



## Standard Practice for Inclined Cargo Tank Ladders<sup>1</sup>

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### 1. Scope

1.1 This practice provides design, construction, and installation criteria for inclined ladders to be installed within cargo tanks.

1.2 Where ladders are attached to platforms, see Fig. 1 and Fig. 2.

1.3 Values stated in SI units are to be regarded as the standard. The values stated in parentheses are provided for information purposes only.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

A 36/A 36M Specification for Structural Steel<sup>2</sup>

#### 2.2 Other Documents:

American Bureau of Shipping Rules for Building and Classing Steel Vessels<sup>3</sup>

American Welding Society Publication, AWS D 1.1 Structural Welding Code—Steel<sup>4</sup>

SAE AMS-C-27725 Coatings, Corrosion Preventative, Polyurethane, for Aircraft Integral Fuel Tanks for Use to 250 Degrees F (121 Degrees C)<sup>5</sup>

Steel Structures Painting Council Specification<sup>6</sup>

### 3. Classification

3.1 Ladders shall be classified into two types:

3.1.1 *Type I*—Ladders installed within cargo tanks carrying cargo other than fuel oil, and

3.1.2 *Type II*—Ladders installed within cargo tanks carrying fuel oil.

### 4. Significance and Use

4.1 This practice establishes the procedure for the construction and installation of inclined ladders to be fabricated and installed, by the shipyards, within the cargo tanks.

### 5. Materials and Manufacture

#### 5.1 Materials—(Type I):

5.1.1 *Stringers*—230-mm (approximately 9-in.) by 50-mm (approximately 1<sup>7</sup>/<sub>8</sub>-in.) structural channels of carbon steel. (See Specification A 36/A 36M.)

5.1.2 *Upper and Lower Clips*—Flat bars of carbon steel. (See Specification A 36/A 36M.)

5.1.3 *Handrails and Stanchions*—25 mm (approximately 1 in.) diameter carbon steel. (See Specification A 36/A 36M.)

5.1.4 *Treads*—75-mm (approximately 3-in.) by 75-mm by 10-mm (approximately <sup>3</sup>/<sub>8</sub>-in.) structural angles of carbon steel. (See Specification A 36/A 36M.)

#### 5.2 Materials—(Type II):

5.2.1 *Stringers*—Structural flat bars of carbon steel. (See Specification A 36/A 36M.)

5.2.2 *Upper and Lower Clips*—Flat bars of carbon steel. (See Specification A 36/A 36M.)

5.2.3 *Treads*—25-mm (approximately 1-in.) by 25-mm square bars of carbon steel. (See Specification A 36/A 36M.)

#### 5.3 Manufacture:

5.3.1 All welding shall be in accordance with American Bureau Shipping Rules for Building and Classing Steel Vessels or AWS D 1.1.

### 6. Dimensions

6.1 Dimensions indicated are typical. However, these dimensions can be changed to suit other existing structures.

6.2 The tread lengths, or the clear widths, between the stringers for Type I ladders, for commercial and naval ships, shall be 455 mm (approximately 18 in.) and 610 mm (approximately 24 in.), respectively.

6.3 The tread lengths or clear widths between stringers for Type II ladders shall be 380 mm (approximately 15 in.).

6.4 The lengths of the ladder shall be fabricated to suit existing requirements.

6.5 Tolerance shall be  $\pm 6$  mm (approximately <sup>1</sup>/<sub>4</sub> in.).

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.03 on Outfitting.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 01.04.

<sup>3</sup> Available from American Bureau of Shipping, ABS Plaza, 16855 Northchase Dr., Houston, TX 77060.

<sup>4</sup> Available from American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126.

<sup>5</sup> Available from Standardization Documents Order Desk, Naval Sea Systems Command, SEA 03R42, 2531 Jefferson Davis Highway, Arlington, VA 22242-5160.

<sup>6</sup> Available from Steel Structures Painting Council, 40 24th St., 6th Floor, Pittsburgh, PA 15222-4656.

