

ORIGINATION FORM

THE INFORMATION BELOW IS TO BE PROVIDED BY THE ORIGINATOR

Modify Specification 471.
Section/File number

New Section _____.
Section number

Subject: Bridge Fender Systems

Origination date: 3-31-11

Originator: Gevin McDaniel
Office/Phone: Structures Design/ (850) 414-4284
Email address/ gevin.mcdaniel@dot.state.fl.us
Userid: st986gm

Problem statement: Composite Piles (CP) are being removed from Specification Section 973; therefore, this specification will only cover the wales and dimensional lumber utilized in bridge fender systems. The piling will be handled by performance specification within Section 471, which is currently the construction specification for bridge fender systems.

Information source: Jerry Hocking, Robert Robertson, Andre Pavlov, Charles Boyd

Background data: Vendors producing various types of polymeric piling have approached the FDOT in hopes of being placed on the QPL for bridge fender system piling. Since there is no industry standard for polymeric piling and so many possible combinations of materials (fiberglass, plastic, vinylester resin, polyester resin, polyurethane resin, various coatings, various UV inhibitors, etc.) there is no efficient way to write a material specification and accommodate a fair playing field for each vendor. Therefore, the fender system piling will be specified based on the minimum performance criteria.

Recommended Usage Note: Use for projects with bridge fender systems

Estimated fiscal impact, if



Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

OFFICE OF THE
SECRETARY

M E M O R A N D U M

DATE: April 13, 2011
TO: Specification Review Distribution List
FROM: Rudy Powell, Jr., P.E., State Specifications Engineer
SUBJECT: Proposed Specification: 4710000 Polymeric Fender Systems.

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

This change was proposed by Gevin McDaniel of the Structures Design Office to add requirements for polymeric piles.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965RP or rudy.powell@dot.state.fl.us. Comments received after **April 27, 2011** may not be considered. Your input is encouraged.

RP/cah
Attachment

POLYMERIC FENDER SYSTEMS.
(REV 4-11-11)

SECTION 471 (Pages 633-634) is deleted and the following substituted:

SECTION 471
~~PLASTIC~~ *POLYMERIC* FENDER SYSTEMS ~~COMPONENTS~~

471-1 Description.

Construct fender systems using ~~plastic~~ *polymeric* components in accordance with the Contract Plans, ~~and~~ Design Standards *and QPL Drawings*.

471-2 Materials.

Meet the following requirements:

*Fiberglass fiber reinforced lumber (Dimensional Lumber)**

.....*Section 973*

Fiberglass structurally reinforced composite lumber ~~Structural Plastics (Wales)*~~

.....*Section 973*

**Use products listed on the Department's Qualified Products List (QPL).*

471-3 Polymeric Pile Product Acceptance.

~~Wales and Dimensional Lumber: For fiberglass fiber reinforced lumber and fiberglass structurally reinforced composite lumber see Section 973 for requirements.~~

~~———— Polymeric Piles: Use only polymeric pile systems configurations listed on the Department's Qualified Products List (QPL).~~

~~———— **471-3.1 QPL Acceptance Criteria for Polymeric Piles.**~~

~~———— Manufacturers seeking evaluation of products for inclusion on the QPL must submit an application in accordance with Section 6, independently certified test reports, and written certification that the ~~system~~ piling configuration meets the requirements of this Section, applicable Design Standards, and the following Evaluation Criteria:~~

———— 1. Design:
———— a. Design ~~fender systems~~ *fender piling configurations and connections in accordance with the latest edition of the FDOT Structures Design Guidelines and based on Vendor's desired ~~e~~Energy absorption Capacity rating.*

———— b. All ~~D~~design ~~C~~calculations and ~~D~~design ~~D~~details must be signed and sealed by a Professional Engineer licensed in the State of Florida.

———— 2. Submittals:
———— a. Submit a completed Product Evaluation Application.
———— b. Submit signed and sealed design calculations. Design calculations may be either by hand or by a computer program with hand calculations verifying the program output.

———— 3. Durability data from an independent lab verifying a minimum maintenance free design life of 50 years with strength losses not exceeding 25% at year 50.

