

RAILWAY SIDINGS

LESSON I

RAILWAY TRAFFIC AND SIDINGS

THE NEED FOR SIDINGS

1.1.1 Railway sidings are an extension of the Railway system and an integral part of it. The need for sidings arises because of the variety of traffic booked, carried and delivered by the Railways. Railway traffic is divided into two broad categories

(i) Coaching, consisting of passengers and their luggage and of parcels carried in brake vans of passenger trains or in parcel vans or motor vans etc.

(ii) Goods or freight, consisting of piece goods in packages or bundles or cases; livestock and bulk goods like coal, food grains, minerals, ores, limestone, dolomite, petroleum (POL) products, iron and steel, heavy lifts, cement, timber, fire woods, etc.

1.1.2 The various streams of railway traffic and commodities have different characteristics, requiring specialized arrangements for stacking or storing, loading into and unloading from railway wagons, etc. Thus bags, bundles and cases are handled on high level goods platform, coal and minerals are unloaded on rail level platforms as it is not possible to deal with all the traffic at a single location when the volumes are large. At a wayside station it is possible to deal with a few parcel packages on the passenger platform and even store them in the station master's office. Similarly, at such a station a small goods shed line suffices for an occasional goods consignment received or booked. However, at a large station like New Delhi or Lucknow or Nagpur, separate parcel platform, parcel godown; goods platform and goods shed are necessary. In large goods shed, separate lines and platforms are to be earmarked for general goods, minerals and heavy goods etc. When large quantities of goods are handled, there is heavy movement of road vehicles, road cranes which generates noise and dust pollution. Therefore, it is desirable to segregate such locations from the main railway station.

1.1.3 Parcel traffic which is cleared by passenger trains in brake vans or parcel vans itself has a variety of consignments, e.g., hard parcel, fruits and vegetables, eggs and poultry, fish.

1.1.4 Because of the variety and nature of material transported by the Railways, it is neither desirable nor possible to deal with all the traffic at a single location when the volumes are large.

1.1.5 At a large station, dealing with important passenger trains, facilities for maintenance of passenger rakes are also created e.g., washing lines with pits for under gear examination, AC coach maintenance lines, battery charging lines, siding for tourist coaches and trains, end loading platform lines for loading/unloading motor vehicle.

1.1.6 Large Railway complexes require special departmental sidings to serve various installations like diesel loco shed, electric loco shed, loco workshop, carriage and wagon workshop, store depot, bridge workshop, flash but welding plant, scrap yard for cutting up condemned rolling stock etc.,. Smaller stations may have to provide only ballast sidings, quarry sidings, pump house sidings, etc.

1.1.7 Special siding arrangements are also required for Defence Department traffic. There are troop sidings at stations and in cantonments; sidings serving vehicle depots. Ordnance Factories which manufacture defence equipments and Ordnance Depots which store and issue defence material. Fig. 1.1 shows a military platform at Meerut Cantt. and also the siding connections to Northern Railway's Flash Butt Welding Plant. The military platform is divided into 3 parts by providing crossovers between the platform line and the common serving line. Hence released wagons can be withdrawn in parts. There is also a ramp for loading and unloading of motor vehicles in motor vans.

1.1.8 All the ports in the country are served by the Railways and have extensive network of railway lines inside for dealing with various commodities imported and exported through the Ports. The railway systems of Calcutta, Chennai and Mumbai Ports are treated like separate Railway Zones and of rest of Ports as only sidings.

