

STATIONS AND YARDS

- ❑ Stations and Yards are the field control units of a railway system of communication and they serve as the waiting places and repairing places for the idle wagons.
- ❑ They also form the basic administrative units of the railway system of any country.

STATIONS

- A **Station** is defined as any place on a railway line where traffic is booked and dealt with, and where an authority to proceed is given to the train.
- In some stations, only one of these functions is carried out and accordingly they are classified as **flag stations** and **block stations**.
- In case of **flag stations**, only traffic is dealt with and there are no arrangements to control the movements of trains.
- In case of **block stations**, no traffic is dealt with. But a train cannot proceed further without obtaining permission from these stations.

PURPOSES OF RAILWAY STATIONS

- ❖ To add or detach the bogies in the trains as per the requirements.
- ❖ To control the movements of train.
- ❖ To enable the express and mail trains to overtake the goods and local passenger trains.
- ❖ To fill the locomotives with water, coal; and diesel.

- ❖ To hold the passengers temporarily in case of emergencies such as floods, accidents, etc.
- ❖ To install workshops for rolling stock.
- ❖ To provide a place for the changing of the engines and running staff.
- ❖ To sort out the wagons for preparing the goods train as required.
- ❖ To take up the passengers and goods.

SITE SELECTION FOR A RAILWAY STATION

- The proposed site should be on a fairly level ground and it should be well drained.
- There should be plentiful supply of water at the site of station.
- There should be plenty of space or room for extending the stations along both the sides.
- As far as possible, the site for a proposed railway station should not be situated on or near a curve on the railway line. The station yard should never be situated on curves.
- The site should be such that permissible maximum gradients can be obtained without much difficulty.

- Two difficulties of station on curve: During the starting of trains, the locomotive will have to exert extra force to pull the train on gradient. And when the bogies are standing in station yards and at the time of strong wind blows, the bogies will acquire movement due to gradient and it might result in serious accident.
- The site for a proposed railway station should be as near as possible to the town or village to be served by it.
- The existence of approach roads connecting the site for a proposed railway station with town or village is highly desirable.

FEATURES OF RAILWAY STATION

- Public Requirements
- Traffic Requirements
- Requirements of locomotive department
- General requirements.

PUBLIC REQUIREMENTS

The facilities to be given to the public at a railway station should be as follows:

- Booking office
- Platforms
- Platform coverings
- Arrangement of drinking water
- Sufficient lights
- Bathrooms
- Waiting rooms and retiring rooms
- Refreshment rooms
- Public telephone

Microphones to announce the arrival and departure of trains

- Guides to help illiterate passengers
- Refrigerators to supply cold water in hot weather

- Inquiry office attached with telephone
- Name-board of the station
- Police office to help the passengers
- Guide map of the city
- Board showing reservation charts
- Charts showing ticket rates
- Big board showing arrivals and departures of the trains at the station.

TRAFFIC REQUIREMENTS

Traffic requirements include following:

- ❖ The arrangements for booking passengers and goods and proper apparatus for issuing and dating tickets, issuing of luggage labels and goods invoices, and also, the arrangements to collect all these things at the end of journey should be made.
- ❖ The arrangements for controlling and recording the movements of trains by means of signals should be made.
- ❖ Sufficient number of sidings to enable the trains to cross or overtake each other should be provided.
- ❖ Sufficient number of sidings to accommodate the goods traffic to be dealt with at the station should be constructed.

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- ❖ Suitable platforms for loading, unloading and storing of goods should be provided.
 - ❖ The arrangements to accommodate the staff of traffic department should be made.
 - ❖ In case of big station, the arrangements should also be made for taking goods and luggage through lifts or underground passages.

REQUIREMENTS OF LOCOMOTIVE DEPARTMENT

These include the following:

- The arrangements for supplying the engines with fuel and water should be made.
- The arrangements for cleaning and examining the locomotives should be provided.
- The arrangements for inspecting and repairing the vehicles should be made.
- The arrangements to accommodate the staff of the locomotive department should be provided.

