SRI LANKA STANDARD 907 : PART 3 : 1990

UDC 669 . 14 . 018 - 41

SPECIFICATION FOR

DIMENSIONS AND SECTIONAL PROPERTIES OF HOT ROLLED STRUCTURAL STEEL SECTIONS

PART 3 - U SECTIONS (CHANNELS)

SRI LANKA STANDARDS INSTITUTION

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SPECIFICATION FOR DIMENSIONS AND SECTIONAL PROPERTIES OF HOT ROLLED STRUCTURAL STEEL SECTIONS

PART 3 U SECTIONS (CHANNELS)

SLS 907 : Part 3 : 1990

(Attached AMD 218)

Gr. 7

SRI LANKA STANDARDS INSTITUTION
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Colombo 3,
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This standard does not purport to include all the necessary provisions of a contract.

AMENDMENT No. 01 APPROVED ON 1996-10-17 TO SLS 907 : Part 3 : 1990

SRI LANKA STANDARD SPECIFICATION FOR DIMENSIONS AND SECTIONAL PROPERTIES OF HOT ROLLED STRUCTURAL STEEL SECTIONS PART 3 - U SECTIONS (CHANNELS)

PAGE 1 AND 3

Title of Standard

Delete the existing title of the standard and substitute the following:

'SPECIFICATION FOR HOT ROLLED STRUCTURAL STEEL SECTIONS PART 3 – U SECTIONS (CHANNELS)"

PAGE 4

Clause 1 Scope

Delete the contents and substitute the following:

"This standard specifies the requirements for chemical composition, manufacture, finish mechanical properties, dimensions, sectional properties, marking, testing and sampling of hot-rolled structural steel U sections".

PAGE 6

Table 1 - Dimensions and properties of hot rolled channels

Incorporate of the following sizes in Table 1 before the size (Designation) 75 x 40 x 6 given in Column 1 :

TABLE 1 - Dimensions and properties of hot rolled channels

Designation H x B x m*	Mass m Kg/m	Sectional area a cm^2	Depth of section H mm	Width of Flange B mm	Thickness of Flange t_r cm	Thickness of web t_w cm	Centre of gravity C_x cm	Radius at Roof r_1 cm	Radius at Toe r_2 cm	Moments of Inertia		Radii of Gyration		Moduli of Section		Stop of Flange 0 degree
										I_x cm^4	I_y cm^4	r_x cm	r_y cm	Z_x cm	Z_y cm^3	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
50 x 25 x 4	3.86	4.92	50	25	6.0	5.0	0.81	6.0	3.0	16.8	2.49	1.85	0.71	6.73	1.48	96.0
50 x 25 x 5	4.87	5.33	50	25	7.0	5.0	-	6.0	3.0	-	-	-	-	-	-	96.0

- Rounded off value of mass

PAGE 13

Clause 6.3.9 Tolerance on mass

Incorporate the following after Table **6**:

"6.4 Chemical composition

The chemical composition of hot rolled U sections shall be in accordance with **6.1** and **SLS 1006 : Part 1 : 1993**.

6.5 Manufacture

The manufacture of hot rolled U sections shall be in accordance with **6.2** of **SLS 1006 : Part 1 : 1993.**

6.6 Finish

The finish of hot rolled U sections shall be in accordance with **6.3** of **SLS 1006 : Part 1 : 1993.**

6.7 Mechanical Properties

The mechanical properties of hot rolled U sections shall be in accordance with **6.4** of **SLS 1006 : Part 1 1993"**

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Clause 7 MARKING

Incorporate the following after this clause:

"8 METHODS OF TEST

The methods of test of hot rolled U sections shall be in accordance with **8** of **SLS 1006 : Part 1 : 1993.**

9 CERTIFICATE OF COMPLIANCE

The certificate of compliance of hot rolled U sections shall be in accordance with **9** of **SLS 1006 : Part 1 : 1993.**

APPENDIX A

Sampling and criteria for conformity

The sampling and criteria for conformity of hot rolled U sections shall be in accordance with Appendix **A** of **SLS 1006 : part 1 : 1993.**

SRI LANKA STANDARD
SPECIFICATION FOR DIMENSIONS AND SECTIONAL PROPERTIES OF HOT ROLLED STRUCTURAL STEEL SECTIONS
PART 3 U SECTIONS (CHANNELS)

FOREWORD

This Standard was authorized for adoption and publication by the Council of the Sri Lanka Standard Institution on 90-12-12, after the draft, finalized by the Drafting Committee on Steel Products had been approved by the Mechanical Engineering Divisional Committee.

