



October 2, 2017

Ed Chesney, P.E.  
Director  
Marine and Aviation Department  
City of Clearwater  
25 Causeway Blvd.  
Clearwater, FL 33767  
Phone: 727.462.6954, ext. 22  
Fax: 727.462.6957  
Email: [Ed.Chesney@myClearwater.com](mailto:Ed.Chesney@myClearwater.com)

Regarding: Condition of damaged fishing pier – Downtown Marina  
Blanket Purchase Order BR512526

Dear Mr. Chesney,

As requested, Orion Marine Construction, Inc. (“Orion”) inspected the existing fishing pier at the City of Clearwater downtown marina to assess the extent of the damage caused by Hurricane Irma and from there determine whether the fishing pier can be repaired and repositioned or needs complete replacement.

#### Background

The City of Clearwater downtown marina is a concrete floating dock system which was designed and manufactured by Shoremaster, a company which has since gone out of business. This floating dock system consists of concrete dock sectionals that are secured together and held in place through a combination of (a) post-tension cables running lengthwise through the dock sectionals, and (b) vertical 24-inch prestressed concrete support piles strategically located adjacent to or at the ends of the docks, to which the docks attach by way of steel framed pile guides that wrap around and fully enclose the piles and are equipped with rollers that interface with the sides of the piles to allow for vertical dock movement with tide and wave but restrict horizontal movement. The fishing pier at issue is part of the floating dock system, and stands alone as the northernmost pier, placing its northern side adjacent to the open waters, which consequently exposes the fishing pier to a greater magnitude and frequency of movement due to wave, tide, and wind. To mitigate these effects, the concrete dock sections that comprise the fishing pier have deeper concrete sidewalls that by extending further down into the water serve as wave attenuators. The fishing pier is comprised of two concrete dock sectionals (an eastern dock sectional and a western dock sectional), and four concrete support piles. Notwithstanding the wave attenuator design, Hurricane Irma, with its high winds, radical fluctuations in sea level and tide, and forceful waves, caused damage to the fishing pier, which in turn precipitated the City’s contracting with Orion to evaluate the situation.

### Method of Inspection, Assessment, and Determination

Inspection was conducted by way of both visual topside inspections and underwater inspections with divers. The conditions observed were documented by photograph and video. Please find enclosed photographs that evidence extensive damage to various components of the fishing pier, including the concrete dock sectionals, the steel framed pile guides, and the concrete piles. The inspection videos similarly evidencing these damages were provided to the City in advance of this letter.

Regarding the concrete piles, the topside and underwater inspections revealed that two of the four piles are visibly leaning in the same direction as the dock displacement. The degree of displacement is approximately 10 inches at the top of the pile. No cracks were observed above the mudline. Leaning of this magnitude, in conjunction with the absence of cracking above the mudline, together indicate that these piles have likely either (a) broken or cracked beneath the mudline, or (b) rotated in-tact thereby displacing the soils beneath the mudline. The two leaning piles were initially installed with a pile driving hammer that advanced the piles downward until firmly embedded in the underlying rock, which is hard, inflexible, and not easily displaced; therefore, it is likely that these piles broke beneath the mudline. However, without extensive subsurface exploratory inspection, it is very difficult to know for sure if these piles are merely bent over or cracked/broken. In either case, the leaning posture makes attachment to the existing dock (or a future dock) ill-advised as the floating docks are designed to ride up and down on a vertically plumb pile. We expect that reuse of the two leaning piles, if in fact possible (although unlikely), would result in faster wear and tear and more frequent repairs and replacement, to the rollers, steel framed pile guides, and the dock itself.

