

DI04006071: Railway, Harbour & Tunnel Engineering

Lecture 3.14: Types of station, site selection and requirements for a railway station and yards

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Civil Engineering

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Introduction to Railway Stations I

A railway station is a place on a railway line where traffic is booked and dealt with, and where trains are permitted to stop. Its primary functions include the safe exchange of passengers and goods, and controlling the movement of trains.

Key Points

- Facilitates passenger boarding and alighting.
- Handling of goods and parcels.
- Control of train movements and signaling.
- Serves as a focal point for transport integration.

Site Selection for Railway Stations I

Selecting an appropriate site for a railway station is critical for operational efficiency and public convenience. The site should accommodate current needs while allowing for future expansion.

Key Points

- Proximity to towns and villages for passenger convenience.
- Availability of flat land with adequate area for tracks, buildings, and future expansion.
- Good drainage facilities to prevent waterlogging of tracks.
- Accessibility by road networks for easy approach and dispersal.

Classification of Railway Stations I

Railway stations are classified based on their functional characteristics, traffic volume, and operational importance. They range from simple halts to complex junctions and terminals.

Key Points

- Operational Classification: Block stations, Non-block stations, Special class stations.
- Functional Classification: Halt stations, Flag stations, Crossing stations, Junction stations, Terminal stations.

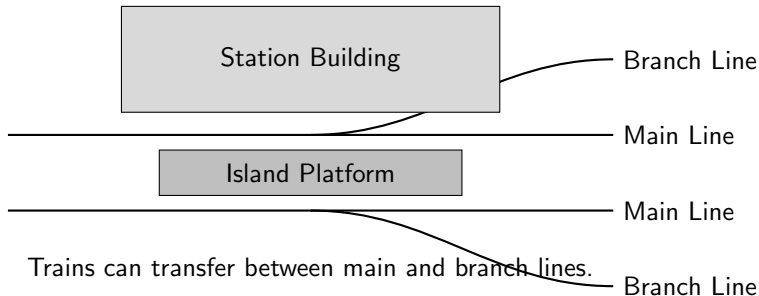
Halt and Flag Stations I

Halts and flag stations are the simplest forms of railway stations, typically located in rural areas with low traffic density.

Key Points

- Halt Station: No station building or staff; trains stop only on passenger request.
- Flag Station: Has a small building and limited staff; trains stop if a flag is shown or by prior arrangement.
- No interlocking or signals are provided.
- Used primarily for local passenger traffic without goods handling.

Schematic of a Junction Station I



Schematic of a Junction Station II

Key Points

- A junction station is where a branch line meets or intersects the main line.
- Requires more complex track layouts and signaling.
- Facilities for reversing engines and repairing rolling stock are often provided.

Terminal Stations I

A terminal station, or terminus, is a station at the end of a railway line. Trains arriving at a terminal station must reverse direction to leave.

Key Points

- Tracks end at buffer stops.
- Requires facilities for reversing locomotives (turntables or reversing triangles), unless using push-pull trains.
- Extensive passenger facilities and circulating areas due to high footfall.
- Examples: Chhatrapati Shivaji Maharaj Terminus (CSMT), Howrah Junction.

Requirements of a Passenger Station I

A well-designed passenger station must provide specific amenities scaled to its category and traffic volume. The table below outlines basic requirements for different categories.

Requirements of a Passenger Station II

Key Points

- | Facility | Small Station | Medium Station | Large/Terminal Station |
- | :— | :— | :— | :— |
- | ****Waiting Rooms**** | Basic seating | Separate class waiting rooms | Executive lounges, retiring rooms |
- | ****Platforms**** | Single, low-level | Multiple, high-level with covers | Numerous, fully covered |
- | ****Ticketing**** | Single counter | Multiple counters, automated machines | Dedicated booking concourse |
- | ****Access**** | Level crossing | Foot overbridges (FOBs) | Escalators, elevators, subways |

Introduction to Railway Yards I

A railway yard is a complex series of tracks provided for receiving, sorting, making up trains, and dispatching vehicles. Yards are isolated from the main line to prevent shunting operations from interfering with regular train movements.

Key Points

- Receiving and dispatching trains.
- Sorting wagons and making up new trains.
- Stabling empty passenger rakes or goods wagons.
- Servicing and minor repairs of rolling stock.

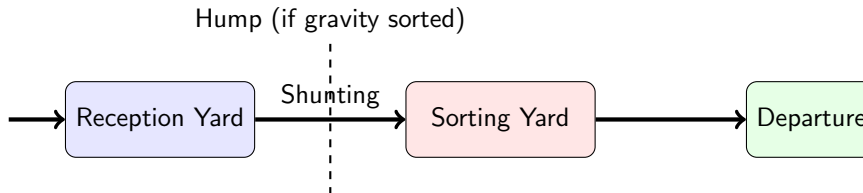
Types of Railway Yards I

Railway yards are categorized based on their primary function. The main types include passenger yards, goods yards, marshalling yards, and locomotive yards.

Key Points

- Passenger Yards: Used for safely stabling, washing, and cleaning passenger train rakes.
- Goods Yards: Designed for receiving, loading, unloading, and dispatching goods wagons.
- Locomotive Yards: Facilities for servicing, fueling, and repairing locomotives.
- Marshalling Yards: The most complex type, used for sorting goods wagons and forming new freight trains.

Layout of a Marshalling Yard I



Key Points

- Wagons are received in the Reception Yard.
- They are sorted according to destination in the Sorting Yard (often using a hump).
- Newly formed trains are moved to the Departure Yard before entering the main line.

Summary I

Railway stations and yards form the critical infrastructure required for the efficient operation of a railway network. Proper site selection and appropriate design ensure smooth traffic flow, safety, and future scalability.

Key Points

- Stations facilitate passenger and goods exchange, classified into halts, crossing, junction, and terminal stations.
- Site selection depends on land availability, topography, and accessibility.
- Yards handle the complex logistics of train formation, sorting, and servicing.
- Marshalling yards are the core of freight operations, requiring reception, sorting, and departure facilities.