



# NASHPA Gas Processing and LPG Recovery Plant

PROC-FC-CB/NASHPA/PROJ-1247 /2015

PROJECT NO.: NASHPA 1247



DOCUMENT NO.:  
NGP-000-SCW-15.03-0004

SPECIFICATION

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## Specification for Structural Steel Works

### REVISION DETAILS

REV	DATE	DESCRIPTION	PRPD	CHKD	REVD	APPD
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00	24/06/2016	Approved for Design	Chen Changqing	Wen Anshun	Li Zhiguang	Zhang Wenhong
C	24/05/2016	Issued for Approval	Chen Changqing	Wen Anshun	Li Zhiguang	Zhang Wenhong
B	04/02/2016	Issued for Review	Chen Changqing	Wen Anshun	Li Zhiguang	Zhang Wenhong
A	15/01/2016	Issued for Discipline Check	Chen Changqing	Wen Anshun	Li Zhiguang	Zhang Wenhong



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REVISION HISTORY

REV.	DATE	REVISION DESCRIPTION
A	15/01/2016	Issued for Discipline Check
B	04/02/2016	Issued for Review
C	24/05/2016	Issued for Approval
00	24/06/2016	Approved for Design



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## 1.0 GENERAL

### 1.1 Introduction

OIL & GAS Development Company Ltd. (OGDCL) is operating NASHPA Oil & Gas fields in Khyber Pakhtunkhwa of Islamic Republic of Pakistan. OGDCL intends to install LPG Recovery Plant, Compressors & Allied Facilities at this field.

### 1.2 Scope

This document covers the requirements for the design, fabrication and erection of structural steelwork, for equipment support and access facilities such as stairways, ladders, walkways, etc.

### 1.3 Definitions

Within this document the following definitions apply:

<b>Project</b>	NASHPA Gas Processing and LPG Recovery Plant PROC-FC-CB/NASHPA/PROJ-1247 /2015
<b>Company/Owner</b>	Oil & Gas Development Company Ltd.(OGDCL)
<b>Consultant</b>	Zishan Engineers (Pvt.) Ltd.
<b>Contractor</b>	Hong Kong Huihua Global Technology Limited Wholly owned Subsidiary of China OIL HBP Science and Technology Corporation Ltd
<b>Manufacturer/Supplier/Vendor</b>	Party(ies), which manufactures and/or supplies material, equipment and service to perform the duties as specified by CONTRACTOR in the scope of supply
<b>Shall</b>	Indicates a mandatory requirement
<b>Should</b>	Indicates a strong recommendation to comply with the requirement of this document

## 2.0 REFERENCES AND ABBREVIATIONS

### 2.1 Codes and Standards

Doc. No.	Description
ANSI A – 58.1	Minimum Design Loads for Building and Other Structures.
AISC 360-05 (LRFD)	Specification for Structural Steel Buildings
AISC Manual	Steel Construction Manual
API 650	Welded Tanks for Oil Storage
UBC	Uniform Building Code
ASCE 7-10	Minimum Design Loads for Buildings and Other Structures.
ASTM A6 / A6M	Standard Specification for General Requirements for Rolled Structural Steel



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Doc. No.	Description
	Bars, Plates, Shapes and Sheet Piling.
ASTM A36	Standard Specification for Carbon Structural Steel
ASTM A 307	Standard Specification for Carbon Steel Bolts and Studs, 60000 PSI Tensile Strength
ASTM A 325 M	Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric)
ASTM A123	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Products
ASTM A153	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A529	Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality
ASTM A53	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A-354	Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and other externally threaded fasteners.
ASTM A563M	Standard Specification for Carbon and Alloy Steel Nuts (Metric)
ASTM A500	Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
ASTM A572	Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
ASTM A588	Standard Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance
ASTM A653	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
ASTM A709	Standard Specification for Structural Steel for Bridges
ASTM F436M	Standard Specification for Hardened Steel Washers (Metric)
AWS D1.1	Structural Welding Code - Steel - 22nd Edition
BS 1449	Steel plate, sheet and strip
BS 4	Structural Steel Sections - Specification for Hot Rolled Sections
BS 4320	Specification for Metal washers for general engineering purposes metric series
BS EN 10034	Structural steel I and H sections - Tolerances on shape and dimensions
BS EN 10056-1	Specification for Structural Steel Equal and Unequal Angles.
BS EN 1011 Part-1	Welding. Recommendations for welding of metallic materials - General guidance for arc welding
BS EN 1011 Part-2	Welding. Recommendations for welding of metallic materials - Arc welding of ferritic steels
BS EN 10111	Continuously hot rolled low carbon steel sheet and strip for cold forming - Technical delivery conditions.