Regarding the fishing pier concrete dock sectionals, and in consideration of the specialty nature of such concrete floating dock systems, including their unique design, fabrication, and installation, Orion engaged Bellingham Marine, a leading floating dock manufacturer/designer and marina builder based in Jacksonville, FL, to lend its expertise in assessing and evaluating whether repair or replacement is most appropriate. Mr. Bryce Fisher of Bellingham Marine, a former employee of Shoremaster (the original manufacturer of this floating dock system), travelled from Jacksonville to the City of Clearwater downtown marina to inspect the fishing pier because Mr. Fisher has the most knowledge of the Shoremaster systems, and consequently, is best able to properly assess the current condition, and determine repair or replacement. Enclosed for your review are Bellingham's recommendations along with photos of damages to multiple components, which corroborate the extensive damages depicted in the videos that Orion has provided to the City.

The fishing pier western floating dock sectional has visible topside cracks on the walking surface of the dock. The fishing pier eastern floating dock sectional has extensive below water damage to the wave attenuation. Although these damages are well documented within the enclosed photographs, the diving videos provide the best visual data of these damages. The underwater damages include extensive fractures and spalling of concrete, which in turn have exposed the structural rebar to the highly corrosive salt water environment. These extensive damages rule out repair as an economically feasible option.

All four of the fishing pier's steel framed pile guides were damaged beyond repair. Only one remains attached to the dock, the other three broke from the docks and slid down the piles where they are currently resting on the seabed.

A water line was also visibly damaged and has been capped off.

In consideration of the extensive damages described above, to both the concrete floating dock sectionals as well as the concrete piles, Orion hereby submits for City approval its recommendation to replace the fishing pier in its entirety with a new fishing pier of similar design, comprised of concrete floating dock sectionals, and supported by new concrete piles. Complete replacement is necessary to ensure structural and wave movement compatibility between the concrete dock sectionals that combine to form the fishing pier. It is also recommended that the four existing piles simply be cut off at the mudline and the above mudline portion be disposed.

Upon your assessment and concurrence, Orion is prepared to work with a supplier and engineer to design, procure, and construct a replacement fishing pier with wave attenuator. Demolition and removal of the existing can also be performed at your request.

Sincerely,

**ORION MARINE CONSTRUCTION, INC.**



Albert Perez, Jr., P.E.

