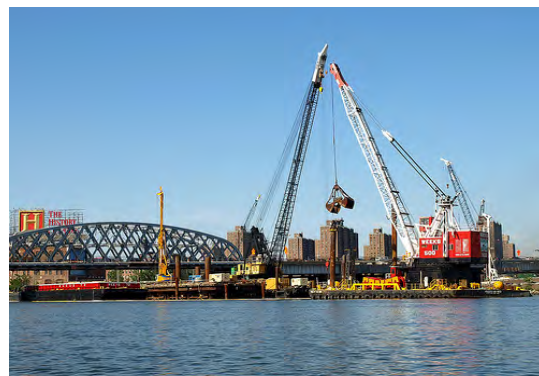




RFQ For:

General Engineering Services RFQ # 17-002



Submitted by The Office of



Due Date:
April 19, 2017

Prepared For:
City Of Key West
1300 White Street
Key West, FL 33040



Arts, Recreation and Entertainment
Ports, Coastal and Waterfront
Real Estate Development
Public Infrastructure
Transportation
Government
Healthcare
Education
Industrial
Energy

April 18, 2017

City Clerk
City of Key West
1300 White Street
Key West, FL 33040

Re: General Engineering Services – RFQ No. 17-002; McLaren File 170366

To Whom It May Concern:

McLaren Technical Services Inc. d/b/a McLaren Engineering Group (McLaren) is pleased to submit one (1) original response and two (2) USB flash drives in response to the City of Key West's intent to secure general engineering services for the subject RFQ. We understand that we may respond to any one, or all of the various disciplines delineated in the RFQ. McLaren is pleased to submit its qualifications to provide Coastal Engineering Services. McLaren are experts in providing services related to the rehabilitation, retrofit, new construction, operation, permitting, and modifications to marine structures including but not limited to docks, marinas, bridges, beach design and beach re-nourishment, seawalls, and erosion control.

Founded in 1977, McLaren takes pride in providing full service professional engineering services including design, inspection and construction administration across eight distinct, yet integrated technical divisions. Known for our passion, hard work, "out-of-the-box" thinking, and versatility, we have successfully engineered many remarkable and challenging projects, some of which are highlighted in the enclosed package.

McLaren is best known for its Marine Division's marine structures and port infrastructure engineering, underwater inspection capabilities, and experience with waterfront construction. As a recognized leader in the waterfront development industry, McLaren has provided design and engineering services for similar projects nationwide for 40 years. Our extensive waterfront experience includes:

- The inspection of over 2 million piles
- Over 200 miles of waterfront inspected
- Over 10,000 substructure units
- The upgrade, repair, or replacement of over 450 facilities
- Work on over 400 marinas and 50 ferry terminals
- A construction value of \$3 billion

In reviewing our qualifications, please consider the following **Key Attributes**, which provide a snapshot of our extensive expertise and capability:

- **40 Years of Engineering Excellence...** providing full design, engineering, and inspection services that includes waterfront structures, bridges, roadways, site/civil, and surveying for both public and private clients. Our portfolio features over 14,000 projects with various degrees of complexity.
- **Marine Design and Engineering Expertise...** in the design of all types of marine structures, including dams, piers, wharves, bulkheads, floating docks and terminals, built to different criteria

Offices: New York, Maryland, Florida, Connecticut, California, Pennsylvania

Licensed in:

Alabama • Arizona • Arkansas • California • Colorado • Connecticut • Delaware • District of Columbia • Florida • Georgia • Hawaii • Idaho • Illinois • Indiana • Kansas • Kentucky • Louisiana • Maine • Maryland • Massachusetts • Michigan • Minnesota • Mississippi • Missouri • Nebraska • Nevada • New Hampshire • New Jersey • New Mexico • New York • North Carolina • Ohio • Oklahoma • Oregon • Pennsylvania • Rhode Island • South Carolina • Tennessee • Texas • Trinidad & Tobago • Utah • USVI • Vermont • Virginia • Washington • West Virginia • Wisconsin • Wyoming

McLaren Technical Services

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April 18, 2017

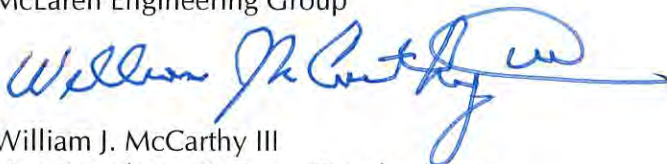
for numerous applications. Our marine and ocean engineers are familiar with traditional and advanced materials and methods of construction, costs, specifications, and means of analysis.

- **Plastic Lumber Expertise...**spanning over 20 years. McLaren has designed more than 50 plastic structures which includes piers, bridges, boardwalks and walkways, around the nation. McLaren has hosted symposiums on design of plastic lumber, and has performed testing for manufacturers. Mal McLaren co-authored eight standards for ASTM on the subject.
- **Local Presence...**Our Project Manager, Andrew Habel, PE, is our Florida Regional Manager and he will lead this project from our Orlando office and act as the single portal to the City of Key West. Mr. Habel will be supported by Mauricio Posada, PE, Sr. Marine Engineer at our Florida office. Additional personnel with marine and coastal engineering experience, including P.E. licensed divers, will be assigned to our Florida office upon contract award, as required and accordance with the scope of work.
- **Industry Innovation...**McLaren is at the forefront of providing innovative design solutions that have become standards in the industry. Examples of our innovative and effective solutions include: innovative materials (plastics, polymers and composites); elastomeric hinge systems; fifth wheel details; UHMW bearings for gangways and ramps; and adjustable platforms for side loading and bow loading ferries; and ADA compliance.
- **Waterfront Permitting...**At any given time McLaren manages over a dozen permitting processes concurrently. We have the experience and understanding of the permitting process, and credibility with multiple agencies. We have filed for and received permits for hundreds of ferry terminals, piers, bulkheads, residential developments and industrial waterfront projects.
- **Underwater Structural Inspection Capabilities...**allowing us to mobilize up to six fully equipped dive teams upon a moment's notice. Our Team Leaders are in-house P.E. Licensed Inspectors/Divers – all of whom are NBIS and ADC certified; specialists in low visibility and cold weather dive inspections; and experienced in utilizing ROVs and the latest in underwater videography and photography.
- **"APPLIED INGENUITY"**... is the motto, goal and indeed, mantra at McLaren. It is our intent to be ever improving - exploring new solutions to old problems and constantly striving to serve our clients better. We will never rest on our accomplishments nor will we be satisfied with what we did yesterday. Ours is a determination to perform better than we did on the last project.

We appreciate the opportunity to submit our proposal to provide Coastal Engineering Services for your consideration. We believe our response demonstrates that, based on our unique experience and qualifications, we are well-qualified for this project. Please do not hesitate to contact me at (845) 353-6400, or via email: wmccarthy@mgmclaren.com, if you have any questions or require additional information from us at this time.

Very truly yours,

The Office of
McLaren Engineering Group



William J. McCarthy III
Vice President - Business Development

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CITY OF KEY WEST

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McLaren Technical Services, Inc. (McLaren) has been providing multidiscipline consulting engineering services to clients worldwide since 1977. McLaren is headquartered in West Nyack, NY and has nine (9) regional offices located in Orlando, FL; Roswell, GA; Baltimore, MD; New York City, NY; Albany, NY; Allentown, PA; Middletown, CT; San Luis Obispo, CA; and Oran, Algeria. McLaren provides premier professional engineering services through eight (8) technical divisions:



Marine...provides underwater inspection and condition assessment services, coastal engineering expertise, and marine design and construction management of all types of marine structures including piers, wharves, and bridges. In New York Harbor alone, our inspection P.E. divers have inspected over 3 million piles over the last decade.

Waterborne Transportation...offers design, permitting, and construction administration services for all types of waterside landings and terminals and their upland facilities/infrastructure. In the Northeast, McLaren has designed over 40 ferry terminal facilities with associated upland infrastructure.



Structural...expertise encompasses all aspects of structural inspection, design and construction, including curtain wall design. McLaren has worked on over 4,000 building structures of varying degrees of complexity, including high-rise buildings, intermodal terminals, and Performing Arts Centers.

Site/Civil...complete design and construction management services for all types of civil and site development projects, including drainage, grading and surveying for large-scale mixed-use developments, parks and waterfront facilities.



Survey...plays a central role in the planning of any type of site or structure. In its various forms, surveying determines distance and elevations, identifies angles and directions, and establishes boundaries. McLaren's multiple, fully equipped survey crews have experience with commercial and residential applications, municipal facilities, and highway and rail facilities.

Bridge, Highway, Rail...offers full bridge, roadway, and rail design, bridge condition assessments, and construction management services. Clients include many state and city DOTs and transit industry giants.





Forensics...responds to calls for expert witness testimony and provides forensics analysis of failed structures. Recent examples have included the I-40 Bridge collapse in Oklahoma, the Queen Isabella Causeway, and a super grid collapse in the Atlantic City Convention Center.

Entertainment...at the forefront of the design of scenic and entertainment structures, staging, rigging, and show action equipment. Recent projects include stage sets for the Rolling Stones, U2, Black Eyed Peas, Lady Gaga, Metallica, and Madonna tours; as well as the renowned Cirque du Soleil.



McLAREN PERSONNEL

Our 200-person staff includes skilled civil, geotechnical, structural, marine, and mechanical engineers, P.E. licensed underwater inspectors, construction management specialists, specification writers and CAD designers experienced in the latest computer-aided design equipment and software. McLaren's success in providing timely, innovative, and cost effective solutions has led to steady growth in the size of our divisions. Total McLaren staff forces available to perform work includes the following disciplines:

<u>36</u>	Administrative/ITS Specialists	<u>2</u>	Landscape Architects
<u>10</u>	Bridge Inspectors	<u>14</u>	Marine Engineers
<u>26</u>	Civil Engineers	<u>6</u>	Mechanical Engineers
<u>9</u>	Construction Inspectors	<u>19</u>	P.E./Certified Divers
<u>15</u>	CAD/Drafting Personnel	<u>2</u>	Planners
<u>4</u>	Geotechnical	<u>29</u>	Structural Engineers
<u>8</u>	Highway Designer/Engineer	<u>10</u>	Surveyors

OUR CLIENTS

We have an excellent history of inspection, engineering and design experience working for both public and private entities. McLaren is currently providing or has recently provided structural engineering services for clients such as the Walt Disney World Company, the University of Central Florida, Bluegreen Corporation, Hillsboro Beach Yacht Club, and the Ritz Carlton.

CONTACT US

For more information, please visit our website, www.mgmclaren.com, which also contains a downloadable version of our corporate brochure. If you prefer, you can contact us directly as follows:

Mr. Malcolm G. McLaren, P.E., SECB – President & CEO	(845) 353-6400 ext. 3328
Mr. Andrew C. Habel, P.E. – Orlando Regional Director	(407) 354-5411
Mr. William J. McCarthy III – Vice President - Business Development	(407) 354-5411
	(407) 354-3466 fax

McLaren Technical Services, Inc. d/b/a McLaren Engineering Group

201 N. Magnolia Avenue, Suite 101
Orlando, FL 32801
EIN# 11-3089183

MARINE ENGINEERING AND WATERFRONT DEVELOPMENT DESIGN SERVICES

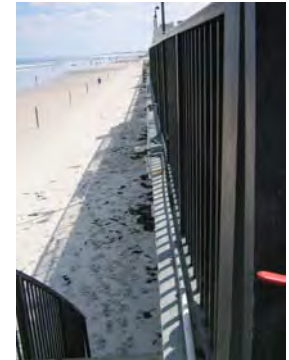
McLaren distinguishes itself as one of the nation's leading experts in the underwater inspection, assessment, design and construction inspection of waterfront structures. As a recognized leader in the waterfront facilities development industry, McLaren has provided design, engineering, and inspection services for many of these type projects nationwide. Waterfront / shoreline development projects are particularly geared for McLaren as we can cover many of the work elements and aspects of such a project given we are a multidiscipline consulting firm.

Our depth of experience and expertise encompass all aspects of marine design and construction, including:

- Underwater Engineering Inspections
- Bulkheads, relieving platforms, quay walls – rehabilitation and new construction
- Crane/Crane Rails and off-loading machinery and equipment
- Breakwaters
- Navigation aids
- Fendering and berthing energy absorption
- Marine Terminal Operations Analysis
- Port and Marine Terminal Planning and Development
- Terminals – berthing, loading and conveying systems
- Application of advanced materials
- Pier design – new or rehabilitation
- Permitting
- Dredging
- Recreational marinas for pleasure craft
- Multi-modal Facilities
- RO-RO Facilities
- Marina Designs/Studies/Permitting
- Effects of water chemistry on materials
- Tidal Influences
- Geotechnical Studies and Design
- Cathodic protection – investigation and design
- Marine borer studies and remediation, infestation and appropriate mitigation
- Gangways/ADA Compliance
- Floating Structures (terminals and piers)

McLaren's professional staff includes specialists in coastal engineering, who are experts in wave analysis, wave attenuation, sediment transport, environmental loading, and structural coastal interaction. McLaren provides waterfront facility master planning, development/design, and design-build RFP document preparation services. Port terminals and marine layout planning, dry bulk handling/conveying, container terminal feasibility studies/design, TEU loading/unloading analyses, RO-RO and LO-LO planning/design, liquid bulk transshipment planning and design, cruise ship terminal design, all are within the realm of expertise offered by McLaren's Marine Division.

Through our extensive experience in this rather specialized field, we can offer expertise in cost estimating, life cycle analysis, and construction supervision. Our underwater inspection capabilities provide assurance that construction is carried out in conformance with plans.



*Daytona Beach Shores
Seawall Repair*

SUBAQUEOUS MARINE INSPECTION SERVICES

McLaren has extensive experience in underwater inspection and structural assessment, varying in type from quay walls and piers to bridge foundations and dams. Much of our underwater work has been performed along the Eastern seaboard, which provides probably the greatest variation of diving media in the nation. The many varied underwater inspections performed by our dive crews have provided us with a tremendous database for the effects of water chemistry and flow on the life of various marine construction types and materials. Through these projects, McLaren has become proficient in many specialized engineering concepts, such as:

- Marine Borer and Zebra Mussel Identification
- Effects of Current Velocity on Scour
- Cathodic Protection – both Galvanic and Impressed
- Measurement of Water Resistivity and Stray Current
- Low Visibility Diving (Tactile Investigations)
- Cold Weather Diving
- Underwater Videography and Photography
- Various Cleaning Methods – Pneumatic Brush, Hand Scraper, Water Blaster
- Ultrasonic Testing
- Statistical Relevance of Representative Sampling
- Structural Analysis/Design of Structural Repairs/Construction Inspection
- Comprehensive Report Preparations and Surveys



McLaren Certified PE Diver



*Hard Rock Hotel & Casino
Punta Cana - Breakwater
Dive Inspection*

INVESTIGATION AND INSPECTION

ABOVE AND UNDERWATER (DIVE) TEAMS

McLaren field staff are capable of and routinely mobilize up to three (3) dive teams participating in underwater inspection dive operations within the New York area. All team members performing field inspections maintain the training and medical certifications required under Contract Diving Operations sections 30.A.06 to 30.A.10 of the U.S. Army Corps of Engineers EM-385. The 3-man field investigation teams comprise 100% commercial divers certified by the Association of Diving Contractors International (ADCI). Our dive teams are OSHA compliant meeting the guidelines of 29 CFR 1910 Subpart T – Commercial Diving Operations. The team members are trained in general OSHA regulations (10-hr), Oxygen First Aid and are all Emergency First Responders CPR/AED/First Aid.

Safety remains the highest priority for our field inspection teams. By fielding teams that comprise both a Team Leader and a Dive Supervisor, the dive plan and equipment are constantly being reviewed and examined. By this manner, McLaren is proud of having zero OSHA violations, of any gravity, within our 40-year history. Our typical crew for this contract will be comprised of the following:

- P.E. Diver / Team Leader
- Engineer / Diver
- Tender

Our P.E. Diver/Team Leaders coordinate all site operations, as well as perform diving and inspection services for projects to which they are assigned; our Engineer/Divers assist the team leader in all of the team leader's activities, as well as cleaning the underwater elements (as necessary). Our Technician Diver/Tenders maintain the equipment, clean underwater elements as necessary, obtain photographs, assist the diver in recording underwater measurements, tend to the diver's umbilical hose, maintain constant visual/umbilical

contact, ensure a continuous supply of air to the diver, and maintain in-water time records for non-decompression diving. Equipped with a dry or wet suit, gloves, fins, a dive helmet, an independent emergency air supply, and any necessary hand tools, our divers perform inspections using surface supplied air and continuous two-way communication.

McLAREN'S APPROACH TO ABOVE AND UNDERWATER INSPECTIONS

McLaren's approach to above and underwater inspections combines advanced knowledge, specialized training, and diving techniques to ensure our services meet or exceed standards and client expectations. Our strong understanding of equipment, techniques and systems required to deliver our services successfully is demonstrated by the following:

Video Inspections...By using an underwater video camera, tethered with cable and cord on a hydrodynamic float, McLaren is able to perform a remotely operated, visual inspection. Engineers and technicians monitoring the video images at the surface will be able to identify any obstructions and retrieve the camera with the tether.

Rigging...Our dive rigging differs depending on varying types of inspection dives, whether shallow or deep, confined or free to the surface. Common to all dives is surface supplied air and constant two-way audio communication with the diver.

Base Field Operations...McLaren establishes a base for field operations at the specific site of each structure being investigated. Each of McLaren's investigative crews operates from one of seven self-sufficient platforms – four survey vans and three survey boats, each properly stocked with the latest necessary equipment. McLaren's equipment inventory is extensive and varied, and allows flexibility to meet changing job requirements.

Work Platforms...Our survey boat fleet includes a 26-foot aluminum work boat with twin 350hp inboard motors, and a 22-foot C-hawk cuddy cabin with a 200hp outboard motor. Supplementary work platforms include three (3) 12-foot Job boats with a 7hp outboard, a 10-foot Job boat with a 3.3hp outboard, and a 16-foot Royalex canoe. Smaller boats are used for above water underdeck inspections, not as diving platforms.

Dive Stations...McLaren maintains six (6) surface supplied dive stations. Our typical dive station comprises a gasoline powered air compressor, a 30-gallon volume tank with particulate and charcoal filters, a two-diver manifold with pneumofathometer, a 200 - 400 foot, four-part umbilical (air supply hose, pneumofathometer hose, communications cable, and strength member), a two-diver hardwire communications box, and the divers helmet. *Diving Systems International* manufactures all of the dive helmets used by our divers. Helmets include the *Superlite 17B*, *Superlite 27B*, *Superlite 17K*, and *EXO-26* units.

Decontamination Stations...The number and kinds of pathogenic organisms that may be present in polluted water are many. Divers working in waters infected with these organisms may be subject to a variety of maladies. The surest methods of protecting divers operating in contaminated waters are to isolate them completely from contact with these organisms and to ensure that divers are adequately decontaminated after completion of the dive. McLaren equips its divers and in-water-tenders with *level A* protection: an encapsulating suit with self-contained breathing apparatus. Topside personnel in contact with the divers and equipment are equipped with *level D* protection: minimum skin protection (tyvek splash suit with hood, gloves, and face shield) and no respirator.

Confined Spaces...For non-diving personnel to enter a confined space without a SCBA, the air inside the space must be sampled first using a gas-analyzing meter. McLaren utilizes typical confined space meters which check for oxygen deficient atmospheres, explosive vapor levels, and a variety of toxic gases or vapors that may have lethal properties. Personnel entering the space wear a monitor that sounds an alarm should the atmosphere become unsafe.

