

Charlotte County

Design – Tiki Point Living Shoreline

RFP NO. 20260251 | Due: February 23, 2026



February 23, 2026

Rhiannon Mills, Senior Contract Specialist
Charlotte County Purchasing Division
18500 Murdock Circle, Suite 344
Port Charlotte, Florida 33948-1094

RE: RFP NO. 20260251 DESIGN – TIKI POINT LIVING SHORELINE

Dear Ms. Mills,

RES Florida Consulting, LLC (together with its affiliates, "RES"), in partnership with Jacobs, is pleased to submit this proposal in response to Request for Proposal (RFP) No. 20260251 for the Design of the Tiki Point Living Shoreline. We sincerely appreciate the opportunity to support the collaborative partnership of Charlotte County (County), the City of Punta Gorda (City), Coastal & Heartland National Estuary Partnership (CHNEP), the Nature Conservancy, the Four Points Sheraton and the Florida Department of Environmental Protection Charlotte Harbor Aquatic Preserves in advancing this important coastal resilience and habitat restoration initiative. RES meets the required qualifications set forth in this proposal response. As provided in the adjacent certificate, we are registered under the State of Florida to perform professional services. Additionally, RES has no conflicts of interest, financial or otherwise, to this project and declares that this proposal is made without collusion with any persons or entities submitting proposals.

RES hereby affirms that all persons and entities with a principal interest in this proposal are fully disclosed within this submittal. This proposal is submitted in good faith and is made without collusion, agreement, or coordination with any other person or entity submitting a proposal in response to RFP.

RES further acknowledges and agrees to comply fully with the provisions of Charlotte County Resolution #2011-221. All communications regarding this solicitation have been, and will continue to be, directed exclusively to the designated representative within the Purchasing Division as required. RES understands and respects the prohibition on contact with members of the Professional Services Committee, user departments, Administration, or members of the Board of County Commissioners during the restricted period, and confirms that neither RES nor its agents or representatives have engaged in any prohibited communications related to this proposal.

As a national leader in providing ecosystem and environmental restoration, we place significant emphasis on providing the best solutions to our clients. We are confident that our strategically developed team of in-house professionals will enable the Collaborative to develop and implement cost-effective and successful solutions. As one of the few firms capable of providing a full-delivery solution, our team approaches project identification, development, design, and engineering from a comprehensive view to understand the complete program that encompasses not only the technical feasibility, but financial, economic, and community values of the project from inception through implementation.

State of Florida Department of State

I certify from the records of this office that RES FLORIDA CONSULTING, LLC is a limited liability company organized under the laws of the State of Florida, filed on January 19, 2022, effective August 29, 2000.

The document number of this limited liability company is L22000019779.

I further certify that said limited liability company has paid all fees due this office through December 31, 2025, that its most recent annual report was filed on November 11, 2025, and that its status is active.

Given under my hand and the Great Seal of the State of Florida at Tallahassee, the Capital, this the Eleventh day of February, 2026



Secretary of State

Tracking Number: 9560649402CU

To authenticate this certificate, visit the following site, enter this number, and then follow the instructions displayed.

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RES warrants that we are fully qualified, with adequate personnel, resources, and experience to undertake and complete the services described in the RFP within a reasonable time. Our multidisciplinary team includes experienced project managers, professional engineers, hydrodynamic modelers, GIS professionals, marine scientists, environmental engineers, restoration ecologists, and field specialists capable of conducting environmental surveys, habitat assessments, benthic mapping, and water quality analyses—ensuring that all aspects of the Tiki Point Living Shoreline project can be delivered in a coordinated and efficient manner.

Our team has substantial experience managing complex habitat restoration and nature-based shoreline projects throughout Florida. This includes responsibility for budgeting, contract administration, funding strategy development, personnel management, and securing federal, state, and local permits. We have successfully applied for and obtained U.S. Army Corps of Engineers (USACE) permits, Florida Department of Environmental Protection (FDEP) permits, Water Management District authorizations, and local government approvals for projects in estuarine and marine environments. RES has developed several EPA-approved generic and site specific Quality Assurance Project Plans (QAPPs) and has implemented many projects in accordance with these QAPPs. Our familiarity with the FDEP Quality Assurance (QA) Rule Chapter 62-160, Florida Administrative Code (F.A.C.), ensures that all environmental monitoring and data collection efforts will be conducted in compliance with applicable quality assurance standards.

RES and Jacobs have also demonstrated extensive experience in intergovernmental coordination, working collaboratively with municipalities, counties, water management districts, federal agencies, and regional environmental programs in Florida. RES and Jacobs are currently collaborating on a large scale restoration initiative within the same watershed as Tiki Point, encompassing more than 400 acres of wetlands. This ongoing partnership within the shared watershed provides the team with valuable regional insight, established coordination efficiencies, and a comprehensive understanding of the hydrologic and ecological dynamics influencing the Tiki Point project area. We understand the importance of aligning technical design with community priorities and funding requirements while maintaining strong working relationships across jurisdictions. For Tiki Point, we will build upon this experience to ensure smooth coordination among the County, CHNEP, the City, and other stakeholders.

With respect to the planning and installation of living shorelines, RES brings direct experience in designing and implementing nature-based and hybrid shoreline stabilization systems in Florida's coastal environments. Our work reflects best practices in living shoreline design, including wave attenuation analysis, sediment stabilization strategies, habitat integration, sea level rise considerations, and long-term adaptive performance. We are knowledgeable in all phases of habitat construction, including site planning, surveying, construction methods, material selection, and ecological field adjustments to maximize habitat function. Our construction-phase experience allows us to provide technical assistance with drafting construction bid specifications, Requests for Bids (RFBs), and contractor selection support, as required under this solicitation.

Project management is a core strength of our organization. We have a proven track record of delivering projects on time and within budget through disciplined schedule control, cost tracking, and proactive risk management. Our team understands contract administration requirements and will work in concert with the County, CHNEP, the City, and designated professionals to provide technical assistance during the preparation of construction documents and procurement packages.



Our structured approach ensures that project scope, schedule, and budget remain aligned from design through construction readiness.

This proposal outlines in detail how we plan to deliver the required services based on the scope provided in the solicitation. Our approach builds directly upon the completed feasibility study and advances the preferred alternative through refined engineering analysis, hydrodynamic modeling, permitting documentation, stakeholder engagement, and preparation of construction-ready documents. We have structured our work plan to ensure regulatory defensibility, technical accuracy, constructability, and readiness for future grant-funded construction.



Water and ecosystem restoration are at the core of our business. Our Florida-based team has decades of experience designing and implementing habitat restoration and living shoreline projects that improve water quality, enhance fisheries and wildlife habitat, reduce erosion, and increase coastal resilience. We are confident that our integrated technical expertise, regulatory experience, funding strategy capabilities, and commitment to collaborative project delivery make RES and Jacobs uniquely qualified to successfully deliver the Tiki Point Living Shoreline project.

We appreciate your consideration and welcome the opportunity to further discuss our qualifications. Our team is committed to providing responsive, high-quality service and to partnering with the City, the County and CHNEP to advance this important investment in shoreline resilience and habitat restoration.

Sincerely,

Megan Reising, MS

Project Manager

mreising@res.us | (513) 488-6346

Nadia Locke, PE, LEED AP

Principal

nlocke@res.us | (954) 484-8500



I. TEAM PROPOSED FOR THIS PROJECT

A. Background of the personnel

RES will serve as the Prime Consultant and will have full responsibility for overall project delivery, contract administration, technical oversight, and coordination with the County, CHNEP, and the City. RES will lead the living shoreline engineering design, shoreline restoration strategy, permitting coordination, and preparation of all regulatory application materials. RES will also oversee stakeholder engagement efforts to ensure integration between design development, regulatory compliance, and public outreach objectives. As Prime Consultant, RES retains full responsibility for quality control, schedule performance, budget management, and compliance with FDEP QA Rule Chapter 62-160 and grant requirements.

While RES will maintain overall contractual responsibility, as this project will be executed through a fully integrated team structure in which **RES, Jacobs, Schnabel Geostuctural Design & Construction (Schnabel), and Olin Hydrographic Solutions, Inc. (OHS)** will operate as a coordinated and unified delivery team. Roles are clearly defined; however, technical development, modeling, design refinement, permitting strategy, and stakeholder coordination will be performed collaboratively to ensure seamless integration across disciplines.

From project initiation through final design, the team will function under a shared work plan, coordinated schedule, and centralized project management framework led by RES. Technical workshops, internal milestone reviews, and interdisciplinary coordination meetings will ensure that modeling outputs, survey data, geotechnical recommendations, and engineering design decisions are continuously aligned. This approach eliminates silos between firms and promotes a cohesive, solutions-oriented team environment focused on delivering a technically sound, constructible, and permissible living shoreline project.

1. Project Manager



Our proposed project manager, **Ms. Megan Reising, MS** possesses 12 years of experience in environmental consulting and natural resource management, making her well-suited to manage a living shoreline project in Charlotte County. She holds a Master of Science degree in biology from Florida Atlantic University and a Bachelor of Sciences degree in Zoology from The Ohio State University. Her expertise includes coastal resilience, marine and estuarine habitat assessments, coastal habitat assessments, environmental permitting at various government levels, and benthic resource surveys. As RES' Coastal Lead for Florida, she manages our dive safety program and corporate American Academy of Underwater Sciences (AAUS) certification.

Ms. Reising has direct experience in coastal resilience projects, like the Wabasso Causeway living shoreline and seagrass restoration project; navigating complex coastal permitting and living shoreline projects, like the Black Creek Trail Living Shoreline project; and conceptual design of shoreline enhancement projects such as the Sea Oats Beach artificial reef breakwater project, Parco Mare mangrove mitigation planting and five year monitoring, and Marice Gibb Memorial Park Living Shoreline project. Her permitting and regulatory knowledge includes experience in environmental permitting at the federal, state, and local levels. Ms. Reising has also assisted with permit applications for seawall rehabilitation projects. She is proficient in sampling and analytical techniques for field data collection and species identification, including seagrass, coral, and mangroves. Her background also includes extensive scientific diving, with over 10 years of experience and certifications such as AAUS Scientific Diver and Professional Association of Diving Instructors (PADI) Advanced Open Water Scuba Diver. Megan Reising is an experienced Project Manager with expertise in project planning and review, budget development and maintenance, team and site coordination, client communication, and construction administration. She has successfully developed permitting strategies, delivered public presentations to build community support for international products, and secured contractual agreements with municipalities, residential clients, and private and international developers. Ms. Reising's comprehensive experience in marine environments, regulatory compliance, and project coordination directly aligns with the demands of a Living Shoreline project, making her a highly capable project manager.



2. Other Key Personnel



Ms. Nadia Locke, PE, LEED AP will serve as the principal for this project, providing executive oversight and strategic direction from initiation through completion. She brings extensive experience managing complex habitat restoration and water resource projects, including feasibility assessments, funding strategy development, stakeholder coordination, permitting, and multidisciplinary team leadership. Ms. Locke is responsible for ensuring quality control, schedule adherence, budget management, and overall client satisfaction. Her background in guiding integrated engineering and ecological initiatives positions her to provide senior-level accountability, risk management, and decision-making authority

to ensure successful and timely project delivery.



Mr. Patrick Shearer, PE, will serve as the lead design engineer. He has extensive experience serving as engineer of record for comparable coastal projects, with 18 years of experience in civil, environmental, and water resources engineering, including several living shoreline projects making him an ideal technical lead for the Tiki Point Living Shoreline restoration project. He brings a deep understanding of nature-based design and habitat restoration, low impact development (LID) design, coastal adaptation and resiliency, crucial for adapting to environmental changes like sea level rise. His direct involvement in projects such as the Jose Marti Park Adaptive Redesign, Wabasso Causeway Seagrass Restoration and Living Shoreline and the North Bay Village Civic Park Living Shoreline

demonstrates his hands-on expertise in designing and implementing complex ecological solutions, including seagrass, mangrove, oyster, and innovative living shoreline and living seawall designs. Mr. Shearer offers a unique perspective by integrating engineering with ecological considerations, allowing for comprehensive projects from developing concepts, to securing funding and implementing construction for challenging urban and suburban coastal areas. His proficiency in regulatory navigation, coordinating with federal, state, and local agencies, and his creative and innovative approach to climate change adaptation and sea level rise will be invaluable for ensuring the project's long-term sustainability and success. Mr. Shearer excels at leading diverse teams, public involvement and outreach, bringing stakeholders to the table for compromise, and implementing feasible cost-effective solutions that meet both technical and environmental compliance standards, ensuring the Tiki Point restoration is both effective and resilient. Mr. Shearer was the engineer of record for the civil/environmental engineering, stormwater retrofits and nature based solutions associated with City of Miami's premiere sea level rise adaptation project at Jose Marti Park which was the first project in Florida to be awarded the Waterfront Edge Design Guidelines (WEDG) accreditation which is a green waterfront rating system, similar to Leadership in Energy and Environmental Design (LEED) but for waterfront sites.



Mr. Ty Smith, PE, will serve as senior engineer, providing technical leadership in nature-based shoreline stabilization, hydrologic and hydraulic modeling, and resilient coastal design. He has direct living shoreline experience as Lead Restoration Design Engineer for the Shalango Living Shoreline Nutrient Bank project in Virginia and the Goldbug Island Living Shoreline in South Carolina, where he led the design, permitting, and installation of a shoreline stabilization system that reduced flooding and erosion while enhancing aquatic habitat. His broader portfolio includes hybrid stabilization projects combining stone toe protection, bioengineering, large woody debris, and process-based restoration techniques directly applicable to the segmented breakwater and marsh-based system anticipated at Tiki Point. Mr. Smith's expertise in hydraulic modeling, sediment transport analysis, and

geomorphic stability ensures that shoreline protection measures are both structurally sound and ecologically functional. As an experienced Engineer of Record and project manager, he integrates technical rigor with constructability, permitting coordination, and long-term resilience planning. His ability to align engineering performance with habitat enhancement objectives provides unique value to the Tiki Point Living Shoreline and supports delivery of a durable, permittable, and environmentally beneficial solution.



Mr. Mark Clark, MS, CEP, Regulatory Specialist for RES Florida region, brings 36 years of experience in completing Florida ecological and coastal projects to the Tiki Point Living Shoreline project. His expertise includes performing ecological studies, protected species coordination, and environmental impact assessments. Mr. Clark served as a permit coordinator for FDOT and is a recognized leader in securing federal, state and local environmental permits for complex projects. For the City of Miami Beach, he managed federal and local permitting for seven seawall replacements within Biscayne Bay, including coordination with the National Marine Fisheries Service. Similarly, for the North Bay Village



Civic Park Living Shoreline project, he was responsible for environmental review, oversight of benthic surveys, and assisting with project design planning to ensure proper permitting.

RES reaffirms that the principal responsible for the project, the proposed project manager, and the lead designer will not be substituted without the express permission of the County.

3. Consultants

Jacobs will serve as a key technical partner, responsible for hydrodynamic modeling and related coastal process analyses to support design refinement and resilience objectives. Jacobs prepared the 2018 Technical Memorandum and feasibility evaluation for this project and brings valuable familiarity with site conditions and prior analyses. Jacobs will provide modeling support to evaluate wave attenuation, shoreline stabilization performance, and water movement dynamics to ensure the proposed living shoreline system meets habitat, erosion control, and storm buffering goals. Modeling results will be directly integrated into the engineering design led by RES.

Jacobs

RES and Jacobs have an established working relationship and have successfully partnered on complex environmental restoration projects, including the East Winter Haven Aquifer Recharge and Wetland Restoration Project. That collaboration demonstrates the team's ability to integrate modeling, engineering design, permitting, and ecological restoration objectives on large, multi-stakeholder initiatives.

Jason Bird, CFM, is a seasoned civil engineering professional with experience in commercial, residential, public open space, utility, stormwater, and transportation projects from feasibility studies to conceptual planning, through design, permitting, and construction administration. His focus on water resources, infrastructure assessment, green infrastructure and sustainability, including LEED and ENVISION evaluations for municipal, master planned communities, and U.S. federal facilities. He has applied his knowledge of infrastructure planning and design, including climate scenario development, to vulnerability and risk assessments and development and prioritization of adaptation strategies to mitigate current and future threats to inform capital investment and enhance the resilience of built and natural assets for our communities.

Luce Bassetti, PhD, GISP, ENV SP, WEDG, has more than 20 years in the management and technical study of regional and international maritime and coastal projects, as well as feasibility and environmental impact assessment. Her experience includes hybrid/living shoreline and nature positive design, met-ocean characterization, marina and harbor wave agitation modeling, coastal wave modeling, hurricane simulations and storm surge studies, coastal sediment transport studies, and wetland hydrodynamic studies. Dr. Bassetti has been focusing on coastal resilience, climate change, and sustainable development to undertake global challenges. She aims to understand the social and economic side of projects in different regions, the impacts on communities, and applicable climate change policies. In 2022, Dr. Bassetti was elected as the new Climate Change Champion for PIANC EnviCOM.

Dr. Bassetti specializes in design, analytical, and numerical modeling of coastal/estuarine phenomena covering wind, tides, waves, storm surges, and their interaction with coastal structures, sediment transport, and shoreline morphology for coastal hazard assessment. She also specializes in metocean data acquisition and data analysis (Python, FORTRAN, Matlab) and is a certified GIS professional (GISP). She has extensive experience and in-depth working knowledge of Federal Emergency Management Agency (FEMA) Wave Height Analysis for Flood Insurance (WHAFIS), Mike 21/3 SW, FM-HD, LITPACK, as well as having comprehensive working knowledge of hydraulic physical modeling techniques, and coastal specialist, planning, and design in a variety of marine, coastal, and estuarine settings.

Yang Zhang, Ph.D., PE, has 20 years of experience in coastal and oceanographic engineering and numerical modeling. Yang possesses a phd degree in coastal engineering and has a wide range of experience on coastal and maritime engineering, including metocean data analysis, wave transformation modeling, hydrodynamic modeling, hurricane and storm surge modeling/Analysis, harbor wave agitation modeling, shoreline and beach stability modeling, site planning, port layout study, design of coastal structure, infra-gravity wave studies, hydrodynamics and sediment transport under the influence of both flows and waves. Dr. Zhang brings expertise in waves, hydrodynamics, sediment transport, hurricane and storm surge, and numerical modeling, shoreline modelling, and tsunami modeling.

Olin Hydrographic Solutions will serve as the project surveyor and will be responsible for hydrographic and topographic survey services required to support design and permitting. They have over 20 years of experience in this field, including coastal survey work. This will include bathymetric data collection, shoreline elevations, and other field data necessary to inform engineering plans and regulatory submittals.



David Olin, PE, has over 20 years of experience working with civil, coastal, and environmental projects in Florida, Central America, and throughout the Caribbean. Mr. Olin has demonstrated expertise in waterfront engineering, surveying and mapping, environmental monitoring and mitigation, and oceanographic studies. His strong diving and boating background, combined with his engineering, surveying, and environmental education, make him uniquely qualified in the field of coastal engineering and mapping. He specializes in coastal and waterfront engineering projects. He has acted as lead investigator and head engineer on a variety of shoreline improvement projects, including beach nourishments, bulkheads, armor structures, and docking facilities. His experience includes inspection and rehabilitation of existing structures as well as design and engineering of new structures. Project size spans from small single-family home bulkheads and docks to large 100+ slip commercial marina facilities and ports. Mr. Olin has designed and worked on numerous beach projects throughout Florida and the Caribbean.

Schnabel brings extensive expertise in geotechnical and geostructural engineering to the Tiki Point Living Shoreline project. The firm specializes in stabilizing waterfronts, ports, and shorelines, contributing to coastal resilience and marine infrastructure. With over 60 years of experience, Schnabel offers a wide range of services, including earth retention systems, specialized foundations, and sheet pile walls, essential for marine construction and shoreline protection.



Schnabel has a proven track record of designing and building intricate shoreline structures in active marine environments, such as bulkhead stabilization projects at the Port of Miami and Port of Houston. Their work emphasizes precision, structural integrity, and minimal disruption to operations. Their geoprofessionals also focus on mitigating shoreline erosion and analyzing geohazards by combining geotechnical investigation with foundation design to tackle issues like flooding and soil-structure interaction. They use advanced techniques on land and water to identify subsurface risks, create robust foundation solutions, and develop detailed plans for resilient coastal infrastructure. Schnabel's integrated approach, combining geotechnical, geostructural, and environmental engineering, allows them to provide strong structural support design and construction for living shoreline and coastal stabilization systems. Their capacity for innovative and cost-effective geostructural work in marine settings positions them as a key partner for the complex challenges of the Tiki Point Living Shoreline project.



Megan Reising, MS Coastal Lead / Senior Scientist

Ms. Reising is a Senior Scientist specializing in natural resource assessments, threatened and endangered species surveys, construction compliance, benthic resource surveys, and environmental permitting at the federal, state, and local levels. She provides numerous ecological services to clients, including the following: marine and estuarine habitat assessments; coastal habitat assessments and permitting; upland habitat assessments and permitting; GPS data collection and GIS mapping.

Ms. Reising is a scientific diver, with over 10 years of diving experience. Ms. Reising is trained in sampling and analytical techniques for field data collection, water quality sampling and assessment and species identification, including seagrass, coral, octocorals, fish and mangroves.

SELECT WORK EXPERIENCE

Black Creek Trail Living Shoreline Design and Permitting, City of Homestead, Miami-Dade County, Florida

RES is the lead living shoreline designer and provides environmental and engineering support for the Black Creek Trail living shoreline project. The scope of this project includes living shoreline engineering design and environmental permitting. Ms. Reising assists with desktop reviews, city/agency coordination, marine benthic surveys, environmental assessments, and permitting applications.

Parco Mare Mangrove Mitigation Monitoring, Broward County, Florida

Establish time-zero and five-year mitigation monitoring plan to offset mangrove impacts as a result of project development. Conduct quarterly mangrove measurements and monitoring. Prepare and submit quarterly monitoring reports to the County and annual monitoring reports to USACE. Ms. Reising established the initial five-year monitoring plan and assists with mangrove monitoring and report submittal to regulatory agencies for compliance.

One Island Park Permitting Support and Coral Relocation, City of Miami Beach, Miami-Dade County, Florida

The project involves the redevelopment of One Island Park in the City of Miami Beach. RES was engaged to conduct a marine resource assessment and provide permitting support for the proposed project, including conducting coral relocation required by the state. Ms. Reising has assists with the marine resource assessment, report, and coordination of coral relocation.

Urban Forestry Master Plan (UFMP), City of Fort Lauderdale, Broward County, Florida

RES was awarded the contract to write the City's UFMP, a Master Plan that identified pathways to resolving urban forestry issues and achieve urban forestry goals, such as creating incentives for tree preservation and increasing canopy cover. Additionally, the UFMP will tie into existing City Master Plan documents, creating a cohesive strategy to make Fort Lauderdale a modern and resilient urban center. Ms. Reising was the assistant project manager and coordinated data collection, public outreach, and the final plan submittal.

Mills Pond Park Mitigation Monitoring, City of Fort Lauderdale, Broward County, Florida

Establish time-zero and five-year mitigation monitoring plan to offset wetland impacts as a result of project development. Conduct quarterly wetland and invasive/exotic vegetation monitoring. Prepare and submit quarterly monitoring reports to the City. Ms. Reising coordinates with the City for monitoring field efforts and reviews the monitoring reports.

Seven Miami Beach Seawall Rehabilitation Projects, City of Miami Beach, Miami-Dade County, Florida

RES performed marine benthic and tree inventory surveys at seven seawall locations Miami Beach and acquired environmental permits from South Florida Water Management District (SFWMD), Miami-Dade County Department of Regulatory and Economic Resources (RER) and USACE. Ms. Reising assisted with preparing the Natural Resources Assessment Report and the permit applications.

AT A GLANCE.

Email

mreising@res.us | 954.824.0315

Years of Experience

12 years

Education

- MS, Biology, Florida Atlantic University, 2013
- BS, Zoology, The Ohio State University, 2011

Certificates | Licenses

- AAUS Scientific Diver
- PADI Advanced Open Water Scuba Diver, Nitrox
- DAN Oxygen Provider Certification
- CPR/AED/First Aid Provider



Hollywood Mooring Field Support, City of Hollywood, Broward County, Florida

RES has provided environmental and engineering support for the City of Hollywood to develop a mooring field. The scope of this project included agency meetings, evaluating management options, and upland support facilities. Ms. Reising assisted with desktop reviews, city/agency coordination, permitting applications, and natural resource surveys.

St. Lucie Artificial Reef Feasibility Study and Design, St. Lucie County, Florida

RES conducted a feasibility study for an artificial reef in Saint Lucie County. RES identified and reviewed suitable artificial reef locations, prepared a feasibility study report, and presented the feasibility study results to the county commission. Based on the study, the County moved forward with a proposed location and requested RES design and permit the artificial reef. Services are ongoing for artificial reef design and regulatory permitting. Ms. Reising provided regulatory permitting consultation and grant review.

Environmental Surveys Palm Beach Gardens Mosque, Palm Beach County, Florida

Ms. Reising completed a natural resource due diligence effort including desktop and field review to determine the potential presence of wetlands and protected floral and faunal species. She also completed the associated report discussing potential natural resource permitting and a general discussion of potential mitigation for natural resource impacts.

Districtwide Mitigation, Wildlife and Environmental Services Contract, Florida Department of Transportation (FDOT) District Four, Florida

RES assessed impacts to federally- and state-listed species associated with the Natural Resource Re-evaluation Technical Memorandum. Work included reviewing previous listed species reports, data collection and analysis, and providing a Natural Resource Evaluation (NRE) report summarizing the findings. Ms. Reising reviewed previously listed species reports, collected data and prepared the NRE.

Environmental Engineering Continuing Services, City of Miami Beach, Miami-Dade County, Florida

RES maintains an ongoing contract to conduct miscellaneous environmental services. Tasks conducted include preparation of Spill Prevention, Control, and Countermeasure plans for 12 facilities including pump stations, fire stations, public works yard, Miami Beach Golf Club and the Convention Center and contamination assessment of the green waste facility. Ms. Reising provided support services as needed.

Highland County Multiple Sites Natural Resources Review, Highland County, Florida

Ms. Reising completed a natural resource due diligence effort including desktop and field review to determine the potential presence of wetlands and protected floral and faunal species at three different sites totaling over 1200 acres. She also completed the associated report discussing potential natural resource permitting and a general discussion of potential mitigation for natural resource impacts.

Land Search in Basin 4 for Permittee Responsible Mitigation, City of Jacksonville, Duval County, Florida

RES provides desktop reviews and Uniform Mitigation Assessment Method (UMAM) scoring for various properties for permittee-responsible mitigation (PRM) to determine the ecological standpoint on site, such as suitability, potential ecological lift, and potential credit generation from the mitigation bank. Ms. Reising assisted with desktop summaries and potential credit allocation by scoring properties through the UMAM.



Nadia G. Locke, PE, LEED AP

Senior Environmental Engineer

Ms. Locke has been providing professional environmental and engineering consulting services for over 30 years. During her career, she has worked in many facets of environmental consulting including NEPA assessments, coastal permitting, environmental audits, site assessment and remediation,

stormwater design, sanitary sewer planning, environmental permitting, climate change impact evaluation, grant assistance, wetland mitigation design, endangered species relocations, Brownfields, community involvement, and training. Ms. Locke has provided litigation support for the FDOT, Miami-Dade Aviation Department, Barry University, and private entities.

