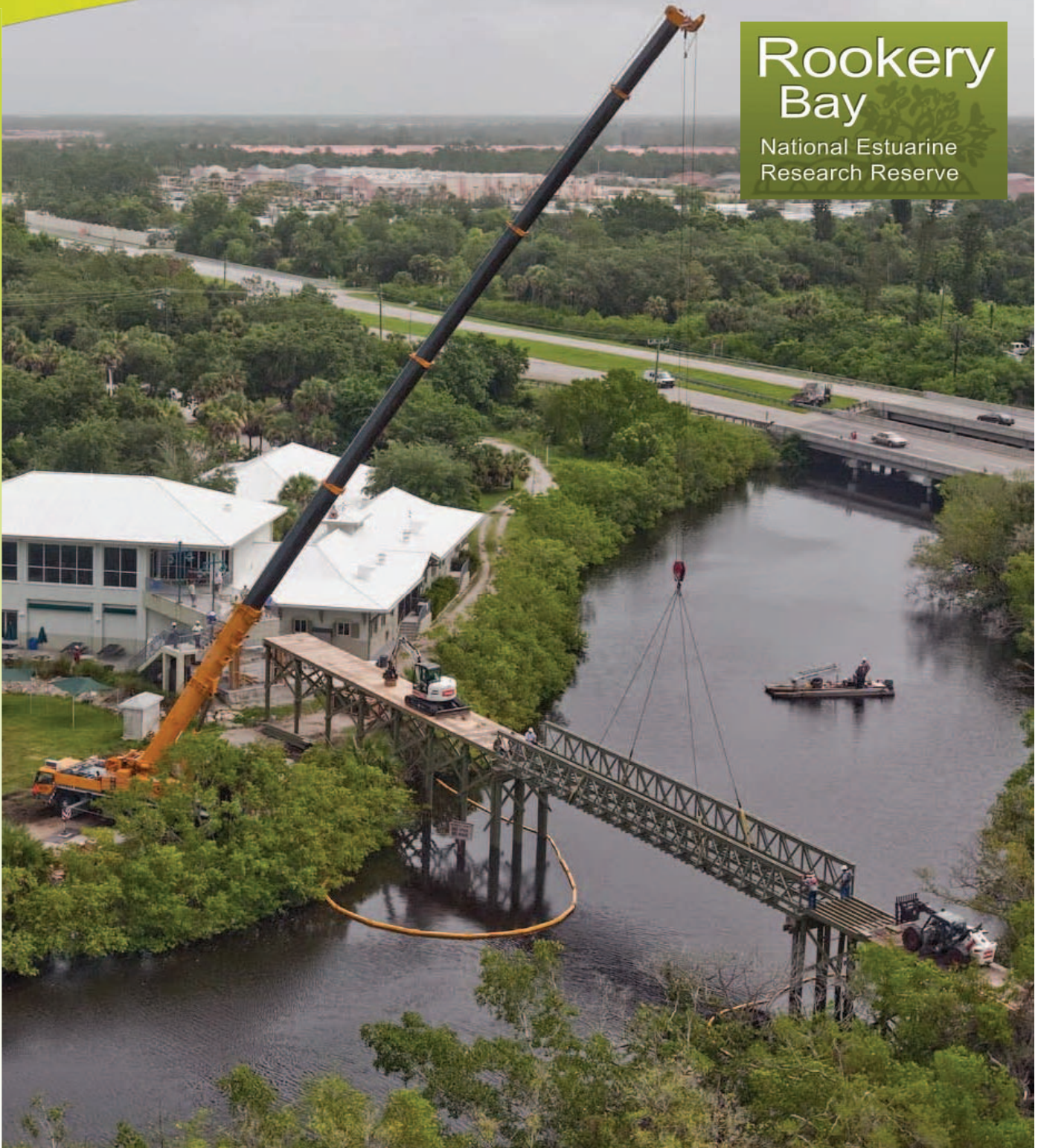


Specializing in top down bridge construction through environmentally sensitive areas.



**Rookery
Bay**
National Estuarine
Research Reserve





Project location with some boardwalk started on initial approach on Southside.



