

SECTION - V
STRUCTURAL STEEL WORK

1.0 GENERAL

1.1 Description

This section covers the requirements for providing fabrication, erection and placing of structural steel work for building construction including temporary supports and all other work as required for structural steel construction.

1.2 Applicable Codes and Standards

The codes and standard generally applicable to the work of this section is listed hereinafter.

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| (1) | IS 210 | Grey iron castings |
| (2) | IS 226 | Structural steel (Standard quality) |
| (3) | IS 451 | Technical supply conditions for wood screws |
| (4) | IS 800 | Code of Practice for use of structural steel in general building construction. |
| (5) | IS 801 | Code of practice for use of cold formed light gauge steel structural members in general building construction. |
| (6) | IS 803 | Code of practice for design, fabrication and erection to vertical mild steel cylindrical welded storage tanks. |
| (7) | IS 806 | Code of Practice for use of steel tubes in general building construction. |
| (8) | IS 808 | Dimension for hot rolled steel sections. |
| (9) | IS 813 | Scheme of symbols for welding. |
| (10) | IS 814 | Covered electrodes for metal arc welding of (Part I & II) structural steel. |
| (11) | IS 816 | Code of practice for use of metal arc welding and general construction in mild steel. |
| (12) | IS 822 | Code of Practice for inspection of welds. |
| (13) | IS 961 | Structural steel (high tensile) |
| (14) | IS 1024 | Code of practice for use of welding in bridges and structures subject to dynamic loads. |
| (15) | IS 1030 | Carbon Steel casting for general engineering purpose. |
| (16) | IS 1120 | Coach Screws. |

(17)	IS 1149	Specification for light tensile steel rivet, bars for structural purposes.
(18)	IS 1161	Steel tubes for structural purposes.
(19)	IS 1182	Recommended practice for Radiograph examination of fusion welded butt joints in steel plates.
(20)	IS 1200	Method of measurement in Building Civil Engineering work.
(21)	IS 1239	Mild steel tubes, tubulars and other wrought steel fittings
	Part I	Mild Steel
	Part II	Mild steel tubulars and other wrought sheet pipe fittings.
(22)	IS 1363	Black hexagonal bolts, nut and black hexagon screws product of Grade C (size range M25 to M64) (Part 1 to 3).
(23)	IS 1365	Slotted counter sunk screws.
(24)	IS 1367	Technical supply conditions for threaded fasteners.
(25)	IS 1477	Code of practice for painting of (Part I and II) ferrous metal in buildings.
(26)	IS 1852	Rolling and cutting tolerances for hot rolled steel products.
(27)	IS 1915	Code of Practice for steel bridges.
(28)	IS 1977	Structural steel (ordinary quality)
(29)	IS 2016	Plain washer.
(30)	IS 2062	Structural steel (fusion welding quality)
(31)	IS 2079	Ready mix paint, air drying, red oxide zinc chrome and priming.
(32)	IS 2595	Code of practice for Radiographic testing.
(33)	IS 3063	Single coiled rectangular section spring warms for bolts, nut and screws.
(34)	IS 3443	Crane rail sections.
(35)	IS 3600	Code of practice for testing of fusion welded (Part-I) joints and weld metal in steel
(36)	IS 3658	Code o f practice for liquid penetrant
(37)	IS 3757	Specification for High Tensile Friction grip bolts
(38)	IS 4000	High strength bolts in steel structures Code of practice.

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| (39) | IS 4923 | Hollow steel sections for structural use. |
| (40) | IS 5334 | Code of practice for magnetic particle flaw detection of welds. |
| (41) | IS 5369 | General requirements for plain washer and lock washers. |
| (42) | IS 5372 | Taper washers for channels. |
| (43) | IS 5374 | Taper washers for I beam |
| (44) | IS 5624 | Specification for foundation bolts. |
| (45) | IS 6227 | Code of practice for use of metal arc welding in tubular structure. |
| (46) | IS 6610 | Heavy washers for steel structures. |
| (47) | IS 7215 | Tolerances for fabrication of steel structures. |
| (48) | IS 8500 | Structural steel- Micro alloyed (medium and high strength qualities) |
| (49) | IS 9595 | Recommendations for metal arc welding of carbon and carbon manganese steel. |

2.0 SUBMITTALS

2.1 Material Report

Prior to start of delivery of structural steel required for contractor shall submit the following to the Architect for review.

