				
Location: Margaret Pace Park				
	Unit	Quantity	Unit Cost	Subtotal
Typology 4: Alternative 1				
<i>Site Prep and Infrastructure</i>				
Sitework and Preparation	Acre	8	\$100,000	\$800,000
ADA Permeable Pathway	SF	23000	\$45	\$1,035,000
Wave Attenuation Structure - Interbay Reef with Oyster Domes	Each	1500	\$150	\$225,000
Water Access Pathways	Each	5	\$10,000	\$50,000
Relocated Basketball Court	Each	1	\$75,000	\$75,000
Additional Volleyball Court	Each	1	\$50,000	\$50,000
Relocated Dog Park	Each	1	\$60,000	\$60,000
Utility Upgrades	Allowance	1	\$150,000	\$150,000
Elevating Existing Park Elements	Allowance	1	\$250,000	\$250,000
<i>Stormwater Improvements</i>				
Drainage inlets in retention areas	Each	6	\$5,000	\$30,000
Sub-surface drainage infrastructure	LF	1500	\$1,000	\$1,500,000
Outflows with tidal backflow preventers	Each	4	\$3,000	\$12,000
<i>Landscape Improvements</i>				
Shade Trees	Each	110	\$400	\$44,000
Shrubs	SF	500	\$150	\$75,000
Grasses and Groundcover	SF	150000	\$10	\$1,500,000
<i>Shoreline Improvements</i>				
Aquatic Vegetation	SF	20000	\$12	\$240,000
Stabilizing Rocks	SF	65000	\$10	\$650,000
<i>Park Structures and Amenities</i>				
Seating	Each	10	\$5,000	\$50,000
New Trash cans	Each	5	\$1,500	\$7,500
Dog stations	Each	4	\$800	\$3,200
Pedestrian level security lighting	Each	50	\$7,500	\$375,000
Additional Signage (Wayfinding, educational)	Allowance	1	\$150,000	\$150,000
<b>Total Direct Cost</b>				<b>\$7,331,700</b>
Mobilization and General Conditions	ls	10%		\$733,170
Bonds, Insurance and Overhead	ls	5%		\$366,585
Profit	ls	10%		\$733,170
Contingency	ls	20%		\$1,466,340
<b>Total Direct Construction Cost</b>				<b>\$10,630,965</b>
Planning, Design, Permitting, and CA/CM Fees	ls	25%		\$2,657,741
<b>Total Cost</b>				<b>\$13,288,706</b>
<b>Total Cost per Acre of Park</b>				<b>\$1,661,088.28</b>
<b>Total Cost per LF of Shoreline</b>				<b>\$7,382.61</b>

<b>Typology 4: Alternative 2</b>				
<b>Site Prep and Infrastructure</b>				
Sitework and Preparation	Acre	8	\$75,000	\$600,000
New Crosswalks (ADA accessible, high-visibility)	Each	1	\$25,000	\$25,000
ADA Permeable Pathway	SF	23000	\$45	\$1,035,000
Stabilized Shoreline	LF	1800	\$450	\$810,000
Wave Attenuation Structure - Interbay Reef with Oyster	Each	1500	\$150	\$225,000
Wave Attenuation Structure - Vegetated Breakwater Islands	LF	1800	\$750	\$1,350,000
Water Access Pathways	Each	5	\$10,000	\$50,000
Relocated Basketball Court	Each	1	\$75,000	\$75,000
Additional Volleyball Court	Each	1	\$50,000	\$50,000
Relocated Dog Park	Each	1	\$750,000	\$750,000
Utility Upgrades	Allowance	1	\$30,000	\$30,000
Elevating Existing Park Elements	Allowance	1		\$0
<b>Stormwater Improvements</b>				
Drainage inlets in retention areas	Each	6	\$5,000	\$30,000
Sub-surface drainage infrastructure	LF	1500	\$100	\$150,000
Outflows with tidal backflow preventers	Each	4	\$3,000	\$12,000
<b>Landscape Improvements</b>				
Shade Trees	Each	110	\$400	\$44,000
Shrubs	SF	500	\$150	\$75,000
Grasses and Groundcover	SF	150000	\$12	\$1,800,000
<b>Shoreline Improvements</b>				
Aquatic Vegetation	SF	20000	\$20	\$400,000
Additional Rock Features	SF	40000	\$10	\$400,000
<b>Park Structures and Amenities</b>				
Seating	Each	10	\$5,000	\$50,000
New Trash cans	Each	5	\$1,500	\$7,500
Dog stations	Each	4	\$800	\$3,200
Pedestrian level security lighting	Each	50	\$7,500	\$375,000
Additional Signage (Wayfinding, educational)	Allowance	1	\$160,000	\$160,000
<b>Total Direct Cost</b>				
				<b>\$8,506,700</b>
Mobilization and General Conditions	Is	10%		\$850,670
Bonds, Insurance and Overhead	Is	5%		\$0
Profit	Is	10%		\$850,670
Contingency	Is	20%		\$1,701,340
<b>Total Direct Construction Cost</b>				
				<b>\$11,909,380</b>
Planning, Design, Permitting, and CA/CM Fees	Is	25%		\$2,977,345
<b>Total Cost</b>				<b>\$14,886,725</b>
<b>Total Cost per Acre of Park</b>				<b>\$1,860,840.63</b>
<b>Total Cost per LF of Shoreline</b>				<b>\$8,270.40</b>







An aerial photograph of a city waterfront. In the foreground, there is a park area with many palm trees and a paved walkway. A body of water is visible, with a bridge or overpass structure crossing it. In the background, several tall, modern high-rise buildings are under construction, with cranes visible against a blue sky with scattered white clouds. The overall scene is bright and sunny.

# CITY OF MIAMI

## RESILIENT WATERFRONT ENHANCEMENT PLAN

### DESIGNING GREEN-GRAY INFRASTRUCTURE FOR THE CITY OF MIAMI'S WATERFRONT

**Sonia Brubaker, Chief Resilience Officer**

*Presentation to Miami River Commission Subcommittee  
July 21, 2023*



# RESILIENT WATERFRONT ENHANCEMENT PLAN

Grant from National Fish and Wildlife Foundation to develop plan to:

- Enhance City-owned waterfront property with nature-based designs
- Identify pilot project sites to serve as prototypes for similar shorelines
- Address permitting, funding, design, and maintenance hurdles of nature-based designs
- Align with ongoing City resilience initiatives
  - Goal 3 of the Miami Forever Climate Ready Strategy
  - Stormwater Master Plan
  - City Seawall Ordinance
  - Resilient 305
  - Miami21 Appendix B – Waterfront Guidelines



# RESILIENT WATERFRONT ENHANCEMENT PLAN



## 4 Different Typologies

End-of-Road on  
Riverfront

End-of-Road on  
Bayfront

Park on  
Riverfront

Park on  
Bayfront



## Each Typology has 3 Options

These options go from simplest to more complex



We used real locations within the City but they are **not final designs** and **not currently being planned** – goal is to have resilient examples that can be used in these or other sites



# Typology 1: End-of-Road on Riverfront

- LOCATION: NE 5<sup>th</sup> Ave (near NE 79<sup>th</sup> St and Little River)



# Typology 2: End-of-Road on Bayfront

- LOCATION: NE 26<sup>th</sup> St





## Typology 3: Park on Riverfront

- LOCATION: Sewell Park



## Typology 4: Park on Bayfront

- LOCATION: Margaret Pace Park





# Develop & Prioritize Strategies

- Held a Dept workshop to brainstorm strategy ideas for each typology
- Strategy “menu” ranged from green to gray
- Short-list strategies were evaluated to understand tradeoffs and preferences:
  - Engineering
  - Environmental
  - Social
  - Implementation Feasibility

City of Miami Waterfront Capital Plan - Strategies and Prioritization Workshop

## Exercise 1 - Initial Strategy List

Potential Strategies Toolkit

Vegetation Only	Edging	Sills	Breakwater	Revetment	Bulkhead	Other
Mangroves Tidal Marsh Vegetation	Multifunctional Wave Attenuation Biologs	Oyster Structures Marsh Sills	Artificial Reef Living Breakwater Breakwater	Revetment Vegetated Gabions Joint planted revetment	Seawall Ecologically enhanced seawall	Elevated Boardwalk/ Platforms Elevated Berms Stormwater Retention/ BMPs

Strategy Ranking Matrix \*

	Very Low	Low	Moderate	High	Very High
Engineering - Construction impacts (traffic disruption, environmental impacts, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engineering - Ability to adapt over time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engineering - Ability to be expanded to other locations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engineering - Suitability for local site conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental - Ability to protect, enhance, and expand ecosystem function	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental - Ability to improve water quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental - Ability to provide carbon sequestration benefits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social - Improves water connections/access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Typology 2 - End of Road on Bayfront - NE 26th St