Birdseye view of completed Southside approach. Abutments being prepared for free-span section.



Construction coming from south side of Henderson Creek. Barge in place for pile setting and structural framing process. Temporary timber decking for top down construction method. Fiberglass reinforced — plastic decking installed after removal of heavy equipment from bridge.



North side connector to 2nd floor observation deck. Construction being performed from barge in the waterway and excavator on the bridge.



By specifying a fiberglass reinforced plastic free span bridge in lieu of a steel free span bridge, the weight is reduced 75%, allowing for use of a smaller crane. By doing this, the engineer greatly reduced environmental impact and project costs.







Project completion. Permanent fiberglass reinforced plastic deck panels installed. View from south side of project.



Completed project. Pedestrian bridge begins on the 2nd floor at the Learning Center, continues across Henderson Creek and into Rookery Bay Estuarine National Preserve where visitors can experience historical sites and the natural habitats throughout the estuarine.

History of Rookery Bay National Estuarine Research Reserve



Since the late 1980's, Southwest Florida has been one of the nation's fastest developing regions. Such unprecedented growth has resulted in profound and lasting impacts to the coast, and has challenged communities to seek ways to improve decisions about land use, environmental regulations, water resources and coastal management. The professionals that make these decisions include government, academic, non-profit, agriculture, development and real estate, marine trades, and many others.

The National Estuarine Research Reserve System Staff and the National Oceanic and Atmospheric Administration's Estuarine Reserves Division teamed up to deliver a unique experience and developed a Coastal Training Program. The Rookery Bay National Estuarine Research Reserve in Collier County, Florida was the first in the Reserve System to implement the Coastal Training concept and hosts classes and research opportunities, bringing the latest scientific information and policy to scientists, stakeholders, key decision-makers, elected officials, and the general public.

Proven to be a successful forum for training and networking coastal professionals, the coastal training model was eventually adopted for use by two other sites in Florida as well as twenty-four other National Research Reserves in the United States. Since then, the Rookery Bay National Estuarine Research Reserve Coastal Training Program has become the largest in the nation, with visiting students and scientists from all over the world.

Project Description

Nature Bridges was contracted to build a 10' x 400' wooden and fiberglass reinforced plastic (FRP) pedestrian bridge system with a 10' x 77' FPR free-span bridge. This FPR free-span bridge is the first of its kind to be installed in the state of Florida and is able to withstand sustainable winds up to 140 mph. To help minimize impact on vessel navigation through Henderson Creek, Nature Bridges first assembled, then installed the fiberglass free span bridge approximately 15 feet above water level. The new pedestrian bridge system connects the second floor of the Learning Center to a planned 1.5 mile trail system to allow visitors to explore important coastal habitats and rich cultural history within the Rookery Bay National Estuarine Research Reserve. The pedestrian bridge allows easier access to the Estuarine for hands on research and training for scientists, students and other visitors from around the world.

Contracted Scope of Work

- ◆ Design and construction of 400' of 10' wide top-down pedestrian bridge, including:
 - 12 x 24 solid timber abutment caps
 - 12" x 45' polymer coated piles
 - Polymer coated heavy timber structural members and cross bracing
 - 24" Bedford FPR decking panels
 - Custom fabricated handrails with 90 degree elbow radius, hot dipped galvanized after fabrication
- ◆ Assembly and installation of a 10' x 77' FPR bridge
- ◆ Collaborative engineering between owner's representative and contractor



Key Project Team members

Florida Department of Environmental Protection, Owner	Jason Russell, Contract Manager Michael Renard, Contract Manager
LPA Engineering Services, Engineer of Record	Michael Schwier
Parker Consulting Services, Inc., Consulting Engineer	Matt Parker, P.E.
Kevin L. Erwin Consulting Ecologist, Inc., Mangrove Consultant	Kevin Erwin
E.T. Techtonics Bridge Manufacturer	G. Eric Johansen, President
Nature Bridges, General Contractor	Brian Green, Project Manager Brent Hallford, Project Superintendent Richard Ridley, Estimator

Type of Construction

In order to reduce impact on Rookery Bay's ecologically sensitive mangrove forests, other vegetation, and wildlife, we used a combination of Nature Bridges' innovative top down construction method and a custom retrofitted barge with a pile guide platform. In top Down construction, our excavator is equipped with a hydraulic vibratory hammer that drives pile sets to their required depth. A ten foot section of bridge is built and the machine moves forward to repeat the process until completed. Material is staged at one end of the bridge and delivered via bridge to the construction area by a modified forklift. No heavy equipment touches the ground at anytime in the bridge path, greatly reducing the impact construction has on environmentally sensitive areas.