Communications...McLaren's communications consoles are manufactured by Helle or Amron (single diver and two diver system). The dive station control comprises this console, data logs, the pneumofathometer, and drawings of the existing facility. Communications in the surface supplied diving mode are hardwired from the dive helmet communications box. This system is reliable and intelligible. When scuba mode is used, communications consist of a full facemask (*EXO-26*) with a single sideband acoustic transceiver

acoustically linked to a topside transceiver. In both cases, information is relayed to the topside engineer who records the information and directs the diver.

Bulkheads, wharfs and similar inspection work...are generally tended from deck with a four (4) or five (5) part umbilical comprising air supply, shielded communications cable, pneumofathometer line, safety line and the optional electrical line, which will be used when employing headlamps rather than hand-held lanterns. Dive boats will be used for more remote operations.

Shallow water dives (less than one atmosphere) are generally performed with the 4-part umbilical and bailout bottle. To provide optimal mobility and data gathering capability, McLaren divers are rigged with hand-held tools attached to a harness and a helmet-mounted lantern. Either fins or boots are used, depending upon the type of bottom soils and the scope of inspection.

Deeper dives and penetrations always require a 4-man crew per OSHA. Tools are lowered to the diver, as needed, to eliminate the possibility of fouling, and often a headlamp is used for lighting.

Cathodic Protection System Evaluation...McLaren has inspected multiple facilities with active and passive cathodic protection systems, in varying conditions. As part of our examination, our field teams utilize a bathycorrometer to measure the electric potential between the protected steel component and a base anode.

SAFETY

McLaren considers safety with the highest sense of importance. Both OSHA and ADC regulations (including confined space entry requirements) are strictly adhered to. All field personnel must meet minimum technical and physical requirements, and must maintain First Aid/CPR certifications, annual fit-to-dive certifications, and diver certifications. They receive in-house training, and must pass an exam on methods and techniques for inspections and diving.

EQUIPMENT

Equipment used for investigations includes various hammers, scrapers, picks, and awls, as well as more specialized equipment such as incremental wood borers, pneumatic and hydraulic coring tools, direct read ultrasonic thickness measuring equipment, pile calipers, pneumofathometers, Nikons/Olympus underwater cameras and strobes, clear water boxes for photography in turbid waters, and Deepsea and SONY underwater video cameras with acrylic "Ikelite" casing and/or underwater video camera with on-board TV monitor and character generator.

STANDARD EQUIPMENT

A summary of the standard equipment available to perform investigations and inspection is as follows:

- 250 ft. of dive umbilical for surface supplied air.
- Gas engine air compressor and volume-tank. Boat diving includes 240 cubic foot air bottles rated 240 psi + . 15 cubic foot bail out bottle carried with diver for safety.
- *Superlite 17B, Superlite 27B, Superlite 17K* diving helmets.
- Viking vulcanized rubber dry suits for contaminated sites or cold water diving.
- Wet suits used for clean, warm water diving.
- Hot-water suits for cold water diving.
- Diving accessories including gloves, boots, fins, weight-belts, etc.
- Underwater lights.
- Underwater video camera with above water monitor and time/date recorder.
- Constant two-way audio communication with recording equipment.
- Underwater 35mm and digital cameras with strobe.
- Six foot fiberglass folding ruler, 25-foot tape measure, metal yardstick, sounding rods and miscellaneous ropes and lines.
- Kraut Kramer ultrasonic thickness gauge, or equivalent.
- Open and closed cockpit fiberglass/aluminum dive boats with outboard motors. Dive boat includes all required Coast Guard accessories, life jackets, flares, marine radio, etc. Trailer provides easy mobility from site to site.

- Econoline 250 van(s) with dive ladders, paint, and miscellaneous tools, etc.

SPECIALTY TOOLS

The diver has access to a multitude of specialty tools specifically designed for the task at hand. These include but are not limited to:

- A *Cygnus 1* Ultrasonic Thickness Meter for steel thickness measurements.
- Water samples are analyzed for dissolved oxygen using a YSI-95 Dissolved Oxygen Meter, in which a remote probe allows for ambient oxygen readings at depth, in real time. A silver/silver chloride (Ag/Ag-Cl) reference cell is used with a multimeter potentiometer the determine voltage difference readings in an electrolyte (seawater).
- *SONY DCR-TRV 27* Digital Video Cameras with *Ikelite* Marine Video 6035.9 Housings or *EWAMarine VMX* Housings.
- *Olympus* Digital Cameras with *Camedia* Underwater Housing and *Inon* Underwater Strobes.
- *Nikonos V* cameras with the *Nikkor UW 20mm* lens, and the *Substrobe 400* underwater flash. An in-frame reference scale is used with the camera when appropriate for close-up photos.
- Underwater videography is recorded using a *Deepsea Power & Light SC2000N* camera and a *wet/dry MultiSea Lite*. The *MultiSea Lite* is not required to be submerged to operate; it will function out of water indefinitely, allowing for uninterrupted video coverage of the splash zone and above. Annotation can easily be over laid on the video in real time with our character generator.
- Timber cores can be extracted with hand increment borers or a *Pneumatic/Hydraulic* drill and 2 inch hole saw. The 2 in. cores have proven to be effective in measuring creosote penetration/retention as well as marine borer infestation levels. *Pneumatic/Hydraulic* power reduces diver fatigue and increased production levels.

McLaren also owns and operates a *Sea Otter*, a remotely operated vehicle (ROV), for situation in which a diver access is impossible or unsafe. McLaren maintains trained and certified staff to deploy and tend the ROV, which safely video-documents conditions in real time.

WATERBORNE TRANSPORTATION DESIGN SERVICES

McLaren’s involvement with the ferry transport industry began in the early 1980s when we were asked to provide engineering support and consultation for the temporary floating ferry terminal at Battery Park City in lower Manhattan. That work has lead to the design of more than 40 ferry landings in the Northeast, and we are now working on the second generation of terminals, which comprise some very significant structures. Our history of experience includes work for port authorities, economic development entities, state departments of transportation, and private ferry operators.



Port Imperial Ferry Terminal

As part of our work for the development of ferry terminal and landing sites, we have found several key issues germane to the development of these facilities:

- | | |
|---|---|
| • Definition of Design Parameters | • Passenger Amenities |
| • ABS Design of Barges, ramps, and lift systems | • Safety |
| • Fendering | • Flexibility of Design for Future Uses |
| • Vehicle/Passenger Movement and Throughput | • ADA Compliance |
| • Anchorage | • Design of Floating Structures |

- Permit Acquisition
- Low Maintenance Solutions/Sustainable Design
- Community Outreach/Participation
- Maintenance / Life Cycle Considerations
- Building code compliance

ENVIRONMENTAL PERMITTING

McLaren has successfully prepared the environmental permit applications and guided clients through the maze of waterfront-related permits and approvals for large municipal projects. McLaren's suggestions for innovative project alternatives have greatly reduced the potential for impacts to aquatic biota and the estuarine habitats, thereby allowing the project to be successfully permitted within a relatively short time frame. Furthermore, by eliminating certain impact issues, the need for extensive fieldwork is greatly reduced.

McLaren is intimately familiar with the process and issues that must be addressed in permitting waterfront projects; and because agency review of permit applications can be a lengthy process, McLaren strives to:

- Design projects in a way that minimizes potential problems during the review period to the extent practicable.
- Get review agency approval of overall project approach and concept as early as possible.
- Develop project construction schedules (including those for producing construction drawings) that recognize the uncertainties regarding the timing of permit issuance.

STRUCTURAL DESIGN AND INSPECTION SERVICES

(BUILDINGS AND SPECIALTY STRUCTURES)

McLaren's depth of experience and expertise encompass all aspects of structural design, inspection and construction services. The firm has provided structural inspection, design and engineering services for thousands of projects in the New York Metropolitan area, nationwide and worldwide.

McLaren has in-depth knowledge of all types of structures, including:

STRUCTURAL EXPERTISE:

- New Building Construction
- Renovations and Additions to Existing Construction
- Façade Design
- Feasibility Studies
- Peer Review/Value Engineering
- Forensic Engineering
- Construction Engineering

- Airport Facilities
- Casinos
- Churches
- Commercial Buildings
- Cultural Buildings
- Damping Systems
- Educational Facilities
- Entertainment Venues
- Healthcare Facilities
- High-Rise Buildings
- Historic Structures
- Hospitality Buildings
- Industrial and Residential Structures
- Laboratories
- Maintenance Facilities
- Mixed-Use Buildings
- Municipal Buildings
- Parking Structures (Underground and Above Ground)
- Recreational Developments
- Retail Facilities
- Transportation Facilities
- Waterfront and Marine Structures

Our experience can be broken down into the following seven (7) categories:

New Building Construction

McLaren has successfully completed projects constructed of steel, reinforced and post-tensioned concrete, masonry, timber, stainless steel and aluminum. We have an in-depth knowledge of all current standards and codes throughout the country and abroad, as well as, many historic codes which they often govern. Key issues that our structural engineers address in structural design projects include:

- Evaluation and selection of alternate structural systems.
- Optimal Foundation systems determined with our in-house geotechnical division.
- Structural system design using state-of-the-art software – SAP, ETABS, SAFE, RAM, RISA 3D, ANSYS, SJ MEPLA and custom in-house software.
- Knowledge of the latest codes and local requirements.
- Blast resistant design using non-linear dynamic analysis.
- Rapid response during design and construction phases.

Renovations and Additions to Existing Construction

In addition to professional design services for new projects, McLaren has diverse experience in dealing with the complexities associated with the evaluation and analysis of both existing and historic structures. Our experience includes forensic engineering analysis, structural analysis of existing and older buildings for renovation/repair and adaptive reuse, and evaluation of distressed/damaged buildings.

Façade Design

McLaren regularly designs specialty façade systems including glass fin walls, parallel cable walls, cable net walls, tensioned truss walls and many other systems using traditional and non-traditional materials such as stainless steel and bronze. Many of our façade systems are designed for blast resistant construction to provide a barrier at the base of the building. Typical designs are performed to the DOD design standards for blast resistant fenestration systems.



St. Croix – Louis E. Brown Apartments

Feasibility Studies

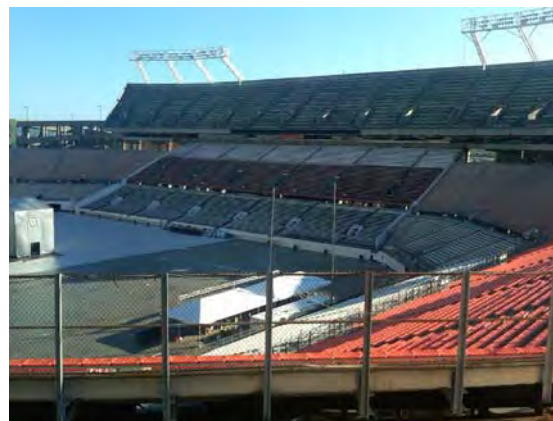
McLaren analyzes existing buildings to determine whether proposed alterations can be made and provides an order of magnitude estimate of costs to make the repairs.

Peer Review/Value Engineering

These services of McLaren are regularly retained to provide review of alterations/renovations of the structural designs of other engineers to assess the feasibility and cost effectiveness of the proposed design.

Forensic Engineering

McLaren assesses the stability of structures that have been damaged by flood, fire, insect infestation, and structural overloading. We develop a strategy and provide an engineering design on how to stabilize the structure, and we develop structural design repair details.



Citrus Bowl Forensic Inspection

Construction Engineering

McLaren regularly provides construction engineering services for steel, concrete, foundation and marine contractors. Our scope of services typically include:

- Shoring Design
- Jacking Sequence Design for Column Removals
- Demo Drawings (DMO in NYC)
- Steel Connection Design
- Foundation Underpinning Design
- Sheeting and Shoring
- Tower Crane Installation Design



Maryland Live Casino – 1.7 Million SF Building Opened in 2012

We have an excellent history of structural inspection, engineering and design experience working for private developers, corporations, contractors, architects, and public and private entities. McLaren’s portfolio of structural projects includes clients such as the University of Central Florida, Walt Disney World, the Georgia Aquarium, Liberty Science Museum, the Baltimore Center for the Performing Arts, the Port Authority of New York and New Jersey, the New York City Economic Development Corporation, the Olympia & York, Carnival Cruise Corporation, U.S. Gypsum, Cappelli Development, R&D Development, and the U.S. Navy.

SITE AND CIVIL ENGINEERING SERVICES

McLaren’s site/civil division provides comprehensive engineering services ranging from the planning stage through final design and construction management for all types of facilities. We have specific in-depth expertise in large site development projects and transportation facilities.

Our recent large-scale site development experience includes: the River Park Center in Yonkers will be a more than two million square foot mixed-used complex that includes retail, residential, hotel, office and entertainment space anchored by a new minor league baseball stadium; the Maxwell House site development which features 1.4 million square feet of residential and commercial space and a waterfront park, esplanade, and marina; and the Port Imperial development which consists of 6,500 residential units and approximately 2 million square feet of commercial space, including office, retail and a full service hotel.



Ritz Carlton, Rose Island, Bahamas

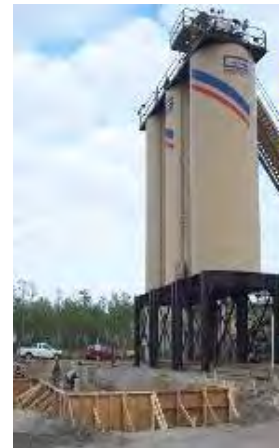
Our site services include:

- Feasibility Studies
- Local and Regional Planning Studies
- Site Planning and Layout
- Topographic Surveys
- Geotechnical Services
- Flood Plain Impact
- Utilities Design
- Subdivision and Land Development
- Demolition and Removal of Existing Structures
- Stormwater Management
- Potential Traffic, Noise and Air Quality Impacts
- Retaining Wall Design
- Earthwork
- Landfill Design
- Landscaping
- Zoning Assistance
- Environmental Permitting
- Public Participation/Meeting Assistance

- Erosion Control
- Drainage Studies, Design and Hydrology
- Highway Design
- Street and Parking Design
- Transportation System Impacts
- Design of Deep and Shallow Foundation Systems
- Construction Plans and Specifications
- Construction Inspection Services
- Construction Support Services
- Maintenance and Protection of Traffic
- Slope Stability Analysis

McLaren engineers in our site/civil division employ state-of-the-art software, including: Autodesk Civil 3D 2013, Hydraflow Hydrographs (extension for AutoCAD Civil 3D 2013), HEC-RAS 4:1:0, Hypack 2012, Watercad V8, Hydraflow Storm Sewers 2013, and WinTR-55 Small Watershed Hydrology.

Geotechnics. Developable land has become less abundant over the past decade as restrictions have increased. Marginal sites have now become viable ones; however, they are often associated with difficult ground. The geotechnical challenges offered by these sites require creative engineering skills and technical expertise. Whether the solution is piling, dynamic compaction, or other means of ground modification, McLaren can assess and recommend the appropriate method. We have stabilized old buildings, underpinned and lifted others, and have designed foundations for hundreds of structures. We have in-depth expertise in providing economical foundation design for clients. McLaren explores all feasible alternatives in geotechnical design, such as reusing existing piles to provide cost effective solutions. We examine the most economical solutions to determine if they will meet the long terms needs of the project.



Asphalt Storage Silo Foundation

SURVEY CAPABILITIES

Surveying plays a central role in the planning of any type of site or structure. In its various forms, surveying determines distance and elevations, identifies angles and directions, and establishes boundaries. To engineers, the information obtained in a survey is both useful and necessary; the data enable them to not only develop a proper design solution, but to perform a design at all.

Our surveying division, therefore, adds a significant piece to our diverse engineering puzzle by delivering the most accurate data in the industry, ascertaining site information needed to execute different types of projects. In fact, our surveyors perform standard control, topographic, hydrographic and cadastral surveys, a range of expertise that takes our firm's self-sufficiency to the next level.

Our multiple, fully equipped survey crews have experience with commercial and residential applications, municipal facilities, and highway and rail facilities. They often work in conjunction with our Site/Civil Division in site development projects, while their hydrographic surveying balances our Marine Division's underwater inspection services.

McLaren's extensive experience portfolio includes surveying and mapping. Our Surveying and Mapping Services Include but are not limited to the following:

- Boundary Surveys
- Subdivisions
- Site Plans
- Facility Surveys
- Control Surveys
- As-Built Surveys
- Route Surveys
- ROW Mapping
- Topographic Surveys
- ALTA/ASCM Title Surveys
- Hydrographic Surveys
- Preliminary/Final Plats
- FEMA Elevation Certificates
- Easement Preparation
- Construction Stake-Out
- Est. of Monument and Benchmarks

Surveying Equipment. McLaren has the capability to provide three (3) fully outfitted crews loaded with all the appropriate survey equipment at any given time. Specifically:

- Each crew will come with either a fully robotic 3" total station or a 3" conventional total station. The crews will also come equipped with either a TDS Recon, Nomad or Ranger, a Spectra TSC3 Ranger, a Survey Controller GPS enabled Ranger or a Carlson Surveyor 2 SurvCE 4.0 data collector.
- Total Stations include:
 - 2009 Trimble 5600 3" Robotic Total Station
 - 2014 Focus 30 3" Robotic Total Station
 - 2015 Sokkia SX 130T 3" Robotic Total Station
 - 2013 Topcon GTS 243-NW 3" Conventional Total Station
- Post processing of survey data is accomplished with Carlson 2014.
- Maps are produced with Hypack 2014, Carlson Survey 2014, Carlson Civil Suite 2014, AutoCAD 2013 or AutoCAD Civil 3D 2013.



McLaren also owns state of the art survey, GPS, and hydrographic equipment that includes:

- Trimble R-8 Real Time Network GPS system accompanied by KeyNet Real Time Kinematic VRS correction service for setting up job control and for hydrographic data acquisition.
- Topcon DL-102C Digital Level, Nikon AZ-2 and AP-8 conventional levels.
- Hypack 2014 software for seafloor mapping and hydrographic data acquisition.
- Valeport 740 Tide Gauge with FTI Single Channel Signal Conditioner.
- Teledyne Odom Hydrographic Digibar Pro Profiling Sound Velocimeter.
- Ohmex SonarMite MILSpec 200kHz echo sounder and transducer

Hydrographic Surveys. Routine hydrographic surveys are conducted using the Portable Seafloor Hydrolite System which includes Sonarmite BT Echo Sounder (for water depth) linked to a Trimble R-8 RTK GPS data logger (for location on the planet) using industry-standard Hypack Max Software supported by an ODOM Digibar Pro Velocity Calibrator (to tell us the speed of sound in water) and a Valeport Model 740 Tide Gauge (to monitor the varying water elevation). The data is then related to the appropriate datum to assure that the underwater information seamlessly integrates with the above water land data. Survey planning, execution and post-processing are accomplished using Hypack Max Software.

BRIDGE AND ROADWAY SERVICES

McLaren offers full service engineering for highway and railroad bridges, pedestrian bridges, overpass structures, culverts, retaining walls, and appurtenant structures. Our professional staff provides expertise in all areas of bridge analysis and design, highway design, rail operations, and construction inspection.

Whether the project involves long span river crossings, highway overpasses, railroad bridges, secondary road structures or bridge inspection programs, McLaren can provide the technical and management expertise to meet our clients' needs.

