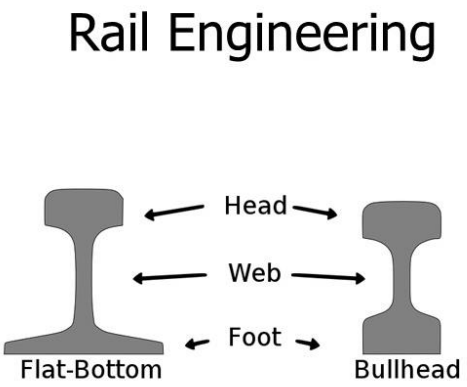
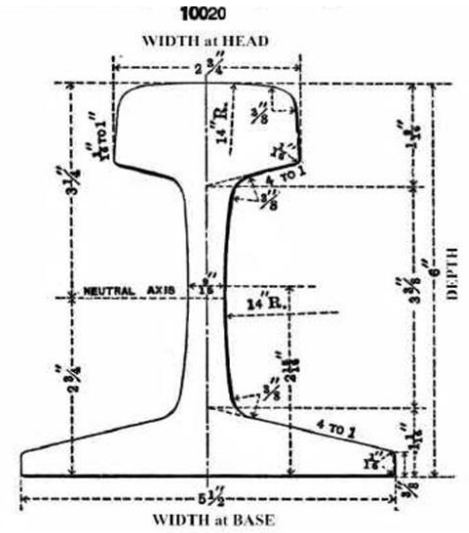
Railroad Track – A High Level Summary

Railroad track is more complex than meets the eye. Modern track has progressed with technology since the era of the Golden Spike. Steel rails have added alloys that provide them with harder finishes extending rail life. Rails comes in different sizes based on their intended application. Class I railroad mainline rail is heavier and taller than rail used in an industrial siding for example. Roadbed and rail determine how heavy a locomotive or train that can be allowed to travel on track.

Rail

Here is a standard for mainline rail. Rail has three main sections as shown below.





Modern track uses welded rail, concrete ties and multilayered roadbed. These materials provide for heavier trains and faster speeds with much less maintenance over wood ties and sectional rail with fish plates and tie plates. Welded rail is more stable and lower cost to install and maintain. There are all types of automated machines that prepare roadbed and lay track in our modern times. They are beyond what we can discuss in this summary.

Gauge is the distance between the rails and is often in layman's terms called track size which is a misnomer. Below are lists of the two main track gauges and some others used around the world for standard (not narrow) gauge railroads by country.

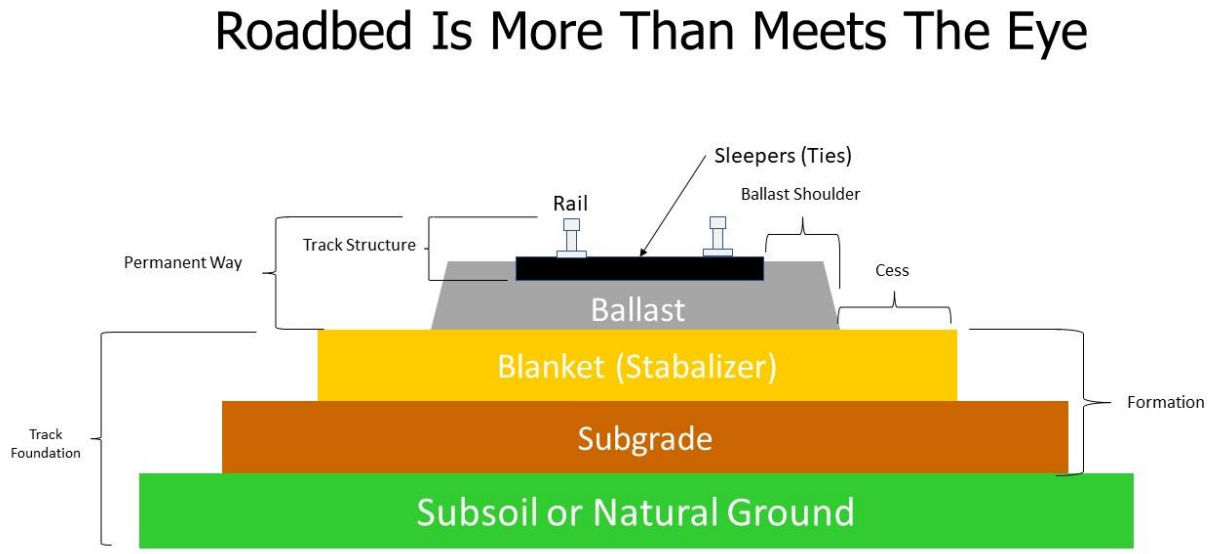
N. American & UK Standard Gauge 4 ft 8 ½ In

USA	Greece
Canada	Hungary
England - Scotland	Iran
Mexico	Israel
Albania	Lithuania
Australia	Macedonia
Bosnia	Montenegro
Bulgaria	N Korea
Central America	Phillipeannes
China	Poland
Croatia	Romania
Cuba	S. America
Czech Republic	Turkey
Congo	Western
Ethiopia	Europe

Russian Standard Gauge 4 ft 11 27/32 In	Other Gauges
Armenia	Ireland – 5ft 3 in
Azerbaijan	Portugal – 5ft 21/32in
Belarus	Spain – 5ft 21/32in
Central Asia	India – 5ft 6in
Estonia	Pakistan – 5ft 6in
Finland	Sri Lanka – 5ft 6in
Georgia	Indonesia – 3ft 6in
Kazakhstan	Japan – 3ft 6in
Latvia	Laos – 3ft 6in
Moldavia	Myanmar – 3ft 6in
Mongolia	Thailand – 3ft 6in
Russia	Vietnam – 3ft 6in
Ukraine	
Uzbekistan	

Roadbed

Roadbed is the most important part of railroad track. The more stable the roadbed the safer a train travels over it and the longer life expectancy of the track. The diagram below provides a cross sectional view of modern roadbed. Train weight, train speed, uneven rails, use of brakes, out of round wheels etc. all contribute to the life expectancy and stability of roadbed with time.



When we look at roadbed, we normally only see the track, ballast and sometimes part of the blanket. To add stability, the right of way directly under the track is prepared and built to the railroad's standards for different conditions of the soil and ground to which the track is to be laid. Soil is tested for density, moisture and composition. The subgrade is an additional layer of material used to help stabilize roadbed, lessen washouts and shifting of the subsoil. The blanket is often rock with additives to support more weight and resist material shifting.