SPECIFICATION

TEC PROJECT No:	**BA0738**
PLANT:	**ASIAN PILLAR PROJECT**
CLIENT:	**DOW CORNING**
LOCATION:	**ZHANGJIAGANG, JIANGSU PROVINCE, PR CHINA**
DOCUMENT TITLE:	**STRUCTURAL STEELWORK**
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1. GENERAL

1.1 Scope

This specification shall govern the design, supply, fabrication and erection of structural steelwork to all steel frame structures. The specification is presented in four sections:

1 - General

2 - Design and Supply

3 – Materials and Fabrication

4 - Shipment and Erection

1.2 Steelwork Contractor's Work scope

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The Steelwork Contractor shall supply all necessary labour, plant and materials to execute the works defined by the Contract between the Steelwork Contractor and The Client.

The works will comprise but not be limited to:

- Supply of all structural materials.
- Preparation of any fabrication details, erection drawings and marking plans from general arrangement drawings and/or electronic model supplied by the Engineering Contractor.
- Supply of bolts, cleats, welding and all other such supplementary items necessary to complete the Works.
- Fabrication of all structural steelwork
- Corrosion protection – primer and intermediate coat only. Top coat by others.
- Fireproofing – Intumescent Paint system
- Transport of structural steelwork to site.
- Erection of structural steelwork.

Any deviation from this specification and any deviation from the original design as shown on the Contract Drawings must have the express approval of the Engineering Contractor.

1.3 Specifications, Codes and References

All materials and workmanship shall be in accordance with the documents listed below, except that where the requirements of any documents are in conflict with this specification, this specification shall take precedence. Equivalent Chinese Codes and Standards as listed below may be adopted.

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AISC 348	Specification For Structural Joints Using ASTM A325 Or A490 Bolts
BCSA & SCI Publication No. 203/02	National Structural Steelwork Specification For Building Construction 4th Edition
BCSA & SCI Publication No. P209/03	Commentary On The National Structural Steelwork Specification For Building Construction 4th Edition
BS 4-1:2005	Structural Steel Sections, Specification For Hot Rolled Sections
BS 3692:2001	ISO Metric Precision Hexagon Bolts, Screws and Nuts
BS 5950-1:2000	Structural Use of Steelwork In Buildings
BS EN ISO 1461:1999	Hot Dip Galvanized Coatings For Fabricated Iron and Steel Articles – Specifications and Test Methods
BS EN ISO 14122-3:2001	Safety Of Machinery – Permanent Means of Access To Machinery – Part 3: Stairways, Stepladders and Guide-Rails
BS EN 440:1995	Welding Consumables. Wire Electrodes and Deposits For Gas Shielded Metal Arc Welding of Non Alloy And Fine Grain Steels. Classification
BS EN 499:1995	Welding Consumables. Covered Electrodes For Manual Metal Welding of Non Alloy and Fine Grain Steels Classification
BS EN 756:2004	Welding Consumables. Wire Electrodes and Wire-Flux Combinations For Submerged Arc Welding of Non Alloy and Fine Grain Steels. Classification
BS EN 758:1997	Welding Consumables. Tubular Cored Electrodes For Metal Arc Welding With and Without a Gas Shield Of Non Alloy and Fine Grain Steels. Classification
BS EN 10055:1996	Hot Rolled Steel Equal Flanged Tees With Radiused Root and Toes
BS EN 10056-1:1999	Specification For Structural Steel Equal and Unequal Angles

Engineering Equipment and Materials Users Association Publication No. 105 : 2002	Factory Stairways, Ladders And Handrails (Including Access Platforms and Ramps)
EMTN 09.061.000	Zhangjiagang Standard for Painting and Protective Coatings
0136-STD-100020024	Specification for Fireproofing
Chinese Codes and Standards	
CECS 24-90	Regulation of Application Technology of Resistive Coating for Steel Structure
GB95-85	Washer Sizes and Dimensions for Ordinary Bolts Grade C
GB700-88	Carbon Structural Steel Section
GB 704-1988	Hot-Rolled Flat Steel dimensions, Shape, Weight and Tolerances
GB 706-88	Hot-Rolled I-Shaped Beam Steel Dimensions, Shape, Weight and Tolerances
GB 707-88	Hot-Rolled Channel Steel Section Dimensions, Shape, Weight and Tolerances
GB 1591-94	High Strength Low Alloy Structural Steel Sections
GB 5117-1995	Welding Electrodes for Carbon Steel
GB 5118-1995	Welding Electrodes for Low Alloy Steel
GB 9787-88	Hot-Rolled Equal-Legged Angle Steel Sections
GB 9788-88	Hot-Rolled Unequal-Legged Angle Steel Sections
GB 14907-2002	General Specification of Fire Resistive Coating for Steel Structure
GB 50011-2001	Seismic Design of Building
GB50017-2003	Code of Design for Steel Structures
GB 50153-92	Engineering Structure Reliability Design Standard
GB 50191-93	Seismic Design of Special Structures
GB 50205-2001	Code of Acceptance of Construction Quality of Steel Structures
GB50068-2001	Unified Standard for Reliability Design of Building Structure