Primary Hazards Affecting Site: King Tide Flooding

Primary Hazards Affecting Site: Heavy Rainfall Flooding, Coastal Storm Flooding

Typology 4 - Park on Bayfront - Margaret Pace Park

Primary Hazards Affecting Site: Erosion, Coastal Storm Flooding

Primary Hazards Affecting Site: Coastal Storm Flooding

# Strategy Menu

Figure 3-1: Shoreline Enhancement Strategy Menu

Softer Techniques - Smaller Waves, Smaller Fetch, Gentler Slope, Sheltered Coast

Harder Techniques - Larger Waves, Larger Fetch, Steeper Slope, Open Coast



Vegetation Only	Stormwater Retention	Edging	Sills	Elevated Features	Breakwater	Revetment	Bulkhead/Seawall
<p><b>Mangroves</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Dissipates wave energy</li> <li>Reduces erosion</li> <li>Provides habitat/increases biodiversity</li> <li>Traps sediment</li> <li>Carbon sink/sequestration</li> <li>Water purification</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>Requires maintenance/monitoring until established</li> <li>Efficacy requires more space</li> <li>Unmaintained plants may block water views</li> <li>Limited high water protection</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Revetment, (Living) Breakwater, Bulkhead/Seawall, Sills, Elevated berm</li> </ul>	<p><b>Stormwater Retention/BMPs</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Treatment and storage of stormwater</li> <li>Provides habitat</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>Vegetation may be sensitive to saltwater inundation</li> <li>Requires maintenance/monitoring until established</li> <li>No high water or coastal storm protection</li> <li>Could be costly</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Edging, Revetment, Breakwater, Bulkhead/Seawall, Sills, Elevated Berm</li> </ul>	<p><b>Multifunctional Wave Attenuation</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Dissipates wave energy</li> <li>Reduces erosion</li> <li>Promotes Water Access</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>No high water protection</li> <li>May require extension into water</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Bulkhead/Seawall, Elevated Berm</li> </ul>	<p><b>Oyster Balls/Bags/Castles</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Dissipates wave energy</li> <li>Enhances water quality</li> <li>Supports oyster restoration efforts</li> <li>Boosts local economy</li> <li>Reduces erosion</li> <li>Provides habitat/increases biodiversity</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>No high water protection</li> <li>Damage caused by debris/sedimentation</li> <li>Monitoring and maintenance required</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Seawall/Bulkhead, Vegetation</li> </ul>	<p><b>Platform/Boardwalk</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Promotes public/water access</li> <li>Aesthetically pleasing</li> <li>Increased educational opportunities</li> <li>Low environmental impacts</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>No coastal hazard protection</li> <li>Damage caused by debris</li> <li>Can shade out vegetation if used in tandem</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Seawall/Bulkhead, Vegetation, Revetment, Edging, Sills, Vegetation</li> </ul>	<p><b>Breakwater</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Reduces wave energy</li> <li>Reduces storm surge flood levels</li> <li>Promotes sediment accumulation</li> <li>Easy to repair if damaged</li> <li>Can provide offshore habitat</li> <li>Supports recreational opportunities</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>No high water protection</li> <li>Requires heavy equipment/intensive labor to install</li> <li>Not aesthetically pleasing</li> <li>May pose danger to watercraft</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Vegetation only, Edging, Sills, Revetment, Bulkhead/Seawall</li> </ul>	<p><b>Revetment</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Reduces wave energy</li> <li>Stabilize shoreline through rocks or other materials on the sloping shoreline</li> <li>Provides toe protection</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>No high water protection</li> <li>Prevents upland sediment to estuarine habitats</li> <li>Requires heavy equipment/intensive labor to install</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Joint-planted Revetment, Edging, Seawall/Bulkhead</li> </ul>	<p><b>Seawall/Bulkhead</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Fixes shoreline position</li> <li>Provides flood protection</li> <li>Reduces wave impacts</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>Increases erosion of adjacent areas</li> <li>Maintenance and elevation necessary over time</li> <li>Provides no ecological benefits</li> <li>Costly to install</li> <li>Requires heavy equipment/intensive labor to install</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Revetment, mangroves, sills, ecologically enhanced seawall, oyster balls</li> </ul>
<p><b>Tidal Vegetation/Seagrass</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Dissipates wave energy</li> <li>Reduces erosion</li> <li>Provides habitat/increases biodiversity</li> <li>Traps sediment</li> <li>Carbon sink/sequestration</li> <li>Water purification</li> <li>Protection of seawalls</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>Limited protection from large storms</li> <li>Requires maintenance/monitoring until established</li> <li>Prone to degradation from pollutants/poor water quality</li> <li>No high water protection</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Revetment, (Living) Breakwater, Bulkhead/Seawall, Sills, Edging, Elevated Berm, Elevated Platform</li> </ul>		<p><b>Bio-logs</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Dissipates wave energy</li> <li>Reduces erosion</li> <li>Provides habitat</li> <li>Traps sediment</li> <li>Filters stormwater runoff</li> <li>Cost-effective</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>Breaks down over time</li> <li>No high water protection</li> <li>Limited protection from large storms</li> <li>May require routine maintenance</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Vegetation, Sills</li> </ul>	<p><b>Marsh Sills</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Dissipates wave energy</li> <li>Slows inland water transfer</li> <li>Provides habitat/increases biodiversity</li> <li>Increases natural stormwater infiltration</li> <li>Toe protection helps prevent wetland edge loss</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>No high water protection</li> <li>Requires more land area</li> <li>Uncertainty of successful vegetation growth and competition with invasive species</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Seawall/Bulkhead, Vegetation, Breakwater</li> </ul>	<p><b>Elevated Berm</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Provides protection from waves and flooding</li> <li>Adaptable to higher elevations over time</li> <li>Can be designed for multipurpose use</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>Vulnerable to erosion without supplemental strategy</li> <li>Costly to install</li> <li>Requires heavy equipment/intensive labor to install</li> <li>Routine maintenance necessary</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Revetment, Vegetation, Sills, (Living) Breakwater</li> </ul>	<p><b>Living Breakwater</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Reduces erosion</li> <li>Enhances habitat/increases biodiversity</li> <li>Supports recreational opportunities</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>No high water protection</li> <li>Requires heavy equipment/intensive labor to install</li> <li>May pose danger to watercraft</li> <li>Requires maintenance/monitoring until established</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Vegetation only, Edging, Sills, Revetment, Bulkhead/Seawall</li> </ul>	<p><b>Joint-planted Revetment</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Enhanced habitat of revetment</li> <li>Increased educational opportunities</li> <li>Increased wave/current reduction and sediment trapping</li> <li>Reinforces revetment</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>Plantings may die out if they become inundated by tides</li> <li>Vegetation may be sensitive to water quality</li> <li>Requires maintenance/monitoring until established</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Revetment</li> </ul>	<p><b>Ecologically Enhanced Seawall</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Enhanced habitat of armored structure</li> <li>Increased wave energy dissipation</li> <li>Increased educational opportunities</li> <li>Enhanced aesthetic value</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>Success of ecosystem enhancement may depend on local water quality</li> <li>Requires maintenance/monitoring</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Seawall/bulkhead</li> </ul>
		<p><b>Vegetated Geogrid</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Reduces erosion</li> <li>Provides habitat</li> <li>Adds aesthetic value</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>Required maintenance until vegetation is established</li> <li>Costly to install</li> <li>Requires heavy equipment/intensive labor to install</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Sills, Breakwater, Bulkhead/Seawall</li> </ul>			<p><b>Artificial Reef</b></p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>Provides habitat/increases biodiversity</li> <li>Dissipates wave energy</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>Requires maintenance/monitoring until established</li> <li>No high water protection</li> <li>May pose danger to watercraft</li> </ul> <p>Pairs Well With:</p> <ul style="list-style-type: none"> <li>Vegetation, Edging</li> </ul>		



# Combining Strategies into Alternatives

- Individual strategies grouped into alternatives (options)
- Up to 3 options for each typology location
- Covers range of nature-based interventions

Less Intervention Lower Complexity More Gray/Traditional		More Intervention Higher Complexity More Green/Nature-based	
Option 1	Option 2	Option 3	
<p><b>Theme:</b> <i>Pocket Park with no water access; focus on elevated green space and water views</i></p> <ul style="list-style-type: none"> <li>• Elevated seawall to be compliant with City seawall ordinance ~ 6ft</li> <li>• Added vegetation in front of seawall</li> <li>• Added green infrastructure and native vegetation in park for stormwater capture/treatment/ increased aesthetics</li> <li>• Picnic/ seating to view water</li> <li>• Install/ incorporate shade sails/ shade trees within seating area</li> <li>• Include ADA sidewalks for future Riverwalk connectivity</li> <li>• No direct water access</li> </ul>	<p><b>Theme:</b> <i>Pocket Park with water access</i></p> <ul style="list-style-type: none"> <li>• Elevated Pocket Park with permeable paving and green infrastructure for stormwater capture/treatment/ increased aesthetics</li> <li>• Pull seawall back and add terraced/ stepped transitional habitat and path to water edge</li> <li>• “Tessellated” stones providing water access, incorporate vegetation planters into steps</li> <li>• Install shade sails along pocket park amenities (seating areas)</li> <li>• Include ADA sidewalks for future Riverwalk connectivity</li> </ul>	<p><b>Theme:</b> <i>Elevated walkway along river, soften seawall</i></p> <ul style="list-style-type: none"> <li>• Elevated walkway with ADA compliance that extends beyond the site boundary (follows waterfront)               <ul style="list-style-type: none"> <li>○ Preserving navigable channel for water transportation as well as, ensure future Riverwalk connectivity</li> </ul> </li> <li>• Add terraced naturalized shoreline with native vegetated river edge</li> <li>• Maintain viewshed with seating</li> <li>• Add more shade trees within along the street edge (species to be tolerant to flooding)</li> <li>• Incorporate local art installation into design</li> </ul>	

*Example from End-of-Road on Riverfront*

# Typology 1 - End-of-Road on the Riverfront

## NE 5th Ave

### Option 1



Typology 1: End of Road on Riverfront - OPTION 1

Location: NE 5th Ave.



Section A-A'



# Typology 1 - End-of-Road on the Riverfront

## NE 5th Ave

### Option 2



Typology 1: End of Road on Riverfront - OPTION 2

Location: NE 5th Ave.

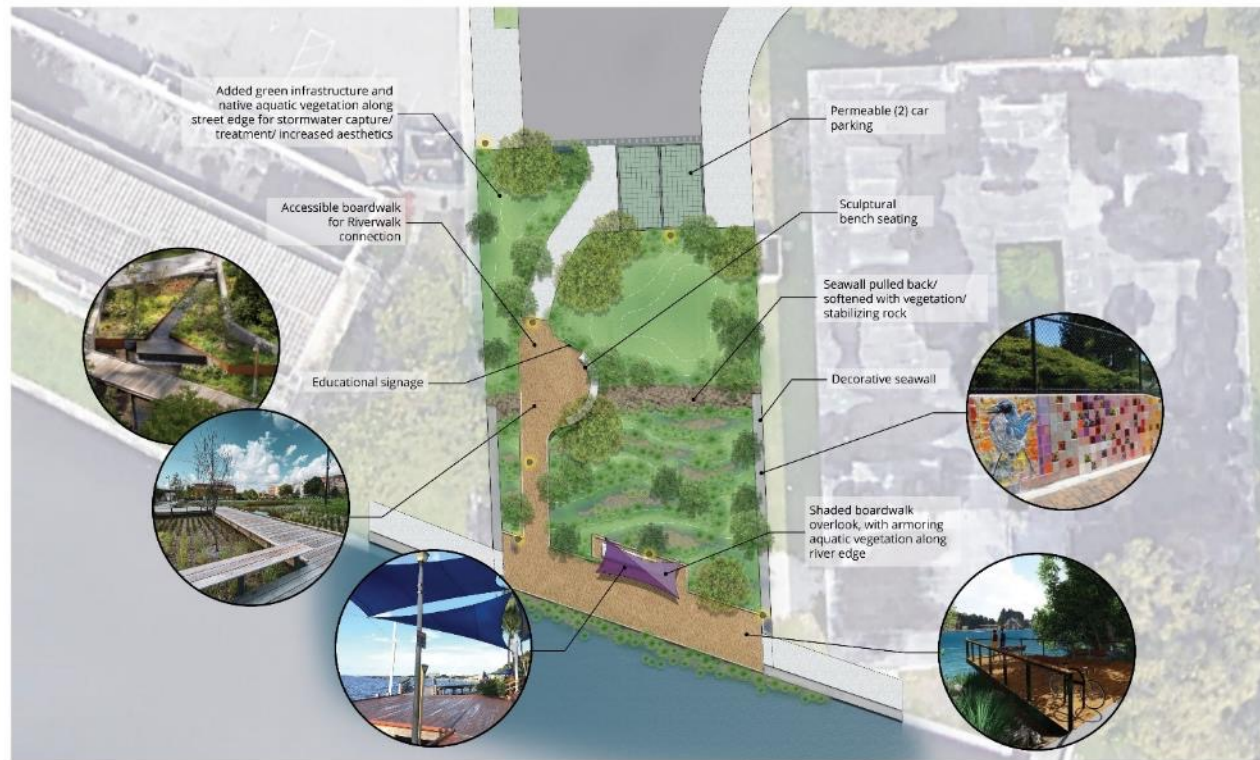


Section A-A'

