

GENERAL SPECIFICATION

STRUCTURAL

GS EP STR 304

Fabrication of Welded Plate Girders (W.P.G.) and Box Girders (B.G.)

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1. Scope

This General Specification for fabrication of Welded Plate Girders (WPG) and Box Girders (BG) shall be used in conjunction with **GS EP STR 301** (for simplification purposes) by any party. The specification **GS EP STR 301** and related PPS shall be used when specified in the present specification. When needed, any additional clarifications shall be found in specification **GS EP STR 301**.

This specification defines the Company's general requirements for the manufacture and inspection of WPG and BG.

This specification applies only to the assembly of flange to webs. Assembly of stiffeners or any other part shall refer to **GS EP STR 301**.

Where required, this specification shall be used in conjunction with a Project Particular Specification (PPS) detailing the additional tests and requirements or the possible modifications to the present specification, based on the particular design conditions or the local legislation of the structural project.

No deviations from the requirements stated in the present specification shall be permitted unless prior approval has been obtained from the Company. Refer to section 5 of this specification.

2. Reference documents

The reference documents listed below form an integral part of this General Specification.

Applicable specifications and documents are listed hereafter in the present section.

The order of precedence of the applicable documents shall be:

- The Purchase Order
- The Project Particular Specification (PPS)
- The Present General Specification
- The Codes and Standards in reference.

Unless otherwise specifically indicated in writing, the Contractor shall work in accordance with the requirements specified herein and the applicable requirements of the latest editions at date of Contract award of the referenced codes and standards, whenever requested in the present specification.

The requirements of this specification shall take precedence over the referenced codes and standards. Where this specification states no overriding requirements the referenced codes and standards shall apply in full.

The Contractor shall equip himself with copies of all the reference specifications referred to in this specification and shall make them readily available to all his inspection personnel involved on the work.

External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the effective date of this document.

Reference	Title
API RP 2A-WSD	Recommended Practice for Planning and Constructing Fixed Offshore platforms
ASME BPVC Section V	Boiler and pressure vessel code: non-destructive examination
ASTM A370	Standard test methods and definitions for mechanical testing of steel products
ASTM A578/A578M	Standard specification for straight-beam ultrasonic examination of rolled steel plates for special applications
ASTM E165/E165M	Standard practice for liquid penetrant examination for general industry
ASTM E23	Standard test methods for notched bar impact testing of metallic materials
ASTM E709	Standard guide for magnetic particle testing
AWS D1.1/D1.1M	Structural welding code - Steel
CSWIP/PCN	Requirements for the certification of personnel engaged in NDT
EN 1435	Non-destructive examination of welds - Radiographic examination of welded joints
ISO 10893-6	Non-destructive testing of steel tubes - Part 6: Radiographic testing of the weld seam of welded steel tubes for the detection of imperfections
ISO 14344	Welding consumables - Procurement of filler materials and fluxes
ISO 148-1	Metallic materials - Charpy pendulum impact test - Part 1: Test method
ISO 3834-1	Quality requirements for fusion welding - of metallic materials - Part 1: Criteria for the selection of the appropriate level of quality requirements
ISO 6507-1	Metallic materials Vickers hardness test - Part 1: Test method
ISO 9001	Quality management systems - Requirements
ISO 9712	Non-destructive testing - Qualification and certification of NDT personnel

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Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published in the applicable yearly collection.

Reference	Title
GS EP STR 201	Materials for offshore steel structures
GS EP STR 204	Subsea structures: Carbon Steel Material and Fabrication
GS EP STR 301	Fabrication of offshore steel structures

3. Definitions

a) Inspector

Either the Company's Inspector or the Contractor's Inspector, or both, shall be referred to herein as the "Inspector". The Company and Contractor may respectively elect an independent inspection agency to act on their behalf in that purpose.

b) Site

The yards, workshops, laboratories or other locations where the fabrication, inspection and testing are to be performed complete or in part, shall be referred to herein as the "Site".

c) Contract documents

The drawings, equipment lists, bills of material, material specifications, etc., latest editions, issued by the Company and attached to the Contract or the Purchase Order shall be referred to herein as the "Contract Documents".

d) Approval

Authorisation in writing given by the Company to the Contractor on a procedure or to proceed with the performance of a specific part of the work without releasing in any way the Contractor from any of his obligations to conform with the technical specifications, requisitions, etc. The words "Approve", "Approved" and "Approval" shall be construed accordingly.

e) PPS

Used to designate the Project Particular Specification as defined in section 1.

4. Quality Assurance/Quality Control

- The Contractor shall operate a Quality Assurance system in accordance with [ISO 9001](#) or equivalent, approved by a recognized authority. The Quality Assurance Manual shall be submitted to Company and made available to the Inspector at all times.
- All fabrication shall follow the requirement of [ISO 3834-2](#) and the requirements stated in the present specification.
- Three weeks prior to commencement of any fabrication, the Contractor shall prepare and submit to Company a written Quality Control Plan which describes the inspections to be performed during the said fabrication. The Quality Control Plan shall set forth "witness", "hold", "review" and "monitor" points.

5. Technical Queries/Non-Conformance Reports

1. Any Contractor's requests for clarifications or deviations to Company specifications shall be submitted to Company only through Technical Queries (TQ), the format of which shall have prior approval of the Company.
2. A deviation to specifications shall not be considered as accepted if it has not been submitted to and accepted by Company through a Technical Query.
3. Approval given by the Company to any Contractor's work procedures, specifications, equipment, etc, shall not release in any way the Contractor from his obligation to meet the Company's specifications.
4. Any work performance or test result which is found, at a later date, not in conformance with Company specifications or agreed procedure shall be subject to a Non-Conformance Report (NCR) to be issued by the Contractor for submission to Company. NCR report shall indicate the corrective action intended by the Contractor.

6. Approval of documents and procedures

The following documents shall require approval of the Company or its Inspector and of an Independent Third Party (if any) prior to allowing fabrication to proceed:

- Drawings and calculation notes for temporary works or handling operations (staking, roll-up, etc.), inclusive of foundations, support points, jacking points and sling points
- Handling and lifting equipment to be used including rigging equipment, cranes, winches, etc. with review of test certificates
- List of proposed welding consumables (brand and type) with their data sheets including supplier's recommendation (see **GS EP STR 301**)
- Consumables handling, drying, storing, flux recycling and traceability procedure
- Sequence of fabrication, assembly, welding and erection
- Inspection test Plan
- Weld Map and Register together with all Welding Procedure Specifications (WPS) and Welding Procedure Qualification Records (WPQR)
- Welding procedure qualification test plan (i.e. up-dated status of WPQ tests of procedures under qualification)
- The Welding Procedure Qualification Tests and welder qualification tests
- List of welders and welding operators, with certificates
- Manufacturing Procedure Specification (MPS) and Mill certificates of Contractor's supplied materials
- Identification, control and traceability procedures for materials
- Key plans showing member identification and weld marking schemes
- Inspection, dimensional and Non-Destructive Testing procedures (including report models)