SELECT WORK EXPERIENCE

Black Creek Trail Living Shoreline Design and Permitting, City of Homestead, Miami-Dade County, Florida

RES is the lead living shoreline designer and provides environmental and engineering support for the Black Creek Trail living shoreline project. The scope of this project includes living shoreline engineering design and environmental permitting. Ms. Locke provides technical assistance and plan reviews for this project.

Sea Oats Beach Artificial Reef/Breakwater Design, Islamorada, Village of Islands

RES conducted a feasibility study for an artificial reef and shoreline stabilization project for two critically eroded beaches in Islamorada. This involved conducting benthic surveys, developing alternative concepts for addressing the eroding shoreline and creating benthic habitat, creating a permitting strategy and identifying funding opportunities. RES is now conducting the design, plan development, permitting coordination and stakeholder engagement for Sea Oats Beach. Ms. Locke is the project manager.

Jose Marti Park Adaptive Re-design, City of Miami, Miami-Dade County, Florida

RES was responsible for leading the innovative urban stormwater retrofits and assisting in the adaptive design for the living shoreline / living seawall waterfront edge. The project site is an existing historically relevant 13-acre park along the Miami River which experiences King Tide flooding and will be redeveloped as the premier Miami adaptation park project to showcase innovative waterfront resiliency adaptations to climate change and sea level rise, and offer many opportunities for waterfront connection for citizens, ecological enhancement, and for innovative stormwater management such as green infrastructure practices which will filter the hyper-urban 100-acre watershed as it drains through the park to Miami River, an impaired waterway. RES provided services related to the natural systems urban restoration and innovative stormwater design for the park's Adaptive Master Plan through year 2060. Services completed include ecological surveys (tree inventory and Florida Bonneted bat survey), stormwater design and modeling, environmental permitting, community engagement and presentations to leaders and city commissioners, agency coordination, cost estimates, engineering planning and construction design plans, architect and coastal engineering coordination, grant support, project implementation. RES supported the city in securing over \$14 million of grant funding for coastal protection and water quality improvement, and the project will be the first in Florida to submit for Waterfront Edge Design Guidelines (WEDG) project accreditation, which is similar to LEED certification (which is a green credit rating system for buildings) but for waterfront sites. Ms. Locke provided quality assurance/quality control (QA/QC) on this project.

Miami Beach Mooring Field, City of Miami Beach, Miami-Dade County, Florida

RES has a coastal engineering contract with the City of Miami Beach. Under that contract, RES has provided numerous coastal projects including the design and permitting of a mooring field, the city's first overwater Baywalk, seawall rehabilitations, kayak/canoe launches and seawall repairs. Each of these projects required benthic surveys, design, agency consultations, and permitting. Several include Ms. Locke has managed the majority of these projects, but has also served as the QA/QC officer for those projects that she did not manage.

AT A GLANCE.

Contact

nlock@res.us | 954.937.9678

Years of Experience

37 years

Education

- BS, Materials Science and Engineering, University of Florida, 1988

Certificates | Licenses

- Registered Professional Engineer, Florida #58676 | Received: 2002
- LEED AP Neighborhood Development
- Certified FDEP Stormwater, Erosion, and Sedimentation Control Inspector #3263 and Instructor #130
- OSHA 40 Hour HAZWOPER / 8 Hour Site Supervisor
- PADI Advanced | NAUI Open Water Diver



USACE Back Bay Study Renderings, Miami Downtown Development Authority, Miami, Florida

This was a collaborative effort to provide a response for the Miami Downtown Development Authority (DDA) to the proposed USACE Back Bay plan. RES was responsible for developing environmental considerations and natural systems planning for the storm surge protection planning coordination for the DDA renderings in response to the USACE Back Bay plan that originally proposed ~15-20-foot coastal walls along the Miami DDA area, including Miami River and Biscayne Bay along Brickell and Bayside Park. The DDA provided major comments to the USACE explaining how a 20-foot seawall along this waterfront would separate the bay from downtown Miami, and impact tourism, real-estate, Biscayne Bay ecology, and the recreational waterfront that drives the economy in Miami. The effort was led by a landscape architect, and contributed to by RES, coastal engineers and the DDA stakeholders, and resulted in graphic renderings depicting the proposed USACE wall, and also an alternative nature-based solution including living shorelines/living seawalls and storm surge protection such as sacrificial spoil islands and hybrid infrastructure which could minimize the detrimental effects of the project and also meet the resilience goals of the USACE project. The renderings were displayed in the New York Times and the Miami Herald, and assisted the DDA and Miami-Dade County to open the conversation to an alternative nature-based plan with the USACE. Ultimately, the project catapulted the DDA and Miami-Dade County on track to evaluate a nature-based plan, which is currently being prepared and coordinated with the USACE. The DDA supported a nature-based plan to increase resilience while also supporting restoration of Biscayne Bay ecosystem, which supports tourism, real estate, economy, recreation and life in Miami-Dade, County. Ms. Locke provided technical and QA/QC reviews.

Beach Corridor Rapid Transit Project NEPA and Environmental Permitting, Miami-Dade County, Florida

This project is an approximately 13-mile corridor that extends from the Miami Design District to Government Center, eastbound along I-395 to Miami Beach and north to the Miami Beach Convention Center. Several alternatives to provide a rapid transit solution were evaluated during a Tier 1 and Tier 2 analysis. This led to a locally preferred alternative. Funding agencies include the Federal Transit Agency, FDOT, Miami-Dade County and the Cities of Miami and Miami Beach. RES conducted environmental permitting for the preferred alternative, of a separate elevated transitway crossing Biscayne Bay Aquatic Preserve. Formal consultation was required with National Marine Fisheries Service. Permitting agencies include the USCG, USACE, SFWMD and Miami-Dade County Department of Regulatory and Economic Resources. Ms. Locke was the project manager for the environmental documentation to satisfy the NEPA requirements for federal funding and the permitting.

Isle of Palms Seawall 15 Replacement and Climate Change Adaptation, City of Fort Lauderdale, Broward County, Florida

Ms. Locke was the project manager for the support that RES provided to the City for replacement of a 900 feet of seawall along the west side of Isle of Palms Drive. Sea level rise had caused surface waters to overtop this seawall and flood adjacent land and roads. The purpose of the project was to raise the height of the seawall and protect the shoreline from the effects of climate change. The City engaged RES to conduct a benthic survey to support the design and permitting. Seagrasses were identified and data regarding seagrass bed size, density, incidental species observed, and substrate conditions were recorded and documented. RES collaborated with the design engineers to assist them in obtaining the regulatory agency permits and to inform the construction procurement process. The report was delivered one week before the contract schedule and under budget. A second, post construction survey was conducted after the seawall was constructed for permit closure.

Tarpon River Environmental Assessment, City of Fort Lauderdale, Broward County, Florida

RES provided services for the Tarpon River Restoration following a 54" sanitary sewer force main break in the Rio Vista neighborhood. Our team identified the impacted area, developed a restoration plan, and implemented rigorous field investigations, including sediment coring, water quality sampling, benthic and hydrographic surveys. We worked closely with USACE, FDEP, and Broward County to streamline permitting and guide sediment removal planning. RES also supported the City with bidding documents, contractor selection, and compliance inspections during restoration. Weekly progress updates were delivered to ensure transparency with residents, and the restoration was successfully completed. Ms. Locke was the QA/QC Manager for this project.



Ty Smith, PE

Senior Engineer

Mr. Smith is a licensed senior water resources engineer with active project experience in strategic watershed management, applied hydrologic and hydraulic modeling, fluvial geomorphology, ecosystem restoration and green infrastructure design, living shoreline design and flood mitigation. His primary responsibilities include facilitating and overseeing engineers and design staff engaged in planning, designing, permitting, and implementing ecosystem restoration and preservation projects throughout the United States.

Throughout his career, he has served as an engineer of record, project manager, and client services manager while leading technical project delivery, managing staff across multiple offices and states, client liaison, and strategic planning. He has managed budgets ranging from \$50k to \$1.3M and designed nature-based solutions for areas from less than 1 acre to 14,500 square miles. Further, he has developed innovative methods for assessing watershed health, securing over \$7M in grant funding for construction, and creating restoration designs to achieve environmental, client, and community goals.

SELECT WORK EXPERIENCE

Nansemond Shoals Living Shoreline Nutrient Bank, VA

Project Engineer. The project is a 1100 linear foot, private living shoreline nutrient bank located within the Lower James River watershed in Virginia. Pre-project conditions consisted of severely eroding, 20-foot-tall banks eroding approximately 5 feet per year, experiencing a maximum fetch of up to 11 miles. The project was designed, permitted, and implemented by RES. The design and construction consisted of near-offshore breakwater structures to abate significant wave/wind/storm surge action, combined with beach nourishment and native revegetation march complexes. Mr. Smith provided engineering during construction services and continues to provide ongoing engineering support on project-specific and land-owner adjacent maintenance activities in accordance with federal and local permits.

Mummichog Living Shoreline Nutrient Bank, VA

Project Engineer. The Mummichog project is a 475 linear foot private living shoreline nutrient bank located within the York River watershed in Virginia. Pre-project conditions consisted of severely eroding, 18-foot-tall banks eroding approximately 3 feet per year, experiencing a maximum fetch of up to 11 miles. The project was designed, permitted, and implemented by RES. The design and construction consisted of near-offshore breakwater structures to abate significant wave/wind/storm surge action, combined with beach nourishment and native revegetation march complexes. Mr. Smith provided engineering during construction services and continues to provide ongoing engineering support on project-specific and land-owner adjacent maintenance activities in accordance with federal and local permits.

Shalango Living Shoreline Nutrient Bank, VA

Engineer of Record. Similar to the Nansemond project above, the Shalango project is a 700 linear foot private living shoreline nutrient bank located within the Great Wicomico River watershed in Virginia. Pre-project conditions consisted of severely eroding, 10-foot-tall banks eroding approximately 3 feet per year, experiencing a maximum fetch of up to 2 miles. Design of the project is underway, and the project will similarly be permitted and implemented by RES. The design will consist of near-offshore breakwater structures to abate significant wave/wind/storm surge action, combined with beach nourishment, native revegetation march complexes, and woody debris complexes for increased habitat refugia. Mr. Smith is leading the engineering design and modeling while providing permitting support in the current project phase.

AT A GLANCE.

Contact

twsmith@res.us | 804.486.5247

Years of Experience

13 years

Education

- Master of Engineering in Civil Engineering, Water Resources (MEng), The University of Virginia, 2013
- Bachelor of Science in Environmental Engineering (BSEnvE), The University of Georgia, 2011

Certificates | Licenses

- Professional Engineer
 - Virginia: 0402063968
 - Georgia: 042733
 - New Mexico: 28765

Additional Information

- Wildland Hydrology/Rosgen
 - Level 1: AFG (11/2021)
 - Level 2: RMA (09/2023)
 - Level 3: RAM (08/2024)
 - Level 4: NCD (08/2025)
- Utah State University
 - Low-Tech Process-Based Riverscape Restoration (08/2020)
- USGS
 - Geomorphic Analysis of Fluvial Systems (05/2016)
- OSHA 10-Hour Construction



Wildcat Swamp Flood Mitigation Project, VA

Project Manager and Engineer of Record. Mr. Smith is managing the design, modeling, and permitting of a flood mitigation project that seeks to minimize the adverse impacts of urbanized hydrology on adjacent publicly and privately owned lands. The project is funded through the Virginia Department of Emergency Management's (VDEM's) Hazard Mitigation Assistance Grant Program and will facilitate the first of four phases using overall watershed management and engineered, hydraulic improvements.

PRIOR WORK EXPERIENCE

Goldbug Island Living Shoreline, Mount Pleasant, SC, The Nature Conservancy, South Carolina Chapter

As Lead Restoration Design Engineer, Mr. Smith led the design, permitting, and installation of a 240 linear foot living shoreline pilot project near Charleston that aimed to reduce flooding, curb shoreline erosion, and enhance aquatic habitats.

Schenks Branch Tributary Stream Restoration, Charlottesville, VA, City of Charlottesville, Department of Public Utilities

As Project Manager and Engineer of Record, Mr. Smith managed the design, modeling, and construction for an 830 linear foot urban stream restoration. This project will enhance water quality (contributing to Chesapeake Bay Total Maximum Daily Load [TMDL] credits) and aquatic habitats. Diverse native plantings were integrated in collaboration with the adjacent Botanical Garden to support future programming spaces.

Bryan Park Dam Removal and Stream Restoration, Richmond, VA, City of Richmond, Department of Public Utilities

As Lead Engineer and Engineer of Record, Mr. Smith led the data collection, design, and permitting for a dam removal and stream restoration project at a historic city park intersected by the Fall Line Trail. Involves complex modeling, interdisciplinary design, and extensive stakeholder coordination for project success.

Central Facility Green Infrastructure Design, Lawrenceville, GA, Gwinnett County Department of Water Resources

As Project Manager and Engineer of Record, Mr. Smith managed the design and permitting of a retrofit project at the client's headquarters. The project used green infrastructure to enhance water quality and conveyance, improved pedestrian space, established a living laboratory, and integrated native plants.

Countywide Watershed Characterization, Gwinnett County, GA, Gwinnett County Department of Water Resources

As Project Manager and Engineer of Record, Mr. Smith managed a data-driven watershed characterization project across 437 square miles in Gwinnett County. In the first phase, analysis results prioritized restoration and preservation activities at a 1-square mile watershed scale. The approach included a repeatable desktop analysis, confirmed with limited field assessment, and fed into dynamic dashboards hosted in ArcGIS Online and Power BI. These dashboards provide decision-makers with updatable tools reflecting changing priorities. Geospatial processing was automated using Python scripts, enabling future updates with new data. Interactive dashboards provided access to characterization data and watershed prioritization rankings. Phase 2 aimed to identify Watershed Improvement Project (WIP) opportunities on county-owned parcels and advance five parcels into concept design per the Gwinnett County Stormwater Management Manual. Approximately 900 sites were evaluated, narrowed down to 120 parcels offering the most water quality credits in the least healthy watersheds. Five concepts were developed based on client preferences, leading to a detailed design project.

Blue Heron Nature Preserve Stage-Zero Stream Restoration Project, Atlanta, GA, City of Atlanta Department of Watershed Management (DWM)

Mr. Smith was Lead Design Engineer for The Blue Heron Nature Preserve (BHNP) Beaver Dam Analog (BDA) pilot project, a wetland restoration project located approximately 8 miles from downtown Atlanta. The project site is in a 30-acre nature preserve that serves as a natural, recreational, and educational asset for the North Buckhead community and residents within the Metro-Atlanta region. The preserve is predominately characterized as a wooded floodplain park with a perennial stream (Mill Creek) that drains approximately 1.3 square miles of medium density urban development. Based on stakeholder engagement and the Preserve's mission and programmatic desires, DWM sought an alternative approach to that of traditional Natural Channel Design techniques in favor of reducing land, habitat, and park space disturbance. DWM acquired 319(h) grant funding to construct a series of BDAs and Post-Assisted Log Structures (PALS) to facilitate "low-tech" process-based restoration techniques along Mill Creek.



Patrick Shearer, PE

Lead/Senior Engineer

Mr. Shearer is a project manager and senior engineer with experience in civil, environmental and water resources engineering. His technical experience is rooted in nature-based habitat restoration, coastal resiliency and urban stormwater retrofits, green infrastructure, and water quality improvement projects related to impaired rivers, bays, and estuaries. He has experience successfully completing environmental studies and analyses including watershed-based studies for hyper-urbanized and environmentally sensitive areas, wetland mitigation banking documents and plans, hydrologic and hydraulic (H&H) modeling, stormwater / watershed management plans, shoreline stabilization and living shoreline plans, stream assessments, stream restoration plans, and water resource-related technical reports. He is experienced in ecological restoration including wetland restoration, stream restoration, oyster restoration, and living shoreline projects in both freshwater and estuarine ecosystems, including the restoration and creation of tidal channels, and living seawalls for hyper-urban areas. Mr. Shearer has provided project management, planning, feasibility, engineering evaluation and design, survey and geotechnical testing coordination, modeling, permitting, and construction administration for the above types of urban and natural resource projects. He has experience in self-mitigating shoreline design projects, wetlands mitigation credit trading, carbon reduction, stormwater inspections, urban forestry, Florida Bonneted bat studies, wetland delineations, State and Federal living shoreline and wetland permitting, Stormwater Pollution Prevention Plans (SWPPPs), construction management, Construction Engineering and Inspection services, environmental compliance support, NPDES, Environmental Resource Permit (ERP), water use permitting, and environmental compliance. Mr. Shearer is also experienced with regulatory evaluations for unique projects, alternatives analysis, preliminary and detailed engineering design, grant procurement, bidding assistance, and design peer reviews. Mr. Shearer’s technical capabilities include AutoCAD Civil 3D, ESRI ArcGIS, Rivermorph Software, HEC-RAS, EPA SWMM 5.0, ICPR4, Total Station Instruments, GPS units, and various other hydrology and land planning applications.

SELECT WORK EXPERIENCE

Jose Marti Park Adaptive Re-design, City of Miami, Miami-Dade County, Florida

Mr. Shearer is the project manager for this project and the Engineer of Record providing civil / stormwater / environmental engineering, green infrastructure, and nature-based solutions for this park which experiences tidal flooding as a result of sea level rise. This project is the premier sea level rise adaptation project for City of Miami. Mr. Shearer has been responsible for leading the innovative urban stormwater retrofits and assisting in the adaptative design for the living shoreline / living seawall waterfront edge, including design and permitting for construction. The project site is an existing historically relevant 13-acre park in Little Havana (the 1980’s Mariel Boatlift was at this location) along the Miami River (a 1,000 year Tequesta corpse was unearthed during the park’s original construction) which experiences King Tide flooding and will be redeveloped as the premier Miami adaptation park project to showcase innovative waterfront resiliency adaptations to climate change and sea level rise, and offer many opportunities for waterfront connection for citizens, ecological enhancement, and for innovative stormwater management such as green infrastructure practices which will filter the hyper-urban 100-acre watershed as it drains through the park to Miami River, an impaired waterway. RES has been engaged to provide services related to the natural systems urban restoration and innovative stormwater design for the park’s Adaptive Master Plan through year 2060. Services completed include ecological surveys (tree inventory and Florida Bonneted bat

AT A GLANCE.

Email

pshearer@res.us | 785.493.2919

Years of Experience

18 years

Education

- BS, Civil Engineering – Environmental Option; Natural Resources and Environmental Science, Kansas State University, 2007
- Integrated Stream and Stormwater Wetland Design in Urban Settings Class, Duke University, 2013

Certificates | Licenses

- Professional Engineer, FL #79596 | Received: 2015

Additional Information

- FDEP qualified Stormwater Management Inspector #34890
- NCSU Stream Restoration Program Certificate Completion, Raleigh, NC (2009)
- NCSU Tidal Wetlands and Stream Restoration Course, Beaufort, NC (2015)
- Toewood Design and Siting for Stream Restoration, USDA (2015)
- NCSU River Course 401: Construction Practices for Stream Restoration, Raleigh, NC (2013)
- Living Shoreline Design Workshops, Virginia Institute of Marine Science, Yorktown, VA (2011-2015)
- Member – American Society of Civil Engineers (2003 – Present)
- Member – American Water Resources Association, since 2017



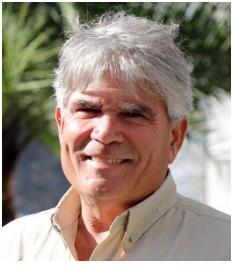
survey), stormwater design and modeling, living shoreline planning and design coordination, nature based solutions, environmental permitting, community engagement and presentations to citizens, leaders and city commissioners, agency coordination, FDOT coordination, cost estimates, engineering planning and construction design plans, architect and coastal engineering coordination, grant support, project implementation, and WEDG accreditation. The project has set new milestones for resiliency adaptation for the city and region, impacting new local codes set during the project for seawall heights and the Riverwalk/Baywalk design criteria, and are now being used as a model and toolbox for local, and possibly global, adaptation strategies. The project is guiding the adaptation of the Miami Riverwalk, which approximately 1,100 linear feet are being adapted by the park project to showcase innovative adaptation strategies including raised permeable pavements with underground stormwater retention and filtration, tidal backflow prevention valves with manatee guards, mangrove and oyster restoration, manatee viewing, 360-degree outdoor living classroom on the river, water quality upgrades such as second generation nutrient separating baffle boxes with clear observation lids so the public will be able to view the pollutant removal, and green infrastructure ecological enhancements tied to hybrid grey infrastructure for flood protection – showcasing many of the goals of the city and the Downtown Development Authority, including carbon reduction. Mr. Shearer supported the city in securing over \$18 million of grant funding for coastal protection and water quality improvement, and the project is the first in Florida to be verified for WEDG project accreditation, which is similar to LEED certification (which is a green credit rating system for buildings) but for waterfront sites.

Margaret Pace Park Waterfront Adaptation, City of Miami, Florida

Mr. Shearer is the project manager and civil/environmental Engineer of Record for this City of Miami sea level rise adaptation project, within a multi-disciplinary team of landscape architects, coastal and structural engineers, architects, and scientists. The project includes approximately 1,900 linear feet of shoreline and waterfront improvements which are centered around the Baywalk for the site and Biscayne Bay. The project has been intensely designed within the small urban footprint, with a cultural melting pot of activity in this park ranging from dog park, tennis, volleyball courts, soccer, basketball courts, playground, and cultural art pieces which tie this urban park strongly to the neighborhood of high-rise condos, and the Miami Women’s Club next door. Mr. Shearer led the innovative stormwater design, which utilizes LID and nature-based solutions to meet the present and future stormwater requirements for the park, and to combat sea level rise and climate change, and restore hydrology to assist the living shoreline design onsite. The project is designed for resilience, and to improve water quality to Biscayne Bay, and to restore ecological processes, habitat, and recreation. The stormwater design provides 100-year storm protection to the park and assists the street drainage which currently is most susceptible to flooding, which meets the new state stormwater rule. Future phases of the park adaptation by the team plan to tackle the streetside runoff more adequately, but this waterfront phase of the project will contain all storm runoff onsite within the Baywalk which has been raised for resilience and to meet city Baywalk design standards. The project is planned to go to construction in 2026, and the team and Mr. Shearer have assisted the city to apply for and obtain environmental permits and grant funding. The project is funded by several grants, and the project timeline has been expedited to meet grant schedules.

Sea Oats Beach Living Shoreline, Islamorada Village of Islands, Islamorada, Monroe County, Florida

Mr. Shearer is the lead design engineer for this living shoreline project to protect US-1 at Sea Oats Beach in Islamorada. RES previously completed a feasibility study for this project site and recommended an approximately one-mile-long breakwater at this location to aid resilience by attenuating wave energy and preventing erosion, while increasing habitat at the Site. Mr. Shearer worked with the design team including coastal engineers and a subconsultant Dr. Wang from University of South Florida (USF) who was responsible for wave modeling for the proposed project. Mr. Shearer worked with the coastal engineer to develop a layout which provides resilience, erosion control, habitat restoration and enhancement, and avoids impacts to natural resources such as seagrass at the site, sea turtles, and manatees, which are listed protected species. The project is within the Florida Keys National Marine Sanctuary, and this requires exceptional avoidance and minimization of impacts to the environment. The design is based on biomimicry concepts, and utilizes the natural shape and layout of the shoreline to support the offshore breakwater which was designed for effective wave attenuation, sand accumulation, erosion control, and to maximize the feasibility and permitability of the project with the permit agencies who oversee this nearshore area, which includes the USACE, FDEP, and Islamorada Village of Islands Nearshore Development Review Committee. Public access and environmental stewardship were guiding design principles, and the breakwaters feature natural breakpoints at least every 75 feet to avoid trapping sea turtles, manatees, crocodiles or other species, and allow public access for swimming, kayaking, and boating in this area without impeding navigation or access.



Mark Clark, MS, CEP

Ecology Division Manager

Mr. Clark has an extensive background performing studies and investigations on biological and ecological impacts, including field evaluations, assessments, recommendations and report writing. Some of his specific responsibilities include project management, wetland jurisdictional determination, environmental resource permitting, NEPA and permit construction compliance, wetland mitigation design, mitigation monitoring, protected species coordination, assessments, surveys and permitting, NEPA documentation, plans review, and assistance with plans preparation.

SELECT WORK EXPERIENCE

Seven Seawalls Permitting, City of Miami Beach, Miami-Dade County, Florida

This contract involves the replacement of seven seawalls within Biscayne Bay. Mr. Clark was responsible for federal and local permitting associated with these seawall replacements, including assisting with National Marine Fisheries Consultation.

North Bay Village Civic Park E Drive, North Bay Village, Miami-Dade County, Florida

This project involves the design of a new seawall and installation of a proposed kayak dock. Mr. Clark is responsible for environmental review and oversight of the benthic survey and assists with project design planning.

Districtwide Mitigation, Wildlife and Environmental Services Contract, FDOT District Four, Florida

RES maintains a contract to provide mitigation and other environmental consulting services to the Planning and Environmental Management Office. Under this contract, RES assists FDOT in identifying and developing mitigation projects to offset future unavoidable wetland impacts. Specifically, RES manages the District Four mitigation ledger, provides agency coordination, conducts wetland and wildlife studies and prepares NEPA documentation. Work also includes reviewing new roadway and bridge projects for compliance with NEPA. Mr. Clark provides technical assistance and review on projects.

Districtwide Environmental Compliance Monitoring, FDOT District Six, Florida

This contract involved providing environmental compliance services for FDOT construction projects. Mr. Clark was responsible for project management, technical and permitting support, site inspections as well as oversight of site inspections on construction projects for compliance with environmental permit conditions, NEPA commitments, and erosion control/ SWPPP.

Seven Seawalls Permitting, City of Miami Beach, Miami-Dade County, Florida

This contract involves the replacement of seven seawalls within Biscayne Bay. Mr. Clark was responsible for federal and local permitting associated with these seawall replacements, including assisting with National Marine Fisheries Consultation.

North Bay Village Civic Park E Drive, North Bay Village, Miami-Dade County, Florida

This project involves the design of a new seawall and the installation of a proposed kayak dock. Mr. Clark is responsible for environmental review and oversight of the benthic survey and assists with project design planning.

SR 786/PGA Boulevard, FDOT District Four, Florida

This 2-mile project involved elevating the roadway and construction of a new bridge to improve water flow and reduce flooding. Mr. Clark was responsible for conducting biological evaluations, habitat mapping of +/-6,589 acres in Loxahatchee Slough, and environmental permitting for direct and indirect impacts in Palm Beach County. Extensive coordination with SFWMD, USACE, Palm Beach County Environmental Resources Management, and FDOT was required.

AT A GLANCE.