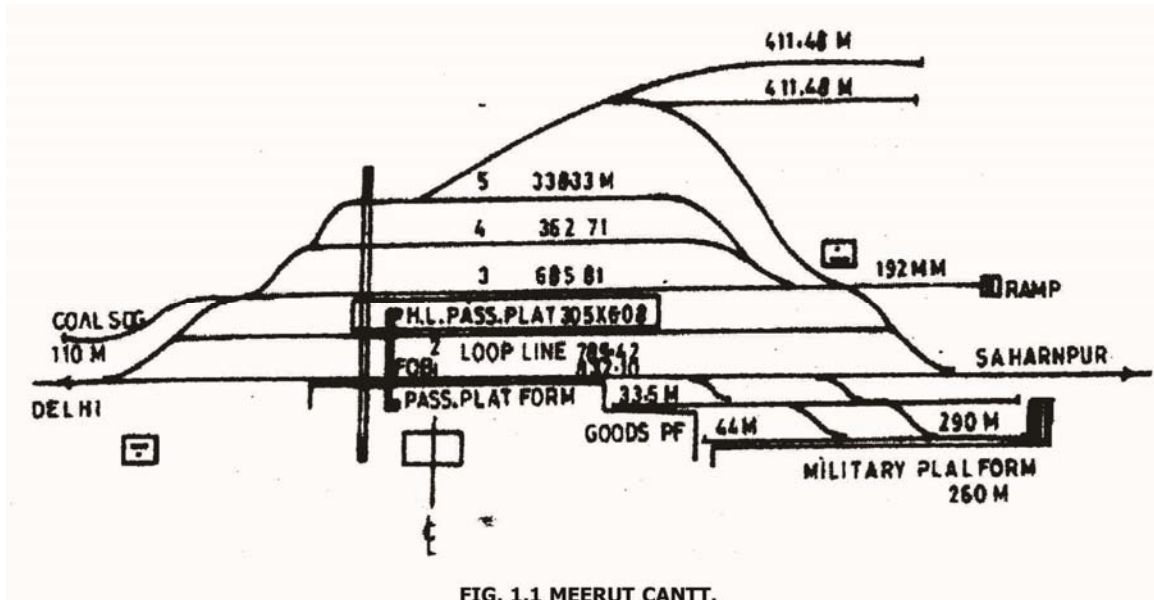


FIG. 1.1 MEERUT CANTT.

1.2 Types of sidings

1.2.1 Railway sidings meant for handling goods traffic are broadly classified as follows :

- (i) Departmental sidings of the Railways
- (ii) Public siding or siding provided by the Railways
- (iii) Assisted siding serving an industrial unit, capital cost of which is shared by the Railways and the siding owner;

The basis of apportionment of cost is discussed later.

(iv) Private siding serving an industrial unit, capital cost of which is borne entirely by the siding owner; Presently new sidings are mostly being constructed as private sidings.

(v) Military siding where traffic exclusively on account of the Defence establishment is dealt with and cost is shared by the Railways and Defence Department in prescribed manner.

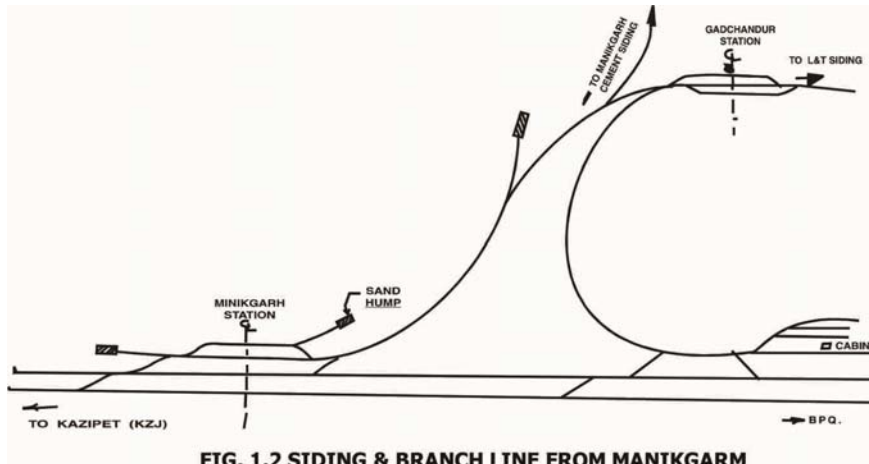
(vi) Colliery sidings.

1.3 New Railway lines for Industry

1.3.1 Just as Railway lines are built for purposes of Defence and development of backward regions, lines are provided for exploiting mineral deposits and even for serving industries.

1.3.2 There are several lines which carry mostly mineral traffic, e.g., K-K line for iron ore and Bhilai-Dalli-Rajhara line for coal on the south Eastern Railway.