- a) Certified copies of mill test reports including chemical analysis and physical properties as required by the applicable Indian Standards for each consignment of steel.
- b) Where such mill certificates are not available or if the Architects feels it necessary to substantiate conformance of the mill test reports, the contractor shall employ an approved testing laboratory to perform the required tests and chemical analysis at his own cost.

2.2 Shop Drawings

Before commencement of any structural steel fabrication work, the contractor shall submit the following to the Architect for his approval:

- a) Fabrication drawings including details of connections.
- b) Assembly, erection and installation drawings and manuals indicating the sequence of work, welding and bolting procedure to be used. Cambers for trusses and large span girders shall be shown.
- c) For composite construction the details and calculation of details and calculation of false work and forms supporting the concrete work in steel structure shall be submitted.
- d) The drawings prepared by the contractor and all subsequent revisions etc. shall be at the cost of contractor for which no separate payment will be made.

3.0 MATERIALS

3.1 Structural Steel

3.1.1 Structural steel used in the works other than steel in reinforced concrete, rails and fastenings shall be either of the following type :

- a) Mild steel conforming to IS : 226 - "Structural Steel (Standard quality)" or IS : 2062 - "Structural Steel (fusion welding quality)" whichever is approved.
- b) Whenever high tensile steel is specified it shall be conforming to IS : 961 - "Structural steel (High Tensile)".
- c) All steel tubes shall be hot finished seamless steel tubes (HFS) of the specified strength and as approved by the Architect and shall conform to IS : 1161. Tubes made by other processes and which have been subjected to cold working, shall be regarded as hot finished if they have been subsequently been heat treated and are supplied in the normalised condition,

3.2 Threaded Fasteners

3.2.1 All bolts and nuts shall comply with IS : 1367.

3.2.2 Black bolts, nuts and screws shall be In accordance with IS : 1363.

3.2.3 Wherever counter sunk screws are specified, they shall be precision grade, slotted, counter sunk head, machine screws conforming to type 'R' of IS : 1364.

3.2.4 Wherever high tensile special quality bolts and nuts are specified, they shall comply with provision of IS : 800.

3.2.5 Coach screws shall be in accordance with IS : 1120 and wood screws shall conform IS : 451.

3.2.6 All plain washers shall conform to requirements of IS : 2016. Wherever spring washers for bolts, nuts and screws are specified, they shall be in accordance with the provision of IS: 3003.

3.3 Cast Iron

Cast iron shall be conforming to IS : 210. All cast iron goods shall be of best quality and make and as approved by Architect.

3.4 Cast steel shall be conforming to IS : 1030. Unless specified otherwise, the steel shall be grade 2 and shall cater or all tests specified in the said standard.

3.5 Rails for the cranes shall comply with the requirements of IRST-12-64 or IS : 3443 if so instructed by the Architect. They shall be obtained form an approved manufacturer.

3.6 Electrodes

Electrodes used for metal arc welding of mild steel shall be heavy coated type electrodes conforming to IS : 814 (Part I& II and shall be of best quality approved by the Architect.

4.0 HANDLING & STORAGE

- 4.1 Structural steel shall be stored out of mud and dirt and proper drainage of the storage area shall be provided. Protect from damage or spoiling by adjacent construction operations.
- 4.2 Fabricated steel shall not be handled until the paint has thoroughly dried. Care shall be taken to avoid paint abrasions and other damager. Steel work shall be transported in the largest practical lengths and in such a way as not to overstress the fabricated sections. All pieces bent or otherwise damaged shall be replaced by the Contractor at his own cost.
- 4.3 Storage of fabricated steel at the job site shall be the responsibility of the Contractor. Material shall be stored at the Job site in a manner which does not overload the existing or newly constructed structures. Materials shall be protected against excessive deflection, corrosion or deterioration.
- 4.4 As far as practicable, stacking of fabricated steel shall be done in sequence of erection. But heavy members shall not be stacked on top of the light ones.

5.0 FABRICATION

5.1 Shop Drawings

- 5.1.1 The Contractor shall prepare required detailed shop drawings giving complete information necessary for the fabrication of the structure. All information should be clearly given and the drawings shall be in conformity with the best modern practice. A marking diagram allotting distinct identification marks to each separate piece of steel work shall be prepared in sufficient detail to ensure convenient assembly and erection. Symbol's used for welding in the drawings shall be in accordance with IS: 813.