# Typology 1 - End-of-Road on the Riverfront

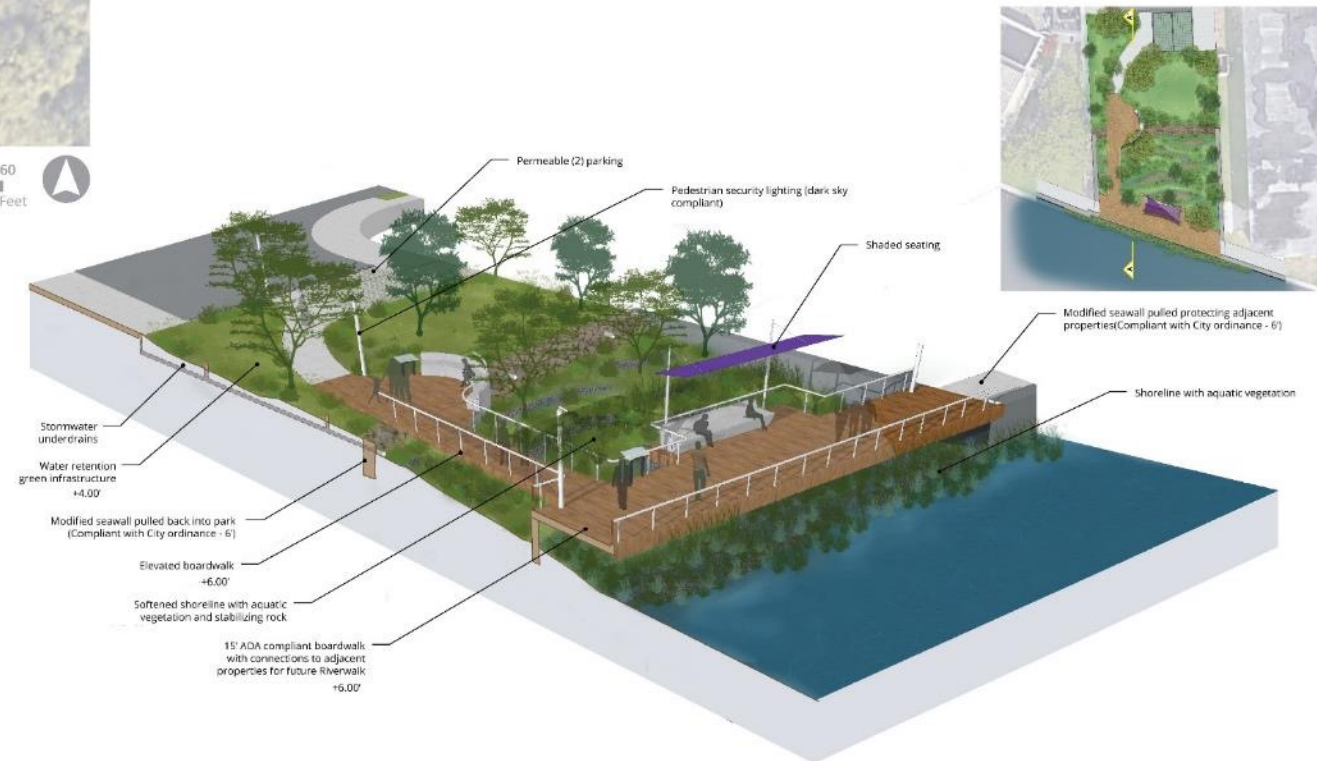
## NE 5th Ave

### Option 3



Typology 1: End of Road on Riverfront - OPTION 3

Location: NE 5th Ave.



Section A-A'



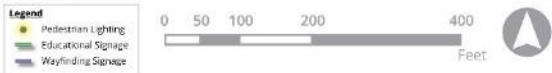
# Typology 3 – Park on the Riverfront

## Sewell Park

### Option 1



Typology 3: Park on Riverfront - OPTION 1  
 Location: Sewell Park



Section A-A'



# Typology 3 – Park on the Riverfront

## Sewell Park

### Option 2



Typology 3: Park on Riverfront - OPTION 2  
 Location: Sewell Park

**Legend**

- Pedestrian Lighting
- Educational Signage
- Wayfinding Signage

0 50 100 200 400 Feet





# Typology 3 – Park on the Riverfront

## Sewell Park

### Option 3



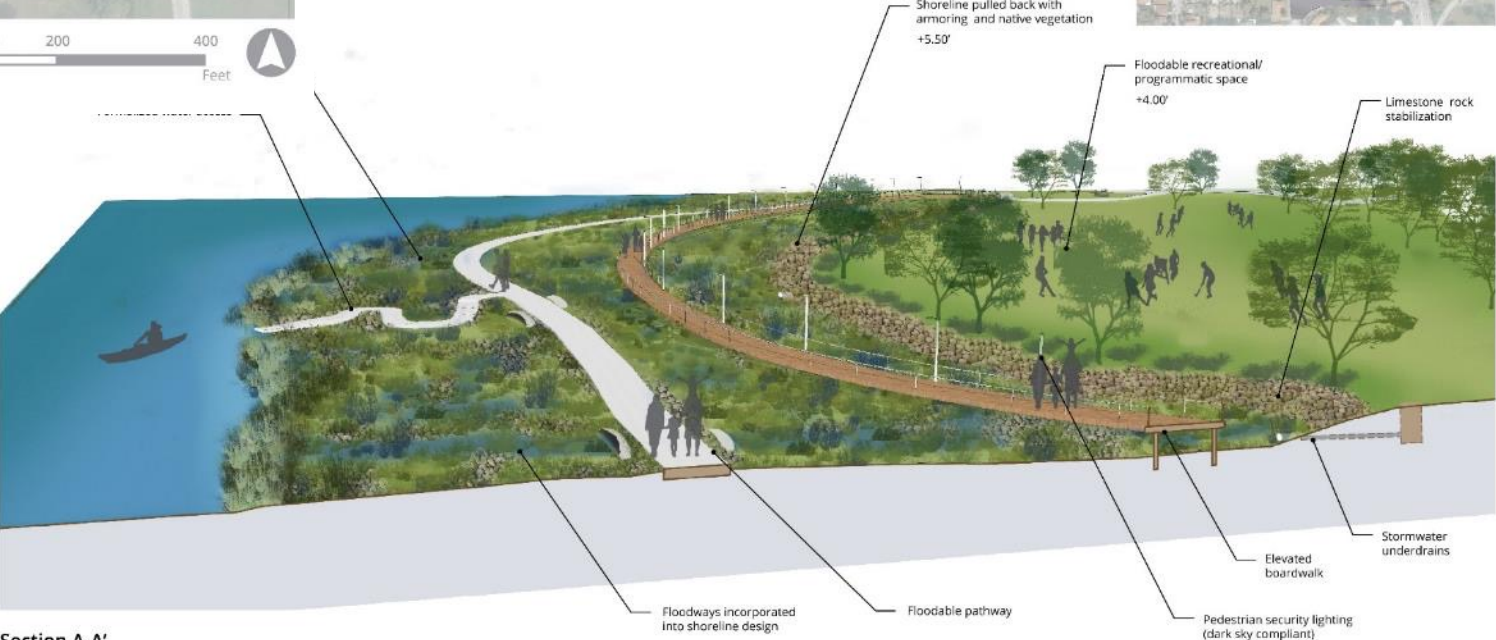
Typology 3: Park on Riverfront - OPTION 3

Location: Sewell Park

**Legend**

- Pedestrian Lighting
- Educational Signage
- Wayfinding Signage

0 50 100 200 400 Feet



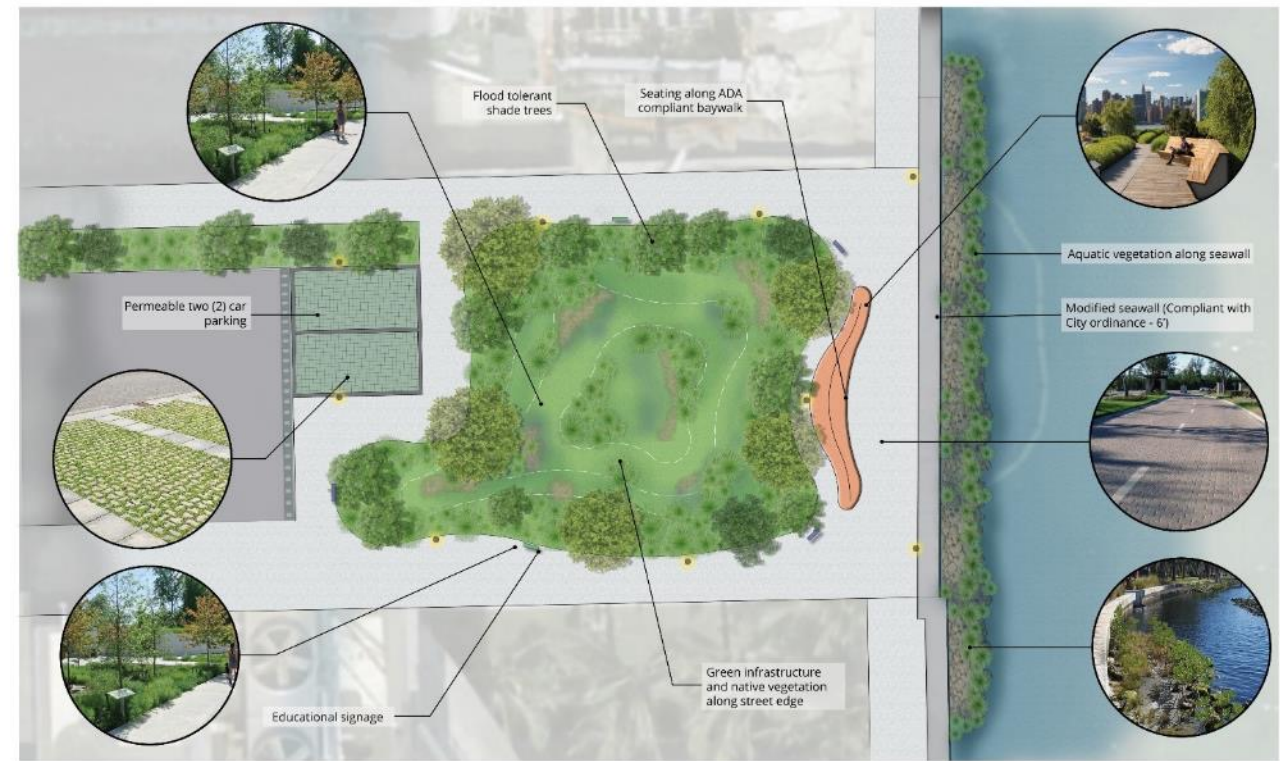
Section A-A'