Contact

maclark@res.us | (954) 609-2420

Years of Experience

36 years

Education

- MS, Entomology, Rutgers University, 1989
- BS, Biology (General), University of Tampa, 1986

Certificates | Licenses

- Certified Environmental Professional (CEP) No. 0349
- FDEP Qualified Stormwater Management Inspector #32220
- USACE Certified Wetland Delineator
- FDOT Water Quality Certification
- FWC Registered Agent for Burrowing Owl Observations, Permitting, Inactive Burrow Scoping and Collapsing



Jason M. Bird, CFM

Principal Technologist / Resilience Market Solutions Lead for Americas East
United Nations - Disaster Risk Reduction, ARISE US Network Chair [2019-2021]

Years of Experience: 25 years as of 2025

Years with Firm: 9 years as of Nov. 2025

Jason Bird is a seasoned civil engineering professional with experience in commercial, residential, public open space, utility, stormwater and transportation projects from feasibility studies to conceptual planning, through design, permitting, and construction administration. His focus on water resources, infrastructure assessment, green infrastructure and sustainability, including LEED and ENVISION evaluations for municipal, master planned communities, and US federal facilities. He has applied his knowledge of infrastructure planning and design including climate scenario development to vulnerability and risk assessments and development and prioritization of adaptation strategies to mitigate current and future threats to inform capital investment and enhance the resilience of built and natural assets for our communities.

Education

- Associates of Arts Degree from Central Florida Community College 2001
- Course work in Civil Engineering with Construction Management focus, University of Central Florida 2001-2004

License/Certificate

- Certified Floodplain Manager (2018-current) #US-19-10971

Naval Station Mayport – NbS - Living Shoreline Design Projects, Jacksonville, Florida.

As Resilience Advisor for Jacobs, supporting the siting, project definition and development of a living shoreline and oyster reef along the northern shore of the NS Mayport Installation, along the St. Johns River to mitigate erosive forces during high water events. Building upon the USACE ERDC EWN Program, and NbS projects identified during the EWN workshops, Jacobs crafted project definitions and built support for projects including identification of funding sources and partners to advance project implementation. [2023-2025]

Living Shoreline Concept Plan, The Nature Conservancy, Punta Gorda, Florida.

Resilience Lead. Developed living shoreline plan and conceptual design for Four Points Sheraton Hotel coastline of Charlotte Harbor to enhance the performance of the coastline in providing ecological habitat, erosion protection and improved aesthetics for visitors to regional tiki bar restaurant along public waterfront promenade. This pilot project will be used to inform the application of living shorelines as nature-based solutions for coastal climate adaptation throughout Charlotte Harbor. [2018-2019]

Tyndall AFB, Coastal Resilience Implementation Plan (CRIP) for USAF.

Project Manager. The project evaluated coastal flood risk and developed a comprehensive strategy to protect the AF base infrastructure and mission from current and future coastal flooding using a combination of nature-based and more conventional flood mitigation structural and non-structural solutions. A benefit cost analysis was performed using the quantified risk of flood impacts in dollar terms, compared to the cost of the mitigation solution alternatives to derive the most cost effective and best performing long term solution to provide mission assurance. [2021-2022]

Tyndall AFB, Resilient Coastline Pilot Study – Phase 2 for USACE ERDC.

Resilience Task Lead. Refined the nature-based coastal solutions for alignment with various funding sources in support of preparation of REPI, DARPA and NFWF grant applications, resulting in securing \$5M in funding for pilot project design and submittal of separate grant applications for additional \$15M for construction of the pilot projects. [2020-2021]

St. Petersburg Strategic Sea Wall Plan, St. Petersburg, Florida.

Resilience Advisor. Project included condition assessment for 14 miles of City owned sea walls along the south St. Pete shoreline of Tampa Bay to identify capital projects and develop innovative land-water interfaces that supports the continued recreation and access to the water, while enhancing safety and erosion control. Supported team with guidance on the application of NbS for conceptual design plans based on specific coastal vulnerabilities, wave energy dynamics and



overall characterization of the shoreline. Project informed City capital planning and investment to update and upgrade their seawalls as a first line of defense against increasing storm severity and sea level rise. [2024-ongoing]

Key West 10th Street & Harris, Community Flood Mitigation Project, Key West, Florida.

Resilience Advisor. Evaluated stormwater management and flood mitigation system for low lying residential community subject to frequent rainfall and tidal flooding. Performed LOS and alternatives analysis to inform phased solution to support incremental improvements capitalizing on immediate needs and available grant funding with future phases positioned to address future sea levels and increasing flood elevations. [2022-23]

City of Tampa, Coastal Area Adaptation Plan

Resilience Lead. Evaluated infrastructure and population vulnerabilities to climate and natural hazards and developed adaptation actions to mitigate them, to support City Climate Action plan and focus areas to enhance coastal resilience for the South of Gandy and Palmetto Beach neighborhoods along the Tampa Bay coastline. Also developed community educational videos as an information source on key topics of land use planning and zoning, emergency evacuation, stormwater management and flood risk mitigation, and best practices to protect private property from flooding and severe weather. [2022-2023]

City of Key West, Sea Level Rise Policy, Key West, Florida.

Resilience Lead. Performed climate science review and tidal conditions analysis to inform development of flood scenarios and boundary conditions for future conditions stormwater modeling and minimum design criteria for critical infrastructure like roads, seawalls, utilities, and broader City land development regulations. [2021 to 2021]

Greynolds Park SLR and Flood Adaptation Plan, Miami Dade County, Florida.

As Resilience task lead, led the technical work to evaluate built and natural asset vulnerability to flooding and develop adaptation strategies to mitigate flood risk. Evaluation included current and future flood exposure from coastal and rainfall induced flooding to protect park assets and operations. Developed, costed and prioritized adaptation strategies to mitigate flood risk today and over asset service life to maintain park operations. [2020-2021]

Integrated Sea Level Rise Mitigation and Stormwater Management Plan, City of Miami Beach, Florida.

Resilience Lead. Development of a multi-disciplinary flood mitigation plan and policy focused on reducing flood risk in the City of Miami Beach through a comprehensive and integrated approach to managing water resources. This project included updating the City's street raising policy to accommodate future sea levels while maintaining access to private properties, and development of a neighborhood project prioritization methodology that factored in numerous City infrastructure needs including improvements to critical services such as potable water distribution, sanitary sewer collection, stormwater management, transportation access, and environmental and social system improvements such as sidewalks, street trees and BGI for stormwater quality treatment. The process involved a robust public awareness and stakeholder engagement campaign to build public trust through an inclusive and transparent process. [2019-2020]

Downtown Waterfront Masterplan, St. Petersburg, Florida.

Project included over 7 miles of waterfront in urban setting including downtown, airport, seaport, industrial and residential areas. As technical lead for sustainable infrastructure, provided infrastructure and asset review and high-level impact analysis for sea level rise and storm surge to inform adaptive strategies for integration into masterplan. [2014-2015]

South Carolina Statewide Nature Based Coastal Resilience Plan, South Carolina.

Resilience Advisor. Support goals and objectives and evaluation and site selection methodology to identify opportunities for the application of NbS to support coastal risk reduction and habitat enhancement along the entire South Carolina coast, including developing a toolbox of NbS strategies and advancement of three primary demonstration projects into design and preparation for implementation. [2024-ongoing]

Nature Based Coastal Defense Alternatives Analysis Study, The Nature Conservancy, Miami Dade County, Florida.

Evaluated four select sites along Biscayne Bay coastline for level of protection against storm surge, provided by nature-based systems to determine ROI for investment focused on multiple benefits. Project included modelling multiple climate scenarios including sea level rise and surge events for 2040 and 2075 to understand system performance and perform alternatives cost benefit analysis for built and nature based coastal protection. [2018-2019]



Luce Bassetti, PhD, GISP, ENV SP, WEDG



Americas Coastal Resilience Director/Maritime Resilience Specialist Global Principal Coastal Planning and Engineering Community of Practice Lead Coastal Planning and Engineering

PIANC Environmental Commission Climate Change Champion, ASBPA board member, Jacobs Positive Mental Health Champion

EDUCATION

- PhD, Physical Oceanography, Florida Institute of Technology School of Engineering
- MS, Physical Oceanography, Florida Institute of Technology School of Engineering
- DESI / BS, Oceanography, European American Institute of Technology. School of Engineering, France

REGISTRATIONS

- GIS Professional certification (#22250)
- ENVISION certified (#23212)
- WEDG Professional
- PADI Dive Master (#DM-176506)

Relevant Experience

Luce Bassetti has more than 20 years in the management and technical study of regional and international maritime and coastal projects, as well as feasibility and environmental impact assessment. Her experience includes hybrid/living shoreline and nature positive design, met-ocean characterization, marina and harbor wave agitation modeling, coastal wave modeling, hurricane simulations and storm surge studies, coastal sediment transport studies and wetland hydrodynamic studies. Luce has been focusing on coastal resilience and climate change and sustainable development to undertake global challenges. She aims to understand the social and economic side of projects in different regions, the impacts on communities, and applicable climate change policies. In 2022 Luce was elected as the new Climate Change Champion for PIANC EnviCOM

Luce specializes in design, analytical and numerical modeling of coastal/estuarine phenomena covering wind, tides, waves, storm surges and their interaction with coastal structures, sediment transport, and shoreline morphology for coastal hazard assessment. She also specializes in metocean data acquisition and data analysis (Python, FORTRAN, Matlab) and is a certified GIS professional (GISP). Luce has extensive experience and in-depth working knowledge of FEMA Wave Height Analysis for Flood Insurance (WHAFIS), Mike 21/3 SW, FM-HD, LITPACK as well as has comprehensive working knowledge of hydraulic physical modeling techniques, and coastal specialist, planning, and design in a variety of marine, coastal and estuarine settings

Project Experience

Lead Author and SME - USACE’s Engineering With Nature Technical Guidelines. USACE. This project will help advance and operationalize the EWN Program by working with the USACE to publish a series of engineering guidance reports on designing and constructing nature-based solutions (NbS) for riverine and coastal systems.

Coastal Advisor | Living Shoreline Concept Plan, The Nature Conservancy, Punta Gorda, Florida. Supported the development of the living shoreline plan and conceptual design for Four Points Sheraton Hotel coastline of Charlotte Harbor to enhance the performance of the coastline in providing ecological habitat, erosion protection and improved aesthetics for visitors to regional tiki bar restaurant along public waterfront promenade. This pilot project will be used to inform the application of living shorelines as nature-based solutions for coastal climate adaptation throughout Charlotte Harbor.

Coastal Design Manager and Modeler | Mayport Living Shoreline, Naval Facilities Engineering Systems Command (NAVFAC), Jacksonville Florida. Lead a team of coastal modeler and designer toward a 100% design package for 2 living shoreline project. An oyster reef and a living shoreline. The work included the evaluation of various state-of-the-art materials for incorporation into the project to increase ecological benefits while maintaining structural integrity of design.

Coastal Lead | Navarre Living Shoreline, Navarre, Florida. Santa Rosa County. Led modeler and engineer for the living shoreline design (breakwater and marsh sill design). Coordinate and supervise the 100% and permit design package including design drawing and specifications.

Coastal Task lead/Modeler | HelenWood Living Shoreline, Alabama, The Nature Conservancy. Performed wave, hydrodynamic and sediment transport modeling to provide design condition to a new breakwater system that would reduce wave energy in the project area with the ultimate goal of further reducing shoreline erosion. The Project would



consist of approximately 0.5 miles of segmented breakwaters (totaling eight) between Helen Wood Park (north end of the existing bulkhead) and the Mobile Area Water and Sewer System (MAWSS) property.

Lead Coastal Modeler (Phase 1) Lead Coastal (Phase 2) | East Bay Oyster Habitat Restoration - The Nature Conservancy (TNC), Santa Rosa County, FL, USA. Responsible for hydrodynamic, wave, sediment transport and shoreline change study of different alternatives of oyster reefs developments in Pensacola Bay. Phase 1 of the project will complete the monitoring, permitting, and design for an approximately 6.5-mile long oyster reef habitat restoration along the east shore of East Bay in Santa Rosa County, FL. TNC has requested support from Jacobs to develop design drawings and specifications for construction and obtain the necessary permits before construction can begin. Construction of 38 oyster reef finished in 2024.

Coastal Task Lead/Modeler | Tyndall AFB Florida, Hurricane Michael Relief United States Air Force, FL: Evaluated coastal flood risk and other natural hazards to identify vulnerabilities to base operations and mission readiness and inform the development of “Base of the Future” design guidelines to be used to design and construct base reconstruction after devastating impacts from Hurricane Michael in Oct. 2018. Evaluated coastal flood risk from wave, tidal and surge and developed nature-based coastal defense strategies to mitigate these risks and protect the base operations and mission readiness from future flood risk associated with severe storms and hurricanes.

Coastal Lead | Tyndall AFB, Coastal Resilience Implementation Plan (CRIP) for USAF. Evaluated coastal flood risk and developed a comprehensive strategy to protect the AF base infrastructure and mission from current and future coastal flooding using a combination of nature-based and more conventional flood mitigation structural and non-structural solutions.

Coastal Task Lead/Modeler | Floridatown, Florida Santa Rosa County Board of Commissioners, Floridatown, FL: Performed wave, hydrodynamic modeling of the Floridatown coastline with results focusing on the 780 feet of linear shoreline that has suffered shoreline erosion from historical hurricane and flood events. Floridatown Park, owned by Santa Rosa County, provides public boating access facilities and recreational park amenities on Escambia Bay in the Pensacola Bay Estuary Watershed. Project coastal advisor for construction 2025-2026.

Senior Coastal Engineer | Resilient Engineering Services for the City of Key West Sea Level Rise, Key West, FL: Provide guidance and engineering work in support of water level for the application of SLR and rainfall projections and the development of tidal boundary conditions for use in stormwater management and other city infrastructure projects.

Coastal Advisor | St. Petersburg Strategic Sea Wall Plan, St. Petersburg, Florida. Resilience Advisor. Project included condition assessment for 14 miles of City owned sea walls along the south St. Pete shoreline of Tampa Bay to identify capital projects and develop innovative land-water interfaces that supports the continued recreation and access to the water, while enhancing safety and erosion control. Supported team with guidance on the application of NbS for conceptual design plans based on specific coastal vulnerabilities, wave energy dynamics and overall characterization of the shoreline.

Coastal Lead | City of Key West, Sea Level Rise Policy, Key West, Florida. Performed tidal conditions analysis to inform development of flood scenarios and boundary conditions for future conditions stormwater modeling and minimum design criteria for critical infrastructure like roads, sea walls, utilities, and broader City land development regulations.

Senior coastal resilience specialist | Vulnerability Assessment and Adaptation Plan for Cape Canaveral, FL. Canaveral Port Authority. Evaluated natural hazards, with emphasis on sea level rise and flooding associated with climate change, in compliance with State of Florida requirements for state funded projects and in alignment with the FDEP Resilient Florida Grant Program.

Coastal Design and Modeling Quality Manager | Marine Corps Air Station Beaufort – NbS – Shoreline Stabilization Design Projects, Beaufort, South Carolina. Advise the design and modeling team on the pilot and full scale project design. Advisor for the Pilot project construction on-going.

Project Manager and coastal Lead | Elkhorn Slough Oyster Reef pilot projects, TNC. Responsible for the conceptualization, design, and providing assembly guides for four treatment types for experimental deployment to increase substrate availability for native oysters. Construction 2025.

Coastal Engineer | Inland and Coastal Flood Investigation, US Department of State, Confidential Locations: Providing coastal engineering guidance, data collection, analysis, remote sensing expertise and translation for multiple locations internationally. Analysis is to support facilities development which must account for future climate conditions.



Yang Zhang, Ph.D., P.E.
Principle Coastal Engineer and Modeler

Personal Details

Length of service in the profession: 18
Year joined Jacobs: 2008
Jacobs office location: Tampa, Florida

Summary Biography

Yang has 20 years of experience in coastal & oceanographic engineering and numerical modeling. Yang possesses a phd degree in coastal engineering and has a wide range of experience on coastal and maritime engineering, including metocean data analysis, wave transformation modeling, hydrodynamic modeling, hurricane and storm surge modeling/Analysis, harbor wave agitation modeling, shoreline and beach stability modeling, site planning, port layout study, design of coastal structure, infra-gravity wave studies, hydrodynamics and sediment transport under the influence of both flows and waves. Yang brings expertise in waves, hydrodynamics, sediment transport, hurricane and storm surge and numerical modeling, shoreline modelling, and tsunami modeling.

Key Skills/Areas of Expertise

- Coastal engineering and modeling
- Waves, Hydrodynamic, sediment transport (sand and fine)
- Living shoreline and nature-based solutions
- Shoreline and beach stability
- Tsunami hazard analysis and modeling
- Wave load, coastal structure design

Education and Qualifications

- PhD, Coastal & Oceanographic Engineering, University of Florida, 2008
- MS, Physical Oceanography, Hohai University, Nanjing, China, 2004
- BE, Civil Engineering, North China University of Water Conservancy, China, 2001

Registrations and Certifications

Professional Engineer: NC: #046216; FL: PE89985

Project Experience

PBS Oyster Restoration Initiative, Pensacola, Florida, Modeling Lead, 2025-present.

Scope/Description/Value: Jacobs provided AE services to complete cost estimating and numerical modeling studies to plan and design the restoration of 600 ha oyster fishery, improving the ecosystem resilience, rebuild sustainable fishery, and improving economic vitality.

Role and Responsibilities: Responsible for leading a set of extensive numerical modelling studies to determine the water level, waves, tidal and wind driven currents, vertical distribution of water temperature and salinity through water column, for the Pensacola and Perdido Bays. The output from the modelling effort will provide critical information for the selection of the most suitable oyster placement areas as well as the oyster reef design.

North Indian River Drive Living Shoreline, Cocoa, FL, Brevard County. Modeling Lead, 2025.

Scope/Description/Value: Jacobs was contracted by Brevard County Public Works to provide technical support to assess potential flood and water quality management considering future conditions and to identify deficiencies and potential solutions to prevent shoreline erosion and flooding typically caused by wave action, storm events, currents, water runoff, wind effects, and other impacts. The project included an area surrounding a 1.7-mile stretch of North Indian River Drive located in unincorporated Brevard County.

Role and Responsibilities: Responsible for leading a Metocean and Wave Modeling study to determine the environmental conditions along the project site. The findings from the study provided critical information for identifying the most suitable shoreline stabilization alternatives and design, as well as determining design criteria for shoreline stabilization solutions.



Port Canaveral Cruise Terminal 2 Waterside Work, Lead Modeler, 2025-present.

Scope/Description/Value: Jacobs was selected Canaveral Port Authority to provide engineering services in support of the development of a new Cruise Terminal 2.

Role and Responsibilities: Responsible for leading a Metocean and Wave Modeling study to determine the water level, wind, wave conditions for both operational and extreme conditions considering future sea level rise. The modelling effort provided critical information for the planning and design of the new cruise terminal.

Navarre Living Shoreline, Navarre, Florida, Santa Rosa County, 2023

Modeling lead for deriving metocean conditions including water level, sea level rise, wave and flow conditions through comprehensive modeling. Coordinated the breakwater design and marsh sill design.

Tyndall AFB, Resilient Coastline Pilot Study – Phase 2 for USACE ERDC. Senior Coastal Engineer. 2020-2021

Helped refine the nature-based coastal solutions for alignment with various funding sources in support of preparation of REPI, DARPA and NFWF grant applications, resulting in securing \$5M in funding for pilot project design and submittal of separate grant applications for additional \$15M for construction of the pilot projects.

East Bay Oyster Habitat Restoration - Phase 1- The Nature Conservancy (TNC), Santa Rosa County, FL, USA. Senior Coastal Modeler. 2016-2017.

Scope/Description/Value: TNC has requested support from Jacobs to develop design drawings and specifications for construction and obtain the necessary permits for different alternatives of oyster reefs developments in Pensacola Bay. Phase 1 of the project will complete the monitoring, permitting, and design for an approximately 6.5-mile long oyster reef habitat restoration along the east shore of East Bay in Santa Rosa County, FL.

Role and Responsibilities: Involvement includes wave and hydrodynamic model calibration and validation.

Tampa Bay Spoil Island 3D Riprap Spillway, Florida, US. Coastal Engineer, 2012.

Scope/Description/Value: This study was to determine the design waves at the project site under storm conditions (based on category I Hurricane winds), and to evaluate the existing riprap spillway design in terms of rock size and stability of the riprap toe and sloping under storm wave conditions and waves induced by the passing vessels.

Role and Responsibilities: Responsibilities for this project include determining storm wave conditions, surge and extreme water levels, as well as passing vessel generated waves. Also performed rock sizing calculations and prepared riprap section design.



II. PROPOSED MANAGEMENT PLAN

A. Team Organization

1. Program Management, Scheduling, and Logistics

In addition to the technical design and permitting documents described above, this project will include a comprehensive program management and scheduling framework to ensure coordinated, transparent, and timely delivery. Deliverables will extend beyond engineering plans to include structured management documentation, schedule updates, cost tracking reports, stakeholder coordination materials, and grant compliance documentation.

At project initiation, RES will prepare a detailed Project Management Plan outlining communication protocols, document control procedures, quality assurance/quality control processes, risk management strategies, and coordination workflows among RES, Jacobs, OHS, Schnabel, the County, CHNEP, and the City. A baseline critical path schedule will be developed in Microsoft Project and submitted for review and concurrence. This schedule will identify major tasks, subtasks, milestone deadlines, agency review durations, stakeholder meetings, and grant reporting requirements. The schedule will clearly identify task interdependencies and the critical path to ensure that activities most influential to overall project completion are continuously monitored.

Management deliverables will include a kick off meeting and monthly coordination meeting, monthly progress reports summarizing work completed, work in progress, upcoming tasks, schedule status relative to the critical path, budget status, risk identification, and mitigation strategies. Monthly coordination meetings will be documented with written summaries identifying discussion items, decisions made, action items, and responsible parties. These management tools will provide the County, City and CHNEP with continuous visibility into project status and performance.



As the project advances through survey, modeling, design, and permitting phases, technical deliverables will include survey reports and CAD base mapping; geotechnical investigation reports; hydrodynamic modeling technical memoranda; progressive design submittals at 30%, 60%, 90%, and 100%; and updated Opinions of Probable Construction Cost at each milestone. Permit application packages will be prepared and submitted with supporting engineering, modeling, and environmental documentation. Responses to regulatory comments and revised submittals will also be documented as part of the deliverable record.

Logistics planning will be integrated throughout the project. During field data collection phases, coordination will be conducted to secure site access, confirm survey windows based on tides and weather conditions, and ensure efficient mobilization of survey and geotechnical crews. As the design advances, constructability reviews will evaluate access points, staging areas, material delivery considerations, environmental protection measures, and sequencing strategies to inform both final design and cost estimates. These logistics considerations will be incorporated into the construction documents to support efficient implementation during the future construction phase.

Through structured program management, disciplined scheduling controls, proactive logistics planning, and continuous coordination, the team will ensure that both technical and administrative deliverables are completed efficiently, transparently, and in full compliance with County and grant requirements.

2. Geotechnical Analysis

The geotechnical investigation is a critical path item and will be tracked within the overall project schedule to ensure early subsurface characterization, minimize redesign risks, and maintain schedule certainty. The Project Manager will oversee the geotechnical scope. This includes managing scope, schedule, budget, quality assurance, peer review of deliverables, coordination with permitting documentation, and integrating recommendations into final construction documents. All analyses and reports will undergo RES' quality assurance review and will align with agency expectations for permit and federal authorizations. The geotechnical analysis for the Tiki Point Living Shoreline project will be a coordinated, phased effort integrated into the engineering design, modeling, and permitting processes, initiated early in the design to inform key technical decisions and reduce risks related to subsurface conditions affecting breakwaters, shoreline grading, marsh platforms, and structural stabilization elements.



3. Engineering and Design

The engineering and design for the Tiki Point Living Shoreline will be managed as a fully integrated, interdisciplinary effort led by RES in close collaboration with Jacobs. The two firms have a strong history of working together on complex environmental and restoration projects and operate as a seamless extension of one another. RES and Jacobs will function as a unified design team, sharing project management systems, document control procedures, technical standards, and quality assurance protocols. This integrated structure ensures consistent communication, efficient decision-making, and a single, cohesive technical voice throughout project delivery. RES selected Jacobs to support our team on this project to bring their history and experience on the project and our success on partnering on projects together.

The Project Manager will oversee all engineering and design activities, ensuring alignment with the project's scope, schedule, and budget. Day-to-day technical coordination will be led by the Design Leads, Patrick Shearer and Ty Smith, who will facilitate collaboration among coastal engineers, hydrodynamic modelers, geotechnical engineers, and ecological specialists. Engineering development will be iterative and milestone-driven, progressing from conceptual refinement through preliminary and final design. During the conceptual phase, the team will evaluate shoreline stabilization alternatives and refine the preferred living shoreline configuration using available data and initial modeling. As the design advances into the preliminary stage, detailed hydrodynamic and wave modeling, along with geotechnical findings, will be incorporated to refine breakwater alignment, crest elevations, marsh platform grading, and structural details. Final design will include complete construction drawings, technical specifications, erosion and turbidity control measures, and updated cost estimates suitable for permitting and construction.

Throughout the design process, RES' expertise in living shorelines and ecological restoration will be fully integrated with Jacobs' coastal engineering and modeling capabilities. Engineering decisions will be informed simultaneously by hydraulic performance, shoreline stability, habitat enhancement objectives, regulatory requirements, and constructability considerations. Regular interdisciplinary coordination meetings will be conducted to ensure modeling results are directly reflected in design refinements, geotechnical recommendations are incorporated into foundation details, and environmental constraints are addressed proactively.

Quality assurance will be embedded within each stage of design. Draft deliverables will undergo internal peer review by senior technical staff from both RES and Jacobs prior to submission. This dual-layer review process strengthens technical defensibility, reduces the likelihood of agency comments requiring redesign, and enhances overall design quality. A design risk register will be maintained to identify and manage potential technical and regulatory risks, including wave overtopping, settlement considerations, scour potential, constructability constraints, and sensitive habitat areas. Addressing these issues early ensures the final design is resilient, buildable, and aligned with permitting expectations.

All engineering and design tasks will be incorporated into the overall project schedule and tracked within Microsoft Project, with defined task dependencies and milestone dates. Engineering activities will be placed on the project's critical path where appropriate, including integration of geotechnical findings, modeling outputs, and agency coordination. The Project Manager will conduct routine progress reviews to confirm adherence to the schedule and allocate resources as needed to maintain momentum. Because RES and Jacobs operate as a cohesive team, adjustments to workload or technical direction can be implemented efficiently without delays typically associated with multi-firm coordination.

Through this collaborative and disciplined management approach, the engineering and design for the Tiki Point Living Shoreline will be delivered in a coordinated, technically rigorous, and schedule-driven manner, resulting in a resilient shoreline solution that balances structural performance, ecological enhancement, and regulatory compliance.

4. Permit Application Preparation

Permit application preparation for the project will be managed as a coordinated, proactive effort integrated directly into design development rather than treated as a standalone, end-of-process task. The project is anticipated to require a state permit and associated federal authorizations. Early and continuous regulatory coordination will be essential to maintaining schedule certainty and minimizing review cycles. RES will lead the permitting effort, working in close collaboration with Jacobs, Olin, and Schnabel to ensure all technical documentation is aligned with agency expectations and submitted in a complete, defensible format.

