



CORPS OF ENGINEERS - BUFFALO DISTRICT

**APPROVED**

in accordance with para. SC. 3  
of the Contract Specifications.

31 MAR 1958  
Date

*Charles H. Goss*  
Signature

CHIEF, CONSTRUCTION DIV.

**VERTICAL END SEALS**

④ NOTE: I' ADDED EACH END FOR SHOP FITTING AS SHOWN. SHOP TO CUT RUBBER FLUSH WITH TOP OF STOP LOG AND FLUSH WITH SEAL SURFACE OF BOTTOM SEAL RUBBER, WHEN BOTTOM SEAL IS IN IT'S AS BUILT ADJUSTED POSITION AND BEFORE IT IS COMPRESSED.

**NOTE: 11/16" BOLT HOLES TO BE FIELD CUT BY OWNER.**

BP-36201-97

**ALCO**

**ALCO PRODUCTS, INCORPORATED**

PLANT No. 3

DUNKIRK, NEW YORK

| DESCRIPTION     |  | REVISIONS |          | SCALE | MADE | CHK'D | CERT. | DATE    | DRAWING NO. |
|-----------------|--|-----------|----------|-------|------|-------|-------|---------|-------------|
|                 |  | NO.       | DATE     |       |      |       |       |         |             |
| 3'-8" WAS 3'-6" |  | 1         | 7/3/2018 |       |      |       |       |         |             |
| ITEM # 1        |  | 36201     |          | CM    | JM   | JWS   | AM    | 4/13/57 | BP-36201-97 |

**VERTICAL END SEALS**

## **DESCRIPTION/SPECIFICATIONS**

### **1. RUBBER SEAL ELEMENTS.**

**1.1. Materials.** The rubber seal elements shall be manufactured of a natural rubber/polyisoprene, which is compounded to provide satisfactory resistance to aging, water exposure, weathering, fatigue and abrasion. The material shall be uniform in quality and free from any contamination, cracks or defects that could be detrimental to the usefulness or performance of the seal. The rubber seal material shall be suitable for service in ambient temperatures of -40°F to +100°F and shall meet the specified material properties provided by the owner.

**1.2. Fabrication.** The rubber seal elements shall be fabricated to the dimensions (and hand, if applicable) as shown on revised (July 2018) Drawing No.'s 36201-97A, 36201-98A and 36201-100B. Holes and notches shall be by the owner. All pieces shall be handled, packaged and shipped in such a way as to prevent damage.

#### **1.3. Quality Assurance.**

**1.3.1. Manufacturer Qualifications.** The rubber seal manufacturer shall demonstrate that they have been manufacturing molded or extruded rubber seals for a minimum of five (5) years. The manufacturer must provide evidence of a minimum of three (3) installations each having been in service for a minimum of three (3) years.

**1.3.2. Warranty.** The fender manufacturer shall provide a written warranty against failure of the fender due to defective materials or workmanship. The warranty period shall be at least sixty (60) days from delivery.

#### **1.4. Submittals.**

The fender manufacturer shall submit the following items for approval prior to manufacture:

- Certified rubber material properties.
- Fender manufacturer qualifications, per paragraph 1.3.1.
- Shop drawings for approval.

**Natural Rubber/Polyisoprene Specifications (or equal):**

The compound shall have no reclaimed polymers and shall include reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents and plasticizers. The rubber seal profile shall be properly cured into a homogeneous form and kept free from oils, grease or other agents which could deteriorate the rubber.

| Property   | Testing Standard       | Requirement            |
|--|------------------------|------------------------|
| Tensile Strength                                   | ASTM D-412             | 3000 PSI (Min)         |
| Aging Tensile Strength<br>(48 Hrs of Aging)        | ASTM D-572             | 80% of Strength (Min)  |
| Elongation at Break                                | ASTM D-412             | 450%                   |
| 300% Modulus                                       | ASTM D-412             | 900 PSI (Min)          |
| Hardness - Shore A<br>Durometer                    | ASTM D-2240            | 60-70                  |
| Compression Set                                    | ASTM D-395 Method<br>B | 30% (Max)              |
| Water Absorption<br>(Natural Rubber and<br>Blends) | ASTM D-471             | 5% by Weight (Max)     |
| Low Temperature<br>Brittleness                     | ASTM D-2137            | Non-Brittle 36" @ -40F |
| Ozone Resistance                                   | ASTM D-1171            | No Cracks @ 50 PPHM    |