# Typology 2 - End-of-Road on the Bayfront

NE 26<sup>th</sup> St

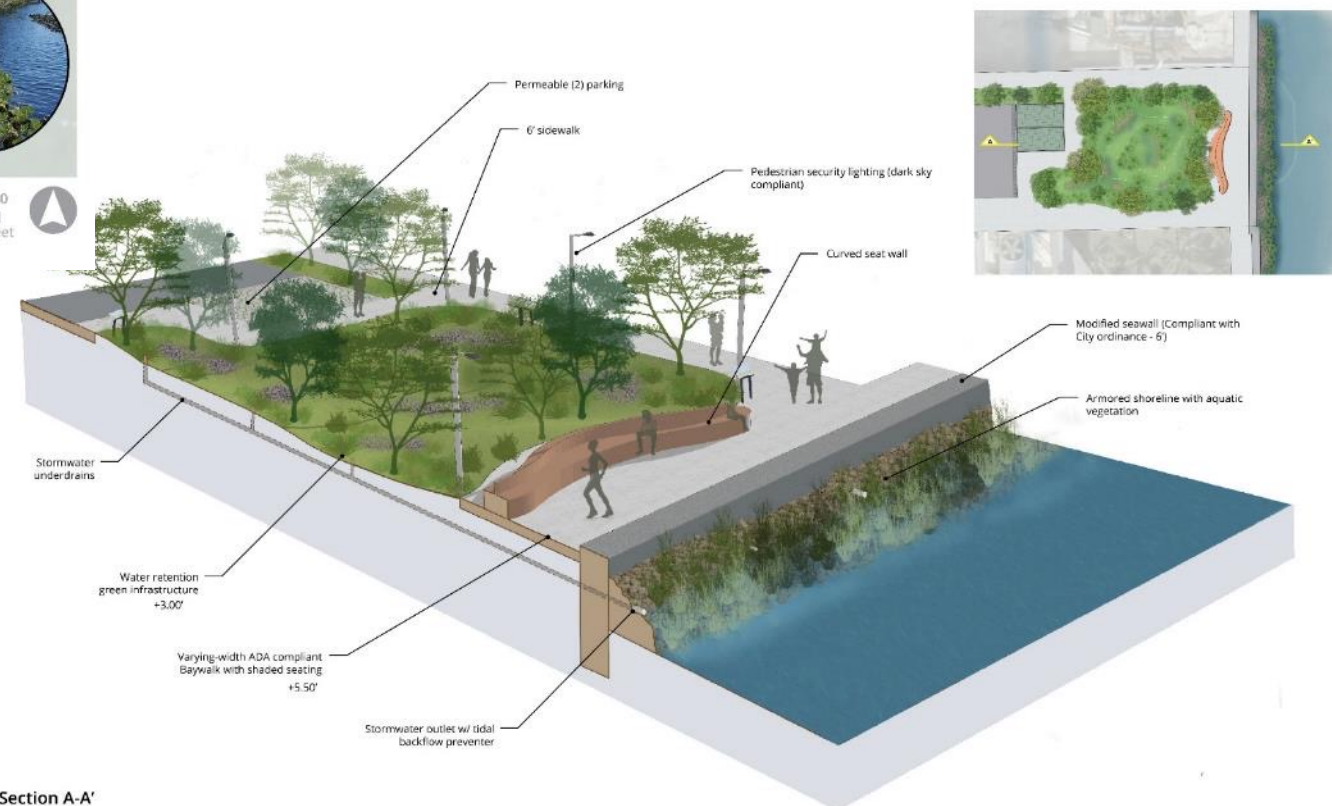
Option 1



Typology 2: End of Road on Bayfront - OPTION 1

Location: NE 26<sup>th</sup> St.

- Pedestrian Lighting
- Educational Signage
- Wayfinding Signage



Section A-A'



# Typology 2 - End-of-Road on the Bayfront

## NE 26th St

### Option 2



Typology 2: End of Road on Bayfront - OPTION 2

Location: NE 26th St.

- Legend**
- Pedestrian Lighting
  - Educational Signage
  - Wayfinding Signage



Section A-A'



# Typology 2 – End-of-Road on the Bayfront

NE 26<sup>th</sup> St

Option 3



Section A-A'



Typology 2: End of Road on Bayfront - OPTION 3

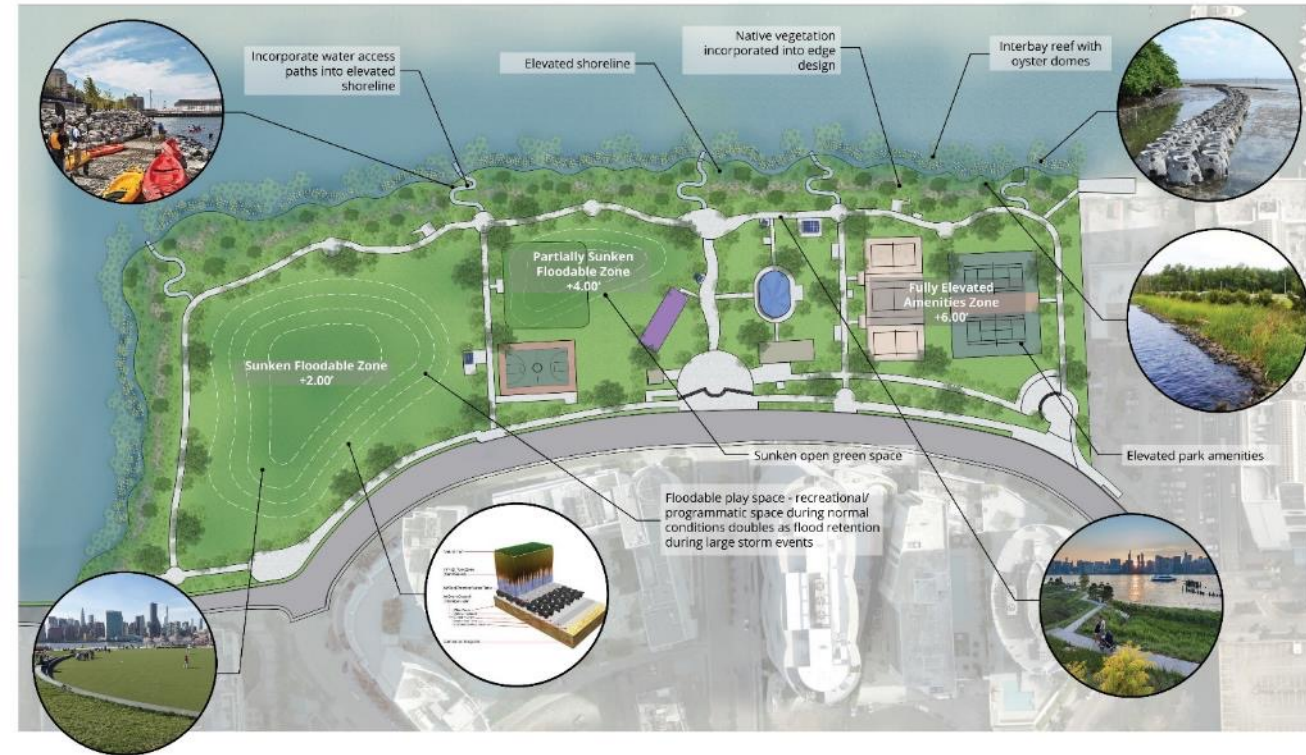
Location: NE 26<sup>th</sup> St.



# Typology 4 - Park on the Bayfront

## Margaret Pace Park

### Option 1



Typology 4: Park on Bayfront - OPTION 1

Location: Margaret Pace Park



Section A-A'



# Typology 4 - Park on the Bayfront

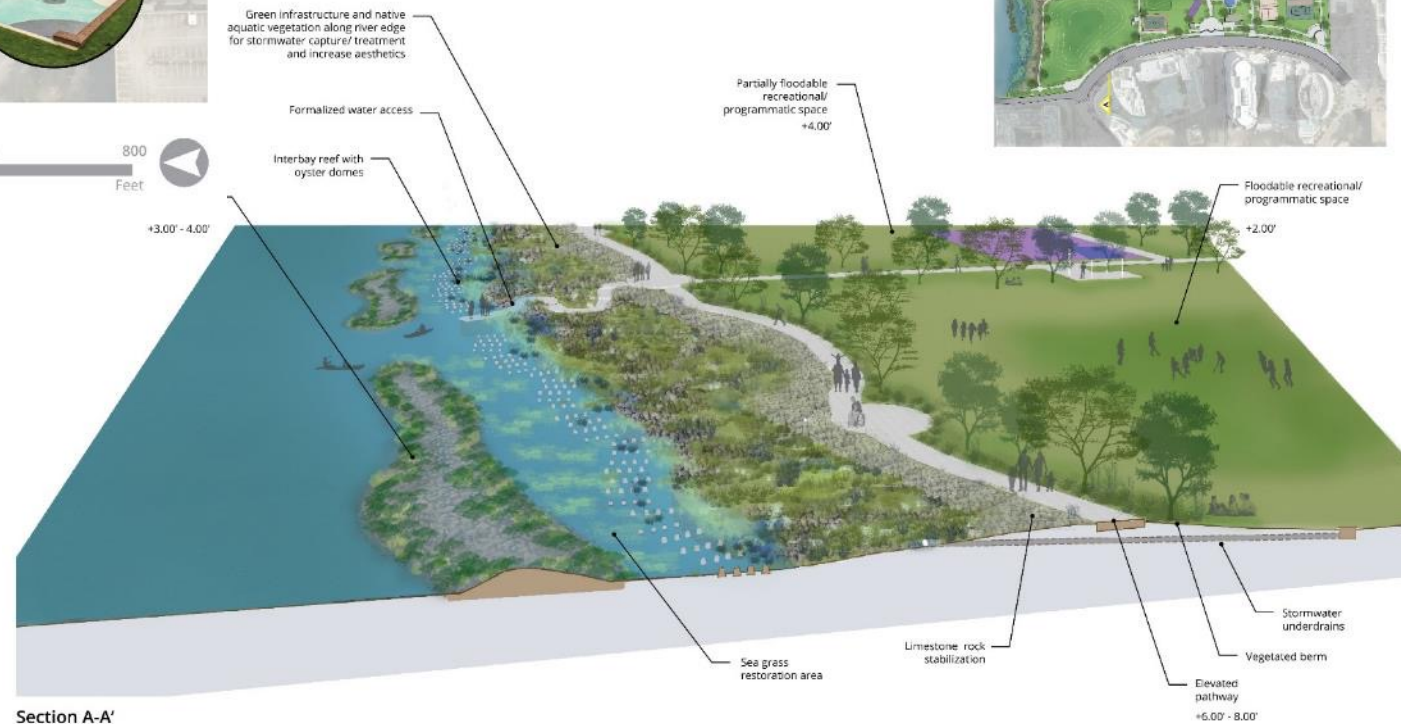
## Margaret Pace Park

### Option 2



Typology 4: Park on Bayfront - OPTION 2

Location: Margaret Pace Park



Section A-A'



# Cost Estimates & Benefit Evaluation

- Cost estimates for each alternative – total, per SF, and per LF of shoreline
- Benefits quantified using FEMA Ecosystem Services' national value per acre for green space

Typology 2: End-of-Road on Bayfront	Total Cost	Cost per SF of Park	Total Cost per LF of Shoreline
Alternative 1	\$1,239,424	\$237	\$17,706
Alternative 2	\$1,468,170	\$281	\$20,974
Alternative 3	\$1,431,241	\$274	\$20,445



Options 1, 2, and 3 for Alternative 2 (End-of-Road on the Bayfront)

All three options provide significant public benefits. Based on FEMA Ecosystem Services' national value per acre for green space and the size of this area, the value of benefits in ecosystem services from Alternative 2 estimated is approximately **\$1,866 per year**<sup>3</sup> Qualitatively, the benefits of Alternative 2 are described below:

# Cost Estimates & Benefit Evaluation

- Qualitative benefits evaluated based on 7 factors

Table 4-4: Typology 2 - End-of-Road on Bayfront Benefits

Benefit	Alt. 1	Alt. 2	Alt. 3	Reasoning
Aesthetic Value				All three alternatives increase the aesthetic value of the area.
Air Quality & Climate Regulation				Alternative three includes more shade trees and groundcover than Alternatives 1 and 2.
Flood Hazard Risk Reduction & Erosion Control				Alternative 1 has fewer drainage inlets and outflows than Alternatives 2 and 3. All 3 alternatives include similar protections against sea-level rise.
Habitat & Pollination				All three alternatives create green space where it did not previously exist. Alternative 2 is the only alternative with custom oyster domes.
Recreation / Tourism				Alternative 2 includes an observation deck and Alternative 3 includes water access.
Increasing accessibility				All three alternatives include the same ADA pathways, parking, and crosswalks.
Bike and pedestrian infrastructure				All three alternatives include the same provisions for bike and walking infrastructure.