1.3.3 On the South Central Railway a 23 km long new line was laid from Manikgarh to Gadchandur. From Gadchandur a private siding goes to L & T Cement Works, Awarpur over a distance of 5 km and another to Manikgarh cement, 3 km away. Both the Cement plants have a new work of reception, loading and departure lines inside. The branch line from Manikgarh is shown in Fig. 1.2



1.4 Definition of Railway Siding

1.4.1 As per para 2501 of Indian Railway Commercial Manual, an assisted/private siding is a siding constructed to serve a Government Department, a factory, mill or other industrial premises other than the colliery or mining area under a special arrangement.

1.4.2 Ordinarily, an assisted or private siding refers to the length from the take off point on the main railway system to the point of entry into the siding holder's premises. However, the Railways' rolling stock consisting of locomotives and wagons goes over various reception/dispatch lines, loading/unloading lines, shunting neck, etc. inside the premises of the plant or factory. In addition, the modification at serving station situated on the main railway system sometimes includes additional running lines, shunting neck, attaching/detaching siding, all provided at the cost of the siding owner. As such the larger definition of a siding includes all the lines at the serving station and inside the premises of the siding owners which are provided at the cost of the siding owner and on which Railway's rolling stock is expected to move.

1.5 Advantage of siding

1.5.1 Assisted and private sidings built to deal with the inward and outward traffic of various siding owners are advantageous both to the Railways and the siding owners. The main benefits are :-

(a) They provide a door to door service because goods do not have to be carted to and from the railway good shed; handling losses and costs are reduced; loading/unloading can be done by mechanical means inside the plant premises; goods receive better security protection in the sidings; noise and air pollution in the city is reduced.

(b) They save to the Railways the cost of providing elaborate facilities for dealing with large volume of traffic in the goods shed.

(c) Transport between the premises of siding owner and good shed being eliminated, thus the congestion on roads inside the city is reduced.

(d) Private or assisted siding builds a long term relationship between the siding owner and the Railways, assuring the Railways of traffic for a long time.

1.6 Location of siding take off or junction

1.6.1 A private or assisted siding may take off

- (i) From a station or a marshalling yard, e.g., in Kanpur area a number of sidings are served by the Juhi marshalling yards as well as the Kanpur Central Goods shed. The commercial transactions are handled by the Kanpur Central Goods Shed since Juhi marshalling yard does not have the requisite complement of commercial staff.
- (ii) From a new block station to be opened specially as the junction for a siding.

- (iii) In between stations, without opening a new block station. These are called outlying sidings and worked according to special procedure prescribed. The siding points are kept key-locked and key is retained at one of the adjacent block stations termed as the parent station. When a train has to go into siding, the Guard of the train takes the key of siding points from the parent Station, stops the train short of the points, sets and locks the points of the siding for the train to enter the siding. After finishing the work in the siding the train comes out and points are restored for the main line. This system of working blocks the main line section for the period the train is inside the siding. This could be adopted when the traffic was light. Where the main line section was busy and its blockade could not be allowed for long duration, a token exchanger was installed at the siding points. With this the Guard after entering the siding and resetting the points for the main line deposited the token and the main line section was restored for movement of trains. When the train was ready to leave the siding the Guard contacted the parent station on telephone and extracted a token to proceed on the main line. The practice of building outlying sidings has been given up.
- (iv) From an existing siding

When several sidings branch off from a main siding, the latter is called an arterial siding. Some times the arterial siding is provided by the Railways as a public siding at their own cost and connections of assisted sidings are given from it to various mills and factories. Thus a large number of sidings were controlled by the Kanpur Central Goods Shed, the wagons to/from which were carried by a Mill Siding Pilot travelling through the busy areas and crossing several roads in the city.

Co-use of Siding

1.6.2 A private siding owner can also allow another siding to be taken off from his siding with the approval of the Railway concerned. The Railways can also ask the siding owner to permit a siding to take off from the private siding, though normally the Railway does not do so. In such a case, cost of the existing siding can be shared on agreed terms, either as a lumpsum or as an annual payment.