GENERAL REQUIREMENTS

- The additional features of a railway station are suitable approach roads from surrounding areas towards the station
- Provision of clocks showing correct time
- Availability of coolies on the platform of station
- Foot-over bridges leading to various platforms

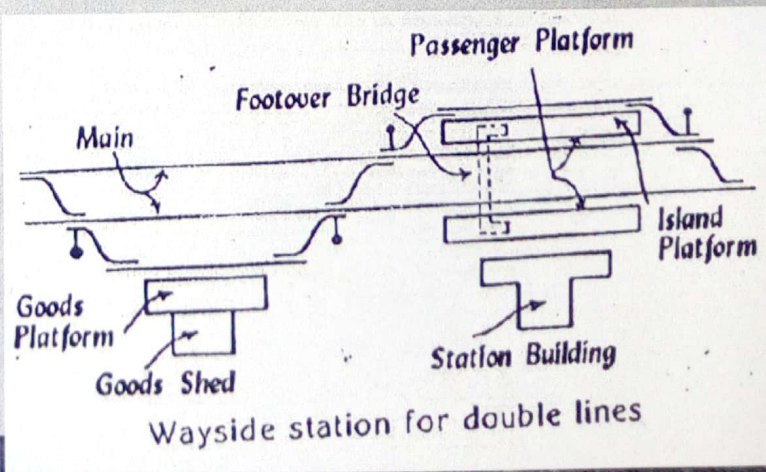
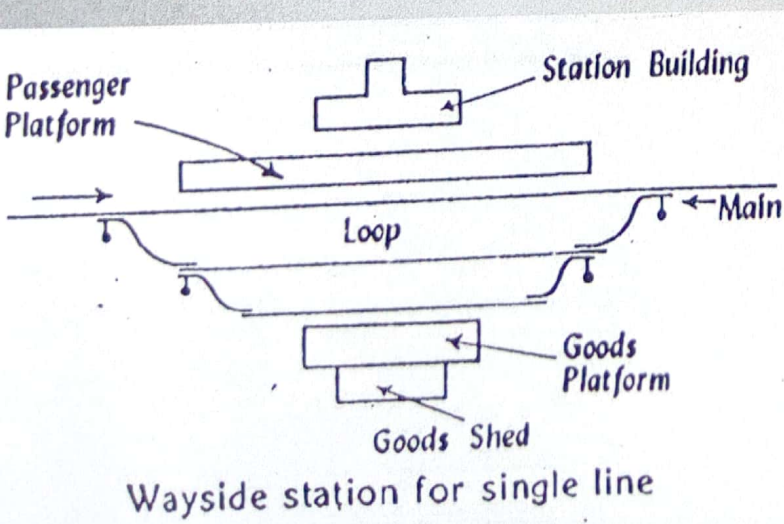
TYPES OF STATIONS

The stations can be divided into the following three types:

- Wayside stations
- Junctions
- Terminals

WAYSIDE STATIONS

In this type of stations, the arrangement is made to cross an up and a down train of for overtaking of the slower trains by the faster trains.



JUNCTIONS

- In this type of stations, the branch line meets the main line and hence the arrangements are made:

