Index 21900 Fender System - Polymeric Piles (Rev. 07/12)

Design Criteria

Structures Design Guidelines (SDG) 3.14

Design Assumptions and Limitations

Design Standards Index 21900 includes standard geometry and details for Polymeric Fender Systems.

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

Use this standard with Index 21220.

Fender System Deflection Limitations:

Polymeric fender systems are intended to be flexible energy absorptive systems; however, their deflections should be limited to avoid contact with pier footings when possible to allow for impacts without potential for pocketing or snagging and to avoid unnecessary damage to, and maintenance of, the fender system. Coordinate with the District Structures Design Engineer to determine the maximum allowable deflection of the fender system acceptable for the project.

Plan Content Requirements

In the Structures Plans:

Place the required fender system deflection limitations (determined as described above) in the plans.

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", one "Fender System Table of Variables" and one "Estimated Quantities Block" 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 and Blocks are applicable to. Place the value for "Required Energy" of each Fender System in the note provided. The Contractor will use this "Required Energy" value to select the appropriate fender system from the QPL. See Introduction I.3 for more information regarding use of Data Tables.

Table for use with Index 21900 Fender System - Polymeric Piles:

ESTIMATED BILL OF MATERIALS FENDER SYSTEM - POLYMERIC PILES DESIGN STANDARDS INDEX NO. 21900			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. 21900, 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 21900 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).

ESTIMATED QUANTITIES, INDEX NO. 21900		Table Date 07-01-11
MARK	UNIT	QUANTITY
Plastic Marine Lumber (Reinforced)	MB	
Plastic Marine Lumber (Non-Reinforced)	MB	
Polymeric Piles	LS	

NOTE: Estimated Quantities are for one entire fender system (left and right fenders).

FENDER SYSTEM TABLE OF VARIABLES INDEX NO. 21900		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 21900.

** See QPL drawings for required pile embedment lengths to determine pile tip elevations and pile lengths.

See the Qualified Products List for approved fender system pile configurations. Select a pile configuration having an Energy Capacity greater than the following Required Energy:
Fender System Required Energy = _____ ft-k

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).

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
471-2	Fender System, Polymeric Piles	LS