1.7 Interchange of Traffic

1.7.1 The sidings built for industries in the past were designed mostly to deal with a small volume of traffic, carried in piecemeal wagons or in trains loads which were much smaller than today. Many of these were close to the serving stations and working the sidings was not difficult. Mostly the train engine performed the required shunting as in the case of a goods shed. When large industrial units started coming up and trains became longer and heavier, the concept of an exchange yard developed on the Railways. The exchange yard was meant for interchanging traffic between the main line Railway system and the siding. A train hauled by main line locomotive was terminated in the exchange yard from where wagons were taken to the siding either in parts or in one block by a shunting locomotive owned by industrial unit, or even by hand shunting; in some cases the movement from the exchange yard to the siding was undertaken by the Railways' locomotive on realization on shunting charges. This system of working involved delays to wagons and locomotives both, primarily because availability of the required locomotive could not always be matched with readiness of rakes to go out. The Railways have accordingly decided that the inter change of traffic should take place inside the siding premises and not at the serving railway station or an exchange yard. In other words the exchange yard should be inside the premises of the plant or factory, merged with the plant's R & D yard. Therefore facilities for direct reception of trains hauled by main line locomotive are created inside the siding premises. Similarly, a train of released wagons is formed inside the siding premises from where it leaves hauled by main line locomotive.

1.8 Block Rake Movement

1.8.1 Block rake or a unit train is a full length train which runs from its origination to destination without attaching or detaching wagon enroute, thus making the movement of goods much faster. Around the decade beginning with 1980 the Railway firmly adopted a strategy to maximize movement of goods in block rakes or unit trains, (avoiding stoppage at intermediate points for attaching and detaching wagons. This concept was even used in 1960 during green revolution in Punjab and Haryana when

tremendous amount of foodgrains traffic had to be moved to deficit areas. Northern Railway hurriedly improvised block rake handling facilities at various loading stations. A number of small works were also taken up later to provide block rake loading, unloading facilities. Typical layout plans for terminals handling block rakes were prepared. A simple layout adopted at FCI's foodgrains depot at Whitefield is shown in Fig. 1.3.

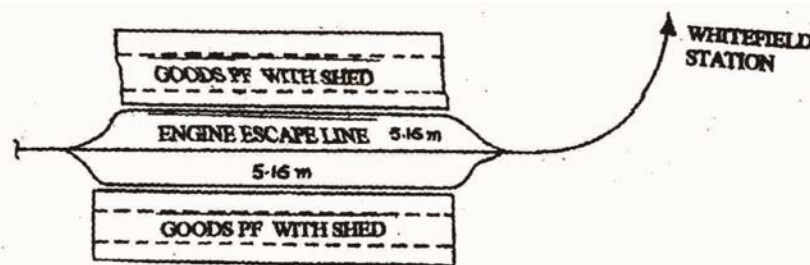


FIG. 1.3 F. C. I. FOOD GRAIN SIDING AT WHITE FIELD

1.8.2 For the purpose of block rake or unit train operation, inefficient four wheeler wagons were segregated from the eight wheeler or bogie wagons and block rakes were formed separately of the four wheeler and the bogie wagons. The four wheeler rakes were used for short distance movement whereas the bogie wagon rakes were put in the long distance circuits. Simultaneously end to end running of locomotives was introduced whereby a locomotive continued from origin to destination with only change of crew at intervals. As result of this policy to undertake the maximum movement in block rakes, large number of goods sheds were closed and the work load on marshalling yards was substantially reduced. Also the traffic which required piecemeal wagons get diverted from the Railways.

1.8.3 It is to be noted that block rakes of traffic can be offered or accepted only by large industrial units like fertilizer plants, cement plants, POL refineries or foodgrains depots and mandis, mines producing coal, iron and other minerals. For loading or unloading about 3000 tones of material per train, sidings are absolutely necessary. Thus presently 80% to 90 % of traffic on the Railways originates from sidings or terminates there.