After formulation of the standard SLS 874 : 1989 Steel Products, in two parts (Part 1 Classification and definitions, Part 2 Identification markings), it has become necessary to present the contents of SLS 73 : 1969 on U sections, L sections and T sections together with other sections such as I,H and special sections not covered therein.

This standard is issued in six parts to meet that necessity and it supersedes SLS 73 : 1969.

The other parts of this standard are:

Part 1 I sections

Part 2 H sections

Part 4 L sections (equal and unequal angles)

Part 5 T sections (tees)

Part 6 Special sections

All values given in this standard are in SI units.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or an analysis shall be rounded off in accordance with SLS 102. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this standard.

In the preparation of this standard, assistance obtained from relevant publications of the International Organization for Standardization and the British Standards Institution is gratefully acknowledged.

1 SCOPE

This standard specifies the dimensions, tolerances and sectional properties of hot-rolled structural steel U sections.

2 REFERENCES

SLS 102 Presentation of numerical values
SLS 874 Steel products
Part 1 Classification and definitions
Part 2 Identification markings

3 DEFINITIONS

For the purposes of this standard the following definitions shall apply (see Figure 1) :

3.1 Y-Y axis : A line parallel to the axis of the web of the section and passing through the centre of gravity of the profile of the section.

3.2 X - X axis : A line passing through the centre of gravity of the profile of the section and at right angles to the Y-Y axis.

4 SYMBOLS

The symbols used in this standard shall have the meaning assigned to them as given below :

H - Depth of section
B - Width of flange
m - Mass per unit length
a - Sectional area
t_f - Thickness of flange
t_w - Thickness of web
r_1 - Root radius
r_2 - Toe radius

