SECTION 7

WORKMANSHIP - ACCURACY OF FABRICATION

7.1 PERMITTED DEVIATIONS
Permitted deviations in cross section, length, straightness, flatness, cutting, holing and position of fittings shall be as specified in 7.2 to 7.5 below.

7.2 PERMITTED DEVIATIONS FOR ROLLED COMPONENTS AFTER FABRICATION (Δ)
(including structural hollow sections)

7.2.1 Cross section after fabrication
In accordance with the appropriate tolerances standard given in Table 2.1

7.2.2 Squareness of ends not prepared for bearing
Note: See also 4.3.3

7.2.3 Squareness of ends prepared for bearing
Prepare ends with respect to the longitudinal axis of the member.
Note: See also 4.3.3

7.2.4 Straightness on both axes
Generally Δ = L/1000 or 3mm whichever is greater.
For components fabricated from structural hollow sections Δ = L/500 or 3mm whichever is greater.
7.2.5 Length
Length after cutting, measured on the centre line of the section or on the corner of angles.

7.2.6 Curved or cambered
Deviation from intended curve or camber at mid-length of curved portion when measured with web horizontal.
Deviation = L/1000 or 6mm whichever is greater.

7.3 PERMITTED DEVIATIONS FOR ELEMENTS OF FABRICATED COMPONENTS (Δ)

7.3.1 Position of fittings
The deviation from the intended position relative to the setting-out point on the primary member shall not exceed Δ.
Fittings and attachments whose location is critical to the force path in the structure:
Δ = 3mm
Other fittings and attachments: Δ = 5mm

7.3.2 Alignment of fittings
Angular deviation Ø relative to intended local orientation.

7.3.3 Position of holes
The deviation from the intended position of an isolated hole, also within a group of holes, the relative position to each other shall not exceed Δ

7.3.4 Punched holes
The distortion caused by a punched hole shall not exceed Δ
Δ = D/10 or 1mm whichever is greater.
7.3.5 Sheared or cropped edges of plates or angles
The deviation from a 90° edge shall not exceed $\Delta$
$\Delta = l/10$ up to a maximum of 3mm.

7.3.6 Flatness
Where full contact bearing is specified, the flatness shall be such that when measured against a straight edge not exceeding one metre long, which is laid against the full bearing surface in any direction, the gap does not exceed $\Delta$.

7.4 PERMITTED DEVIATIONS FOR PLATE GIRDER SECTIONS ($\Delta$)

7.4.1 Depth
Depth on centre line.

7.4.2 Flange width
Width of $B_w$ or $B_h$.

7.4.3 Squareness of section
Out of squareness of flanges.
$\Delta = B/100$ or 3mm whichever is greater.

7.4.4 Web eccentricity
Position of web from edge of flange.
7.4.5 Flanges
Out of flatness.

7.4.6 Top flange of crane girder
Out of flatness where the rail seats.

7.4.7 Length
Length on centre line.

7.4.8 Flange straightness
Straightness of individual flanges.

7.4.9 Curved or cambered
Deviation from intended curve or camber at mid-length of curved portion when measured with the web horizontal.
Deviation = L/1000 or 6mm whichever is greater.

7.4.10 Web distortion
Distortion on web depth or gauge length.
Δ = d/150 or 3mm whichever is greater.

7.4.11 Cross section at bearings
Squareness of flanges to web.
Δ = D/300 or 3mm whichever is greater.
7.4.12 **Web stiffeners**
Straightness of stiffener out of plane with web after welding.

$$\Delta = \frac{d}{500} \text{ or } 3\text{mm whichever is greater}$$

7.4.13 **Web stiffeners**
Straightness of stiffener in plane with web after welding.

$$\Delta = \frac{d}{250} \text{ or } 3\text{mm whichever is greater}$$

7.5 **PERMITTED DEVIATIONS FOR BOX SECTIONS ($\Delta$)**

7.5.1 **Plate widths**
Width of $B_f$ or $B_w$.

- $B_f$ or $B_w < 300\text{mm}$
  $$\Delta = 3\text{mm}$$
- $B_f$ or $B_w \geq 300\text{mm}$
  $$\Delta = 5\text{mm}$$

7.5.2 **Squareness**
Squareness at diaphragm positions.

$$\Delta = \frac{D}{300}$$

7.5.3 **Plate distortion**
Distortion on width or gauge length.

$$w \text{ Gauge length} = \text{width}$$

$$\Delta = \frac{w}{150} \text{ or } 3\text{mm whichever is greater}$$
7.5.4 Web or flange straightness
Straightness of individual web or flanges.

\[ \Delta = \frac{L}{1000} \text{ or } 3 \text{mm whichever is greater} \]

7.5.5 Web stiffeners
Straightness in plane with plate after welding.

\[ \Delta = \frac{d}{500} \text{ or } 3 \text{mm whichever is greater} \]

7.5.6 Web stiffeners
Straightness out of plane to plate after welding.

\[ \Delta = \frac{d}{250} \text{ or } 3 \text{mm whichever is greater} \]

7.5.7 Length
Length on centre line.

\[ L \pm \Delta = 3 \text{mm} \]

7.5.8 Curved or cambered
Deviation from intended curve or camber at mid-length of curved portion when measured with the uncambered side horizontal.

\[ \text{Deviation} = \frac{L}{1000} \text{ or } 6 \text{mm whichever is greater} \]