STEEL

Lecture - 3

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Content

1. Market Form of Steel
2. Various Types of Structural Steel
3. Properties of Structural Steel
4. Summary

Market Form of Steel

Reinforcement Steel

Structural Steel

Significant Reason

Concrete is strong in resisting the compression force but weak to resist the tension
steel is strong in tension and makes a good bond with concrete

A sufficient strength in all aspect and safe to carry the load. Use to construct the building in mono and hybrid form.

Various Types of Structural Steel

Rolled Steel bar Section

Indian Standard Strip

Indian Standard Flat

Indian Standard Round Bars

Rolled Steel Plate Section

Rolled Steel Tube

Indian Standard Square Bars

Rolled Steel Angle Section

Rolled Standard Sheet Section

Rolled Steel Tee Section

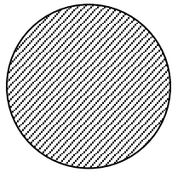
Build Up Section

Rolled Steel Channel Section

Rolled Steel I Section

Structural Steel Section

Indian Standard Round Bars (ISRO)



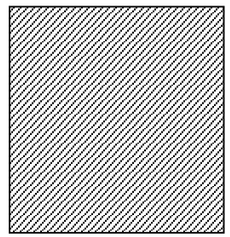
Designated as ISRO 10 *(round bar having diameter 10mm)*

Available in diameter varying from 6mm to 25 mm

Indian Standard Square Bars (ISSQ)

Designated as ISSQ 10 *(Square bar of Size 10mm)*

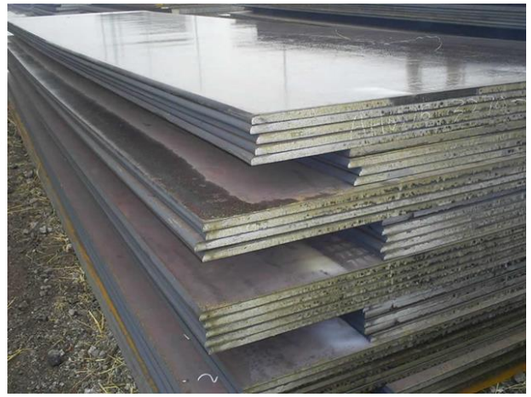
Used for grill work, handrails for staircase etc.,



Structural Steel Section

Rolled Steel Plate Section (ISPL)

Designated as ISPL 500 × 5 *(500mm width and 5mm thickness)*



Used for construction of water tank and other storage structure, built up column, base plate for foundation etc.,

Rolled Standard Sheet Section (ISSH)

Plate having thickness less than 5 mm, designated as ISSH 1800 (l)× 600(b) × 4(t)

Use of construction of boxes and vehicle bodies

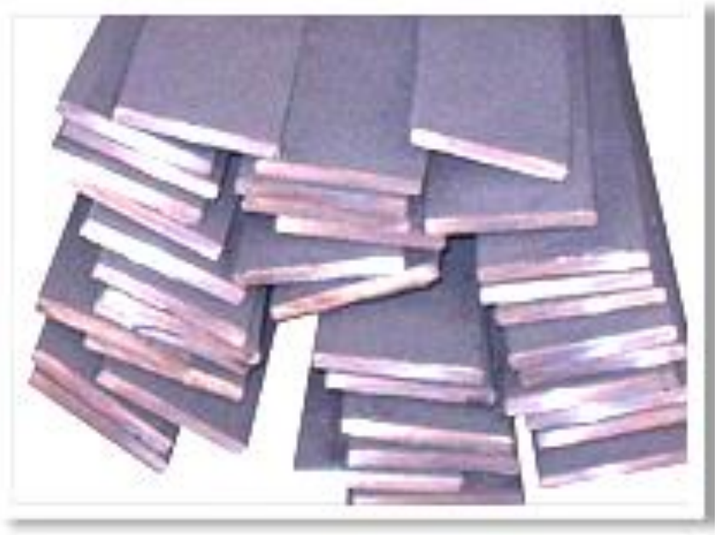
Structural Steel Section

Indian Standard Strips (ISST)

Designated as ISST 100 × 2 mm (steel strip with a width of 100mm and thickness 2mm)

Indian Standard Flat (ISF)