Bridge and roadway services offered are comprised of:

- Comprehensive Services for All Phases of Work
 - *Project Scoping*
 - *Preliminary Design (Phases I-VI)*
 - *Final Design (Phases V & VI)*
 - *Construction Support Services*



**Design of Pedestrian Bridges
Montgomery County, MD**

- *Construction Inspection Services*

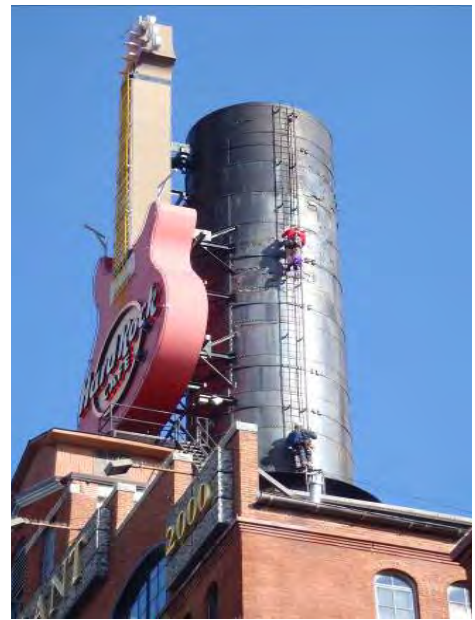
- Above and Underwater In-Depth Inspection Services
- Load Rating Analysis
- Recommendations for Repairs / Rehabilitation / Safety Measures
- Designs for Complete Bridge Replacement / Repair / Upgrades
- Culvert Inventory and Inspection
- Preparation of Contract Documents and Construction Cost Estimates
- Constructibility Review / Contractor Review
- Maintenance and Protection of Traffic Planning and Implementation
- Environmental Reports / Permitting
- Traffic Study Analysis / Accident Data Review / Signalization
- Solutions to Drainage Problems
- Geotechnical Design
- Application of Innovative Materials (Plastic Lumber Bridges, Walkways)
- Community Relations / Public Participation

With the efficient use of computers for design and document production, we are able to devote our efforts to the optimization of design and management of the process. By using our library of details considerable drafting time is saved, structural analysis can be refined and geometric accuracy is assured.

Our bridge inspection teams are available to assess conditions, file state and federal inspection reports, and most importantly, use our system of computerized management to compile the assembled inspection data and focus on the prioritization of deficient elements. This helps to identify those elements in greatest need of rehabilitation. In this way, a group of bridges can be repaired or upgraded in a fashion that optimizes the use of available funds. Management of infrastructure repair is a science to which we have dedicated significant time and resources.

Rope-Access Inspection. Among the unique elements of McLaren's inspection capacity is the ability to thoroughly examine a bridge's structure using rope-access trained engineer climbers. As demonstrated by our recent inspection work at the Poughkeepsie-Highland Railroad Bridge, there are several cost-saving advantages to employing our SPRAT-certified engineers. Foremost, an inspection utilizing rope-access instead of conventional inspection equipment such as UBIU's, Bucket Trucks, and Manlifts causes less interruption of roadway/bridge traffic and railroad operation. Rope-access will also allow for rapid assembly and disassembly of equipment, increased schedule flexibility, and, since the engineers carry the rope-access gear, rapid mobilization. These benefits all provide considerable savings in the cost, planning, coordination and execution of the inspection.

Our bridge inspection staff is NBIS, NICET, NACE, and SPRAT certified and employs access techniques ranging from hard-hat diving to abseiling – meaning no aspect of a bridge inspection will go unreached. In short, our engineers are trained, experienced and prepared to provide services through all aspects of any project.



***Hard Rock Café Climbing Inspection
Baltimore, Maryland***

FORENSICS ENGINEERING SERVICES

On-Call Investigation... Predicated on our diverse technical engineering capabilities, the McLaren is often called upon to provide expert testimony on technical issues. In this, our fastest growing division, McLaren engineers have become adept at investigating, analyzing and simulating the events leading to a host of structural failures and deficiencies.



Video Analysis of Bridge Collapse

Cause and Effect... Explaining and documenting through forensic analysis, McLaren's engineers allow judges and juries to understand what happened and why. We offer our findings in not only the form of technical papers, but also with supporting full-motion real time video simulation, at various perspectives and in high detail. These findings are not only used to support litigation, but also to assess building standards and material uses.



Citrus Bowl Forensic Inspection

Using state-of-the-art analytical software and other testing tools, we can recreate conditions in a virtual world, build simulations, identify the mechanism of failure and propose innovative and effective solutions. Our quality control procedures in data collection, research, and reports preparation ensure a complete, clear and concise document, offering an undisputable legal exhibit for invaluable litigation support.

Today, the need to compile and present certified documentation in the event of a catastrophic failure is essential. Our success in the area of failure investigation is considered by many to be the key element in identifying culpability and establishing responsibility.

McLaren offers a complete range of services encompassing:

- Failure Analysis
- Expert Testimony and Litigation Support
- Condition Surveys
- Deficiency Investigation and Assessment
- Structure Integrity Investigation
- Construction Claims
- Federal and Local Code Compliance

ENTERTAINMENT ENGINEERING

Our dedication to provide continued services to the entertainment industry through visionary engineering and design has enabled our services to be amongst the most comprehensive offered. McLaren's experienced staff offers proficiency in stage and scenery design (moveable and stationary), theater facilities and rigging, themed architectural elements and sculptures, studio fit-out design, billboard and special signage, promotional displays, amusement rides, show action equipment, and mechanized effects, inspection and consultation on special structures. McLaren brings more than 25 years of engineering expertise in the areas of structural and mechanical engineering for entertainment facilities, theatres and equipment.



Elton John Stage Design, Tampa FL

Since our firm is involved in the engineering of all types of structures, theaters, entertainment shows, passenger terminals, etc., our capabilities for design and analysis are comprehensive. We are extensively familiar with materials, systems, mechanisms, machinery, hydraulics, rigging, effects, methods of construction, costs, specifications, and means of analysis. We are an engineering firm with advanced



**Hexagon Temporary Structure
Miami Beach, FL**

modeling capabilities and experience, and therefore possess an advantage in the design of moving systems under extreme loading and environmental conditions.

Entertainment engineering has evolved tremendously with technology over the past twenty to thirty years. What was once a group of four singers standing on a stage has now become a technological extravaganza complete with moving platforms, flying bridges, tracking video walls weighing dozens of tons, pyrotechnics, hydraulic lifts and 16 ton speakers. In many cases these stages must be portable, and able to be erected in hours. Permanent installations compete for attention at theme parks, casinos, public spaces, and retail stores. The more grandiose the show, the greater the appeal. These events, shows, or installations are the result of some very creative development, but the journey

from imagination to installation requires serious engineering design and fabrication. Over the past fifteen years, the McLaren Engineering Group has provided that engineering for large rock concerts, Broadway shows, theme parks, casinos and many other performance events and venues.

Complete services provided to the industry include:

- Concept development
- Static and dynamic analysis
- Finite element and matrix structural analysis
- Fatigue and fracture analysis
- Range of motion studies
- Rigging system design
- Themed attraction integration
- Ride/Show engineering
- O&M Manual preparation
- Design of show set elements
- Load rating of existing structures
- Field investigations and inspections
- Fabrication and installation inspection
- Custom machinery design
- Safety assessments and specifications

What we do...Our involvement with the entertainment industry began in the early 1990s when McLaren was asked to provide engineering support and consultation for the Pink Floyd and the Rolling Stones' World Tours. We have continued to hone our skills with a steady stream of projects that run the gamut: from the Tina Turner 24/7 World Tour, Elton John Tour, and MSNBC Studio, to Cirque du Soleil, all 20 Shubert Theaters, Toys R' Us Animatronic T-Rex, to the Mohegan Sun Casino, Wynn Casinos in Las Vegas and Macau, and four Super Bowl Half-Time shows. Just as the industry has progressed, so has the demand of our clients, with each project pushing the envelope further. As a result, to meet these growing expectations, the ingenuity and breadth of our services has developed to include:



**2015 Tortuga Music Festival
Fort Lauderdale, FL**

- Scenery and Trussing
- Sculptures and Signage
- Theme Park Attractions
- Theatrical Structures and Rigging
- Themed Architectural Elements
- Theatrical Equipment and Staging
- Entertainment Facilities: New and Renovations
- Mechanized Effects / Show-Action Equipment
- Television and Film Production Studios/Sets
- Animatronics
- Permanent, Temporary and Touring Stages/Sets

As the entertainment industry continues to change, McLaren follows suit in taking the ideas and concepts of our clients and making them a reality. Easier said than done, this challenges our engineers and designers to push the limits technically, while not compromising the aesthetic appeal of the project. We are responsible

for incorporating the clients' ideas, while maintaining the functionality, structural soundness and durability of the mechanical components, including accommodating electrical, control system, and safety requirements.

Portable staging poses a battle on all of these fronts. The very nature of the structure being "Portable" requires the designer and/or engineers to fulfill all of the aforementioned requirements, in addition to being able to replicate the action of the structure, its assembly and the installation and dismantling process without diminishing the safety, durability, function and visual appeal of the structure(s) to the audience. To meet such challenges we employ cutting edge technologies and equipment, combined with personalized involvement and interaction with end-users, that allow the clients' imagination to be the limit of our capabilities.

SECTION 2
Key Personnel

Section 2 Key Personnel

MCLAREN ENGINEERING GROUP (MCLAREN) distinguishes itself as one of the nation's leading experts in the structural inspection, assessment and design of marine and waterfront structures. The firm has 40 years of such experience, and our qualified professionals have considerable expertise in the inspection and assessment of ferry terminals / marine structures, both above and below water, all phases of design, bid phase services, construction phase services, and project management / administration. We also possess a specialty in marine borers infestation identification and remediation. Our qualified professionals have considerable expertise in the areas of structural and civil design and engineering, construction inspection services, construction safety services, and project management.

As a multi-disciplined consulting firm, however, McLaren possesses experts in a range of engineering categories. Our 200-person staff features marine engineers and designers, underwater inspectors, structural engineers, bridge/highway/rail inspectors and designers, waterborne transportation planners, mechanical engineers and forensic investigators. This staff will be available to support this project and ensure its successful completion.

We believe our ability to provide the highest level of service is exemplified by our history of successfully executing projects of similar scope, and is combined with an understanding of various waterfront repairs and design projects. Our understanding of the materials and techniques used in site inspection, design, and construction further augments these comprehensive services.

PROJECT ORGANIZATION

Our view is that corporate qualifications and historical experience mean little without the commitment of senior level staff. The strength of our project team, therefore, is the people we assign. A summary of our project team is provided below.

KEY PERSONNEL

Set forth below are brief bios of the key staff that will be assigned to this project with their respective roles indicated.

Malcolm G. McLaren, P.E., SECB will serve as **Principal-in-Charge** for this contract. Mr. McLaren is a registered professional engineer in the state of Florida and has more than 40 years of design, engineering and inspection experience for marine, bridge/highway/rail, structural, site/civil, geotechnical, and forensics projects nationwide. As Principal-in-Charge, Mr. McLaren will provide management review, ensure that the appropriate resources of the team are available to conduct the work, and will provide senior-level input to technical aspects of the project.

Andrew Habel, P.E. will serve as **Project Manager** for this contract. Mr. Habel is a registered professional engineer in the states of Florida, Georgia, Alabama, North Carolina, Mississippi, as well as being a registered professional in Puerto Rico. He has 11 years of experience in the structural design and inspection of marine, commercial, residential and entertainment structures. His responsibilities include structural inspection, design of structural systems, report preparation, and construction administration. He is well versed in all phases of the design process, and is proficient in using AutoCAD, ETABS, SAFE, and RISA3D for computer modeling. Mr. Habel is an NAUI certified diver. As such, he possesses a specialty in the inspection and assessment, and design of marine and waterfront structures and components above and below the water.

As Project Manager, Mr. Habel will make certain that all of the needs and requirements of the City are satisfied. He will report to the City all project-related issues and will ensure that all tasks associated with this project are managed effectively from start to finish. Mr. Habel's role as Project Manager will entail, but not be limited to the following:

- The Project Manager will serve as a single portal of contact and control between the City and the staff assigned to the project to ensure cost efficient project management, clear direction to all project staff personnel and timely response to the City
- Providing direct oversight with regard to project execution and accountability
- Verifying and approving the project schedule and budget
- Implementing project changes as requested by the City
- Providing all staff resources necessary for successful project implementation and completion
- Providing review and approval of project performance and deliverables

Mauricio Posada, P.E. will serve as the Senior Engineer for this contract. Mr. Posada is a registered professional engineer in the state of Florida and holds registration in four additional states. He has over 17 years of civil, structural and marine engineering experience in the analysis, design, rehabilitation, forensic, and detailed engineering for structural projects. Mr. Posada's experience includes ports, foundations, offshore and onshore engineering, and industrial and commercial projects for the maritime and oil/gas/petrochemical industries. He is proficient in the design of steel, aluminum, wood and concrete structures which includes reinforced and precast concrete, P/T, and masonry. His experience also includes dynamic, vibration and seismic engineering, and lifting/rigging analysis/solutions.

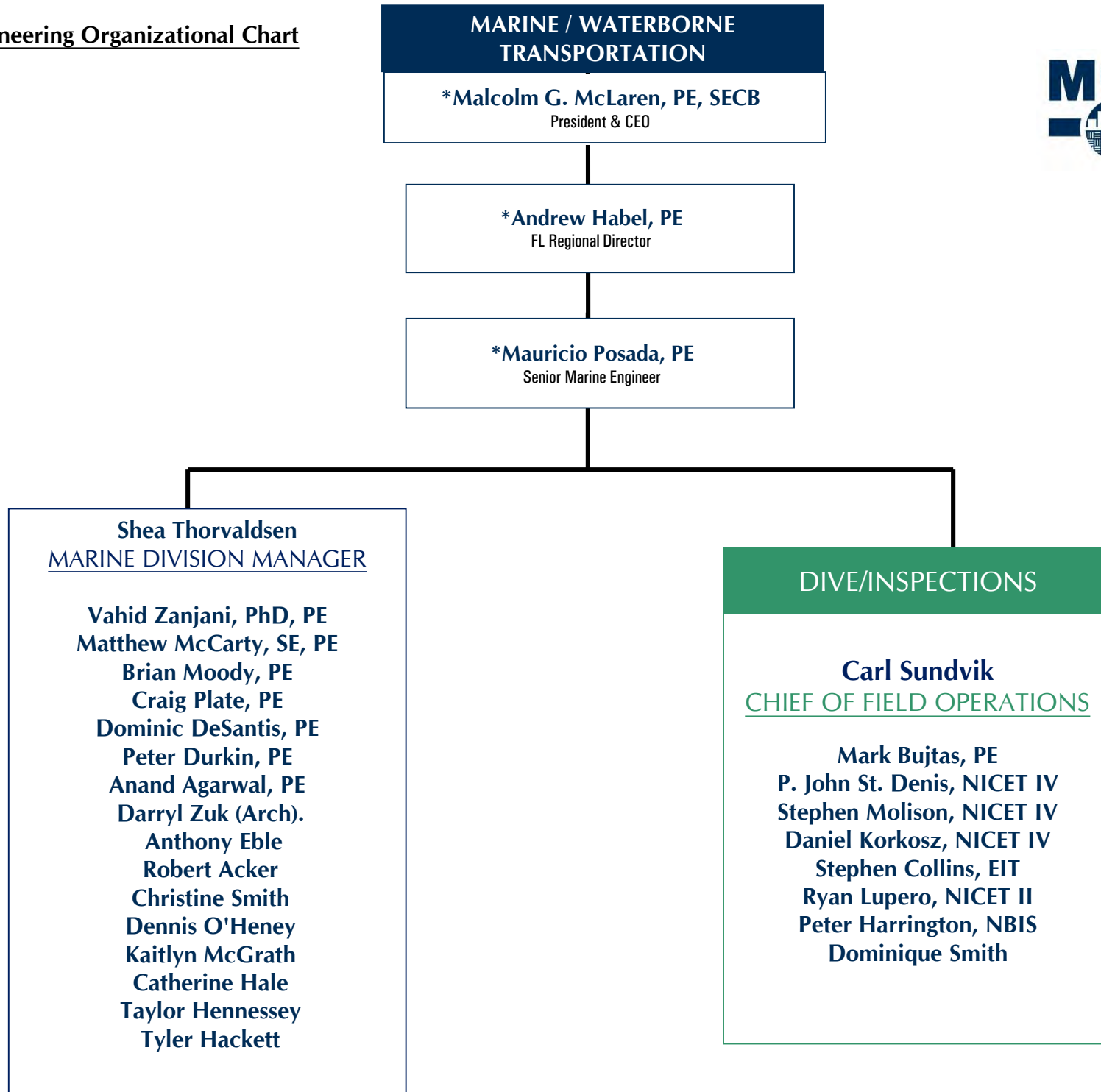
Resumes are provided at the end of this section

STAFF AVAILABILITY

McLaren's experienced field personnel have worked throughout the country and worldwide and are comfortable adapting to a variety of geographic conditions and environments. McLaren's technical and administrative support staff forces available to perform work under this contract are currently over 200. Our technical staff availability is best described on the *Staff Availability Chart* provided at the end of this section.

Our management approach, organization, facilities and capabilities are ideally suited for this contract, as our corporate depth and expertise allows us to execute multiple projects, large and small, simultaneously and with a consistent level of efficiency. At this time, the overall corporate workload is such that added man loading could be absorbed without the need to hire more personnel. Further, the designated key staff members proposed for this project will remain assigned to this project to ensure the requisite level of expertise and to maintain continuity. If, however, key personnel must be altered or replaced, our depth ensures that any such changes can be made and absorbed seamlessly.

Marine Engineering Organizational Chart



RESUMES

Andrew C. Habel, P.E.
Florida Regional Director, Senior Engineer

Education:

B.S. Civil Engineering, University of Alabama; Huntsville, Alabama, 2004

Registration:

Professional Engineer: Alabama #34569, Florida #69819, Georgia #PE039243, Mississippi #25927, South Carolina #31912, Puerto Rico #27248

NAUI Certified Diver

Experience:

Mr. Habel is a structural engineer with 13 years of experience in the structural design and inspection of marine structures, commercial, multi-family residential, marine structures, and entertainment structures. His responsibilities include structural inspection, design of structural systems, report preparation, and construction administration. He is well versed in all phases of the design process, and is proficient in using AutoCAD, ETABS, SAFE, and RISA3D for computer modeling. Representative marine projects include:

- **Bertram Yacht Marina Inspection and Report, Miami, FL; for Reidenbaugh Hufford Associates LLC;** Project Engineer for the inspection of above-water and in-water inspections of the marina topside structures, piers, and finger piers. Mr. Habel provided an assessment report of the various structures onsite for use as a due diligence report by the client.
- **Daytona Shores Seawall, Daytona Beach, FL;** Structural Engineer responsible for the inspection report of finding for a leaning seawall at Daytona Beach Shores Hotel.
- **The Lens, St. Petersburg Pier Replacement Project, St. Petersburg, FL; for Buro Happold Consulting Engineers, P.C.;** Project Engineer for the professional geotechnical and marine engineering services for the replacement of St. Petersburg Pier. Specific project tasks included an existing condition investigation, wind and wave climate study, and design of the pier foundation.
- **Staten Island Homeport, Staten Island, NY; for New York City Economic Development Corporation;** Project Engineer for design and construction support services for long-term rehabilitation of one mile of shore located at Staten Island Homeport. McLaren provided engineering analysis and design for concrete bulkheads, sheet pile bulkheads, rip rap, a timber fishing pier, and a kayak launch. A full set of construction drawings and technical specifications were prepared, as well as construction cost estimates and assistance with bidding.
- **New Stapleton Waterfront Development, Staten Island, NY; for New York City Economic Development Corporation;** Project Engineer for design of cast-in-place concrete retaining walls, vinyl and steel sheet pile walls, rip rap, a kayak launch, and a timber fishing pier for one mile of shore located at Staten Island Homeport on Staten Island. Project engineer for project permitting.
- **Pier C North Seawall Collapse Repairs & Chart House Monitoring, Weehawken NJ; for Hartz Mountain;** Project Engineer for the emergency engineering and monitoring services provided in response to a collapsed portion of the northern seawall at Pier C. The collapse was due to the failure of the supporting timber substructure during a storm event in 2009. Repair design documents and construction administration were prepared.
- **Hard Rock Hotel & Casino – Breakwater Dive Inspection; Punta Cana, DR; for Hard Rock Hotel and Casino Resort Punta;** Project Manager for the underwater inspection and letter report with photographs for the existing breakwater currently under construction. All work was performed using SCUBA, with wireless, through water communications, which will provide constant communications with topside personnel. The goal of the inspection is an examination of the conditions to observe the conditions outlined above and that will form the basis of future study.