Project Size and Project Value

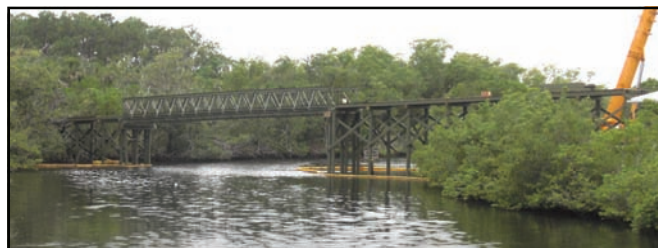
This project consisted of 4,770 square feet of pedestrian bridges with guard rails.
Contract amount: \$696,965.00

Length of Project

Approximately 3 months; construction began on May 4, 2009 and was completed on August 12, 2009.

Self Performance

Nature Bridges self performed 99% of the project. Crane operation was the only work subcontracted.



Rookery Bay National Estuarine Research Reserve Pedestrian Bridge

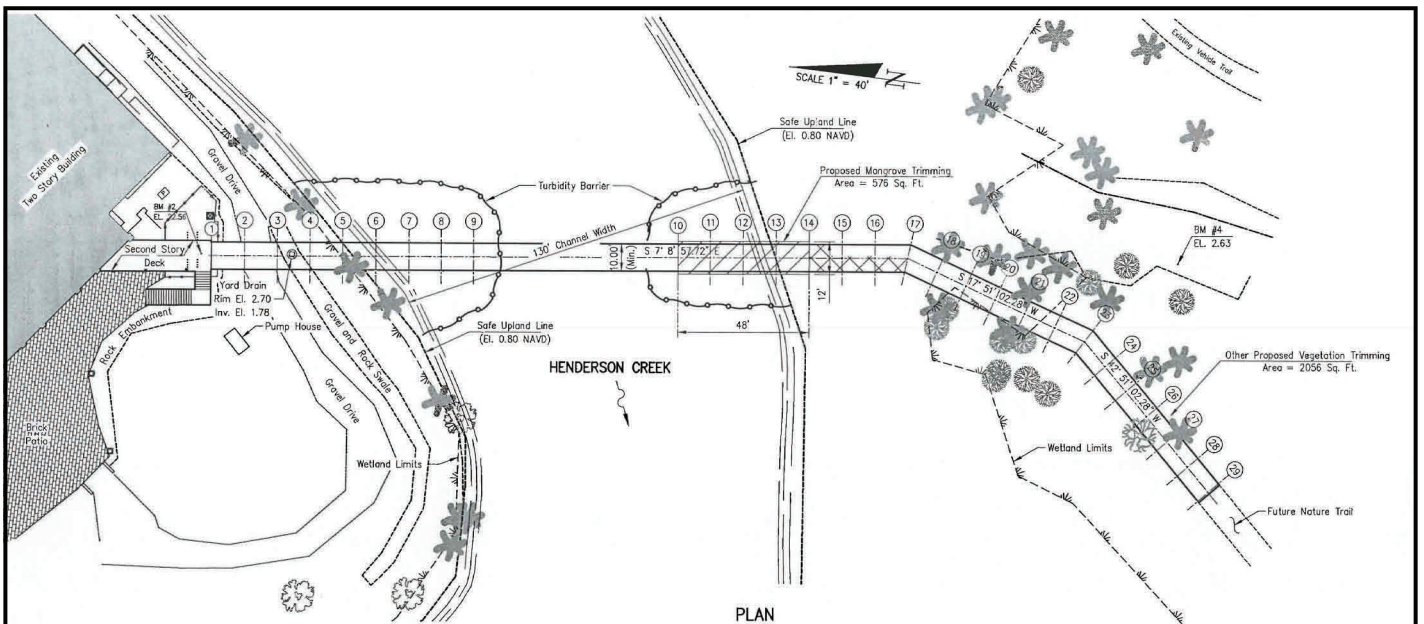
Because of the ecologically sensitive environment in and around Rookery Bay, it was important to the Florida Department of Environmental Protection that there be minimal impact on the environment during construction. We were able to exceed our clients' expectations by using innovative construction methods and materials.