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Doc. No.	Description
BS EN 10149	Specification for hot-rolled flat products made of high yield strength steels for cold forming
BS EN 10162	Cold Rolled Steel Sections - Technical delivery conditions - Dimensional and cross-sectional tolerances.
BS EN 10210	Hot finished structural hollow sections of non-alloy and fine grain steels
BS EN 10268	Cold rolled steel flat products with high yield strength for cold forming - Technical delivery conditions.
BS EN 1991-1-4 2005	Eurocode 1: Actions on Structures –Part 1-4 General Actions-Wind Actions
BS EN 22553	Welded, brazed and soldered joints - Symbolic representation on drawings
BS EN ISO 1461	Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods
BS EN ISO 4014	Hexagon head bolts - Product grades A and B
BS EN ISO 4017	Hexagon head screws - Product grades A and B
EN 10025 Part 1	Hot rolled products of structural steels – Part 1:General technical delivery conditions
EN 10025 Part 2	Hot rolled products of structural steels – Part 2:Technical delivery conditions for non-alloy structural steels
ISO 2553	Welded, brazed and soldered joints - Symbolic representation on drawings
ISO 898-1	Mechanical properties of fasteners made of carbon steel and alloy steel - Bolts, screws and studs with specified property classes - Coarse thread and fine pitch thread.
ISO 898-2	Mechanical properties of fasteners - Nuts with specified proof load values - Coarse thread.

## 2.2 Project Specifications, Procedures and drawings

Particular reference is made to the following project specifications:

Design Basis for civil and Structure works	NGP-000-SCW-15.05-0001
General Notes for Structural Steel Works	NGP-000-SCW-15.01-0002
Specification for Coating and Painting	NGP-000-PAI-15.03-0001

## 2.3 Abbreviations

The following abbreviations are used in this document:

ACI	American Concrete Institute
AISC	American Institute of Steel Construction
API	American Petroleum Institute
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers



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ASTM	American Society for Testing and Materials
AWS	American Welding Society
BS	British Standards
EN	European Standard
ISO	International Organization for Standardization

### 3.0 DESIGN

#### 3.1 Design Requirement

Design of steel structures shall be in accordance with document No. NGP-000-SCW-15.05-0001-Design Basis for Civil and Steel Structure works

#### 3.2 Design Loads and Load Evaluation

Foundations and structures shall be designed to include all dead loads, live loads, equipment, loads, vibrations, piping, piping expansion, thermal and friction, wind, seismic, impact and erection, operating loads and forces.

#### 3.3 Other Loads

##### 3.3.1 Pipe Anchors

Pipe anchors shall be designed for the forces and moments developed from the line stressing. When more than one anchor is supported on one support, due account shall be taken for the direction of thrust, but in any case members shall be designed to resist any one anchor thrust as a minimum. Anchor support members in structures shall be suitably braced to reduce deflection to a minimum.

##### 3.3.2 Roofs

For the design of roofing, and in addition to climatic on seismic loading, a concentrated load of 100 kg on a square of 0.50m must be taken into account.

The frame will be designed for a maximum allowable differential vertical settlement of 50mm.

##### 3.3.3 Stresses

Permissible stresses in structure design shall be in accordance with the reference Codes and Standards.

#### 3.4 Miscellaneous

##### 3.4.1 Connections

All shop connections shall be preferably made by welding, high tensile bolts or ordinary bolts.

Ordinary grade and higher-grade bolts do not have the same diameter. Therefore, it is strongly recommended that to eliminate the possibility of incorrect bolts being used. All field holes shall be made by drilling (oxy cutting strictly forbidden).

A minimum of 2 bolts shall be used in all bolted connections. Hole dia. for bolts shall be in accordance with AISC Standards.



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Washers are required with bolts in accordance with the Standards. A locking device shall be employed on bolts to prevent the nuts loosening in connections subjected to vibration from machinery.