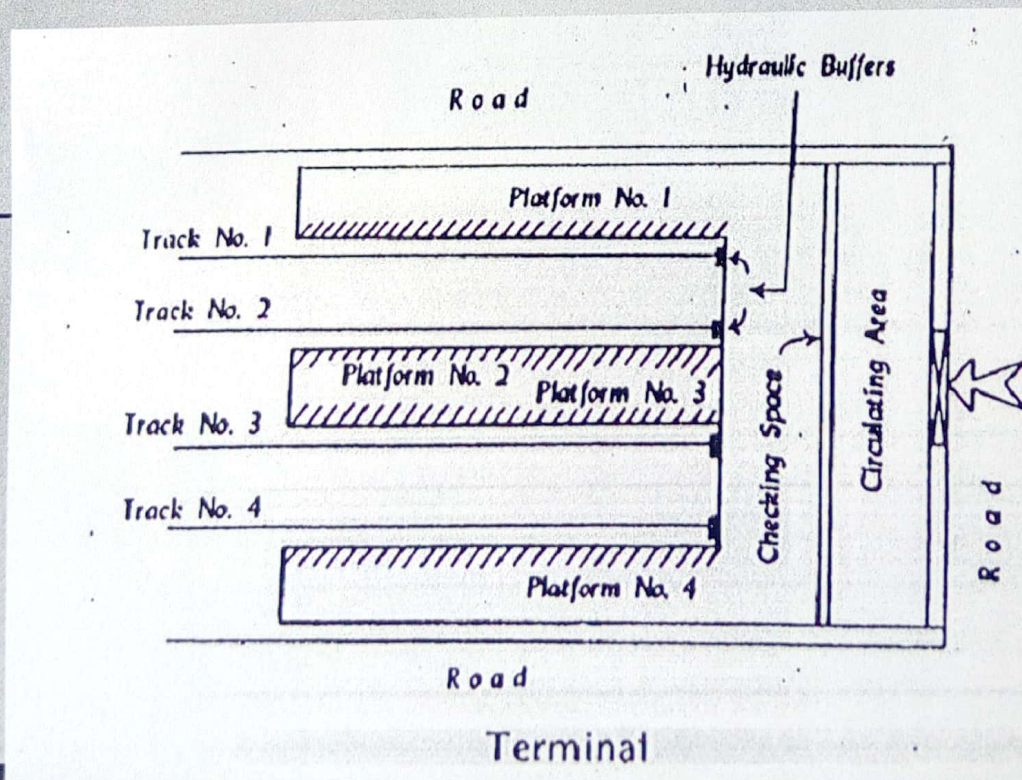
- 1) To facilitate the interchange of traffic between main and branch lines, and
- 2) To clean and repair the vehicles of the trains which terminate at the junctions.

The junctions may occur between a single branch line and single or double main lines
OR between double branch line and main tracks.

TERMINAL

The station at which a railway line or one of its branches terminates or ends is known as the terminal station or terminal junction.

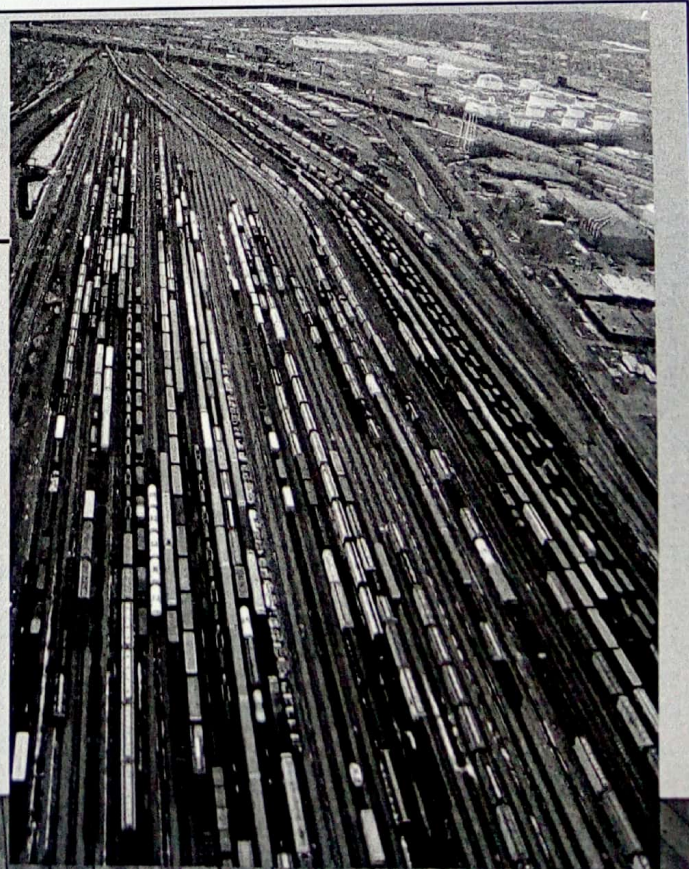
In terminal stations, the additional arrangements such as facilities to reverse the engines, number of sidings, examination pits, etc. are to be provided.



YARD

A **rail yard**, **railway yard** or **railroad yard** is a complex series of railroad tracks for storing, sorting, or loading/unloading, railroad cars and/or locomotives.

Railroad **yards** have many tracks in parallel for keeping rolling stock stored off the mainline, so that they do not obstruct the flow of traffic.