I_x, I_y - Moments of inertia

r_x, r_y - Radii of gyration

z_x, z_y - Moduli of section

θ - Slope of flange
δ, Δ - Tolerances

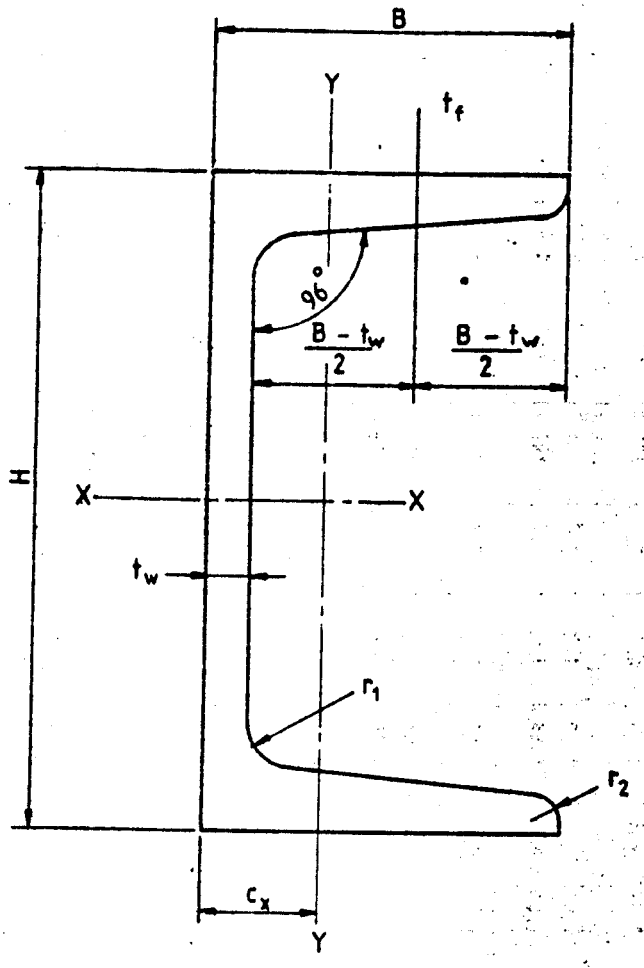

FIGURE 1 - Channel section

TABLE 1 – Dimensions and properties of hot rolled channels

Designation	Mass	Sectional area	Depth of section	Width of Flange	Thickness of Flange	Thickness of web	Centre of gravity	Radius at Root	Radius at Toe	Moments of Inertia		Radii of Gyration		Moduli of Section		Slope of Flange
H x B x a *	a	a	H	B	t_f	t_w	C_x	r_1	r_2	I_x	I_y	r_x	r_y	Z_x	Z_y	θ
	kg/m	cm²	mm	mm	mm	mm	cm	mm	mm	cm⁴	cm⁴	cm	cm	cm³	cm³	degree
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
75 x 40 x 6	5.7	7.26	75	40	6.0	3.7	1.35	6.0	2.0	66.1	11.5	3.02	1.26	17.6	4.3	91.5
75 x 40 x 7	6.8	8.72	75	40	7.3	4.4	1.32	8.5	2.4	76.5	12.5	2.06	1.20	20.4	4.7	96
100 x 45 x 6	5.8	7.41	100	45	5.1	3.0	1.40	6.0	2.0	123.8	14.9	4.09	1.42	24.8	4.8	91.5
100 x 50 x 8	7.9	10.02	100	50	6.4	4.0	1.62	6.0	2.0	164.7	24.8	4.06	1.57	32.9	7.3	91.5
100 x 50 x 9	9.2	11.75	100	50	7.5	4.7	1.54	9.0	2.4	187.7	25.9	4.00	1.48	37.5	7.5	96
125 x 50 x 8	7.9	10.08	125	50	6.6	3.0	1.64	6.0	2.4	270.1	25.6	5.18	1.60	43.2	7.6	91.5
125 x 65 x 11	10.7	13.67	125	65	6.6	4.4	2.04	7.0	2.4	356.8	57.2	5.11	2.05	57.1	12.8	91.5
125 x 65 x 13	12.8	16.25	125	65	8.1	5.0	1.96	9.5	2.4	418.6	59.8	5.08	1.92	67.0	13.2	96
150 x 55 x 10	9.9	12.67	150	55	6.9	3.6	1.67	7.0	2.4	471.8	37.9	6.10	1.73	62.9	9.9	91.5
150 x 75 x 14	14.4	18.39	150	75	7.8	4.8	2.39	8.0	2.4	698.5	103.1	6.16	2.37	93.1	20.2	91.5
150 x 75 x 16	16.4	20.94	150	75	9.0	5.4	2.23	10.0	2.4	782.6	102.2	6.11	2.21	104.3	19.4	96
175 x 60 x 11	11.2	14.24	175	60	6.9	3.6	1.75	7.0	3.0	719.9	50.5	7.11	1.88	82.3	11.9	91.5
175 x 75 x 18	17.6	22.42	175	75	9.5	5.1	2.40	8.6	3.2	1149.9	126.4	7.16	2.37	131.4	24.8	91.5
175 x 75 x 19	19.2	24.45	175	75	10.2	5.7	2.21	10.5	3.2	1227.8	120.9	7.09	2.22	140.3	22.9	96
200 x 70 x 14	14.0	17.77	200	70	7.1	4.1	1.97	8.0	3.2	1161.9	84.2	8.09	2.18	116.2	16.7	91.5
200 x 75 x 21	20.6	26.26	200	75	10.8	5.5	2.36	8.5	3.2	1728.9	146.8	8.11	2.36	172.9	28.5	91.5
200 x 75 x 22	22.2	28.28	200	75	11.4	6.1	2.18	11.0	3.2	1825.1	140.4	8.03	2.23	182.5	26.4	96
225 x 80 x 26	26.0	33.10	225	80	12.4	6.4	2.31	12.0	3.2	2704.2	187.2	9.04	2.38	240.4	32.9	96
225 x 90 x 24	24.0	30.60	225	90	10.2	5.8	2.47	11.0	3.2	2555.7	209.7	9.14	2.62	227.2	32.1	96
250 x 80 x 30	30.4	38.76	250	80	14.1	7.1	2.30	12.0	3.2	3828.4	219.2	9.94	2.38	306.4	38.5	96

Contd..