The permitting strategy will begin during preliminary design with confirmation of jurisdictional boundaries, required agency authorizations, and anticipated technical reports and investigations. Early coordination meetings with regulatory agencies will be conducted to introduce the project, confirm data needs, and identify potential concerns related to submerged aquatic



vegetation, protected species, essential fish habitat, sovereign submerged lands, or water quality certification requirements. This early engagement will reduce regulatory uncertainty and allow the team to address agency input before advancing into final design.

Permit application materials will be developed in parallel with engineering deliverables. As design progresses, supporting technical documentation—including modeling summaries, geotechnical reports, ecological assessments, benthic surveys, and construction sequencing plans—will be prepared in coordination with the responsible technical leads. RES will establish a permitting matrix outlining required application components, responsible team members, subconsultant deliverables, and internal review deadlines. This matrix will be tracked weekly to ensure that all supporting documentation is completed on schedule and fully coordinated prior to submission.

RES and Jacobs will function as a unified team in agency coordination efforts. Agency meetings, responses to requests for additional information, and formal submittals will be developed collaboratively and presented with a consistent technical message. Comments received from regulatory reviewers will be tracked in a centralized response log, with clear assignment of responsibility and response deadlines. The Project Manager will oversee comment resolution to ensure timely and coordinated responses that maintain forward progress.

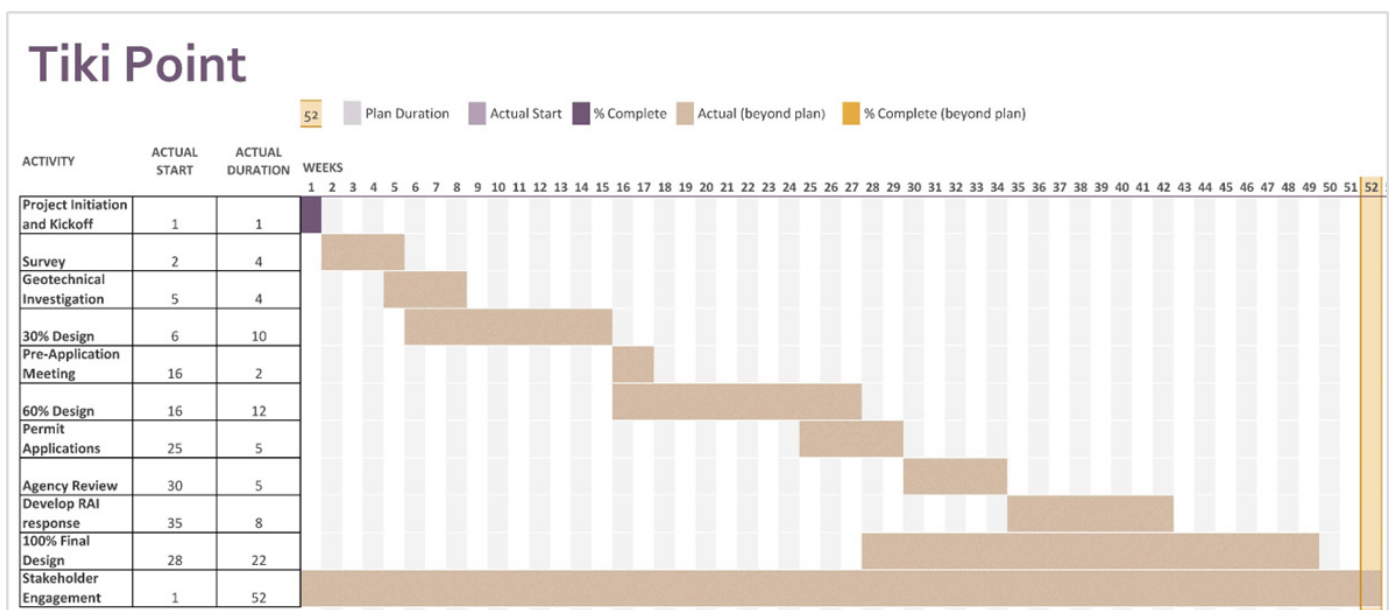
The permit preparation process will be fully integrated into the project schedule and managed on the critical path where applicable. Key milestones, including agency pre-application meetings, draft submittals, final application submission, and anticipated review durations, will be incorporated into the master schedule. Proactive tracking of deliverables, internal review periods, and agency coordination efforts will allow the team to anticipate potential bottlenecks and adjust resources as needed to meet deadlines.

WORK PLAN

A clearly defined work plan is essential to ensure that complex restoration projects are delivered in a structured, transparent, and accountable manner. It establishes the sequence of activities, defines responsibilities, identifies key milestones and deliverables, and provides a roadmap for maintaining schedule and budget through completion. For the Tiki Point Living Shoreline project, a detailed work plan has been developed to guide technical investigations, engineering design, public engagement, permitting, and grant preparation in a coordinated and efficient process, as described below.

The project schedule provided below illustrates the major milestones and reflects our understanding of the logical sequencing, anticipated level of effort, and coordination required to deliver the Tiki Point Living Shoreline project by March 31, 2027. The schedule accounts for expected agency and stakeholder review periods, coordination intervals, and critical path tasks based on our experience with comparable living shoreline and habitat restoration initiatives. It also assumes an executed contract starting in March 2026.

Upon award, RES will prepare a more detailed, fully resource-loaded Microsoft Project schedule in collaboration with the County, the City, CHNEP, and project partners. This refined schedule will validate milestone dates, integrate defined review durations, incorporate subconsultant task timelines, and establish clear decision points to actively guide project execution.





Project Management will be continuous throughout the life of the project and will provide the structure necessary to maintain schedule, budget, quality control, and communication through completion on March 31, 2027.

At a minimum, monthly project status meetings will be conducted with the County, the City, CHNEP, Jacobs, RES, and, when necessary, OHS and Schnabel to review progress, discuss upcoming milestones, identify risks, and confirm action items. During active design development, permitting review cycles, grant preparation periods, or other critical project milestones, coordination meetings will increase to bi-weekly or weekly as needed to maintain the schedule and ensure timely decision-making and progress. Meeting agendas will be distributed in advance, and formal meeting minutes will be prepared following each coordination meeting to document decisions, assignments, and schedule updates. A running action item log will be maintained and updated regularly to ensure accountability and transparency.

This continuous management structure ensures that survey and geotechnical efforts, engineering design, specifications development, permitting, public engagement, and grant preparation remain integrated and aligned throughout the project lifecycle.

PROJECT INITIATION AND KICKOFF

This phase establishes the project's administrative, technical, and communication framework. RES will conduct a formal kickoff meeting with the County, the City, CHNEP, and project partners to confirm scope, schedule milestones, reporting structure, budget controls, grant coordination strategy, and document management protocols. Roles and responsibilities of RES, Jacobs, OHS (Survey), and Schnabel (Geotechnical) will be confirmed to ensure seamless coordination.

During the initiation and kickoff, the identification of locations to host the stakeholder engagement meetings will start. Having this process start during this phase of the project allows the stakeholders to be notified as early as possible about the time and location for engagement meetings. This also holds our team accountable to meet project deadlines to be prepared for these stakeholder meetings.

A detailed project schedule will be developed to align with the required completion date of March 31, 2027. Public engagement planning will also begin in this phase, including the identification of key community stakeholders, the development of presentation materials, and the establishment of a communication platform to share updates.

An initial public meeting will be conducted to introduce the project vision, outline shoreline challenges and opportunities identified in the feasibility phase, and gather local input regarding shoreline use, community priorities, and concerns. Public feedback will be documented and incorporated into early design considerations.

Simultaneously, survey and geotechnical scopes will be finalized, access permissions coordinated, and field schedules established to allow data collection to begin immediately.

Deliverables:

- Project Management Plan and detailed milestone schedule
- Kickoff meeting agenda and meeting minutes
- Public engagement plan
- Initial public meeting presentation materials
- Public meeting summary and comment log
- Finalized survey scope and field schedule
- Finalized geotechnical investigation plan and boring layout

BENTHIC AND BATHYMETRIC SURVEY AND GEOTECHNICAL INVESTIGATIONS

This phase provides the technical foundation for design. The Project Manager will coordinate with the OHS and Schnabel leads to confirm the scope, schedule, and safety procedures before mobilization.

RES will conduct updated benthic surveys to identify the current location of the regulated resources relative to the project footprint. The presence of seagrass is a concern during living shoreline restoration projects and a minimum setback of 3 feet needs to be maintained for placement of any breakwaters. While no seagrass was found during the 2018 initial concept planning conducted by Jacobs, an updated survey will be required for permitting to demonstrate that the design will not impact benthic resources. The survey will be conducted during the optimal seagrass growing season of June to September.

OHS will perform a detailed topographic and bathymetric survey of the shoreline, nearshore areas, and tie-in locations. The survey will establish vertical and horizontal control, existing shoreline alignment, tidal benchmarks, existing vegetation limits,



and adjacent infrastructure constraints. Data will be compiled into a digital terrain model suitable for engineering analysis and plan development.

A detailed geotechnical investigation plan will be prepared collaboratively by RES, Jacobs, and Schnabel. The plan will specify boring locations, vibrocore sampling points, in-situ testing locations, and laboratory testing protocols based on preliminary shoreline feature layouts. It will also consider access, environmental sensitivities, tidal conditions, and permitting for over-water drilling. Identified geotechnical risks will be tracked and proactively managed through design adjustments or construction specifications.

Sediment samples collected during the 2018 study, showed that sediment was soft and poorly consolidated due to the organic content. This will be taken into consideration for possible settlement of material placed on the bay bottom in front of the seawall. Additional sediment characterization may be performed to support structural design and permitting. All field activities will be scheduled to minimize environmental disturbance and coordinated with ecological monitors if necessary. Field exploration will include upland and over-water borings or vibrocore within proposed breakwater alignments and marsh creation areas. Standard Penetration Tests (SPT), sediment sampling, and groundwater measurements will be conducted to characterize soil properties like stratigraphy, shear strength, consolidation, and bearing capacity.

Collected samples will undergo laboratory testing. The geotechnical engineer will then analyze these results to determine allowable bearing capacity, settlement potential, slope stability, global stability of shoreline features, and lateral earth pressures. For breakwater or sill structures, analyses will assess foundation performance under wave loading and long-term consolidation effects. A Geotechnical Engineering Report will document the findings, including subsurface profiles, design parameters, and recommendations for foundation preparation and construction.

Geotechnical findings will be directly integrated into the living shoreline design. Regular interdisciplinary meetings involving the geotechnical engineer, engineer team, and the project manager will confirm design criteria, refine breakwater elevations, evaluate marsh platform settlement tolerances, identify constructability constraints, and address potential differential settlement or scour.

Schnabel will conduct subsurface investigations, including borings along the proposed shoreline alignment and any structural feature locations. Laboratory testing will evaluate soil classification, strength parameters, consolidation characteristics, and suitability for supporting living shoreline elements or structural stabilization measures. The geotechnical evaluation will also assess slope stability, settlement potential, and constructability considerations.

Survey and geotechnical findings will be reviewed collaboratively with the design team to confirm appropriate shoreline treatments, material selections, embedment depths, and grading transitions.

Deliverables:

- Signed and sealed Topographic and Bathymetric Survey
- Benthic Resources Survey Report
- Digital terrain model and base mapping
- Geotechnical Engineering Report including borings, laboratory data, and design recommendations
- Technical memorandum summarizing geotechnical implications for shoreline design

ENGINEERING AND ECOLOGICAL DESIGN

Design will progress in structured stages to refine technical elements while incorporating stakeholder feedback and field data.

30% Concept Design

At this stage, the team builds upon the previous conceptual shoreline configuration using the preliminary information. This includes the layout of living shoreline components (e.g., oyster reef features, planted marsh benches, wave attenuation devices, or other nature-based elements), grading concepts, and preliminary structural details. Hydrodynamic considerations will be evaluated to confirm wave attenuation performance and sediment stability. Constructability and access constraints will be reviewed early to avoid later redesign.

Deliverables:

- 30% Concept Design Plans
- Preliminary grading plan and shoreline sections
- Preliminary opinion of probable construction cost



- 30% design review meeting and meeting minutes

60% Design Development

The 60% phase advances the project into a coordinated, technically robust, and constructible design. Detailed grading plans, shoreline sections, structural details (if applicable), planting plans, and erosion and sediment control measures will be developed based on survey data and geotechnical recommendations. Quantities will be refined, and construction sequencing will be evaluated to ensure practical staging and shoreline access.

At this stage, outline technical specifications to accompany the engineering drawings will be prepared. These draft specifications will define material requirements, performance criteria, installation methods, testing standards, and measurement and payment provisions. Specifications will address, at a minimum:

- Living shoreline components (e.g., reef structures, oysters, coir systems, biodegradable stabilization materials)
- Fill materials and grading tolerances
- Structural elements, if required
- Native plant species, planting densities, and establishment criteria
- Erosion and sediment control requirements
- Contractor submittals and quality control requirements

The 60% specifications will establish the framework for construction quality, durability expectations, ecological performance standards, and contractor responsibilities. They will also identify required certifications, inspection protocols, and acceptance criteria. This early development of specifications ensures that design intent, constructability, and permitting requirements are aligned before finalization.

A public meeting will be conducted during this phase to present the refined design, summarize anticipated construction methods, and gather community input prior to final document completion.

The RES internal team of construction estimators will review the 60% design documents and develop an updated opinion of probable construction cost.

Deliverables:

- 60% Design Plans
- Outline Technical Specifications (Draft)
- Updated Engineer's Opinion of Probable Construction Cost
- 60% Design Review Meeting Minutes
- Public Meeting Materials and Comment Summary

90–100% Final Design

The 90–100% phase culminates in the preparation of complete, signed and sealed construction documents suitable for bidding and construction. Plans will include detailed layout sheets, grading and cross sections, structural details, planting schedules, staging and access plans, and erosion and sediment control drawings. All quantities will be finalized and coordinated with the cost estimate. This cost estimate will be developed by the RES' internal construction estimators and general contractors, who constructed several living shoreline projects, including Belle Isle and Mummichog Living Shoreline. These two projects are provided in this proposal.

Comprehensive technical specifications will be finalized and fully integrated with the plan set. These specifications will clearly define the contractor's scope of work, material standards, installation procedures, inspection requirements, submittal requirements, warranty provisions, and measurement and payment criteria. The specifications will include:

- Detailed material standards for shoreline stabilization elements
- Structural design criteria and construction tolerances
- Native vegetation specifications including species lists, installation methods, plant sourcing, maintenance, and success criteria
- Quality assurance and quality control requirements
- Environmental protection measures and turbidity monitoring (if required)
- Construction sequencing and protection of adjacent resources
- Contractor submittal requirements and documentation standards



The final specifications will be written to minimize ambiguity, reduce construction risk, and clearly communicate performance expectations. They will align with permit conditions and grant requirements, ensuring that compliance obligations are embedded directly within the construction documents.

A final public meeting will be conducted to present the completed design, summarize construction expectations, and outline next steps toward bidding and implementation.

Deliverables:

- Final Signed and Sealed Construction Plans
- Final Technical Specifications
- Final Engineer’s Opinion of Probable Construction Cost
- Final Design Review Meeting Minutes
- Final Public Meeting Presentation and Summary

PERMITTING

Permitting will proceed in coordination with design development to minimize schedule risk. Our team will schedule pre-application meetings at the completion of 30% design plans to engage the agencies early in the process. This early engagement will help identify concerns and plans to incorporate those concerns into the 60% Plans.

Application packages will be developed at 90% design plans and include detailed engineering plans, environmental documentation, construction methods, and impact assessments. Supporting documentation may include habitat benefit narratives, water quality considerations, and erosion control measures.

Responses to review comments will be tracked and addressed promptly to maintain the schedule. Coordination meetings will be held as needed to resolve technical questions.

Deliverables:

- Complete permit application packages
- Supporting technical reports and environmental documentation
- Permit response letters and comment matrix
- Permitting coordination meeting minutes
- Final permit authorizations

GRANT APPLICATION AND FUNDING SUPPORT

In parallel with the design, RES will identify and prepare grant applications necessary to secure construction funding. Applications typically include detailed project narratives, community benefit descriptions, resilience justification, cost documentation, and supporting exhibits derived from the engineering plans. The team will coordinate required attachments, schedules, and budget breakdowns to ensure completeness and competitiveness.

Deliverables:

- Draft and final grant application packages
- Project narratives and benefit summaries
- Detailed cost documentation and schedules
- Grant coordination meeting minutes

BIDDING AND POST-DESIGN SUPPORT

Upon permit issuance and funding readiness, RES will support the bidding process. This includes assisting with the preparation of front-end documents, participating in pre-bid meetings, answering Requests for Information (RFIs), and preparing addenda if necessary. While construction administration is not included beyond pre-bid and RFI support, the team will remain available to clarify design intent.

Deliverables:

- Complete construction bid package
- Pre-bid meeting participation and meeting minutes
- RFI responses and addenda (if required)



III. PREVIOUS EXPERIENCE OF TEAM

As the nation’s largest nature-based solutions company, RES supports the public and private sectors with durable, resilient infrastructure for communities through solutions for environmental mitigation, stormwater and water quality, and climate and flooding resilience. RES has a unique operating model for delivering ecological uplift, based on science-led design, full delivery, long-term stewardship, and guaranteed performance. From headwaters to coastal shores, RES designs, builds, and sustains sites that preserve the environmental balance, lifting impaired ecosystems into restored health and ultimately, self-sufficiency. These projects restore sensitive wetland, prairie, and species habitats as well as floodplains, streams, river valleys, and coastal and tidal systems. The result is nature-based systems that cleanse water, shelter wildlife, buffer storms, and sequester carbon from the atmosphere.

RES works closely and creatively with municipalities, developers, non-governmental organizations, landowners, regulatory agencies and other stakeholders to balance the needs of the client, community, and the resource. Our operating model is built around this approach. We employ teams covering the full project lifecycle, combining in-house analytics and technical expertise with implementation resources and capabilities.

RES recognizes the importance of maintaining team continuity throughout the duration of the project to ensure consistency in technical approach, institutional knowledge, and communication. The professionals identified in this proposal are committed to serving in their designated roles through completion of the assignment. RES will not substitute the proposed designer or other key personnel without prior written approval from the County. Maintaining a stable, dedicated team is fundamental to delivering a coordinated, high-quality outcome for the Tiki Point Living Shoreline project.

We have helped clients successfully permit more than 3,900 projects, creating rich, high-functioning ecosystems as part of each permit. Our clients include local, county, and state governments, large mining operators, energy production companies, energy transmission companies, Fortune 500 companies, departments of transportation, and other public-sector organizations. RES now employs 918 dedicated staff in 51 operational hubs across the country. RES’ experience includes:

- Restoration of over 431 miles of shorelines, terraces, and levees
- Restoration, enhancement, and preservation of 77,899 acres of wetlands
- Restoration of over 690 miles of streams
- Rehabilitation, preservation, and management of over 20,401 acres of special-status species habitat, protecting 28 species
- Currently conducting monitoring and maintenance (including invasive species management) for over 88,429 acres of mitigation and restoration habitat
- Successful close-out of over 117 mitigation sites
- Permitting and development of over 338 permittee-responsible mitigation projects
- Design, permitting, management, and development of 197 wetland, stream, species, and conservation banks
- Delivery of 20,000 acres of custom, turnkey mitigation solutions
- Design and construction of over 356 stormwater management facilities
- Reductions of over 524 tons of water quality nutrients
- Planting of over 28,140,473 trees across all operating regions
- Development and operation of nurseries in six states, including the largest coastal nursery in Louisiana
- Facilitation of compensatory mitigation and nutrient offsets for over 3,980 federal and state permits
- Long-term protection and conservation of over 88,429 acres
- Restoration and protection of 20,700 acres of upland and prairie habitat
- Restoration of over 431 miles of shorelines, terraces, and levees



1,097,132
POUNDS WATER QUALITY
NUTRIENTS REMOVED



28,140,473
TREES PLANTED



77,899
ACRES WETLANDS
RESTORED



88,429
ACRES LAND
CONSERVED & PROTECTED



690
MILES STREAMS RESTORED



20,401
ACRES SPECIAL-STATUS
SPECIES HABITATS PROTECTED



431
MILES SHORELINE &
TERRACES RESTORED



RELEVANCE TO THE TIKI POINT LIVING SHORELINE

Collectively, the projects discussed below demonstrate our team's ability to deliver living shoreline systems across a range of scales and energy environments while integrating engineering rigor, ecological enhancement, regulatory compliance, and stakeholder coordination.

For the Tiki Point Living Shoreline, this experience translates into:

- Proven capability in designing segmented breakwaters, marsh creation, and hybrid shoreline systems.
- Application of hydrodynamic modeling and geotechnical analysis to optimize performance and durability.
- Experience navigating complex local, state and federal permitting pathways for coastal projects.
- Demonstrated ability to coordinate with public agencies and stakeholders to maintain alignment and support.
- Identify and support funding for coastal projects.

These projects reflect the same technical disciplines, regulatory frameworks, and stakeholder environments anticipated for Tiki Point, positioning the team to deliver a resilient, permittable, and publicly supported living shoreline solution. Further details and more project experience are provided in **Section VI**.

RES' approach focuses on nature-based infrastructure, often combining precision grading, installation of oyster structures, and planting native vegetation suitable for tidal environments. RES has successfully implemented innovative living seawall designs, incorporating textured ecological features and mangrove planters, partially inset landward to promote habitat and resilience while avoiding seagrass impacts. These designs are developed in collaboration with coastal engineers, structural engineers, landscape architects, scientists, and ecological concrete manufacturers to adapt to sea level rise and increase coastal resiliency. **Below is our team experience for 1. Living Shoreline projects, 2. Coastal Engineering and Design projects, 3. Stakeholder Engagement and Public Education projects, 4. Permitting Application Preparation projects/tasks.** These outlined scope items are provided for each project.

| North Bay Village Civic Park Living Shoreline Miami-Dade County, Florida |
|---|
| Scope Items: |
| Living Shoreline ✓ Coastal Engineering & Design ✓ Stakeholder Engagement ✓ Permit & Regulatory Coordination ✓ |
| <p>RES led environmental site analysis, living shoreline engineering, resiliency consulting, and environmental permitting for this highly visible municipal waterfront project, which integrated a living shoreline with public waterway access improvements to create a new park for North Bay Village. The project required a detailed benthic survey to map seagrasses, corals, and other benthic resources to inform design constraints. A hybrid living shoreline design was developed to avoid seagrass impacts and minimize the overall project footprint, expediting permitting while enhancing shoreline stability. Innovative elements included a strategic landward retreat of a portion of the shoreline, living seawall design, and specialized riprap mitigation measures designed to satisfy regulatory requirements while strengthening long-term resiliency. The project demonstrates RES' ability to balance public access, ecological sensitivity, regulatory constraints, and engineered shoreline protection. RES prepared an onsite mitigation plan to remove debris covering seagrasses, relocate several coral species and to avoid seagrasses to result in a net environmental improvement for the project. The project is the gateway to the North Bay Village snorkel trail which is currently being planned. RES presented to citizens groups, the resiliency board, and several presentations to the Mayor as public engagement for the project. RES worked in conjunction with University of Miami to explore innovative coastal adaptations and to evaluate SEAHIVE for the site. The team included civil and coastal engineers, landscape architects, environmental engineers and scientists. The project was funded by two grants and schedule control was a major factor. RES worked hand in hand within the team to prioritize the grant schedules, and regularly updated the Village staff and Mayor to stay on track with grant deadlines and to request extensions when possible, which resulted in one extension for a FIND grant. RES maintained cost control by allocating experienced staff to lead the effort and to guide the multi-disciplinary team by focusing on the feasibility and permitting for the project from project inception. By aligning the design to the permit requirements in Biscayne Bay, the project was able to reduce design iterations and to develop a design that avoided and minimized all seagrass impacts down to zero. One setback however, SFWMD agency staff required a second benthic study, due to time of year during permitting, and RES second benthic survey documented a new 8 square foot patch of seagrass which overlapped the project area. SFWMD agency staff required RES and team to avoid all seagrass impacts. RES was able to work with the design team and find an innovative design solution which allowed shifting the zig-zag dock and re-aligning the layout within limited space to avoid all seagrass impacts. RES designed a self-mitigating restoration plan for corals within the design footprint.</p> |



**Jose Martí Park Adaptive Re-Design
City of Miami Beach, Miami-Dade County, Florida**

Scope Items:

Living Shoreline ✓ | Coastal Engineering & Design ✓ | Stakeholder Engagement ✓ | Permit & Regulatory Coordination ✓

For this urban waterfront project, RES led stormwater retrofit design and nature based solutions and supported the adaptive redesign of a living shoreline/living seawall interface along the Miami River. The project addressed chronic King Tide flooding through innovative stormwater management and living shoreline strategies that enhanced hydrologic performance while improving ecological connectivity. RES brought innovative shoreline concepts to the team, through several vendor relationships, to inform the coastal engineer and landscape architects of the opportunities for the site. RES utilized the coastal engineer’s benthic survey to document historic oyster recruitment at the site and to aid oyster restoration within the heavily polluted Miami River. RES stormwater design restored the local aquifer function, in conjunction with the living shoreline design, which allows for a slower release of now treated freshwater to the Miami River, which can aid in seagrass and oyster restoration near the site. RES assisted in demonstrating the feasibility of kayaking on this working river, which is a working port connected to the Bahamas and Caribbean. The integration of urban infrastructure upgrades with nature-based shoreline elements required coordinating closely with municipalities, educating stakeholders and design professionals, and carefully aligning with regulatory requirements in a constrained, developed setting, including FDOT coordination for the area under I-95 which was designed as a landward retreat living shoreline. One setback, FDOT and the Miami River commission did not want mangroves on the project. RES was able to work with the coastal engineer and landscape architect to recommend suitable replacements and demonstrate viability for coastal cordgrass historically found in this area to replace mangroves. Cost control has been a repeating issue on this project. City of Miami has faced budget cuts, and RES and team have had to value engineer the project and to bid it three times with the City to be able to work within the City’s budget and select a suitable contractor. RES was able to cut costs to meet the City’s needs and preserve the intent of the project and the 150% pollutant load reduction required for Miami River/Biscayne Bay and to meet the new state stormwater rule. RES performed this project during covid, we led the initiation of online meetings during this intense project schedule driven by grants, and over 20 public meetings including stakeholders, agency staff, FDOT, city and state lawyers were performed and led by Mr. Shearer of RES. This experience demonstrates RES’ capacity to partner in hybrid living shoreline solutions within dense hyper-urban environments and to work collaboratively within a multi-disciplinary team to lead to successful outcomes. RES assisted in securing over \$18 million in state and federal grants for the project.

**Belle Isle State Park Living Shoreline
Lancaster County, Virginia**

Scope Items:

Living Shoreline ✓ | Coastal Engineering & Design ✓ | Stakeholder Engagement ✓ | Permit & Regulatory Coordination ✓

RES stabilized approximately 1,000 linear feet of actively eroding shoreline along the Rappahannock River through installation of offshore rock sill breakwaters, bank regrading, tidal marsh establishment, and upland meadow restoration. Engineering included wave energy evaluation, crest elevation determination, grading design, and integration of sea level rise projections. The project required coordination within a public park and included educational components to increase public awareness of living shorelines. RES prepared and managed the state and federal permitting process, including post-construction compliance. The project demonstrates scalable hybrid shoreline stabilization applicable to Tiki Point.

