

**REQUIREMENTS FOR THE OPERATION OF ORGANIZATIONS  
INVOLVED IN THE DESIGN, MANUFACTURE, FABRICATION  
AND ERECTION OF STEEL STRUCTURES AND THEIR  
COMPONENTS**

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### Revision History

Issue Date	Revision	Revision Description
02/05/2019	01	Issue for use
10/11/2020	02	Removing the Attestation of Conformity under clause 6.2 as an accepted option for certification Align it in accordance with latest DMS format

## Dubai Municipality Standard

## المواصفات القياسية لبلدية دبي

DMS 35: 2020

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## Foreword

With a view to have a comprehensive set of Dubai Municipality Standards which would be consistent and fulfill local needs and yet be at par with international requirements, Dubai Central Laboratory is developing standards taking guidance as much as possible from international and regional norms.

This Dubai Municipality Standard (DMS) describes the Technical Requirements for the Operation of manufacturers, fabricators and erectors of steel structures and their components. This standard may be used as a basis for certification of these organizations as suppliers of conformity assured products/services.

This standard is prepared by the Dubai Municipality - Dubai Central Laboratory Department and is issued after consultation, feedback, and validation involving various stakeholders, including the industry, government regulators and other interested parties (persons/organizations).

This standard combines essential features and specification requirements of international best practices. Extensive references have been made to the scheme as practiced in the EU (European Union) as well as in the USA (United States of America).

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DMS 35: 2020

### 1 General provisions

#### 1.1 Purpose

The purpose of this Standard is to specify the requirements for the operation of organizations involved in the design, manufacture, fabrication and erection of steel structures and/or its components. Organizations that adhere to the requirements in this Standard have the personnel, organization, experience, documented procedures, knowledge, equipment and commitment to: (a) produce structural components of steel structures, and/or (b) erect fabricated steel to the quality required for structural steel buildings and other structures.

This Standard can be used by Conformity Assessment Bodies as a criteria document for certification of organizations involved in the design, manufacture, fabrication and erection of steel structure and/or its components.

#### 1.2 Scope

The requirements of this DMS standard includes quality management system and technical requirements specific to the operation of organizations in this industry. Health, environmental and safety issues are not covered.

This standard is applicable to organizations that design, manufacture and/or fabricate structural steel and its components for use in structural steel buildings and other structures. The structural steel can be in accordance with internationally recognized specifications such as EN 1090 (European) or AISC (American) or any other recognized international standard specifications.

#### 1.3 Internationally Recognized Standards and Best Practices

The internationally accepted standards, references, and best practices for steel fabrication recognized by this DMS includes (but not limited to) the following:

- European CE Marking Scheme as per EN 1090 and related standards (in accordance with EU Construction Products Regulations);
- American Certification Standard for Steel Fabrication as per AISC 207-2016 and related publications, issued by the American Institute of Steel Construction.

- c. Metal Building Systems Manual (MBSM) and related standards issued by the Metal Building Manufacturers Association, U.S.A.
- d. Welding Quality Assurance – as per recognized standards (AWS, ISO 15614, ISO 3834, etc.)
- e. Other equivalent standards

## 2 Definitions

- 2.1 Manufacturing (EN 1090-1) – as used in this standard, those work operations required to produce the component, which may encompass fabrication, welding, mechanical fastenings, assembly, testing and documentation of the performance characteristics declared.
- 2.2 Fabrication (AISC 207-16) - The process of preparation and assembly of individual parts into a shipping piece in accordance with all contract documents. Fabrication includes all production operations performed in the manufacturing and shipping of the product (e.g., assembly, drilling, sawing, milling, and thermal and mechanical cutting).
- 2.3 Erection (AISC 207-16) - The process of assembling individual members into a structural steel building or bridge in accordance with all contract documents.
- 2.4 Structural components (EN 1090-1) - components to be used as load-bearing parts of works designed to provide mechanical resistance and stability to the works and/or fire resistance, including aspects of durability and serviceability which can be used directly as delivered or can be incorporated into a construction work.
- 2.5 Constituent products (EN 1090-1) - materials or products used in manufacturing with properties which enter into structural calculations or otherwise relate to the mechanical resistance and stability of works and parts thereof, and/or their fire resistance, including aspects of durability and serviceability
- 2.6 Weldability ( EN 1090-1) - quality of a steel material for which a qualified welding procedure can be developed
- 2.7 Component specification ( EN 1090-1) - document or documents giving all necessary information and technical requirements for manufacturing the structural component