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GB/T50104-2001	Building Drawing Standard
GB/T50105-2002	Building Structure Drawing Standard
GBJ 132-90	Engineering Structure Design Terminology and Symbol Standard
GBJ 135-90	Design of High Rise Structures
GB/T41-2000	Hexagon Nuts Sizes Product Grade C
GB/T699-2001	Quality Carbon Structural Steel
GB/T1231-91	Technical Code for High Strength Hexagon Bolts, Nuts and Plain Washer applied to Steel Structure
GB/T3277-1991	Checker Plate Standard
GB/T3633-1995	Technical Code for Sets of Torsion Shear Type High Strength Bolts
GB/T11263-2005	Hot Rolled H and Cut T Section Steel
GB/T13912-2002	Technical Requirement and Testing Method for Hot-Dipped Galvanized Coatings on Iron and Steel Products
JGJ7-91	Code for Design, Fabrication of Steel Trusses
JGJ81-2002	Technical Specification for Welding of Structural Steel of Building
JGJ82-91	Code for Design, Fabrication and Acceptance of High Strength Bolts
SH 3076-96	Code for Design of Building Structures in Petrochemical Engineering

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1.4 Safety Precautions

Safety precautions throughout fabrication and erection shall comply with National Structural Steelwork Specification for Building Construction, and any other National and International codes and practices listed in the contract documents.

1.5 Site Co-ordination

The Steelwork Contractor shall liaise with the Engineering Contractor to co-ordinate his activities with those of other Contractors who may be involved with the main civil engineering contracts.

1.6 Site Levels

All data and temporary benchmarks used by the Steelwork Contractor in the execution of the Works shall be related back to the master setting out datum points for the Project.

1.7 Setting Out

The Steelwork Contractor shall be totally responsible for the correct and proper setting out of the steelwork and for the correctness of the positions, levels, dimensions and alignment of all parts of the works, and for the provision of all necessary associated instruments, appliances and labour.

2. DESIGN AND SUPPLY

2.1 Scope

This part of the specification governs the design and supply of structural steelwork.

2.2 Applicable Standards

All structural steelwork and connections designed by the Engineering Contractor shall conform to BS 5950-1:2000 and other codes and standards as listed in 1.3, or equivalent Chinese Standard GB50017-2003. T0

2.3 Standard Details

Details of flooring, stairways, handrailing, handrail standards, kick plates, access platforms and ladders shall comply with the standard details for the Project.

2.4 Bolted Connections

High strength bolts, 20 mm in diameter, to BS 3692:2001 or equivalent Chinese Standard GB/T1228 -1991, GB/T1228 -1991, shall be used for all bolted connections except as follows: T0

(a) For large structures, where use of 20 mm diameter high strength bolts would be impractical, larger diameter high strength bolts may be used.

(b) Bolted connections for ladders, handrail posts, stair stringers, stair

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treads, removable members, removable flooring, platform framing members 175 mm and under in size, purlins, side rails, and minor pipe support members that require not more than three bolts per connection, smaller bolts may be used. Minimum bolt size 12 mm diameter.

High-strength bolts shall be tightened by the "calibrated wrench pre-tensioning" method as per AISC 348 or in accordance with equivalent Chinese Standard GB50205-2001. T0

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2.5 General Arrangement Drawings

The Engineering Contractor will provide the Steelwork Contractor with general arrangement drawings and details of all connections and/or an electronic model showing the member sizes and locations.

2.6 Items Supplied by Steelwork Contractor

The Steelwork Contractor shall supply all items required for the fabrication of the structure.