**Sea Oats Beach Shoreline
Islamorada, Village of Islands, Florida**

Scope Items:

Living Shoreline ✓ | Coastal Engineering & Design ✓ | Stakeholder Engagement ✓ | Permit & Regulatory Coordination ✓

This project started as a feasibility study to identify opportunities and benefits for two highly erodible areas that have suffered severe storm impacts in the Florida Keys: Ann’s Beach and Sea Oats Beach. The scope included conducting benthic resource surveys, evaluating various design options and permitting constraints, and developing opinions of portable costs for several alternatives. The primary project objectives defined by the Village are:



Sea Oats Beach Shoreline Islamorada, Village of Islands, Florida

- provide erosion control to safeguard against storm surges and sea level rise,
- provide a refuge for juvenile fish species and coral (e.g., snapper/grouper complex),
- protect sea turtle critical habitat as identified by the U.S. Fish and Wildlife Service (FWS) (e.g., loggerhead sea turtle);
- incorporate habitat components to aid in water quality enhancements and shoreline protection (e.g., seagrass and mangroves), and
- create an economic resource for the Village (e.g., ecotourism industry, education).

The Village hired RES to further design and permit one of the concepts for Sea Oats Beach. In addition to providing the ecological and engineering expertise for the design and permitting, RES is conducting public engagement, identifying funding opportunities.



Belle Isle State Park Shoreline Stabilization Project, VA



JACOBS PROJECT EXPERIENCE

Hancock County Marsh Living Shoreline Hancock County, Mississippi

Scope Items:

Living Shoreline ✓ | Coastal Engineering & Design ✓ | Stakeholder Engagement ✓ | Permit & Regulatory Coordination ✓

Jacobs led this large-scale project that included approximately six miles of segmented breakwaters, 46 acres of restored marsh, and 46 acres of subtidal reef habitat. The design incorporated detailed wind-wave modeling, current analysis, and geotechnical investigations to optimize performance under high-energy coastal conditions. The project required coordination among federal and state agencies and funding partners and successfully navigated complex permitting requirements. Its resilience through multiple hurricane events demonstrates the durability of the engineering approach. The scale, modeling rigor, and regulatory coordination provide strong precedent for the technical demands anticipated at Tiki Point.

Naval Station Mayport – Living Shoreline & Oyster Reef Design City of Jacksonville, Duval County, Florida

Scope Items:

Living Shoreline ✓ | Coastal Engineering & Design ✓ | Stakeholder Engagement ✓ | Permit & Regulatory Coordination ✓

Jacobs supported the siting, project definition, and advancement of a living shoreline and oyster reef system along the northern shoreline of Naval Station Mayport on the St. Johns River. The project was developed to reduce erosion during high water events while enhancing habitat and supporting long-term installation resilience. Building upon the USACE Engineering With Nature (EWN) framework, Jacobs refined nature-based coastal solutions, aligned the project with funding pathways, and built agency and installation support to advance implementation.

Marine Corps Air Station Beaufort – Nature-Based Shoreline Stabilization Beaufort, South Carolina

Scope Items:

Living Shoreline ✓ | Coastal Engineering & Design ✓ | Stakeholder Engagement ✓ | Permit & Regulatory Coordination ✓

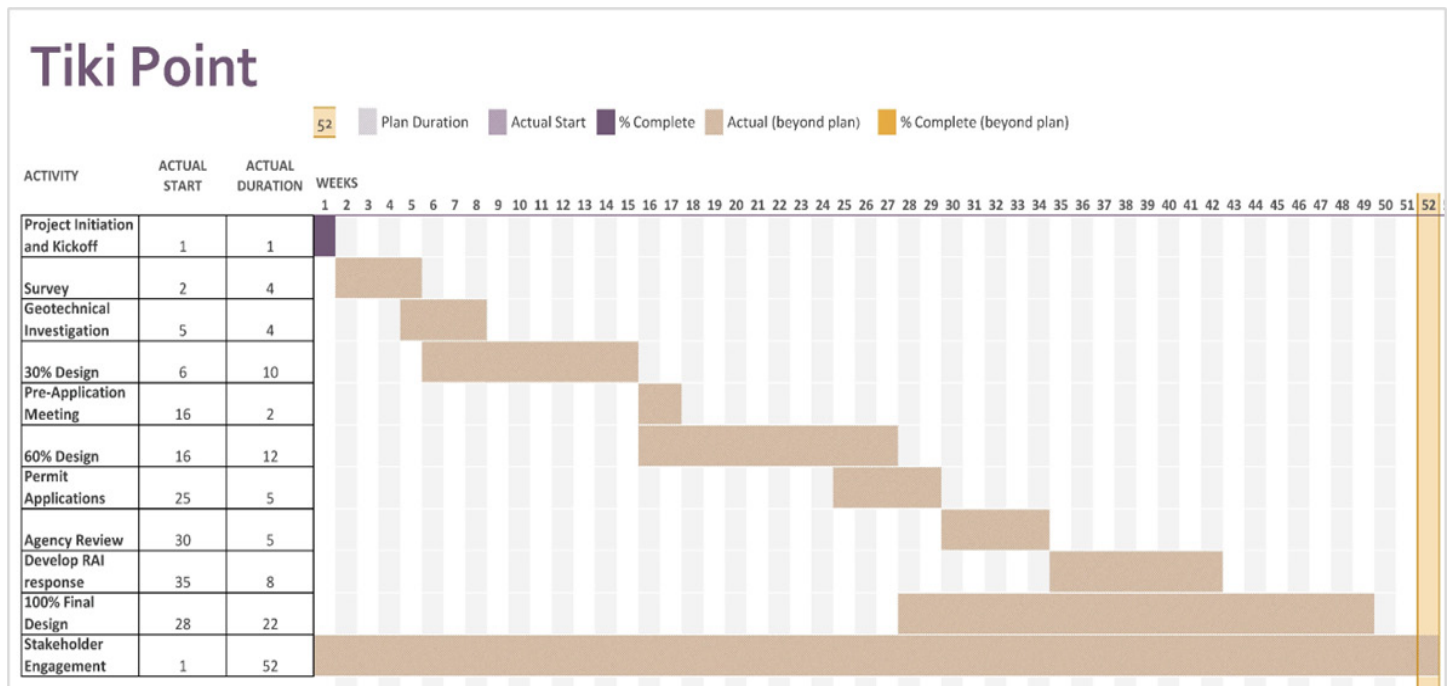
Jacobs developed a shoreline stabilization solution along Albergotti Creek to mitigate erosive forces during high water events. The project leveraged the USACE EWN program to integrate nature-based stabilization approaches into federal infrastructure planning. Jason supported project definition, funding strategy development, and coordination with installation leadership and federal partners to move the concept toward implementation.



IV. PROJECT CONTROL

A. Schedule

The project schedule will be developed and actively managed using Microsoft Project to establish a detailed Critical Path Method (CPM) schedule. The baseline schedule will incorporate all required milestones, including 30%, 60%, 90%, and 100% design submittals, stakeholder engagement activities, preparation of permit applications, coordination with City-led monitoring and Quality Assurance Plan activities, and final deliverable submission prior to the March 31, 2027, completion deadline. The schedule will clearly define task durations, dependencies, and decision points, allowing the team to identify and manage the project’s critical path throughout the project. A graphic of our proposed schedule is provided below.



To ensure that the schedule will be met, the team will implement a structured CPM scheduling approach that includes critical path identification, float management, monthly schedule updates, milestone-based progress tracking, formal schedule reviews during monthly coordination meetings, early regulatory coordination to reduce permitting delays, parallel task execution where appropriate, and internal QA/QC reviews prior to each major submittal.

Critical path activities, such as pre-construction monitoring data, agency coordination, and permit application preparation, will be closely tracked and updated on a regular basis. Float will be monitored and managed to prevent compression of later activities. The schedule will be updated monthly, or more frequently if needed, to reflect actual progress, and will be reviewed during monthly coordination meetings with the County, CHNEP and the City. These meetings will serve as formal schedule check-ins to evaluate progress against planned milestones, identify potential constraints, and implement corrective actions when necessary. Meeting minutes will document schedule status, action items, responsible parties, and target completion dates to maintain clear accountability.

To further protect the schedule, early coordination with FDEP, USACE, and other applicable agencies will occur during design development phases to minimize late-stage permitting risk. Internal quality assurance and quality control reviews will be conducted prior to each design submittal to ensure deliverables are complete, technically sound, and consistent with DEP QA Rule Chapter 62-160 requirements and grant documentation standards.

The Project Manager will be responsible for ensuring that the project schedule is met. The Project Manager will develop and maintain the Microsoft Project schedule, monitor the critical path, evaluate progress against milestones, and implement corrective actions if schedule variances occur. The Project Manager will lead monthly coordination meetings, provide schedule updates to the County, CHNEP and the City, and ensure alignment between design, permitting, and stakeholder engagement activities.



Supporting this effort, the Design Lead will deliver technical milestones in accordance with the established schedule; the Permitting Lead will manage regulatory coordination timelines and permit application preparation; and the Public Outreach Lead will coordinate stakeholder engagement activities to align with design phases.

While individual task leaders are accountable for their respective components, ultimate responsibility for overall schedule performance rests with the Project Manager, who serves as the single point of accountability to the County, CHNEP and the City.

B. Cost

Cost control will be managed through a structured project management framework that integrates budgeting, tracking, forecasting, and internal review procedures from project initiation through final deliverable submission. The project budget will be broken down by task and subtask consistent with the Scope of Services and grant requirements. This task-based budget structure will align directly with the project schedule to ensure scope, schedule, and cost remain integrated throughout the project lifecycle.

The control techniques planned to manage project costs include task-based budgeting aligned with the scope of services, real-time tracking of labor and expenses through established accounting systems, monthly internal budget reviews, earned value-based comparison of actual costs to percent complete, milestone-based cost checkpoints at 30%, 60%, 90%, and 100% design stages, subconsultant scope tracking, proactive variance identification, and implementation of corrective actions when needed.

Project costs will be monitored using established accounting and project management systems that track labor hours, billing rates, subconsultant expenses, and direct costs in real time. Monthly internal budget reviews will compare actual expenditures against the planned budget and percent complete for each task. This earned value-based approach allows early identification of cost variances and enables corrective measures before impacts become significant. Any anticipated variance will be communicated promptly to the County, CHNEP and the City with recommended mitigation strategies.

At each major design milestone, the team will evaluate the level of effort relative to progress achieved to confirm that remaining work can be completed within the established budget. This stepwise review process provides structured cost control checkpoints throughout the project.

Our team has demonstrated the ability to meet project cost control requirements on federally and state-funded coastal and habitat restoration projects by delivering services within fixed budgets, maintaining disciplined scope management, proactively coordinating with regulatory agencies, and identifying technical challenges early to prevent cost overruns.

The Project Manager will be responsible for overall cost control and financial performance of the project. The Project Manager will oversee budget development, review monthly cost reports, approve invoices, and ensure alignment between project progress and expenditures. The Project Manager will serve as the primary point of contact with the County and CHNEP regarding financial matters and will provide transparent reporting on budget status throughout the project.

Supporting this responsibility, technical leads will monitor discipline-specific labor utilization to ensure consistency with planned level of effort, and subconsultant expenditures will be tracked against approved scopes to prevent cost creep.

While cost accountability is shared across the project team, ultimate responsibility for maintaining budget compliance rests with the Project Manager, who has authority to adjust staffing allocations, redistribute resources, and implement corrective actions to maintain financial performance.

C. Recent, current and projected workload

Our team has more than sufficient capacity to perform the tasks required to design and permit the Tiki Point Living Shoreline. Each team meets regularly with its respective lead and conducts a finance and resource budgeting analysis. During these planning cycles, we consider work in progress and currently projected workloads paired with a review of pipeline opportunities to develop resource projections for the upcoming period. To maintain proper staffing levels and resource loading, the respective team members then plan and appropriately staff regional offices with strategic new hires and capacity in anticipation of winning new opportunities. Our team has the resources and experience to execute complex projects of this size and larger, and has the necessary capability to provide the level of quality, responsiveness, and client service that our partners expect.



Our locally-focused and broadly supported team has critical key staff members who are within a one-hour drive of the project site and who will be committed to this project. These staff members will be able to meet during regular and frequent in-person office meetings and field visits as needed. In addition, these and other dedicated staff will be available to participate in meetings, workshops, planning charrettes, stakeholder, and public outreach engagements either in person or virtually. We have purposefully built in a level of redundancy across the different teaming partners to reduce the potential for any issues to arise if any of the key staff are no longer available to work on the project, for whatever reason. Our objective is to maintain a consistent teaming front that will be aligned and ready to implement each phase of this project seamlessly, within the expected timeframe and available budget.



V. PROPOSED DESIGN APPROACH FOR THIS PROJECT

The Tiki Point Living Shoreline project builds directly upon the prior feasibility evaluation prepared by Jacobs, which assessed shoreline conditions, erosion mechanisms, wave climate influences, and conceptual stabilization alternatives. Based on that feasibility effort, the project has progressed beyond problem identification and now requires refinement, validation, and advancement into detailed engineering design and permitting.

The feasibility report identified shoreline instability driven by wave energy exposure, vessel wake influence, and localized erosive processes affecting nearshore bathymetry and bank conditions. The evaluation also considered conceptual living shoreline configurations intended to reduce wave energy, stabilize sediments, and improve ecological function while maintaining navigational and hydraulic integrity. The recommended approach emphasized the use of offshore or nearshore attenuation features combined with habitat-enhancing shoreline treatments rather than traditional hardened vertical structures.

Our understanding is that the current phase of work must validate and optimize those conceptual configurations through updated survey data, refined hydrodynamic modeling, geotechnical investigation, and regulatory coordination. The feasibility-level assumptions must now be translated into performance-based engineering design that confirms wave attenuation targets, shoreline stabilization performance, constructability, and compliance with federal and state permitting criteria.

Additionally, the project must carefully consider the presence of environmentally sensitive resources, including submerged aquatic vegetation, mangroves, tidal wetlands, and other estuarine habitats that may be located within or adjacent to the proposed project footprint. While benthic resources were not identified in the 2018 survey, updated surveys will be required. The final design must avoid and minimize impacts to these resources while enhancing ecological value wherever feasible.

We also understand that the project is funded in part through CHNEP and federal infrastructure investment programs, which require adherence to documentation, reporting, and quality assurance standards, including compliance with DEP QA Rule Chapter 62-160. The design must therefore be technically defensible, well-documented, and supported by recognized modeling tools to satisfy both regulatory agencies and funding partners. It will be important to include preparation and implementation of an EPA-compliant QAPP, as required for environmental data collection and monitoring activities associated with the project. The QAPP will define project objectives, data quality objectives, sampling methodologies, laboratory analytical procedures, quality control measures, data management protocols, and reporting requirements to ensure that all collected data are scientifically defensible and meet applicable federal and state standards. Preparation of the QAPP will occur prior to initiation of any monitoring or sampling efforts, and all activities will be conducted in accordance with the approved plan to ensure regulatory compliance and data integrity.

In summary, this phase of the Tiki Point Living Shoreline project is intended to transform a conceptual resilience strategy into a fully-engineered, permitted, and constructible shoreline stabilization system that delivers measurable wave attenuation, ecological enhancement, and long-term coastal resilience benefits.

1. Design Philosophy

The Tiki Point Living Shoreline project will be advanced through an integrated, resilience-based approach that unifies technical rigor, ecological restoration principles, regulatory strategy, and constructability considerations into a single, performance-driven framework. Our philosophy is grounded in the understanding that this project must do more than stabilize erosion; it must function as a self-sustaining shoreline system that attenuates wave energy, enhances habitat, improves water quality, and increases long-term climate resilience while remaining constructible, permittable, and fiscally responsible.

The project will be delivered through a structured, phased process that methodically advances feasibility findings into a validated, optimized, and permit-ready design. Early technical validation will guide decision-making at each step. Hydrodynamic modeling will be used as an active design tool to refine layout, structural configuration, material selection, crest elevations, and shoreline alignment. Survey and geotechnical investigations will be initiated early to reduce uncertainty and minimize the potential for redesign. Elevations, alignments, and structural sizing will be informed by modeling outputs, subsurface conditions, and observed shoreline dynamics to ensure reliable performance under daily tidal conditions as well as storm events.



Nature-based solutions will be prioritized wherever feasible, with living shoreline elements strategically configured to work with natural coastal processes rather than against them. Structural components will be designed to reduce wave energy while promoting sediment stabilization and ecological recruitment. At the same time, constructability and long-term maintenance will be incorporated from the outset, with attention to access, staging, material availability, durability, and lifecycle performance.

Continuous interdisciplinary coordination will occur throughout design development to ensure alignment among engineering, environmental, permitting, and stakeholder engagement efforts. Proactive regulatory coordination will begin during conceptual refinement to identify permitting considerations early and reduce the likelihood of delays during formal review. Through this integrated approach, the design will achieve technical performance, environmental stewardship, regulatory defensibility, and long-term adaptability—ensuring successful delivery of the Tiki Point Living Shoreline project.

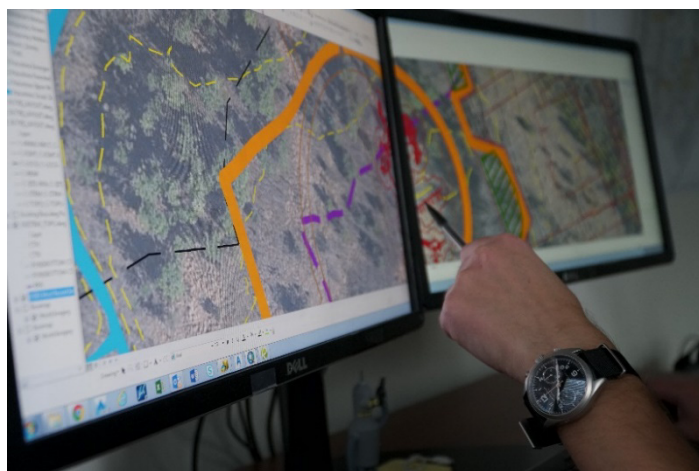
PROJECT INITIATION AND DESKTOP DATA REVIEW

The team will conduct a formal kickoff meeting with the County, CHNEP, and the City to confirm project objectives, communication protocols, data availability, schedule expectations, and grant compliance requirements. During this phase, existing feasibility documentation, prior modeling efforts, environmental data, survey information, and available background reports will be reviewed to confirm baseline conditions and identify any data gaps.

A detailed Project Management Plan will be developed outlining communication procedures, document control protocols, quality control processes, and coordination workflows. Concurrently, a baseline Microsoft Project schedule will be prepared, identifying key milestones, design phases, agency coordination points, and critical path tasks. This foundational step ensures that the project advances with clarity, defined expectations, and structured oversight.

FIELD DATA COLLECTION AND EXISTING CONDITIONS ASSESSMENT

The first component of our approach is to confirm and refine the assumptions developed during the feasibility phase. Hydrographic and topographic surveys will be performed by OHS, which will collect bathymetric data, shoreline elevations, and other physical characteristics necessary to support engineering analysis and permitting documentation. Survey data will be incorporated into CAD-based mapping to establish the technical foundation for design development



and incorporated into a refined digital terrain model of the project area. The updated base condition will be used to validate shoreline alignment, bathymetric contours, and nearshore geometry that influence wave transformation and sediment stability.

RES scientific divers will conduct updated benthic resources surveys. This work needs to be conducted during the optimal seagrass growing season, which lines up nicely with the required schedule for this project. The presence and absence of resources will be documented early in the design process so that structure placement will avoid and minimize impacts to regulated benthic resources. RES has a structured diving program and maintains accreditation with the American Academy of Underwater Sciences, which is a rigorous program that requires RES to meet AAUS standards and training requirements. RES owns all of the equipment to do this type of work including multiple sized vessels and equipment in Florida.

GEOTECHNICAL ANALYSIS

A comprehensive geotechnical investigation will be conducted by Schnabel to support the final design of the Tiki Point Living Shoreline system. Given the shallow coastal environment, variable estuarine sediments, and the anticipated installation of nearshore attenuation features and shoreline stabilization elements, subsurface characterization is critical to ensure long-term structural stability, constructability, and regulatory defensibility. The primary purpose of the geotechnical program will be to characterize subsurface stratigraphy and engineering properties within the footprint of the proposed living shoreline elements; evaluate bearing capacity and settlement potential; assess shoreline slope stability under both static and storm loading conditions; and identify any soft, organic, or highly compressible soils that may influence design configuration. The findings will directly inform structural sizing, embedment depth, foundation preparation requirements, and adaptive design considerations.



The field exploration program will be developed in coordination with the engineering and modeling teams to ensure that borings are strategically located along the proposed alignment of offshore attenuation features, segmented sills, reef modules, or other shoreline stabilization components.

Marine borings will be advanced using boat-mounted drilling equipment to characterize subsurface conditions beneath proposed offshore or nearshore features. Borings will extend to depths sufficient to identify competent bearing strata and evaluate settlement potential, generally anticipated to range between approximately 15 and 30 feet below the mudline depending on soil variability and structural demands.

In shoreline and transitional areas where grading, marsh enhancement, or sill installation is proposed, land-based or amphibious drilling methods will be utilized. SPT will be performed at regular depth intervals to assess soil density and strength characteristics and to identify stratigraphic transitions. In soft cohesive or organic layers, vane shear testing may be conducted to evaluate undrained shear strength. Where appropriate, Cone Penetration Testing (CPT) may be incorporated to provide continuous stratigraphic profiling in loose sands or soft estuarine deposits.

All borings will be logged by a qualified geotechnical professional in accordance with the Unified Soil Classification System (USCS), documenting soil types, groundwater conditions, shell content, organic layers, and other relevant subsurface characteristics.

Using the field and laboratory data, detailed geotechnical engineering analyses will be performed to support final design. Bearing capacity analyses will be conducted to determine allowable foundation pressures for proposed living shoreline elements, including low-crested breakwaters, reef modules, or segmented sills. Both short-term and long-term loading conditions, including storm-induced forces and potential hydrostatic variations, will be considered.

Settlement analyses will evaluate both total and differential settlement, particularly in areas underlain by soft estuarine or organic soils. Where compressible layers are present, consolidation modeling will estimate primary and secondary settlement to inform crest elevation design and long-term performance expectations.

For shoreline banks and transitional slopes, stability analyses will be performed under static and storm surge conditions. These evaluations will incorporate soil strength parameters, water level fluctuations, and potential erosion scenarios to confirm that proposed grading or stabilization measures maintain adequate factors of safety.

Geotechnical findings will also be integrated with hydrodynamic modeling results to assess potential scour and sediment mobility around proposed features. Recommendations for embedment depth, toe protection, geotextile separation layers, or footprint adjustments will be provided as needed to enhance structural stability and durability. If soft or highly compressible soils are encountered, design modifications may include increasing the footprint of structural elements to distribute loads, incorporating reinforcement or separation geotextiles, adjusting crest elevations to account for predicted settlement, or selecting lighter-weight modular systems where appropriate. This iterative integration between geotechnical evaluation and structural design ensures a performance-based and site-responsive solution.

The geotechnical evaluation will also address constructability within the shallow marine environment. Recommendations will be provided regarding excavation methods, equipment access, staging considerations, and sediment management. Special attention will be given to minimizing disturbance within environmentally sensitive areas, including submerged aquatic vegetation and designated critical habitat for the smalltooth sawfish. Foundation preparation and installation methods will be developed to reduce turbidity, control sediment displacement, and limit in-water construction duration where feasible.

Existing environmental conditions, including shoreline configuration, adjacent habitat resources, and hydrologic influences, will be documented and incorporated into both the modeling and design processes. This comprehensive assessment minimizes uncertainty and reduces the potential for design revisions later in the project.

HYDRODYNAMIC MODELING AND PROGRESSIVE DESIGN DEVELOPMENT

Jacobs will perform hydrodynamic modeling to evaluate wave climate, shoreline response, and the anticipated performance of proposed living shoreline configurations. Modeling will assess wave attenuation characteristics, hydraulic behavior under tidal and storm conditions, sediment stability considerations, and overall system resilience. The modeling effort will be structured to both validate the feasibility assumptions and optimize the final configuration of living shoreline elements.

Given the coastal setting and anticipated wave-driven shoreline processes, the preferred modeling platforms will include industry-accepted and agency-recognized tools such as ADCIRC for storm surge and tidal hydrodynamics and SWAN



(Simulating WAVes Nearshore) for wave transformation and attenuation analysis. These models are widely accepted by the USACE and the FDEP for coastal and nearshore evaluations and are well-suited to simulate water surface elevations, wave heights, and wave energy dissipation under varying conditions. Where appropriate, CMS-Wave or similar USACE-supported coastal modeling tools may be used to evaluate nearshore sediment transport and shoreline response.

The selection of these modeling platforms is based on their technical defensibility, regulatory acceptance, and demonstrated performance in evaluating wave attenuation structures and living shoreline systems in Florida's coastal environments. Modeling scenarios will include existing conditions and proposed conditions to quantify the anticipated reduction in wave energy, improvements in shoreline stability, and potential changes in local hydrodynamics.

Model inputs will incorporate updated survey data, bathymetry, tidal datums, and relevant storm events. Results will be documented in a technical memorandum and will directly inform design refinement at the 30% and 60% milestones. Modeling outputs will be used to optimize crest elevations, spacing, alignment, and materials of proposed shoreline stabilization features to ensure both performance and constructability.

The living shoreline system will be developed using performance-based criteria derived from modeling outputs and site-specific conditions. Rather than relying on prescriptive dimensions alone, crest elevations, feature widths, and spacing will be tied to quantifiable reductions in wave height and energy transmission. This ensures the final configuration delivers measurable resilience benefits. The project will follow a hybrid engineering–ecological design framework. Structural elements such as low-crested breakwaters, segmented sills, reef modules, or other attenuation features will be evaluated in conjunction with habitat-based components such as marsh fringe enhancement, mangrove integration (where appropriate), or oyster recruitment surfaces. Each alternative will be assessed for hydraulic performance, durability, ecological benefit, constructability, and lifecycle cost.

Environmental resource mapping will guide the placement and alignment of proposed features to avoid submerged aquatic vegetation and other critical habitats identified in the feasibility study and updated field investigations. Design refinements will prioritize minimizing shading, scour, or hydrologic alterations that could negatively impact sensitive resources.

PERMITTING AND REGULATORY COORDINATION

Regulatory coordination will begin early in the design process to confirm permitting pathways, jurisdictional boundaries, consultation requirements, and documentation expectations. Based on the project scope and location, permitting is anticipated to involve coordination with the FDEP and USACE as the lead permit agencies. Due to the project's proximity to navigable waters, RES will coordinate with the United States Coast Guard (USCG) to ensure that the proposed project does not affect navigation or public safety.