- 2.8 RFI - A documented request for information or clarification generated during the construction phase of the project. ( AISC 207)
- 3 Quality management system requirements
- The organization shall operate a quality management system that is aligned with the requirements of ISO 9001.
- 4 Technical Requirements
- In addition to the general provisions of ISO 9001, the organization shall comply with these technical requirements that are specific to the organizations engaged in the fabrication, manufacturing and erection of steel structures and its components. These requirements are essential to the effective implementation of a factory production control system by the organization in order to assure the manufacturing and fabrication of products according to agreed standard specifications and customer requirements.
- 4.1 Control of Project Specifications and Documentation
- A documented procedure shall be developed to control project documents. Documents covered shall include, but not be limited to, contract documents, revisions of contract documents, shop drawings, erection drawings, and any quality assurance documents received. The document control procedure shall provide for the following:
- 4.1.1 Traceability of documents
- Contract documents and changes to the contract documents, including, but not limited to, revised contract documents, change orders, and RFIs, shall be traceable. The documented information shall indicate, at a minimum, date of receipt, summary of issue, and ultimate disposition of the change, including distribution of the final decision to the appropriate parties. The documented procedure shall define methods for receipt and documentation of owner and general contractor requirements and fabricator-originated changes as they occur throughout the fabrication and detailing process.
- 4.1.2 Revision Control
- For project documents that the fabricator, erector or manufacturer produces, revisions shall be clearly identifiable and there shall be a method for monitoring and identifying the latest revision. The documented procedure shall include provisions

to prevent inadvertent use of obsolete documents. Documents shall remain legible and easily identifiable.

4.1.3 Access

Documents shall be available and readily accessible to all personnel responsible for performing functions affecting the quality of the completed work.

4.1.4 Communication

Changes and revisions shall be clearly communicated to all personnel responsible for performing functions affecting the quality of the completed work.

4.2 Constituent products and materials

4.2.1 A constituent product is a material or product used to manufacture a component which remains part of the finished product, e.g. raw materials and welding consumables. These products must meet the relevant standards specifications (EN, ISO, ASTM, etc.) or other standards as specified in the project documentation or specified in relevant standard specification document, for the strength properties, weldability, fracture toughness of the steels and tolerances on dimensions and shapes.

4.2.2 The documents supplied with the constituent products (batch numbers, inspection certificates, test reports and declarations of compliance, etc.) must be checked to verify that the information on the products supplied matches the specifications for the products ordered. If these documents are not available, measures must be taken to prove that the product meets the requirements of the inspection and test plan.

4.2.3 Constituent products of steel and galvanized steel shall fall within Class A1 of the European classification with respect to reaction to fire, and no further documentation is required. Classification shall be performed in accordance with EN 13501-1 and/or as DCD regulations.

4.2.4 The organization shall have a system to verify compliance of incoming constituent product to the specifications that are relevant to the quality of the final product. The verification system may include testing, inspection, and other forms of verification.



4.3 Preparation and assembly

4.3.1 General - This clause specifies the requirements for cutting, shaping, holing and assembly of constituent products for inclusion into components, and for assembly of components.

*NOTE: Welding and mechanical fastening are covered in separate clauses.*

4.3.2 Identification and traceability – At all stages of manufacturing, each piece (or package of similar pieces) of steel component shall be identifiable by a suitable system. Identification may be achieved by any means such that does not produce any damage on the item.