Designated as ISF 10 x 3(flat of width 10mm and thickness 3 mm). Available in suitable widths varying from 10mm to 400mm. Thickness varying from 3mm to 40mm. Used for steel grillwork for windows and gates.



https://www.sandeepsteels.com/Flat.htm

Structural Steel Section

Rolled Steel Tubes

Inner diameter varying from 15 to 150mm. Thickness varying from 2 to 5.4mm. Efficient structural sections for formwork and trusses

Rolled Steel Angle Sections (ISA)

Designated as ISA and width and length of legs

Available as;

Equal angle sections (Two legs will be equal in length) available in sizes varying from 20mm x 20mm x 3mm to 200mm x 200mm x 25mm

https://handysteel.com.au/angle

Structural Steel Section

Rolled Steel Tubes

Inner diameter varying from 15 to 150mm. Thickness varying from 2 to 5.4mm. Efficient structural sections for formwork and trusses

Rolled Steel Angle Sections (ISA)

Unequal Angle Section, e.g.,

Unequal angle sections (Two legs will not be equal in length)

https://handysteel.com.au/angle

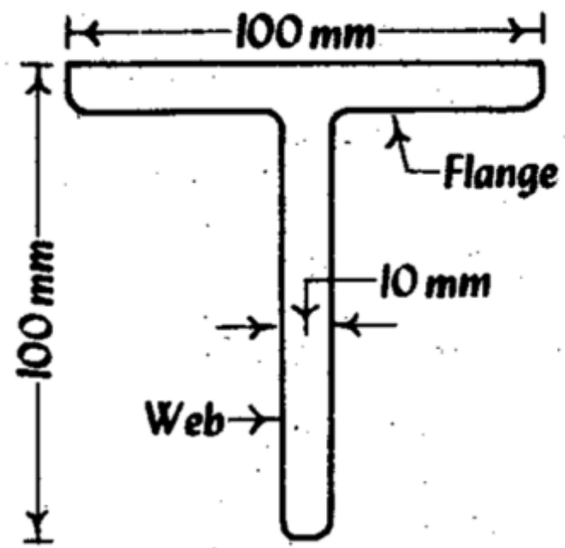
Structural Steel Section

Rolled steel Tee sections

Resembles the alphabet T. Consists of web and flange. Designated by overall dimensions and thickness. Available in sizes varying from 20mm x 20mm x 3mm to 150mm x 150mm x 10mm.Widely used as members of the steel roof truss and form built – up sections.

Different types available are:

Indian Standard Normal Tee (ISNT)
Indian Standard Heavy Tee (ISHT)
Indian Standard Short Tee (ISHT)
Indian Standard Junior Tee (ISHT)



T-section

Structural Steel Section

Rolled steel Channel sections

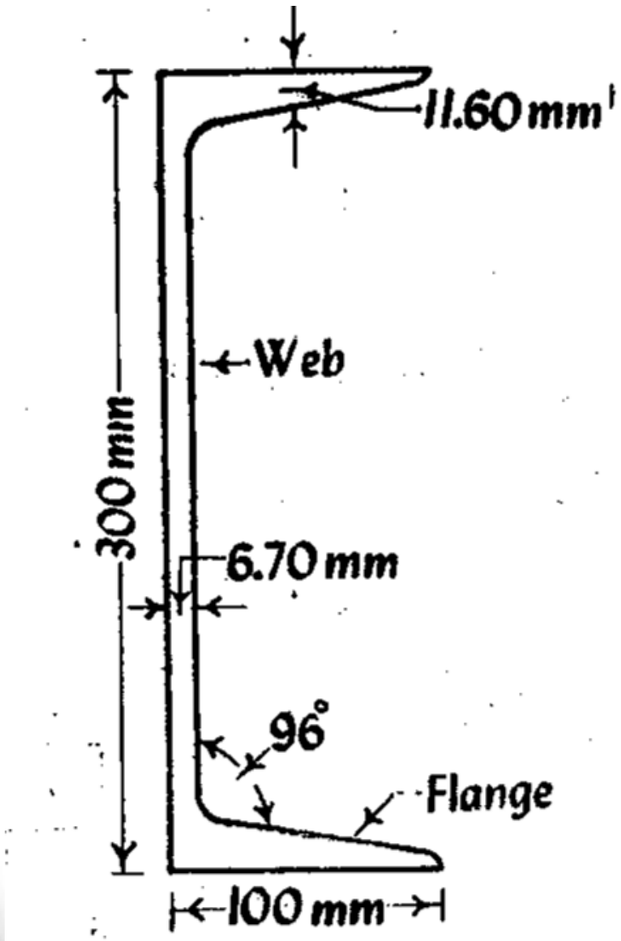
Consists of a web and two equal flanges.