The Steelwork Contractor shall NOT supply any anchor bolts or expansion bolts for attaching steelwork to foundations, unless specifically noted on the drawings. These bolts shall be supplied by the Civil Contractor.

Bolts required for site erection of steelwork shall be supplied with a minimum 5 percent wastage allowance for all types of fasteners.

The Steelwork Contractor shall provide bolts for connecting steelwork to clips on vessels and, when indicated on the general arrangement drawings, provide bolting and shims for attaching equipment to steelwork.

2.7 Detailing and Documentation of Structural Steel

2.7.1 General

The Steelwork Contractor shall review all fabrication drawings supplied by the Engineering Contractor. The steelwork Fabricator shall review these drawings for any omissions. Any omissions shall be notified to the Engineering Contractor.

When shipment can be expedited by the substitution of alternative sections, splicing members or built–up members for members shown on any drawing, each substitution shall be made only with the full knowledge and written consent of the Engineering Contractor.

2.7.2 Approval of Steelwork Contractor's Drawings (if required)

Where required the Engineering Contractor shall review and comment on any special drawings, erection plans and shop details submitted by the Steelwork Fabricator. The Engineering Contractor will not necessarily wish that fabrication is held pending his review, but the Steelwork Contractor should always confirm this before proceeding with fabrication.

The Engineering Contractor's review of the Steelwork Contractor's drawings is made primarily to ensure that the details shown are generally in accordance with the design requirements and any approval given shall not relieve the Steelwork Contractor of his responsibilities for the detailed correctness of his drawings. If mistakes are found on the Steelwork Contractor's drawings during the fabrication or erection periods, the cost of any modifications shall be borne by the Steelwork Contractor.

2.7.3 Drawings, Materials and Documentation (if required)

The following documentation shall be provided by the Steelwork Contractor (where required by the Contract) for planning, layout, installation, maintenance and record purposes (see also 2.7.2 above), with the exception of documentation detailed in paragraph (d) which shall be furnished by the Supplier of structural steel:

(a) Shop detailed drawings which show welding details, shop connection details, holes and penetrations in flooring.

(b) Erection diagrams showing the complete structures, welding details for field welds, field connection details, piece mark and name of the structure. Total weights of the fabricated structures shall be listed by section size. Total field weld lengths of each weld size and type (fillet or butt).

(c) Bolt summary and placement lists.

(d) "Mill test report" shall mean the original Manufacturer's mill test reports. Such reports shall state the specification to which the material complies, the heat, lot or melt number, the heat treatment (if any), the results of the chemical analysis and both mechanical and non-destructive tests.

(e) On completion of the steel erection one set of 'as erected' drawings.

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3. MATERIALS AND FABRICATION

3.1 Scope

This part of the Specification governs the shop detailing and fabrication of structural steelwork. This section should be read in conjunction with Section 2.

3.2 General

3.2.1 Applicable Standards

All structural steelwork shall be fabricated in accordance with the National Structural Steelwork Specification for Building Construction (NSSS) or equivalent Chinese Specification YB9254-95. A copy of the NSSS is available and shall be used for guidance only during detail design. T0

Where conflict exists between the Engineering Contractor's arrangement drawings and specifications, the drawings shall govern.

3.3 Materials

3.3.1 Steel Quality

All hot rolled sections shall be weldable structural steel in accordance with BS EN 10025:2004, Grade S275 JR or equivalent Chinese Standard GB700-88,Q235B. T0

The dimensions, form, weight tolerances of all structural rolled sections shall conform to BS 4-1:2005, BS EN 10056-1:999 for angles and BS EN 10055:1996 for rolled tees or equivalent Chinese Standard GB/T11263-2005,GB9787-88,GB9788-99,GB707-88. T0

3.3.2 Bolts

Carbon steel bolts and nuts shall be in accordance with BS 3692:2001 Grade 8.8 or equivalent Chinese StandardGB3077-99. T0

All bolts shall be hot dip galvanised in accordance with BS EN ISO 1461:1999 or equivalent Chinese StandardGB/T13912-2002. T0

3.3.3 Welding Consumables

Consumables for use in metal arc welding shall comply with BS EN 499:1995, BS EN 440:1995, BS EN 756:2004 and BS EN 758:1997 as appropriate or Chinese Standard GB/T5117-95,JGJ81-2002. T0

Electrodes will be packed, stored and protected from weather effects in

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accordance with the conditions specified by the Manufacturer.