TYPES OF YARDS

For convenience the classification of railway yards can be done in the following four categories:

- A) Passenger yards
- B) Goods yards
- C) Marshalling yards and
- D) Locomotive yards

PASSENGER YARDS

The main function of passenger yards is to provide facilities for the safe movements of passengers and the vehicles for the passenger.

The passenger platform may be considered as passenger yards.

Similarly at junctions or terminal the separate sidings are provided to accommodate the passenger trains during their idle period.

GOODS YARDS

- These are provided for receiving, loading and unloading of goods.

- The goods platforms may be treated as goods yards.
- Separate goods sidings will also have to be provided.
- It should be remembered that it is not possible to load or unload the goods at all places where the train stops.
- Hence a vehicle is made a conveyance unit and this peculiar characteristics of goods traffic requires the provision of goods yards at a number of places along a railway line.

MARSHALLING YARDS

- **Marshalling Yard** is a place where goods trains are received, sorted, reformed and dispatched.

- The main purpose of having Marshalling yards is to isolate goods wagons received from various centers in the order of station at which they are to be send.
- Thus in one way, they are working as distributing centers.
- Also the empty wagons are kept in Marshalling yards and the same can be supplied as and when required by other stations.
- In fact, the function of a Marshalling yard in a railway system is **like the function of the heart in a human body.**

Considerable importance is therefore attached to the equipment and design of a

TYPES OF MARSHALLING YARDS

1. Flat Yards

- Sorting by push and pull method of shunting.
- Maximum number of wagons that could be sorted out in a flat yard with one shunting neck and one shunting engine will be around 500 or so in a day.
- If the total quantum of traffic is more than this it is advisable to have a hump yard or separate Up and Down Yards.
- Flat yards are economical in space, but slow in working and wasteful in shunting engine hours.

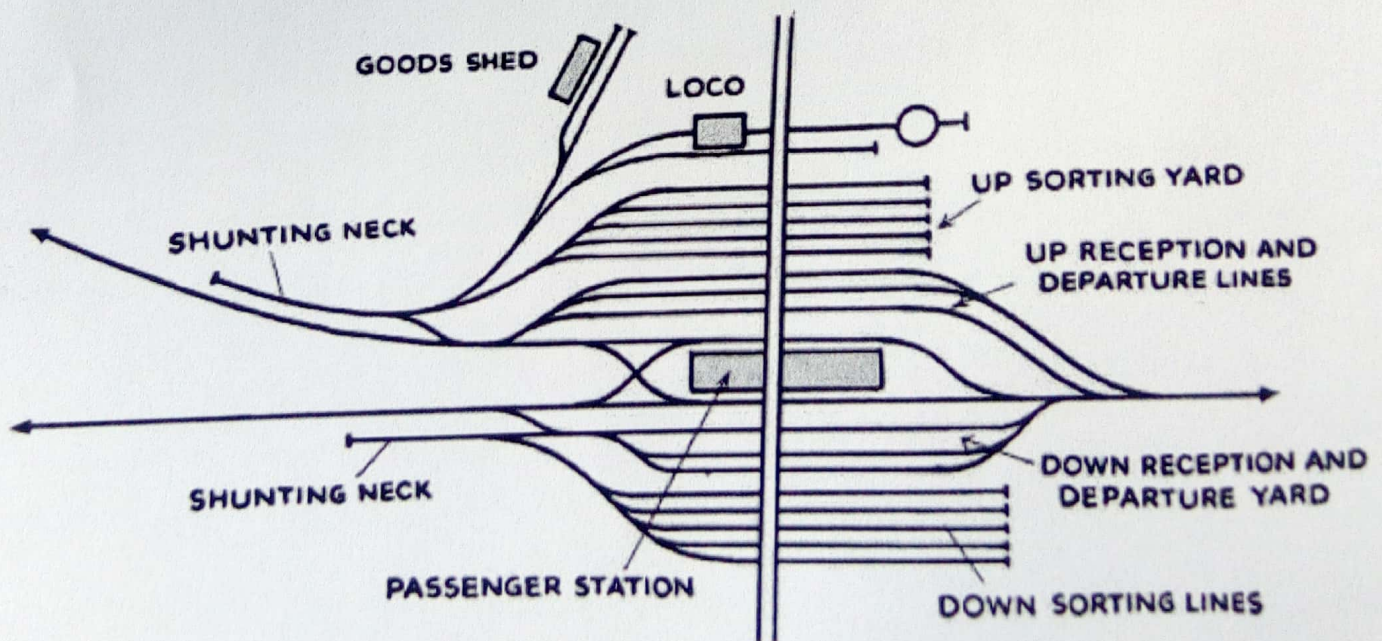
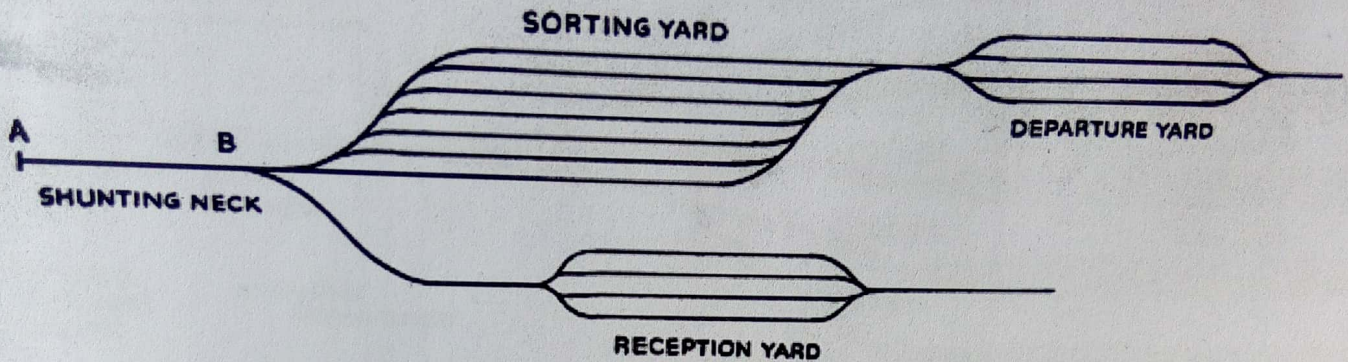