FDEP will serve as the primary state permitting authority for work occurring in coastal waters and sovereign submerged lands. Authorization will likely be required under Florida's Environmental Resource Permitting (ERP) program and Sovereign Submerged Lands authorization, depending on final design elements. FDEP's review will evaluate potential impacts to submerged aquatic vegetation (SAV) and overall consistency with Florida's coastal resource protection criteria. FDEP may also require detailed benthic resource surveys, SAV mapping, turbidity monitoring plans, and water quality protection measures to demonstrate avoidance and minimization of impacts. RES will initiate pre-application coordination with FDEP early in design development to confirm data needs, species review triggers, and anticipated permit conditions. By proactively addressing both FDEP regulatory criteria and Florida Fish and Wildlife Conservation Commission (FWC) resource protection requirements within the permit package, the project will be positioned for a more efficient review process and reduced risk of extended agency comment cycles.

These projects also require authorization from the USACE under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. The USACE typically authorizes these projects via an Individual Permit (IP) or a Nationwide Permit (NWP). As part of the ERP review process, FDEP coordinates closely with the FWC to ensure compliance with state-listed species protection requirements and marine resource management policies. Species protection measures will be incorporated directly into the construction drawings and technical specifications to ensure contractor compliance. Where necessary, time-of-year construction windows and monitoring commitments will be integrated into the project schedule to align with state resource protection requirements.

NWPs are general "blanket" permits that have already been issued for certain types of activities and can be used to streamline the permitting process. Living shoreline projects that restore aquatic habitats can potentially be authorized by several NWPs, including the following:



- NWP 13 for Bank Stabilization
- NWP 18 for Minor Discharges
- NWP 54 for Living Shorelines
- NWP 27 for Aquatic Habitat Restoration, Establishment, and Enhancement Activities

NWPs can expedite permitting, but they do have limitations, so understanding these limits and designing the appropriate project to meet the targeted permit requirements can speed up the permitting process. NWPs 13 and 18 both have limits that generally make them unsuitable for use on living shoreline projects exceeding 500 linear feet in length. NWP 54, while specifically written for living shoreline projects, has the same 500 linear foot limit as well as a requirement that the project be constructed no more than 30 feet out from the mean low water line in tidal waters.

Note that the preamble discussion in the “Reissuance and Modification of Nationwide Permits” issued by the USACE and published in the Federal Register on December 27, 2021, discusses NWP 27’s applicability to living shoreline projects. NWP 27 requires the project “be planned, designed, and implemented so that it results in an aquatic habitat that resembles an ecological reference.” In the preamble discussion, the USACE points out that “living shorelines are an example of resiliency projects in coastal areas that do not resemble ecological references because they may include engineered structures such as sills or breakwaters.” While some USACE Districts may allow use of NWP 27 for specific types of living shoreline projects, a permittee will likely have to clarify that the primary intent of a particular project is to re-establish estuarine wetland and oyster habitats as well as identify nearby ecological reference sites containing those target habitats and demonstrate how the project will result in restored habitats comparable to those ecological reference sites.

If able to be used, NWP 27 presents a permitting advantage as it does not have specific length or acreage limits; however, it does require coordination with, and in most circumstances, written authorization to use from the USACE. The USACE has 45 days to issue an authorization to use an NWP after it receives a complete permit application, known as a pre-construction notification (PCN). The USACE has the first 30 days after receipt to determine if a PCN is complete. If it is not complete, the USACE notifies the applicant of the deficiencies, and the 45-day clock stops. The clock also stops if the project has any potential to affect threatened or endangered species (NWP General Condition 18) or cultural resources (NWP General Condition 20) and the USACE must coordinate with outside agencies such as the FWS, National Marine Fisheries Service (NMFS) and the State Historic Preservation Office (SHPO) on those issues. In addition, the USACE conducts a 33 CFR 408 (a.k.a. “Section 408”) review, making sure the applicant’s project does not impact a USACE Civil Works project or USACE real estate (which can also stop the clock). Designing a project to fit within the NWP requirements can speed up the permitting process. Pre-coordination with the USACE and clear permit application documents are critical to avoid the USACE deeming an application incomplete and issuing a request for additional information, which slows down the review process.

Note that NWP 27 does have several exceptions to the PCN requirement. These exceptions include “activities conducted on non-Federal public lands and private lands, in accordance with the terms and conditions of a binding stream enhancement or restoration agreement or wetland enhancement, restoration, or establishment agreement between the landowner and the FWS, Natural Resources Conservation Service, Farm Service Agency, NMFS, National Ocean Service, United States Forest Service or their designated state cooperating agencies.” However, even if the project is part of such a “binding agreement” and a PCN is not required, the USACE still requires submittal of a Report “at least 30 days prior to commencing activities.” The Report must contain much of the same information as a PCN.

In order to decrease the amount of time needed for USACE review and coordination, it helps to coordinate with the USACE early and gather as much information that they may need up front, including engineering/geotechnical analyses, endangered species assessments, submerged aquatic vegetation (SAV)/oyster surveys, and cultural resource surveys to submit with a PCN or NWP 27 Report.

First, it is recommended to conduct a pre-application meeting with the USACE District staff to determine if NWP 27 is appropriate for a specific living shoreline project and if the project requires a PCN. Objectives for that meeting should include:

1. Review of a project map for a specific project and concept drawings
2. **Confirm that the co-applicants will be the City and Four Points.**
3. If NWP 27 is appropriate, confirmation this information is appropriate to submit with the PCN or Report:
 - a. Project Description with location map and 30% design drawings;



- b. Baseline Condition Report including regulated resource delineation, threatened and endangered species assessment, and cultural resources assessment; and
 - c. Any additional engineering/geotechnical reports the USACE deems necessary for timely review (i.e., H&H, sedimentation, wind/wave, alternatives, etc.).
4. Discussion about typical endangered species issues/resolutions with FWS and NMFS.
 5. Confirmation applicant and/or applicant's consultant can coordinate directly with Jerry Androy (USACE Galveston Archeologist) regarding need/scope of work for cultural resource surveys before PCN submittal.
 6. Review landowner agreements and/or agency MOUs/lease agreements.
 7. Discuss USACE Section 408 (Civil Works Project compatibility) review process documentation needs.
 8. Discuss USCG navigability concurrence, NMFS Essential Fish Habitat (EFH) coordination requirements, and potential agency-requested analyses, if any.

Second, informed with specifics on how the USACE prefers to see data collected and presented, we recommend conducting the necessary assessments and surveys, producing a complete PCN or Report, and submitting it to the USACE as quickly as possible. This may shorten the process to less than six months.

Keep in mind, even if the project qualifies for an NWP, the USACE may still require an Individual Permit (IP) for many reasons, one of which is if the project is high profile and should be coordinated with the public. IPs require a 30-day public comment period, whereas project-specific NWP authorizations do not.

In addition to state and federal coastal construction authorizations, coordination will likely be required with the FWC regarding protected species and with the NMFS for EFH and Endangered Species Act (ESA) considerations. The Jacobs feasibility report identified that the project area includes designated critical habitat for the smalltooth sawfish (*Pristis pectinata*), with documented regional occurrences. As a result, ESA consultation under Section 7, administered through NMFS in coordination with the USACE, is anticipated as part of the federal permitting process.

The presence of designated critical habitat for smalltooth sawfish will directly influence design refinement and permit documentation. Living shoreline elements will be configured to avoid unnecessary encroachment into shallow nearshore zones that may function as refuge or foraging habitat. Feature alignment, crest elevation, and spacing will be evaluated to maintain hydraulic connectivity and avoid creating barriers to movement between open water and shoreline habitats. Segmented or permeable configurations will be prioritized over continuous impermeable structures to preserve tidal exchange and habitat accessibility. To reduce impacts to listed species movement, continuous structures will be limited to 75 feet in length to allow unhindered movement and entrapment.

Hydrodynamic modeling will support this effort by quantifying changes in flow patterns, water surface elevations, and wave energy distribution to demonstrate that the proposed design will not result in adverse modification of designated critical habitat. Modeling outputs will be incorporated into the permit application to provide defensible technical documentation of anticipated hydraulic and habitat effects.

Construction sequencing and methods will also be developed with habitat protection in mind. Turbidity control measures, minimization of in-water work duration, and potential seasonal timing considerations will be evaluated in coordination with NMFS and others to reduce short-term impacts. Material selection and structural design may incorporate ecologically compatible or habitat-enhancing elements where feasible, further aligning the project with conservation objectives.

Permit application materials will include detailed engineering drawings, modeling summaries, environmental resource documentation, habitat impact assessments, construction sequencing plans, and erosion and turbidity control measures. If required, sovereign submerged lands authorization and water quality certification components will be incorporated into the permit process. All agency comments will be tracked, documented, and addressed promptly to maintain schedule momentum and ensure full regulatory compliance.

This proactive, habitat-sensitive, and technically grounded permitting strategy will reduce regulatory risk, enhance review efficiency, and improve the likelihood of timely permit issuance consistent with the overall project schedule.



2. Anticipated Challenges and Proposed Solutions

Several challenges are anticipated in advancing this project from feasibility into final design and permitting. One significant consideration is the presence of environmentally sensitive and potentially protected resources within and adjacent to the project area. Based on prior evaluations and the coastal setting, critical habitats may include submerged aquatic vegetation, seagrass beds, mangrove communities, tidal wetlands, Essential Fish Habitat, and critical habitat for the smalltooth sawfish. These resources require careful evaluation.

To address this, environmental resource mapping will be incorporated early in the design process using updated survey data, aerial imagery, and field verification as needed. Proposed shoreline stabilization elements will be configured to avoid direct impacts to critical habitats wherever practicable. Hydrodynamic modeling will also be used to confirm that proposed features do not create unintended scour, shading, or flow alterations that could adversely affect adjacent habitats or undermine structures. Where minor impacts are unavoidable, design modifications such as adjusted alignment, increased spacing, or alternative construction techniques will be evaluated to minimize disturbance.



Another anticipated challenge is accurately predicting shoreline response and wave attenuation performance under varying tidal and storm conditions.

To address this, industry-recognized hydrodynamic and wave modeling tools will be utilized to simulate both existing and proposed conditions. Modeling outputs will allow refinement of feature elevations, spacing, and alignment to ensure the proposed configuration achieves measurable reductions in wave energy while avoiding adverse impacts to adjacent properties, navigation channels, or critical habitat areas.

Regulatory complexity associated with in-water work, sovereign submerged lands, and protected resources is also anticipated. Early and proactive coordination with FDEP, USACE, and resource agencies such as FWC and NMFS will occur during preliminary design to identify potential concerns before formal permit submission. By integrating modeling results, habitat mapping, and detailed engineering justification into the permit application package, we will reduce regulatory risk and streamline review cycles.

Constructability within a shallow marine environment presents additional logistical challenges, including limited access, tidal constraints, weather windows, and turbidity management. These will be addressed through detailed sequencing plans, staging evaluations, and incorporation of turbidity and resource protection measures into the construction documents.

Finally, long-term resilience in the face of sea level rise and increasing storm intensity must be considered. The design will evaluate crest elevations, freeboard allowances, and adaptive design options to ensure that shoreline features maintain performance over time while preserving adjacent habitat functions.

3. Innovative Approaches in Engineering and Design

Innovation in this project will focus on integrating advanced modeling technologies, adaptive coastal engineering principles, and a range of nature-based shoreline stabilization strategies tailored to site-specific conditions.



Hydrodynamic and wave modeling platforms such as ADCIRC and SWAN will be used in combination to simulate storm surge, tidal dynamics, and nearshore wave transformation. These models allow evaluation of multiple design scenarios, including variations in crest height, gap spacing, orientation, and feature geometry. This iterative modeling approach enables performance optimization prior to construction and supports regulatory defensibility. Where appropriate, additional tools such as CMS-Wave or sediment transport modeling modules may be employed to evaluate localized sediment stability and shoreline evolution.

Digital terrain modeling and integrated CAD/GIS workflows will be utilized to combine survey, bathymetric, and environmental resource data into a unified design environment. This allows precise alignment of proposed features relative to seagrass beds, mangroves, and other sensitive habitats, minimizing impacts and improving construction accuracy.



With respect to living shoreline alternatives, multiple stabilization approaches will be evaluated to determine the most effective and environmentally beneficial solution for Tiki Point. These may include low-crested offshore breakwaters, segmented sill systems, rock or concrete oyster reef modules, hybrid living breakwaters incorporating ecological recruitment surfaces, coir fiber logs or biologic-based stabilization systems for transitional areas, and planted marsh fringe restoration. The evaluation will consider hydraulic performance, habitat enhancement potential, constructability, durability, and lifecycle cost.

Where feasible, the design may incorporate textured or ecologically enhanced armor units designed to promote oyster recruitment and marine habitat colonization. These systems can provide both structural wave attenuation and biological enhancement, supporting water quality and habitat objectives. The use of modular, prefabricated elements may also be evaluated to improve installation efficiency and reduce in-water construction duration.

Adaptive design principles will also be incorporated. This may include designing features with the ability to be incrementally elevated or supplemented in the future if monitoring indicates changing conditions due to sea level rise or increased storm frequency. By combining performance-based modeling, habitat-sensitive layout, and adaptable structural concepts, the project will advance beyond traditional shoreline hardening approaches and deliver a resilient, nature-based solution.

Through integration of advanced technologies, innovative shoreline stabilization typologies, and environmentally responsive engineering, the proposed design will maximize resilience benefits while preserving and enhancing critical coastal habitats.

4. Public and Stakeholder Engagement Approach

The Tiki Point Living Shoreline project is located within an established residential and recreational waterfront setting where property owners, boaters, anglers, park users, and local environmental advocates have a direct interest in shoreline conditions and water quality. Based on the findings of the feasibility study, which identified shoreline erosion, wave energy impacts, and habitat degradation at Tiki Point, our public engagement approach is designed to clearly communicate how the project responds to these documented needs while creating visible, long-term community benefits. The goal is not simply to inform the public, but to build enthusiasm, local pride, and a sense of shared ownership in the project.

RES and Jacobs will implement a community-focused outreach strategy that emphasizes accessibility, transparency, and positive storytelling. Engagement efforts will include community workshops held at accessible local venues such as Lashley Park, small-group meetings with adjacent property owners, and on-site informational sessions to explain how the living shoreline will stabilize erosion, enhance habitat, and improve the overall waterfront experience. Visual renderings, before-and-after graphics, and easy-to-understand diagrams will be used to show how the project improves shoreline appearance, supports fisheries, and protects the area from future storm impacts. Clear messaging will focus on benefits that matter most to residents—protecting property, preserving views, enhancing wildlife, and maintaining safe navigation and recreation.

Virtual public meetings will also be used to ensure broad and equitable access to project information for residents throughout the City. Meetings will be conducted using a widely accessible online platform that allows participants to join via computer, tablet, or smartphone, with an option to dial in by phone for those without internet access. Public notice can be distributed through the City's website, social media channels, email distribution lists, and other established communication outlets to maximize awareness.

In addition to in-person engagement, the team will prepare fact sheets, FAQs, and digital content that the County, City and CHNEP can share through websites, newsletters, and social media. Messaging will highlight how the living shoreline builds upon the feasibility study's recommendations and represents a forward-looking investment in City's waterfront resilience. Where appropriate, outreach will also include youth and educational components, reinforcing the project as a community asset and demonstration of environmental stewardship. We can engage local youth and community members in hands-on educational programs as part of the outreach to encourage future volunteerism during implementation.



Feedback from the stakeholder engagement can be used to help to create educational signs to be installed at the project. In addition to the no oyster harvesting signs, this is an opportunity to teach the public about the environment and benefits of the project.

A key advantage of our team is that RES maintains a dedicated Government Affairs and Community Engagement team that will support public outreach, coordinate with local leadership, and position for future construction funding opportunities. This team brings experience in crafting clear,



compelling messaging that resonates with local audiences while also aligning project outcomes with state and federal funding priorities. Their involvement will help maintain community momentum, strengthen support among local and regional decision-makers, and reinforce public confidence in the project as it progresses toward full implementation.

Through early and consistent engagement, transparent communication of benefits, and visually compelling outreach materials, the Tiki Point Living Shoreline project will be positioned not only as an erosion control effort but as a community-enhancing investment that residents can support, celebrate, and take pride in for years to come.

5. Project Management Approach

RES will approach the Tiki Point Living Shoreline project with the purpose of delivering the highest quality technical, financial, and administrative performance from project initiation through completion on March 31, 2027. The project will be managed under a centralized leadership structure led by the RES Project Manager, Megan Reising, with executive oversight provided by the Principal-in-Charge, Nadia Locke, PE. This structure ensures both day-to-day operational control and senior-level accountability. The Project Manager will serve as the primary point of contact and will be responsible for coordinating all disciplines, managing subconsultants, overseeing deliverables, maintaining schedule and budget performance, and facilitating communication with the County, the City and CHNEP. The Principal-in-Charge will provide executive guidance, strategic oversight, and resolution of high-level issues to ensure contractual and funding objectives are achieved. Ms. Locke will also ensure that RES commits the dedicated resources to ensure successful project delivery within the required schedule.

Upon notice of award, RES will conduct an internal coordination meeting followed by a formal project kickoff meeting with the County, the City and CHNEP and project stakeholders. This meeting will confirm objectives, reporting protocols, public engagement milestones, grant preparation timelines, permitting sequencing, and documentation standards. Early in the project, the team will also conduct a site visit following RES protocol, including development of a Health and Safety Plan (as required), photographic documentation, and detailed field notes to inform subsequent technical efforts.

A comprehensive Project Management Plan (PMP) will be developed at project initiation. The PMP will outline deliverables, milestone deadlines, risk mitigation strategies, QA/QC procedures, communication protocols, and meeting schedules. Concurrently, a detailed Microsoft Project schedule will be prepared to define task sequencing, interdependencies, survey and geotechnical timelines, design milestones (30%, 60%, 90%, 100%), public meetings, permitting review periods, grant submission windows, and critical path activities. The schedule will undergo internal quality control review before distribution and will be actively managed throughout the project lifecycle. Schedules will be updated at each billing cycle, at a minimum, to reflect the percentage complete and progress toward identified milestones.

RES utilizes project management controls, including Microsoft Project for scheduling, NetSuite for financial tracking and invoicing, and Procore or Primavera when construction-related coordination warrants additional tracking tools. Task-level budget monitoring will occur continuously, with labor and subconsultant expenditures evaluated against planned allocations. Upon completion of milestone billing periods, the Project Manager and accounting team will review charges against scheduled activities prior to invoice submittal. Invoices will be supported by appropriate documentation and submitted with transparency to facilitate open dialogue regarding scope and budget status.

Risk management will be integrated into routine oversight rather than treated as a separate exercise. Potential schedule risks (e.g., permit review durations), technical risks, grant timing, and stakeholder coordination risks will be identified early and documented within the PMP. Mitigation strategies such as parallel task execution, early field investigations, pre-application coordination, and early grant narrative development will be implemented proactively.

QA/QC will be implemented through RES' established QA/QC Program. Designated Quality Assurance Reviewers (QARs) are experienced professionals trained to evaluate deliverables from technical, regulatory, constructability, and scope compliance perspectives. Structured QA/QC reviews will occur at each design milestone to ensure consistency between hydrodynamic modeling, engineering plans, and technical specifications; alignment with permit and grant requirements; and overall document completeness. Internal self-check audits may be conducted periodically to confirm adherence to PMP protocols, and documentation of these reviews can be provided upon request.

RES team members and subconsultants will be integrated fully into project coordination efforts. All team members will participate in coordination meetings as appropriate and will utilize shared communication tools to ensure transparency and inclusion. This structured yet collaborative management framework ensures accountability and coordinated execution across all disciplines. Through this approach, RES will deliver the Tiki Point Living Shoreline project efficiently, transparently, and successfully within scope, schedule, and budget.



VI. PRESENT EXAMPLES OF RECENTLY ACCOMPLISHED SIMILAR PROJECTS

Belle Isle State Park Shoreline Management

Virginia Department of Transportation | Lancaster, VA (Northern Neck)



Belle Isle State Park was experiencing severe bank erosion behind their Visitor Center along the banks of the Rappahannock River. Since 2007, the shorelines had experienced erosion rates up to 7.6' feet per year along the Rappahannock and had become vertical, actively sloughing banks over 8 feet tall in areas. As high-energy waves impacted the shores, they scoured away at the highly erodible sand on the exposed bank face, exposing newly vulnerable substrate, which further accelerated erosion. This project stabilizes and protects the shoreline via the installation of rock structures and a tidal marsh along approximately 1,000 linear feet of shoreline.

The design consists of eight offshore rock sill structures to act as breakwaters, which reduce wave energy impacting the shoreline. Behind the structures, 0.6 acres of tidal marsh were established and densely planted with 12,000 tidal grass plugs. The vertical bank slopes were graded to a gentle slope and planted with tidal scrub shrub plants and grasses. The uplands behind the Visitor Center that were impacted by construction activity were planted with an upland meadow mix that emphasizes species that are beneficial to pollinators. The project was designed to be resilient during large storm events and will accommodate current estimates of sea level rise.

Living shorelines provide a more sustainable alternative to traditional hard-armored stabilization approaches. Living shorelines incorporate natural habitat elements for organisms, provide better water quality functions, and serve similar, if not better, shoreline protection functions. In addition to the client receiving TMDL credits, the Park benefits from having a stabilized shoreline and intends to provide educational materials and signage to park goers.

Work Completed to Date: Permitting, design, construction, and Year 1 monitoring. The initial NTP was issued in August 2019. Design and permitting continued through January 2021. Construction occurred from January – May 2021.

Work Remaining: The site will be monitored for success annually as requested by the client and as per regulatory requirements.

1. Schedule Control

- Recurring monthly meetings with the client.

AT A GLANCE.

Client Contact

Joseph Parfitt, TMDL Program Manager | 804.339.4365
Joseph.Parfitt@VDOT.Virginia.gov

Contract Value

\$1,868,578

Project Size

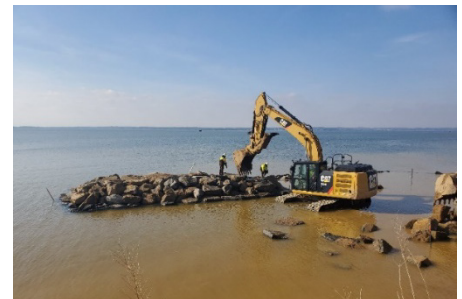
1,000LF

Contract Period

August 2019 – May 2021
Monitoring ongoing

Project Highlights

- TMDL credit generation (572 lbs/yr TP, 861 lbs/yr TN, 938,862 lbs/yr TSS)
- Permitting, design, construction, and monitoring





- Provided a summary report with each monthly invoice that detailed what work was completed, next step to complete, and any items that are potentially behind schedule.

2. Cost control.

- Project structured as time and materials, with a not to exceed budget.
- Monthly invoices summarized percent complete/dollars remaining for each task.
- RES sought quotes from different quarries to secure the best price for imported sand.

3. Problems and means taken to solve them.

- Previously unidentified historic resources were found onsite during the design/permitting stage. A historic well was found exposed on the eroding bank. RES immediately notified the client of the concern, adjusted the design as appropriate to protect the artifact, and worked with the client and regulators to secure approval from DHR (dept of historic resources) to proceed with the project. RES Florida has a senior in house archaeologist so that we are able to resolve these issues quickly and efficiently.
- An existing Spartina marsh had expanded its footprint beyond its mapped extents from the WOTUS delineation by the time construction began. Our construction crews adjusted the design in the field to avoid an unpermitted impact. This concern and approach was communicated with the client and approved. The site continued to perform well with the field change and there were no issues with permit compliance.
- During the second year of monitoring, Spartina alterniflora plantings were struggling to survive due to sand accumulation behind the breakwater structures that elevated the marsh above the species' tolerance range. This was documented in a bi-annual monitoring report, the extents of the struggling Spartina alterniflora were GPS located and mapped, and RES performed a planting of Spartina patens in those areas. Subsequent monitoring events demonstrated survival of the replanted species.



North Bay Village Civic Park Living Shoreline

EAC Consulting | North Bay Village, Florida



North Bay Village (NBV), an island community, is developing a new Civic Park, which is funded by two grants, the first from Florida Inland Navigation District (FIND) and the second from FDEP Land and Water Conservation Fund (L&WCF) grant, totaling over \$900,000. RES was assigned to the project by a NBV Commissioner, due to our experience with living shorelines and Biscayne Bay permitting regulations. RES is responsible for environmental site analysis, environmental engineering and permitting of this unique living shoreline and public waterway access project. To expedite permitting, RES performed a benthic survey under an initial task order prior to project design authorization, which mapped the locations and quality of seagrasses, corals, and benthic resources in the project area. RES worked with the multi-disciplinary project team, including landscape architects, civil / structural / coastal / environmental/electrical engineers, planners, scientists, stakeholders, and university advisors to develop a hybrid living shoreline plan which avoided all seagrass resources and minimized the project footprint to expedite permitting of in-water features. The grants require the project to include a non-motorized boating dock for public access, picnic area with pavilion, nature trail with signage, lighting, landscaping, and bike rack. Replacement of the existing seawall and a children’s splash pad were additions to the project during project implementation and approved by the Village Commission. The living shoreline is designed to be resilient, to meet the Village’s new seawall code which requires adaptation to sea level rise and includes structural stabilization for this island community which currently consists entirely of seawall/bulkheads at the waterfront edge. Innovative design elements such as the living seawall panels/cap fascia with ecological concrete and textured biophilic face were developed during the project design by RES, the coastal and structural engineers, ecological concrete manufacturers, Village staff, as well as an advisory team from University of Miami Civil Engineering department. Environmental permitting is the critical pathway for construction of the living shoreline and ADA accessible floating kayak dock, and RES has worked hand-in-hand with the project design team to streamline the design and permitting timeline to meet grant requirements. The living shoreline design is prepared to be self-mitigating to environmental resources, subject to agency approval. Construction is planned for late 2024.

1. Schedule control.

- The project was funded by two grants and schedule control was a major factor. RES took the lead in managing the grant requirements and grant schedule within the multidisciplinary team. RES kept the Village updated and abreast of the grant requirements and team’s status to meet these requirements, over the duration of the multi year project. RES worked hand in hand within the team to prioritize the grant schedules, and regularly updated the Village and Mayor to stay on track with grant deadlines and to request extensions when possible. RES assigned one dedicated individual, Mr. Shearer who had recent experience with the same FIND and resilience grant requirements for the project, from our City of Miami work, to track the grant schedule versus project progress, and grant requirements, and to provide continued coordination to ensure the project stayed on target. Mr. Shearer coordinated with FIND and the Village to acquire an extension to the FIND grant in order to maintain funding applicability and Village compensation related to the grants.

AT A GLANCE.

Client Contact

Rachel Streitfeld, Mayor
305.756.7171 |

rstreitfeld@nbvillage.com

* Lead Designer Reference

Contract Value

\$78,200

Project Size

0.75 acres

Contract Period

September 2022 – Ongoing

Project Highlights

- Innovative Living Shoreline/Living Seawall Design

Key Staff

- Patrick Shearer, PE
- Mark Clark, CEP



2. Cost control.

- RES maintained cost control by allocating experienced staff to lead the effort and to guide the multi-disciplinary team by focusing on the feasibility and permitting for the project from project inception. By aligning the design to the permit requirements in Biscayne Bay, the project was able to reduce design iterations and to develop a design which avoided and minimized all seagrass impacts to zero. Cost control was maintained by identifying all of the permit considerations, including FPL underwater utility easement, and stormwater permit concerns at the initiation of the project with experienced staff using recent projects in Miami and Biscayne Bay to assert design priorities related to permit agency requirements and site limitations related to Biscayne Bay Aquatic Preserve. RES worked in conjunction with University of Miami to explore innovative coastal adaptations and to evaluate cost alternative technologies and options for the site.