3.3.4 Open Grid Type Flooring

Open grid type flooring shall be rectangular type galvanised welded steel grating as described on the drawings.

All flooring panels shall be banded with material of the same thickness as the main bars.

Stair and nosing treads shall be 25 mm deep steel grating with 5 mm thick bearing bars and chequered plate non-skid nosing.

All holes penetrations etc. shall be formed during fabrication. Site cutting shall not be permitted.

3.3.5 Solid Plate Flooring

Solid plate flooring shall be 6 mm thick on plain steel chequered floor plate unless otherwise noted on drawings with an elongated raised pattern arranged in a two way design. Flooring shall be painted in accordance with clause 3.5. 17 mm diameter drainage holes shall be provided approximately every 1.4 m^2 with at least one hole per plate.

All holes penetrations etc shall be formed during fabrication. Site cutting will not be permitted.

3.3.6 Handrailing

All handrailing shall be in accordance with the standard detail drawings for the Project.

3.4 Fabrication

3.4.1 General

The fabrication procedures to be adopted and the standard of workmanship shall be in accordance with the National Structural Steelwork Specification for Building Construction or equivalent Chinese standard YB9254-95 and this Specification. T0

3.4.2 Cutting

(a) Cold sawing shall be used when it is required to cut a section accurately to length, or where a rough edge might detract from the appearance of the structure. All burrs and arisses left after sawing shall be removed.

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(b) Gas flame cutting is permissible for the notching of beams and for edges of sections where these edges are to be butt-welded or machined after cutting. No over-cutting will be permitted; radius all notches. In all instances, flame cut edges shall be dressed to neat, free from oxide, clean finishes. Under no circumstances will compression surfaces be prepared using gas flame cut edges.

(c) Small angles and thin flats may be cut by cropping, providing the members are not distorted by such an operation.

(d) Bearing end compression butt joints for splices or base plates shall be milled so as to obtain whole area contact between the two mating surfaces.

(e) Stiffening angles or plates shall be accurately ground to fit.

(f) Transverse welds on plates or flanges in tension shall be avoided particularly in the case of structures subject to low temperature, vibration or dynamic loading.

3.4.3 Welding

Welding, consumables and arrangements will be in accordance with the T0 National Structural Steelwork Specification for Building Construction or equivalent Chinese Standards,GB50205-2001

All butt-welded joints shall have full penetration and be double-welded or single-welded using a backing strip.

All welding shall be executed by the manual shielded metal arc welding process, except that automatic welding or a combination of automatic and manual welding may be used subject to the Engineering Contractor's prior written approval and the following conditions:

(i) The automatic welding procedure shall be qualified using the same material, process, and type of equipment to be used for production. If the machine operator performing the production welding is not the same operator used in qualification of the procedure, he shall be qualified separately.

(ii) Welding starts and stops on all passes shall be held to a minimum. When starts and stops are unavoidable, each position shall be properly conditioned before proceeding with the adjacent welding. The use of starting and stopping plate is recommended.

Welding procedure for shop welded members with butt welds greater than 30 mm in thickness or with double fillet welds exceeding 22 mm leg dimensions

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shall be submitted to the Engineering Contractor for review and approval before the start of welding.

The following points shall be specifically noted:

(a) All weld metal to achieve the same mechanical properties as the parent metal.

(b) Fusion faces shall be free from cracks, notches, heavy scale, moisture, oil, paint or any other substance or irregularities that would impair the quality of the weld.

(c) For fillet welds, the two mating surfaces shall be in close contact with no gap exceeding 3 mm.

(d) Tack welds shall be not less than the throat thickness or leg length of the root run to be used within the joint, and shall be subject to the same welding conditions as those specified for the root run.

(e) For concave fillet welds, the throat thickness shall be not less than 0.7 times the specified leg length.

(f) Each weld run shall be cleaned before it is covered by a further weld run, particular attention being paid to the junctions between weld metal and the fusion faces. Visible defects, such as cracks, cavities and other deposition faults, shall be removed before the deposition of further weld metal. Where a process generates slag to protect the weld metal, this slag shall be removed from each weld run before a further run is superimposed.

3.4.4 Bolting

All holes shall be drilled accurately through all thicknesses of interconnecting plate in one operation and all burrs shall be removed. All site holes shall be drilled.

