PIP STF05530
Grating Fabrication Details
PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

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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1. Introduction

1.1 Purpose
This Practice provides structural steel fabricators with standard grating details for the fabrication of grating in process industry facilities.

1.2 Scope
This Practice describes the requirements for fabrication of grating for typical platforms and is intended to be issued to fabricators supplying grating. Details are provided that show the configurations for openings in the grating and typical details for grating arrangement and clearances.

2. References
Applicable parts of the following Practices, industry codes and standards, and references shall be considered an integral part of this Practice. The edition in effect on the date of contract shall be used, except as otherwise noted. Short titles are used herein where appropriate.

2.1 Process Industry Practices (PIP)
- PIP STF05520 - Pipe Railing for Walking and Working Surfaces Fabrication Details
- PIP STF05521 - Angle Railing for Walking and Working Surfaces Fabrication Details
- PIP STS05120 - Structural and Miscellaneous Steel Fabrication Specification

2.2 Industry Codes and Standards
- ASTM International (ASTM)
  - ASTM A36/A36M - Standard Specification for Carbon Structural Steel
  - ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability

3. Definitions

**contract documents:** Any and all documents, including codes, studies, design drawings, specifications, sketches, practices, and data sheets, that the purchaser or engineer of record has transmitted or otherwise communicated, either by incorporation or reference, and made part of the legal contract agreement or purchase order between the purchaser and the fabricator.

**engineer of record:** Purchaser’s authorized representative with overall authority and responsibility for the engineering design, quality, and performance of the civil works, structure, foundations, materials, and appurtenances of the project. The engineer of record shall be a professional engineer as defined by these practices.
fabricator: The party responsible for furnishing fabricated structural and miscellaneous steel

purchaser: The party who awards the contract to the fabricator. The purchaser may be the owner or the owner’s authorized agent.

4. Requirements

4.1 General

4.1.1 All equipment, materials, labor, and supervision shall be provided and all operations necessary for the fabrication of grating platforms shall be performed in accordance with the contract documents.

4.1.2 Fabricator shall comply with all safety requirements specified in the contract documents.

4.1.3 Fabricator shall be solely responsible for quality control of all materials and workmanship.

4.1.4 Grating shall be fabricated in accordance with Federal Standards and Instructions of the Occupational Safety and Health Administration (OSHA), including any additional requirements by state or local agencies that have jurisdiction where the grating platform is to be erected.

4.2 Materials

4.2.1 Unless otherwise specified, the materials for grating shall be in accordance with PIP STS05120.

4.2.2 Unless otherwise specified, steel grating shall be rectangular welded type, with plain 3/16-inch x 1-1/4-inch bearing bars on 1-3/16-inch spacing center-to-center with cross bars on 4-inch spacing center-to-center. The metric equivalent for grating shall be as specified in the contract documents as applicable.

4.2.3 Banding and toe plate banding shall be steel in accordance with ASTM A36/A36M or ASTM A1011/A1011M. The metric equivalents for bars and plates used for banding and toe plate banding shall be as specified in contract documents as applicable.

4.2.4 Fastener assemblies shall be as specified in the contract documents. The fabricator shall provide a minimum of two fastener assemblies per support beam per panel, with a minimum of four fastener assemblies per panel. In addition, the fabricator shall provide a minimum of 5% extra quantity of fastener assemblies.

4.3 Fabrication

4.3.1 All grating shall be fabricated in accordance with PIP STS05120 and Details 1 through 10 of this Practice.

4.3.2 The location and limits of grating and the direction of the span of grating bearing bars shall be in accordance with the contract documents.
4.3.3 At joints in the grating floor system, cross sections of bearing bars for grating panels shall be aligned with cross sections of abutting panels to maintain spacing symmetry. Grating joints shall be permitted only at supports.

4.3.4 Clearance allowances shall be provided for fitting grating panels together, for penetrations, for toe plates, etc., and shall be in accordance with Details in this practice and the contract documents.

4.3.5 Grating shall have 1-inch (25-mm) minimum bearing on supporting steel.

4.3.6 If grating areas are shown as removable in the contract documents, the weight of each removable fabricated grating section shall not exceed 350 pounds (160 kgf).

4.3.7 Edges of removable grating panels shall be banded.

4.3.8 Unless otherwise specified in the contract documents, edges of grating panels other than removable panels need not be banded. Where butting grating panel ends occur, stops shall be provided at each side of the panel ends as shown in Detail 7.