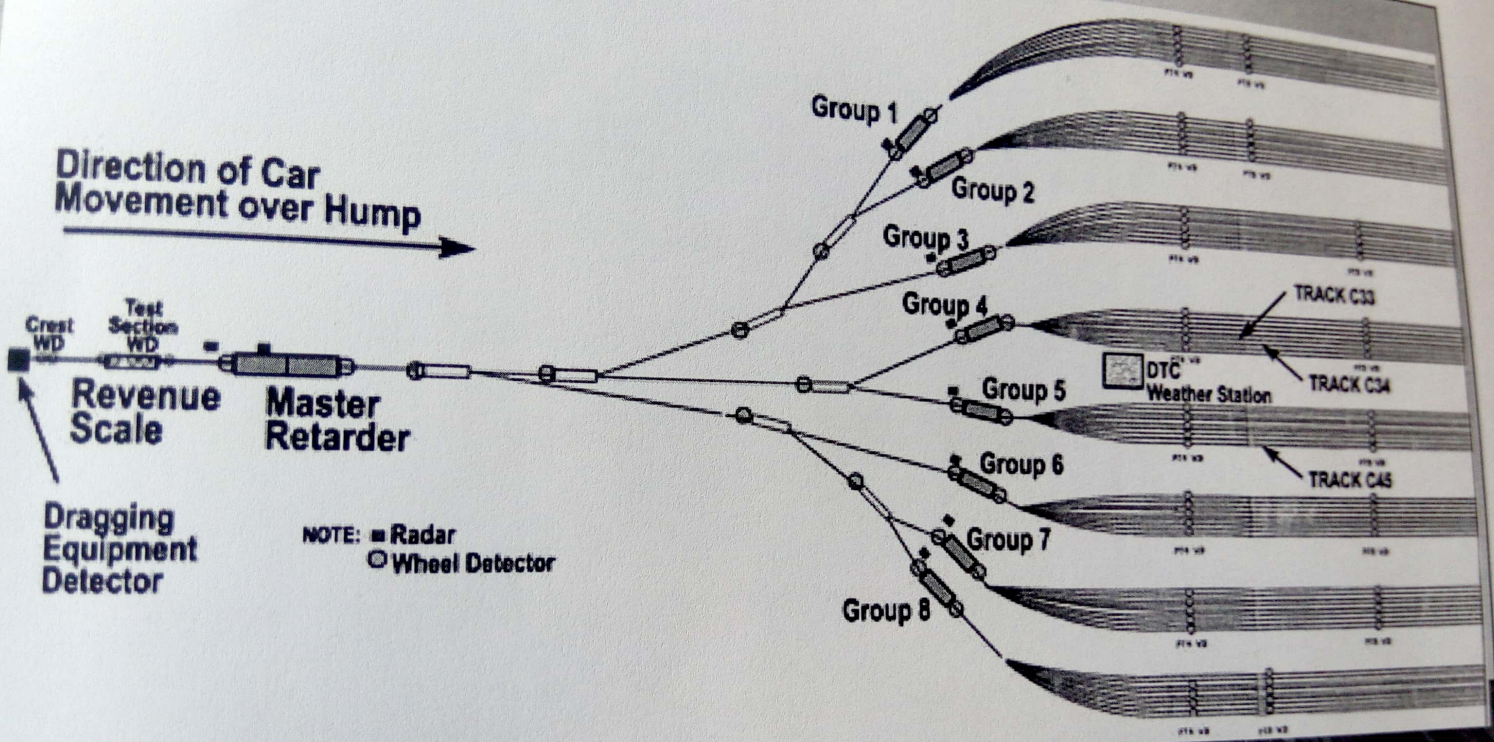
Figure 5 - Typical layout of a flat-shunted yard (Bhalerao, 2008)