Designated by height of web and width of flange

Available in sizes varying from 100mm x 45mm to 400mm x 100mm.

Widely used for beams and columns.

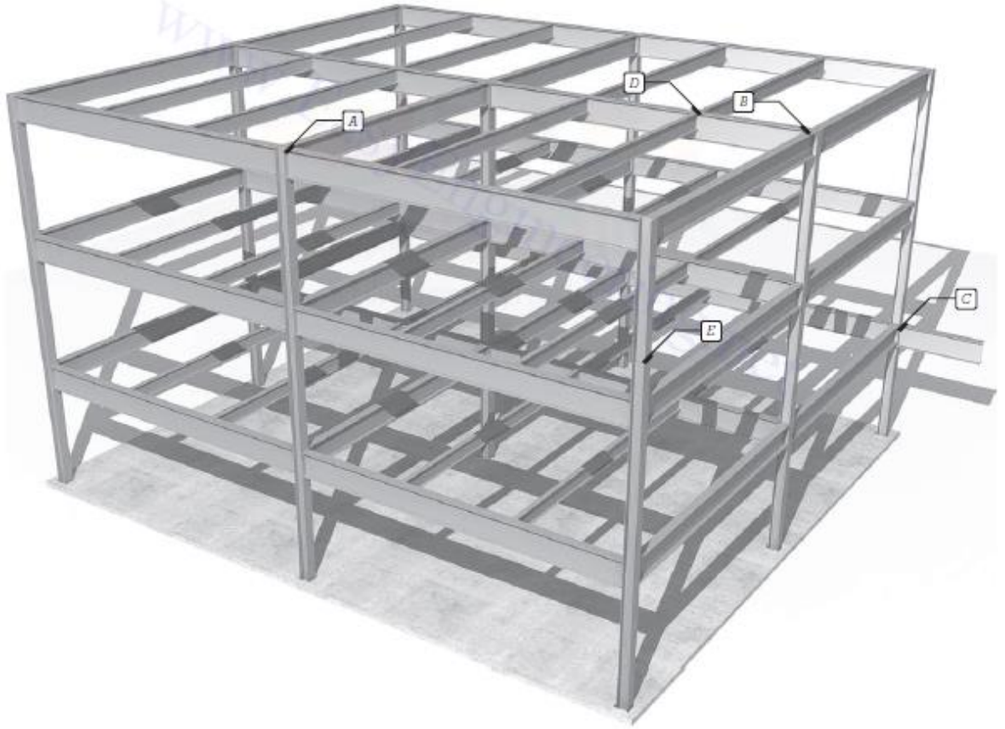
The different types available are:
Indian Standard Junior Channel (ISJC)
Indian Standard Light Channel (ISLC)
Indian Standard Medium Channels (ISMC)



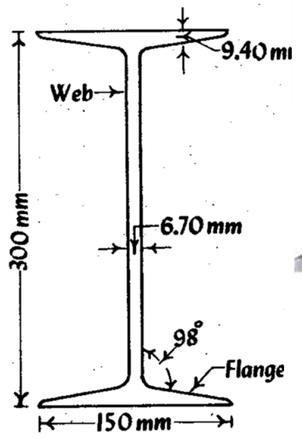
Structural Steel Section

Rolled Steel I – Sections

Composed of a combination of available basic sections like plates, angles, channels etc. For increased strength and stability Different sections are joined by welding or riveting



Different types are:
Indian Standard junior beam (ISJB)
Indian Standard Light Beam (ISLB)
Indian Standard Medium Beam (ISMB)
Indian Standard Wide Flange Beam (ISWB)
Indian Standard Heavy Beam (ISHB)



I-section

Strongest and most economical of all sections. Used as columns, purlins in trusses and grillage foundations.