4.3.9 Openings and cutouts in grating panels for piping, conduit, structural members, and equipment shall be banded as indicated on the following details and the contract documents.
Drawings

Detail 1 - Grating Opening at Interior Column
Detail 2 - Grating Opening at Base Plate
Detail 3 - Grating Opening at Corner Column
Detail 4 - Circular Openings
Detail 5 - Toe Plate Banding at Opening for Pipe Support
Detail 6 - Toe Plate Banding at Openings for Equipment
Detail 7 - Typical Grating Panel Layout
Detail 8 - Typical Grating Panel Fastener Arrangement
Detail 9 - Typical Clearances at Perimeter of Floors
Detail 10 - Typical Clearances at Railing
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NOTES:
1. ADJUST DIMENSION IN PLAN TO BE BETWEEN "MIN" AND "MAX" DIMENSIONS TO ALLOW FOR TOE PLATE TO BE WELDED ON BEARING BAR AS SHOWN IN SECTION "B–B".
2. CHECK TO AVOID INTERFERENCE WITH GUSSET PLATE FOR VERTICAL BRACING.
3. WHERE COLUMNS ARE FIREPROOFED, CLEARANCES ARE TO THE FIREPROOFING.

DETAIL 1: GRATING OPENING AT INTERIOR COLUMN

NOTES:
1. ADJUST DIMENSION BETWEEN EDGE OF BEARING BAR AND BASE PLATE TO BE BETWEEN "MIN" AND "MAX" DIMENSIONS BASED ON LOCATION OF BEARING BAR.
2. CHECK TO AVOID INTERFERENCE WITH GUSSET PLATE FOR VERTICAL BRACING.
3. WHERE COLUMNS ARE FIREPROOFED, CLEARANCES ARE TO THE FIREPROOFING.

DETAIL 2: GRATING OPENING AT BASE PLATE

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

DETAIL 3: GRATING OPENING AT CORNER COLUMN

NOTES:
1. ADJUST DIMENSION IN PLAN TO BE BETWEEN "MIN" AND "MAX" DIMENSIONS TO ALLOW FOR TOE PLATE TO BE WELDED ON BEARING BAR AS SHOWN IN SECTION "B-B", PAGE 5.
2. CHECK TO AVOID INTERFERENCE WITH GUSSET PLATE FOR VERTICAL BRACING.
3. WHERE COLUMNS ARE FIREPROOFED, CLEARANCES ARE TO THE FIREPROOFING.

PLAN

DETAIL 4: CIRCULAR OPENINGS

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES. METRIC DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS, UNLESS NOTED OTHERWISE.
DETAIL 5: TOE PLATE BANDING AT OPENINGS FOR PIPE SUPPORT

DETAIL 6: TOE PLATE BANDING AT OPENINGS FOR EQUIPMENT

NOTES FOR DETAILS 5 & 6:
1. FOR OPENING LOCATION AND DIMENSIONS "A", "B", AND "D", REFER TO DESIGN DRAWINGS.
2. "A" AND "B" DIMENSIONS PERPENDICULAR TO BEARING BARS FOR OPENINGS AND CUTOUTS ARE NOMINAL. THE ACTUAL OPENINGS SHALL BE FABRICATED BASED ON THE TOE PLATE ATTACHED TO THE EDGE OF THE NEAREST BEARING BAR GREATER THAN THE NOMINAL DIMENSION SHOWN. (REFER TO SECTION "B-B", PAGE 5)

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES. METRIC DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS, UNLESS NOTED OTHERWISE.
WHEN BUTTING PANEL ENDS OCCUR, TACK WELD STOPS AT EACH SIDE OF ONE OF THE PANEL ENDS TO PREVENT PANELS FROM TELESCOPING. USE MATERIAL TO MATCH BEARING BARS.

SECTION D–D

DETAIL 7: TYPICAL GRATING PANEL LAYOUT

THE METHOD FOR FASTENING GRATING SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

FASTEN AT INTERMEDIATE SUPPORT

NOTE:
- TWO FASTENER ASSEMBLIES REQUIRED AT EACH SUPPORT
- ONE FASTENER ASSEMBLY IS REQUIRED AT EACH CORNER OF PANEL (MINIMUM)

DETAIL 8: TYPICAL GRATING PANEL FASTENER ARRANGEMENT

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES. METRIC DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS, UNLESS NOTED OTHERWISE.
DETAIL 9: TYPICAL CLEARANCES AT PERIMETER OF FLOORS

SECTION
(AT WALL)

SECTION
(AT SIDING)

DETAIL 10: TYPICAL CLEARANCES AT RAILING

SECTION
(BEARING BARS PERPENDICULAR TO RAILING)

SECTION
(BEARING BARS PARALLEL TO RAILING)

SECTION
(WHERE RAIL POST ADJUSTMENT IS REQUIRED)

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