Despite numerous obstacles encountered in the field, the professionalism, dedication and hard work of all our employees assigned to the project exemplified Nature Bridges' core values: demanding the best of ourselves through knowledge, education, and experience, while providing the best service to our clients. Because of our employees' ingenuity in resolving problems, Nature Bridges was able to bring the first phase of this project to a close on time and within budget.



Nature Bridges incorporated innovative materials, "green" building methods, and unique problem solving techniques to complete the project. Stunning in its beauty and practical to the environment, the bridge system was constructed with ecologically friendly materials and methods, which was especially important to the National Estuarine Research Reserve.

The new pedestrian bridge allows easier access to the Reserve for scientists and researchers to conduct investigations on the environmental impact that development and growth have on coastal areas. The structure is connected to the second floor of the Learning Center where research is conducted and information is provided to help facilitate coastal decisions in regard to land management, restoration, and development. This research is able to be shared quickly with various governmental entities, educational associations, non-profit organizations, scientists and many others.



Re-Engineering of Project

There were several areas of limited access on this project site. The material staging area had limited access at the time of construction due to flooded roads from recent storms. The easement afforded to Nature Bridges by DEP through the protected mangroves was very narrow. Also, the designated staging area for the crane was small and limited the size of crane we could use to set the free-span bridge.

The construction documents called for fiberglass piles to be used. It was discovered that the piles would need to be approximately ten feet longer than specified to meet the maritime height requirements. Purchasing longer fiberglass piles would have added exorbitant costs to the project. Fiberglass piles are also more difficult to install than timber piles. Nature Bridges recommended the pile specification to be changed to polymer coated timber piles, which are much easier to drive than fiberglass piles, and would keep the project within the original budget. The Owner and Engineer of Record agreed and made the change.

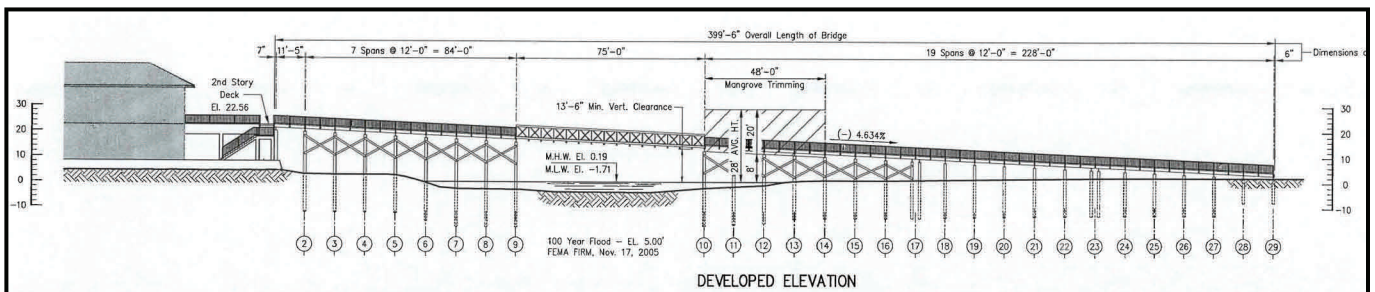
Additionally, the original plans and specifications called for the pedestrian bridges to be built by conventional means. This would have meant that equipment used to construct the boardwalk would have destroyed ecologically sensitive vegetation and wildlife habitats. This issue, along with limited site access, prompted Nature Bridges and our client, the Department of Environmental Protection, to re-engineer the project using our top down construction method. By doing this, we were able to reduce the impact to wildlife habitats and vegetation, and reduce overall construction costs.