4.3.3 Handling and storage

Constituent products shall be handled and stored in accordance with manufacturer's recommendations. Constituent products that have been handled or stored in a way or for a length of time that could have led to deterioration shall be checked prior to use to ensure that they still comply the relevant requirements.

4.3.4 Cutting – Cutting shall be carried out in such a way that geometrical tolerances, maximum hardness and smoothness of free edges are maintained in accordance with appropriate requirements. Cutting may be carried out through known and recognized cutting methods such as: (a) sawing, (b) shearing,, (c) disc cutting, (d) water jets techniques, and (e) thermal cutting.  
Thermal cutting equipment and process shall be regularly checked to ensure that they continue to meet the specification requirements for the cut constituent product.

4.3.5 Shaping – Shaping includes bending, pressing or forging to the required shape through either a hot or cold forming process. The organization shall maintain procedures and standard specification requirements for shaping. Products that do not meet the requirements after the shaping process shall be treated as non-conforming products.

4.3.6 Holing – This clause applies to the making of holes for connections with mechanical fasteners and pins. The organization shall define the dimensions, clearances, and tolerances. Holes for fasteners and pins may be formed by any process (e.g. drilling, puching, laser, plasma or other thermal cutting) such that: (a) Cutting requirements relating to local hardness and quality of cut surface are fulfilled; (b) all matching

holes for fasteners or pins register with each other so that fasteners can be inserted freely;

- 4.3.7 Assembly – Assembly of components shall be carried out so as to fulfil the specified tolerances. Precaution shall be taken so as to prevent corrosion produced by contact between different metallic parts. The fit between manufactured components that are interconnected at multiple connection interfaces shall be checked using appropriate means.

#### 4.4 Welding

If welding is undertaken as a manufacturing process in production of the component then certain criteria shall be met:

##### 4.4.1 Welding procedures

Welding needs to be carried out with qualified procedures using a welding procedure specification (WPS). The following steps are needed to develop a WPS:

- Develop a preliminary welding procedure specification
- Complete a welding procedure test
- Complete a welding procedure qualification record (WPQR)
- Prepare welding procedure specifications (WPS) for production based on the WPQR

The preliminary WPS can be based on previous experience or using some of the published resources that are available.

##### 4.4.2 Qualification of welding procedures

Welding procedure test pieces need to be produced under supervision of a notified body, and then tested in accordance with the relevant standard of qualification.

##### 4.4.3 Welders and welding operators

Welders and welding operators shall be qualified to an appropriate welding qualification standard. (Example: ASME, AWS, ISO, or EN, or other equivalent standards). Details of welder and welding operator qualifications shall be documented and maintained.

4.4.4 Welding coordinator

Based at the manufacturing site, this person is responsible for overseeing welding operations. The welding coordinator needs to be suitably qualified or experienced in the welding operations they supervise, as specified in EN ISO 14731 or other equivalent standards.

For certification purposes, the welding coordinator will be assessed by the Conformity Assessment Body. Experience and knowledge of the relevant standards is more important than formal qualifications.

4.5 Mechanical fastening and bolt installation procedures

The organization shall develop and implement a documented procedure for bolting and other types of mechanical fastening. The procedure shall meet the requirements of the relevant standards as well as the requirements of approved construction documents and referenced standards. The documented bolting procedure shall include storage, pre-installation verification, installation, and inspection of fastener assemblies for snug-tightened, pre-tensioned and slip-critical joint types.

4.6 Erection

4.6.1 General

This clause gives requirements for erection and other works undertaken on site including grouting of bases and those relevant to the suitability of the site for safe erection and for accurately prepared support.

4.6.2 Site conditions

Erection shall not commence until the site complies with the technical requirements with respect to the safety of the work.

4.6.3 Erection plan and erection methods

The organization shall prepare an erection plan for every project. The erection plan may be described in drawings or in text in whole or in part. The erection plan shall include the following:

- a) Project name and location.
- b) Indication of access for material delivery and equipment delivery, including lay-down, shake-out, and field-assembly areas.