Structural Steel Section

Built –up sections:

Composed of a combination of available basic sections like plates, angles, channels etc used to increased strength and stability. Different sections are joined by welding or riveting

Different types are:

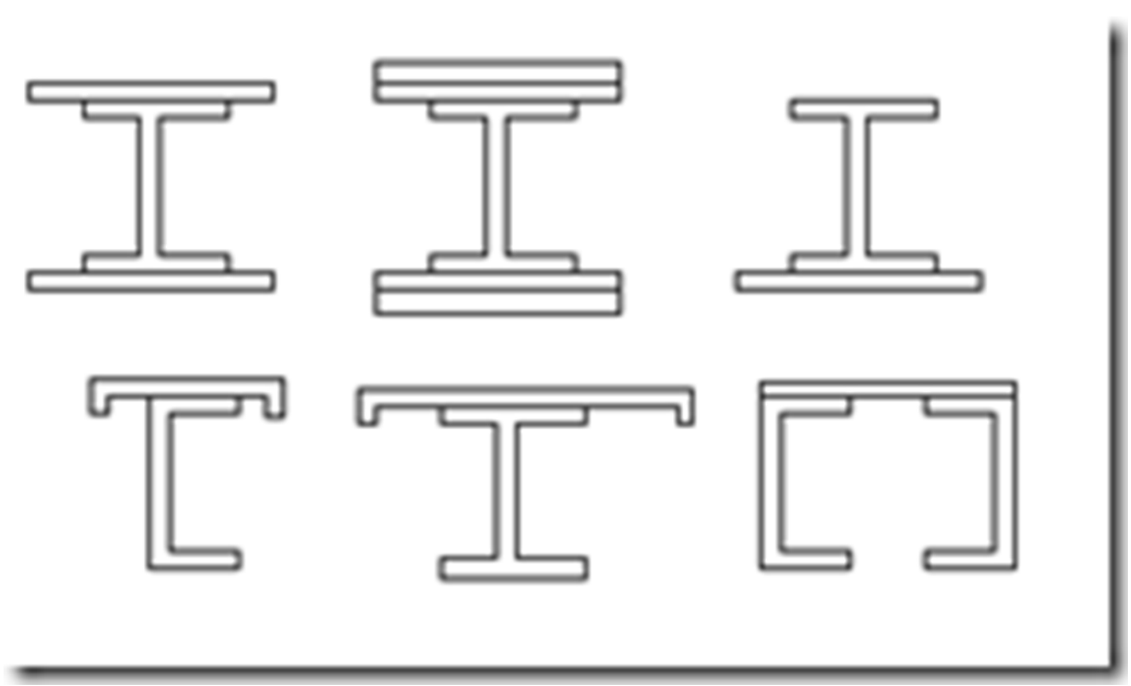
Two angles back to back

Two channels

I-sections with top and bottom plates

Plate girder

Built up column sections



Use of Structural Steel in Building construction

A tower crane lowers a series of beams to ironworkers. The worker to the left uses a tagline to maneuver the beam into the proper orientation. (Photo by James Digby. Courtesy of LPR Construction Company)

Bolting joist girders to a column. (Courtesy Vulcraft Division of Nucor)

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Use of Structural Steel in Building construction

A 10-story steel frame nears completion. The lower floors have already been decked with corrugated steel decking. (Courtesy Vulcraft Division of Nucor)

Pouring a concrete fill on a steel roof deck, using a concrete pump to deliver the concrete from the street below to the point of the pour. Shear studs are plainly visible over the lines of the beams below. The welded wire reinforcing strengthens the concrete against cracking. (Courtesy of Schwing America, Inc.)

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Use of Structural Steel in Building construction

A tower crane installs precast concrete hollow-core planks for floor decks in an apartment building. Precast concrete is also used for exterior cladding of the building. The steel framing is a design known as the “staggered truss” system, in which story-height steel trusses at alternate levels of the building support the floors. The trusses are later enclosed with interior partitions. An advantage of the staggered truss system is that the floor structure is very thin, allowing overall floor-to-floor heights as small as 823 feet (2.6 m). (Courtesy of Blakeslee Prestress, Inc.)

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Summary

- ✓ Market form of Steel
- ✓ Structural Steel of various types such as round bar, square bar, I section, T section , Channel section, Built up beam section is covered.

Thank You