

# **Materials for Railway Ballast on the Railway Track**

## **Materials for Ballast Railway Engineering Notes**

The following materials for Railway Ballast used on the railway track.

1. Broken Stone
2. Gravel
3. Cinders / Ashes
4. Sand
5. Kankar
6. Moorum
7. Brick Ballast
8. Selected Earth

### **1. Broken Stone**

Broken stone is one of the best materials for railway ballast to be used on the railway tracks. Almost all the important railway tracks are provided with broken stone.

The stone to be used as railway ballast should be hard, tough nonporous and should not decompose when exposed to air and light. Igneous rocks like quartzite and granite forms the excellent ballast materials. When these are not available then lime stone and sand stone can also be used as good ballast material.

#### **Advantages of Broken Stone**

1. It holds the track in position
2. It is good for heavy traffic
3. It can serve high speeds equally well.

#### **Disadvantages of Broken Stone**

1. The main disadvantage is that it is expensive in its initial cost.

### **2. Gravel**

Gravel ranks next in its suitability for use as materials for ballast and is used in many countries of the world in very large quantities. Gravel consists of worn fragments of rocks occurring in natural deposits. Gravel or shingle may be obtained from river bed or it may be dug out from gravel pits.

### Advantages of Gravel

1. It is cheaper in its cost as it has not to be broken as like stone ballast
2. It has got excellent drainage properties, if properly cleaned

### Disadvantages of Gravel

1. It easily rolls down under the vibrations and packing under the sleepers get tense
2. The variation in size is considerable and hence requires screening before use
3. Gravel as obtained from gravel pits, is full of earth and hence requires proper cleaning if proper drainage of the track is to be done.

## 3. Cinders Or Ashes

The residue from the coal in locomotives or other furnaces is called cinder or ashes. It is one of the universal forms of ballast as it is a byproduct of all the railway which uses coal as a fuel.

### Advantages of Cinders or Ashes

1. Handling of the material is not cumbersome this material can be handle easily
2. Cost is very low and hence can also be used for sidings
3. It has got fairly good drainage properties
4. Large quantities of this material can be made available at short notice.
5. In case of emergence such as caused by the destruction of portion of railway track during floods. This material proves to be very useful and is used in the formation repairing as well as for packing of track.

### Disadvantages of Cinders or Ashes

1. It is highly corrosive and cannot be used where steel sleepers are fixed
2. The foot of the rails get affected due to use of this type of material as ballast
3. It is very soft and can easily be reduced to powder under vibrations and hence the track becomes very dusty. This is objectionable particularly in dry weather.

## 4. Sand

Sand is another good materials for railway ballast , coarser sand is to be preferred to finer sand and the best sand is that which contains a quantity of fine gravel varying in size from 1/8 upwards.

### Advantages of Sand

1. If the sand is free from earth and vegetation then it has good excellent properties to drain off water immediately
2. It is cheaper if available in nearby locality
3. It produces very silent track and hence are suitable for packing cast iron pot sleepers.

### Disadvantages of Sand

1. It gets easily disturbed under vibrations and hence its maintenance is very difficult

2. The sand can be easily washed off or blown away and hence requires frequent renewal.
3. The sand particles may get into the moving parts of the vehicles and produces friction. This leads to heavy wear of vehicles

## 5. Kankar

Kankar a lime agglomerate is found in many places in the form of nodules of varying sizes.

### Advantages of Kankar

1. Kankar is suitable Materials for ballast when other good material for ballast is not available or if available uneconomically.
2. Kankar is good for light traffic on metre and narrow gauges

### Disadvantages of Kankar

1. It is very soft and can be reduced to powder form easily, hence, making the track dusty.
2. The maintenance of track is very difficult

## 6. Moorum

The decomposition of laterite results into the formation of moorum. It has red and sometimes yellow color. The best moorum is that which contains large quantities of small laterite stones.

### Advantages of Moorum

1. Moorum is good materials for ballast when other material for ballast is not available.
2. Moorum can be safely used on newly laid track and acts as a soling when broken stones are laid afterwards.
3. Moorum has got good drainage properties

### Disadvantages of Moorum

1. Moorum is very soft and reduces to powder and hence to dust form in short time.
2. Maintenance of tracks laid with this material is difficult

## 7. Brick Ballast Or Brick Bats

Sometimes the broken pieces of over burnt bricks, called brickbats, are used as materials for ballast.

### Advantages of Brick Ballast

1. It has got excellent drainage properties
2. They can be used as good ballast material where suitable material for ballast is either unavailable or uneconomical

### Disadvantages of Brick Ballast

1. Brickbats turn down into powder form easily and hence the track becomes dusty
2. Maintenance of the track laid with this material as ballast is very difficult.
3. Rails are often corrugated on the tracks laid with this material as ballast

## **8. Selected Earth**

Selected earth may be used as material for railway ballast for sidings and also for newly laid tracks.