Operations Manager – Marine/Civil







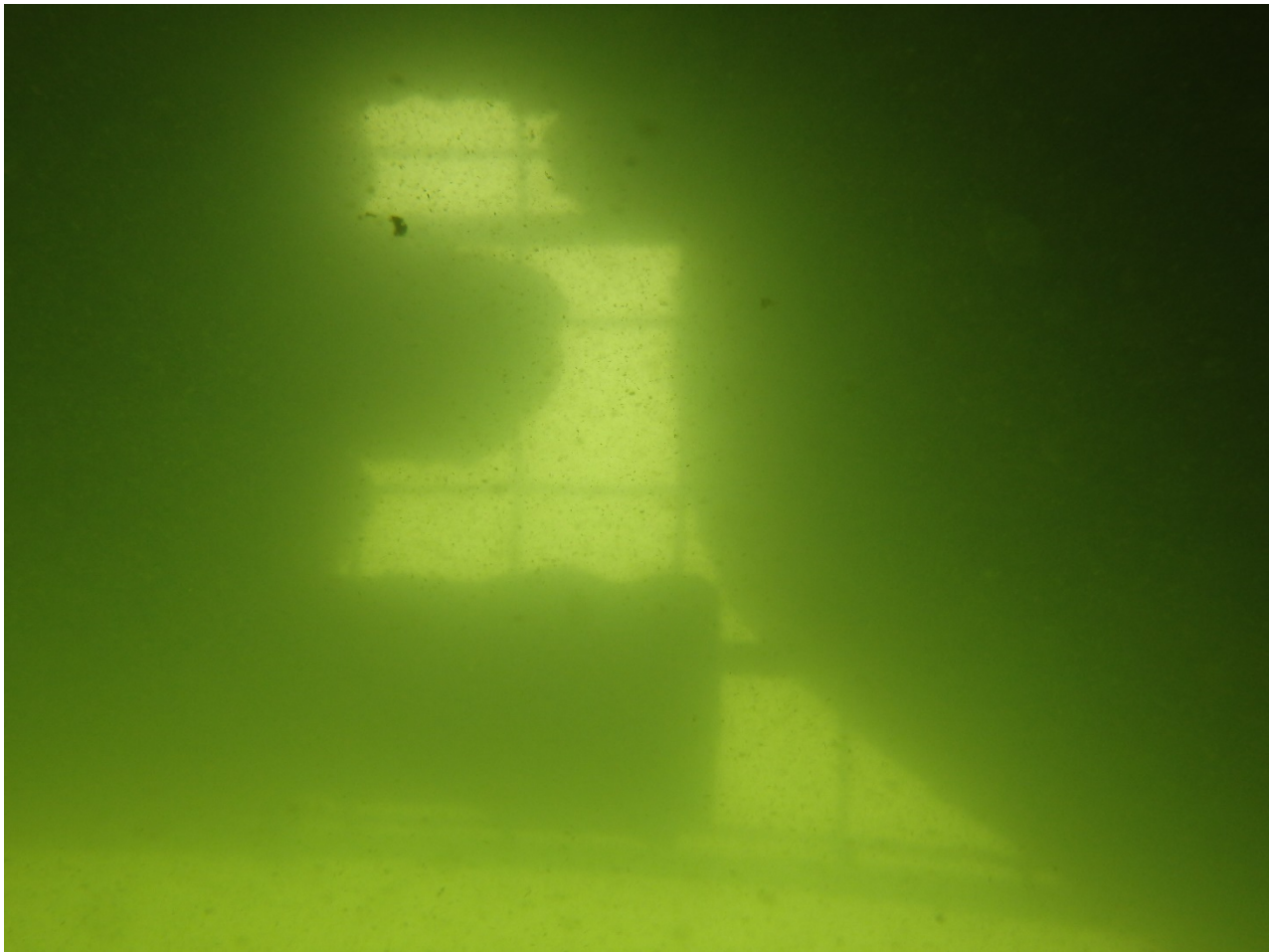














Florida  
Floats, Inc.  
dba Bellingham Marine

1813 Dennis St.  
Jacksonville, FL 32204

(904) 358-3362  
FAX (904) 354-4818  
bellingham-marine.com



THE WORLD'S MOST  
COMPREHENSIVE  
MARINA BUILDER

Albert (A.J.) Perez, Jr., P.E.  
Operations Manager - Civil  
Orion Marine Construction, Inc.  
5440 W Tyson Ave  
Tampa, FL 33611

RE: Clearwater Harbor Marina & Boatyard  
Fishing Pier  
210 Drew St  
Clearwater, FL 33755

Dear Mr. Perez,

Upon personal inspection of the Clearwater Marina attenuator and fishing pier on 9/19/2017 and after viewing the additional underwater video, we have determined severe visible structural issues as well as a high probability of hidden structural issues with the damaged dock sections.

Onsite inspection of the dock section showed significant structural cracking on the deck surface. Several of these cracks span the entire width of the dock, and are wide enough to indicate penetration into the foam core. The number of the cracks in close relation to each other further indicates severe underlying structural issues. These cracks cannot be repaired other than superficially, which will not add to or repair the structural integrity of the dock module.

The underwater video showed additional serious damage to the winged sections that cannot be repaired at all. The rebar is visible and large pieces of the concrete attenuator are missing. This damage will continue and more sections of the concrete will break away and continue to erode the ability of the dock to perform its function and safely protect the inner marina.

Our Recommendation is to remove and replace the damaged 100' dock section and replace with a new dock section with a pile design that incorporates piles on both sides of the dock to minimize potential for future damage.

Respectfully,

*Bryce Fisher*

**Bryce Fisher** | *Manager of Project Development*  
C: (409)935-3499 / E: [bfisher@bellingham-marine.com](mailto:bfisher@bellingham-marine.com)

**Bellingham Marine – Main Office**  
1813 Dennis Street, Jacksonville, FL 32204  
[www.bellingham-marine.com](http://www.bellingham-marine.com)