Matrix Key:



Indicates *No* benefits



Indicates *Fewer* benefits compared to the other alternatives



Indicates *Moderate* or the same benefits as other alternatives

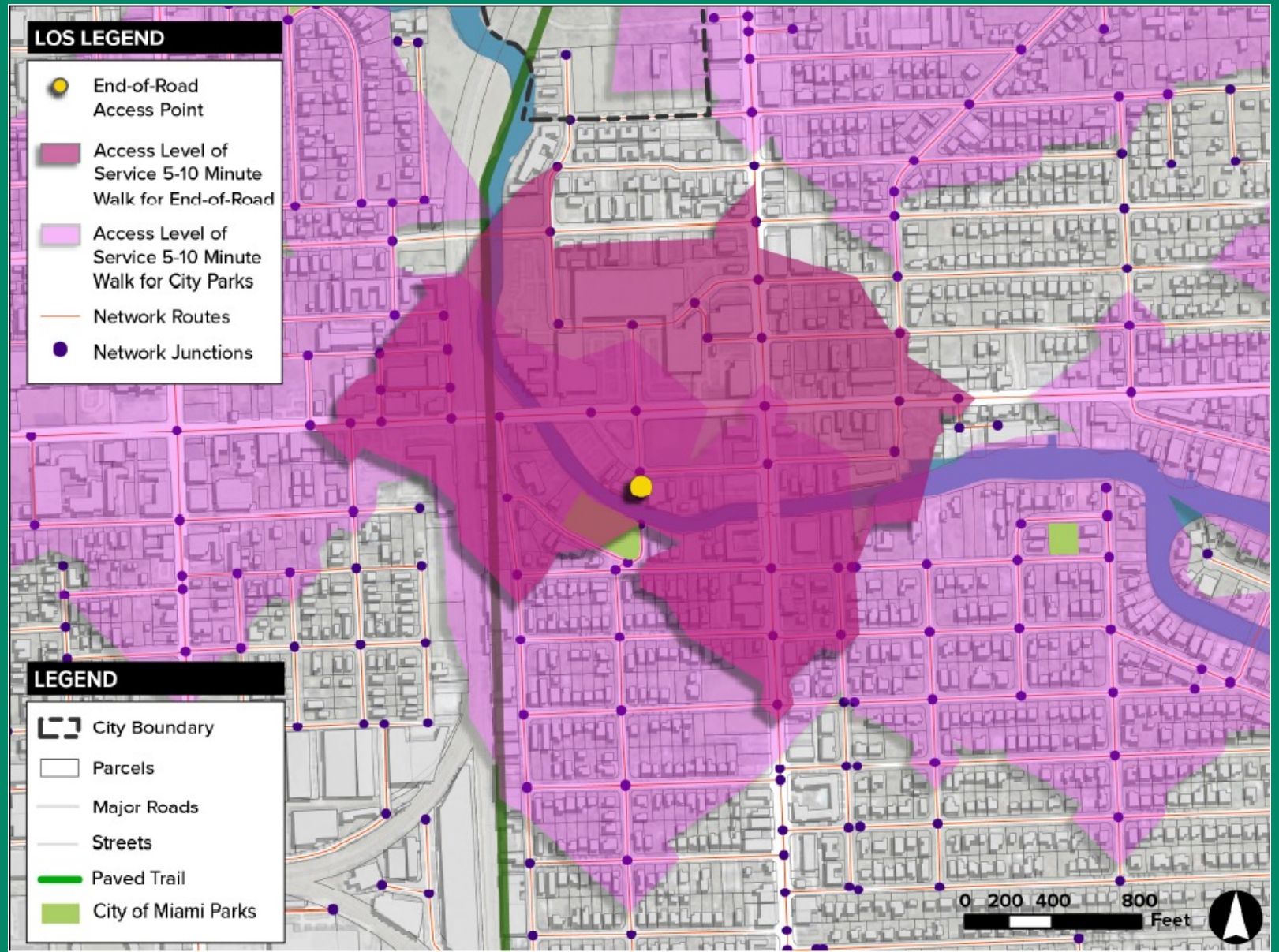


Indicates *More* benefits than the other alternatives



# Cost Estimates & Benefit Evaluation

- Evaluated walkability and level of service benefits for new open space in end-of-road typologies



# Preliminary Permitting Investigation

- Preliminary Matrix for City, County, State and Federal requirements

			City			County			State				Federal	
Typology	Location	Alternative	Building	Planning	Resilience & Public Works	Miami-Dade Division of Environmental Resource Management (DERM) Class I	Miami-Dade Division of Environmental Resource Management (DERM) Class II	Planning and Zoning	Florida Department of Environmental Protection (FDEP)	South Florida Water Management District Environmental Resource Permit	South Florida Water Management District Right-of-Way	Sovereign Submerged lands	US Army Corps of Engineers 404 (Dredge and Fill)	US Army Corps of Engineers Section 108
End of Road on Riverfront	NE 5th Ave	Design Alternative 1	Project will require a permit from the building department and review by select trades if applicable (structural, electrical, storm water, fire, tree preservation, flood plain, etc.)	Rezoning required if EOR is transitioned to park space. Review to ensure compliance with archeological and historical requirements for SFWMD and USACE permits.	Permit required for closure of ROW. Utility permit required.	Required for work any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required for to control stormwater discharge to any surface water in Miami-Dade County.	Landscaping Requirements	Statewide-Environmental resource permit. Must meet conditions of an exemption or general permit before proceeding with SFWMD individual permit.	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	Required for work within and adjacent to SFWMD ROW (C-7/Little River Canal)	Review of use of all submerged lands. Completed in conjunction with ERP review.	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13.	Engineering review conducted by the USACE to confirm that a proposed work will not adversely affect civil works of the District. Required for work in Little River Canal.
		Design Alternative 2	Project will require a permit from the building department and review by select trades if applicable (structural, electrical, storm water, fire, tree preservation, flood plain, etc.)	Rezoning required if EOR is transitioned to park space. Review to ensure compliance with archeological and historical requirements for SFWMD and USACE permits.	Permit required for closure of ROW. Utility permit required.	Required for work any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required for to control stormwater discharge to any surface water in Miami-Dade County.	Landscaping Requirements	Statewide-Environmental resource permit. Must meet conditions of an exemption or general permit before proceeding with SFWMD individual permit.	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	Required for work within and adjacent to SFWMD ROW (C-7/Little River Canal)		Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13.	Engineering review conducted by the USACE to confirm that a proposed work will not adversely affect civil works of the District. Required for work in Little River Canal.
		Design Alternative 3	Project will require a permit from the building department and review by select trades if applicable (structural, electrical, storm water, fire, tree preservation, flood plain, etc.)	Rezoning required if EOR is transitioned to park space. Review to ensure compliance with archeological and historical requirements for SFWMD and USACE permits.	Permit required for closure of ROW. Utility permit required.	Required for work any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required for to control stormwater discharge to any surface water in Miami-Dade County.	Landscaping Requirements	Statewide-Environmental resource permit. Must meet conditions of an exemption or general permit before proceeding with SFWMD individual permit.	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	Required for work within and adjacent to SFWMD ROW (C-7/Little River Canal)	Review of use of all submerged lands. Completed in conjunction with ERP review.	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13.	Required for work in Little River Canal.
End of Road on Bayfront	NE 26th St	Design Alternative 1	Project will require a permit from the building department and review by select trades if applicable (structural, electrical, storm water, fire, tree preservation, flood plain, etc.)	Rezoning required if EOR is transitioned to park space. Review to ensure compliance with archeological and historical requirements for SFWMD and USACE permits.	Permit required for closure of ROW. Utility permit required.	Required for work any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required for to control stormwater discharge to any surface water in Miami-Dade County.	Landscaping Requirements	Statewide-Environmental resource permit. Must meet conditions of an exemption or general permit before proceeding with SFWMD individual permit.	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	Not Applicable	Review of use of all submerged lands. Completed in conjunction with ERP review.	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13.	N/A
		Design Alternative 2	Project will require a permit from the building department and review by select trades if applicable (structural, electrical, storm water, fire, tree preservation, flood plain, etc.)	Rezoning required if EOR is transitioned to park space. Review to ensure compliance with archeological and historical requirements for SFWMD and USACE permits.	Permit required for closure of ROW. Utility permit required.	Required for work any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required for to control stormwater discharge to any surface water in Miami-Dade County.	Landscaping Requirements	Statewide-Environmental resource permit. Must meet conditions of an exemption or general permit before proceeding with SFWMD individual permit.	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	N/A		Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13.	N/A
		Design Alternative 3	Project will require a permit from the building department and review by select trades if applicable (structural, electrical, storm water, fire, tree preservation, flood plain, etc.)	Rezoning required if EOR is transitioned to park space. Review to ensure compliance with archeological and historical requirements for SFWMD and USACE permits.	Permit required for closure of ROW. Utility permit required.	Required for work any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required for to control stormwater discharge to any surface water in Miami-Dade County.	Landscaping Requirements	Statewide-Environmental resource permit. Must meet conditions of an exemption or general permit before proceeding with SFWMD individual permit.	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	Not Applicable	Review of use of all submerged lands. Completed in conjunction with ERP review.	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13.	N/A
Park on Riverfront	Sewell Park	Design Alternative 1	Project will require a permit from the building department and review by select trades if applicable (structural, electrical, storm water, fire, tree preservation, flood plain, etc.)	Review to ensure compliance with archeological and historical requirements for SFWMD and USACE permits.	Utility permit required. ROW permit not required unless ROW is impeded by work within the park.	Required for work any work in, on, over or upon tidal waters or coastal wetlands of Miami-Dade County or any municipality within the County	Required for to control stormwater discharge to any surface water in Miami-Dade County.	Landscaping Requirements	Statewide-Environmental resource permit. Must meet conditions of an exemption or general permit before proceeding with SFWMD individual permit.	Required for drainage, placement of riprap, and upland work. Individual Permit anticipated	Required for work within and adjacent to SFWMD ROW (C-6/Miami River Canal)	Review of use of all submerged lands. Completed in conjunction with ERP review.	Required for dredge and fill within tidal surface waters (riprap). Likely qualifies under NWP 54 and 13.	Engineering review conducted by the USACE to confirm that a proposed work will not adversely affect civil works of the District. Required for work in Miami River.