Andrew C. Habel, P.E.
Florida Regional Director, Senior Engineer

- **Ferry Shore Facilities – Derrick #3 Conversion; for New York City Department of Transportation;** Project Engineer for the structural schematic design for replacing the existing oil fired steam power plant of Derrick #3 with a diesel powered compressed air system. McLaren provided an inspection, survey, and structural and mechanical design services necessary for the replacement.
- **City of Orlando “On-Call” Agreement - John H. Jackson Community Center; Orlando, FL; for the City of Orlando;** Under a continuing professional consultant agreement in structural engineering, Mr. Habel served as Project Manager providing structural inspection, analysis and design services at the John H. Jackson Community Center. The work included a structural analysis of the existing roof framing in the area of the John H. Jackson community center roof to receive a new Advantix DT-RT roof top unit. Additionally, Mr. Habel provided structural design and drawings for a steel framed catwalk with steel ladder to access the steel frame mounted HVAC unit located in the open-air screened area containing multiple HVAC units. The catwalk utilized steel bar grating to allow for adequate ventilation in this area.
- **Recent Walt Disney World Projects –** Below is a listing of projects in which Mr. Habel has served as lead structural engineer.
 - Yachtsman Steakhouse Fall Protection Platform
 - Gasparilla Grill Fall Protection Platform
 - Fantasmic Lighting Truss Fall Protection
 - FY14 Fall Protection Points Recertification
 - FY15 Fall Protection Points Recertification
 - Primeval Whirl Little Dip Track
 - Ride and Show Mechanical Engineering
 - Space Mountain
 - Parade Floats Evaluation

Mauricio Posada, P.E.

Senior Marine Engineer

Education:

Master of Science, Civil Engineering (Structural Engineering), The University of Texas, 2001
Bachelor of Science, Civil Engineering, Universidad de los Andes, Bogotá, Colombia, 1998

Professional Registrations and Certifications:

Licensed Professional Engineer: Alaska #13772, 2013; Florida #69521, 2009; Louisiana #37932, 2013; New York # 097467, 2017; Texas #99369, 2007
Transportation Worker Identification Credentials (TWIC)
Basic Orientation Plus Safety Training by Delaware Valley Safety Council
Port of Philadelphia and Sunoco Logistics Safety Training by Delaware Valley Safety Council

Computer Software:

SAP 2000, Visual Structural Analysis, STM D, Micro SAS, StruCAD, Prosheet, AutoCAD, Microstation, Cwalsht, PY-Wall, STAAD Foundation, Navisworks, SACS (static and dynamic analyses, ice roads, tow, loadout, lift, fatigue, pile-soil interaction), Caesar II (pipe stress software)

Experience:

Mr. Posada has over 17 years of civil, structural and marine engineering experience in the analysis, design, rehabilitation, forensic, and detailed engineering for structural projects. Mr. Posada's experience includes ports, foundations, offshore and onshore engineering, and industrial and commercial projects for the maritime and oil/gas/petrochemical industries. He is proficient in the design of steel, aluminum, wood and concrete structures which includes reinforced and precast concrete, P/T, and masonry. His experience also includes dynamic, vibration and seismic engineering, and lifting/rigging analysis/solutions. Mr. Posada's experience includes the following:

- **Wharves Strengthening Program, Cargo Wharves I-VII; Port of Miami, FL; for the Port of Miami;** Senior Maritime Structural Engineer responsible for the structural engineering analyses for the strengthening of the existing wharves to permit the planned dredge (deepening from -42 feet to - 52.74 feet). The structures were checked to ensure that they have sufficient toe depth, anchorage, and structural integrity to withstand the deeper dredge depth. The structures were also checked with respect to the higher berthing and mooring loads. Analysis and design of maritime structures such as bulkheads and dolphins including mooring and berthing analyses. Project management of small/medium size jobs. The bulkhead structural and stability analyses were performed using ProSheet and CWALSHT software. Different alternatives were included in the study such as new bulkheads with tension piles, bulkheads with anchor rods, toe walls, composite sections and addition of relieving platforms. Mr. Posada was involved in Phase 1 study of different reinforcement alternatives for the new dredge elevation and in Phase 2 was responsible for the structural design, detail design, calculations and specification production and coordination of drawings.
- **Fabrication Yard Bulkhead Retrofit; Port of Iberia and Morgan City, LA;** Lead Engineer for the design and retrofit of wharves, piers and dry-docks for three (3) fabrication yards. The project included retrofit of the existing bulkhead to sustain a deeper channel after dredging; addition of bollards and cleats; replacement of damaged piers; and the addition of a waterfront structure to accommodate larger barges.
- **Ingleside Port Facility Conceptual Study; Ingleside, TX;** As Senior Structural Engineer, Mr. Posada developed various alternatives for a new port facility that could accommodate new vessels. Mr. Posada proposed various wharves configurations, concrete, steel and composite structures, mooring dolphin structures and different foundations layouts.
- **SeaOne Caribbean FEED Project; Gulfport, MS, Dominican Republic, Puerto Rico;** Lead Structural Engineer for this project that included several components. Mr. Posada's responsibilities included the

Mauricio Posada, P.E.
Senior Marine Engineer

FEED design of waterfront structures, such as bulkheads and dolphins for the CGL production and export facility located in Gulfport; the design of receiving terminals located in the Dominican Republic and Puerto Rico; foundation design for various waterfront structures; the design of platforms, foundations and civil engineering work for three terminals. Mr. Posada performed analyses, prepared technical specifications for loadout, tow, transportation and installation activities, provided construction quantities and cost estimates, and provided seismic engineering services for this multi-billion project that will allow the export of up to 1.5 billion cubic feet per day of natural gas to different locations in the Caribbean.

- **EMAS AMC - Angostura Phase III Design; Trinidad and Tobago;** Lead Structural Engineer and Project Manager responsible for the design of boat protection structures for two existing platforms and a J-tube. Mr. Posada's overall responsibilities included analyses, drawings, and engineering reports. He performed environmental and earthquake load analyses, and vortex shedding (VIV) and spectral fatigue analyses. He was also responsible for the clamp design and the cathodic protection design. In his role as Project Manager for this project, he was responsible for the deliverables, schedule, project costs and supervision of the junior engineers.
- **South Timbalier 311A Structural Design CVA; for Walter Oil & Gas Corporation;** Senior Structural Engineer for this project which involved a 6-Pile, fixed platform at a water depth of 391 feet. Mr. Posada verified the in-place, dynamic, spectral fatigue, and installation analyses. In addition, Mr. Posada performed independent dynamic and fatigue analyses per BSEE request. He also reviewed the dynamic amplification factors for the structure and overall dynamic behavior.
- **Ewing Bank 834 Structural Design CVA; for Walter Oil & Gas Corporation;** Senior Structural Engineer for this 14-skirt pile, fixed platform located at a water depth of 1,186 feet. Services provided by Mr. Posada included verification of the in-place, dynamic, spectral fatigue, and installation analyses (loadout, lift, transportation); detailed design verification of components such as the trunnion and padeyes; and review of the dynamic amplification factors for the structure and overall dynamic behavior.
- **Monopod Design; Cook Inlet, Alaska; for Furie Petroleum;** Senior Structural Engineer, Complete analysis and design of the monopod, deck and 18-foot diameter caisson at a water depth of 104 feet. Mr. Posada performed an in-place analyses including ice load cases, lift, loadout and tow analyses with attention given to the selection of special materials for cold temperatures. He analyzed the pile-soil interaction and performed a structural analysis due to ice vibration. Mr. Posada was the Engineer of Record and performed all project management duties that included interacting with the fabricator, client, installation companies, equipment vendors and supervised the Junior Engineers and Drafters.
- **Mooring and Passing Ship Condition Study at Hess Terminal; Bayonne, NJ; for Hess;** Senior Maritime Structural Engineer and Project Manager responsible for the mooring analysis of the terminal. The terminal receives large ships (Panamax and Aframax) which experience large surge and sway forces due to large ships passing nearby at high speeds. A dynamic mooring response analysis was performed using Optimoor's Dynamic version in order to determine the forces on the mooring lines and bollards. The study included recommendations about location and size of additional mooring points required to sustain the large forces induced by the passing ship.
- **BP Terminals; Sciotoville, OH; Cheboygan, MI; and Curtis Bay, MD; for BP;** Senior Maritime Structural Engineer and Project Engineer. Mr. Posada provided a mooring analyses for 3 BP Terminals in OH, MD, MI. Mr. Posada was responsible for developing mooring models using Optimoor to include the geometry of the berths, vessel properties, mooring elements and environmental criteria per OCIMF recommendations.

Brian C. Moody, P.E.
Georgia Regional Director, Senior Engineer/P.E. Diver

Education:

M.S.C.E. Structural and Geotechnical Engineering, Manhattan College, 1999

B.S.C.E. Structural Engineering, Manhattan College, 1997

Registrations & Certifications:

Professional Engineer: Georgia 040398-2015; New York 078994-1-2001, South Carolina (Pending), Florida (Pending)

Transportation Worker Identification Credentials (TWIC)

National Bridge Inspection Standards (NBIS), 2015 Refresher Course #FHWA-NHI-130053

National Bridge Inspection Standards (NBIS), 2010 Refresher Course #FHWA-NHI-130053

National Bridge Inspection Standards (NBIS), 2005 Course #FHWA-NHI-130055

NYSDOT Bridge Inspection Course, 2011

Association of Diving Contractors International (ADCI), Hard Hat Surface-Supplied Air Diver #4727

DAN Nitrox Diver Qualified

OSHA Fall Protection, OSHA Confined Space

Metro-North RR Safety Training Course

ASTI Certification Courses - CPR/AED, Emergency Oxygen Administration, Bloodborne Pathogens & OPIM and Universal First Aid

Professional Societies:

American Society of Civil Engineers

Experience:

Mr. Moody is a professional engineer with over 18 years engineering and diving experience involving underwater condition assessment, inspection, structural design and construction inspection services. He has worked on all types of moveable and stationary structures including bridges, marine structures, canal structures, water taxi landings, marinas, piers, wharfs, fender systems, relieving platforms, anchorage systems, bulkheads, dams, and culverts, roadways, buildings, and foundations. As a Team Leader/P.E. Diver his responsibilities include inspection, design and analysis, report preparation, construction inspection and construction support services. He has worked on projects for the NJDOT; NJ Transit; MTA: TBTA, Metro-North, LIRR and NYC Transit; NYCDOT; NYCEDC; NYSDOT; NYSTA; New York Canal Corporation; PANYNJ; NYCEDC; NHDOT; and U.S. Coast Guard. Mr. Moody's has also been involved with the preparation of boring plans, waterfront site investigation, permitting services, and development of conceptual designs, as well as supervising the taking of geotechnical boring samplings. Representative projects include:

- **Waterfront Revitalization – 4th and 5th Street Piers at Kent Avenue; Brooklyn, NY; for RD Management Corp;** Team Leader/Marine Engineer during the design phase of this redevelopment project along Williamsburg's waterfront. The 4th and 5th Street Piers were revitalized in two phases: the demolition phase and the construction phase. Services provided included detail design, construction inspection and construction administration for both phases. An investigation of the waterfront structures including existing pile fields and bulkheads, and a hydrographic survey of the project site area was conducted. Mr. Moody was involved with boring plans, waterfront site investigation, permitting services, and developing conceptual designs, as well as supervising the taking of geotechnical boring samplings.
- **Staten Island Ferry Transfer Bridge Inspection; Staten Island, NY;** Team Leader/Diver for the inspection of 21 transfer bridges at various facilities throughout New York City and Staten Island. The task order included surface inspection utilizing visual and tactile procedures.

Brian C. Moody, P.E.

Georgia Regional Director, Senior Engineer/P.E. Diver

- **Yonkers Pier; Yonkers, NY;** Team Leader/Marine Engineer for underwater inspection of the timber piles, which support concrete high level relieving platform. Responsibilities included inspection of concrete underdeck and pile cap faces, as well as construction administration and report preparation.
- **Maxwell House Waterfront Site Development; Hoboken, NJ;** Team Leader/Marine Engineer during the design phase of pier rehabilitation for the conversion design of the former Maxwell House coffee industrial site to a residential mixed-use facility. Work involved design of two piers to be incorporated in the New Jersey Waterfront Walkway. Plans prepared included conversion and modifications of existing buildings, design of roadways that connect to local streets, site and utility development, and the addition of a connecting two-level underground parking area to Elysian Park on Sinatra Drive.
- **Staten Island Homeport / The New Stapleton Waterfront; Staten Island, NY; for New York City Economic Development Corporation;** Project Engineer for the design and construction support services for the development of the proposed mixed-use site including the design of bulkheads, rip-rap slopes, kayak launches, floatation docks and seawalls at Staten Island Homeport. A full set of construction drawings and technical specifications were prepared, as well as construction cost estimates and assistance with bidding.
- **25th Street Wharf Structural Rehabilitation; Brooklyn, NY; for Lafarge North America;** Project Engineer for the inspection and design rehabilitation of the 25th Street Wharf, located along the Gowanus Canal in Brooklyn. Responsible for the above water and underwater inspection and assessment of the wharf, which comprises a low-level relieving platform, provision of preliminary and final design services with construction cost estimates for rehabilitation and life cycle cost analysis.
- **Pier 78 Platform Assessment and Improvement; New York, NY;** Project Manager for the design and construction management of a ramp and platform leading into the Hudson River at 38th Street in the Hudson River Park. Responsibilities included dive inspections, design, and construction oversight.
- **Pier 1 and Pier 2 Condition Assessment; Staten Island, NY; for New York City Department of Transportation;** Team Leader/Marine Engineer for the design and construction support services necessary to repair two pile supported concrete deck piers (Piers 1 and 2) as well as the adjacent waterfront structures used as wet storage and repair berthing for the Staten Island Ferryboats. Repairs encompass the timber fender system surrounding each pier. Responsibilities included performing the necessary inspections and designing the required repairs.
- **Subaqueous Rehabilitation of Slip 4; St. George Ferry Terminal; Staten Island, NY; for New York City Department of Transportation;** Team Leader/Marine Engineer for this contract. Responsibilities included design and resident engineering services for the underwater inspection and rehabilitation of the supporting structure of the transfer bridge and terminal wing at Slip 4.
- **Green Street Pier Inspection; Brooklyn, NY; for Park Tower Group;** Assistant Project Manager for the inspection of the existing Greet Street Pier. Responsible for marine engineering services, including a condition survey of the existing pier and adjacent bulkhead, a condition report of the pier and bulkhead, an alternatives study of at least three repair options for the pier, designs for the pier and for the new bulkhead, design of a water taxi landing and marina, and construction support services.
- **Below Water Inspection of Canal Structures; Albany, Syracuse and Buffalo, NY; for New York State Thruway Authority;** Team Leader/Diver for the underwater inspection of approximately 100 canal structures along the New York Waterway Canal System. Provided underwater condition assessment of structures, which included locks, guard gates, fixed crest dams, moveable dams, taintor gates, spillways, terminals, docks, guide structures and culverts. Prepared comprehensive reports, which included drawings and photo documentation.

Shea Thorvaldsen

Marine Division Manager / Director of Infrastructure

Education:

B.S. Civil Engineering, Tulane University, 1997

Professional Registration and Certifications:

Engineer-in-Training: Louisiana

Professional Association of Diving Instructors (PADI) Rescue Diver

Emergency First Responder/O2 Provider

OSHA 30, OSHA 10

Professional Societies and Affiliations:

American Society of Civil Engineers (ASCE)

Society of American Military Engineers (SAME)

New York Harbor School – Professional Advisory Committee (PAC)

Software:

AutoCAD and AutoCAD LT, True View, HCSS Heavy Bid (HCSS) and Heavy Job, Autodesk Constructware, Procore Construction Project Management, Microsoft Project, Microsoft Publisher, Primavera Sure Track, Primavera Contractor, Timberline Estimating

Experience:

Mr. Thorvaldsen has more than 20 years of marine, site/civil and geotechnical engineering for waterfront structures. He has provided design, inspection, and cost estimating services for marine structures and various projects nationwide. Mr. Thorvaldsen has a diverse background that includes the management and on-site supervision of numerous waterfront project components from the principal's role down to the supervisory/foreman roles. This includes engineering, design build, resident engineering inspections, SWPPP inspections, permitting, estimating and budgeting, bid review and award, cost management and control, project scheduling, submittal and shop drawing management, payment and change order processing, safety, punch list administration, engineering and project closeout capabilities. Representative projects include:

- **Substation Construction, Mott Haven Substation; for Consolidated Edison;** Project Manager for the nearly \$6.5 million foundation contract for substation construction at the Consolidated Edison Mott Haven Substation in the Bronx. Included pile driving, excavation, soil nail shoring and stabilization, and infrastructure installation. **Estimated Value (2005-2010): \$76M; With Escalation (2017), Approx.: \$97M**
- **India Street Pier (Design-Build) and The Edge Pier Construction, North 5th Street Pier; Greenpoint Brooklyn, NY;** Executive Project Manager in charge of mobilization, purchasing, schedule and financial oversight, client relations and company performance on three Brooklyn Waterfront projects valued at \$7.4M, \$5.5M and \$4.8M respectively. The scope of services included sheet pile bulkheads, pipe pile foundations and precast construction, finishes, and ferry landings.
- **WittPenn Bridge Replacement - Construction Engineering Services; Kearny, NJ; for CCA Civil, Inc.;** McLaren is providing construction engineering services for the erection of the WittPenn Bridge's main span which is 320 feet long by 110 feet wide weighing nearly 2,440 tons, as well as, the erection of the vertical lift towers, counterweight system, and machine & control room. The erection solution will require a unique approach given the limiting geometry of the navigable waters. Mr. Thorvaldsen is supporting this project by providing reviews of environmental loads and overall project support relative to the marine engineering portion. **Estimated Value: \$500M**
- **Green Street Site Development; Brooklyn, NY; for Greenpoint Landing Developers, LLC;** Project Manager for the engineering inspection and design services as they related to the various shoreline

Shea Thorvaldsen

Marine Division Manager / Director of Infrastructure

Project Role: Deputy Project Manager

treatments, pier structure and basic utilities. Scope of Services included preparation of documents and filing for permit applications (U.S. Army Corps., New York State Department of Environmental Conservation, Coastal Zone Management, DSBS) Development of preliminary and final design, as well as development of contract bid documents, which include construction drawings, technical specifications, and an opinion of probable construction cost with each phase of submission. McLaren provided Stage I – Shoreline Stabilization, Stage II – Demolition, Stage III – Pier Reconstruction, as well as bid phase support and construction administration services. **Estimated Value: \$16M**

- **Domino Sugar Refinery Redevelopment Bulkhead/Waterfront Platform Reconstruction; Brooklyn, NY; for Two Trees Management, LLC;** Project Director/Technical Advisor for the marine engineering services associated with the reconstruction of the existing platform and bulkhead in order to redevelop the former Domino Sugar Refinery site. The reconstruction scope of work included the full replacement of the approximately 1,250 ft. long Domino Sugar platform and bulkhead to support a new public park. Reconstruction included the installation of new prestressed concrete piles, new concrete pile caps and a composite concrete deck to support a new public park designed to support emergency vehicle loading and total live load and dead load surcharges of up to 600 PSF. A new concrete bulkhead system was also designed along the inshore edge of the platform. The proposed changes at this historic site include the construction of several high rise buildings for both residential and commercial space as well as the addition of five (5) acres of green open space that will incorporate some of the original facility's historic items into the site's transformation. The existing gantry cranes, syrup silos and refinery building will be rehabilitated and integrated into the overall program in order to preserve the historical industrial heritage of the Williamsburg community. **Estimated Value: \$21M**
- **Pier 57 Restoration; New York, NY; for Various Agencies;** Executive Project Manager for the marine engineering services as part of the restoration of New York City's historic Pier 57, located at 15th Street and the West Side Highway, on the Hudson River. Plans were to restore and redevelop Pier 57 into a cultural hub containing retail and recreational public space. Working included restoring the historic bulkhead, marina and water taxi landing design, replacement of fender piles around the pier, marine environmental permit applications, dock anchor piles, wave screen structure and support piles, water taxi landing and all pier connections, and structural repair drawings (for the pier fender system, structural piles at the headhouse, and concrete girders between the caisson roof and 1st floor). **Estimated Value: \$210M**
- **Staten Island Homeport Bulkhead/Seawall Rehabilitation; Staten Island, NY; for New York City Economic Development Corporation;** Executive Project Manager for the redevelopment of the 35-acre decommissioned U.S. Navy Homeport Facility in three (3) Phases. For Phase 1 McLaren assisted in the development of approximately five (5) acres; providing schematic design of three (3) waterfront treatments for the repair of the existing bulkhead structure and shoreline stabilization, preparation of a very complicated permit package for both the entire site and for the Phase I section, development of contract bid documents (including construction drawings, technical specifications, and an opinion of probable construction cost for each phase of submission), value engineering, bid process support and construction support services. For Phases 2 & 3, McLaren is assisting with the redevelopment to further expand waterfront access to the New Stapleton community and prepare the area for future private development. McLaren worked with the NYCEDC across multiple permits and produced a resilient shoreline design that does not require that Front Street be pushed inland from the shoreline. McLaren also worked with the NYCEDC to track the estimated construction cost so that the final design will be phased and bid without last minute adjustments and alternates to the design that would require permit modifications. The completion of Phases 2 and 3 will be informed by the standards of regulatory compliance, site design goals, and construction cost and shoreline resiliency.