- 5.1.2 The Contractors shall prepare comprehensive details of material sheets for each shop drawings giving therein all the items shown on the drawings together with their weights, marks, numbers, cutting lengths etc. Three copies of all working drawing and bill of material sheets shall be submitted to the Architect for approval. Fabrication shall not commence until the approval of the relevant drawings has been obtained from the Architect. While the shop drawings prepared by the Contractor and approved by the Architect are deemed to represent the correct interpretation of the work to be done, the Contractor is not relieved of the responsibility for accuracy of detailed dimensions shown thereon.

5.2 Templates

All fabrication shall be in accordance with IS : 800 and IS: 1915. Extensive use of templates shall be made. The templates shall be steel bushed were considered necessary by the Architect.

- 5.2.1 In case actual members are used as templates for similar pieces, it will be at discretion of the Architect to decide whether such pieces are fit to be incorporated in the finished structure. The Contractor shall arrange for corresponding part of each unit manufactured from the same drawings to be interchangeable as far as economic manufacturing conditions permit and

shall advise the Architect of the precise arrangement made in this respect, but prior approval of the Architect in writing should be taken.

5.3 Straightening

All materials shall be straight unless required to be of curvilinear form and shall be free from twists. If necessary, the materials shall be straightened and/or flattened by pressure. Heating of rolled sections and plates for purpose of straightening will not be permitted. Limited straightening may however be affected by local application of heat with a gas torch, but prior approval of the Architect, in writing, should be taken.

5.4 Cutting

5.4.1 Gas Cutting shall normally be permitted for mild steel only. Gas cutting of high tensile steel may be permitted provided special care is taken to leave sufficient metal to be removed by machining so that no metal that has been hardened by flame is removed. Gas cutting shall preferably be done by machine, Hand flame cutting; may only be permitted subject to the approval of the Architect. Gas cut edges shall be free of gouge. Any gouges that remain after cutting shall be removed by grinding.

5.4.2 Rolled sections shall be sawed or flame cut to length. Small plate pieces the gussets may be sheathed or chopped to size. Sawing, shearing and chopping shall be clean and free from any distortion. If necessary, the edges shall be ground afterwards.

5.4.3 For tubular construction cutting of the pipe and preparation of joint surface shall be done in a neat manner for a good fit up. The ends of the tubes may be flattened or otherwise framed for connections provided that the methods adopted for such flattening do not injure the material. The change of section shall be gradual.

5.5 Holing

5.5.1 Holes shall preferably be done by drilling. Punching shall not be restored to unless previously approved by the Architect. In any case, punching of holes in materials having a thickness in excess of the connector diameter or in the materials thicker than 16mm shall not be permitted. Where punching is permitted the holes shall be punched 3 mm less in diameter than the required size and reamed after assembly to the full size.

5.5.2 Holes shall be drilled or punched at right angles to surface of the member, not more than 1.5 mm/2.0 mm (as the case may be depending upon whether the connector diameter is less than or more than 25 mm) larger than the connector diameter. Holes shall not be formed or enlarged by burning or gas cutting. Holes shall be clean-cut without torn or ragged edges. Outside burrs resulting from drilling operations shall be removed.

5.5.3 Holes through more than one thickness of material of members such as compound stanchions and girder flanges shall be drilled after the members are assembled and tightly clamped or bolted together. They shall then be separated, and burrs removed if so directed by the Architect.

5.5.4 Steel members adjustment shall be provided with slotted holes as shown on the drawings. Suitable templates shall be used for proper location of the holes.

5.6 Fabrication Tolerances

Unless otherwise shown on the drawings, the fabricating tolerances shall generally be as follows :

- a) Compression members shall not deviate from straightness by more than $1/1000$ of the axial length between points which are to be laterally supported.
- b) A variation of 1 mm is permissible in the overall length of members with both ends finished for contact bearing,

Members without ends finished for contact bearing which are to be framed together in parts of the structure, may have a variation from the detailed length not greater than 2mm for members 10 metres or less in length and not greater than 3 mm for members over 10 metres in length.

6.0 ASSEMBLY

6.1 All connections shall be either bolted or welded as shown on the drawings. Contractor shall not redesign or alter any connection without prior approval Architects.