- c) Sequence of erection.
- d) Dimensions and locations of cranes or other lifting equipment.
- e) Required site conditions for the crane location and confirmation of adequate base support for the crane.
- f) Sizes, model names or numbers, and capacity charts for lifting equipment.
- g) Information regarding the heaviest lift and its radius; the longest radius and its lift weight; and the boom configuration for each at every location of the lifting equipment.
- h) Indicate critical lifts, if any, and include the critical lift protocol or procedure.
- i) Requirements for multi-lift rigging.
- j) Types of slings to be used and, if more than one type, the locations in which they will be used.
- k) Rigging information for atypical lifts (weight, geometry, center of gravity, etc.) such as slings and hardware, rated lifting beams, beam clamps (including catalog cuts), as applicable to the lift.
- l) Designation of crane paths from position to position, indicating load travel paths, swing restrictions, and personnel exclusion zones.
- m) Designation of space required for field assembly prior to erection.
- n) Identification of special fastening sequences and/or methods.
- o) Identification of special or atypical connections.
- p) Traffic control notes.
- q) Falsework requirements and corresponding design calculations.
- r) Jacking layout and jacking procedure.

- s) Notation of special problems due to overhead restrictions, underground utilities, barriers to crane tail swing, etc.

The erection plan shall be reviewed before the start of erection by the erector's project management team and be available to all employees assigned to the project. All revisions shall be approved by the site superintendent and communicated to affected personnel at the time of the revision.

#### 4.7 Coating and other surface treatment

##### 4.7.1 Material preparation

The organization shall have a documented procedure for surface preparation. The documented procedure for surface preparation shall support achievement of cleanliness and surface profile required by coating manufacturer recommendations, product data sheets, and contract documents.

##### 4.7.2 Application of coating

The organization shall have a documented procedure for the application of coatings and other surface treatment. The documented procedure shall support application and curing of coatings in accordance with manufacturer recommendations and product data sheets and with contract documents.

##### 4.7.3 Low emitting materials

Wherever applicable, coatings and other low emitting materials used shall comply with the Al Sa'fat – Dubai Green Building Evaluation System.

##### 4.7.4 Fire safety

Coated components shall be able to demonstrate that the component has a fire classification that complies with the requirements of UAE Fire and Life Safety Code of Practice, according to its use and function.

#### 4.8 Geometrical tolerances

The organization shall define the allowable geometrical deviations relevant to both essential and functional criteria. The defined tolerances shall be in accordance with established international standards. The tolerance includes manufacturing and erection tolerances.

- 4.8.1 Essential tolerances – Those applicable to a range of criteria that are essential for the mechanical resistance and stability of the completed structure.
- 4.8.2 Functional tolerances – Those required to fulfil other criteria such as fit-up and appearance.
- 4.9 Inspection, testing and correction
- 4.9.1 Inspection and testing procedures - The organization shall develop and implement a documented procedure for inspection and testing to ensure that the completed work meets the requirements of the contract documents.
- 4.9.2 Inspection and testing plan - All inspection and testing shall be undertaken in accordance with a pre-determined inspection and testing plan. The plan shall include inspection and testing of (a) constituent products and (b) components
- 4.9.3 Inspection and testing personnel - Qualification requirements for Inspectors shall be defined and documented. Inspectors should be assigned on the basis of qualification, evidenced by experience, training and education. Qualification standards and certifications granted by recognized industry organizations can be used as a basis for qualification.
- 4.9.4 Non-conforming products
- Product or work determined during inspection and testing to be nonconforming should be addressed by the organization's nonconformance procedure (Refer to [5.8]).
- 5 Factory production control
- The organization shall implement a factory production control (FPC) system to ensure that products placed on the market conform to the declared performance characteristics. The FPC system shall consist of procedures, inspections and tests to control all aspects of manufacture, from checking the incoming goods up to delivery and acceptance by client of the finished product. The FPC system shall cover the following:

5.1 Personnel – The organization shall be able to demonstrate that the personnel assigned to carry out tasks that will affect the quality and conformity of the finished product shall have appropriate competencies, responsibilities and authority.