The Top Down Construction Method



Top down construction is a “green” construction method. Our excavator is equipped with a hydraulic vibratory hammer that drives two sets of piles up to ten feet apart to the required depth. Carpenters then install pile caps, stringers, and decking. When a section of boardwalk is finished the excavator is moved to the end of that section to drive the next set of piles. The process is repeated until the bridge is finished. All material is staged at one end of the bridge and fed out via the bridge to the construction zone by a modified forklift. Guard rail is installed after the bridge deck is complete. Heavy equipment does not touch the ground, but stays on top of the bridge, preserving the landscape. Constructing boardwalks, pedestrian bridges, and piers using the top down construction method allows us to bring people into the most fragile terrains with minimal impact.

Other issues were circumvented by utilizing top down construction for the Rookery Bay National Estuarine Research Reserve pedestrian bridge project. By using this construction method, Nature Bridges was better able to deal with the limited access easement, as no machinery needed to be located beside the bridge path. This also minimized the amount of mangrove trimming that needed to be accomplished, limiting trimming to the width of the bridge. Another issue that was better managed was the affect of tidal influence on pile driving. By driving most of the piles from the structure, it greatly limited the number of piles that had to be driven using the barge. Working from the barge can be effected by the tides, but working from the excavator is not.



Custom Drilling Equipment

While attempting to drive piles, Nature Bridges encountered six feet of cap rock that was not indicated in the geotechnical reports. Unable to auger pilot holes for the piles to the required depths using our normal methods, we fabricated custom drilling equipment to penetrate the cap rock. The custom fabrication done on site included a drill shaft and casing for the drilling process. A custom drill bit capable of penetrating the cap rock was fabricated by Jeffery Machines, Inc. in Birmingham, Alabama.

Barge with Hydraulic Boom Ladder/Crane



To assist with pile placement in Henderson Creek, we used our custom retrofitted barge with a hydraulic boom crane as a guide to help place piles for the free-span bridge abutments. The barge is constructed from a pontoon boat that Nature Bridges recycled. It was stripped then modified with tools and equipment to facilitate driving piles in waterways and wetlands. The barge has proven to be very beneficial to Nature Bridges' construction operations and was advantageous to this project.

Setting the Free-Span Bridge

The 18,000 pound FRP free-span bridge exceeded the weight limit that the crane could safely handle with the required reach. Nature Bridges removed the pre-assembled guard rail panels from the bridge to decrease the weight. By doing this, we were able to reduce the bridge weight below the crane's weight limit, therefore enabling the use of the smallest possible crane to continue to minimize the impact to the natural environment.

Prior to setting the free-span bridge, Nature Bridges coordinated with the U.S. Coast Guard to close the Henderson Creek waterway to all boat traffic. Prior to closing the waterway, signage and barricades were used to set the boundaries in the waterway. After closing the waterway, Nature Bridges used a boat to patrol the barricaded boundaries to insure the safety of personnel and boaters.



