

DI04006071: Railway, Harbour & Tunnel Engineering

Lecture 3.15: Type of Yards, Marshalling Yards & its Types and Platforms

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Civil Engineering

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Introduction to Railway Yards I

A railway yard is a complex series of parallel tracks used for storing, sorting, or unloading railroad cars and locomotives. They are essential for the smooth operation and management of railway traffic.

Key Points

- Yards provide facilities for making up trains, storing cars, and maintenance.
- They are laid out to allow cars to be sorted efficiently according to their destination.
- Yards act as a buffer to absorb variations in traffic flow.
- Proper yard design is critical to minimize delays in goods and passenger transit.

Classification of Railway Yards I

Railway yards are classified based on the specific functions they perform. Each type of yard is designed with distinct track layouts and facilities to serve its primary purpose effectively.

Key Points

- Passenger Yards: Dealing with the reception and dispatch of passenger trains.
- Goods Yards: Designed for receiving, loading, unloading, and dispatching freight.
- Marshalling Yards: Used for sorting goods wagons to form new trains.
- Locomotive Yards: Providing facilities for servicing, fueling, and repairing locomotives.

Passenger and Goods Yards I

Passenger and goods yards are the primary interfaces between the railway system and its customers. They require specific infrastructure to handle people and freight safely and efficiently.

Key Points

- Passenger yards require platforms, concourses, ticketing facilities, and waiting rooms.
- They include stabling lines for parking idle passenger rakes and washing lines for cleaning.
- Goods yards need loading/unloading platforms, goods sheds, and approach roads for trucks.
- Weighbridges and crane facilities are common in heavy goods yards.

Introduction to Marshalling Yards I

A marshalling yard is a railway yard found at important junctions where freight trains are received, sorted, and dispatched. It acts as a massive sorting machine for railway wagons.

Key Points

- Wagons from various origins are separated according to their destinations.
- Empty wagons are stored and distributed as needed.
- Marshalling yards are crucial for the economic operation of freight services.
- They minimize the need for point-to-point dedicated freight trains.

Functions of a Marshalling Yard I

The operation of a marshalling yard involves several sequential steps to process incoming trains and assemble outgoing ones. A typical yard consists of reception, sorting, and departure yards.

Key Points

- Reception: Incoming trains are received, and locomotives are detached.
- Sorting: Wagons are uncoupled and directed to specific sorting tracks based on destination.
- Marshalling: Sorted wagons are coupled together in a specific order.
- Departure: Formed trains are moved to departure tracks, attached to a locomotive, and dispatched.

Comparison of Marshalling Yards I

Marshalling yards are classified mainly by the method used to move wagons during the sorting process. The choice depends on topography, traffic volume, and available capital.

Key Points

- Type | Topography Requirement | Shunting Power | Efficiency
- Flat Yard | Level ground | Shunting engine (Push/Pull) | Low capacity, slow sorting
- Gravitational Yard | Natural steep slope | Gravity | High capacity, difficult to control speed
- Hump Yard | Artificial hump (gradient) | Gravity + Shunting engine | Highest capacity, most efficient

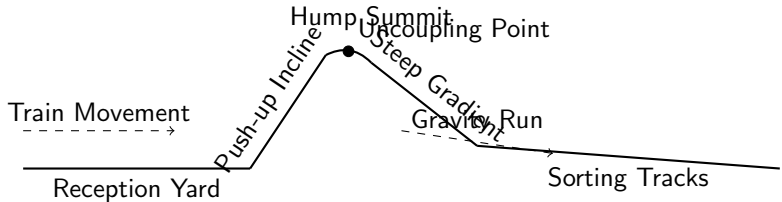
Flat and Gravitational Yards I

Flat and gravitational yards represent two ends of the spectrum regarding natural topography. Both have specific applications and limitations in modern railway engineering.

Key Points

- Flat Yards are common where land is perfectly level and traffic volume is relatively low.
- They require continuous use of shunting locomotives, making operations slow and costly.
- Gravitational Yards utilize a continuous falling gradient throughout the yard.
- Wagons move purely by gravity; however, finding suitable natural topography is very rare.

Hump Marshalling Yard Profile I



Key Points

- Hump yards feature an artificial hill (hump) over which wagons are pushed.
- Wagons roll down the steep gradient into the sorting tracks by gravity.
- Retarders (track brakes) are used to control the speed of the rolling wagons.
- This is the most efficient design for high-volume freight sorting.

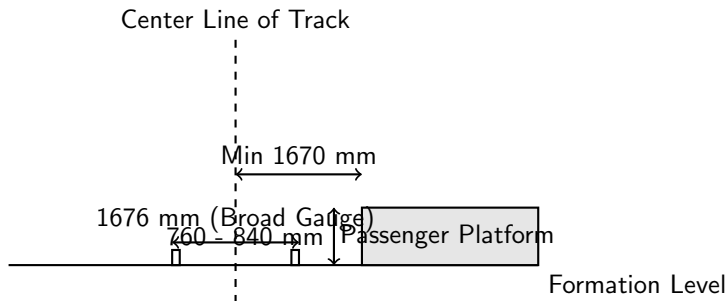
Railway Platforms I

Platforms are raised areas alongside railway tracks providing convenient and safe access for passengers boarding and alighting trains, or for loading and unloading goods.

Key Points

- Passenger platforms can be High-level, Low-level, or Rail-level depending on the station category.
- Island platforms serve tracks on both sides, saving space and centralizing amenities.
- Goods platforms are typically raised to the floor level of goods wagons for easy transfer.
- Platform lengths must accommodate the longest train planned for that route.

Passenger Platform Clearances I



Passenger Platform Clearances II

Key Points

- Strict clearances are maintained between the track center and platform edge to prevent collisions.
- For Broad Gauge (BG) in India, the minimum horizontal distance from track center to platform coping is 1670 mm.
- The height of a high-level passenger platform above rail level is typically between 760 mm and 840 mm.
- These dimensions ensure passenger safety while allowing trains to pass without restriction.

Summary I

This lecture covered the critical infrastructure of railway yards and platforms, essential for the organization and movement of trains and freight.

Key Points

- Yards are classified into Passenger, Goods, Marshalling, and Locomotive yards.
- Marshalling yards are vital for freight sorting, with Hump yards being the most efficient.
- Platform design must adhere to strict clearance dimensions to ensure passenger safety and operational efficiency.