

# Special Specification 4061

## Outer Dolphin Repair



### 1. DESCRIPTION

This specification governs for the repair of damaged outer dolphins. Damage includes lateral displacement of some pin-mounted fender piles and damage to rubber marine fenders joining the fender pile to the concrete structure and marine fender reinforcement chain set. The repair may require realignment of the displaced pin-mounted piles, replacement of rubber marine fenders and its reinforcement chains.

### 2. EQUIPMENT

Provide equipment necessary to complete the work. Operate all water going vessels, barges, etc., in accordance with United States Coast Guard regulations.

### 3. MATERIALS

Furnish new materials. Ensure all materials and construction methods conform to the details shown on the plans and the requirements of this Item. Materials may be referenced by the following list of standards.

#### 3.1. ASTM International (ASTM):

- A153, Zinc Coating (Hot Dip) on Iron and Steel,
- A325, High-strength Bolts for Structure Steel joints,
- F738M, Stainless Steel Bolts,
- RR-C-271F Chain and Attachments, Carbon and Alloy Steel,
- A449, Quenched and Tempered Steel Bolts and studs, and
- D2000, Rubber Products in Automotive Applications.

#### 3.1.1. Marine Fenders. Furnish elements molded of rubber, homogeneous and free from defect, impurities, pores or cracks, and bonded to integral, steel mounting plates.

##### 3.1.1.1. Provide natural or synthetic molded rubber conforming to or exceeding the minimum requirements of one of the following ASTM D2000 Specifications:

- 3BA 620 A13 B13 C12 EA14 F17
- 3BA 720 A14 B13 C12 EA14 F17
- 4CA 720 A25 B35 C32 EA14 F17

##### 3.1.1.2. Meet the following performance requirements for the fend element:

- Energy Absorbed, Minimum: 74.3 ft-kps,
- Reaction at Minimum Absorbed Energy, Maximum: 61.5 kips, and
- Maximum Deflection at Minimum Absorbed Energy: 57.5 percent.

#### 3.1.2. **Anchor Bolts, Nuts and Washers.** Meet the requirements of ASTM A325 or ASTM A449, size per manufacturer's recommendations and will be galvanized in accordance with ASTM A153.

#### 3.1.3. **Reinforcement Chain Set.** Galvanize chains and all attachment hardware in accordance with ASTM A153. Provide chain fabricated of Domestic Alloy. Table 1 lists attachments and hardware required for each Marine Fender Reinforcement System.

**Table 1**

Angle Iron	4" x 4" x 3/4"	4 Ea.
All Thread with Double Nuts and Washer	1-1/4" x 6"	4 Ea.
All Thread with Double Nuts and Washer	1-1/8" x 6"	4 Ea.
Eye Nuts	1-1/4"	4 Ea.
Eye Nuts	1-1/8"	4 Ea.
Safety Shackles	1-1/4"	8 Ea.
Hex Bolt with Nuts and Washer	1"	16 Ea.
Chain-Alloy Domestic	1-1/4"	30 Ft.
Bolt Spacers	3/4" x 4" x 12"	2 Ea.

3.1.3.1. Nuts penetrating the outer most ends of Marine Fender will be spot welded in place.

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#### **4. WORK METHODS**

Perform work and follow procedures as shown in the plans.

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#### **5. MEASUREMENT**

This Item will be measured by the each for re-alignment of pin-mounted fender piles, the replacement of marine fenders of the size specified, and the installation of the reinforcement chains set, on each outer dolphin, as indicated on the plans.

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#### **6. PAYMENT**

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for re-alignment of pin-mounted fender piles, replacement of marine fenders, and installation of reinforcement chain set replacement as shown on the plans. This price is full compensation for all labor, machining, realignment of pin-mounted fender pile, equipment, furnishing, installation and incidentals.