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## 1. INTRODUCTION

### 1.1 Scope

This document provides the specification for fabrication of all structural steelwork for Ma'aden Projects.

This document is intended to be used in conjunction with the applicable documents listed herein.

### 1.2 Purpose

The purpose of this specification is to:

- Set the minimum engineering standard for all materials, detailing, fabrication, and delivery of structural steelwork.

## 2. KEY TERMS AND DEFINITIONS

AISC	American Institute of Steel Construction
API	American Petroleum Institute
ASD	Allowable Strength Design
ASME	American Society of Mechanical Engineers
ASSE	American Society of Safety Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
DTI	Direct Tension Indicator
LRFD	Load and Resistance Factor Design
NDT	Non Destructive Testing
NAAMM	National Association of Architectural Metals Manufacturers
SBC	Saudi Building Code
SDI	Steel Deck Institute
SJI	Steel Joist Institute
Employer	Saudi Arabian Mining Company (Ma'aden) and its authorized representatives and respective affiliates.

## 3. REFERENCED DOCUMENTS

Applicable parts of the following regulations, industry codes and standards, and references shall be considered an integral part of this document. The edition in effect at date of contract award shall be used, unless otherwise noted.

### 3.1 Statutory Regulations

All work performed and materials furnished shall comply with the applicable statutory regulations, codes and other requirements of the Kingdom of Saudi Arabia (including but not

limited to directives of the High Commission for Industrial Safety and Security, Royal Commission regulations applicable to the Site, regulations of the Presidency of Meteorology and Environment, Saudi Building Code and other applicable codes and regulations). The Contractor shall ensure that he is fully aware and informed of all Government laws, local ordinances, regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority over the Project and/or Site, which in any manner affect the Project and those engaged or employed on the Project, or which in any way affect the conduct of the Work. The Contractor shall at all times observe and comply with all such Government and/or Ministry laws, bylaws, ordinances, codes, regulations, orders and decrees.

### **3.2 Industry Codes and Standards**

The work shall conform to the following applicable codes and standards.

#### **3.2.1 Local Codes and Standards**

Saudi Building Code SBC 306 – Steel Structural Requirements.

#### **3.2.2 International Codes and Standards**

##### **3.2.2.1 American Institute of Steel Construction (AISC)**

- AISC Allowable Stress Design (ASD) of Simple Shear Connections
- AISC Code of Standard Specification for Steel Building and Bridges
- AISC Detailing for Steel Construction
- AISC Engineering for Steel Construction: A Source Book on Connections
- AISC Load and Resistance Factor Design of Simple Shear Connections
- AISC Load and Resistance Factor Design Specification for Structural Steel Buildings
- AISC Manual of Steel Construction, Allowable Stress Design
- AISC Manual of Steel Constructions, Load and Resistance Factor Design (LRFD)
- AISC Manual of Steel Constructions: Volume II Connections (ASD/LRFD)
- AISC Specification for Structural Joints using ASTM A325 or A490 Bolts
- AISC Specification for Structural Steel Building: Allowable Stress Design and Plastic Design
- AISC 326 – Detailing for Steel Construction.

##### **3.2.2.2 American Society for Testing and Materials (ASTM)**

- ASTM A1 – Carbon Steel Tee Rails
- ASTM A6/A6M – Rolled Structural Steel Bars, Plates Shapes and Sheet Piling
- ASTM A36/A36M – Carbon Structural Steel
- ASTM A53 – Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
- ASTM A106 – Seamless Carbon Steel Pipe for High Temperature Service
- ASTM A108 – Steel Bars, Carbon, Cold-Finished, Standard Quality
- ASTM A123 – Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

