PIP STF05520
Details for Pipe Railing for Walking and Working Surfaces
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In an effort to minimize the cost of process industry facilities, this Practice has been prepared from the technical requirements in the existing standards of major industrial users, contractors, or standards organizations. By harmonizing these technical requirements into a single set of Practices, administrative, application, and engineering costs to both the purchaser and the manufacturer should be reduced. While this Practice is expected to incorporate the majority of requirements of most users, individual applications may involve requirements that will be appended to and take precedence over this Practice. Determinations concerning fitness for purpose and particular matters or application of the Practice to particular project or engineering situations should not be made solely on information contained in these materials. The use of trade names from time to time should not be viewed as an expression of preference but rather recognized as normal usage in the trade. Other brands having the same specifications are equally correct and may be substituted for those named. All Practices or guidelines are intended to be consistent with applicable laws and regulations including OSHA requirements. To the extent these Practices or guidelines should conflict with OSHA or other applicable laws or regulations, such laws or regulations must be followed. Consult an appropriate professional before applying or acting on any material contained in or suggested by the Practice.

This Practice is subject to revision at any time.

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### PIP STF05520
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#### Table of Contents

1. **Scope** .................................. 2

2. **References** ............................. 2
   2.1 Process Industry Practices ............. 2
   2.2 Industry Codes and Standards .......... 2

3. **Definitions** ........................... 2

4. **Requirements** ........................ 3

#### List of Details

- Plan - Typical Post Location ............... 5
- Elevation - Typical Railing.................. 5
- Elevation A-A ................................ 6
- Section B-B .................................. 6
- Section C-C .................................. 6
- Elevation D-D ................................ 7
- Elevation E-E ................................ 7
- Wall-Mounted Handrail ....................... 8
- Handrail Attachment to Wall Details ...... 8
- Post Connection to Structural Steel ...... 9
- Railing Details .............................. 9
- Elevation - Removable Railing ............. 10
- Post Connections to Concrete .............. 11
1. **Scope**

This Practice provides requirements for designers, fabricators, and installers of pipe railing. This Practice provides fabrication and installation details for standard pipe railing for walking and working surfaces and for stair railing or handrail for egress. Although the details in this Practice are intended to meet U.S. Occupational Safety and Health Administration (OSHA) requirements for process facilities, they may not meet the requirements of local or national building codes.

*Comment:* As of the effective date of January 17, 2017, this Practice is no longer fully compliant with new OSHA Regulations 29 CFR 1910 Subpart D – Walking-Working Surfaces that were published on November 18, 2016. This Practice will need to be supplemented or modified by the user to be in full compliance with the new OSHA regulations until the complete revision of this Practice incorporating the changes is published by PIP.

2. **References**

When adopted in this Practice or in the contract documents, the latest editions of the following codes, standards, specifications, and references in effect on the date of contract award shall be used, except as otherwise noted. Short titles will be used herein when appropriate.

2.1 **Process Industry Practices (PIP)**

- PIP STS05120 - Fabrication of Structural and Miscellaneous Steel Specification
- PIP STS05130 - Erection of Structural and Miscellaneous Steel Specification

2.2 **Industry Codes and Standards**

- American Society for Testing and Materials (ASTM)
  - ASTM A36 - Standard Specification for Structural Steel
  - ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
  - ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

3. **Definitions**

The following definitions from OSHA 1910, Subpart D, shall apply to this Practice:

*handrail:* A single bar or pipe supported on brackets from a wall or partition to provide a continuous handhold for persons using a stair

*stair railing:* A vertical barrier erected along exposed sides of a stairway to prevent falls of persons
standard railing: A vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of persons

4. Requirements

4.1 Refer to project design documents for the location, orientation, and arrangement of railing for regular operational use, special fabrication details, and any changes to the requirements of this Practice.

4.2 Railing that meets the requirements of this Practice is designed to withstand a concentrated load of 200 pounds (890 N) applied in any direction at any point along the top rail, in accordance with OSHA requirements.

4.3 Railing shall be carbon steel, round structural tubing or pipe conforming to ASTM A500 Grade B or ASTM A53 Grade B, standard weight, 1.9 inches (48 mm) O.D. (1.5 inches [38 mm] nominal diameter).

4.4 All structural shapes and plates shall be steel, in accordance with ASTM A36 unless otherwise noted.

4.5 All bolts for railing connections shall be 5/8-inch (16-mm) diameter and shall be in accordance with ASTM A307 unless otherwise noted.

4.6 Railing shall be welded construction except as shown in design drawings and/or the attached details. All joints and welds in top rail shall be smooth finished. Railing systems shall be surfaced in a manner to prevent injury from punctures or lacerations and clothing snags.

4.7 Railing assemblies shall be coated after fabrication in accordance with the design drawings and specifications governing the project. Galvanizing shall be done after fabrication and in accordance with PIP STS05120. Field damage to coating shall be repaired with materials equivalent to original coating in accordance with PIP STS05130.

4.8 The minimum clearance between handrail or the top rail of stair railing/standard railing and any obstruction shall be 3 inches (75 mm).
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Dimensions are given in feet and/or inches. Metric dimensions in parentheses are in millimeters, unless noted otherwise.
STANDARD RAILING

FIELD SPlice (Typ)
SEE DETAIL PAGE 8

FLOOR LINE

1'-7 (475)

3'-6 (1050)

STAIR RAILING

TOE PL

ELEVATION A-A

PAGE 5

WORKING
POINT

STAIR RAILING CONTINUOUS

TOP RAIL CONFIGURATION VARIES WITH STRINGER AND POST LOCATIONS

POST AT STRINGER

POSITION POSTS AND INTERMEDIATE RAIL(S) SUCH THAT THE LEAST DIMENSION AT OPENING DOES NOT EXCEED 1'-7 (475)

TOE PL

SECTION B-B

PAGE 5

SECTION C-C

PAGE 5

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES. METRIC DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS, UNLESS NOTED OTHERWISE.

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WALL MOUNTED HANDRAIL

HANDRAIL ATTACHMENT TO WALL DETAILS

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POST CONNECTION TO STRUCTURAL STEEL

RAILING TERMINATION AT COLUMNS

NOTE: POSTS AT 2'-0 (600) MAY BE OMITTED IF RAILS AND TOE PLATE ARE ATTACHED TO COLUMN.

RAILING DETAILS

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PIPE RAILING FOR WALKING AND WORKING SURFACE DETAILS

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DETAIL 1

DETAIL 2

DETAILS

POST CONNECTIONS TO CONCRETE

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