TABLE 1 - Dimensions and properties of hot rolled channels

Designation	Mass	Sectional area	Depth of section	Width of Flange	Thickness of Flange	Thickness of web	Centre of gravity	Radius at Root	Radius at Toe	Moments of Interia		Radii of Gyration		Moduii of Section		Slope of Flange
H x B x a *	a kg/m	a cm^2	H mm	B mm	t_f mm	t_w mm	C_x cm	r_1 mm	r_2 mm	I_x cm^4	I_y cm^4	r_x cm	r_y cm	Z_x cm^3	Z_y cm^3	θ degree
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
250 x 100 x 28	28.0	45.72	250	100	10.7	6.1	2.71	11.0	3.2	3697.3	298.6	10.17	2.89	295.8	41.0	96
300 x 90 x 36	35.9	45.74	300	90	13.6	7.6	2.37	13.0	3.2	6384.2	311.5	11.81	2.61	425.6	47.0	96
300 x 100 x 33	33.1	42.19	300	100	11.0	6.7	2.56	12.0	3.2	6066.0	346.9	11.99	2.67	404.4	46.6	96
350 x 100 x 39	38.9	49.54	350	100	12.5	7.4	2.42	13.0	4.8	9330.9	395.5	13.72	2.83	533.2	52.2	96
350 x 100 x 42	42.2	53.74	350	100	8.1	13.5	2.46	14.0	4.8	10032.2	431.7	13.66	2.83	573.3	57.2	96
400 x 100 x 46	45.8	58.34	400	100	14.0	8.0	2.37	14.0	4.8	14021.7	461.7	15.50	2.81	701.1	60.5	96
400 x 100 x 50	49.5	63.04	400	100	15.3	8.6	2.43	15.0	4.8	15123.4	506.3	15.49	2.83	756.2	66.9	96

** Rounded off value of mass*

5 DESIGNATION

Steel U sections shall be designated by the letter U followed by depth of section, width of flange and rounded off value of mass per unit length as follows :

U HxBxm

Example :

U 75 x 40 x 6 (see Table 1)

6 REQUIREMENTS

6.1 Dimensions and sectional properties

The dimensions and sectional properties shall be as given in Table 1 (see Figures 1 and 2).

6.2 Mass

The mass per metre values shall be as given in Table 1.

6.3 Tolerance

This standard covers the following two alternatives :

a) Tolerances for the thickness of the flanges and the web shall be specified (see 6.3.3) along with a higher mass tolerance as given in Table 6, column 4. This alternative shall be designated by the symbol D (dimensional tolerance); or

b) Where no tolerances are specified for either the thickness of the flanges or the web, tighter mass tolerance given in Table 6, column 3 shall be applicable. This alternative shall be designated by the symbol M (mass tolerance).

At the time of ordering, the interested parties shall agree as to which of these two alternatives would be applicable, designating the choice by the appropriate symbol D or M.

Example :

U HxBxm - D or
U HxBxm - M

If no symbol is indicated in the order, the supply shall be made complying to either of the two alternatives.

6.3.1 *Tolerance on depth* (δ_H)

The tolerance on depth shall be as given in Table 2.

TABLE 2 - Tolerance on depth

Dimensions in millimetres

Depth (H)		Tolerance on depth (δ_H) (3)
Over (1)	Up to and including (2)	
-	200	± 2.0
200	400	± 3.0

6.3.2 *Tolerance on width of flange* (δ_B)

The tolerance on width of flange shall be as given in Table 3.

TABLE 3 - Tolerance on width of flange

Dimensions in millimetres

Width of flange (B)		Tolerance on width of flange (δ_B) (3)
Over (1)	Up to and including (2)	
-	65	± 2.0
65	100	± 3.0

6.3.3 *Tolerance on thickness of flange and web* (δ_t)

6.3.3.1 When the section is ordered to tolerance designation (δ_t) (see 6.3 a), tolerance on thickness of flange shall be as given in Table 4.