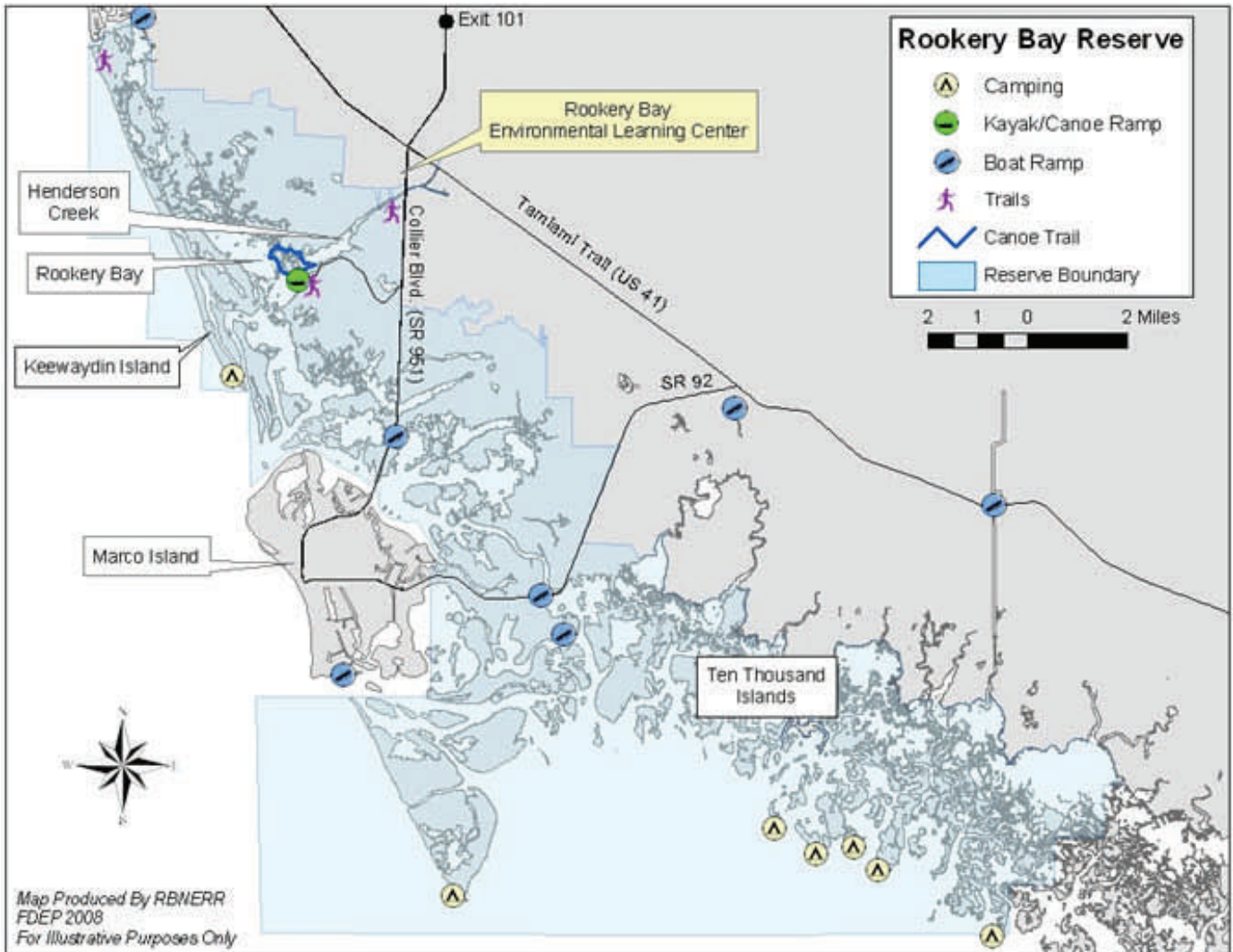
This is the only free-span fiberglass reinforced plastic pedestrian bridge currently installed in the state of Florida.

New Non-Skid Finish for Deck Panels



The original non-skid surface specified for the FRP deck panels was extremely coarse. This caused concern due to the possibility of personal injury should anyone fall. The manufacturer provided several types of standard finish samples for us and our client to review. However, each of the finishes provided were still too coarse for direct skin contact. Brian Green, Nature Bridges' Project Manager, worked closely with the manufacturer, Bedford Reinforced Plastics, Inc., and the distributor, Environmental Composites, to produce a new non-skid finish that would be less likely to cause injury. Mr. Green recommended mixing sand with the finish in order to retain the non-skid surface. This finish is less coarse, non-skid, extremely durable, and has a beautiful appearance. As a result of Mr. Green's ingenuity, the manufacturer now has a new marketable finish for this product that is less likely to cause personal injury, and can be used in both commercial and residential applications.

Nature Bridges is pleased to have had the opportunity to construct this project for the Florida Department of Environmental Protection. It proved to be a wonderful learning experience for all who were involved. The results are outstanding due to a collaborative and open minded effort put forth by the Owner, Contractor, and their respective Engineers. The Rookery Bay National Estuarine Research Reserve Pedestrian Bridge will serve scientists, educators, and visitors for many years to come, allowing people into this pristine habitat with minimal impact to its plants and wildlife.





Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

Rookery Bay Estuarine Research Reserve
300 Tower Road
Naples, Florida 34113
September 9, 2009

Robin Ridley
Nature Bridges
2074 Raymond Diehl Road
Tallahassee, FL 32308

Ms Ridley:


Please consider this as a letter of recommendation for your company in your pursuit of an Eagle Award with the Associated Builders and Contractors. Our experience with Nature Bridges has been in a word, outstanding.

From the very beginning we were aware that our project, a 400 foot long pedestrian bridge and boardwalk with a 75 foot long fiberglass trussed free span, would be unique and challenging. Brian Green assisted our consulting engineers with some initial design modifications based on your company's experience, and his recommendations proved to be wise and helpful. After specially ordered materials arrived Brian rejected a number of pilings as not meeting his specifications and standards. His steadfast commitment to quality was evident and inspiring.

During construction your crew encountered extremely hard rock below the surface that was not fully described in the limited geotechnical report that was available. Despite the difficulties your men used their experience, creativity, and just plain toughness to overcome one obstacle after another. The work was done in the south Florida summer heat, through the rain, in a wetland, with clouds of mosquitoes, and the crew typically worked from sun up to very late in the day.

Sections of the timber framed bridge were built out from both banks of the creek over several weeks of very hard work. When it came time to assemble and fly in the free span, the crane dropped it into place with $\frac{3}{4}$ of an inch to spare. Everyone on site that day was truly amazed at the precision that was evident, and in the level of workmanship your company demonstrated at every stage of construction. We are pleased to give your company our highest possible recommendation.

Sincerely,


Randy McCormick
Environmental Manager



Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

To whom it may concern:


This letter of recommendation, for the Eagle Award from the Associated Builders and Contractors, Inc., is in reference to the Pedestrian Bridge over Henderson Creek Project, located at the Rookery Bay National Estuarine Research Reserve, 300 Tower Road, Naples, Florida 34113.

The project consisted of a 400 foot long pedestrian bridge and boardwalk, with a unique 75 foot long fiberglass free span portion over a navigable waterway. Nature Bridges, the Engineer of Record, and the Department coordinated on the Drawings and Specifications for this project, and Nature Bridges' input was vital to the overall success of this project, both from an aesthetic and budget prospective.

The construction manager for this project, Brian Green, was exceptionally professional and throughout the project demonstrated an intense interest in customer satisfaction, adherence to the schedule, and quality control. Brian's work ethic and experience, complimented by competent and hard working crews, facilitated the completion of this project, despite difficulties with subsurface conditions, working in environmentally sensitive areas, and constant weather changes.

The Department, both management and staff, have been impressed by the level of workmanship demonstrated at every stage of construction, and we are most pleased with the final product. It is my pleasure to give J.D. James, Inc. DBA Nature Bridges the highest possible recommendation.

Sincerely,



Jason Russell
Construction Project Consultant
Florida Department of Environmental Protection
Coastal and Aquatic Managed Areas
(850) 245-2148
Cell: (850) 274-2257

 **PARKER**
CONSULTING SERVICES, INC.
CIVIL ENGINEERS

September 9, 2009

Associated Builders and Contractors, Inc.
Attn: 2009 Excellence in Construction Awards
4250 N. Fairfax Drive, 9th Floor
Arlington, VA 22203-1607

Re: Nature Bridges
Rookery Bay National Estuarine Research Preserve
Pedestrian Bridge Over Henderson Creek

Gentlemen,

We are writing this correspondence in support of Nature Bridge's application for the Excellence in Construction Award. As the engineer of record for this project, we worked closely with Nature Bridge's staff, the Florida Department of Environmental Protection (the client), the LPA Group (project engineer) and ET Techtonics (bridge manufacturer) to help eliminate traditional high-impact construction methods with virtually no deviation to the aesthetic appearance of the proposed project.

The Rookery Bay Pedestrian Bridge and Boardwalk was an innovative design met by excellence in construction methodology and implementation. On Nature Bridges' initiative we were able to complete an innovative design that exceeded the expectation of the client, allowed minimal environmental disturbance and provided a cost effective low maintenance structure that can be enjoyed for years to come.