STAFF AVAILABILITY CHART

STAFF AVAILABILITY

McLaren has the ability to begin work on assignments immediately without the need to increase manpower. Dedicated staff required for the project are readily available upon contract award. Key staff members stay assigned to our projects from start to finish; providing the continuity required services for a cost-efficient solution.

McLaren's technical and administrative support staff forces available are currently 200. ***Our technical staff availability is best described on the Staff Availability Chart provided on the following pages***



Available Personnel

Leadership

Malcolm G. McLaren, P.E., SECB	Project Executive
Steven L. Grogg, P.E.	Senior Vice President & Site/Civil Division Chief
William B. Gorlin, P.E., S.E.	Vice President & Entertainment Division Chief
William J. McCarthy, III	Vice President & Business Development Director
David W. McLaren, P.E.	Vice President & Maryland Regional Director
Jeremy D. Billig, P.E.	Vice President & New York City Regional Director
Richard L. Wurster	Chief Financial & Operating Officer
Raymond S. Fusco	Chief of Staff
Lisa M. Tronzano	Director of Human Resources
Peter M. Melewski, P.E.	National Director of Strategic Planning
Shea E. Thorvaldsen	Marine Division Manager
Thomas W. Broderick, P.E., LEED AP	Structures Division Manager
Donald O. Viele, P.L.S.	Survey Division Manager
Gerard J. Bartucci, P.E.	Deputy Director of Infrastructure
Andrew C. Habel, P.E.	Florida Regional Director
Brian C. Moody, P.E.	Georgia Regional Director
Matthew B. Kawczenski, P.E., S.E.	Pennsylvania Regional Director
James P. Bridges, P.E.	Albany Regional Director

Marine Engineering

Dominic DeSantis, P.E.	B.S. Civil Engineering, Manhattan College
Craig Plate, P.E.	B.S. Civil Engineering, Manhattan College
Brian Buckman, P.E.	M.Eng. Structural Engineering Mechanics & Materials, University of California B.S. Civil Engineering & Operations Research, Princeton University
Vahid Zanjanzadeh, Ph.D., P.E.	Ph.D. Civil Engineering-Structure & Mechanics, North Carolina State University; M.S. Civil/Structural Engineering, University of Akron; M.S. Civil-Earthquake Engineering, International Institute of Earthquake Engineering & Seismology; B.S. Civil Engineering, University of Science and Technology
Matthew McCarty, P.E., S.E.	M.Eng. Civil Engineering, John Hopkins University; B.S. Civil Engineering, John Hopkins University
Mauricio Posada, P.E.	M.S. Civil Engineering, University of Texas; B.S. Civil Engineering, Universidad de los Andes, Bogota, Colombia
Victoria Christini, P.E.	B.S. Civil Engineering, Pennsylvania State University
Christine Smith, E.I.T.	M.E. Structural Engineering, Stevens Institute of Technology; B.E. Civil Engineering, Stevens Institute of Technology
Ashleigh Campbell	M.S. Education, University of Washington; B.Eng. Naval Architecture, SUNY Maritime
Carl Sundvik	Civil Engineering Technician, Westchester CC; U.S.C.G. Emergency Medical Technician School
Daniel Korkosz	A.S. Marine Technology, College of Oceaneering, Wilmington, CA
John St. Denis	U.S. Navy Dive School; The Ocean Corporation, Commercial Dive School
Steve Molison	Divers Institute of Technology, Inc.; Coursework, Niagara County Community College
Ryan Lupero	Minnesota Commercial Diver Training Center; B.A. Manhattan College, Finance, Manhattan College
Anand Agarwal, P.E.	M.S. Civil Engineering, Manhattan College, NY; B.S. Civil Engineering, Manhattan College
Robert McCombs, E.I.T.	B.S. Civil, Cornell University; AS Engineering, Ocean County College
Catherine Hale	M.S. Maritime Systems Environmental Engineering, Stevens Institute of Technology; B.S. Environmental Science, Simmons College
Shafique Islam, E.I.T.	B.S. Civil Engineering, City College of New York
Taylor Hennessy	B.S. Offshore and Coastal Systems Engineering, minor in Maritime Administration and Mathematics, Texas A&M University

Waterfront / Ocean / Environmental Engineering

Robert Acker, E.I.T.	M.E. Ocean Engineering, Texas A&M University, College Station; B.S. Ocean Engineering, Texas A&M University, College Station
Anthony Eble	M.E. Ocean Engineering, Stevens Institute of Technology; B.S. Civil Engineering, Rutgers University B.S. Physics, minor in Math, Richard Stockton State College of New Jersey
Dennis O'Heney	B.S. Civil & Environmental Engineering, Lafayette College
Kaitlyn McGrath	B.S. Environmental Sciences, Villanova University; B.A. Geography, minor in Sustainability
Tyler Hackett	B.S. Ocean Engineering, Florida Institute of Technology

Marine Architecture

Darryl Zuk M. Arch. Columbia University Graduate School of Architecture, Planning, & Preservation;
B.S. Georgia Institute of Technology, College of Architecture

Diving Inspection

Underwater Team 1* Mark Bujtas, P.E. / John St. Denis / Ryan Lupero

Underwater Team 2* Brian C. Moody, P.E. / Steve Molison / Stephen Collins

Underwater Team 3* Craig Plate, P.E. / Carl Sundvik / Dan Korkosz

Structural Engineering

W. Richard Mahoney, P.E. B.S. Architectural Engineering, Pennsylvania State University
V. Doug Platt, P.E. M.S. University of Illinois; B.S. NJ Institute of Technology, Civil Engineering
Peter Koklanos, P.E., LEED AP M.S. Structural Engineering and Geomechanics, Stanford University; B.S. Civil Engineering, Syracuse University
Colleen Kirk, P.E., LEED AP M.E. Structural Engineering, Stevens Institute of Technology; B.E. Civil Engineering, Stevens Institute of Technology
Janelle Hall, P.E., LEED AP M.Eng. Structural Engineering, Lehigh University; B.S. Civil Engineering Pennsylvania State University
Alvin Tabar, P.E. B.S. Civil Engineering, University of San Carlos
Daniel Rachal, P.E. B.S. Civil Engineering, Texas A&M University
Laura Goodman, P.E. M.E. Structural Engineering, Stevens Institute of Technology; B.E. Civil Engineering, Stevens Institute of Technology
Bradford Fallon, P.E. B.S. Civil Engineering, University of Maryland
Brian Riggs, P.E. B.S. Civil & Environmental Engineering, Bucknell University
Ryan Graham, P.E. M.S. Structural and Earthquake Engineering, University at Buffalo; B.S. Mechanical Engineering, Binghamton University
Diego Eras, P.E. B.S. Civil Engineering, The City College of New York
Stephanie Richmond, P.E. M.S. Civil and Structural Engineering, Cornell University; B.S. Civil Engineering, Cornell University
Haseebullah Sayed, P.E. B.S. Civil and Environmental Engineering, Virginia Tech
Anthony Fahoury, P.E. M.S. Structural Engineering, University of Southern California; B.S. Civil Engineering, University of Southern California
Ashutosh Parulkar, P.E. M.S. Structural Engineering, University of Texas at Arlington; B.E. Civil Engineering, Mumbai University
Jake Leventhal, P.E. M.E. Structural Engineering, Stevens Institute of Technology; B.E. Civil Engineering, Stevens Institute of Technology
James Hoepker, P.E. M.S. Civil Engineering, Manhattan College; B.S. Civil Engineering, Manhattan College
Kyle Gilbert, P.E. M.E. Civil Engineering with concentration in Structural Engineering, Stevens Institute of Technology
B.E. Civil Engineering, Stevens Institute of Technology
Abdul Hadi Syed, P.E. M.S. Structural Engineering, Illinois Institute of Technology; B.S. Civil Engineering, Osmania University
Saruar Manarbek, P.E. M.Eng. Structural Engineering, Massachusetts Institute of Technology; B. Eng. Civil Engineering, University of Warwick
Albert Johnson, E.I.T. B.S. Civil Engineering, Manhattan College
Artur Kukulka, E.I.T. B.S. Civil Engineering, Manhattan College
Nicolas Ferreira, E.I.T. B.E. Civil Engineering, Stevens Institute of Technology
Jonathan Bashan, E.I.T. B.S. Civil and Environmental Engineering, New Jersey Institute of Technology
Masiel Melo, E.I.T. B.S. Civil Engineering, Manhattan College
Scott Strycharz, E.I.T. B.S. Civil Engineering, University of Massachusetts
Diana Galofaro, E.I.T. B.S. Civil Engineering, Syracuse University
Victoria Caruso, E.I.T. M.Eng. Structural Engineering, Lehigh University; B.S. Civil Engineering, Lehigh University
Christopher Gerding, E.I.T. M.S. Civil and Structural Engineering, University of Maryland; B.S. Civil Engineering, Clemson University
Russell Vignali, E.I.T. M.Eng. Structural Engineering, Lehigh University; B.S. Integrated Business & Civil Engineering, Lehigh University
Constantine Panagakos, E.I.T. B.S. Civil Engineering, Virginia Technical Institute
Bryan Nortz, E.I.T. B.S. Civil Engineering, Rutgers University
Robert B. Peifferm E.I.T. M.Eng. Structural Engineering, Lehigh University; B.S. Architectural Engineering, Pennsylvania State University
Melissa Carey, E.I.T. M.S. Structural Engineering, University of Delaware; B.S. Civil Engineering, University of Delaware
Kevin Klepeisz, E.I.T. B.S. Civil Engineering, Ohio State University
Mark Cunningham B.S. Civil and Environmental Engineering, Pennsylvania State University
Patrick Doliber B.S. Civil Engineering, Cornell University
William Green B.S. Mechanical Engineering, University of Central Florida
Lawrence Bennett B.S. Civil Engineering, University of Central Florida
Stephen Bonadonna B.A. Theater, SUNY Geneseo
Patrick Lawrence B.F.A. Technical Direction and Production Management, State University of New York at Purchase College
Megan Anderson B.F.A. Technical Direction/Production Management & Design Technology, State University of New York at Purchase College
Barton Breisch M.Eng. Structural Engineering, Lehigh University; B.S. Physics, Bloomsburg University
Cassandra Dutt B.S. IDEAS: Civil Engineering, Design, Theater, Lehigh University

Troy Brandt	B.S. Civil & Structural Engineering, Clemson University
Caleb Justis, E.I.T.	B.S. Civil Engineering, University of Delaware
Vladimir Diaz, E.I.T.	M.S. Structural Engineering, City College of New York; B.S. Civil Engineering, INTEC
Nicholas Konicoff	B.S. Civil Engineering, Penn State University

Bridge/Highway/Rail Engineering

Swapan Chaudhuri, Ph.D., P.E.	Ph.D. Civil Engineering, University of Pennsylvania; M.S. Civil Engineering, University of Pennsylvania; B.S. Civil Engineering, University of Calcutta
Mark Bujtas, P.E.	B.S. Mechanical Engineering, New Jersey Institute of Technology
Porfirio Lantigua, P.E.	B.S. Civil Engineering, University of New Haven
Amnon Peleg, P.E.	M.A. Computer Science, CUNY Queens College; B.S. Civil Engineering, Israel Institute of Technology
Richard Karis, P.E.	M.S. Structural Engineering, Clarkson College of Technology; B.S. Civil Engineering, Clarkson College of Technology
Nabil Saadi	B.S. Civil Engineering, Aleppo University, Aleppo, Syria
Levon Hoomes, E.I.	M.S. Civil Engineering, Florida State University; B.S. Civil Engineering, Florida State University

Site/ Civil Engineering

John Lange, P.P.	M.U.P Urban Planning, CUNY Hunter College; B.A. Geography, SUNY Binghamton
Pete Mellits, P.E., LEED AP	B.S. Civil Engineering Technology, Old Dominion University; Fire Officer IV Certification
Lamberto Santos, P.E.	B.S. Civil Engineering; B.S., Sanitary Eng. Mapua Institute of Technology
John Speer, P.E., P.P.	B.S. Civil Engineering, New Jersey Institute of Technology
Peter Durkin, P.E.	B.S. Civil Engineering, Villanova University
Philip Custer, P.E.	B.S. Civil Engineering, University of Maryland, College Park
Stephen Zaskey, P.E.	B.S. Civil Engineering, University of New Hampshire
Reuben Hull, Jr., PE, PMP, LEED Green Assoc.	B.S. Civil Engineering, University of New Hampshire
Alison Scott, E.I.T.	B.S. Civil Engineering Technology, Central Connecticut State University
Chris Leung, E.I.T., LEED AP	B.S. Civil Engineering, Ryerson Polytechnic University, Toronto, Ontario, Canada
Brendan Kelly, E.I.T.	B.S. Civil Engineering, University of Villanova
Nicole Heinlein, E.I.T.	B.S. Civil and Environmental Engineering, University of Maryland College Park
Rebecca Dunn	M.E. Civil Engineering, Stevens Institute of Technology; B.E. Civil Engineering, Stevens Institute of Technology of Engineering
Jennifer Cunney	B.S. Civil and Environmental Engineering, University of Massachusetts-Amherst
Jennifer Anderson	B.S. Civil Engineering, University of Maryland
Luis Martinez Frias	B.S. Civil Engineering, Manhattan College

Geotechnical/ Drilling

Luke Daur, P.E., LEED AP	B.S. Civil Eng. Manhattan College; US Navy Civil Engineering Corp Training
Brian Haggarty, E.I.T.	B.S. Civil Engineering, University of Villanova

Surveying - Land Survey / Hydrographic Survey / Lands Underwater

Stephen Joseph Hall, L.S.	Anne Arundel Community College - Urban Storm Drainage Design and Practice; Catonsville Community College, Land Survey 1
Kevin Kurbel, L.S.	B.A. English Literature & Language, University of Michigan
John Dusenbury	Survey Crew Chief - A.S. Surveying Technology, Community College of Baltimore County
James Donnelly	Survey Crew Chief - 14 Years Experience
Brian Osborne	Survey Crew Chief - 11 Years Experience
Luke Crawford	Survey Crew Chief - 12 Years Experience
Alexander Van Houten	Rod Person - 9 Years Experience
Kenneth Pierce	Rod Person - 4 Years Experience
Christopher Huslinger	Rod Person - 4 Years Experience

Landscape Architecture

Larissa Torres, RLA	MBA, University of Maryland, Smith School of Business; Bachelor of Landscape Architecture, University of Maryland
Denise Lai	B.L.A. Landscape Architecture SUNY College of Environmental Science and Forestry

Finite Element Analysis - ANSYS, STAAD-PRO, Risa3D, ETABS, SAFE

Jon Skinner, P.E.	B.S. Civil Engineering, Arkansas State University
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Mechanical

Michael Adamovich	B.S. Mechanical Engineering, Bingham University
Fred Smith	B.S. Mechanical Engineering, New Jersey Institute of Technology; B.A. Liberal Studies, Iowa State University
Matthew Saide	B.S. Mechanical Engineering, Tufts University
Ian Sanderson	B.S. Mechanical Engineering, New Jersey Institute of Technology
Frank Allison	B.S. Mechanical Engineering, University of California; A.S. Mathematics, Laney College; A.S. Natural Science, Laney College
Thomas Carpenter	B.S. Mechanical Engineering, Cornell University
Robert Herman	Hydraulics and Fluid Power Design, Bosch Rexroth; Physics and Spanish Literature, Brooklyn College

Resident Engineering

Stephen Collins	B.S. Civil Engineering, Manhattan College
John DiMura	M.F.A. Political Science, State University of NY at Albany; B.A. Political Science, State University of NY at Albany

Construction Engineering

Eric Helt, P.E.	B.S. Civil Engineering, Rutgers University; A.A.S. Construction Engineering Technology, Alfred State College
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Special Inspections

Nicholas Bailey	American Concrete Institute (ACI): Field Grade I / Concrete Special Inspector
Joseph Fedele	ACI: Field Grade I / Concrete Special Inspector

Design Support Services

Computer-Aided Applications

Pre-Visualization	Murphy Gigliotti - 28 Years Experience
Computer Graphics	Sid Richardson - 24 Years Experience
CAD Drawings	Woo Young Chung - 33 Years Experience
CAD Drawings	Jay Issa - 31 Years Experience
CAD Drawings	Osbourne Rowe - 29 Years Experience
CAD Drawings	Edward Chiu - 27 Years Experience
CAD Drawings	Danny Vargas - 25 Years Experience
CAD Drawings	Beverly Marquez - 25 Years Experience
CAD Drawings	George Kolb - 24 Years Experience
CAD Drawings	Ignacio Balais - 21 Years Experience
CAD Drawings	Ranya Rozeik - 16 Years Experience
CAD Drawings	Robert Grip - 14 Years Experience
CAD Drawings	Alex Dragos - 12 Years Experience
CAD Drawings	Devon Bryant - 10 Year Experience
CAD Drawings	Carolyn G. Webber, EIT - 5 Years Experience
CAD Drawings	Talia Ordonez - 2 Years Experience

*These individuals function in 2 capacities (diving and engineering discipline).