4. Problems and means taken to solve them.

- One setback over the course of the project was during permitting. The project was impacted by SFWMD agency staff turnover during the permitting. This extended the permitting review timeframe. The new SFWMD agency staff required a second benthic study, due to time of year during permitting. The second RES benthic survey showed that seagrass had moved and regrown in areas previously devoid of seagrass. The new benthic survey documented a new eight square foot patch of seagrass which overlapped the project area for a floating ADA kayak launch. The SFWMD agency staff required RES and team to avoid all seagrass impacts, in order to streamline permitting. RES was able to work with the design team and find an innovative design solution which allowed shifting the project layout slightly and re-aligning the layout within limited space to avoid seagrass impacts. A few small corals were present within the design area. A self-mitigating restoration plan was developed by RES for corals onsite within the design footprint.



Pleasant Point Drive Living Shoreline

City of Norfolk Department of Public Works | Norfolk, VA



AT A GLANCE.

Client Contact

Justin Shafer, Project Manager
757.714.6691 |
justin.shafer@norfolk.gov

Contract Value

\$369,884.00

Project Size

- 0.53 acres
- 270 LF of protected shoreline
- 185 LF of restored shoreline
- 0.14 acres of new tidal wetlands

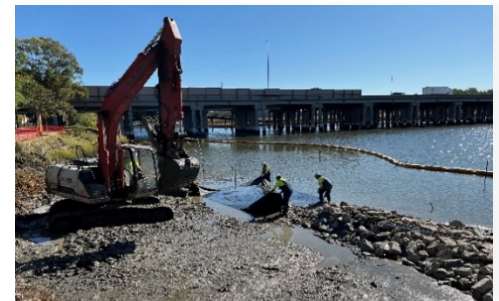
Contract Period

September 2022 – March 2023

Project Highlights

- Winner of the HCCA Excellence in Infrastructure Award
- Construction completed ahead of schedule

The City of Norfolk contracted RES to construct a living shoreline designed by Hazen and Sawyer. Construction included the removal of approximately 360 cubic yards of riverbed muck and subsequent offsite hauling of the material. To prevent future erosion, RES installed 370 linear feet of stone sills using riprap and clean sand backfill. Additionally, 12 linear feet of 24" reinforced concrete pipe and a new end wall were installed. RES made use of on-site, available resources by harvesting 40 square yards of wetland sod and replanting it where it was better suited for erosion control. To ensure the long-term stability of the shoreline, eight trees, 130 shrubs, and 7,054 grasses and plugs were installed. In addition to erosion control, Goose Fencing was positioned on the site to prevent access without affecting the property owner's view.



The site's access and stockpile areas were very small, but the RES crew worked creatively in the limited space using two large excavators and a track truck. Crew members stayed ahead of the tide schedule and planned work accordingly. RES' crew worked efficiently and completed the project ahead of schedule and under budget. The City of Norfolk was very pleased with RES' work and a good relationship was formed in the area. Additionally, RES was selected as a winner of the Heavy Construction Contractors Association (HCCA) Excellence in Infrastructure Award for the positive impact the project had on the surrounding community.

1. Schedule control.

- RES used MS Project to track the project's schedule and worked closely with the crew to remove any constraints and provide the necessary resources to complete the project slightly ahead of schedule.

2. Cost control.

- The project had an established budget based that we based on the competitively bid estimate that we had submitted for the project. We were able to utilize our depth chart of vendors and suppliers to bring the project in slightly under budget.

3. Problems and means taken to solve them.

- There were no real problems associated with the project. It was a fast paced project and went very smoothly.



Mummichog Living Shoreline Nutrient Bank

RES-owned Bank | Gloucester County, Virginia



Breakwater Completion

Developed under Virginia’s nutrient trading framework, the Mummichog Living Shoreline Nutrient Bank project helps regulated point and nonpoint sources meet the Chesapeake Bay TMDL requirements by delivering verified nutrient reductions.

The project is located within the Jones Creek sub-watershed within the Lower York River, within the York watershed (HUC 02080107), with a service area spanning multiple watersheds across coastal Virginia. The shoreline has a medium-to-high fetch of 2-10 miles and experienced high wind, wave, and storm-surge energy, intensified by recent sea-level rise. The shoreline erosion caused bank failure and rapid land loss. The banks onsite range from 11 to 22 feet in height, with an eroding face composed primarily of compacted, sandy loam soil.

RES designed a living shoreline solution tailored to these conditions, incorporating offshore stone breakwaters, beach nourishment, and phased slope stabilization to a 4:1 ratio. Native tidal marsh, shrub, and upland vegetation were selected to restore intertidal habitat, improve shoreline stability, and maintain natural sediment and tidal processes. The project delivers substantial annual reductions in nitrogen, phosphorus, and suspended solids, while also improving aquatic habitat, enhancing shoreline resilience, and long-term protection of downstream water quality.

1. Schedule control.

- RES met with a land owner bi-weekly, and as available to review schedule with the client.
- Maintained solid communication with land owner, Gloucester county, DEQ

2. Cost control.

- Meetings with team to review billable hours.
- Received competing quotes to select cost efficient solution.
- Maintained proactive team communication to prevent lag time.

3. Problems and means taken to solve them.

Grade tie:

- Construction team met with engineering to revise grading.
- Engineering provided updated graphics to allow for accuracy.

AT A GLANCE.

Bank Sponsor

Rick Atkinson, General Manager
804.729.8989 | ratkinson@res.us

Project Size

475 LF

Project Timeframe

Design & Permitting: 4/2025 – 9/2025

Construction: 9/2025 – 1/2026

Project Type

Living Shoreline Nutrient Bank

Project Highlights

- Preconstruction bank heights ranged between 11 and 20 feet
- RES maintains a great working relationship with the landowners
- The bank is protected utilizing breakwaters constructed at a height to withstand larger storm events



Disposal of left over materials:

- Team met with an adjacent land owner to allow for spread of excess mulch and fill.

Access to project site:

- Poor access to site did not allow for construction equipment and trucking to get to the project.
- Made agreement with adjacent land owner to allow for access and material staging.



Pre-restoration bank heights



Jose Marti Park Adaptive Re-Design

Curtis + Rogers Design Studio | Miami-Dade County, City of Miami, FL



RES provided civil and environmental engineering services that include environmental site analysis and impact evaluations, vulnerability assessments, resiliency planning, and design related to drainage improvements, green infrastructure, and stormwater management at the Jose Marti Park site on the west bank of the Miami River in the heart of Downtown Miami. This project site is approximately 13 acres and consists of a waterfront park, paths, playgrounds, a pool complex, gym, recreation and community center, basketball courts, baseball fields, exercise equipment, and waterfront access via seawalls and imbricated shoreline areas. I-95 lies over a portion of the site, and overhangs the gym building, basketball courts, and parking areas – and this area was historically the location of the Tent City during the Mariel Boatlift in the 1980s. The park is the center for the community in this area of Little Haiti and regularly experiences tidal flooding from the river and this is exacerbated during the King Tide portions of the year, and hurricane season. With future sea level rise projections showing increased water levels for the park, our team of architects, engineers, scientists, and planners has been tasked with adapting the waterfront to future predicted sea level rise tidal and storm surge elevations that will set a model for other properties along the Miami River and other portions of the city that can benefit from this adaptive design.

The project was initiated by a FIND grant related to requirements for a raised riverwalk, 1,100 linear feet of living shoreline, kayak launch, and improved seawall at the site. The project schedule had to be expedited, including during the Covid pandemic, to meet the FIND grant deadline which was surpassed by the project team. RES' role on the project was to provide civil/environmental engineering for sea level rise adaptation and stormwater upgrades to the site to reduce onsite and neighborhood flooding and to provide water quality treatment using nature-based solutions to the maximum extent practicable. RES' role was to lead nature-based solutions related to stormwater retrofits and living shoreline design. RES conducted an evaluation on the feasibility of pump stations and drainage wells to reduce flooding, and deep drainage wells were designed into the project to improve resilience and redundancy in drainage design. RES provided environmental engineering and science, and ecological design considerations for the living shoreline, living seawall, habitat restoration, and green infrastructure components of the project. RES performed the tree inventory and Florida bonneted bat survey for the site. We were responsible for environmental permitting for the stormwater improvements and received the local Miami-Dade DERM stormwater permit on the first submittal. RES coordinated FDEP/SFWM environmental resource permits and drainage well permits, assisted with USACE permitting, and was the lead agent for the FDOT District Six construction

AT A GLANCE.

Client Contact

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 Curtis + Rogers Design Studio
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* Lead Designer Reference

Contract Value

\$250,990 (Consulting)
 \$23,243,422 (Construction)

Project Size

13 acres

Contract Period

October 2019 – Ongoing

Project Highlights

- FIND grant
- June 2023, Awarded 1st WEDG verification in Florida
- March 2021, Awarded ~\$14M- – CDBG-MIT General Infrastructure grant

Project Staff

- Patrick Shearer, PE
- Jim Orioles, PE
- Esteban López, PE
- Justin Freedman, MS



agreement related to improvements in the FDOT right-of-way under I-95 that FDOT leases to the city. RES met with the FDOT District Six District Secretary and City of Miami attorneys several times to coordinate permit reviews and improvements at the site.

RES provided site analyses, assessments, and design for innovative stormwater retrofits involving LID design for this hyper-urban, green resilience project. Components of the environmental site analysis and vulnerabilities and resiliency assessments included heat island effect considerations, energy resource considerations, stormwater and green infrastructure assessment, community outreach, and site design related to the stormwater and environmental aspects of the project. The project is a pilot designed to showcase and scale up resiliency and adaptation design measures, to create a toolbox for Miami and South Florida to adapt with sea level rise, and as a model for other parts of the Riverwalk/Baywalk in Miami. A variety of climate-change-oriented sensors, metrics, and grant funding approaches were included in RES' project evaluation to assist with project funding and resiliency. This project features stormwater design conveying green infrastructure such as permeable pavement with regenerative underground exfiltration chambers, smart stormwater infrastructure, bio-retention/bio-swale planting areas; tree planter retention areas with structural soils; bio-sorption activated media (BAM); pollutant removal devices and filtration; solar power; stormwater engineering art; and climate change concepts through public education and outreach. The stormwater retrofits have been integrated into the living shoreline aspects of the project, and kayak ramp, with the intent to reconnect the historic hydrologic cycle to the water's edge portion of the river, enhance ecology for oyster restoration, and provide resilience for the park and neighborhood. Tidal valves and backflow preventers with manatee protection are being installed on existing outfalls to prevent "sunny day flooding" and minimize tidal water from the river from impacting drainage at upstream locations.

RES led the natural systems and green infrastructure design and integrating the LID principles to showcase stormwater management as functional environmental art which ties the site to the Everglades and Biscayne Bay natural areas of Miami and the Miami River. Innovative living seawall elements are part of this design and reduce carbon footprint. The final design has been bid and is going to construction in early 2025 and is part of the Tranche 1 of the City of Miami Forever Bond general obligation bond program. The project team has many partners, and the New York-based Van Alan Institute has led a separate and concurrent study and series of events to educate the community on sea level rise, climate change, gentrification, and worked with our project team to create a project that provided equity, economy, and ecology for the citizens, the Miami River, and the City of Miami. The project is intended to improve pedestrian safety, harness social interaction and business development, and to improve water quality and flood reduction in the district. ~\$18 million was awarded for a CBDG grant, FIND, and local grants. The project is the first in Florida to receive the WEDG verification, which is a green rating system for waterfront sites.



1. Schedule control.

- The City authorized the project a few months prior to the Covid-19 worldwide epidemic. The project schedule was aggressive and was overshadowed by two grants which dictated the project schedule. RES performed this project during covid, and our team seamlessly integrated into the initiation of online meetings during this intense project schedule. Not only was the project breaking new ground in terms of innovation to sea level rise in Miami, but very high in the public eye and required extensive neighborhood involvement, public meetings, commissioner meetings and updates, and presentation to various stakeholders, city groups/departments, and the Miami resilience committee for approval and recommendations. The schedule was driven by grants, and over 20+ public meetings including stakeholders, agency staff, FDOT, city and state lawyers were performed and lead by Mr. Shearer of RES for the nature based solutions and civil engineering aspects. We informed our client of grant and permitting requirements, and maintained extensive coordination the keep the project on schedule and on track to deliver beyond the city's expectations. Several submittals were made before the deadline dates occurred. Due to resilient design RES was able to secure the Miami Dade County DERM Class II stormwater permit on the first submittal and this helped the project be ahead of schedule. RES lead the team



related to green infrastructure and was a strong proponent of hybrid living shoreline designs, and informed both the coastal engineer and landscape architect of how to streamline permitting and design for these features. This experience demonstrates RES' capacity to maintain schedule control, and to maintain the goals of the client.

- RES brought innovative shoreline concepts to the team, through several vendor relationships, to inform the coastal engineer and landscape architects of the opportunities for the site. RES utilized the coastal engineer's benthic survey to document historic oyster recruitment at the site and to aid oyster restoration within the heavily polluted Miami River. RES stormwater design restored the local aquifer function, in conjunction with the living shoreline design, which allows for a slower release of now treated freshwater to the Miami River, which can aid in seagrass and oyster restoration near the site. The site includes a kayak launch which RES assisted to demonstrate the feasibility of kayaking this working river location, which is a working port connected to the Bahamas and Caribbean. The integration of urban infrastructure upgrades with nature-based shoreline elements required close coordination with municipal stakeholders, a lot of educating stakeholders and design professionals, and careful alignment with regulatory requirements in a constrained, developed setting, including FDOT coordination for the area under I-95 which was designed as a landward retreat living shoreline. One setback, FDOT and the Miami River commission disapproved of mangroves on the project. RES was able to work with the coastal engineer and landscape architect to recommend suitable replacements and demonstrate viability for coastal cordgrass historically found in this area to replace mangroves.

2. Cost control.

- Cost control has been a recurring issue on this extensive project. City of Miami has faced budget cuts, and RES and team have had to value engineer the project and to bid it three times with the city to be able to work within the City's budget to select a suitable contractor. The initial bids came in higher than the city wanted due to materials limitations resulting from the Covid epidemic. The second bid only had one contractor bid, and the city deemed this not cost competitive. The city coordinated with the design team for the third bid, in order to value engineer the project to within the City's new budget. RES was able to value engineer the design with the team to cut costs to meet the City's needs and preserve the intent of the project and the 150% pollutant load reduction required for Miami River/Biscayne Bay and to meet the new state stormwater rule.

3. Problems and means taken to solve them.

- Any innovative project is bound to run into problems, and RES addressed client concerns and aided navigation of this large project through the permit agencies and a gauntlet of stakeholders with various counter-points of view to the flooding adaptation project that the team was assigned. One particular problem to note was the extents of the project were insufficient to defend against the riverfront flooding in the area due to low areas on each end of the project, north and south of the project. RES used our hydrology and hydraulics analysis of the site, including topographic survey, and flood modeling to justify that other areas of the adjacent properties should be included in the project to protect from King Tide flooding. RES identified city owned right of way that could be used to fortify this section of waterfront, from low spots to allow King Tide flooding. RES and the team were authorized to add this southern right of way project area to the shoreline improvements, which allowed to effectively raise other sections of the shoreline to prevent tidal flooding. For the north end of the project, the team identified a parcel that FDOT was working on. Coordination was performed with the City and FDOT and it was coordinated that in the future once the FDOT project was completed, that FDOT would dedicate this adjacent parcel to the City. The parcel was being raised and adding shoreline protection, so this allowed for RES and team to contribute additional flood protection to this low lying and heavily populated Little Havana neighborhood. RES designed and additional deep drainage well to address drainage including the 100-year storm, to prevent building flooding in this low lying coastal area.



Statewide Coastal Restoration Guide with a Living Shoreline Chapter

FDEP | Statewide, FL

Alongside the University of Central Florida (UCF), RES was selected by the FDEP to develop a Statewide Coastal Restoration Guide (SCRG) with a Living Shoreline Chapter for use by practitioners to identify and understand the underlying factors critical for project success, especially at the statewide level, and improve efficiency and effectiveness of deploying nature-based solutions, such as living shorelines. RES’s responsibilities on this project include assembling a statewide steering committee and meta-analysis team that help inform and guide the plan development process and conduct a meta-analysis of the existing living shoreline projects in Florida to identify key commonalities (predictor and response variables) that can be used to model and predict the key characteristics necessary for achieving successful restoration outcomes at a given location and scale. RES coordinates with the Florida Estuarine Restoration Team (FLERT) steering committee and meta-analysis team through quarterly meetings that serve as the primary mechanism for collecting input and guidance used to support the project goals. In collaboration with UCF, RES developed an Implementation and Quality Assurance Plan (IQAP) in April 2024 that outlined the available data, data sources, and existing models, described the research objectives, provided a framework for the meta-analysis process and statewide model analysis, and identified data gaps. RES is worked with UCF to identify high-priority locations for pilot studies that will provide opportunities to test a variety of nature-based living shoreline techniques across variable shoreline conditions and locations. The pilot studies will be conducted to further test and optimize the statewide model, identify additional data gaps, and help inform where future studies and data collection should be focused. The upcoming final tasks of the project require updating the IQAP based on the results of the completed pilot studies and developing the final guide document, which will include the final model, a design suitability matrix for future living shoreline projects, and chapters incorporating an array of factors and shoreline conditions that exist around the state. The model will also leverage available data to evaluate resiliency variables associated with changing climate conditions (sea-level rise), severe weather events, and socio-economic factors.

AT A GLANCE.

Client Contact

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University of Central Florida (UCF)
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Contract Value

\$240,000

Contract Period

November 2023 – March 2025

Project Type

Advisory Services

Project Highlights

- Collaborating with subject matter experts
- Developed an Implementation and Quality Assurance Plan
- Supported completion of a meta-analysis of the statewide body of work
- Developing a Statewide Coastal Restoration Guide and model

Key Staff

- Matthew Martin, GISP
- Lauren Jennison
- Patrick Shearer, PE

1. Schedule Control

The project schedule was governed by clearly defined milestone deadlines and performance standards established in the grant, including hard due dates for each task and deliverable. The contract included enforceable consequences for late submittals, including a five percent reduction in task funding per day of delay, which reinforced strict adherence to the approved timeline. To manage these requirements, RES implemented a milestone-driven schedule framework aligned with the project timeline, sequencing major deliverables such as FLERT establishment, development of the Implementation and Quality Assurance Plan, statewide meta-analysis execution, pilot studies, and staged preparation of the SCRG. Deliverables were prepared in incremental stages, outline, draft, review, revision, and final submission, to allow adequate review time and reduce the risk of schedule disruption due to extensive revisions. Quarterly FLERT meetings, combined with weekly coordination calls with UCF and FDEP, provided structured checkpoints to ensure alignment, address technical questions early, and confirm that work remained on track. Through proactive planning, continuous coordination, and disciplined milestone management, the project was successfully delivered in accordance with the grant-mandated schedule.

2. Cost Control

The SCRG project was administered under a fixed grant award structure and contracted based on defined task-based funding amounts, based on the Scope of Work. Because task budgets could not be exceeded and payment was contingent upon FDEP acceptance of deliverables, rigorous cost control measures were implemented both externally and internally. Externally, the contract established firm task funding limits, prohibited interim payments, and tied compensation directly to successful



completion of deliverables, creating a structured financial accountability framework. Internally, RES developed a detailed cost estimate broken down by task, subtask, labor category, and projected hours, which served as the project's baseline budget. The RES Project Manager utilized internal financial management software to track percent completion against remaining budget in real time, monitor burn rates, and forecast cost at completion for each task. Weekly coordination meetings with UCF and FDEP minimized scope creep and avoided duplicative effort, while phased deliverable development reduced the risk of rework. These combined measures ensured that all work was completed within the allocated task funding amounts while maintaining technical quality and compliance with grant requirements.

3. Problems and means taken to solve them.

The SCRG project encountered several challenges that required proactive management and coordination. First, the original Scope of Work was intentionally broad and programmatic in nature, which created early ambiguity regarding the level of technical detail, data requirements, and deliverable expectations. To resolve this, RES and UCF worked closely with FDEP at the project kick-off to refine scope elements into clearly defined methodologies, deliverable outlines, and review protocols, thereby reducing uncertainty and preventing rework or budget impacts. A second challenge involved a delayed project kickoff due to contracting issues between FDEP and UCF, which compressed the available working timeframe while strict grant deadlines remained in place. The team mitigated this by collaboratively resequencing tasks, refining internal schedules, and prioritizing early scope clarification to maintain compliance with milestone deadlines. A third challenge was coordinating a large and diverse group of stakeholders through the FLERT Steering Committee, which included multiple regional ERTs, academic institutions, regulatory agencies, and non-profit organizations with differing perspectives and priorities. To manage this complexity, the team utilized a centralized SharePoint platform for document control, deployed online surveys to efficiently gather structured feedback on key technical elements, conducted quarterly virtual workshop meetings to build consensus, and prepared detailed meeting agendas and minutes to document decisions and support development of the statewide model and design matrix. Through early scope refinement, structured stakeholder engagement, disciplined documentation, and proactive schedule adjustments, the project team successfully delivered the project in alignment with grant requirements despite administrative, technical, and coordination challenges.



VII. EXPERIENCE AND CAPABILITIES

1. Advanced Geotechnical and Topographic Survey Work

Our team, comprised of RES and our partners, excels in both self-performing work and strategically engaging specialized subcontractors when necessary. While we pride ourselves on our in-house capabilities, we recognize that certain specialized aspects of a project benefit from external expertise. Our process involves carefully selecting competent and reliable subcontractors who consistently meet or exceed required insurance, safety, and regulatory standards. We ensure all subcontractors adhere to strict safety protocols, including providing Occupational Safety and Health Administration (OSHA) logs, signing our EHS&S Code of Conduct, and performing daily Activity Hazard Analyses. This structured approach to subcontractor management allows us to control costs, maintain high-quality standards, and deliver projects on time and within budget.

Our extensive experience working alongside subcontractors has cultivated a deep understanding of project requirements and how to seamlessly integrate diverse teams. For instance, we have frequently engaged OHS and Schnabel.

Advanced Geotechnical: Our team frequently collaborates with Schnabel to provide comprehensive geotechnical services, particularly for complex hydrogeological restoration and living shoreline projects. We have engaged Schnabel as a subcontractor for specialized geotechnical evaluations. RES believes that both slope stability analyses and cone penetrometer testing (CPT) will be required for the Tiki Point Living Shoreline project.

RES conducted geotechnical slope stability analyses to determine potential design recommendations for failing shorelines. For instance, in the Town Center Condos Living Shoreline Stabilization project, a geotechnical slope stability analysis was critical due to condominium units being approximately 10 feet from a failing bank. This analysis helped inform the design of shoreline stabilization plans.

RES has conducted comprehensive subsurface explorations, often through CPT, to evaluate the suitability of the substrate for offshore structures and predict potential settlement. This data is essential for understanding the bearing capacity of soils, especially since many living shoreline projects are built in areas with poor soil conditions. RES considers initial and long-term settlement concerns and integrates foundation layers, such as geotextile fabric stabilization, when necessary to distribute structural loads and prevent settlement.

Our team also coordinates geotechnical testing to support site design and hydrologic and hydraulic modeling. For example, in a project involving a wetlands mitigation bank, we performed soil boring investigations to understand fill patterns and estimated depths to historic land surfaces. This detailed geotechnical work ensures that our living shoreline designs are structurally sound, environmentally appropriate, and capable of withstanding coastal forces while promoting ecological benefits.

Topographic Survey Work: OHS is a Florida-based company specializing in waterfront engineering, surveying and mapping, and environmental services. Their team of engineers, surveyors, and biologists collectively possesses extensive experience from numerous waterfront projects across Florida, the Caribbean, and Central America.

Our company has collaborated with OHS on various projects, where they have demonstrated their capabilities in coastal and bathymetric surveys. For instance, in the Chaves Lake Bathymetric Survey, OHS provided a certified bathymetric survey, adhering to the Standards of Practice set forth by the Florida Board of Professional Surveyors and Mappers. This project included detailed depth measurements and sediment probes, highlighting their expertise in submerged land assessments.

In projects requiring bathymetric data, such as for proposed breakwater installations, our approach incorporates available bathymetric and tidal data to evaluate wave energy patterns, sediment transport, and current dynamics. This information is critical for informing breakwater spacing, elevation, and material sizing to ensure effective wave energy dissipation and sediment accretion. Our multidisciplinary design team, including coastal engineers, marine scientists, and GIS analysts, collaborates to produce environmentally sensitive design packages that meet constructability standards and long-term resilience goals, informed by bathymetric data and shoreline erosion assessments.

2. Ecological Assessment and Environmental Services

Successful implementation of the Tiki Point Living Shoreline requires a comprehensive understanding of coastal ecology, protected species, wetland systems, and marine resources. RES brings extensive experience in South Florida conducting



ecological assessments, regulatory coordination, and habitat restoration services for both public and private clients. Our multidisciplinary team of ecologists, biologists, marine scientists, and GIS specialists works closely with coastal engineers to ensure that restoration and shoreline stabilization solutions are environmentally sound, permissible, and resilient.

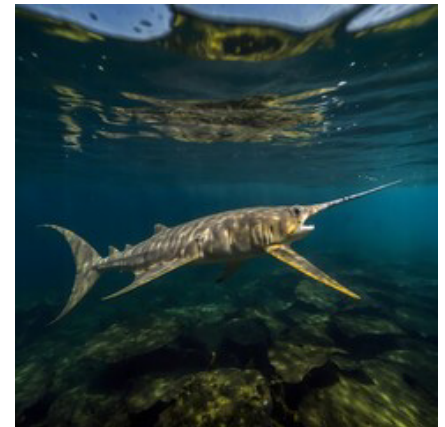


Wetland Delineation and Evaluation: Living shoreline projects frequently involve work within wetlands, tidal systems, and sovereign submerged lands. RES staff have delineated thousands of acres of wetlands throughout Florida and are highly experienced in both Florida Unified and Federal wetland delineation methodologies. For Tiki Point, we will conduct detailed wetland and jurisdictional boundary assessments to confirm the extent of tidal wetlands, mangroves, SAV, and other regulated resources.

Our team utilizes GPS survey equipment, aerial interpretation, and GIS analysis to accurately document wetland limits and habitat conditions. Several of our senior scientists are former regulators and have experience

reviewing jurisdictional determinations from an agency perspective. This background allows us to proactively prepare documentation that meets regulatory expectations and minimizes delays during agency review. Early coordination with agencies having wetland jurisdiction will support a clear permitting pathway.