1.9 Block Rakes with engine-on-load

1.9.1 The latest thinking is that a siding should be designed not only for a train to directly enter and exit from siding, but also the locomotive should remain on the train while it is being loaded or unloaded; the terminal work should be with engine-on-load. In the past locomotive was considered to be a more valuable asset than a rake consisting of four wheeler stock. Today a rake consisting of modern bogie wagons fitted with air brakes is even costlier than a locomotive and it is worth while detaining locomotives for 3 to 4 hours while the rake is being released/unloaded so that the same locomotives can take away the released rake.

1.9.2 The price of a BOXN open wagon is about Rs.13.75 lakh and that of a BOBRN open hopper wagon Rs. 20 lakh. A rake consisting of 58 BOXN or BOBRN wagons would cost about Rs. 8 crore or Rs. 12 crore. Against these costs, the price of diesel locomotive is about Rs. 5 crore only.

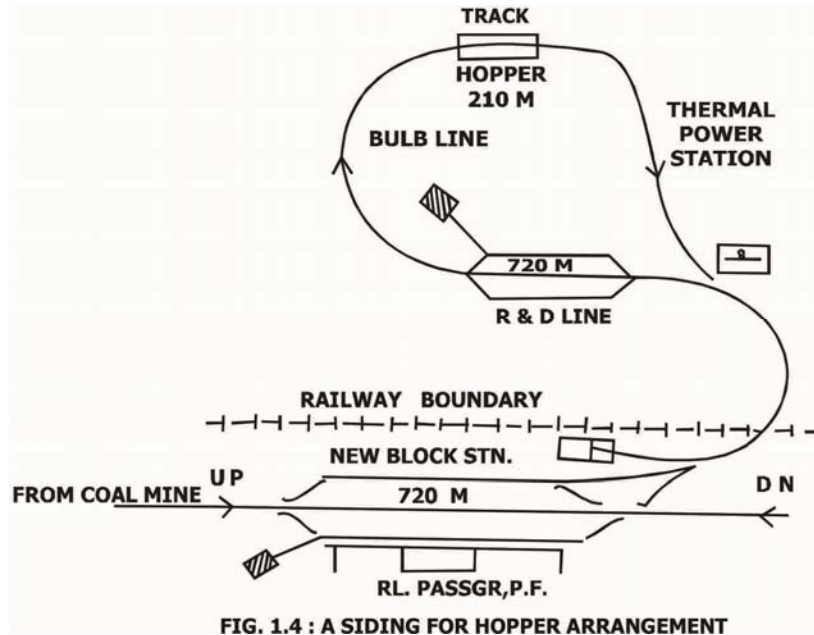
1.9.3 This engine on load system of handling trains requires the loading and unloading arrangements in the siding to be very efficient. Mechanized handling can release a full rake in 3 to 4 hours.

1.9.4 Merry-go-Round

A good example of the engine on load concept is the merry-go-round (MGR) system adopted for carrying coal to a plant situated at short distance from the coal mines. Under this system a train runs from mines to the plant and back in a closed circuit. Wagons are loaded mechanically while in motion at a low speed. Similarly they are unloaded in motion over a track hopper. The locomotive remains

attached to the rake all the time. The rake consists of bottom discharge hopper wagons. In case the bottom door opening mechanism does not work on its own, the doors are opened by manual intervention. A length of track hopper of 100 metres accommodates 9 bogie wagons and 210 metres holds 18 wagons. In case of failure of automatic door opening, lots of 9 to 18 wagons are stopped at the hopper and a full rake takes six or three stoppages over the hopper for unloading.

1.9.5 Some large industrial units far away from mines are drawing coal from mines in rakes of hopper wagons. Coal is unloaded over a track hopper located on a bulb line on which the train moves in an all forward direction, conforming to the engine-on-load system of working. An example of track hopper arrangement is given in Fig. 1.4.



1.10.1 Rules and Procedures for Sidings

The subject of construction and Working of assisted and private sidings, apportionment of capital cost and incidence of charges like interest on capital, maintenance expenses, supervision and inspection charges is covered mainly in the Indian Railway Code for Engineering Department. It is also dealt with in the Code for the Traffic Department and in the Indian Railway Commercial Manual. The provisions are modified from time to time through circulars and correction slips issued by the Railway Board.