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## Index 471-030 Fender Systems - Prestressed Concrete Piles & FRP Wales

### Design Criteria

*Structures Design Guidelines (SDG)* 3.14

### Design Assumptions and Limitations

**Do not use this fender system unless approved by the District for use on the specific project.**

**Standard Plans** Index 471-030 includes a fully designed Fender System with 14" square prestressed concrete piling having a maximum **"Energy Capacity" of 50 ft-kip**.

Refer to **SDG** 3.14 for additional Fender System design criteria, assumptions and limitations.

Use this standard with Index 510-001.

### Plan Content Requirements

In the Structures Plans:

Include Index 471-030 on waterways where a fender system is required and no barge traffic is present

Prepare and include in the plans supplemental project specific designs and details for the following items:

- Electrical service for navigation lights including conduit path from bridge to fender system and identification of service point. Coordinate design with Index 510-001 and Specifications Section 510.
- Access ladders and catwalks from bridge to fender system are optional and may be included at the discretion of the District.

Designate in the plans the type of decking material to be used for catwalks: 2" x 12" Plastic Lumber or Fiberglass Open Grating. Catwalk decking material shall be determined by the District.

Complete the following "Data Tables" and include them in the plans. One "Estimated Bill of Materials Table" and one "Fender System Table of Variables" are required for each Fender System location within a project. For projects with multiple fender systems or configurations, clearly note which Fender System the Tables are applicable to. See **FDM 115** for more information regarding use of Data Tables.

Base the Minimum Pile Tip Elevations on the minimum embedment of 20 feet for the 14" square prestressed concrete piles into soil having a blow count (N) greater than 6.

Provide the required Clearance Gauge details in the plans adjacent to the Data Tables. Specify the numeral height, sign dimensions, foot marks and intermediate foot marks (when required), based on coordination with the USCG District Commander, 33 CFR 118.160 and the USCG Bridge Lighting and Other Signals Manual.

Table for use with Index 471-030 Fender Systems - Prestressed Concrete Piles:

ESTIMATED BILL OF MATERIALS FENDER SYSTEM - PRESTRESSED CONCRETE PILES STANDARD PLANS INDEX 471-030				Table Date 07-01-11
MARK	NO. REQ'D.	UNIT	QUANTITY	
A1		MB		
A2		MB		
A3		MB		
A4		MB		
A5		MB		
A6		MB		
B		MB		
C		MB		
D		MB		
* E		MB		
F1		MB		
F2		MB		
F3		MB		
F4		MB		
F5		MB		
F6		MB		
G1		MB		
G2		MB		
H1		MB		
H2		MB		

NOTE: For Member Marks, Sizes and Dimensions see Standard Plans Index 471-030, Sheet 7.

Bill of Materials Table above is for an entire fender system (left and right fenders).

\* Provide 2'-6" wide Fiberglass Open Grating for full length of fender in lieu of 2' X 12" Plastic Lumber when called for in Plans. Provide Stainless Steel Mounting Hardware and install per Manufacturer's recommendations. See Index 471-030 for notes. Include the cost of Fiberglass Open Grating and miscellaneous items required to install the grating in the price for Plastic Marine Lumber (Non-Reinforced).

FENDER SYSTEM TABLE OF VARIABLES INDEX 471-030			Table Date 07-01-11
CONTROL POINTS	STATION	OFFSET Lt. or Rt.	
A			
B			
C			
D			
DIMENSION "L"			
CLEAR CHANNEL WIDTH			
CHANNEL SKEW ANGLE			
MHW or NHW ELEVATION			
MLW or NLW ELEVATION			
PILE CUTOFF ELEVATION			
MINIMUM PILE TIP ELEVATION LEFT FENDER			
PILE LENGTH LEFT FENDER			
MINIMUM PILE TIP ELEVATION RIGHT FENDER			
PILE LENGTH RIGHT FENDER			
NUMBER OF WALE ROWS			

NOTE: Work this Table with Standard Plans Index 471-030.



## Payment

Include quantity for Composite Marine Lumber 10" X 10" Wales Mark A under Pay Item for Plastic Marine Lumber (Reinforced). Include quantity for all other Plastic Lumber under Pay Item for Plastic Marine Lumber (Non-Reinforced).

In AASHTOWare Project Preconstruction™ (formerly TRNS\*PORT), include estimated quantities for the Index 471-030 fender systems.

Item number	Item Description	Unit Measure
471-1-1	Fender System, Plastic Marine Lumber, Reinforced	MB
471-1-2	Fender System, Plastic Marine Lumber, Non-Reinforced	MB
455-34-2	Prestressed Concrete Piling, 14" Sq.	LF