Welding shall be restricted to shop fabrication and performed in accordance with the AWS Specification for Steel Structure Welding.

#### 3.4.2 Flooring

A platform should be provided for any item of equipment, which requires attention for operation or servicing whilst the plant or equipment is in commissioning whenever this is located at more than 2 meters above grade level or other platforms.

Solid floor plates shall have a raised pattern affording a non-slip surface and shall be 6mm minimum thick exclusive of pattern.

Solid floor plates shall be attached to the supporting steelwork with Ø12mm Countersunk bolts unless otherwise noted on the drawings. Unsupported edges shall have 60 × 10mm butt strap. A Ø20mm drainage hole shall be provided in each panel.

Open grid flooring shall be galvanized and shall have main bars not more than 40-mm spacing.

Open grid flooring shall be attached to the supporting steelwork with clips or other effective means. Holes or cut-outs in panels shall be made and shall have perimeter stiffening strips welded in.

#### 3.4.3 Stairways

Stairways shall be provided for access to platforms serving equipment, which requires regular and frequent operational attendance or rapid escape or access in the event of an emergency.

Stairs shall have a minimum width of 800mm and shall be arranged with a slope not exceeding 45°.

All stairs in the same structure shall have the same slope and stair handrails shall be continuous with platform handrails.

Maximum vertical difference in level in a single flight shall be 4600 mm

Landings shall be 1 200-mm minimum length.

Stair tread width shall be 210 mm minimum and be hot dip galvanized open grid type to match flooring. Treads shall have visible edges.

The horizontal distance between adjacent nosing shall not exceed the tread width. The vertical distance between treads may vary between 190 mm and 210 although all rises in any flight shall be the same.

#### 3.4.4 Ladders

Ladders shall be provided for following condition:

- For access to platforms not served by stairways.
- As an emergency escape from a platform already served by a stairway and/or a ladder.



- For access to locations where no platform is necessary but where observation of a process condition is required, involving no manual effort and which will not create a hazardous situation, e.g. to check a level indicator.

Changes of inclination should be avoided as far as possible but if this is impractical, intermediate platform shall be provided to avoid a change of inclination within a “flight”.

When access to an upper platform is from the side or front of ladder, the ladder shall be extended for a distance of not less than 1m or equivalent hand holds shall be provided. Stringers at the top of ladders where “walk through” access is required shall be suitably placed apart.

#### 3.4.5 Safety

Safety cages shall be provided for ladders serving platforms more than 5m above grade. Where height between platforms will not permit access to a full cage, partial caging permitting side entry shall be provided.

Self-closing safety gates are required for ladders serving platforms 2.0 meters or more above grade.

##### Dimensions

- Ladders width 500 mm
- Rung Spacing 250 to 300 mm
- Rung Diameter 20 mm
- Clearance to nearest obstruction 240 mm (min)
- Cage Diameter (inside) 800 mm
- Centreline cage to centreline rungs 400 mm

#### 3.4.6 Platforms & Walkways

Platforms and walkways shall be a minimum of 800 mm wide.

Where pipes or fittings intrude on a passageway, a minimum clear way of 450 mm is required.

Headroom clearance shall be a minimum of 2000mm taking into account electrical fittings and other obstructions.

#### 3.4.7 Hand Railing & Toe Plates

Handrails shall extend around edges of all platforms, landings, walkways and stairs.

Except at stair and ladder openings, toe plates shall extend continuously around the edges of platforms, landings, stiles and walkways situated more than 2 m above grade. Toe plates shall also be provided around all pipe penetrations through landings and around large openings.

##### Dimension

- Top rail above platform 1000mm (approx.)



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- Bottom rail above platform 500mm (approx.)
- Top rail above stair nosing 800mm (approx.)
- Bottom rail above stair nosing 400mm (approx.)
- Outer dia. of rails 40mm (approx.)
- Hand rail standard spacing 2000mm (approx.)
- Toe plate up stand above flooring 100mm

The fabrication shall comply with:

- Code & Reference Standards.
- Approved Drawings.

Variations or modifications if any shall be previously approved by the COMPANY.

The structure shall be manufactured to allow as much shop assembling as possible, compatible with easy transport and quick and economical erection at jobsite.

All steelwork elements shall be delivered at site properly protected with a rustproof paint coat. The painting shall conform to the painting specification.