SECTION 3
Relevant Experience

Section 3 Relevant Experience

McLaren possesses an extensive corporate portfolio, demonstrating how our expert professional engineering and design services have made us a leader in the industry. On the following pages, we present a sampling of relevant projects specific to marine/coastal engineering that demonstrates our Team's expertise and ability to provide services that consistently meet or exceed our client's expectations.

Maryland Port Administration Miscellaneous Engineering Services

Location

Various Locations, MD

Client

Maryland Port
Administration/
STV Incorporated

Project Type

On-Call Engineering

Services

Structural Engineering
Marine Engineering
Underwater Inspection
Above Water Inspection
Surveying
Load Rating

Duration

2016-2021

McLaren Fee

\$250,000 est.

Reference

STV Incorporated
225 Park Avenue South
New York, NY 10003-1604
Kyle Kramer
(212) 777-4400
kyle.kramer@stvinc.com

Description

The Maryland Port Administration (MPA) owns and operates various marine terminal facilities, and the World Trade Center Building located in Baltimore, Maryland. Contract MPA #515827 provides professional architectural and engineering services on an as-needed basis for the planning, development and construction of new facilities and/or for the improvement of existing facilities in the Port of Baltimore or other State owned facilities. The services include the preparation of comprehensive reports, planning reports, designs, construction documents (drawings, specifications and schedules) and cost estimates for a period of five (5) years, with a total contract value of \$24,000,000.00.

McLaren's Role

McLaren as part of a team is responsible for providing all structural and marine engineering work. Assignments to date have included:

North Locust Point Peer Review and Design

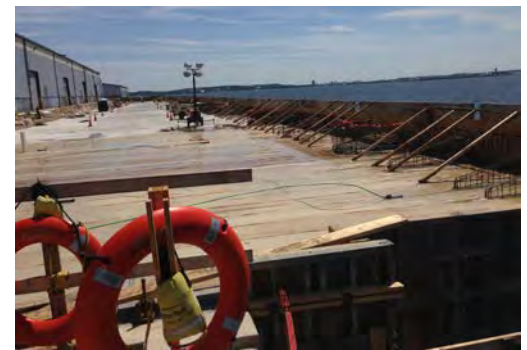
MPA has tasked McLaren with providing survey, inspection, and engineering services necessary to produce 100 percent design documents for installation of a new stone revetment at Berths 6-8, demolition of Pier 7, and installation of a new back-filled sheet pile bulkhead around the perimeter of Pier 7.

Dundalk Marine Terminal, Berths 1-3 Replacement

MPA has tasked McLaren with completing the design of the Berth Replacement from 30 percent schematic design through 100 percent Construction Documents. Specifically, the scope of the construction, approximately 1,965 linear feet of wharf. Work items for design include: Sequencing and Logistics for marine construction and dredging; Design of demolition of fendering and pile supported platforms; Design of Dredging; and Marine structural/civil design for new pile supported platform over water and approach platform on land (piles, caps, planks, seawalls, and other related structure), cutoff walls, bulkhead systems, return bulkheads, mooring hardware and tiebacks for the same, fendering, and passive cathodic protection.

Miscellaneous Load Rating Task Assignments

MPA has tasked McLaren with providing engineering services to load rate various structures (Marine and waterfront) for various uses, with various configurations, and under various circumstances requiring quick responses. Project to-date include: 50k Short Fuse Load Rating Analysis; Recertify Load Ratings for North Locus Point Pier 4/5 and to update the life expectancy; South Locust Point Crane Lift Load Rating.



Port Newark Berth 3 Wharf Reconstruction

Location

Port Newark, New Jersey

Client/Owner

The Port Authority of New York and New Jersey

Services

Structural Design
Constructability Review
Wharf Restructure
Culvert Restructure
Construction
Administration

Contract Period

2011-Present

Construction Value

\$10,000,000



Project Description

The Port Authority of New York & New Jersey (PANYNJ) wanted to redevelop Berth 3 to full serviceability. The new berth was designed and reconstructed to a level of quality, safety, durability, and reliability that meets the PANYNJ needs, requirements, and preferences.

McLaren's Role

McLaren Engineering Group (McLaren) provided structural design services and prepared final design contract documents, for the replacement of Berth 3 and the adjacent culvert structure under Corbin Street. McLaren also designed the replacement floating docks.

McLaren's expertise in waterfront structural design, constructability, serviceability, and construction administration/inspection contributed significantly to this safe and cost-effective design.

McLaren explored various alternatives that were available in order to satisfy the Stage 1 Alternative 1 concept. The selected materials best balanced first cost versus maintenance costs for the life of the wharf.

McLaren provided a solution for Berth 3 that ties into adjacent berths at both the north and south ends. This solution wasn't disruptive to the structural integrity of the adjacent wharves both during and after construction. Proper joints were detailed, and temporary conditions were examined, so no damage was sustained to these agencies.

McLaren also worked with PANYNJ to advise the appropriate choice of floating dock and dock anchorage. McLaren also provided recommendations for the final locations of the new floating docks.

During the demolition of the existing wharf, disruption to adjacent berths and the undermining of the roadway was limited. When the culvert was demolished and removed, an alternate temporary path was established. The staging of construction was of particular importance for the culvert replacement. During construction of the new culvert the existing utilities that run across and through the culvert must be supported and maintained. McLaren designed a temporary support system for these utilities.

After examining all available alternatives (e.g. minimizing the height of sheeting, full height sloped excavation, ground freezing / grouting to eliminate the use of high boom cranes, etc.), it was determined that permanent steel sheeting for the culvert will be installed inboard of an existing timber sheeting.

Project Highlights

- ◆ Wharf Reconstruction Design
- ◆ Construction Staging to Maintain Railroad Traffic
- ◆ Maintenance and Protection of Traffic to Maintain Vehicular Traffic



Location

Wilmington, Delaware

Client/Owner

CardnoTEC /
Diamond State Port
Corporation

Services

Underwater Inspection
Loading Peer Review
Finite Element Modeling
Resident Engineering
Multibeam Hydrographic
Survey

Contract Period

2014-Present

Construction Value

\$6.8 million (*estimated*)

Fee

\$475,900

Reference

Diamond State Port
Corporation
1 Hausel Road
Wilmington, DE 19801
Mr. Randall M. Horne, PE
Director of Engineering and
Maintenance
(302) 472-7827
rhorne@port.state.de.us



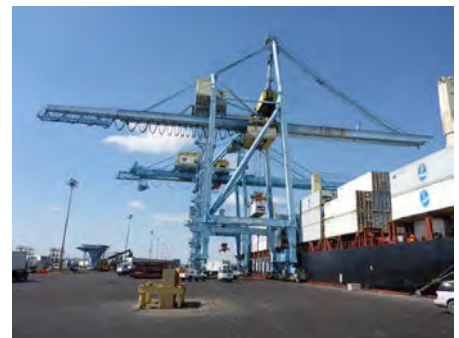
Project Description

The goal of the project is to rapidly determine if there is a safety or capacity deficiency with the existing wharf structure, then design repairs for rehabilitation of the wharf (piles) to accommodate new cranes.

McLaren's Role

McLaren Engineering Group (McLaren) independently developed order-of-magnitude structural loads and capacities. This effort allowed us to rapidly determine where potential deficiencies exist. McLaren performed an existing document review and identified any additional information necessary for our analysis. McLaren reviewed the:

- Capacity of the piles, especially concerns with the Alpha pile capacity, from both a structural and geotechnical aspect
- Code considerations regarding the increase in loading and change-of-use triggers for code compliance especially as this relates to spiral reinforcing in the piles
- Performance of the batter piles and their potential interaction with the soil backfill
- Ability to perform a load test of the piles to develop additional information and concerns that such load tests will cause the piles to fail
- Specified crane loading in the 1970's era construction documents and procurement documents as well as the loading proposed for the current upgrade
- Code prescribed load distribution factors for crane wheels
- Potential increase in the exposed pile length due to dredge
- Operational consideration as they relate to the simultaneous use of adjacent cranes



McLaren compared the results of this independent order-of-magnitude analysis to the results developed by Anchor Consultants in order to ascertain if there were indeed deficiencies in the structure.

McLaren performed the above water portion of the inspection focusing on the deck topside and underside, the crane rails and support beams, the steel piles, beams and box beams, the

pile caps and other structures. The underwater portion included a Level I Swim-by one hundred percent (100%) and Level II (tactile with minimal cleaning) inspection for all piles that required repairs. The underwater inspection also included a Level I inspection of the cut-off bulkhead.

In addition to refinement of our own analysis performed concurrently with peer review of Anchor's analysis, McLaren performed an analysis of potential measures.

McLaren also:

- Reviewed crane loading information.
- Provided structural analysis of storm loading to confirm that the results of the PDA testing indicate that the cranes could be ordered; and the deck and crane rail concrete elements to confirm that they were adequate to support the new loading.
- Analyzed and provided summary letters regarding New Boxer crane, waterside rail, deck and crane rail.
- Coordinated with Cardno and the Diamond State Port Corporation (Port) about nature of the structural and service limit states of the piles to support crane specification.
- Provided a summary letter, regarding the equivalent load factors for the waterside rail.
- Verified the conclusions from the previous reports, specifically what was required to ensure that the wharf could support the Boxer 4000 crane. After the previous review, the crane was reconfigured to shift the counterweight and remove some of the waterside wheel loading. Therefore, McLaren performed the analysis at the wharf again, using our 3D interactive models, to update the imposed loads and behavior of the structural system.
- Analyzed the structures and their behavior based upon their existing conditions i.e. current level of deterioration. This included the concrete deterioration at the deck level, corrosion of the fluted steel piles, loss of section of the concrete within the same piles, and overall predicted deterioration. This analysis allowed us to provide a phased repair program that addressed the Immediate (within 1 year), Priority (within 3 years), and Routine (within 5 years) and long term capital repairs to maintain the wharf at the required capacity.
- Prepared the complete design criteria establishing loadings for the wharf structures based upon the Boxer 4000 cranes, predicted deterioration of the structural members, anticipated dredge depths and potential scour. The environmental loads (wind, wave, current, flood overtopping) were developed for the site from the FEMA Flood Insurance Study and available metrological data.
- Augmented available topographic survey with a multi-beam hydrographic survey. These two (2) surveys provided the information necessary to layout the repairs, and confirm water depths, siltation rates, and any other changes to the mudline elevations that may affect the wharf.
- Provided 30 %, 75%, and 100 % Construction documents.
- McLaren provided resident engineering services. Since the previous work completed, the Port purchased the new cranes (Boxer 4000), and required inspections and engineering of repairs be completed to ensure that the wharf meets all structural requirements.



Project Challenges and Solutions...The results of Phase 1 required additional study, McLaren further developed our analysis and participated in a collaborative peer review with Anchor Consulting. This review allowed us to resolve any differences in the assumed loading and capacities of the structural elements.

Reconstruction of Berths 30, 32 and 34 Fender System

Location

Port Newark, New Jersey

Client/Owner

Port Authority of New York
and New Jersey

Services

Underwater Inspection
Condition Survey
Marine Engineering
Structural Engineering
Cost Estimating
Permitting

Contract Period

2013

Project Description

The Port Authority of New York and New Jersey retained McLaren Engineering Group (McLaren) to provide the necessary waterfront engineering services to provide Stage III and Stage IV services for the reconstruction of Berths 30, 32, & 34 Fendering System at Port Newark (PA Agreement No. 415-12-168).

The berths are located at the eastern portion of the Port Newark Marine Terminal in New Jersey with the wharf facing the Newark Bay.

McLaren Role

McLaren provided expert professional structural and waterfront engineering services for the reconstruction of Berths 30, 32, and 34 fendering systems at Port Newark. The objective of the contract was to develop the preliminary replacement designs into an economical and constructible set of bid documents and ultimately guide the project to a successful outcome and bringing the facility components back to full serviceability at a level of quality, safety, durability and reliability that meets the PANYNJ needs, requirements and preferences.

Work included the preparation of Stage III final design contract documents; and Stage IV services for the reconstruction. Project tasks included the removal of the existing timber fender system and reconstruction of Berths 30, 32, and 34 fender system; perform priority repairs for the A-line piles for Berths 30, 32, and 34; and a detailed underwater inspection, evaluation, and report for the priority repairs for the A-line piles.

McLaren coordinated with the Port Authority in order to ensure the project proceeded within the budget and schedule created.



Expert Consultation/Forensic Engineering

Port of Freeport – Berth 7 Failure

Location

Port of Freeport, TX

Client/Owner

Porter Hedges LLP

Services

Expert Consultation
Forensic Engineering
Marine Engineering
Sonar Scanning

Contract Period

2011-2013

Project Description

Port Freeport's ship docks consist of seven (7) berths. The berth of interest is Berth 7, which is oriented in a northeast to southwest direction along the shores of the Federal Channel. The project site is located approximately 2 miles west of the Gulf of Mexico in Freeport, Texas along the Brazos Port Upper Turning Basin. The Brazos Harbor provides channel access connecting the Gulf of Mexico and the various marine facilities located along the Port of Freeport.

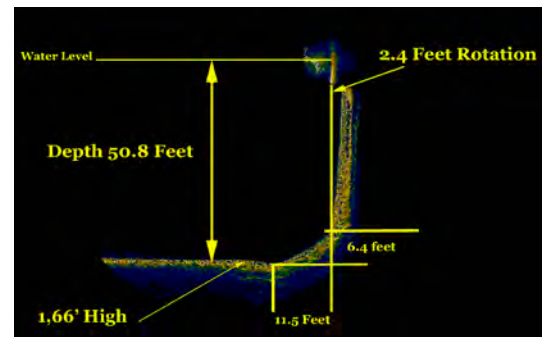


In 2004, Port Freeport contracted separately with Professional Service Industries (“PSI”) and Goldston Engineering Inc. (“Goldston”) to perform professional engineering design services that would result in contract documents for the construction of a berthing facility known as Berth 7. The berth consists of a closed wharf relieving platform with a steel sheet pile bulkhead and concrete buttress counterfort wall. Vertical support for the relieving platform is performed by auger cast piles; horizontal restraint is provided by a sheet pile deadman anchor and tie rod system integrating the counterfort wall, sheet pile bulkhead and relieving platform. All construction occurred in the dry and the facility was subsequently dredged to provide access to the channel.

In September 2007, Goldston issued plans and specifications and the project was put out for public bid. Subsequently, Port Freeport awarded the construction contract to McCarthy Building Companies Inc. (“McCarthy” or “the contractor”) in December 2007. Construction commenced in 2008, by late July 2009, vertical settlement of the deck slab was observed, prompting several investigations by various entities as the condition of the dock continued to deteriorate. The deficiency was eventually mitigated by the installation of grouted tie back anchors as specified and designed by Halcrow, who was retained as a consultant by Port Freeport.

McLaren’s Role

McLaren was retained by Porter Hedges LLP to perform an independent analysis of the Berth 7 failure. This analysis included but was not limited to review of technical design documents, specifications, reports, drawings, and assessment of the basis of design, alternative designs, in-situ inspection of the failed elements, review of the available data relating to the failure, and the assessment of alternative failure hypotheses.



Seagirt Marine Terminal Infrastructure Condition Assessment & Asset Management

Location

Baltimore, MD

Client/Owner

CardnoTEC/
Ports America Chesapeake

Project Type

Marine Assessment
Services

Services

Marine Engineering
Asset Management
Above and Below Water
Assessment

Duration

2014 - 2015

McLaren Fee

\$124,100

Reference

CardnoTEC
2496 Old Ivy Road,
Suite 300
Charlottesville, VA 22903
(410) 990-0299
James Hunt
james.hunt@cardnotec.com

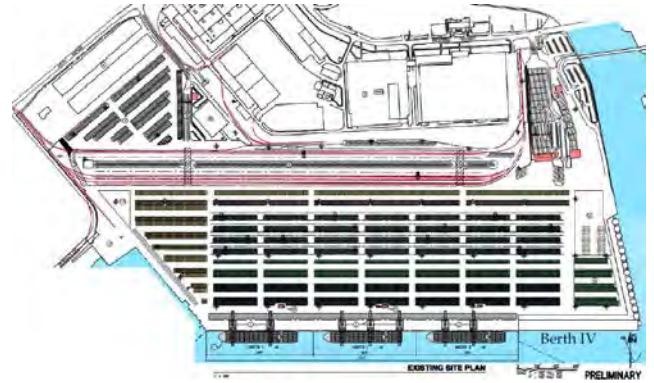
Project Description

In 2009, Ports America Chesapeake (PAC) entered into a 50-year concession agreement with the Maryland Port Administration to operate and maintain the Seagirt Marine Terminal (SMT) in the Port of Baltimore.

As part of the concession agreement, PAC fully completed in 2012 the construction of a new 50' deep berth (Berth IV) as well as the installation of four new super-post-Panamax container cranes. The other three berths and the container yard were completed in the mid to late 80's. Under this recent long-term lease, PAC is responsible for implementing a System Preservation Plan with the aim of maintaining the functionality and long-term survivability of the equipment and infrastructure through the stewardship and management of the terminal assets.

PAC's objective is to roll the System Preservation Plan into a an Asset Management System (AMS) that will allow us to monitor and understand the conditions of our assets and will allow us to create an investment plan to cost-effectively control the life cycle of the terminal infrastructure while maintaining high levels of service minimizing operational interruptions.

The AMS will identify the best candidates not only for preventive maintenance but also for rehabilitation and/or reconstruction based on existing and future operational, physical, financial and managerial constrains to be defined during the development of the AMS. The implementation of the AMS will rely on the results of a new Facility Condition Assessment (FCA), which will be part of this Project's scope.



McLaren's Role

McLaren has provided inspection, engineering and asset management services to Ports America Chesapeake (PAC). Tasks included under this contract included:

- Develop extensions to the ASTM Uniformat classifications suitable for application to marine infrastructure
- Develop repair coast and degradation curves to allow projection of element life cycles
- Complete an inventory of the existing marine terminal infrastructure.
- Provide a Comprehensive Facilities Condition Assessment (FCA) including West Marginal Wharf, Colgate Creek Marginal Wharf, Seagirt Berths 1 - 4 and the Container Yard.
- Development of An Asset Management System (AMS) database to store the results of the Asset Inventory, the observed conditions, assessments and recommended actions, including an Asset Management Tool (AMT) that will show inventory updates while storing historical data; Develop a prioritized maintenance/rehabilitation inspection plan; Generate 1-year incremental, 5 and 20 year forecasts with varying granularity by which to plan future repairs, among other tasks.



Battery Park City Ferry Terminal – Continuing Preservation

Location

New York, New York

Client/Owner

Port Authority of New York
& New Jersey

Project Type

Ferry Terminal

Services

Marine Engineering
Structural Assessment
Design Services
Confined Space Inspection

Contract Period

2012-Current



Project Description

The Port Authority of New York & New Jersey (PANYNJ) contracted McLaren Engineering Group (McLaren) to provide structural and marine engineering services for the design of a permanent floating ferry terminal, which will provide a minimum 25-year life. The facility is the largest of its kind in the United States, encompassing more than $\frac{3}{4}$ acres of floating structure.

Though McLaren's On-Call agreements with the PANYNJ, the PANYNJ retained McLaren to provide inspection services and design services for on-going maintenance at the facility.