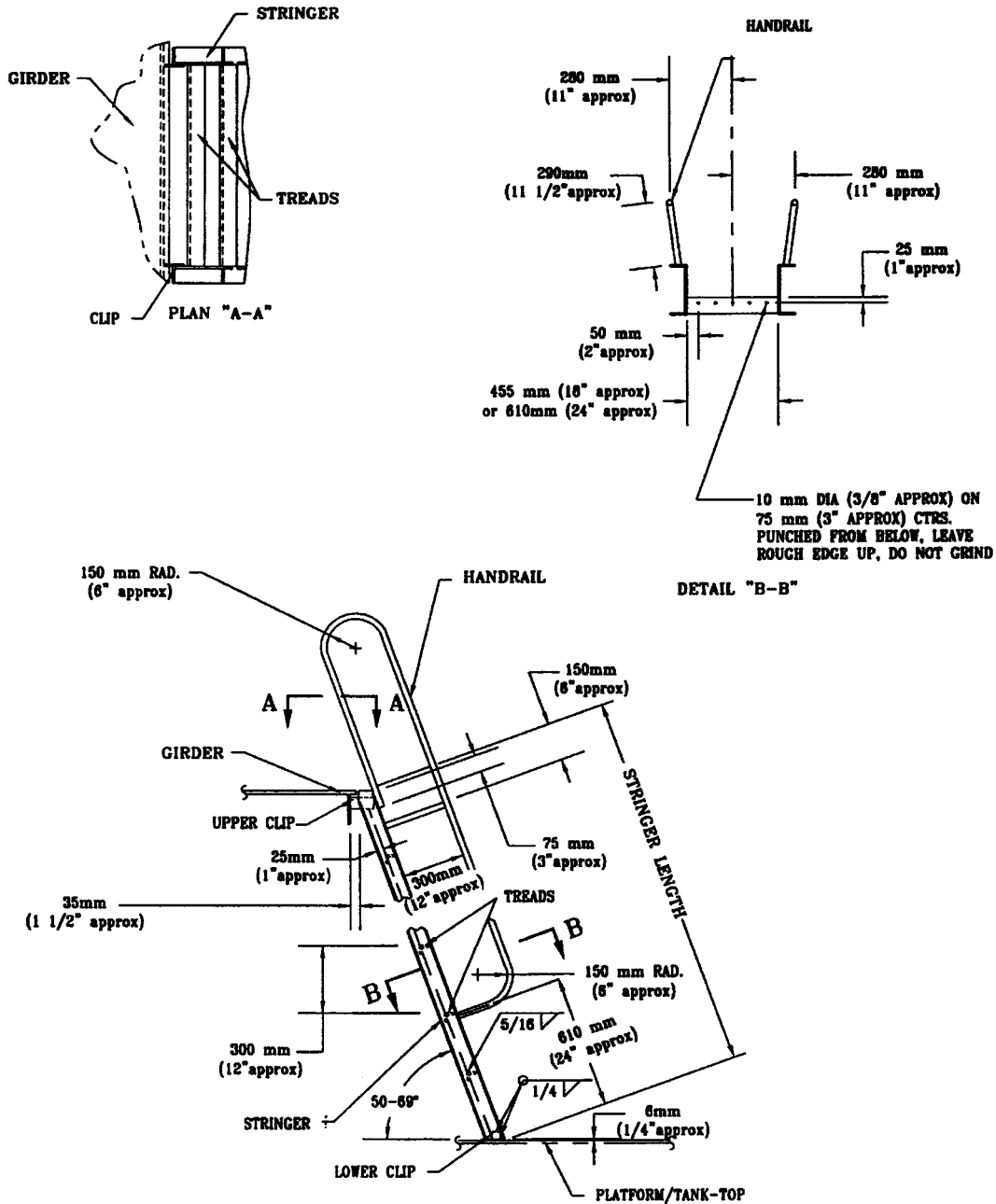


FIG. 1 Type I Ladder Elevation

6.6 Type I ladders shall have the following dimensions: installed angle: 50 to 69° from the horizontal; tread depth: 175 to 250 mm (approximately 7 to 10 in.) at 50°, tapering to 75 mm (approximately 3 in.) at 69°; riser height 175 to 300 mm (approximately 7 to 12 in.); handrail 25 to 31 mm (1 to 1 1/4 in.) in diameter.