- ASTM A143 – Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
- ASTM A153/A153M – Zinc Coating(Hot-Dip) on Iron Steel Hardware
- ASTM A307 – Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
- ASTM A325 – Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
- ASTM A325M – High Strength Bolts for Structural Steel Joints (Metric)
- ASTM A384 – Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
- ASTM A385 – Providing High- Quality Zinc Coating (Hot-Dip)
- ASTM A490 – Heat-Treated Steel Bolts, 150ksi Minimum Tensile Strength
- ASTM A490M – High Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints (Metric)
- ASTM A500 – Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- ASTM A501 – Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
- ASTM A563 – Carbon and Alloy Steel Nuts
- ASTM A563M – Carbon and Alloy Steel Nuts (Metric)
- ASTM A569/A569M – Steel, Carbon (0.15 Maximum Percent), Hot-Rolled Sheet and Strip, Commercial Quality
- ASTM A572/A572M – High-Strength Low Alloy Columbium-Vanadium Structural Steel
- ASTM A759 – Carbon Steel Crane Rails
- ASTM A780 – Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
- ASTM A786/A786M – Rolled Steel Floor Plates
- ASTM A992/A992M – Steel for Structural Shapes for Use in Building Framing
- ASTM B695 – Coating of Zinc Mechanically Deposited on Iron and Steel
- ASTM E376 – Measuring Coating Thickness by Magnetic-Field or Eddy Current (Electromagnetic) Test Methods
- ASTM F436/F436M – Hardened Steel Washers
- ASTM F606/F606M – Standard Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers and Rivets.
- ASTM F959/F959M – Compressible-Washer Type Direct Tension Indicators for Use with Structural Fasteners.

3.2.2.3 *American Welding Society(AWS)*

- AWS D1.1 – Structural Welding Code – Steel

- AWS D1.3 – Structural Welding Code – Sheet Steel
- AWS QC1 – Standard for AWS Certification of Welding Inspectors.
- 3.2.2.4 *American Petroleum Institute(API)*
  - API 650 – Welded Steel Tank for Oil Storage.
- 3.2.2.5 *American Society of Safety Engineers (ASSE)*
  - ASSE A1264.1 – Safety Requirements for Workplace Walking/Working Surfaces and Their Access; Workplace, Floor, Wall and Roof Openings; Stairs and Guardrails Systems
  - Introduction of Fall Protection.
- 3.2.2.6 *American Society of Mechanical Engineers (ASME)*
  - ASME A120.1 – Safety Requirements for Powered Platforms and Traveling Ladders and Gentries for Building Maintenance
  - ASME B30.11 – Monorails and Underhung Cranes - Includes Interpretations Dated May 2004 thru August 2009.
- 3.2.3 *Alternative Design Codes***
- 3.2.3.1 *National Association of Architectural Metals Manufacturers (NAAMM)*
  - NAAMM MBG 531 – Metal Bar Grating Manual.
- 3.2.3.2 *Steel Deck Institute*
  - SDI Design Manual for Composite Decks, Form Decks and Roof Decks No.30.
- 3.2.3.3 *Steel Joist Institute*
  - SJI Standard Specification and Load Tables.
- 3.3 *Ma'aden Standard Specifications***
  - MD-101-SMEM-EG-ST-SPC-0002      Steelwork Erection
  - MD-101-SMEM-EG-ST-SPC-0009      Protective Coating for Steelwork
  - MD-101-SMPM-PM-QA-PEI-0001      Ma'aden Contractor Quality Requirements Project Execution Instruction

## **4. MATERIALS**

### **4.1 Structural Steel**

All material shall be new, free from rust, pitting, flaws, cracks, and any other defects and shall have a smooth uniform finish. All steel plates, flats and rolled sections in the work shall be in accordance with ASTM A6/A6M or ASTM A500 or ASTM A501 as appropriate.

Pipe shall conform to ASTM A53 Type E and S, Grade B or ASTM A106 Grade B, unless otherwise specified.

The steel supplier shall be subjected to an approval and conformity process by the Employer. Supplier shall submit a pre-qualification document, in which Employer shall evaluate, make inspection on the plant and facilities, evaluate the conformance assurances and certificates, prior to approval.

Mill certificates and heat numbers, shall be supplied for all steel used in the works, cross-referenced to the item numbers to be cut from the materials, prior to the commencement of

以上内容仅为本文档的试下载部分，为可阅读页数的一半内容。如要下载或阅读全文，请访问：<https://d.book118.com/147131161064006143>