

Hindbookcenter



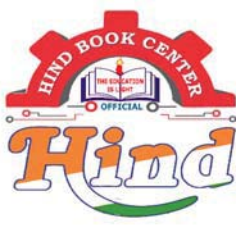
Hind Book Center & Photostat

Unacademy
Civil Engineering
Toppers Handwritten Notes
Railway And Airport Engineering
By-Jaspal Sir

- Colour Print Out
- Blackinwhite Print Out
- Spiral Binding, & Hard Binding
- Test Paper For IES GATE PSUs IAS, CAT
- All Notes Available & All Book Availabile
- Best Quaity Handwritten Classroom Notes & Study Materials
- IES GATE PSUs IAS CAT Other Competitive/Entrence Exams

Visit us:-www.hindbookcenter.com

Courier Facility All Over India
(DTDC & INDIA POST)
Mob-9654451541



Hindbookcenter



MADE EASY, IES MASTER, ACE ACADEMY, KREATRYX

**ESE, GATE, PSUs BEST QUALITY TOPPER HAND WRITTEN
NOTES MINIMUM PRICE AVAILABLE @ OUR WEBSITE**

- | | |
|--------------------------------|---------------------------|
| 1. ELECTRONICS ENGINEERING | 2. ELECTRICAL ENGINEERING |
| 3. MECHANICAL ENGINEERING | 4. CIVIL ENGINEERING |
| 5. INSTRUMENTATION ENGINEERING | 6. COMPUTER SCIENCE |

IES, GATE, PSU TEST SERIES AVAILABLE @ OUR WEBSITE

❖ IES –PRELIMS & MAINS

❖ GATE

➤ **NOTE;- ALL ENGINEERING BRANCHS**

➤ **ALL PSUs PREVIOUS YEAR QUESTION PAPER @ OUR WEBSITE**

PUBLICATIONS BOOKS -

MADE EASY, IES MASTER, ACE ACADEMY, KREATRYX, GATE ACADEMY, ARIHANT, GK

RAKESH YADAV, KD CAMPUS, FOUNDATION, MC –GRAW HILL (TMH), PEARSON...OTHERS

HEAVY DISCOUNTS BOOKS AVAILABLE @ OUR WEBSITE

Shop No.7/8 Saidulajab Market Neb Sarai More, Saket, New Delhi-30 9654451541	Shop No: 46 100 Futa M.G. Rd Near Made Easy Ghitorni, New Delhi-30	F518 Near Kali MaaMandir Lado Sarai New Delhi-110030	F230, Lado Sarai New Delhi-110030
---	---	---	--

Website: www.hindbookcenter.com

Contact Us: 9654451541

RAILWAY ENGINEERING

by

JASPAL SIR
(EX IES)

***Written, Edited &
Compiled by:***

AJAY PRAKASH

CONTENTS

1. Rails & Rail Joints
2. Sleepers
3. Track Fasteners
4. Ballast & Subgrade
5. Stresses on Track
6. Geometrical Design of Track
7. Points and Crossings
8. Track Junction
9. Stations, Yards and Equipments
10. Signalling
11. Tractive Resistance
12. Maintenance of Tracks

RAILS & RAIL JOINTS

Rails :

- These are steel girders used for carrying the axle load (train load) and transfer it to the subgrade through sleeper and ballast.
- Rail convert the moving wheel load of train into point load, which acts on the sleepers.
- Since it has to resist high wear & tear, it is made of high carbon steel.
- In India, its manufacturing is done by 'open hearth/duplex process.'

NOTE :

- Steel is manufactured by two processes :

(i) Triplex Process :

- It has three main production facilities :
 - (a) Acid Bessemer Converter
 - (b) Basic Open Hearth Furnace
 - (c) Acidic Open Hearth Furnace
- It is outdated.
 - ↳ 1950's में बन्द हो गया था।

(ii) Duplex Process : (or, Open Hearth Process)

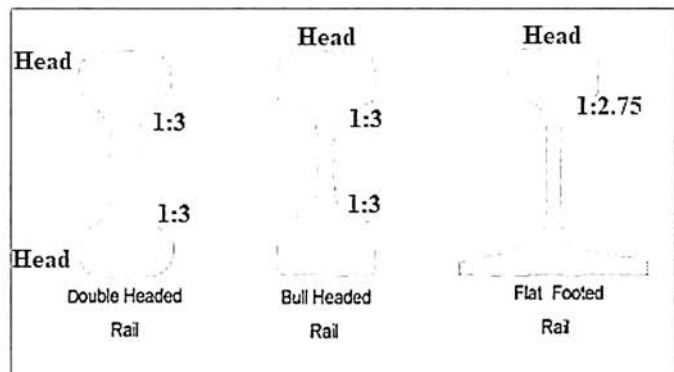
- It consists of blowing hot metal & scrap in the Acid Bessemer Converter and finally refining them in Basic Open Hearth
- Here, scrap is also utilized.
- Used in today's time



Lec-1

Types of Rails :

- (1) Double Headed Rails (DH Rails)
- (2) Bull Headed Rails (BH Rails)
- (3) Flat Footed Rails (FF Rails)
OR, Vignales Rails



(1) Double Headed Rails :

- These rails were used in beginning.
- The idea behind providing two heads was, if one head will worn out, the rail can be inverted and re-used.
- But in lower part due to indentations, smooth running surface was not obtained.

(2) Bull Headed Rails :

- In these rails, head was made a little thicker and stronger than lower part.

(3) Flat Footed Rail / Vignole's Rail :

- Here, bearing plate / flat plate is used at bottom.
- These rails are designated by weight of rail per unit length

eg: 52 kg/m or 52 MR
60 kg/m or 60 MR

- 52 MR : $V \leq 130$ kmph
60 MR : $V \leq 160$ kmph



Lec-1 (20:35)

- Flat footed rails are more stronger, stiffer, easy to lay, cheaper and easy to maintain in comparison to double head / bull headed rails.

Requirement of Rails :

- These must be capable of withstanding the lateral forces.
(Hence, width of head and foot is increased.)
- To allow for vertical wear of 10 mm on its head.
↳ अगर 10 mm से ज्यादा wear & tear हो रही है तो उस rail को change करना पड़ेगा
- Minimum tensile strength is 72 kg/m^2 .
- Must pass weight / tup test.
↳ इसमें 1.5 m की rail लेते हैं और इसके ऊपर 1000 kg (1 tonne) का weight fall कराया जाता है, 7.2 m की height से। ऐसा करने से concerned rail fail नहीं होनी चाहिए।