6.7 Type I ladder tread surfaces shall have slip-resistant surfaces of a material compatible with materials to be carried in that tank.

6.8 Type II ladders shall be as follows: installed angle 70 to 90° from the horizontal; treads shall be equally spaced at a maximum of 305 mm (approximately 12 in.); the distance from the top tread to the upper walking surface is to be approxi-

mately equal to the normal tread spacing; and the distance from the bottom tread to the lower walking surface is not to exceed 375 mm (approximately 15 in.).

## 7. Workmanship, Finish, and Appearance

7.1 Ladders shall be free of all sharp edges, burrs, projections, weld splatter, and other defects which might be injurious to personnel or equipment or both.

7.2 For cargo tanks carrying cargo other than fuel oils, coat the ladders with one coat 3.0-mil dry film thickness inorganic zinc silicate following surface preparation in accordance with the Steel Structures Painting Council specifications or manufacturers paint instructions.

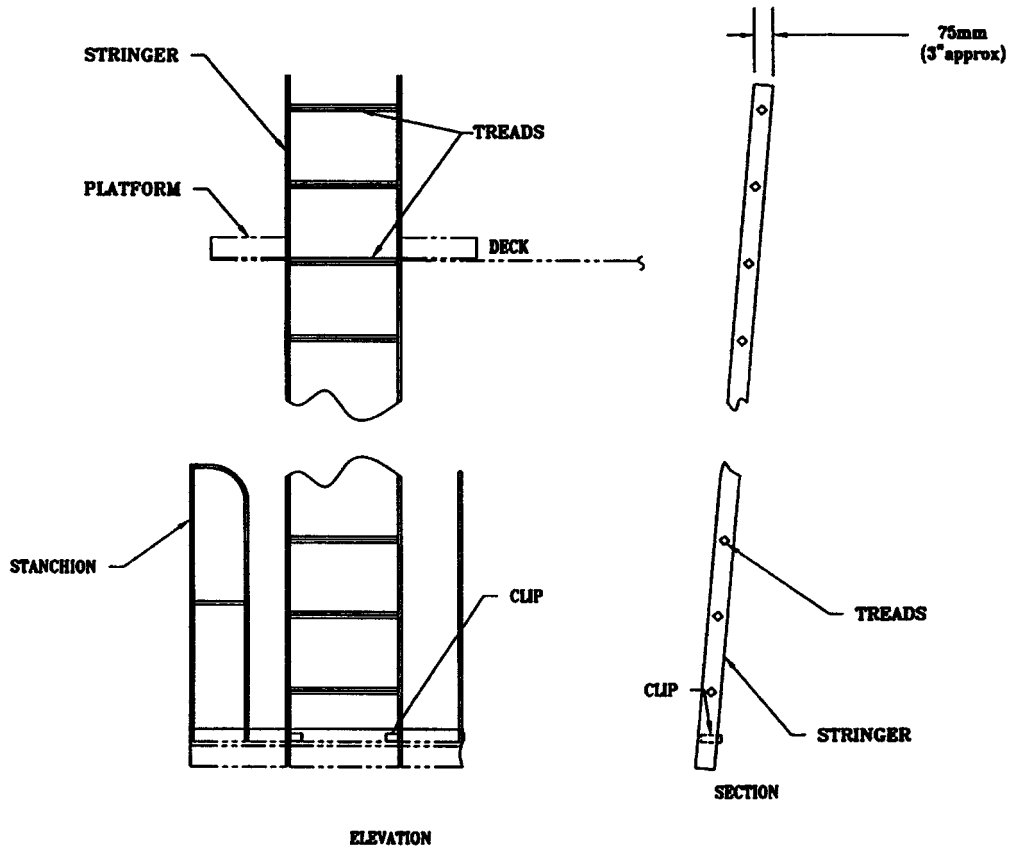


FIG. 2 Type II Ladder

7.3 For spaces carrying fuel oil cargo, one coat of 3.0-mil dry film thickness of corrosion preventive coating shall be applied to the ladders in accordance with SAE-AMS-C-27725.

7.4 Connections between ladders and mounting clips may be bolted in lieu of the welding shown.

8. Keywords

8.1 cargo tank access; cargo tank ladders; inclined ladders; ladders

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