Index 21930 Fender Systems - Prestressed Concrete Piles (Rev. 07/13)

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.

Design Standards Index 21930 includes a fully designed Fender System with 14" square prestressed concrete piling having an **"Energy Capacity" of 38 ft-kip**.

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

Use this standard with Index 21220.

Plan Content Requirements

In the Structures Plans:

Include both Indexes 21900 and 21930 as alternates. The Contractor will select which fender system to construct. See also the IDS for Index 21900 plan requirements.

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 21220 and ***Specification*** 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 Introduction I.3 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.

Table for use with Index 21930 Fender Systems - Prestressed Concrete Piles:

ESTIMATED BILL OF MATERIALS FENDER SYSTEM - PRESTRESSED CONCRETE PILES DESIGN STANDARDS INDEX NO. 21930			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 Design Standards Index No. 21930, 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 21930 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 NO. 21930		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 Design Standards Index 21930.

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 TRNS*PORT, include estimated quantities for both Index 21900 and Index 21930 fender systems as alternates.

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