———— 4. Report from an accredited (~~AMRL or A2LA?~~) independent lab verifying the flexural ~~mechanical~~ properties of the piling as derived from ASTM D 6109 with the

following modification. Supports shall be located to provide a minimum span to depth ratio of 20:1.

_____ 54. For pile sections remaining hollow under service conditions, a report from an accredited (~~AMRL or A2LA?~~) independent lab verifying a minimum bolt pull-through and crushing resistance of ~~25~~10 kip when equipped with vendor's detailed connection hardware at a maximum distance of two feet ~~four inches (4")~~ from the end of a pile with a minimum length of ~~eight~~four feet (~~8' 0"~~).

_____ 65. Submit signed and sealed design details in 11" x 17" ~~MicroStation, AutoCAD or PDF~~ format. Show all details specific to the how the pile configuration fits within the fender system. These details supplement Design Standards Index No. 21900.~~the Polymeric Fender System Design Standards.~~ Include the following:

- _____ a. Notes specific to the piling used in fender system
- _____ b. Pile properties, sizes and spacing
- _____ c. Energy Capacity of the fender system
- _____ d. Connections details if different from those shown on Design Standards Index No. 21900.

_____ 76. Detailed material specifications showing material type, quality, certifications, acceptance and rejection criteria and placement procedures.

_____ 87. Other information pertinent to the design and performance of the ~~fender system~~pile configuration as necessary.

_____ 98. A ~~well-documented~~field construction manual describing in detail, with illustrations, construction requirements and the step-by-step construction sequence for the pile handling and installation. Submit manual in 8.5" x 11" format in ~~either pdf~~PDF or MS Word format.

471-43 Construction Details.

Unless otherwise shown in the vendor's approved field construction manual, use the following construction details.

Protect materials at all times against exposure to extreme heat or impact. Transport ~~Structural Plastic~~products in a manner that will minimize scratching or damage to the outer surfaces, stack on dunnage above ground so that it may be easily inspected and store in a manner that will avoid damage. Handle and lift ~~Structural Plastic~~products with nylon slings. Do not use sharp instruments in handling the product. ~~Structural Plastic~~Products damaged in shipping or handling will be rejected.

~~Structural Plastic~~Products sections-containing cracks in the reinforcing rods or cracks, partial or full depth, across the section or splits will be rejected.

Cut, bevel, drill, countersink and otherwise install ~~Structural Plastic~~products in accordance with the manufacturer's recommendations. Set all material accurately to required levels and lines, with members plumb and true and accurately cut and fitted. Securely attach all materials to substrate by anchoring and fastening as shown on the plans. Perform all cutting and drilling in a manner that allows for the collection of all debris and dispose of properly.

Install piles in accordance with Section 455. ~~After driving, cut off piles at the elevation shown on the plans to a tolerance of +0.0"/-2.0" using sawing or other means as approved by the Engineer to provide a smooth level cut.~~

471-54 Method of Measurement.

The quantity of dimensional fiberglass fiber reinforced lumber, fiberglass structurally reinforced composite lumber to be paid for will be the plan quantity, in feet board measure, computed based upon the dimensions shown in the plans. The quantity of ~~fiberglass structurally reinforced composite~~ *polymeric* piles to be paid will be the length in feet furnished and driven to the authorized lengths, as approved by the Engineer.

471-65 Basis of Payment.

Price and payment will be full compensation for the work specified in this Section including all material, storage costs, disposal of unused material and waste, transportation costs, labor, equipment, fasteners and other necessary items required for completing the work. No separate payment will be made for plates, bolts, screws or other hardware necessary to complete the work.

Price and payment for ~~Plastic~~ *Polymeric* Fender System Components including fiberglass structurally reinforced composite piles will be full compensation for all labor, equipment and materials required to furnish and install the piles to the elevation shown in the plans. No separate payment will be made for pile cut-offs. ~~Plastic~~ *Polymeric* Fender System Components including fiberglass structurally reinforced composite piles to be paid for under Section 455.

Payment will be made under:

Item No. 471-1 Plastic Marine Lumber – MB.

implemented: None

Implementation of these changes, if and when approved, will begin with the January 2012 letting.