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# Critical Review of Provisions and Comparative Study of is 800-2007 and is 800-2025

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**Abstract:** ***Is 800 dealing with General Construction in Steel-Code of Practice was revised in the year 2007, in which Limit State Method was introduced. Now it is under revision and Draft IS 800 is now available. In this paper an effort has been made to critically review various clauses of the code IS 800-2007 and IS 800-2025 (Draft). Various provisions of the Code have been compared.***

**Keywords:** IS 800-2007, IS 800-2025 draft, steel design codes, limit state method, sustainable steel construction

## 1.Introduction

The Indian Standard **IS 800** ("General Construction in Steel-Code of Practice") governs the design, detailing, fabrication, erection, and quality assurance of steel structures in India. The current operative standard is **IS 800-2007**, which was published following a major revision that replaced earlier methods and established design norms using the limit state philosophy. After almost two decades, BIS has drafted a **new revision-IS 800-2025**-incorporating modern design principles, materials, and sustainability considerations.

## 2.Scope and Objectives

### 2.1 IS 800-2007

- Applies to *general construction in steel* including hot-rolled sections joined by welding, bolting, or riveting.
- **Based entirely on Limit State Method (LSM)**-delivering strength and serviceability checks under ultimate and serviceability limit states.
- Covers material properties, structural analysis, member design (tension, compression, bending), combined forces, and connection detailing.
- Incorporates safety factors and partial strengths satisfying fundamental reliability.

### 2.2 IS 800-2025 (Draft)

- The new draft maintains **general construction in steel**, but with a **wider and clearer structure** of chapters (material, analysis methods, fire resistance, durability, sustainability, fabrication, erection).
- Aims to integrate **state-of-the-art design provisions**, align with international practices (e.g., Eurocode, BS), and support *emerging structural steel technologies*.
- Includes **additional topics** such as fire performance, sustainable construction practices, and fatigue-not fully developed in 2007.

## 3.Design Philosophies

### 3.1 IS 800-2007

- Utilizes the **Limit State Design philosophy**, which replaced earlier elastic and working stress methods.
- Ensures combined actions (dead, live, wind, earthquake) are considered with appropriate load and resistance factors.
- Member design and stability checks utilize limit state formulations throughout.

### 3.2 IS 800-2025 (Draft)

- Retains **Limit State Method** as the principal design framework-but with **enhanced clarity** on *methods of structural analysis* and *limit state design*, including more comprehensive annexes.
- Expected to introduce **improved load combinations**, explicit guidance on *temperature stress analysis*, and *more detailed serviceability criteria*.

## 4.Materials and Properties

### 4.1 IS 800-2007

- Focuses on **hot-rolled structural steels**, referring to appropriate Indian Standards (e.g., IS 808 for dimensions).
- Recognizes conventional structural steels conforming to IS standards.

### 4.2 IS 800-2025 (Draft)

- **Expands material scope** to include a broader range of steels:
  - Fire-resistant steels (e.g., IS 15103)
  - Weathering steels (e.g., IS 11587)
  - Seismically resilient steels (e.g., IS 15962)
  - High strength steels consistent with IS 2062
- Includes tables with updated **tensile properties** aligned with modern material specifications.

## 5.Structural Analysis and Member Design

### 5.1 Common Provisions (Both Versions)

Both codes systematically cover:

- Design of *tension members, compression members, bending members*,
- *Combined forces* and their interaction criteria,

- *Connections* including bolting and welding.

The draft text outlines a detailed table of contents with chapters for analysis, member design, combined forces, connections, and durability.

### 5.2 Differences Introduced in Draft 2025

- Incorporates enhanced *elastic lateral torsional buckling* and other stability considerations.
- Contains annexes including *design for floor vibration*, *elastic lateral torsional buckling*, and *design of corrugated web girders*, indicating broader analytical guidance.
- Emphasizes *temperature stress analysis* and design against *fire resistance*-reflecting modern safety requirements.

## 6.Connections

### 6.1 IS 800-2007

- Provides conventional connection design procedures including riveted, bolted (including high strength friction grip bolts) and welded joints per referenced standards.

### 6.2 IS 800-2025 (Draft)

- Continues coverage of riveted, bolted, and welded connections with increased clarity on referenced standards.
- Suggests more modern specifications for bolt types, welding configurations, and composite connections with updated references.

## 7.Fire Resistance and Durability

### 7.1 IS 800-2007

- General provisions for durability and corrosion protection, but **fire resistance guidelines are limited**.

### 7.2 IS 800-2025 (Draft)

- Introduces **specific fire resistance criteria**, including minimum fire rating durations and methods, with references to additional IS codes (e.g., IS 1641, IS 1642).
- Extended durability requirements for steelwork are added-improving long-term performance specifications.

## 8.Sustainability and Modern Practices

### 8.1 IS 800-2007

- Predominantly technical without specific sustainability language.

### 8.2 IS 800-2025 (Draft)

- Includes a **chapter on Sustainable Steel Construction**, recognizing environmental impacts and lifecycle performance-which is new for Indian steel codes.

## 9.Fabrication and Erection

### 9.1 IS 800-2007

- Basic clauses related to fabrication and erection procedures.

### 9.2 IS 800-2025 (Draft)

- Broader coverage including *detailed execution phases*, quality assurance, and testing requirements, better aligning design with construction practices.

## 10. Referenced Standards

### 10.1 IS 800-2007

- Refers to Indian Standards for materials and practices relevant at the time (e.g., IS 801, IS 814, IS 816).

### 10.2 IS 800-2025 (Draft)

- Relies on a **wider suite of updated IS standards** for steel grades, connections, fire resistance, and corrosion protection, reflecting the evolution of Indian standards since 2007.

## 11. Summary of Key Differences

| Aspect | IS 800-2007 | IS 800-2025 (Draft) |
|---|---|---|
| Design philosophy | Limit State Method (established) | Limit State Method (enhanced) |
| Material coverage | Conventional structural steels | Expanded material types (weathering, fire-resistant, seismic) |
| Fire resistance | Limited | Explicit fire design criteria |
| Durability & sustainability | Basic | Includes sustainability and lifecycle performance |
| Analysis detail | Standard analytical provisions | Enhanced analysis and annex guidance |
| Fabrication/Erection | General | Expanded execution and QA clauses |
| Connections | Conventional | Updated referenced standards and composite considerations |
| Annexes | Minimal | Multiple annexes with analytical and design aids |

## 12. Conclusion

The **IS 800-2025 draft** represents a **significant and necessary evolution** of India's steel design code. It continues the limit state design foundation of **IS 800-2007** while substantially broadening material scopes, analytical guidance, durability and fire design requirements, sustainability focus, and construction detailing. It is structured to align more closely with international practice and modern industry expectations.

## References

[1] Draft IS 800: General Construction in Steel (Fourth Revision)-BIS, April 2025 (Draft for Comments).
[2] SQVe Consultants summary of IS 800 draft changes.
[3] Civil Engineering Web draft version table of contents for IS 800-2025.
[4] Details on draft provisions like materials and connections.