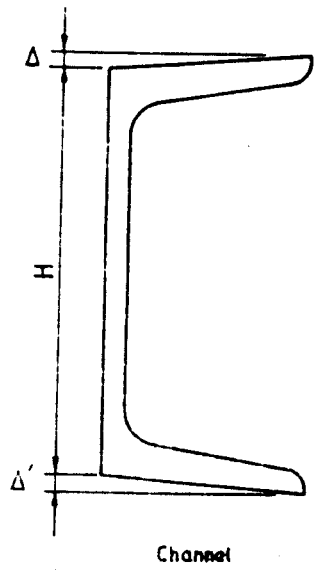

FIGURE 2 - Flange out-of-square

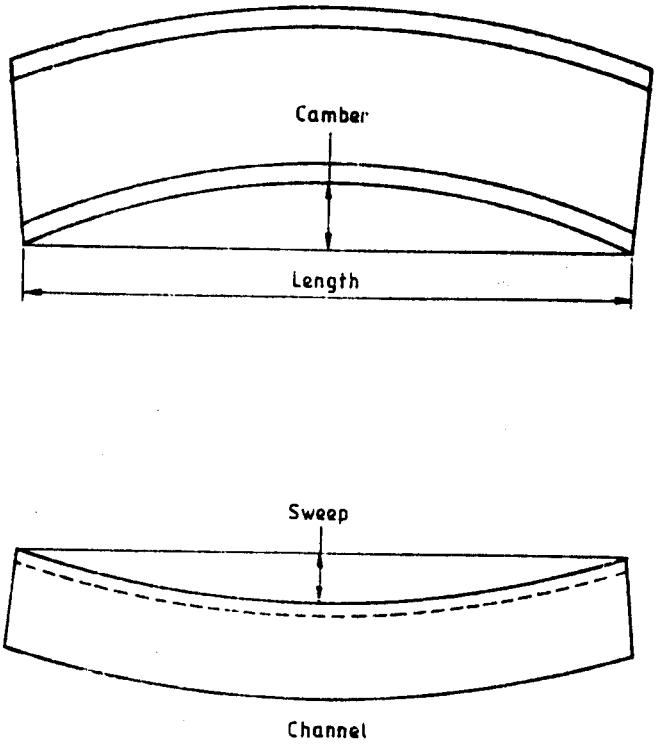

FIGURE 3 - Measurement of camber and sweep

TABLE 4 - Tolerance on thickness of flange

Dimensions in millimetres

Depth (H)		Tolerance on thickness of flange (δ_{tf})
Over (1)	Up to and including (2)	(3)
-	140	- 0.5
140	300	- 1.0
300	400	- 1.5

NOTE
The plus tolerance on thickness of flange is limited by the tolerance on mass δ_m as given in column 4 of Table 6.

6.3.3.2 When the section is ordered to tolerance designation δ_t (see 6.3 a), tolerance on thickness of web shall be as given in Table 5.

TABLE 5 - Tolerance on thickness of web

Dimensions in millimetres

Thickness of web (t_w)		Tolerance on thickness of web (δ_{tw})
Over (1)	Up to and including (2)	(3)
-	10	± 0.5
10	-	± 5 % of t

6.3.4 *Tolerance on length (δ_l)*

Sections ordered as 'specified' or as 'exact' lengths shall be supplied as follows :

a) 'Specified lengths' When a section is to be cut to a specified length, it shall be cut to within ± 25 mm of that length. When a minimum length is specified, it shall be cut to within +50, -0mm of that minimum length.

b) 'Exact length' When a section is to be cut to an 'exact' length, it shall be cold sawn to within ±3.2 mm of that length.

6.3.5 *Tolerance on squareness of flange (Δ_{sq})*

The flanges shall be parallel within a maximum tolerance $\Delta_{sq_{max}}$ of 3 mm; where $\Delta_{sq} = \Delta + \Delta'$ (see Figure 2).

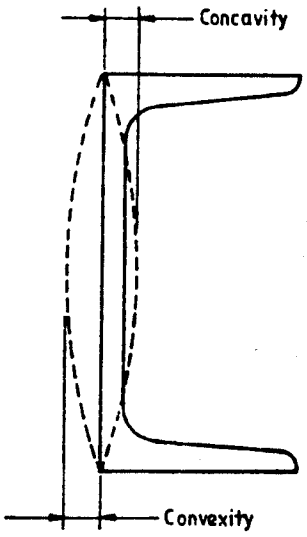

FIGURE 4 - Flatness of web of channels

6.3.6 *Camber*

Camber measured as shown in Figure 3 shall not exceed 0.20 per cent of the total length.

6.3.7 *Sweep*

Sweep measured as shown in Figure 3 shall not exceed 0.20 per cent of the total length.

NOTE
Due to the greater flexibility of channels in comparison to columns about the Y-Y axis, sweep tolerances if necessary are subject to negotiation at the time of enquiry and order.

6.3.8 *Tolerance on flatness of web*

The tolerance on flatness of outer face of web of channel shall be as follows (see Figure 4).

Convexity : Not permitted

Concavity : 15 per cent of nominal thickness of web

6.3.9 *Tolerance on mass (δ_m)*

When tolerance on mass per unit length is specified as the controlling tolerance in lieu of tolerance on thickness of either flange or web, the tolerance specified in column 3 of Table 6 shall apply; for all other cases, tolerances specified in column 4 shall apply.

TABLE 6 - Tolerance on mass per unit length

Depth (H) (mm)		Mass controlling tolerance in per cent	Thickness-controlling tolerance in per cent
Over	Up to and including		
(1)	(2)	(3)	(4)
-	150	± 3.0	± 5.0
150	-	± 2.5	± 4.0

7 MARKING

Markings of U sections shall conform to SLS 874 : Part 2.

SRI LANKA STANDARDS INSTITUTION

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