Washers shall be fitted under all nuts and where nuts or bolt heads bear on a tapered flange, tapered washers shall be used. Appropriate washers shall be fitted around oversize or slotted holes and at sliding connections.

The use of drift pins shall not cause distortion of components or enlargement of bolt holes.

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3.4.5 Camber

The amount of camber to be formed in long span members will be shown on the relevant drawings.

3.4.6 Ladders

Ladders with cages, safety gates, and top rails, hand-railing with top rail, mid-rail, toe-plate and posts and circular or trapezoidal platform shall be shop fabricated and shop assembled. Site welding is not permitted.

3.5 Corrosion Protection and Fireproofing

All structural steelwork, chequer plate flooring, ladders, cages, stairs and handrails shall be protected with the appropriate paint system and/or fireproofing.

The paint system shall be in accordance with the Zhangjiagang standard for painting and protective coatings, EMTN 09.061.000.

Fireproofing shall be in accordance with Specification 0136-STD-100020024, Fireproofing.

3.6 Marking of Structural Steel

3.6.1 General

Every piece of structural steel shall be clearly marked in order that its correct location in the works can be easily verified once installed. The marks shall be sufficiently raised or indented such that corrosion protection does not obscure them. Alternative systems to the one described below shall be submitted for the Engineering Contractor's approval.

3.6.2 Suggested Erection Marking System

The first letter of the mark shall be the prefix letter assigned to a particular structure and noted as such on the Steelwork Contractor's Arrangement Drawing. There shall be a dash between the first and second letters of the mark.

The second letters of the mark shall indicate the type of structural framing in accordance with the table below:

'B' - Rolled beams and channels

'MB' - Main Beam (beam between columns)

'C' - Column, post or strut not designated by a co-ordinate system

on the Arrangement Drawing

'VB' - Vertical bracing or skewed bracing

'F' - Frames shipped in one piece

'G' - Sheeting rails

'H' - Hangers

'K' - Loose Gussets

'L' - Ladders, Safety Cages or Lintels

'M' - Bolsters, Shims and Miscellaneous Materials

'P' - Floorplates, Plain, Chequer or Grating

'R' - Handrail and Rail Posts

'S' - Sag Rods

'T' - Trusses

'HB' - Horizontal Bracing

'BK' - Loose Baseplates or Bearing Plates

'PG' - Plate Girders

'SS' - Stair Stringers

'TB' - Runway Beams

Beam marks shall be positioned on beams at the same end as they are shown on the plan view of the Steelwork Contractor's framing plan.

All unsymmetrical beams, girders or trusses shall have a direction identified on one end, preferably north or east.

All members to be marked "top" where possibility of erecting the member in an inverted position exists.

All columns to have the mark stamped on the outside face of the flange and marked "north" or "east". Column marks shall carry a tier suffix for spliced columns.

On vertical bracing the mark shall be stamped on the lower end.

Where a member is shipped in two or more pieces each piece shall have a

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different mark.

The use of R or L suffixes for opposite hand marks will not be permitted.

Hard stamping shall be used to identify members unless otherwise specified by the Engineering Contractor.

All rods, turnbuckles, clevises etc., are to be tagged and marked with the tag wired firmly to the member.

All bolts, washers, etc., shall be shipped in kegs or crates and tagged or clearly marked as to size, diameter and length.

Galvanised members shall be tagged with a metal plate having raised letters so that the mark shall be visible after galvanising.

The Steelwork Contractor may submit an alternative proposal for marking galvanised members, subject to written approval of the Engineering Contractor.

3.7 Inspection

The Steelwork Contractor shall have as part of his usual business practice an established routine quality control programme that can ensure that all variables affecting the requirements for reliability have been considered, evaluated and controlled. All records shall be made available to the Engineering Contractor for inspection.

Every facility shall be given to the Engineering Contractor to visit the Steelwork Contractor's works and to inspect the steelwork during all stages of the preparation and fabrication and during any trial assemblies.

Any work that is considered not to be in keeping with this specification or with recognised good practice shall be corrected at the Steelwork Contractor's expense.

Inspection by the Engineering Contractor shall not relieve the Steelwork Contractor of his stated responsibilities or his liability for rectifying any defects that may subsequently appear or be found during or after erection.

The Steelwork Contractor shall allow access to the Engineering Contractor for the purposes of inspection of any stage of the corrosion protection process.