# Permitting Pre-Application Meetings

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- Agencies
  - City of Miami
  - Miami-Dade County RER & DERM
  - South Florida Water Management District
  - US Army Corps of Engineers





# Permitting Pre-Application Meetings: What We Learned

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- **City of Miami**

- Permitting process and agencies needed for review
- Additional stakeholders to engage

- **MD RER/DERM**

- Elevations of proposed elements need to consider current County flood data
- Outfalls will trigger a Class II Permit, but may not be required with the green infrastructure in our designs
- Constructed wetlands need to have barriers between adjacent properties
- Permitting requirements would be reduced if proposed designs do not extend past the current mean high-water line



# Permitting Pre-Application Meetings: What We Learned

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- **USACE**

- Any designs that impede navigable waterways would need justification for impacts
- All projects would need an existing resource survey prior to moving into design
- Positive impacts are not necessarily frowned upon, but justification for all impacts is required
- Similar reference projects can provide lessons learned (Jose Marti, Brittany Bay Park)
- Proposals, including breakwater reefs would need to meet certain impact criteria and provide justification



# Successful Implementation: What's Needed

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- **Planning & Zoning:** Land use and zoning changes may be required for certain sites if they are intended to be parks
- **Formal Process:** A formal process needs to be adopted to evaluate the level of amenities on sites, make decisions on land use updates, and plan for future maintenance
- **Project Phasing:** Projects can be phased based on waterline/shoreline amenities/interior approach
- **Specialized Design and Maintenance:** Different design and construction approaches will be utilized based on the specialization required for the work

Many of the design alternatives would require specialized maintenance contracts – maintenance management plans are critical



# Successful Implementation: What's Needed, cont

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- **Funding & Financing:** There are a variety of funding mechanisms that could be utilized, including FIND, FEMA Flood Mitigation Funding, HUD, Conservation funds, and GO Bonds
- **Collaboration:** Partnerships with private developers, property owners, Miami River Commission, and the DDA are necessary to promote nature-based designs across the waterfronts
- **City Alignment:** Policy and operation updates to help align these ideas with other efforts throughout the City



# Thank you!

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# **Miami River Commission's Urban Infill and Greenways Subcommittee July 21, 2023**

Miami River Commission's (MRC) Urban Infill and Greenways Subcommittee Chairman Jim Murley convened a public meeting on July 21, 2023, 1407 NW 7 ST, at 10:30 AM. The sign in sheet is attached.

## **I. Review and Discuss the "Resilient Waterfront Enhancement Plan"**

Sonia Brubaker, Director of the City of Miami's Office of Resilience and Sustainability, Timothy Kirby, City of Miami's Office of Resilience and Sustainability, and Yohermo Echeverria, City of Miami Parks Department, distributed and presented a PowerPoint presentation regarding the City of Miami's "Resilient Waterfront Enhancement Plan". The PowerPoint notes the plan was funded by a grant from the National Fish and Wildlife Foundation and states:

- "Enhance City-owned waterfront property with nature-based designs
- Identify pilot project sites to serve as prototypes for similar shorelines
- Address permitting, funding, design, and maintenance hurdles of nature-based designs
- Align with ongoing City resilience initiatives"

### **Successful Implementation: What's Needed**

- **Planning & Zoning:** Land use and zoning changes may be required for certain sites if they are intended to be parks
- **Formal Process:** A formal process needs to be adopted to evaluate the level of amenities on sites, make decisions on land use updates, and plan for future maintenance
- **Project Phasing:** Projects can be phased based on waterline/shoreline amenities/interior approach
- **Specialized Design and Maintenance:** Different design and construction approaches will be utilized based on the specialization required for the work

Many of the design alternatives would require specialized maintenance contracts – maintenance management plans are critical

- **Funding & Financing:** There are a variety of funding mechanisms that could be utilized, including FIND, FEMA Flood Mitigation Funding, HUD, Conservation funds, and GO Bonds
- **Collaboration:** Partnerships with private developers, property owners, Miami River Commission, and the DDA are necessary to promote nature-based designs across the waterfronts
- **City Alignment:** Policy and operation updates to help align these ideas with other efforts throughout the City"

Director Brubaker kindly agreed to present the City of Miami's "Resilient Waterfront Enhancement Plan" at the full MRC's next public meeting on September 11, noon, Main Library Auditorium, 101 W. Flagler.

## **II. New Business**

MRC Director Brett Bibeau stated the MRC recently used State grant funding to remove large invasive Brazilian peppers and garbage from vacant County owned riverfront 3795 NW South River Drive. While doing so he noticed the site is essentially a swamp, therefore recommended the County plant Cypress Trees etc. on the site.

MRC Director Bibeau stated composting reduces waste in landfills, while capturing carbon monoxide in the soil, and recommended watching “Kiss the Ground” on Netflix. Director Bibeau stated if it is illegal to compost in an odorless, insectless fashion at single family homes in the City of Miami and unincorporated Dade County, the City and County should consider amending their codes to make it legal.

The public meeting adjourned.



Miami River Commission Urban Infill and Greenways Subcommittee

Public Meeting

July 21, 2023 - 10:30 AM

1407 NW 7 ST, Arts and Crafts Boardroom (facing Miami River)

Name

Organization

Telephone

Email

Brett Bibeau

MRC

305-644-0544

brettbibeau@  
mianirivercommission.org

Jim Murley

MDC/MRC

705-968-4881

James.Murkey@miamigov.com

Yohermo Echeverria

Park & Rec.

786-553-6826

yecheverria@miamigov.com

Sonia Babaker

com / office of  
Resilience  
& Sustainability

703-434-9929

sbabaker@miamigov.com

Timothy Kirby

City of Miami Office of  
Resilience & Sustainability

646-384-5894

tkirby@miamigov.com

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION  
**CONTRACT RENEWAL**

375-020-23  
CONTRACTS ADMINISTRATION  
OGC - 04/06

Contract No.: ASP28 Renewal: (1st, 2nd, etc.) 1st  
Financial Project No(s): 445054-2-78-01  
County(ies): Miami-Dade

This Agreement made and entered into this 14 day of November, 2022, by and between the State of Florida Department of Transportation, hereinafter called "Department", and Miami River Commission (Miami River Fund, Inc.), 1407 NW 7 Street, Miami, Florida 33125 hereinafter called "Contractor".  
(This date to be entered by DOT only.)

**WITNESSETH:**

WHEREAS, the Department and the Contractor heretofore on this 9 day of August, 2021 entered into an Agreement whereby the Department retained the Contractor to perform maintenance of all turf and landscape areas within the right-of-way on the State Roads described in "Exhibit A" of the original contract; and  
(This date to be entered by DOT only)

WHEREAS, said Agreement has a renewal option which provides for a renewal if mutually agreed to by both parties and subject to the same terms and conditions of the original Agreement;

NOW, THEREFORE, this Agreement witnesseth that for and in consideration of the mutual benefits to flow each to the other, the parties agree to a renewal of said original Agreement for a period beginning the 19 day of December, 2022 and ending the 18 day of December, 2023 at a cost of \$38,868.00.

All terms and conditions of said original Agreement shall remain in force and effect for this renewal.

IN WITNESS WHEREOF, the parties have executed this Agreement by their duly authorized officers on the day, month, and year set forth above.

Miami River Commission  
Name of Contractor

Brett Bibeau, Managing Director  
Contractor Name and Title

BY: Brett Bibeau  
Authorized Signature

\_\_\_\_\_  
Name of Surety (SEAL)

\_\_\_\_\_  
City State

By: \_\_\_\_\_  
Florida Licensed Insurance Agent or Attorney-In-Fact (Signature) Date

Countersigned: \_\_\_\_\_  
Florida Licensed Insurance Agent Date

STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION

DocuSigned by:  
BY: Rudy Garcia  
District Secretary or Designee (Signature)

Title: District Director of Operations

DocuSigned by:  
Legal: Alicia Trujillo  
12CAF0E1B1DB4BC...

Fiscal: \_\_\_\_\_  
Approval as to Availability of Funds



**Policy Committee:**

**Governor of State of Florida**  
Mr. Ron DeSantis  
Designee: Ms. Patricia Harris

**Chair of Miami-Dade Delegation**  
Senator Ana Maria Rodriguez  
Designee: Senator Ileana Garcia

**Chair of Governing Board of South Florida Water Management District**  
Mr. Chancey Goss  
Designee: Mr. Scott Wagner

**Miami-Dade State Attorney**  
Ms. Katherine Fernandez-Rundle  
Designee: Mr. David Maer

**Mayor of Miami-Dade County**  
Mayor Daniella Levine Cava  
Designee: Mr. Jim Murley

**City of Miami Mayor**  
Mayor Francis Suarez  
Designee: Ms. Megan Kelly

**City of Miami Commissioner**  
Commissioner Alex Diaz de la Portilla

**Miami-Dade County Commissioner**  
Commissioner Eileen Higgins  
Designee: Ms. Maggie Fernandez

**Chair of Miami River Marine Group**  
Mr. Bruce Brown  
Designee: Mr. Richard Dubin

**Chair of Marine Council**  
Mr. Michael Karcher  
Designee: Mr. Phil Everingham

**Executive Director of Downtown Development Authority**  
Ms. Alyce Robertson  
Designee: Ms. Christina Crespi

**Chair of Greater Miami Chamber of Commerce**  
Mr. Alfred Sanchez  
Designee: Ms. Sandy O'Neil

**Neighborhood Representative Appointed by City of Miami Commission**  
Dr. Ernest Martin  
Designee: Mr. Tom Kimen

**Neighborhood Representative Appointed by Miami-Dade Commission**  
Ms. Sallye Jude  
Designee: Mr. Mike Simpson

**Representative from Environmental or Civic Organization Appointed by the Governor**  
Mr. Horacio Stuart Aguirre

**Member at Large Appointed by the Governor**  
Mr. Luis Garcia  
Designee: Mr. John Michael Cornell

**Member at Large Appointed by Miami-Dade Commission**  
Ms. Sara Babun  
Designee: Ms. Roselvic Noguera

**Member at Large Appointed by City of Miami Commission**

**Managing Director**  
Mr. Brett Bibeau

# Miami River Commission



c/o Robert King High  
1407 NW 7<sup>th</sup> Street, Suite 2  
Miami, Florida 33125  
Office: (305) 644-0544  
BrettBibeau@MiamiRiverCommission.org  
www.miamirivercommission.org

## Re: Miami River Commission Unanimous Resolution to Renew FDOT Contract ASP28-R1 - Fin# 445054-2-78-01

During the Miami River Commission's (MRC) 11/7 public meeting, noon, 101 W Flagler, the MRC was provided printed copies of FDOT Contract ASP28-R1 - Fin# 445054-2-78-01 & its renewal letter, and the MRC unanimously adopted the following distributed printed resolution, with the following members voting in favor, Chairman Horacio Stuart Aguirre, Vice Chairman James Murley, Commissioner Eileen Higgins, Mike Simpson, Patty Harris, Tom Kimen, John Michael Cornell, Spencer Crowley, Megan Kelly, Neal Schafers, and Bruce Brown:

"The Miami River Commission authorizes its Managing Director (Mr. Brett Bibeau) to execute the attached contract (ASP28-R1 - Fin# 445054-2-78-01, hereinafter the "Contract") on behalf of the Miami River Commission;

The Miami River Commission designates Miami River Fund Inc., a Florida Not For Profit Corporation, as its fiscal agent; and

The Miami River Commission assigns all payments to be made pursuant to the Contract to Miami River Fund, Inc, as the fiscal agent of the Miami River Commission, and therefore directs the Florida Department of Transportation to make all Contract payments to the Miami River Fund, Inc."

Horacio Stuart Aguirre  
Chairman,  
Miami River Commission

**Miami River Commission's  
Urban Infill and Greenways Subcommittee  
June 16, 2023**

Miami River Commission's (MRC) Urban Infill and Greenways Subcommittee Chairman Jim Murley convened a public meeting on June 16, 2023, 1407 NW 7 ST, at 12:30 PM. The sign in sheet is attached.