Fig.1 FLAT YARD



2. Hump yards

- A hump of suitable height is provided and wagons are rolled from the crest of hump to desire sorting lines with gravitational force.
- With proper mechanization it is possible to sort up to 5000 wagons per day in a single hump.
- One train load of 60 wagons can be sorted in 20-25 minutes in no-mechanised hump yard.
- With retarders it can be done in 12-15 minutes.
- In fully mechanized yards it can be done in 7-8 minutes.
- Hump yard are economical in Shunting Engine Hours compare to Flat yards.



3. Gravity Yards

- Natural slope of the site is taken to locate reception and sorting lines in such a fashion that wagons can be rolled from reception to sorting lines without the help of a shunting engine.
- Wagons on reception lines are held in position by track brakes.
- Main advantage is the reduction in operating costs due to saving in shunting engine hours.
- Economical than Flat yard, but layout is dependent on the availability of plenty of land with the required topography.



The important points to be considered in the design of marshalling yards are as follows:

(a) The marshalling yards should be designed for through working of traffic which means that the shunting operations should not disturb the time table of regular trains.

(b) It should be remembered that the efficiency of marshalling yards does not depend on their storing capacity. But it depends on the number of wagons sorted out. Thus the design of marshalling yards should be such that maximum number of wagons are despatched in a given period rather than stored.

(c) The design of marshalling yards should be made while keeping in view the probable future extension of the yard due to increase in goods traffic.

(d) As far as possible, the marshalling yards should be kept parallel to the running lines.

(e) The marshalling yards should be constructed at all important railway stations, especially where main routes are converging.

(f) The marshalling yards should be designed in such a way that wagons move in one direction only as movements in both directions will result in uneconomy and delay.

(g) The *tranship platforms* with necessary repairing facilities should be provided on one or more sidings of the marshalling yard. These sidings should be reserved for defective wagons only. The goods can be taken out from the defective wagon and can be reloaded in another wagon by the use of tranship platform.

(h) In some of the foreign countries, the television has been installed in large marshalling yards to facilitate the sorting of wagons.

(i) The marshalling yards should also be provided with adequate lighting.

(j) The marshalling yards are very costly in construction and maintenance.

(k) If the marshalling yards are not properly operated, they may lead to various undesirable effects such as delay in the transit of wagons, damage to wagons during shunting operations, traffic congestion on approaches to the marshalling yards, etc.

Requirements of a locomotive yard

- Should be located near the passenger and goods yards
- Water column
- Engine shed, Ash pit, inspection pit, repair shed, turn table
- Hydraulic jack for lifting operations
- Over head tank and loco well
- Sick siding
- Place for future expansion