When prefabricated elements are delivered, they shall be duly marked for ease in identification during assembling duties.

When delivered at site, all portions of structural prefabricated assembly shall be stored with all necessary precautions to avoid damage or possible distortions of such elements.

The positioning of all steelwork, the plumbing of stanchions and columns and the assembly of every part of the structure with due accuracy shall be in accordance with the approved drawings.

No permanent connections shall be made until as much of the structure as will be stiffened by such connections has been approved or accepted with respect to alignment.

Regarding design of steel structure:

- For local fabrication work, CONSULTANT shall either design the construction details of steel structure or the SUPPLIER's design will be vetted by CONSULTANT.
- For foreign supplied skids, the SUPPLIER shall develop design, fabrication and installation details of steel structure and CONSULTANT will approve the design.
- The fabrication drawings shall show:
  - a) The example of subassembly marking.
  - b) The erection matches mark between subassemblies and civil works.
  - c) The materials take off (if required).
  - d) The recommendations of erection such as mounting sequence, if any.



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- e) The reference to other drawings when deemed necessary.
- The fabrication drawings shall be completed with all indications relating to bevels and welds to be carried out:
- a) In the workshop.
  - b) In the jobsite, if any.
- The limit of supply will be:
- a) All structure components.
  - b) Erection bolts with nuts and washers, Roof sheeting fastener
  - c) Stairways, ladders and hand railings,
  - d) Foundation bolts for structural works.

#### 3.4.8 Temporary Bracing

Adequate bracing which may include guys and such temporary members as may be considered necessary for safety, shall be installed and shall be left in position until such time as conditions of safety permit its removal.

#### 3.4.9 Inspection & Tests

The inspection and tests will consist in the following:

- Examination and checking the certificates stating the grades of steel used in the structural works.
- Checking their compliance with specifications and drawings.
- Mechanical test certificates where required by the Codes & Standards.
- Checking the full compliance of structural elements sizes dimensional.
- Workmanship inspection in compliance with the related Codes.
- Painting or coating inspection

On completion of each test or inspection, the results shall be drawn up in inspection reports. The results shall be indicated in a bound file showing all the results according to the above list and forwarded to the COMPANY for information.

## 4.0 FABRICATION

### 4.1 Shop Fabrication and Assembly

- a) Fabricate structural steel members in accordance with reference Codes and Standards.
- b) Perform corrective work on material not meeting ASTM A6/A6M tolerances for camber, profile, flatness, or sweep subject to limitations given in appropriate ASTM material specifications.

### 4.2 Bolt or Weld Shop Connections



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4.2.1 Bolt or weld field connections, except where welded connections are indicated. Shop connections will normally be welded.

4.2.2 Use high-strength threaded fasteners for bolted connections, except that standard threaded fasteners may be used in temporary erection connections when the final connection is welded after adjustment and for temporary bracing.

4.2.3 Install high-strength bolted construction according to AISC standard or equivalent standards, using fully pretension bolts, unless noted otherwise.

4.2.4 Punch, ream, or drill bolt holes.

#### 4.2.5 Welding

- a) Welder and tacker certificates of qualification shall be in accordance with reference codes & standards. Only certified welders shall perform the work.
- b) Welding procedures (including wide gap and repair welds) for all grades of steel shall be qualified in accordance with reference codes & standards.
- c) Where field welding is indicated on the drawings, members in the welded connection shall be properly prepared to the profile and dimensions of the qualifying Weld Procedure Specification (WPS). All weld bevel preparations shall be dress ground smooth and be free of all surface contaminants.
- d) Material used for runoff tabs and backing straps shall be the same as the base material.
- e) Use of strong backs and temporary support members shall be used to minimize distortion during fit up and production welding. Attachment of strong backs and supports shall be to an approved WPS. Removal of strong backs and supports shall be by flame cutting or arc air gouging 3mm above the structural member and dress grinding smooth to the surface. Use of hammers to physically remove fit up assemblies is forbidden.
- f) CONTRACTOR/SUPPLIER shall provide suitable weather protection habitats for onsite welding to protect the welded joint from inclement weather, i.e. rain, strong winds etc.
- g) CONTRACTOR/SUPPLIER shall develop remedial procedures for the correction of distortion in structural members.
- h) CONTRACTOR/SUPPLIER shall ensure that preparation of members is such that the fabrication tolerances and weld joint fit up tolerances can be achieved without physically forcing members together.
- i) Full penetration double sided welds shall have the second side cut back visually and MPI inspected after back cutting to ensure freedom of defects prior to welding the second side.
- j) Welding equipment used for production welding shall be fully calibrated and in good operable condition to ensure correct welding parameters as per approved WPS are being used. CONTRACTOR/SUPPLIER shall provide calibration records to COMPANY prior to work commencing.