The component parts shall be assembled in such a manner that they are neither twisted nor otherwise damaged and shall be prepared so that the specified camber if any is provided. Drafting done during assembly shall not distort the metal or enlarge the holes. Poor matching of holes shall be cause of rejection. However, if permitted by the Architect, holes that must be enlarged due to mismatching shall be reamed.

6.2 Bolting

6.2.1 All steel work which bolted together shall be in close contact over the whole surface. Where two bolted surfaces are to be in permanent contact after assembly, each shall be thoroughly scrapped free of loose scales, dirt and burrs and a heavy coat of red oxide, zinc chrome or other approved paint applied after cleaning and drying.

All bolts shall be provided with washers under the nut tapered on the inside of the flanges of R.S. Joists and channels. Bolts and studs shall project not less than one full thread through the nut after tightening. Unless otherwise specified, the ends of the bolts shall be burred after erection to prevent the removal of nuts.

6.2.2 High strength bolts shall be used in bearing or friction as shown on the drawings.

High strength bolted joints shall be made without the use of erection bolts. Bolts shall be of a strength that will extend not less than 6 mm beyond the nuts. Bolts shall be entered into holes without damaging the thread-members shall be brought tightly together with sufficient high-strength fitting up bolts which shall be retightened as all the bolts are finally

tightened. Bolts heads shall be protected from damage during placing. Bolts that have been completely tightened shall be marked for identification. Bolted parts shall fit solidly together and shall not be separated by interposed compressible materials. The contact surface in high strength bolted connections shall be free of oil, paints, lacquer, loose scale or other coatings. The facing surfaces shall be machined flat. Final tightening of high strength bolts shall be by turn-of-nut method. Retightening shall not be permitted. Whenever the Contractor intends to use other means of tightening he shall obtain prior approval of the Architect.

6.2.3 Anchor bolts shall be set by use of templates secured firmly in place to permit true positioning of the bearing plates and assemblies. When in drawings anchor bolts are shown to be installed in sleeves, the sleeves shall be completely filled with grout.

6.3 Welding shall be done in accordance with IS : 816.

6.3.1 Welding procedures shall be based on the specific analysis of any given heat of steel (based on the certified mill test reports) and shall be subject to the review of the Architect.

These procedures shall call for one or all of the following

- a) Proper bead shape.
- b) Minimized penetration to prevent dilution of the weld metal with the alloy elements.
- c) Preheating, controlled inter-pass temperature and controlled heat input.

6.3.2 Welding shall be performed only by qualified and tested welders specifically trained and experienced for the type of job required to execute the welding work to the complete satisfaction of the Architect. However periodical testing of welders shall be done as per IS 817, IS 7310 (Part I) and IS 738 (Part I).

6.3.3 Use of standard weld symbols as adopted by IS : 813 is mandatory. Pre-qualified joints which are detailed, prepared and welded in accordance with the requirement of IS : 816 shall be invariably used.

6.3.4 Structural welding shall not commence until joint elements are bolted or tacked in intimate contact and adjusted to dimensions shown with allowance for any weld shrinkage that is expected. Welding sequence shall be planned and controlled to minimise undue stress increase or undue distortions in restrained members. Heavy sections and those having a high degree of restraint shall be welded with low hydrogen type electrodes.

6.3.5 If copper wire spacers are used between two surfaces to be welded to reduce transverse stresses in the weld, care shall be taken that it does not mix with the weld metal.

6.3.6 Concave bead shape shall be avoided. Ratio of weld width to weld depth shall preferably vary from a minimum of 1 to 1, to a maximum of 1.4 to 1.