Nature Bridges' "top-down" construction method allowed the client to provide a secondary means of egress across Henderson Creek and through an environmentally sensitive area comprised mostly of protected Mangrove trees. Because the "top-down" method allows all material transport and boardwalk construction to take place above ground, the project was completed with the least impact possible to the estuary area that it traversed.

The use of polymer coated timber piles and timber pile caps in-lieu-of the proposed fiberglass members allowed the client to save on material cost as well as overall installation cost while providing a low maintenance product that achieved the overall aesthetic intent of the project.

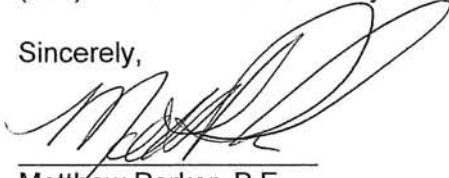
In order to keep the project on schedule, the boardwalk was constructed from both ends so that the bridge could be set as the final step. An additional degree of precision was required as the entire 400 feet of boardwalk was designed at a 4.634% slope, and

contained two (2) 25 degree turns before finally connecting to the nature trail. Furthermore, the bridge abutments tolerances were less than one (1) inch.

Nature Bridges ability to vanquish all obstacles was demonstrated by the innovation and sheer perseverance shown in the method utilized to overcome the dense "cap-rock" that was discovered throughout the majority of the project area. The crew's resources allowed them to fabricate a special auger bit to break through the cemented limerock while utilizing a cast iron pipe as a sleeve to achieve precise placement of the piles.

If you have any questions or concerns, please do not hesitate to contact me at (850)877-8400 ext. 103 or by email at MattParker@ParkerConsultingServices.com.

Sincerely,



Matthew Parker, P.E.

Rookery Bay

National Estuarine
Research Reserve



RESOURCE
MANAGEMENT



LEARNING
CENTER



CALENDAR



PUBLICATIONS



RESEARCH



CONTACT US

Menu

- » Home
- » About Us
- » Resource Management
- » Learning Center
- » Education
- » Professional Development
- » Calendar
- » Research
- » Become a Member
- » Get Involved
- » Publications
- » Visitor Use

Upcoming Events

Save The Date

Upcoming events at Rookery Bay Environmental Learning Center:

- » **Saturday
September 26
National Estuary Day**

[» view flyer](#)



WELCOME to Rookery Bay



Photo by D. Graff/RBNERR

Pedestrian Bridge

The new pedestrian bridge was installed at Rookery Bay Environmental Learning Center. The bridge will lead visitors from the second floor of the center across Henderson Creek to a proposed interpretive trail, scheduled to open to the public by Thanksgiving. The bridge was funded with a NOAA grant and matched by funds from the State of Florida. A helicopter hired by the bridge manufacturer was seen and heard circling over the area as it captured the installation on film. The center portion of the bridge has a free span of 75 feet, designed to minimize impact on vessel navigation on the creek.



Helping Least Terns Nest in Peace

The 2009 Least Tern nesting season is complete. The posted area on Keewaydin is now open.

[» read more](#)

Search

Search Rookery Bay

Address

Rookery Bay National Estuarine Research Reserve
 300 Tower Road
 Naples, Florida 34113
 Tel: (239) 417-6310
 Fax: (239) 417-6315
 Email: info@rookerybay.org

News

[Hydrologic Restoration on Shell Island Road now complete](#)

Reserve Staff works to restore Tidal Flushing to Rookery Bay Mangroves

[» read more](#)

[Keewaydin Island Sea Turtle Update](#)

Update on loggerhead turtles satellite tagging.

[» read more](#)

Upcoming Schedule



naplesnews.com

News Sports Business Opinion Entertainment Lifestyles Media Jobs Homes Cars Classified

Studio55 Latest Videos Today's Photos Photo Galleries Webcams Twitter Facebook Special Projects Participate Databases

Naples Videos » Rookery Bay



Rookery Bay 00:56/00:57

Published July 2, 2009

A video panorama of Rookery Bay on the floating dock behind the Education Center.

SEANCHOR.COM
Naples Daily News

CLICK HERE
For your
Dream Boat!

Videos

Recent



Naples Princess



Rookery Bay



Naples Zoo