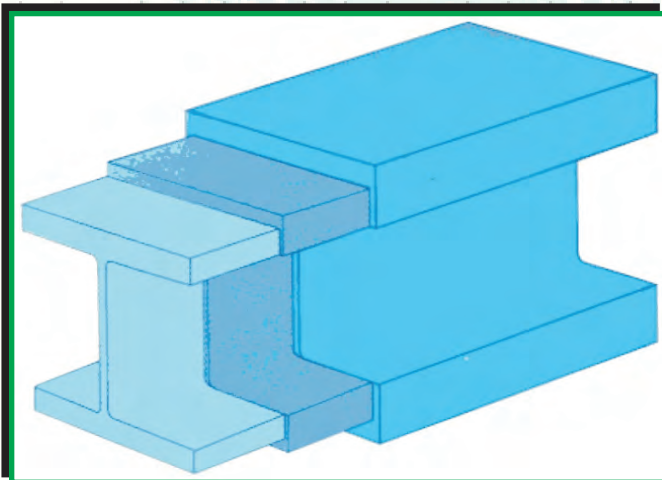


DESIGN MANUAL FOR EFFECTIVE USE OF PARALLEL FLANGE SECTIONS



**INSTITUTE FOR STEEL DEVELOPMENT & GROWTH
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INSDAG

Steel is the backbone of all industries and the basic ingredient for growth and development of a country. Traditionally, the fortunes of the steel industry have been linked to the economic cycle of the country. Per capita consumption of steel speaks volumes about the relative position of the country on the development frontier. In India the per capita consumption of steel stands low compared to developed and developing countries. Moreover, steel is completely recyclable and environment friendly. Hence, a large potential exists in furthering the usage of steel in various segments of industry. Institute of Steel Development & Growth (INSDAG), a non-profit making, member based organization established by Ministry of Steel and the major steel producers of the country. The Institute primarily works towards the development of advanced design methodologies & technical marketing by expanding applications of steel in different segments of industry, upgrading skills & know-how, creating awareness amongst potential users and communicating the benefits of steel. Our founding members are SAIL, Tata Steel Ltd., RINL, JSW Steel Ltd., and Arcelor Mittal Nippon Steel India Limited (AM / NS) apart from Ministry of Steel. INSDAG has got very good networking among the member organisations/professionals for exchange of ideas. The Institute is registered as a "Society" under Societies Registration Act of West Bengal.

Director General looks after the daily affairs of the Institute and Executive Council provides guidance and direction. Two other functional committees namely the Working Group and Project Review Committee provide administrative and technical guidance respectively. The Institute has defined its mission, role, and functions and has evolved its short, medium and long term Activity Plans. The Institute primarily works towards the development of technology in steel usage and the market for the steel fraternity. Some of its roles are:

- Ø Creating awareness amongst potential users on affordability of steel.
- Ø Bringing out technical publication on steel applications.
- Ø Providing technical advisory services on materials, construction practices etc.
- Ø Upgrading the skills of work force by refresher courses / training programmers.
- Ø Communicating the benefits of steel through life cycle cost studies.
- Ø Providing requisite thrust to increase steel consumption in rural areas.
- Ø Assisting in the development of ancillary industries for creating new market.

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SECTIONS

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Our Mission Statement

To work in unison for all the stakeholders in the steel industry so as to evolve ways and means for more efficient usage of steel and provide optimum value to the customer

INSDAG Publication no - INS/Pub/151
January 2023

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Price: Rs. 1500/- Only

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FORE WORD

This publication titled “**Design Manual for Effective use of Parallel Flange Sections**” was mainly prepared by Mr. Pydi Lakshmana Rao, General Manager (Civil & Structural) based on project work carried out by him and the technical contents of the document were reviewed both internally and externally.

The external review was done by Dr. Saroj Mandal Professor in Civil Engineering Department, Jadavpur University, Kolkata having vast experience in the field of structural engineering. Valuable suggestions and inputs by him have been included in this publication. INSDAG expresses its heartfelt thanks for his valuable contribution.

Director General extended all necessary facilities to bring out the publication.



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Message from Reviewers

December 20, 2022

I have gone through the report titled “Design Manual for Effective Use of Parallel Flange Sections” prepared by Sri Pydi Lakshmana Rao from INSDAG.

I strongly believe that this manual is highly useful for practicing design engineers. Chapter 1 contains Introduction, Chapter 2 contains Notations & Formulae and static properties of PF sections and conventional sections, Chapter 3, 4, 5 contains strength tables for bending capacities, compression & tension and combined forces and Chapter 6 contains Conclusions & Recommendations. Tables, Figures are given in Nomenclature 1 & 2.

The choice of sections for the conventional tapered flange rolled beams is rather limited. As a result, when a section is slightly inadequate, the choice is limited to either the next section available (which is 25% to 40% heavier in weight) or built-up sections through welding, which are time consuming and expensive. The availability of Parallel Flange Sections with improved yield strength and other accompanying features would bridge the long felt need of the designers and users with an aim for more innovativeness, strength and flexibility.

The weight of steel beam/ column required will be less in case of parallel flange sections compared to conventional ISMB sections. Considering all above points in mind, it is strongly recommended to the designer and construction personnel to use parallel flanged sections as far as practicable. This manual will help to create awareness and increase the consumption of efficient parallel flange sections resulting in saving of material and cost of the structure.

Dr. Saroj Mandal
Professor in Civil Engineering Department
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