- a) Tasks and responsibilities shall be documented;
- b) Competencies and trainings records are maintained;
- c) Training needs are identified and training plans are prepared and implemented.

Personnel requiring special qualifications shall satisfy the relevant requirements (refer also to clause [4.4.3], [4.4.4] and [4.9.3]).

5.2 Equipment – The organization shall be able to demonstrate that equipment influencing the conformity of the components are, where appropriate, calibrated, inspected, and maintained. Maintenance and calibration procedures are documented and calibration, inspection and maintenance records are maintained.

5.3 Structural design process - In the case of structural design carried out by the manufacturer, the FPC system shall ensure compliance with the design brief, identify the procedures for checking the calculations and those individuals responsible for the design.

The records shall be sufficiently detailed and accurate to demonstrate that the manufacturer's design responsibilities have been carried out satisfactorily. A record of the documents shall be retained for a period defined in the manufacturers FPC procedure.

5.4 Constituent products and materials – The organization shall have a system for verifying and ensuring that constituent products conform to the specifications and records are maintained and traceable.

The specification for the constituent products used in manufacture shall be retained according to the manufacturer`s FPC procedures.

- a) Purchasing procedures established, documented and implemented;
- b) Incoming goods inspection procedures are established, documented and implemented;
- c) Products identification system and traceability are maintained;
- d) All records are maintained.

5.5 Component specifications – The manufacture of components shall be controlled using a component specification giving all the necessary information of the

component in sufficient detail to enable it to be manufactured and for its conformity to be evaluated.

5.5.1 In a purchaser provided component specification the purchaser provides the necessary technical information to manufacture the component. The information needs to include specification of all constituent products to be used for all parts of the component. The specification needs also to include all geometrical information needed and the relevant requirements for execution of the work. Any particular requirements for execution need to be given.

5.5.2 In a manufacturer provided component specification the manufacturer develops the necessary technical information to manufacture the component and all its parts. In this case there are two options for the content of a declaration of conformity:

Option 1 - The manufacturer declares the geometry and the material properties of the component, and any other information needed to enable others to perform a structural design.

Option 2 - The manufacturer declares the geometry and the material properties of the component and the structural characteristics resulting from design of the component.

The manufacturer shall implement a documented inspection and test plan for checking and recording that manufactured components conform to their component specification. The component specification shall be prepared from design information.

5.6 Manufacturing process – The organization shall maintain detailed documented procedures for the manufacturing process including welding procedure specifications (WPS) and initial type testing (ITT) for every project.

5.7 Product evaluation - The organization shall establish procedures to ensure that the declared values and classes of all of the characteristics are maintained. The means of production control of characteristics and the sampling methods for a component or family to be evaluated shall be specified. If the component specification includes a prescribed inspection and test plan for component properties then those requirements shall be followed.

5.8 Non-conforming products - The organization shall have written procedures that specify how to deal with non-conforming products. Such events shall be recorded as they occur and these records shall be kept for the period defined in the manufacturer's written procedures.



6 Conformity Assessment and Certification

6.1 Dubai Municipality – Dubai Central Laboratory Department (DCLD) is the designated Conformity Assessment Body for assessing conformity to this standard.

6.2 Conformity to this standard shall be evaluated through the DCLD Factory Assessment Certification Scheme and the relevant DCLD Specific Rules for Certification.

6.3 Product delivered to site shall demonstrate compliance with this standard through a Certificate of Conformity or Mark of Conformity issued by Dubai Municipality

7 Publications referred to:

EN 1090 Execution of steel and aluminium structures – Conformity assessment requirements and technical requirements

AISC 207 Certification standard for steel fabrication and erection and manufacturing of metal components

MBSM Metal Building Systems Manual

ISO 9001 Quality management systems requirements

ISO 15614 Specifications and qualification of welding procedures

ISO 3834 Quality requirements for fusion welding of metallic materials