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- k) Use of pre heating either by fuel gas or electric resistance shall be such that a uniform heat is applied to the weld joint area and measurements where practical shall be on the back side of the welded joint 1 minute after the heat source is removed to ensure the complete joint assembly is at the correct pre-heat level for welding. Pre-Heat and Inter pass temperatures shall be measured with electric pyrometers or tempilsticks.
- l) CONTRACTOR/SUPPLIER shall handle, store and bake electrodes in accordance with the consumable manufacturer's recommendations. Damaged or damp electrodes, welding fluxes or FCAW reels shall be discarded and immediately removed from the work site.
- m) Control of low hydrogen electrodes on site shall be by the use of heated quivers at a minimum temperature of 75°C.
- n) CONTRACTOR/SUPPLIER shall develop a system of weld identification linked to the WPS, welder, weld repairs and Non-destructive Examination (NDE) report numbers and submit to COMPANY prior to work commencing for approval.
- o) Welding Procedures, NDE procedures and corrective procedures require COMPANY approval prior to work commencing.
- p) Correct earth return leads shall be used especially adjacent to equipment or CP monitoring systems.
- q) COMPANY shall have the right to remove any welder whose performance in producing sound welds as determined visually as well as by Ultrasonic (UT), Radiography (RT), Magnetic Particle Inspection (MPI) or Dye Penetrant Inspection (DPI) is questionable.
- r) CONTRACTOR/SUPPLIER shall submit proposals for use of weld able primers to protect prepared welded joints during erection.
- s) CONTRACTOR/SUPPLIER shall ensure that working at height during site erection and field welding is from certified work platforms or scaffolding. Use of safety harnesses is mandatory for working outside a designated work platform while at height.

#### 4.3 Holes for Other Work

- a) Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as approved by COMPANY.
- b) Reinforce holes as indicated.
- c) Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning.

#### 4.4 Base Plates and Column Plates

Base plates and column plates are milled or pressed, loose or attached.

#### 4.5 Bearing Plates

Provide bearing plates under girders, trusses, and beams resting on piers and walls, loose or attached.



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#### 4.6 Trusses

4.6.1 Shop weld and field bolt connections unless indicated otherwise.

4.6.2 Do not splice top and bottom chords, except in the case of third point splices. These are permitted if approved by COMPANY to avoid special handling and shipping problems.

#### 4.7 Anchor Bolts

Provide templates for anchor bolt groups.

#### 4.8 Transportation

When transportation of steelwork to another site is required, Company/Contractor shall provide labor, equipment, and material for tie-down and shall follow the requirements of reference Codes and Standards.

### 5.0 ERECTION

Erect structural steel members shall be in accordance with reference codes & standards.

#### 5.1 Setting Base Plates and Bearing Plates

Perform the following procedures for setting the base plates and bearing plates:

5.1.1 Clean concrete (and masonry) bearing surfaces of bond-reducing materials. Roughen to improve bond to surfaces.

5.1.2 Clean bottom surface of base and bearing plates.

5.1.3 Set loose and attached base plates and bearing plates for structural members on wedges or other adjusting devices.

5.1.4 Tighten anchor bolts to specified torque after supported members are positioned and plumbed. Do not use impact torque wrenches.

5.1.5 Do not remove wedges or shims. If protruding, cut off flush with edge of base or bearing plate prior to grouting.

5.1.6 Place non-shrink grout solidly between bearing surfaces and plates or steel member so that no voids remain. Comply with Grout Manufacturer's instructions.

#### 5.2 Field Assembly

Perform the procedures for field assembly listed as following:

##### 5.2.1 General

- a) Clean bearing surfaces and other surfaces that will be in permanent contact before assembly.
- b) Establish required levelling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.
- c) Complete field connections before load is applied.