The Engineering Contractor reserves the right to inspect steelwork prior to shipment from the Steelwork Contractor's shop. The Steelwork Contractor shall notify the Engineering Contractor ten days prior to shipment to allow for any inspection.

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4. SHIPMENT AND ERECTION

4.1 Scope

This part of the specification governs the shipment of structural steelwork to, and its erection at the site.

4.2 Shipment

- Steelwork shall be shop assembled into units and shipped in as large sections as permitted by transportation limitations to minimise site erection activities.

- All shipments, including partial shipments, shall be accompanied by sufficient bolts or connectors of the proper size and length to suit the material shipped.

4.3 Unloading and Storage

The Steelwork Contractor shall store materials at site as specified or as directed by the Engineering Contractor. The Steelwork Contractor should ensure that steelwork delivery to site does not interfere with the work of other Steelwork Contractors.

The Steelwork Contractor is to unload in a manner that shall not cause damage or distortion to the steelwork and its corrosion protection, and shall store and protect it on site awaiting erection in such a manner as shall not cause any damage or distortion. Any such damage shall be made good by the Steelwork Contractor at his own cost and to the satisfaction of the Engineering Contractor. The Engineering Contractor shall direct whether such making good shall be carried out at the site or elsewhere.

4.4 Supervision

The Steelwork Contractor shall have suitably qualified staff available on site during all working hours. The Steelwork Contractor shall also have available for reference by the Engineering Contractor and others a complete set of current drawings relating to the steelwork and other instructions which have been issued subsequently.

4.5 Erection

4.5.1 General

All work to be in accordance with the National Structural Steelwork Specification for Building Construction (or equivalent Chinese Standard GB50205-2001) and this specification. T0

The Steelwork Contractor shall supply all plant, labour, materials and access platforming to enable the structural steelwork to be erected in a safe and workmanlike manner. All erection practices shall be reviewed and approved by the Engineering Contractor.

Any protective coating damage resulting during the course of steelwork erection shall be made good at the Steelwork Contractor's cost.

The Steelwork Contractor shall also corrosion protect all field connections to the same procedure.

Erected structures shall only be considered completed when approved by the Engineering Contractor in writing.

4.5.2 Erection Practices

All erection practices shall be reviewed and approved by the Engineering Contractor but shall be in accordance with the National Structural Steelwork Specification for Building Structures or equivalent Chinese Standard GB50205-2001. T0

4.5.3 Plant and Equipment

All plant and equipment used in the erection of the steelwork shall be suitable in all respects to carry out the works to the satisfaction of the Engineering Contractor.

All lifting and other equipment used for the erection shall comply in every respect with current regulations and kept in compliance with all registers. Registers shall be made available for inspection by the Engineering Contractor.

4.5.4 Stability During Erection

The Steelwork Contractor shall supply, erect and remove all temporary works used to ensure the stability of the structure during erection. The Steelwork Contractor shall ensure that erection methods do not apply forces that the steelwork is not designed for, particularly when relying upon baseplate rigidity for stability of temporarily free-standing columns.

4.5.5 Foundations

Before commencing the erection of the steelwork, the Steelwork Contractor

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shall ensure that the foundations are in a suitable condition to receive the steelwork. Any damage to the foundations caused during erection shall be made good to the Engineering Contractor's satisfaction.

The Steelwork Contractor shall inspect anchor bolts and foundations for line and level before erection commences and in ample time to allow any corrections to be carried out, and shall advise the Engineering Contractor of any apparent discrepancy from the foundation drawings.

4.5.6 Packing and Grouting

The Steelwork Contractor shall provide and place all steel packing and wedges required to level and plumb the structure.

The grouting of HD bolts and base plates will be by others.

4.5.7 Runway Beams and Lifting Beams

The Steelwork Contractor shall arrange for all runway and lifting beams to be tested after erection. The testing shall be carried out by an approved Steelwork Contractor and witnessed by a recognised authority. Test certificates and reports shall be submitted to the Engineering Contractor.

The safe working load shall be plainly and permanently marked on both sides of the runway beam so as to be clearly visible to the operator.

4.5.8 Accuracy of Erected Steelwork

Permitted deviations in erected steelwork shall be in accordance with the National Structural Steelwork Specification for Building Construction or equivalent Chinese Standard GB50205-2001 T0

5. HOLDS

None.

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GB/T1591-94 Low Alloy Structural Steel

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JSJT90 Staircase Handrail for Platforms

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