$$\frac{\text{width-of-weld}}{\text{depth of fusion}} = 1 \text{ to } 1.4$$

- 6.3.7 Field welding shall not be permitted unless shown on the drawings.
- 6.3.8 Subsequent to fabrication, the overlapping or contacting surfaces, or other closed sections (such as tubular, box section) which are inaccessible to painting shall be seal welded. When the end of the tube is not automatically sealed by virtue of its connection by welding to another member the end shall be properly and completely sealed. Before sealing, the inside of the tube shall be made dry and free from loose scale.
- 6.3.9 Order of assembly of the tubular sections shall consist of welding the tensile member to the main member first. Compression members shall be cut back to overlap the tensile member and then welded to both of these members.
- 6.3.10 No welding shall be done when the surface of the member is wet nor during periods of high wind. No welding shall be done on base metal at a temperature below -5°C . Base metal shall be preheated to the temperature as per relevant IS codes.
- 6.3.11 Each layer of multiple layer weld except root and surfaces runs may be moderately peened with light blows from blunt tool. Due care should be taken to prevent scaling or flaking of weld and base metal from over peening.
- 6.3.12 Electrodes other than low-hydrogen electrodes shall not be permitted for thicknesses of 32 mm and above.
- 6.4 Inspection of welds
- All welds shall be inspected for flaws by any of the methods given in clause 7. The choice of method shall be determined by Architect.
- 6.5 Tolerances
- The dimensional and weight tolerances for rolled shapes shall be in accordance with IS 1852 for indigenous steel and equivalent applicable codes for imported steel. The tolerance for fabrication of structural steel shall be as per IS 7215.
- 6.6 End milling
- Where compression joints are specified to be designed for bearing, the bearing surfaces shall be milled true and square to ensure proper bearing and alignment.

7.0 INSPECTION

- 7.1 The contractor shall give due notice to the Architect in advance of the work getting ready for inspection. All rejected material shall be promptly removed from the site.
- 7.2 No materials shall be painted or erected or despatched to site without inspection and approval by the Architect.
- 7.3 The Contractor shall provide all the testing and inspection services and facilities for shop works except where otherwise specified.
- 7.4 For fabrication work carried out at site, the same standard of supervision and quality control shall be maintained, and inspection and testing shall be conducted in a manner satisfactory to Architect.

- 7.5 Testing of welds
- 7.5.1 Magnetic particle test
- Welds are to be tested in accordance with relevant IS codes. If heat treatment is performed, the completed weld shall be examined after heat treatment. All defects shall be repaired and retested. Magnetic particle test shall be carried out using alternating current. Direct current may be used with the permission of Architect.
- 7.5.2 Liquid penetrate inspection
- These tests shall be carried out as per IS codes. All defects shown shall be repaired and rechecked.
- 7.5.3 Radiographic Inspection
- All full-strength butt weld shall be radiographed in accordance with the recommended practice from radiographic testing as per relevant IS codes.
- 7.6 Test failure
- In event of failure of any member to satisfy inspection or test requirement, the contractor shall notify the same to Architect. Before repairing contractor shall obtain permission from Architect. The quality control procedures to be followed to ensure satisfactory repairs subject to approval of Architect.
- 7.7 The contractor shall maintain records in all inspection and testing which shall be made available to the Architect as and when required.
- 8.0 SHOP ERECTION**
- 8.1 Steel work shall be temporarily shop erected completely or partially as directed by the Architects so that the accuracy of fit may be checked before despatch. Due notice shall be given to the Architects so that the accuracy of fit may be checked before despatch. Due notice shall be given to the Architects when the work is ready for inspection and the assembly shall not be dismantled until it has been inspected and approval obtained.
- 8.2 The parts shall be assembled with a sufficient number of parallel drifts to bring and keep the components in place. In the case of parts drilled or punched through steel jigs resulting in similar parts being interchangeable for portion of the steel work, trial assembly shall be carried out to the extent required by IS : 1915.
- 8.3 All erection marks shall be die-stamped and also distinctly stenciled in paints. The marking shall be as per the marking diagram approved by the Architects.
- 9.0 ERECTION**
- 9.1 As far as possible, the Contractor shall deliver the fabricated steel work to the site in the same sequence as that which he wishes to follow for the erection. Despatch should be scheduled to avoid cluttering up of the site. The bolts required for erection shall be bagged according to size prior to despatch.