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- d) Provide inspection plan for installation or slip critical connections to COMPANY for approval.

#### 5.2.2 Structural Components

- a) Set structural frames accurately to lines and elevations indicated.
- b) Align and adjust the various members forming part of the complete frame or structure before permanently fastening.
- c) Adjust as necessary to compensate for discrepancies in elevations and alignment.
- d) Splice members only where indicated on approved shop drawings.
- e) CONTRACTOR shall not field cut or alter structural members or connections without COMPANY approval.

#### 5.2.3 Bolts

- a) Install high strength bolted construction according to reference Codes and Standards, using fully pretension bolts unless noted otherwise.
- b) Turn-of-nut tightening, installation of alternate design bolts, or direct tension indicator tightening shall tighten bolts in slip-critical connections. Calibrated wrench tightening may also be used for connections noted to be fully pretension but not slip-critical.

#### 5.2.4 Welded Components

- a) On exposed welded construction, remove all erection bolts, cut off run-off plates and grind out tack welds and temporary backing bars. Fill access holes either by use of an approved WPS or by placing a cover plate over the cope hole and seal fillet weld in place.
- b) Field weld components and connection welds shall be indicated on approved shop drawings.

### 5.3 Erection Tolerances

Erection tolerances shall comply with reference Codes and Standards. All specified tolerances are to be achieved at ambient temperature.

### 5.4 Touch-Up Painting

After erection, touch-up abrasions on shop-primed (or galvanized) surfaces except surfaces that are indicated as unpainted. Paint welds, bolts, nuts, and surfaces adjacent to welds on painted steel members after inspection and approval. Painting shall be in accordance with, Painting specification.

## 6.0 WELDING

All welds, except fillet welds, or where noted on the drawings, shall be double sided complete penetration welds. Single sided full penetration welds shall only be used where access to the second side is not possible. Welds shall be continuous and provide a full all around seal.

### 6.1 Qualifications

- 6.1.1 Electrodes for the welding process shall meet the requirements of AWS.



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6.1.2 Qualification requirements for welders, tackers, arc air gougers and welding procedures shall be as noted in Section 5.2.5 of this Specification.

## 6.2 Inspection and Testing

6.2.1 Welding procedures shall be qualified prior to use according to AWS. Use of pre-qualified procedures according to AWS will be acceptable, provided certified test results meeting all specification requirements are submitted to and approved by COMPANY.

6.2.2 All Welders, Tackers and Welding Operators shall be qualified by tests prescribed in AWS for welding structural shapes, pipe, and plates.

6.2.3 A program for inspection and testing of production welds shall be submitted to COMPANY for approval. This shall include for procedures covering UT, RT, MPI and DPI plus extent and acceptance criteria.

## 7.0 FINISHES

All structural steel that is to be painted shall receive surface preparation and be painted according to this specification and the project paint specification.

- a) Clean steel of oil and grease according to SSPC SP 1. Remove dirt and foreign material by brushing.
- b) Steel members that are concealed from public view by interior building finishes shall be painted.
- c) Steel members that are in contact with concrete or metal deck shall be unpainted.
- d) Protect machine finished surfaces with rust-inhibiting coating, which is removable prior to erection or which has characteristics that make removal unnecessary.

### 7.1 Interior Steel Members

Preparation: Clean according to reference Codes and Standards.

Primer: Apply shop paint for exposed members to thickness recommended by Finish Coat Manufacturer.

Do not paint within 50 mm of field welds (and on contact surfaces of slip critical connections).

Prior to assembly, clean and paint surfaces inaccessible after shop assembly.

### 7.2 Exterior Steel Members Exposed to Atmosphere

Preparation: Clean according to reference Codes and Standards.

Primer: Apply shop paint for exposed members to thickness recommended by Finish Coat Manufacturer.

Do not paint within 50 mm (of field welds (and on contact surfaces of slip-critical connections).

Prior to assembly, clean and paint surfaces inaccessible after shop assembly.

### 7.3 Galvanized Finish



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7.3.1 Hot-dipped galvanized coating shall be according to reference Codes and Standards.

7.3.2 Provide for exterior suspended steel lintels and at other locations noted as required. All hardware for galvanized structural steel shall be galvanized according to reference Codes and Standards.