**I) Discuss City of Miami's Evaluation and Appraisal Report (EAR) with Potential Amendments to the Comprehensive Plan**

Ms. Sue Trone, Chief of Comprehensive Planning, City of Miami, distributed and presented the draft Evaluation and Appraisal Report (EAR) based track changed amendments to the Comprehensive Plan related to the Miami River. In addition, Ms. Trone distributed and presented a related summary memo. The memo states in part:

“Given the effort that went into the most recent update to the Miami River Sub-Element, adopted in 2010, little change is recommended at this time. The Planning Department has provided some updates that primarily address outdated information. This is to say, the updates offered recommend striking some information because some information is no longer relevant. Policies that tie to other elements for internal consistency within the MCNP are flagged below for ease of review.

A summary of the proposed amendments follows:

1. Line 84: Correction of a typo. (This is not part of the Port of Miami River Sub-Element)
2. Line 119: Objective PA-3.1: This objective references Policy LU-1.3.3 and Goal CM-3. These are listed here:

***Policy LU-1.3.3***

*Pursuant to Ch.163.3177(6)(a),F.S., the City shall maintain regulatory incentives and criteria that encourage the preservation of recreational and commercial Working Waterfronts as defined in Ch.342.07,F.S., particularly in the “Port of Miami River” Subelement to guide future development within the Miami River Corridor.*

*Pursuant to Ch.163.3177(6)(a),F.S., the City shall maintain regulatory incentives and criteria that encourage the preservation of recreational and commercial Working Waterfronts as defined in Ch.342.07,F.S., particularly in the “Port of Miami River” Subelement to guide future development within the Miami River Corridor.*

*Pursuant to Ch.163.3177(6)(a),F.S., the City shall maintain regulatory incentives and criteria that encourage the preservation of recreational and commercial Working*



*Waterfronts as defined in Ch.342.07,F.S., particularly in the "Port of Miami River" Subelement to guide future development within the Miami River Corridor.*

**Goal CM-3**

*Pursuant to Section 163.3178(2)(g), F.S., The City will maintain strategies that will be used to preserve and adequate supply of land for recreational and commercial Working Waterfront uses defined in Section 342.07, F.S.1*

3. Line 133: "large scale" is stricken. "expedited state review" is underlined. This is because in 2011 the Florida Legislature replaced the Large Scale amendment process for comprehensive planning with the Expedited State Review process. This is codified in Sec. 163.3184 (3), Florida Statute.
4. Lines 139-140: "by a reviewer selected by the Planning Department" is added text. This text is recommended language to Policy PA-3.1.2 which memorializes the no-net-loss policy for Category A properties within the working waterfront. This proposed language is offered with expectation of creating an arm's length between the analyst and the reviewer. Moreover, the City's adopted fees for the the Planning Department recently were amended to charge a separate fee for this service. This is recommended for additional clarity for applicants, stakeholders to working waterfronts, and the City of Miami which is responsible for administering the policy.
5. Line 215: "and Policy IC-2.1.30" is stricken. This policy was repealed in a previous ordinance and this should have been stricken at that time.
6. Lines 260-261: This amendment addresses the outdated reference to the FL Department of Community Affairs (strike out "Community Affairs") and updates it to "Economic Opportunity".
7. Line 285: Policy PA-3.3.8: Strike entire policy. This policy refers to Enterprise Zone tax incentives which no longer exist.
8. Line 300: Renumber Policy PA-3.3.9 to 3.3.8. Strike specific policies to make the policy more generalized and less necessary to update based on state-level changes to Brownfield policies.
9. Line 324: Renumber Policy PA-3.3.10 to 3.3.9. Strike specific policies to make them more generalized.
10. Line 330: Renumber Policy PA-3.3.11 to 3.3.10

11. Line 340: Renumbered
12. Lines 357-368: Strike policies for annual reporting.
13. Line 370: Policy PA-3.4.1: Propose a new policy for monitoring on loss or gain of recreational and commercial Working Waterfront land and uses to be presetned to the City Commission at a public hearing and report within one year of adoption and then in seven (7) year increments thereafter.

#### Next Steps

A legal review will commence later in July. All amendments will be brought to the Planning, Zoning, and Appeals Board (PZAB) on September 6, 2023. City Commission will be asked to vote on the amendments at a proposal hearing (first reading) by October 19, 2023. Transmittal for state coordinated review will commence no later than October 31, 2023.”

This item will be presented at the full Miami River Commission’s July 10 public meeting, noon, 101 W Flagler in the Library Auditorium.

**MRC Urban Infill and Greenways subcommittee Chairman Jim Murley suggested the full MRC recommend approval of the City Administrations proposed EAR based Amendments to the Comprehensive Plan related to the Miami River.**

## **II) Discuss City of Miami’s New Draft Parks Master Plan**

Carlos Perez presented a PowerPoint regarding the City of Miami’s draft new Parks Master Plan. The MRC’s previously provided advisory input was thankfully incorporated into the draft Parks Master Plan. This item will be presented at the full Miami River Commission’s July 10 public meeting, noon, 101 W Flagler in the Library Auditorium. **MRC Urban Infill and Greenways subcommittee Chairman Jim Murley suggested the full MRC recommend approval of the City Administrations proposed EAR based Amendments to the Comprehensive Plan related to the Miami River.**

## **III) Discuss Security along the Miami River Greenway**

MRC Urban Infill and Greenways subcommittee Chairman Jim Murley stated he requested this item be placed on the agenda. MRC Director Bibeau thanked City of Miami Police Officers Maguffey, Russell and Sarmiento and State Attorney Katherine Fernandez-Rundle’s new MRC designee David Hardin for attending the meeting and their recent excellent work in Miami River Rapids Park. The Officers stated they recently made another arrest of the illegal drug dealer whom has been selling illegal drugs and living in Miami River Rapids Park, and Mr Hardin stated they have now added a charge of selling close to the Miami Bridge which is a educational facility for



children, and will add a stay away order on sentence to ensure he doesn't return to this location again as he has done after previous arrests at this same location.

MRC Director Bibeau provided the following email from a resident of Neo Lofts, 10 SW South River Drive which he previously forwarded to the Little Havana Police Commander and NRO, "If you could be my voice at the meeting, mentioning the situation under the Bridge (Riverwalk beneath 1 ST Bridge near S. River Drive), it would be greatly appreciated. Nothing has changed since the last time we spoke, I did receive a call from the police officer you phoned with (I don't remember his name), he told me they had passed by and they saw no one in that area, he also reminded me that it is not illegal for people to be there. However, the drug dealing situation continues, and one only needs to be around for 10 mins to see how people arrive to buy drugs from the guy that made that spot his headquarters. Thank you!"

MRC Director Bibeau thanked Roman Jones whom recently started funding a security guard whom patrols 2 blocks of the City owned on-road Miami River Greenway from 450 NW North River Drive to 600 NW 7 Ave, including the area beneath the 5 ST Bridge. MRC Bibeau added the areas beneath several Miami River Bridges remains problematic and recommended the City of Miami Police Department provide Officers along the public Riverwalk patrolling on bicycles and or Segways.

#### **IV) New Business**

MRC Director Bibeau thanked and distributed the City of Miami's plans to replenish landscaping along the City of Miami owned on-road Greenway. Director Bibeau stated this month he will walk the entire route with the plans taking notes to provide to the City for consideration.

The public meeting adjourned.

**brettbibeau@miamirivercommission.org**

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**From:** brettbibeau@miamirivercommission.org  
**Sent:** Monday, June 26, 2023 10:05 AM  
**To:** 'Oscar Gonzalez'  
**Cc:** 'Brett Bibeau'  
**Subject:** NE Shoreline next 836

Hi Oscar,

Per my call this AM, are you available for a site visit on the Miami River shoreline to the NE of 836 this Friday, 6/30, at 8:30 AM?

THX

Sincerely,  
Brett



# Miami River Commission Urban Infill and Greenways Subcommittee

## Public Meeting

June 16, 2023 - ~~10 AM~~ 1 PM

1407 NW 7 ST, Larger Boardroom (facing Miami River)

Name	Organization	Telephone	Email
Brett Bibeau	MRC	305 644 0544	brettbibeau@miami rivercommission.org
ofc. Scot Russell	MPD	954-729-1981	43718@miami-police.org
ofc. Miguel Sarmiento	MPD		45387@miami-police.org
DAVID HANSEN	MOSAD	305-629-2100	DAVIDHANSEN@miami -com
SUB TRONE	CITY OF MIAMI	305-416-1445	strone @miamigov. com
ofc. Alexia Maguffey	MPD	305 603 6991	43102@miami-police .org
Jim Murley	009/MDA	305 968 4881	James.Murley@ MiamiState.com
Megan Kelly	MRC	305 365 6559	megan.kelly@gmail
Eileen Braton	MRC & SGCA	305-790-4284	Eileen.Braton@ peelsoad.com

# **Miami River Commission's Stormwater Subcommittee Public Meeting Minutes June 7, 2023**

The Miami River Commission (MRC) Stormwater Subcommittee's public meeting convened June 7, 2023, 10 AM, 1407 NW 7 ST. The attendance sheet is attached.

**I. "Miami River Basin Water Quality Improvement Plan" Agency Quarterly Implementation Progress Reports** – Ms. Juliet Ruggiero, Miami Dade County's Department of Environmental Resource Management's (DERM) provided a report covering January – March 2023. The most alarming water quality violation was detected at Wagner Creek testing station WC03 in March had E-coli of 13,700 (cfu/100ml) when the safe water quality standard is only 410 (cfu/100ml), and testing station WC02 had 7,750 (cfu/100ml) when the safe water quality standard is only 410 (cfu/100ml).

**II. Discussion Regarding 169 NW South River Drive** – Attendees reviewed a picture of the City of Miami owned crushed stormwater outfall, located beneath the County owned 169 NW South River Drive. The County riverfront parcel is a Sewer easement where a sewer line tunnels beneath the Miami River to the Sewage pump station on the opposite side of the River. The County is currently planning to transform the unimproved site into a small public riverfront park, and the City should repair their crushed outfall under this site before the park is completed. Billy Joe McCarly, MDC WASD, stated she will communicate with Elyrosa Estevez, City of Miami, regarding this issue. In addition, Ms McCarly stated WASD is still exploring the reported sewage odor at this location, but haven't found anything yet.

**III. "Discussion Regarding Collapsing Shoreline Along South River Drive West of 27 Ave** - MRC Director Bibeau thanked the representatives from the City of Miami Public Works and Parks Departments, Miami-Dade County Public Works and the South Florida Water Management District for participating in the June 2 site visit to the subject site. Attendees agreed to determine ownership of the subject areas and consider the MRC's recommendation to provide a public Riverwalk featuring a new seawall.

**IV. Update Regarding FDEP's "Vacuum Truck, Street Sweepers, and Scavenger Water Decontamination Vessel" Grant Award** - MRC Director Bibeau thanked FDEP for awarding the MRC's submitted application for \$600,000 in grant funding from the State's FY 22-23's \$20 million for improving water quality in the Biscayne Bay Aquatic Preserve, by increasing frequency of vacuum truck services in stormwater manholes along the Miami River (\$300,000), landside garbage pickups (\$165,000), street sweeper truck (\$100,000) and Scavenger Water Decontamination Vessel services (\$35,000) along the Miami River. The stormwater system was identified as a source of pollution in the County's recent helpful Miami River Water Quality Assessment, which was reviewed during the MRC Stormwater Subcommittee's June quarterly public virtual workshop. The full MRC board reviewed pictures from the 1<sup>st</sup> quarter's completed work during their publicly noticed June 5 public meeting.