Wildlife Surveys and Protected Species Coordination: Based on prior evaluations and the coastal setting, critical habitats may include submerged aquatic vegetation, seagrass beds, mangrove communities, tidal wetlands, EFH, and critical habitat for the smalltooth sawfish. These resources require careful evaluation. RES ecologists have decades of experience conducting habitat assessments and protected species surveys throughout Florida and the Gulf Coast. Our team routinely evaluates habitat suitability, designs and implements species-specific surveys, and develops avoidance and minimization strategies consistent with state and federal regulations.



Our experience includes coordination with the FWC, FWS, and NMFS for species such as manatees, sea turtles, shorebirds, wading birds, and other coastal and marine species. For Tiki Point, we will evaluate potential impacts to protected species and develop construction sequencing, turbidity control, and seasonal work windows as needed to minimize disturbance.

This proactive approach will support permit applications, reduce regulatory risk, and ensure the living shoreline design enhances rather than adversely affects local habitat conditions.

Habitat Assessments and Conservation Planning: RES personnel have prepared and secured approvals for Environmental Resource Permits across Florida, including projects in sensitive coastal and estuarine environments. Our ability to integrate engineering design with ecological planning provides a comprehensive approach to shoreline restoration projects like Tiki Point.

For this project, we will evaluate existing habitat types, assess shoreline condition and ecological function, and identify opportunities to enhance habitat value through marsh creation, reef features, and living shoreline components. Our team understands how to design projects that achieve both shoreline stabilization and ecological uplift, including nutrient reduction, fisheries habitat enhancement, and long-term resilience. Where applicable, we will incorporate conservation measures that align with regional habitat management objectives and water quality goals.

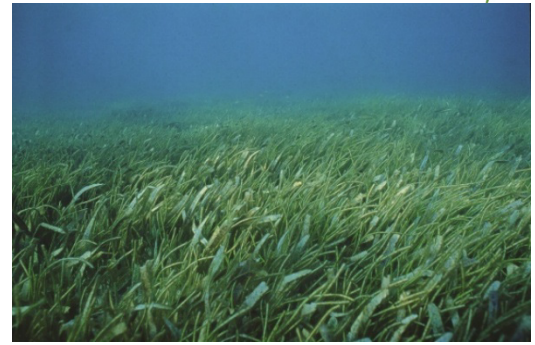
Marine and Coastal Ecology: The Tiki Point Living Shoreline will require careful consideration of marine and estuarine resources. RES has extensive experience in coastal permitting and marine ecology, including:

- Benthic resource surveys (seagrasses, oysters, corals, sponges, and other marine invertebrates)
- Mangrove surveys and permitting
- Water quality monitoring and turbidity compliance
- EFH assessments
- Manatee observation and protection plan development



- Sovereign Submerged Lands and Joint Coastal Permit coordination
- Sediment characterization and sampling where necessary

Our marine scientists and engineers work collaboratively to ensure that shoreline stabilization features are designed to maintain tidal exchange, avoid impacts to submerged aquatic vegetation, and enhance fisheries habitat. Where appropriate, living shoreline elements such as oyster reef structures or marsh platforms can be configured to improve ecological function while attenuating wave energy.



3. Develop of shovel-ready Engineering and Design Plans and Cost Estimates

RES possesses robust capabilities for delivering shovel-ready engineering and design plans and cost estimates, primarily due to our integrated, turnkey approach to large-scale construction and restoration projects. This comprehensive model allows us to manage all phases of a project, from initial assessment and design through implementation, monitoring, and long-term maintenance, ensuring efficiency and cost-effectiveness.

Our ability to produce shovel-ready plans stems from integrating design and construction responsibilities under a single entity. This approach eliminates gaps in responsibility that often lead to change orders in traditional Design-Bid-Build models. By involving our experienced construction teams in the design process, we can make informed decisions in the field based on actual site conditions and incorporate best practices learned from similar projects. This streamlines the planning process and ensures that designs are practical and buildable from the outset.

Our ability to provide highly accurate and reliable cost estimates for shovel-ready engineering and design plans is significantly enhanced by the direct involvement of our construction team, a practice that sets us apart in the engineering field. This integrated approach is a cornerstone of our turnkey project delivery model. Unlike traditional engineering firms that typically separate design from construction, our model embeds constructability expertise directly into the design process. This means our experienced construction personnel contribute their real-world knowledge from the earliest stages of project development. This early involvement allows us to:

- **Refine Material and Labor Estimates:** Our construction team provides current, real-time insights into material costs, availability, and labor rates, which can fluctuate significantly. For instance, rough estimates for riprap placement can be around \$2,200 per linear foot, and dredge and fill around \$40 per cubic yard, but these figures can vary by as much as 50% depending on specific project conditions. By having our construction experts on board, we can fine-tune these numbers to account for each site's unique characteristics, resulting in more precise cost projections.
- **Identify Efficiencies and Cost Savings:** Our construction team helps identify opportunities for value engineering and cost-saving measures during the design phase, rather than post-design. They can recommend construction methods that are more efficient or identify alternative materials that offer comparable performance at a lower cost, thereby preventing costly revisions during execution. For example, specific cost estimates often detail unit costs for various activities, like road maintenance, gate replacement, or culvert replacement, providing a granular view of potential expenses.
- **Account for Site-Specific Challenges:** Construction teams are adept at anticipating potential challenges related to site access, logistics, and unforeseen ground conditions that can significantly impact project costs. Their input helps incorporate realistic allowances for items such as mobilization/demobilization, clearing and grubbing, and managing unsuitable soil, which can be substantial components of overall construction expenses.
- **Provide Detailed Cost Breakdowns:** Our cost estimates are meticulously prepared, breaking down expenses by specific work items and activities. This includes not only direct construction costs like excavation, structure demolition, and material installation, but also indirect costs such as environmental assessments, design and permitting, and bidding and construction phase services. We also factor in general cost items like mobilization, contractor general conditions, and bonding, and construction contingencies to provide a comprehensive financial picture.



4. Preparation of permit applications and agency coordination

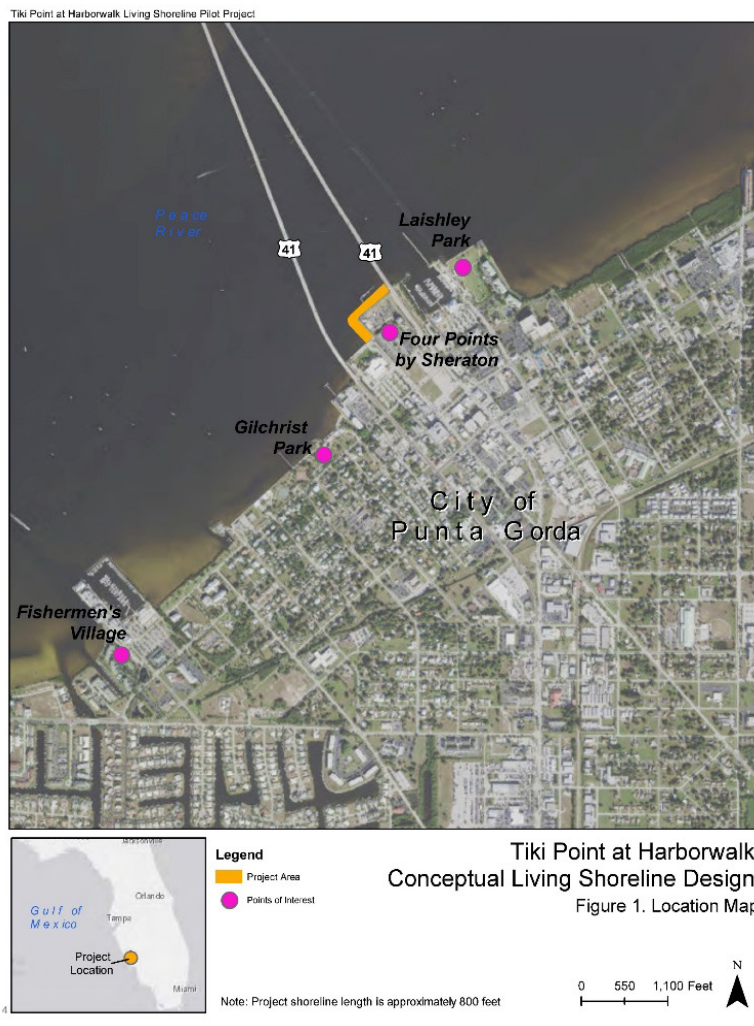
RES has extensive experience preparing permit applications and conducting pre-application agency coordination throughout Florida and along the Florida coast. Our team brings decades of collective experience navigating ERP, Clean Water Act authorizations, NPDES permits, coastal construction permits, NEPA documentation, mitigation planning, and related local, state, and federal approvals. We routinely coordinate with the FDEP, USACE, FWS, FWC, NMFS, Water Management Districts, the U.S. Coast Guard, EPA, and local municipalities to advance projects efficiently through the regulatory process. Senior leadership anchors this capability.

Mark Clark provides expertise in permit applications and pre-application coordination. Supporting Mark is a deep bench of permitting and compliance professionals with specialized expertise. Team members bring decades of experience in permitting and compliance, pollutant load analysis, mitigation planning, wetland delineation, compensatory mitigation banking, habitat restoration permitting, and permit tracking systems. Our staff includes professionals with backgrounds in soil and water science, ecology, biology, marine science, urban forestry, hydrology, and civil and environmental engineering. Several team members have former regulator experience, providing valuable insight into agency review processes and expectations.

Our team's permitting services are grounded in rigorous environmental analysis and defensible documentation. Along Florida's coast, RES brings specialized experience addressing the regulatory and technical challenges of sensitive marine and estuarine environments. We conduct benthic resource surveys, seagrass mapping, mangrove assessments, and water quality monitoring to inform permit documentation. Our team understands the unique conditions of coastal systems, including high water tables, sandy soils, saline environments, tidal influence, and wave energy, and incorporates those considerations into permit narratives and supporting technical analyses. Our team routinely prepares applications for projects involving shoreline stabilization, living shorelines, dredge and fill activities, coastal restoration, and habitat enhancement, ensuring consistency with state and federal coastal resource regulations.

Pre-application agency coordination is a cornerstone of our approach. RES proactively engages regulatory staff early in project development to present conceptual plans, discuss potential impacts, confirm data requirements, and identify mitigation expectations. This early coordination reduces uncertainty, aligns technical analyses with agency priorities, and minimizes the likelihood of delays during formal review. Our team prepares meeting materials, technical memoranda, and follow-up documentation to ensure agencies have clear, concise, and defensible information from the outset. We maintain detailed permit tracking systems to monitor review timelines, information requests, and compliance obligations through construction and post-construction reporting.

Across Florida and its coastal regions, RES has demonstrated the ability to successfully advance projects through complex regulatory frameworks by combining technical depth, thorough documentation, proactive coordination, and disciplined permit management. Our cumulative experience spans several decades and is supported by a multidisciplinary team, which positions us to efficiently prepare permit applications and conduct pre-application coordination that reduces risk, maintains schedule momentum, and supports successful project delivery.



Tiki Point at Harborwalk Conceptual Living Shoreline Design | Figure 1. Location Map | Jacobs Technical Memorandum August 7, 2018



5. Project Management, including conducting meetings, preparation of presentations, and preparation of responses to stakeholder comments

EXPERIENCE AND CAPABILITIES IN PROJECT MANAGEMENT

RES brings a disciplined, transparent, and performance-driven approach to project management, with particular strength in conducting meetings, preparing clear technical presentations, and developing comprehensive responses to stakeholder comments. Our approach is built on structured planning, defined roles and responsibilities, proactive communication, and rigorous documentation to ensure projects are delivered efficiently and collaboratively.

At the outset of each project, RES develops and implements a dynamic Project Management Plan (PMP) that defines scope, schedule, budget controls, communication protocols, and quality assurance procedures. The PMP establishes a clear team structure led by a Project Manager who serves as the primary point of contact for the client and stakeholders. Phase leads such as design, permitting, and monitoring leads are identified and integrated into a RACI (Responsible, Accountable, Consulted, Informed) matrix to clearly define responsibilities across the team, subcontractors, and client representatives. The PMP is treated as a living document and is updated throughout the project lifecycle to reflect evolving conditions, stakeholder input, and technical refinements.

Beyond meeting facilitation and stakeholder coordination, RES integrates risk management, quality control, and compliance oversight into every project. Potential risks, including schedule delays, cost impacts, utility coordination issues, or regulatory constraints, are identified early and monitored throughout execution. Safety and environmental compliance plans are developed and enforced, and quality control testing is performed in accordance with applicable standards. Subcontractors are carefully selected and managed, with defined performance expectations and reporting requirements.

Scope changes are managed through formal change order procedures to ensure transparency and mutual agreement. All project documentation, including schedules, meeting minutes, comment matrices, compliance records, and financial documentation, is maintained systematically to ensure accountability and audit readiness.

CONDUCTING MEETINGS

Effective meetings are central to RES' project delivery model. Internally, regular coordination meetings are held during active phases of design, permitting, and construction to ensure alignment across disciplines, maintain accountability, and track progress against milestones. Meeting frequency is scaled to project intensity and phasing. Meetings are held weekly during critical phases and biweekly or monthly as appropriate. Agendas are prepared in advance, action items are documented, and responsibilities and due dates are clearly assigned to maintain forward momentum.

Externally, the Project Manager leads all client and stakeholder meetings to ensure consistency in messaging and responsiveness. These meetings may include progress updates, milestone reviews, public briefings, regulatory coordination sessions, and construction progress meetings. For construction-phase projects, RES has experience conducting structured weekly construction meetings where contractors are required to provide updated critical path schedules and short-term look-ahead schedules to proactively manage sequencing and risk. Pre-construction conferences and pre-bid meetings are also facilitated to ensure clarity of scope, expectations, and compliance requirements before work begins.

Public outreach meetings will be led in combination by the project manager and the lead engineer.

RES Government Affairs and Community Engagement professionals will assist with meeting logistics, messaging strategy, and documentation to ensure information is conveyed in a clear, accessible, and positive manner. Meetings will be conducted in an organized and interactive format, typically including a presentation outlining project goals, anticipated benefits, schedule, and design progression, followed by an open question-and-answer session and opportunities for written comments. Visual exhibits, renderings, and summary handouts will be used to help stakeholders understand the project in practical terms. All meetings will be documented through sign-in sheets, presentation materials, and meeting summaries, capturing key comments and responses.

Many technical people can overlook the importance of how the public is handled and let the technical drivers overshadow stakeholder wishes. Our job is not only to make the project technically sound and environmentally beneficially, but it is also to give the public an amenity that they can be proud of. It is our experience that projects are only successful if the stakeholders believe they are successful. We have had to learn some tough lessons through public meetings and the largest lesson is to not disregard the importance of the stakeholder voice. We have learned to listen, document and address public concerns and show the public how we will address their concerns directly. We also realize that we cannot address everyone's



desires, especially when there are opposing opinions. But with careful listening and thoughtful education, we can bring everyone to understand and accept the design decisions.

PREPARATION OF PRESENTATIONS

RES routinely prepares comprehensive, audience-appropriate presentations for clients, regulatory agencies, public stakeholders, and governing bodies. Presentations are developed for major milestones and decision points and are structured to clearly communicate complex technical information in a concise and visually accessible format. Materials are tailored to the audience, providing technical depth for engineering and regulatory discussions while offering clear, high-level summaries for community or board presentations.

RES understands that the visual aids for public meetings need to be graphically pleasing and in laymen terms. They need to be stylized, aesthetically pleasing and professional. For design reviews, presentations are structured to confirm the overall approach, identify critical issues, solicit targeted feedback, and document consensus decisions. These materials typically include design summaries, cost estimates, schedule updates, risk assessments, and supporting technical documentation. Visual aids such as site plans, grading plans, cross-sections, modeling outputs, conceptual renderings, and construction details are incorporated to enhance understanding.

Preparation of Responses to Stakeholder Comments: RES employs a systematic and transparent process for managing and responding to stakeholder comments. All comments received during design reviews, public meetings, or regulatory coordination are logged into a formal comment tracking matrix. This matrix identifies the source of the comment, the subject matter, the assigned team member responsible for response, and the resolution status. This structured approach ensures that no comment is overlooked and that responses are consistent, documented, and defensible. RES will prepare responses to comments and provide them in the matrix format to the County, City and CHNEP for review and adjustment for review and augmentation. We will update the comments for final review. We will consult with you to determine how the responses should be relayed and tracked, to ensure timely responses are provided to all stakeholders.

As part of the permit processing, notices will be sent to upland owners with riparian rights. RES will prepare those notices for the agencies in accordance with the statutes. As public comments are relayed to the agencies, RES will incorporate them into a separate matrix and prepare responses for review. Mailings require certified letters be sent as evidence of delivery. Responses will be prepared with clarity and supporting documentation as needed. This may include additional data analysis, revised plans, updated technical memoranda, or explanatory narratives. Where appropriate, responses clarify technical methodologies, justify design decisions, or incorporate stakeholder recommendations into revised project documents. When feedback cannot be fully incorporated, RES provides a clear rationale supported by technical analysis or regulatory standards. Updated plans and reports are issued to reflect all agreed-upon revisions, maintaining a transparent and traceable record of changes.

RES has extensive experience preparing detailed response packages for regulatory agencies and stakeholders, including purpose-and-need narratives, supporting environmental documentation, jurisdictional determinations, and property access documentation. This disciplined comment management process strengthens agency relationships, builds stakeholder



confidence, and helps maintain project momentum. For one project in Miami-Dade County, we had the facilitate the largest mailing and comment resolution that FDEP's Southeast District had every required. Over 6,000 mailings were successfully managed, comments addressed and the permits were issued.



VIII. VOLUME OF WORK – TOTAL OF PAYMENTS RECEIVED FROM COUNTY WITHIN THE PAST 24 MONTHS

Within the past 24 months, RES has received \$0.00 in total payments from the County. We currently have no active or completed contracts within this jurisdiction for the specified period, ensuring we have full capacity and resources available to dedicate to this project.



IX. LOCATION

RES and our project partners maintain a strong presence in Florida, with several key team members based in Tampa and Fort Lauderdale. This geographic distribution allows the team to remain highly responsive to the needs of Tiki Point. Team members located in the Tampa area can typically reach Charlotte County within approximately one hour, while Fort Lauderdale-based staff can mobilize to the project area in approximately 2.5 hours.

In addition, team members located elsewhere in Florida and nationally are fully committed to supporting the project. While some staff may not reside within immediate driving distance, they routinely travel for project meetings, site visits, and critical milestones to ensure continuity and hands-on involvement. Through a combination of regional presence, strategic travel, and virtual coordination tools, the RES and Jacobs team ensures consistent accessibility, rapid response capability, and dedicated support throughout the duration of the project.



X. LITIGATION

RES Florida Consulting, LLC has not been named as a defendant or co-defendant in any lawsuit within the last five years. We maintain a clean litigation record and remain in good standing across all jurisdictions in which we operate.



XI. MINORITY BUSINESS

RES is not a certified Minority Business Enterprise (MBE). However, our team is committed to providing opportunities for such firms. We regularly subcontract specific elements of our projects to a range of professional service firms and vendor/supplier companies classified as Disadvantaged Business Enterprises (DBEs) and MBEs. In addition, our proposed subconsultant team comprised of **Jacobs, OHS and Schnabel** do not hold MBE certifications. These partners were selected specifically for their technical capabilities and specialized experience.



XII. SUBMITTAL FORMS

The required submittal forms have been included following this page.

- Proposal Submittal Signature Form
- Drug Free Workplace Form
- Human Trafficking Affidavit
- Addendum 1 and 2 (Acknowledged)



**PART IV - SUBMITTAL FORMS
PROPOSAL SUBMITTAL SIGNATURE FORM**

| | | | | | |
|-----------|---|------------------------------|---|---|---|
| 1. | Project Team Name and Title | Years experience | City of office individual will work out of for this project | City individual's office is normally located | City of individual's residence |
| | Megan Reising, MS, Project Manager (RES) | 12 | Fort Lauderdale | Fort Lauderdale | Lauderdale by the Sea |
| | Nadia Locke, PE, LEED AP, Principal (RES) | 37 | Fort Lauderdale | Fort Lauderdale | Fort Lauderdale |
| | Ty Smith, PE, Engineer (RES) | 13 | Richmond, VA | Richmond, VA | Richmond, VA |
| | Patrick Shearer, PE, Lead Engineer (RES) | 18 | Fort Lauderdale | Fort Lauderdale | Sebastian |
| | Mark Clark, CEP, Ecologist (RES) | 36 | Fort Lauderdale | Fort Lauderdale | Parkland |
| | Jason Bird (Jacobs) | 25 | Sarasota | Sarasota | Sarasota |
| | Luce Bassetti (Jacobs) | 23 | Houston, TX | Houston, TX | Houston, TX |
| | Yang Zhang (Jacobs) | 18 | Tampa | Tampa | Tampa |
| 2. | Magnitude of Company Operations | | | | |
| | A) Total professional services fees received within last 24 months: | | | \$ 46,290,108 | |
| | B) Number of similar projects started within last 24 months: | | | 4 | |
| | C) Largest single project to date: Bois d'Arc Lake Mitigation Project | | | \$135,543,987 | |
| 3. | Magnitude of Charlotte County Projects | | | | |
| | A) Number of current or scheduled County Projects | | | 0 | |
| | B) Payments received from the County over the past 24 months (based upon executed contracts with the County). | | | \$ 0 | |
| 4. | Sub-Consultant(s) (if applicable) | Location | % of Work to be Provided | Services to be Provided | |
| | Jacobs | Sarasota, FL | 35% | Design and Modeling | |
| | Olin Hydrographic Solutions | Palm Beach County, FL | 5% | Hydrographic Survey | |
| | Schnabel Geotechnical Design & Construction | Tampa, FL | 10% | Geotechnical Services | |
| | | | | | |
| 5. | Disclosure of interest or involvement: List below all private sector clients with whom you have an active pending contract and who have an interest within the areas affected by this project. Also, include any properties or interests held by your firm, or officers of your firm, within the areas affected by this project. NONE | | | | |
| | Firm | Address | | | |
| | Phone # | Contact Name | | | |
| | Start Date | Ending Date | | | |
| | Project Name/Description | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

NAME OF FIRM **RES Florida Consulting, LLC**
(This form must be completed and returned)



DRUG FREE WORKPLACE FORM

The undersigned vendor in accordance with Florida Statute 287.087 hereby certifies that RES Florida Consulting, LLC
does: (name of business)

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of Chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

Justin Freedman, General Manager

Proposer's Signature

2/20/2026

Date

NAME OF FIRM RES Florida Consulting, LLC

(This form must be completed and returned)



**HUMAN TRAFFICKING AFFIDAVIT
for Nongovernmental Entities Pursuant To FS. §787.06**

Charlotte County Contract #20260251

The undersigned on behalf of the entity listed below, (the "Nongovernmental Entity"), hereby attests under penalty of perjury as follows:

1. I am over the age of 18 and I have personal knowledge of the matters set forth except as otherwise set forth herein.
2. I am an officer or representative of the Nongovernmental Entity and authorized to provide this affidavit on the Company's behalf.
3. Nongovernmental Entity does not use coercion for labor or services as defined in Section 787.06, Florida Statutes.
4. This declaration is made pursuant to Section 92.525, Florida Statutes. I understand that making a false statement in this declaration may subject me to criminal penalties.

Under penalties of perjury, I declare that I have read the foregoing Human Trafficking Affidavit and that the facts stated in it are true.

Further Affiant sayeth naught.



Signature

Justin Freedman

Printed Name

General Manager

Title

RES Florida Consulting, LLC

Nongovernmental Entity

2/20/2026

Date

END OF PART IV

NAME OF FIRM **RES Florida Consulting, LLC**

(This form must be completed and returned)



PURCHASING DIVISION

Charlotte County Administration Center
18500 Murdock Circle, Suite 344
Port Charlotte, Florida 33948-1094

Phone 941.743.1378
Fax 941.743.1384

TO: PROSPECTIVE PROPOSERS

DATE: JANUARY 30, 2026

RE: ADDENDUM #1, RFP NO. 20260251, DESIGN – TIKI POINT LIVING SHORELINE

PROPOSAL DUE DATE: 3:00 p.m. (EST), FEBRUARY 23, 2026

Firms are hereby notified that this addendum shall be made a part of the above-named proposal and contract documents. The following are issued to revise/clarify the proposal and contract documents, and these items shall have the same force and effect as the original proposal and contract documents. Proposals to be submitted on the above-specified date at Purchasing shall conform to the revisions and clarifications as listed herein.

ITEM # 1 QUESTION/ANSWER

Q1: There isn't a budget listed in the RFP, is this only calling for qualifications showing 100% expertise in the services requested, or do we need to submit a budget/price with our proposal?

A1: The budget for this project is \$320,000. This RFP is for design qualifications and should not include pricing with your proposal.

Q2: The RFP title and most of the language calls for "design," but there are sections referencing a "design build." Can you please verify if build/construction is part of the proposal submission or just design with cost estimates?

A2: This project is design and permit preparation only as described in the RFP. Permitting and construction build will follow this project in a subsequent separate phase and project.

Q3: Hydrodynamic modeling and Geotech services are referenced as "having the capabilities to perform," which we do, but are they required? This also goes back to the first question, as including these services would affect final price in a submission.

A3: Hydrodynamic modeling and Geotech services capabilities are needed as referenced in the RFP.

This addendum is binding and is to be considered as if contained within the original proposal documents of RFP No. 20260251. Firms are required to acknowledge receipt of this addendum on their proposal forms.

Kimberly Corbett

Kimberly A. Corbett, C.P.M., CPPB
Senior Division Manager - Purchasing

KAC/m

cc: Professional Services Committee
Clerk
File



PURCHASING DIVISION

Charlotte County Administration Center
18500 Murdock Circle, Suite 344
Port Charlotte, Florida 33948-1094

Phone 941.743.1378
Fax 941.743.1384

TO: PROSPECTIVE PROPOSERS

DATE: FEBRUARY 12, 2026

RE: ADDENDUM #2, RFP NO. 20260251, DESIGN – TIKI POINT LIVING SHORELINE

PROPOSAL DUE DATE: 3:00 p.m. (EST), FEBRUARY 23, 2026

Firms are hereby notified that this addendum shall be made a part of the above-named proposal and contract documents. The following are issued to revise/clarify the proposal and contract documents, and these items shall have the same force and effect as the original proposal and contract documents. Proposals to be submitted on the above-specified date at Purchasing shall conform to the revisions and clarifications as listed herein.

ITEM # 1 QUESTION/ANSWER

Q1: We are unable to find the "Technical Memorandum prepared by Jacobs, Aug. 7, 2018", that is referenced in the RFP, RP-20, can you please provide this document or a link to the location?

A1: Included in this addendum, please find the document (44 pages).

This addendum is binding and is to be considered as if contained within the original proposal documents of RFP No. 20260251. Firms are required to acknowledge receipt of this addendum on their proposal forms.

Kimberly Corbett

Kimberly A. Corbett, C.P.M., CPPB
Senior Division Manager - Purchasing

KAC/m

cc: Professional Services Committee
Clerk
File



ores

The logo consists of a stylized leaf icon on the left, rendered in a blue-to-green gradient, followed by the lowercase text 'ores' in a bold, blue, sans-serif font.