- 9.2 All structural work shall be erected in accordance with IS : 800/IS : 806 and IS : 1915 and as per the approved erection drawings. The Contractor shall be responsible for setting out the works. The suitability any capacity of all plant and equipment used for erection shall be to the Satisfaction Architects. These shall be regularly serviced and maintained. Occupational safety practices shall be strictly adhered to and shall be to the satisfaction of the Architects.
- 9.3 Individual pieces shall plumbed, leveled and aligned. Drift pins may be used only to bring together the several parts. They shall not be used in such manner as to distorter damage the metal. Temporary bracing, guyline and staging shall be provided to ensure proper alignment and to adequately protect all persons property and to withstand all loadings to which the structure may be subjected during erection.
- Attachment of such temporary steel work to the permanent steel work shall only be done with the approval of the Architects. Temporary steel work shall remain in position until the structure is stable and self-supporting and until the structure is stable and self-supporting and permanently bolted or welded to the satisfaction of the Architects. After removal of temporary steel work, the permanent structure shall be made good to the complete satisfaction of the Architects.
- No permanent bolting or welding shall be done until proper alignment has been obtained. Erection of the parts with any moderate amount of reaming, chipping or cutting shall be immediate reported to the Architects. The steel work shall be rejected unless corrective action is approved by the Architects.
- 9.4 No erection shall be permitted more than 2 story above a complete bolted and/ or welded floor or above a decked surface.
- 9.5 Placement of joists shall not start until the supporting work is secured. Temporary bridging, connections and anchors shall be provided to assure lateral stability during erection. Bridging to steel joists shall be installed immediately after joist erection, before any construction loads are applied. Horizontal or vertical bridging shall be provided in accordance with the type of span of the joists. Ends of the bridging lines shall be anchored at top mid bottom chords whom terminating to walls or beams.
- 9.6 Erection Tolerances
- The Contractor shall control the erection of steel structures in such a way that in level no components are more than 10mm out of their correct position nor shall the lines of the structure depart from straightness and plumb by more than a 3mm in metres. The error shall be measured from the designed position of level given by the dimensions and co-ordinates on the drawings.
- In structures where movements due to temperature change considerable the deviations listed above will apply at the morning position of the member being checked.

10.0 FILLED MODIFICATION

Correction to accommodate minor misfits in steel structure by moderate use of drift pins and reaming will be permitted. Errors that cannot be corrected by these measures, but require modifications must be reported immediately to the Architect alongwith Contractors proposed solution.

11.0 GROUTING UNDER BASE PLATES

Grouting under base plates shall be done after erection of the structural steel unless otherwise approved by the Architects. All bearing plates, bearing assemblies and masonry plates shall be steel level and to the elevations shown on plans. These shall be shimmed with approved means and grouted to assure full bearings on the supporting substrata regardless of the tolerances otherwise permitted.

11.1 The grout to be used in superstructure stanchion bases shall be cement mortar 1 : 2 (1 cement : 2 coarse sand) and shall have a 28 days compressive strength of atleast 300 kg/sqm. The surface which are to receive the grout shall be thoroughly cleaned immediately prior to the grouting operation. The grout shall be carefully worked under the base plates and shall completely fill the space under the base plates. Air pockets in the grout packing shall be avoided.

11.2 After the grout has had its initial set, the grout shall be cut back flush with the base plate and the surplus grout shall, be removed. Before leaving the site the Contractor shall retighten the nuts of all anchor bolts.

12.0 CLEANING & PAINT TOUCHING

After erection, exposed surfaces of filed connections, unpainted areas adjacent to tie connections and damaged area in the shop coat shall be cleaned to the same standards required or the shop cost. These shall then be painted with the same used in the shop coat.

13.0 INSERTS & EMBEDMENTS

Various steel inserts and embedment are required under the Contract to be fabricated, positioned and secured firmly into place inside the formwork prior to concrete being poured. There are also requirements of jointing, threading, bolting and welding inserts and embedment of different concrete and structural steel elements in order to establish structural continuity and connection. Great care shall be exercised by the Contractor in executing all aspects of the work related to inserts and embedment - including tolerances so that the final assembly of the concrete elements can meet satisfactorily the continuity and contiguity requirements intended in the structure.

The payment for the inserts and embedment shall be based on the weight of the fabricated puce at the same rate as that applicable to structural steel. The said rate shall be deemed to include supply of materials (Including rounds/bars), labour and all works related to steel inserts and embedments indicated in this specification.

14.0 MODE OF MEASUREMENT

- 14.1 For purpose of payment, the weight of the actual completed structures shall be calculated from the approved drawings for different items of work. The contractor shall submit to the Architect relevant material list containing weight of each item.
- 14.2 No allowances will be permitted for bolts, nuts, washers, studs, screws etc., galvanizing, welding or for rolling margins. One tonne for the purpose of payment shall mean One Metric Tonne i.e. 1000 Kg.
- 14.3 The weight of members made out of standard rolled section such as beams, channels, angles etc. shall be based on standard IS 808; without deducting for holes, notches, bevels cut etc. Where a component consists of a cut joists or channels, the full weight of the rolled section shall be considered only if more than half the section is used. Otherwise, only half the section unit weight shall be considered for calculation of the weight of the components.

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