

Approval & Reception Procedure

DEE- Departamento de Estruturas e Edifícios	
Steel Structures and Components Fabricated in Factories and Delivered to Construction Sites	Document no. ARP/DEE/005
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1 Reference standard

The Reference standard is Regulamento de Estruturas de Aço para Edifícios.

2 Approval procedures

2.1 General

In general, the approval procedure includes document submission before production and submission before delivery of steel structures. Case by case, inspections on factories will be carried out before any production in factories. In all cases, the documents listed in 2.2 should be submitted for verification before any inspection activities. If necessary, random inspections on the factories could be made during production stage.

2.2 Documents to be submitted before any production in factories

The documents listed in Table A & Table B shall be submitted and approved before any production of steel structural elements.

2.3 Documents to be submitted before delivery

The following document listed in Table C should be submitted and approved before any delivery of steel elements to the site.

3 Reception procedure

3.1 Stocking on the site

The steel element should be delivered and stored on site in an appropriate way such that

- The steel elements will not be subjected to any deformation
- Minimizing the damage to the coating surface
- Without contamination to the steel elements
- Easy access for visual inspection of the delivered elements

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3.2 Inspection on site of delivered elements

General visual inspection should be done on the delivered steel elements:

- The appearance of the steel elements
- Any deformation of steel elements found
- The welding joint quality
- The coating appearance (heavy damage, easy peeling off or not enough thickness)

4 Acceptance criteria

The acceptance of the delivered steel structures or components should depend on the followings:

- The validity of the submitted quality records of the steel structure (Point 2.3).
- The conditions of the delivered steel structures or components (Point 3).

In case of any doubts in the acceptance, it shall be considered as not completed, and the corresponding site installation, preliminary or full erection activities shall not be start, without full clarification of the situation and without a clear decision (e.g. clarification by the steel fabrication factory, additional tests, designer's comments or third party experts' opinion).

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Table A

Parties	Document to be submitted	Remarks
General	<ul style="list-style-type: none"> • Define the factories for Fabrication, Galvanization, Zinc Spraying, Paintings and Installation on site. • A plan with flow chart showing the work sequence. 	<ul style="list-style-type: none"> • The responsible department in the fabrication factory should be defined and declared for all the quality control works of the steel works (including fabrication, welding, galvanization, zinc spraying, and painting).
Fabrication Factory	<ul style="list-style-type: none"> • Catalogue and job references • Certificate of quality management system • Organization chart • Quality control plan (see remark) • Information of the 3rd party laboratories for material tests, welding tests, and coating tests (galvanization, zinc spraying and paints). • Welding Procedure Specifications (WPS) and Procedure Qualification Records (PQR) • Valid and qualified welder certificates • Procedure for surface preparation (e.g. sand blasting) • Mill certificates of welding electrodes • Mill certificates of steel materials 	<ul style="list-style-type: none"> • The quality control plan should show the responsible department of the factory for the quality control work, procedure of quality control, the sampling frequency, and the conformity and acceptant criteria for material tests, welding tests, coating tests, dimension checking complying with the Macau Code, and the contractual specifications. • The 3rd party laboratories, as testing laboratories only, are recommended to be accredited for the requested tests by international bodies (such as CNAL, HOKLAS). Hence List of accredited tests of the proposed laboratory should be submitted for approval • The WPS and PQR approved by a competent, independent inspection agency should be submitted and approved

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Table B

Parties	Document to be submitted	Remarks
Galvanization Factory	<ul style="list-style-type: none"> • Catalogue and job references • Certificate of quality management system • Organization chart • Dimension of galvanizing tank and temperature control system • Galvanizing process • Quality manual for each galvanizing process • Quality control records of each galvanizing process • Origin and certificate of zinc 	<ul style="list-style-type: none"> • Calibration certificates of temperature control system should be submitted and approved.
Zinc Spraying Factory	<ul style="list-style-type: none"> • Catalogue and job references • Certificate of quality management system • Organization chart • Method statement of zinc spraying. • Temperature and humidity control procedure • Quality manual for each process • Quality control records of each process • Origin and certificate of zinc 	<ul style="list-style-type: none"> • Calibration certificates of temperature and humidity control system should be submitted and approved
Painting Application Factory	<ul style="list-style-type: none"> • Catalogue and job references • Certificate of quality management system • Organization chart • Quality control manual • Working location for coating application • Temperature and humidity control procedure • Application method statement • Catalogue of Paintings 	<ul style="list-style-type: none"> • Calibration certificates of temperature and humidity control system should be submitted and approved.

Remark:

- a. Visit and inspection of any factory will be done case by case.
- b. The quality conformity of the steel works should be declared by the responsible department of the fabrication factory.
- c. The 3rd party laboratories should be understood as testing laboratories only.

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Table C

Designation	Document to be submitted	Remarks
General	<ul style="list-style-type: none"> • The conformity analysis and declaration from the responsible department of fabrication factory • The types and quantity of steel elements to be delivered. 	
Materials	<ul style="list-style-type: none"> • The incoming records of steel materials to the factory • Mill certificates of steel materials • Traceable test reports of raw materials by 3rd party laboratories 	<ul style="list-style-type: none"> • The incoming records should be traceable including details of manufacturers, steel grades, dimensions, quantity, day of receiving etc • The test reports of 3rd party laboratory should be endorsed with an identification stamp, and stamp of accreditation, if any (e.g. CNAL)
Welding	<ul style="list-style-type: none"> • Traceable test reports of welding joints by 3rd party laboratories 	<ul style="list-style-type: none"> • The test reports of 3rd party laboratory should be endorsed with an identification stamp, and stamp of accreditation, if any (e.g. CNAL)
Galvanization, Zinc Spraying, and Painting	<ul style="list-style-type: none"> • Traceable test reports of coating thickness and uniformity test (for galvanization coating only) by 3rd party laboratories 	<ul style="list-style-type: none"> • The test reports of 3rd party laboratory should be endorsed with an identification stamp, and stamp of accreditation, if any (e.g. CNAL)
Dimension Check during fabrication	<ul style="list-style-type: none"> • Auto-control records of the fabrication factory 	