McLaren's Role

Baseline Condition Survey Inspection

McLaren performed the initial baseline inspection of this terminal following its completion. The initial investigation included a visual and tactile inspection of deficiencies, on the exterior and interior of all structures including: the entire hull, gangways, ramps, canopy, building structures, glass screens, anchor towers, and confined spaces. A 100% visual/tactile inspection was also conducted on the underwater portions of the barge and anchor towers.

Ultrasonic thickness measurements were taken along the shell plating. Within the building, a determination of the types of ceiling/soffit components were made, including: sizes and spacing of hangers and framing, determination of hot rolled or cold rolled members, types and sizes of all connections, thickness of ceiling and use of bridging member.

Stage III Inspection and Stage IV Construction Services for the South Anchor Tower Rubber Fender Replacement PACC

McLaren performed an inspection of the existing rubber fender system bumpers, attachment plates and devices of the rubber fender system components for damage, corrosion or deterioration. McLaren developed a construction cost estimate and approximated anticipated construction schedule for the replacement of the existing damaged and deteriorated rubber fender system bumpers at Slips 1 through 6.

McLaren developed construction drawings (Stage III) including layout drawings that identify the scope of work necessary to replace the fendering at the south anchor tower and the vessel Berthing Fender Systems in slips 1 through 6. Prior to the beginning of construction, McLaren provided (Stage IV) construction administration services including reviewing the Contractor's submittals and detailed shop drawings for approval.

Domino Sugar Refinery Redevelopment Bulkhead/Waterfront Platform Reconstruction

Location

Williamsburg
Brooklyn, New York

Owner

Two Trees Management,
LLC

Services

Underwater & Above Water
Inspection
Hydrographic Survey
Bulkhead Design
Platform Design
Waterfront Permitting
Construction Documents &
Bid Phase Support
Construction
Administration
Waterfront Edge Design
Guidelines (WEDG)
Certified

Contract Period

2013-Present

Role

Marine and Waterfront
Engineer

Construction Cost

\$21,000,000 (est.)

Design Cost

\$550,000

Reference

Two Trees Management,
LLC
45 Main Street, Suite 602
Brooklyn, NY 11201
Mrs. Bonnie Campbell
(718) 222-2500



Project Description

McLaren was retained by Two Trees Management, LLC to provide marine engineering services for the reconstruction of the existing platform and bulkhead in order to redevelop the former Domino Sugar Refinery site in Williamsburg, Brooklyn. The proposed changes at this historic site include the construction of several high rise buildings for both residential and commercial space as well as the addition of five (5) acres of green open space that will incorporate some of the original facility's historic items into the site's transformation. The existing gantry cranes, syrup silos and refinery building will be rehabilitated and integrated into the overall program in order to preserve the historical industrial heritage of the Williamsburg community.

McLaren's Role

The existing site consisted of four (4) buildings used for the former Domino Sugar Refinery and a timber pile supported wharf that extended the entire length of the site, approximately 1,250 feet. A historical bulkhead extends along the entire length of the wharf and is comprised of several segments of differing construction



Project Site Progression



Domino Sugar Refinery Redevelopment

Bulkhead/Waterfront Platform Reconstruction

types exhibiting varying levels of deterioration. The pile supported wharf also had varying widths along the length of the site.

McLaren reviewed previous waterfront inspection reports and drawings, and met on site with the client to assess the existing conditions and gain a better understanding of the project goals. Upon review and analysis, it was determined that the demolition and reconstruction of the entire platform was required but sections of the existing bulkhead could be repaired. McLaren used the foundation of the existing bulkhead, that sits on-top of the existing seawall foundation, saving the client a 1/3 of the cost. The new platform designed by McLaren will support a future public park that will be incorporated into the planned upland development.



Precast Gravity Wall On-Top Existing Seawall Foundation

McLaren performed a thorough condition assessment of the existing bulkhead construction using our own, in-house P.E. certified divers to further develop a number of alternatives. Additionally, McLaren performed a Hydrographic Survey of the area surrounding the existing platform to establish mudline elevations for use during the permitting process as well as the reconstruction of the platform.

Upon completion of the inspection Phases, McLaren performed a detailed assessment of the current conditions as it relates to the future construction. Design alternatives were studied in order to provide all information for the reconstruction of the entire bulkhead as opposed to rehabilitation.

Cost estimate, design and construction administration services were provided for the:

- Demolition and removal of existing concrete platform, timber pile caps and bracing
- Installation of new bulkhead
- Repair of existing concrete bulkhead
- Installation of new prestressed precast concrete piles and steel h-pile extensions
- Installation of new platform structure (precast concrete pile caps, prestressed precast concrete planks, cast-in-place concrete topping slab, cast-in-place concrete cut-off walls)

Special inspection work includes:

- Pile Driving
- Concrete reinforcing inspections
- Observing cast-in-place concrete placement

Ferry Shore Facilities – Waterfront Facility Inspection and Design

Location

New York, New York

Client/Owner

New York City Department
of Transportation
(NYCDOT)

Services

Site/Civil Engineering
Marine Engineering
Geotechnical Engineering
Structural Assessment
Design Services
Permitting
Construction Support
Services

Contract Period

2005-2012

Construction Cost

\$100,000,000 (est.)

Project Description

McLaren Engineering Group (McLaren) was engaged to provide on an as-needed basis architectural, engineering, and construction related services for their various ferry facilities citywide. The ferry facilities contained within this contract included but were not limited to the following:

- Ferry Terminals
- Buildings
- Facilities (including connecting transit modes)
- Maintenance Berthing Facilities
- Marine and Upland Structures

Ferry facilities' components/structures included but were not limited to the following:

- Piers, pontoons, gangways
- Moveable Bridges
- Ship Fendering and Mooring Systems
- Passenger Terminal Buildings
- Soil Retaining Structures
- Associated MEP Systems
- Dredged Channels
- Fuel/Oil Storage
- Maintenance/Industrial Buildings
- Elevated Traffic Structures
- Rail/Rapid Transit Stations
- Bus Terminals, Parking Facilities

Staten Island Ferry Maintenance Facility

McLaren provided the necessary design and construction support services to ensure the structural integrity and water tightness of the Ferry Maintenance Facility building envelope. McLaren performed a condition survey to determine the extent of structural damage and deterioration in the building envelope, including the existing parapets and lintels at windows and doors. The survey also identified and documented cracks in façade masonry, and included any necessary exploratory probe work to verify assumptions regarding the causes of the observed distress. The existing concrete structure was investigated for corrosion damage at locations of water intrusion. Based on the findings of the condition survey, McLaren developed design and construction documents for the NYCDOT and will oversee construction.



Maintenance Facility

Emergency Ferry Landing Barges and Associated Equipment

McLaren provided marine design services necessary for three (3) emergency ferry-landing barges to prepare for future civil emergencies. Using the barge and associated system designs recently constructed at Slip 7 of the St. George Ferry Terminal as the concept vessel, McLaren conducted a condition survey, developed design alternatives and prepared construction documents.



Moveable Transfer Bridges

Transfer Bridge Inspection

McLaren performed the latest cycle of inspection on the NYCDOT's transfer bridges at various facilities throughout New York City and Staten Island, which was last completed in 2009. Under the previous cycle, McLaren performed bridge inspections on 21 transfer bridges. The task order included surface inspection utilizing visual and tactile procedures. McLaren investigated the feasibility of transporting the Denka Lift on upper bridge/gangplanks at each terminal. Calculations and analysis, preliminary sketches, a conceptual cost estimate, a forecast of whether the physical work could be effected with the upper bridge/gangplanks in situ or otherwise and an estimated work duration was included in scope of services. McLaren also prepared preliminary and final designs.

Ferry Shore Facilities – Waterfront Facility Inspection and Design

Subaqueous Rehabilitation of Slip 4 – St. George Ferry Terminal, Staten Island, NY

McLaren provided professional engineering design services for the underwater rehabilitation of the supporting structure of the transfer bridge and terminal wing at the St. George Ferry Terminal's Slip 4. Based on its 2005 underwater inspection of the site, McLaren assessed the condition of the existing structures and systems, and developed a program of repairs. McLaren provided schematic, design, construction and bid documents while also overseeing the construction phase of the project.

RACON Systems Installation Design – St. George & Whitehall Ferry Terminals

For the design and installation of RACON Beacon systems at the Whitehall Ferry Terminal in Manhattan, and the St. George Ferry Terminal on Staten Island, McLaren provided engineering support and consultancy to the NYCDOT.



St. George Ferry

Pier 1 and Pier 2 Condition Assessment – Staten Island Ferry

For this task, McLaren provided the necessary design and construction support services for the repair of two high level timber pile supported concrete deck piers (Piers 1 and 2) and wharves (Wharf 2 through 3). These repairs included not only the pier and wharf structures, but also the timber fender system surrounding each pier and wharf. McLaren performed a Level I underwater inspection of both piers, and the adjacent wharf and bulkhead structures, with a Level II and III inspection of a considered sample of waterfront structures. From the condition survey, McLaren developed design and construction documents that highlight the following:

- Plans for specific details relating to the repair or replacement of marine structures that included piers and adjacent waterfront structures. Details included concrete encasement of damaged timber piles and replacement of existing timber pile bracing.
- Demolition plans were developed to allow for the safe removals while maintaining overall stability of the structures for those portions of the structure requiring replacement.

Conversion of Derrick #3

McLaren was tasked to provide inspection, survey, design and construction support services necessary to replace the existing oil fired steam power plant of Derrick #3 with a diesel powered compressed air system. McLaren performed an investigation of the existing site conditions, completed a preliminary barge stability analysis, and has provided the structural and mechanical design services needed for replacement of the power plant.

Staten Island Ferry Permitting Support

McLaren provided permitting support services to the NYCDOT for obtaining permits from the New York State Department of Environmental Conservation, the U.S. Army Corp of Engineers, and the New York State Department of State to perform general maintenance activities at Staten Island Ferry, City/Hart Island Ferry, and various Private Ferry sites throughout the City.

Staten Island Ferry Environmental Support

McLaren supported the NYCDOT in the final remediation of a fuel oil leak at St. George Ferry Terminal. McLaren developed and executed a work plan, which was submitted to the New York State Department of Environmental Conservation, for boring and testing needed for location/identification of remaining oil at the site. McLaren's site investigation report, summarizing our field investigation and testing effort, resulted in the site being classified as 'closed' according to the NYSDEC without need for additional remediation.

Miscellaneous Engineering Services (On-Call)

McLaren provided, as requested by the city, on-call services for miscellaneous engineering tasks at ferry facilities citywide. To date, work produced under this task order includes:

1. Inspection and damage assessment of St. George Ferry Terminal Slip 5
2. Replacement of the elevated concrete slab at the upper receiving areas of Slips 4, 5 and 6 at the St. George Ferry Terminal.
3. Upgrade to the photovoltaic electrical generation system of the Whitehall Ferry Terminal to meet stringent ConEd requirements.

SUNY Maritime Rehabilitation of Campus Pier & Other Waterfront Structures

Location

Throgs Neck, New York

Client/Owner

State University
Construction Fund

Services

Underwater Inspection
Marine Engineering and
Design
Permitting
Construction Inspection
Yokohama Replacement

Contract Period

2006-2014

Construction Cost

\$7,302,000



Pier Under Construction

Project Description

McLaren Engineering Group (McLaren) performed marine structures inspection, and rehabilitation and repair design services for the SUNY Maritime Campus' entire waterfront in Throgs Neck, New York. The project involves an in-depth inspection of the campus' Main Pier and comparison to a previous cursory investigation to assess the full extent of damage and deterioration. McLaren also performed a structural and load rating analysis of the pier, and designed an extension to the pier to accommodate the docking of an additional sea-faring vessel.



SUNY Maritime Campus Pier & Waterfront

McLaren performed the rehabilitation design of the 5,000 square foot deck surface and pier in a way to help prevent future occurrences of significant damage and deterioration as was found during the inspection process. The project also included mooring and berthing dolphin design, rubber fendering design, and floating dock design. McLaren worked with campus personnel to develop a scheme that meet the operation requirements. The floating dock design was included in permit documentation that was approved by the USACE, NYSDEC and NYSDOS.

In addition to work on the pier, McLaren also performed an in-depth inspection of the steel sheet pile bulkhead at the college's Student Activity Building to fully assess the extent of deterioration. McLaren designed the replacement of the C channel whaler providing lateral support to the steel sheet piling, and designed the replacement timber bracing between the piles supporting the boat crane. McLaren designed the replacement of the timber bracing between the piles supporting the campus boat shed and re-point approximately 3,400 feet of the college's seawall as well.

McLaren is currently performing construction inspection services.

Port Authority of New York and New Jersey Term Agreement Contracts

Location

Various Locations, New York and New Jersey

Client/Owner

Port Authority of New York and New Jersey

Project Type

Inspection and Design Engineering Services

Services

Marine Engineering
Above and Underwater Inspections
Structural Engineering
Load Rating Analysis
Design
Construction Admin.

Contract Period

1990-2012

Project Description

McLaren Engineering Group (McLaren) has been providing the Port Authority of New York and New Jersey professional engineering inspection and design service through term agreement contracts since 1990. McLaren worked on four (4) separate call-in term agreements for marine engineering; inspection, design and construction inspection and management for their in-water and upland facilities. They are:

- Performance of Marine Condition Surveys and Diving Inspection Technical Services (426-09-013)
- Performance of Expert Professional Facilities Condition Surveys of Waterfront Facilities (405-09-027)
- Performance of Expert Professional Structural Engineering Design Services (415-09-063) and
- Performance of Expert Professional Engineering Services (Waterfront) (415-09-065)

These contracts involve various structure types, including but not limited to piers, wharves, berths, docks, outfalls, seawalls, ferry facilities and building structures.

McLaren's Role

McLaren, as Prime Consultant to the Port Authority of New York and New Jersey, was responsible for underwater inspection, above water inspection, facility inspection, design repairs and construction support services on these contracts.

Project Highlights

- ◆ Marine Engineering
- ◆ Structural Engineering
- ◆ Underwater Inspection Services
- ◆ Above Water Inspection
- ◆ Underwater Videotaping
- ◆ Geotechnical Engineering
- ◆ Fathometer Survey Services
- ◆ Load Rating Analysis
- ◆ Database Management
- ◆ Report Preparation
- ◆ Construction Administration



Location

Manhattan, New York

Client/Owner

Battery Park City Authority
(BPCA)

Project Type

Marine Structure Inspection
Analysis and Reporting

Services

Above and Underwater
Inspections
Assessment Reports
Rehabilitation
Recommendations
Cost Estimating
Bid document Preparation
Construction Inspection
Construction
Administration

Contract Period

2014-2015

Project Description

Since 2005, McLaren Engineering Group (McLaren) has been providing marine engineering and underwater inspection services to the Battery Park City Authority (BPCA). As part of BPCA's phased Pile Remediation Program, McLaren has performed condition inspections and assessments for over 3,500 precast concrete piles supporting various sites within the Battery Park City esplanade in lower Manhattan.



North Cove Marina

McLaren's Role

Under the current phase of BPCA's Pile Remediation Program, McLaren performed a limited underwater condition inspection of the piles and retaining structures supporting the waterfront esplanade in and around the North Cove Marina. The site consists of 116 prestressed concrete piles located within the marina and along the esplanade to the North. Visual inspections were performed to identify repair completion status and investigate developing settlement and sink holes inland of the esplanade. Design repairs and construction inspection/administration services were provided.

Inspections were performed in accordance with Association of Diving Contractors International (ADCI), U.S. Army Corps of Engineers (USACE), and OSHA's standard procedures. McLaren also utilizes the New York City Economic Development Corporation (EDC) "Waterfront Facilities Maintenance Management System, Inspection Guidelines Manual" dated October 1999 for inspection and reporting purposes.



North Cove Marina & Esplanade



McLaren Diver

Location

Vallejo, California

Client/Owner**Services**

Marine Engineering
Geotechnical Engineering

Contract Period

2014-2015

Fee

\$355,700

Construction Cost

\$2,800,000

Reference

Vortex Marine Construction
Livingston Street Pier
Oakland, CA 94606
Blaise Fettig
(510) 261-2400
bfettig@vortex-sfb.com

**Project Description**

The goal of this project was to develop the existing site so it could function as a bulk handling marine terminal. The shoreline was built out in two phases. The first phase consisted of construction of a pile supported wharf approximately 500 feet long. This wharf replaced a former structure at this location and offers relatively deep dredge depths. New fill was placed behind this platform.

The second phase of construction consisted of extending the wharf structure toward the north along a shallower mud flat. A larger area located behind this platform was filled. Dredging was required along the outshore edge of the platform to accommodate the necessary vessel drafts. It was necessary to determine how this cut impacted the shoreline north of the site.

McLaren's Role

McLaren Engineering Group provided the necessary marine consulting and engineering services related to the design of the Vallejo Marine Terminal and developed construction documents.

McLaren prepared the design criteria establishing all loadings for the pier structures (platforms), fendering and engineered fill for the project. The environmental loads (wind, wave, current) were developed from the previously published design standards for the Mare Island Strait, adjusted to reflect the greater wind fetch at the project site. McLaren worked with VMC to develop a geotechnical exploration program and specify the required engineering parameters in the geotechnical report. The performance and load criteria for mooring and berthing were also developed. This assured that the platform and fendering would be adequate to resist the energy imparted by vessel operations. McLaren also worked with VMC to develop the desired performance and durability requirements for the structures.



Brooklyn Navy Yard Waterfront Structural Design Development

Location

Brooklyn, New York

Client/Owner

Brooklyn Navy Yard
Development Corp

Project Type

Waterfront Rehabilitation

Services

Marine Engineering
Above Water Inspections
Underwater Inspections
Design Services
Construction Cost Estimating
Bid Document Preparation
Permitting
Construction Administration
Construction Inspection

Contract Period

1992-2012

Project Description

As part of Brooklyn Navy Yard Development Corporation's 10-year Master Plan to revitalize the Navy Yard as an economic development facility, McLaren Engineering Group (McLaren) was selected to provide specific area waterfront rehabilitation services at this 213-acre site. Improvements have been made to various marine structures at the facility, including Piers C, D, G and K; Berths 3A, 6, 7, 7A, 14A, 17, 18, 20A and 20B.



McLaren first performed above water and underwater inspection and assessment of piers, low-level relieving platforms, bulkheads/seawalls, and wharves. Preliminary and final design services, with construction cost estimates, were then provided for the rehabilitation.