- IV. City of Miami Issued Notice of Violation** – MRC Director Bibeau thanked Seybold Canal resident Charlie Hand for texting him picture of poor water quality on Seybold Canal, which he then forwarded to Elyrosa Estevez, City of Miami, whom sent an inspector whom issued a Notice of Violation to FDOT.

The MRC SSC's next quarterly public meeting will be September 6, 2023, 10 AM, 1407 NW 7 ST.

The public meeting adjourned.

# Miami River Commission Stormwater Subcommittee Public Meeting

June 7, 2023 - 10 AM

1407 NW 7 ST, Arts and Crafts Boardroom (facing Miami River)

Name	Organization	Telephone	Email
Billie Jo M. Carley	Miami Dade WASD	(865) 599-4175	BillieJo.Mcarley@miamidade.gov
Brett Bibeau	MRC	305 6440544	
Juliet Ruggiero	DERM		
Arita Nash	FDEP	786-797-1977	Nancy.Jackson@miamidade.gov
Nancy Jackson	00R Christ Bryothler Team		
Iken Cathey	DERM	305-372-6415	Iken.Cathey@miamidade.gov
PATRICIA HARRIS	MRC	305 262-3763	PATRYKAK@GMAIL.COM



## **RESOLUTION OF THE MIAMI RIVER COMMISSION AS REQUESTED BY FDOT**

- **The Miami River Commission authorizes its Managing Director (Mr. Brett Bibeau) to execute the attached contract (ASP28-R1 - Fin# 445054-2-78-01, hereinafter the “Contract”) on behalf of the Miami River Commission;**
- **The Miami River Commission designates Miami River Fund Inc., a Florida Not For Profit Corporation, as its fiscal agent; and**
- **The Miami River Commission assigns all payments to be made pursuant to the Contract to Miami River Fund, Inc, as the fiscal agent of the Miami River Commission, and therefore directs the Florida Department of Transportation to make all Contract payments to the Miami River Fund, Inc.**

**City of Miami's 1<sup>st</sup> Annual  
Miami River Holiday Boat Parade Committee  
June 12, 2023**

The City of Miami's 1<sup>st</sup> Annual Miami River Holiday Boat Parade Committee convened a public meeting on June 12, 2023, 1 PM, at 1407 NW 7 ST. The sign in sheet is attached.

Mercedes Librada Rodriguez provided a positive update regarding the City of Miami's 1<sup>st</sup> Annual Miami River Holiday Boat Parade. Attendees discussed the City of Miami's 1<sup>st</sup> Annual Miami River Holiday Boat Parade on the Miami River, December 2, estimated 6:00 - 8 PM, a line of 40 vessels x 45 feet max each = 1,800 feet. 200 feet between each vessel x 23 gaps = 4,600 feet. Grand total = 6,400 feet navigates at idle no wake speed from Brickell Bridge to Tamiami Canal and back. An estimated 15 vessels will require openings on taller bridges, while 25 vessels will slip beneath without an opening. All vessels in the parade, plus marine patrol and fire department vessels, will monitor Radio Channel 9 and all trade cell phone #'s. The slowly moving line of vessels will proceed from east to west, turn around while keeping their place in line, and then the parade officially starts as the boats return from west to east, ending at the confluence of the Miami River and Biscayne Bay fireworks displays at the mouth of the River and Lummus Park. All vessels will be required to indemnify the City, County and MRC, and provide Certificates of Insurance coinsuring the City, County and MRC.

- I. **Status of USCG Permit** – Brett Bibeau, Managing Director, Miami River Commission, presented a May 10 email from the USCG acknowledging receipt of the subject "Marine Event" permit application, and a June 12 email changing the date from Saturday, December 9, to Saturday, December 2. Robert Olivas, USCG, noted this permit application will be publicly noticed providing the public 30 days to submit written comments.
- II. **Status of FDOT Permit** – Ms Rodriguez stated now that the City Commission recently formally adopted an item officially creating the "City of Miami's 1<sup>st</sup> Annual Miami River Holiday Boat Parade", the City is expected to sign the drafted letter soon which is a requirement to submit in order for the FDOT permit application to be submitted. Mr. Bibeau stated this morning he spoke with Pablo Orozco, FDOT, whom is unavailable to attend today but stated he would attend the July 17 City of Miami's 1<sup>st</sup> Annual Miami River Holiday Boat Parade Committee meeting, 1 PM, 1407 NW 7 ST.
- III. **Status of Miami-Dade County Public Works Permit** – The City of Miami's 1<sup>st</sup> Annual Miami River Holiday Boat Parade Committee's May public meeting minutes state, "Sandra, Miami-Dade County Public Works, stated they will not require a separate permit for their Bridge openings, rather will accept the USCG permit which was previously applied for."



- IV. **Status of DERM Permit** – Spencer Crowley stated Miami-Dade County DERM does not have the legal authority to regulate nor require a permit for the subject Miami River Holiday Boat Parade. Mercedes Rodriguez stated DERM Director Lisa Spadafina, asked for a letter with the pertinent facts so that she may consider whether or not she feels a County permit is required for the City of Miami's 1<sup>st</sup> Annual Miami River Holiday Boat Parade. Brett Bibeau stated he would write a 1<sup>st</sup> draft of the subject letter, and email it to Mr. Crowley for potential revisions. Mr. Crowley recommended no letter be sent, because no permit is required, but he agreed to review a draft letter if one is to be sent.
- V. **Discussion Regarding City of Miami Police Department Participation**  
Ms. Mercedes Librada Rodriguez thanked the various Officers participating in today's public meeting from the City of Miami and Miami Dade County Police Departments. Ms. Rodriguez distributed a list of the Parks along the River where people will be able to watch the parade for free, and police officers will be present. In addition, Ms. Rodriguez distributed a list of the Miami River Bridges, noting ownership which is either FDOT or MDC. Attendees discussed the 2 road closures, the 5<sup>th</sup> Street Bridge for 2 extended bridge openings, and NW North River Drive from NW 2 to NW 3 ST. Ms Rodriguez stated alcohol will be sold in Lummus Park. The Police Department agreed to provide an updated in-kind services invoice with the new date.
- VI. **Discussion Regarding City of Miami Fire Department Participation** –  
Ms. Rodriguez thanked the City of Fire Department for provided a written invoice for their in-kind services, and asked them to change the date to December 2. Ms. Rodriguez also thanked the Miami-Dade County Fire Department for agreeing to provide in-kind services in the unincorporated Dade portion of the Parade route.
- VII. **Discussion Regarding City of Miami Parks Department Participation**  
Ms. Rodriguez thanked the City of Miami Parks Department for providing a written invoice for their in-kind services, and asked them to change the date to December 2.
- VIII. **Status of DDA Sponsorship** – Attendees thanked the DDA for including a \$10,000 sponsorship for the City of Miami's Holiday Boat Parade in their draft Budget to be voted on by the City Commission in September, and if approved would become available in October 2023.

- 3 -

- IX. **Status of Miami-Dade County Community Grant (CG) Application –** Mr. Bibeau stated the MRC was awarded a CG grant for Riverday in 2023, therefore isn't eligible to apply again for the Holiday Boat Parade. Therefore, he thanked the Friends of the Underline whom agreed to submit the \$7,500 competitive grant application and he will assist with the paperwork.
- X. **Status of Miami Dade County Tourist Development Council (TDC) Grant Application -** Mr. Bibeau stated the MRC was awarded a TDC grant for Riverday in 2023, therefore isn't eligible to apply again for the Holiday Boat Parade. Therefore, he thanked the Friends of the Underline whom agreed to submit the \$10,000 competitive grant application and he will assist with the paperwork.
- XI. **Discuss Yacht Clubs –** Ms Rodriguez stated she and Mr Bibeau recently met with the Coral Reef Yacht Club, and have a meeting scheduled on June 15 at 8 PM with the Miami Outboard Club.
- XII. **Discuss Pro Sports Teams Vessels –** Mr. Bibeau authored a 1<sup>st</sup> draft letter from Ms. Rodriguez inviting all local professional sports teams to have Vessels in the Parade.
- XIII. **Status of Miami River Shipping Terminals Not Navigating Miami River on 12/9, from 6-10 PM –** On April 26 Mark Bailey, Miami River Marine Group, emailed the Miami River's international shipping terminals regarding the planned Holiday Boat Parade. As of May 10, he had not received any objections to shipping vessels not navigating the Miami River during the Parade. Mr. Bailey stated he would email an update with the new December 2 date.
- XIV. **Update Regarding City Commission 6/8 Agenda Item RE 11 Creating the “City of Miami’s 1st Annual Miami River Holiday Boat Parade” and waiving all City fees for Police, Fire, Parks, etc. -** Ms. Rodriguez thanked the City Commission for unanimously adopting 6/8 Agenda Item RE 11 Creating the “City of Miami’s 1st Annual Miami River Holiday Boat Parade” and waiving all City fees for Police, Fire, Parks, etc.
- XV. **Discussion of Documents to be Posted on Miami River Commission Website –** Mr. Bibeau distributed a 1<sup>st</sup> draft “Holiday Vessel Registration Form”. Ms. Rodriguez and Committee attendees stated revisions, which Mr. Bibeau stated he would incorporate into a revised 2<sup>nd</sup> draft version.



**XVI. New Business**

Ms. Rodriguez stated she would like alcohol to be sold in Lummus Park and she would ask Bacardi to donate product.

Ms. Rodriguez stated she asked a clothing company to donate shirts for the City of Miami's 1<sup>st</sup> Annual Miami River Holiday Boat Parade

The next City of Miami's Miami River Holiday Boat Parade Committee's public meeting will be held July 17, 1 PM, 1407 NW 7 ST.

The public meeting adjourned.

# City of Miami's 1<sup>st</sup> Annual Miami River Holiday Boat Parade Committee

## Public Meeting

June 12, 2023 - 1 pM

1407 NW 7 ST, Arts and Crafts Boardroom (facing Miami River)

Name	Organization	Telephone	Email
LUIS SIERRA	MDPD	(305) 558-3594	L4@MDPD.COM
MIKE OLIVAS	USCG	(305) 535-4317	ROBERT.M.OLIVAS 2@USCG.MIL SECTOR MIAMI WATERWAYS@USCG.MIL
H. Sangronis	MPD Special events	(305) 505-7950	42553@miami-police.org
G. VASSARI	MPD SEU	(561) 414-7284	28408@MIAMI-POLICE.ORG
A. CHAPMAN	MPD SEU	(786) 365-3256	43757@MIAMI-POLICE.ORG
Merci Rodriguez	MRC	(786) 365-2929	merci0121@aol.com
BRUCE BROWN	MRC	305/788-8411	brook402@brbwitha.net
Mark Bailey	MRC	305/577-7777	<del>mark.bailey@MRC</del> mark.bailey@miamirivermarinegroup.org
Spencer Cowley	MRC/EIND	3/5192822	fcowley@aicw.org