Each of the repair packages was fully designed and constructed, and McLaren provided full engineering services throughout those phases. Specifically, the following were performed for each of the waterfront structures listed above:

- Data Accumulation and Research
- In-Depth and Detailed Underwater and Above Water Condition Surveys and Assessments
- Preparation of a Condition Survey Report
- Preparation of an Alternatives Study and Feasibility Report with Costs
- Preparation of Environmental Permits and Coordination Meetings with NYSDEC and USACE
- Preparation of Bid Documents (Contract Drawings, Technical Specifications and Boilerplate/General Specifications) – Submittals to 30%, 70%, 100% and Final Stages
- Bidding Assistance and Evaluation/Contractor Selection
- Construction Inspection using Underwater Inspection Crews
- Construction Administration Support Services (Shop Drawings/Submittals, Clarifications, Meetings, As-Built Documentation, Scheduling)

Prior to repairs, the structures were in a dilapidated state. Because the facilities are old timber structures, McLaren was exposed to nearly every type of timber construction – and nearly every type of condition for which a solution was needed. Repairs were executed in consideration of the environmental regulations and included:

- Wrapping timber piles in plastic and driving new timber piles
- Posting timber piles and shimming non-bearing piles
- Encasing timber and steel piles in concrete
- Replacing or encasing timber pile caps
- Protecting, through encasement, timber cut-off walls and underdeck
- New cast-in-place concrete pile caps
- Constructing new steel sheet piles/anchored “dead man”
- Constructing new cast-in-place cutoff walls
- Reconstructing severely deteriorated seawall of low-level platforms
- Design of cathodic protection systems



PROJECT MANAGEMENT

McLaren uses a technical matrix management approach, with a single point of contact and control to guide all activities during the program. Our focus is to address project elements and variables in the most expeditious and professional manner, while providing our client with a quality product. The benefit to the client is a highly-qualified group of professionals with a successful history and expertise of similar work efforts, as well as local knowledge to handle the complexities of an On-Call agreement. For McLaren, project management means control over all aspects of the project. Some of the elements of our Project Management Approach include:

- **Project Initiation.** Upon notice to proceed on a particular project, McLaren will initiate a kick-off meeting to solidify a clear understanding of a given project's requirements and establish communication channels. When a task is assigned, we will finalize our staffing and implement our schedule of operations. The schedule, along with the primary milestones, will be established. In this way, we can ensure that our performance and production will accommodate the client's desired schedule and enable us to assign personnel to the various work items over the life of the project, thus optimizing available manpower.
- **Coordination.** Coordination of all project staff members and their tasks in the project is vital to the timely completion of each milestone. Our controls will include screening to determine the most qualified candidate(s) with a proven track record in working with the various agencies, daily monitoring by the Project Manager of their work, internal reporting requirements, incremental progress review to assure schedule adherence, and quality control checks throughout the process. The ultimate goal is to deliver the prescribed scope of services in a timely, cost-effective manner.
- **Scheduling.** Utilizing up-to-date scheduling software, including Microsoft Project© so the master schedule can easily incorporate the discrete tasks involved in a given task order into a logical, orderly chain of events. The Project Manager will be responsible for determining the schedule impacts and providing the client with an analysis, revised schedule, justifications for time adjustment, and solutions for mitigating the delays and maximizing early completions in the master schedule.
- **Client Review.** Client review periods at various phases of the project will be incorporated into the design schedule to encourage feedback. Client review periods will also foster a direct dialog with the consultant team, and reiterate our team's emphasis on communication.
- **Communication.** Communication is perhaps the most important aspect of management throughout the duration of any project. On a daily basis, we will transmit information via e-mail, phone and fax. Using our e-mail network and systems configurations, all communications sent over the Internet will automatically be distributed to the other team members. This will result in a seamless and immediate exchange of e-mail information, and will foster a more efficient manner of communication.

"McLaren designs have always been within the agency's budgetary goals and have routinely helped the Department in negotiating with the contractors to keep the change orders to minimum levels...McLaren Team provides excellent cooperation when needed and they participate in all meetings as required by the agency."

- Hardee Saini,
NYC Department of Corrections

TEAM COORDINATION

Project control meetings will be held as required by McLaren with all project staff members and the Project Manager in order to monitor overall progress, review data gathering and reporting efforts, and program future work.

COORDINATION AND MEETINGS

Coordination will be a significant task in the progress of the project. During the early task phases of work, the McLaren team will arrange and conduct all necessary meetings with staff, utilities, and any other agencies that will be involved. Coordination with these parties will be necessary to obtain the necessary input and approvals and to ensure compliance with applicable laws, regulations, and design requirements governing the work. McLaren's Project Manager will be responsible for organizing all required project coordination meetings.

DEFINED SCOPE OF WORK

In order to succeed, any project must have a clearly defined scope of work to which all parties involved understand and agree. This will allow the efficient completion of work, avoid the execution of unnecessary work, and avoid the potential for duplication of efforts.

The assignment of staff levels, and the clear definition of responsibility serves several purposes. First, it provides a distinct chain of command and communication within the project – both on the part of the Consultant and the Client. It also allows the proper application of specialty personnel to each task of the project, thereby avoiding lost time or duplication of efforts. Finally, staff assignments provide for the immediate movement within the project as a whole to accommodate emergency conditions, change in scope, or revision of interim schedule items so that the overall project schedule will remain unaffected.

DAILY MANAGEMENT PRACTICES

McLaren's Daily Management Practices assure quality of our engineering product as well as efficient flow of information and budget control. Our practice involves:

1. A written record of all project-related telephone conversations is made and kept on file. This serves as a means of recording directives of the client. The Project Principal receives a copy of all "telecons" and reads them daily to obviate any perceived problems.
2. At the beginning of each project, a project initiation data sheet is developed by the Project Manager to record the scope of work, schedule, and needs of the client.
3. Manpower budget sheets are generated for each project and are checked weekly for deviations.
4. Internal executive management meetings are held to monitor progress of work, redistribute manpower, and discuss specific technical problems.
5. Minutes of all meetings are taken by the Project Manager and distributed to all attendees and interested parties, including the Project Principal.
6. Field reports are issued for all site visits.

"McLaren consistently meets extremely tight deadlines, adheres to schedules and milestones, and produces all required deliverables in a timely manner."

- Sharika Sims,
New York City Department
of Parks and Recreation

7. A copy of all project-related incoming/outgoing mail is given to the Project Principal for information.
8. All information related to the project is kept by the Project Manager in a series of binders segregating the project into the following categories:
 - Transmittals
 - Minutes of meetings
 - Field reports
 - Telecons
 - Calculations (often broken into subcategories)
 - Superseded calculations
 - Reports (soils, testing, etc.)
 - Design sketches and details
 - Specifications
9. Before any work is transmitted to the client, either the Project Principal or Project Manager must review the technical content of all reports or drawings, as a quality assurance control.
10. A daily record is compiled of all outgoing correspondence and its method of transmittance, whether by mail, fax, courier or hand delivered.

We believe the preceding 10-step program provides proper controls for product quality assurance. We have used these basic techniques for the successful management and execution of more than 12,000 projects over our 39-year history.

Based on our prior experience, McLaren envisions a wide range of assignments and has thus assembled our team with the appropriate expertise. With regard to the on-call assignments that could potentially be assigned under this agreement, our approach is that they are all related insofar as they will all be managed by the same structure, each will be worked as a separate project, with separate schedules, budgets, and staffing. Staffing overlap will be avoided except where advantageous. It is our experience that any and all task orders can be worked concurrently, and our project team has been assembled with this goal in mind.

EXECUTION OF ASSIGNED TASKS WITH PROPOSED STAFFING

Relative to duration, we understand that on-call assignments can vary in length. Naturally, duration is dependent upon scope, but in all cases, McLaren will work with the client to properly define all services required for each task and establish a schedule that meets the needs and preferences of the client. Once the schedule and budget have been established, it will then be our responsibility to meet or exceed those parameters with our proposed staffing.

As described in the above sections, McLaren has a clear understanding of the nuances of on-call services and the anticipated tasks. In fact, at one time or another, all of our employees have performed services under a Term Contract. We understand that operating under this type of contract requires a dedication and attention to that contract. Our client must have a single point contact person that understands their contract, their schedule requirements, their budgetary constraints, their design standards, and their methods of operation. We have thus established a staffing structure to do just that, while accomplishing the on-call assignments to the utmost satisfaction of the client.

QUALITY CONTROL REVIEW PROCESS

Quality Control is an important function and its implementation will be integrated into the overall project in such a manner as to cause the least disruption to the schedule flow. Senior-level personnel will be made available to review all work elements and to ensure a consistency of product along with the highest engineering quality to meet the demands of a given project.

Our quality control procedures include the implementation of corrective action and a readily available paper trail to record and document all actions. Our Quality Services Program continually defines, reviews and augments the process encompassing all aspects of the operation. McLaren is committed to strict adherence to quality control, and will meet the client's requirements to ensure a project's successful outcome.

McLaren has a long-standing history of providing high quality products to its clients. This philosophy emanates from the owner, President and CEO, Mr. Malcolm McLaren. Over the company's 39-year history, McLaren has developed numerous quality plans to satisfy its clients and these plans were followed in the development of the technical products. Major elements of these plans have included the following:

- Formal kick-off meetings to fully define task requirements, input from client, technical approach, schedule and milestones, deliverables, risk areas, funding and personnel resources.
- Proper briefing of personnel prior to task initiation to ensure that they fully understand the scope of what they've been assigned and can accomplish the work in the hours allocated.
- Periodic reviews by line supervisors to ensure the work is proceeding on schedule and within cost.
- Interim technical reviews at key milestones to assess quality, progress, identify problems, and define workarounds as required.
- Allocation of adequate time for checking by the Department Manager and Project Manager as well as incorporating corrections and comments prior to issue to the client.
- Categorization of errors and statistical process techniques are used to identify and correct technical problems and to provide feedback to designers and engineers to minimize errors.
- Adherence to established requirements for senior management review and sign off. Project staff meetings are held approximately every Monday at 12:00 Noon to review project technical status as well as man-hour/cost expenditure and schedule status. The project review meeting is followed by a Quality Assurance meeting, chaired by the President and attended by the Director of Quality Assurance, Project Managers and technical and Non-Technical Division heads and or their assistants. At these meetings, various quality related matters are discussed. This may include: results of quality assurance checks, design deficiencies, revisions to various rules, regulations and standards that have impact on our work. The quality issues discussed at the meetings are tracked until they are satisfactorily resolved.

McLaren strives to produce the highest quality of technical products and continues to forge ahead in the quest to provide consistently high quality products to its clients.

CORPORATE LICENSE



Florida Board of Professional Engineers
2639 North Monroe Street, Suite B-112
Tallahassee, FL 32303-5268

McLaren Technical Services, Inc.
100 SNAKE HILL ROAD
WEST NYACK, NY 10994

Each licensee is solely responsible for notifying the Florida Board of Professional Engineers in writing the licensee's current address.

Name changes require legal documentation showing name change. An original, a certified copy, or a duplicate of an original or certified copy of a document which shows the legal name change will be accepted unless there is a question about the authenticity of the document raised on its face, or because the genuineness of the document is uncertain, or because of another matter related to the application.

At least 90 days prior to the expiration date shown on this license, a notice of renewal will be sent to your last known address. If you have not yet received your notice 60 days prior to the expiration date, please call (850) 521-0500, or write, Florida Board of Professional Engineers, 2639 North Monroe Street, Suite B-112, Tallahassee, FL 32303-5268 or e-mail: board@fbpe.org. Our website address is <http://www.fbpe.org>.

State of Florida

Board of Professional Engineers

Attests that

McLaren Technical Services, Inc.

d/b/a: MCLAREN ENGINEERING GROUP



FBPE
FLORIDA BOARD OF
PROFESSIONAL ENGINEERS

Is authorized under the provisions of Section 471.023, Florida Statutes, to offer engineering services to the public through a Professional Engineer, duly licensed under Chapter 471, Florida Statutes.

Expiration: 2/28/2019

Audit No: 228201900978 R

CA Lic. No:

30398

REQUIRED FORMS

ANTI-KICKBACK AFFIDAVIT

STATE OF ^{New York}FLORIDA)
COUNTY OF ^{Rockland}MONROE : SS)

I, the undersigned hereby duly sworn, depose and say that no portion of the sum herein bid will be paid to any employees of the City of Key West as a commission, kickback, reward or gift, directly or indirectly by me or any member of my firm or by an officer of the corporation.

By: *W. P. Carthy III*

Sworn and subscribed before me this

17th day of April, 2017.

^{New York}
NOTARY PUBLIC, State of ~~Florida~~ at Large

My Commission Expires: Nov 8 2017
Donna M. Brangaccio
DONNA M. BRANGACCIO
Notary Public, State of New York
No. 01BR6032744
Qualified in Rockland County
Commission Expires Nov. 8, 2017

**SWORN STATEMENT UNDER SECTION 287.133(3)(a)
FLORIDA STATUTES ON PUBLIC ENTITY CRIMES**

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICE AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid, Bid or Contract No. RFQ No. 17-002 for General Engineering Services for the City of Key West, Key West, Florida.

2. This sworn statement is submitted by McLaren Technical Services, Inc.
(Name of entity submitting sworn statement)

whose business address is 100 Snake Hill Road
West Nyack, NY 10994 and (if applicable) its Federal Employer Identification Number (FEIN) is 11-3089183 (If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement.)

3. My name is William J. McCarthy, III and my relationship to
(Please print name of individual signing)

the entity named above is Vice President – Business Development.

4. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including but not limited to, any Bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, material misrepresentation.

5. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

6. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes, means

1. A predecessor or successor of a person convicted of a public entity crime: or

2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

7. I understand that a "person" as defined in Paragraph 287.133(1)(8), Florida Statutes, means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter

into a binding contract and which Bids or applies to Bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

8. Based on information and belief, the statement, which I have marked below, is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies.)


Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor any affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.

The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989, AND (Please indicate which additional statement applies.)

There has been a proceeding concerning the conviction before a hearing of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer did not place the person or affiliate on the convicted vendor list. (Please attach a copy of the final order.)

The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in the public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

The person or affiliate has not been put on the convicted vendor list. (Please describe any action taken by or pending with the Department of General Services.)

(Signature) 
(Date) April 17, 2017

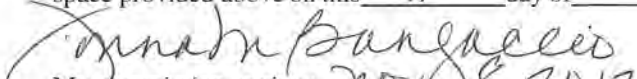
STATE OF New York

COUNTY OF Rockland

PERSONALLY APPEARED BEFORE ME, the undersigned authority,

William J. McCarthy, III who, after first being sworn by me, affixed his/her signature in the
(Name of individual signing)

space provided above on this 17th day of April, 2017.


My commission expires: Nov 8 2017
NOTARY PUBLIC

DONNA M. BRANGACCIO
Notary Public, State of New York
No. 01BR6032744
Qualified in Rockland County
Commission Expires Nov. 8, 2017

EQUAL BENEFITS FOR DOMESTIC PARTNERS AFFIDAVIT

STATE OF New York)
: SS
COUNTY OF Rockland)

I, the undersigned hereby duly sworn, depose and say that the firm of McLaren Technical Services, Inc. provides benefits to domestic partners of its employees on the same basis as it provides benefits to employees' spouses per City of Key West Ordinance Sec. 2-799.

By: 

Sworn and subscribed before me this

17th day of April, 20 17.


NOTARY PUBLIC, State of New York at Large

My Commission Expires: Nov 8 2017

DONNA M. BRANGACCIO
Notary Public, State of New York
No. 01BR6032744
Qualified in Rockland County
Commission Expires Nov. 8, 2017

INDEMNIFICATION


To the fullest extent permitted by law, the CONSULTANT expressly agrees to indemnify and hold harmless the City of Key West, their officers, directors, agents, and employees (herein called the "indemnitees") from liabilities, damages, losses and costs, including, but not limited to, reasonable attorney's fees and court costs, such legal expenses to include costs incurred in establishing the indemnification and other rights agreed to in this Paragraph, to persons or property, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the CONSULTANT, its Sub-consultants or persons employed or utilized by them in the performance of the Contract. Claims by indemnitees for indemnification shall be limited to the amount of CONSULTANT's insurance or \$1 million per occurrence, whichever is greater. The parties acknowledge that the amount of the indemnity required hereunder bears a reasonable commercial relationship to the Contract and it is part of the project specifications or the bid documents, if any.

The indemnification obligations under the Contract shall not be restricted in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the CONSULTANT under workers' compensation acts, disability benefits acts, or other employee benefits acts, and shall extend to and include any actions brought by or in the name of any employee of the CONSULTANT or of any third party to whom CONSULTANT may subcontract a part or all of the Work. This indemnification shall continue beyond the date of completion of the work.

CONTRACTOR: McLaren Technical Services, Inc.

SEAL:

100 Snake Hill Road, West Nyack, NY 10994
Address



Signature

William J. McCarthy, III
Print Name

Vice President – Business Development
Title

April 17, 2017
Date



THE CITY OF KEY WEST

Post Office Box 1409 Key West, FL 33041-1409 (305) 809-3883

ADDENDUM NO. 1

GENERAL ENGINEERING SERVICES / RFQ # 17-002

March 20, 2017

This addendum is issued as supplemental information to the RFQ for clarification of certain matters of both a general and a technical nature. The referenced Request for Qualifications (RFQ) package is hereby amended in accordance with the following items:

On Page 2 of 49 Please make the following change:

For information concerning this Request for Qualifications please contact **Janet Muccino, Project Manager**, Engineering Services Department only in writing and requests for information must be received at least ten (10) days prior to the date fixed for opening of responses to RFQ. The contact email address is jmuccino@cityofkeywest-fl.gov. The City's "Cone of Silence" Ordinance Section 2-773 does not allow verbal communication.

On Page 9 of 49 Please make the following change:

Contacts:

All requests for information should be only in writing and emailed to **Janet Muccino, Project Manager** at jmuccino@cityofkeywest-fl.gov and requests for information must be received at least ten (10) days prior to the date fixed for the opening of responses to the RFQ. Any and all such interpretations and any supplemental instructions will be in the form of written addendum to the RFQ. If City issues an addendum, the Respondent has sole responsibility to receive any such addendum or any interpretations shall not relieve such Respondent from any obligation under his response as submitted. All addenda so issued shall become a part of the Contract document.

All Bidders shall acknowledge receipt and acceptance of this Addendum No. 1 with Attachment by submitting the addendum with their proposal. Proposals submitted without acknowledgement or without this Addendum may be considered non-responsive.

Signature

MCLAREN ENGINEERING GROUP

Name of Business



THE CITY OF KEY WEST

Post Office Box 1409 Key West, FL 33041-1409 (305) 809-3883

ADDENDUM NO. 2

GENERAL ENGINEERING SERVICES / RFQ # 17-002

April 12, 2017

This addendum is issued as supplemental information to the RFQ for clarification of certain matters of both a general and a technical nature. The referenced Request for Qualifications (RFQ) package is hereby amended in accordance with the following items:

- 1.) I was curious if for this contract, and MEP firm can apply as Prime for our area of discipline? Or would we need to team with other engineers – i.e. civil, structural, etc.

An MEP can be prime; however, this RFQ is for general engineering services spanning the disciplines identified in the RFQ and teaming would be required. Discipline specific contracts will not be awarded

- 2.) No 'Scope of Work' (listed on Page 7) has been provided for "Structural Engineering" services, mentioned on Page 4. Please clarify.

Consultant team shall include licensed structural professional engineer/structural engineering firm to support evaluation and design of buildings (renovation and new), foundations, roof systems, coastal engineering, etc.

- 3.) ***ADD THE FOLLOWING TO ARTICLE 4 / PART 3 / DRAFT AGREEMENT***

ARTICLE 4

TERM OF AGREEMENT; TIME FOR PERFORMANCE; CONTRACTOR DAMAGES;

- 4.6 The CONSULTANT shall provide design assistance to City staff and attend City Commission Meeting(s) should an omission, lack of detail or design considerations result in a Change Order issued by the Contractor against the City utilizing plans prepared and sealed by CONSULTANT. This assistance will be provided at no charge to the City to allow CONSULTANT the opportunity to address the issue leading to the Change Order to the satisfaction of the City Commission.

- 4.) Consultant team shall include licensed Landscape Architect/Landscape Architectural firm to support landscape and irrigation system design requirements. Experience with local landscaping conditions and plant materials preferred.

All Bidders shall acknowledge receipt and acceptance of this Addendum No. 2 by submitting the addendum with their proposal. Proposals submitted without acknowledgement or without this Addendum may be considered non-responsive.



Signature

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Applied Ingenuity

The motto, goal and indeed, mantra at McLaren is "***Applied Ingenuity.***" It is our intent to be ever improving - exploring new solutions to old problems and constantly striving to serve our clients better. We will never rest on our accomplishments nor will we be satisfied with what we did yesterday. Ours is a determination to perform better than we did on the last project.