TRACK DRAINAGE

✓Drainage of a track, Station Yards and platforms are the three places Where Drainage arrangements are needed.

✓Track Drainage Comprises of Interception, Collection and disposal of from the track.

✓This is done by adopting proper Surface and Subsurface Drainage System

Types of track Drainage

1.Surface Drainage

2. Subsurface Drainage

SURFACE DRAINAGE

1.Surface Drainage

✓Surface Water due to rain or Snow or Flow From Adjacent areas have to be Disposed of Through Surface Drainage.

✓Surface Drainage has to be attended to in three locations.

a. Drainage in mid-section
b. Drainage in Station Yards
c. Drainage at Station Platforms

1.Drainage in mid-section

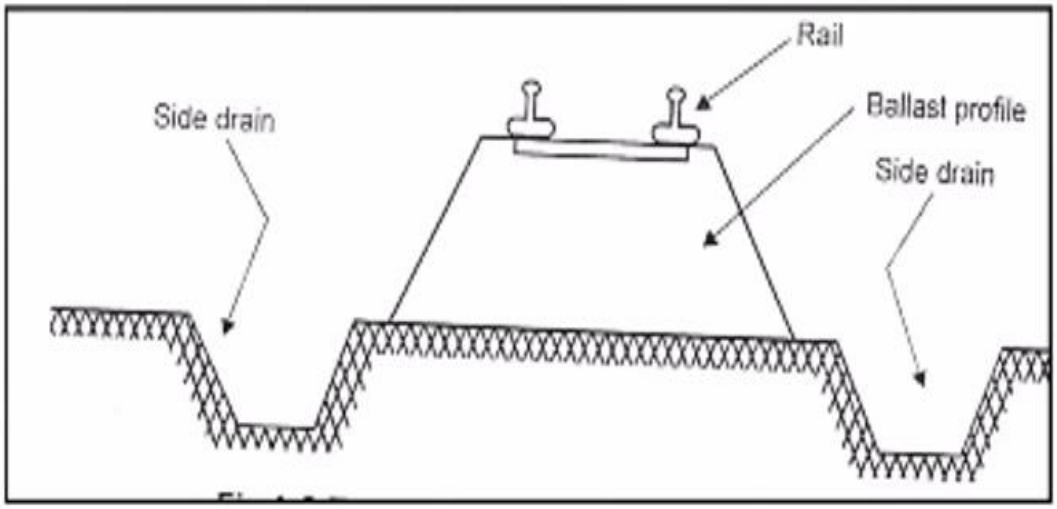
✓A typical arrangement of cross Section of a mid-section. Side Drains may be unlined or lined.

✓At a level Crossing all water should flow to the side Drains.

DRAINAGE IN MID SECTION

✓In cutting catch water Drains Have Been Provided Wherever Necessary.

✓All Extra Ballast on the Side Should be Recovered Which Encourage Growth of the vegetation.



DRAINAGE IN STATION YARDS

✓Open Surface Drains-Shaped Drains, Longitudinal Drains and Open Drainage are Provided to Free Station Yard From Water .

✓A typical surface drainage system with open Drains for a Station Yard.

✓Every Station Yard is Provided with a network of Cross and Longitudinal Drains.

✓In Station Yard the vulnerable points are water columns and carriage watering points with washing Hydrants.

DRAINAGE IN STATION PLATFORMS

For Drainage of Station Platforms the following Points Should be Taken into account

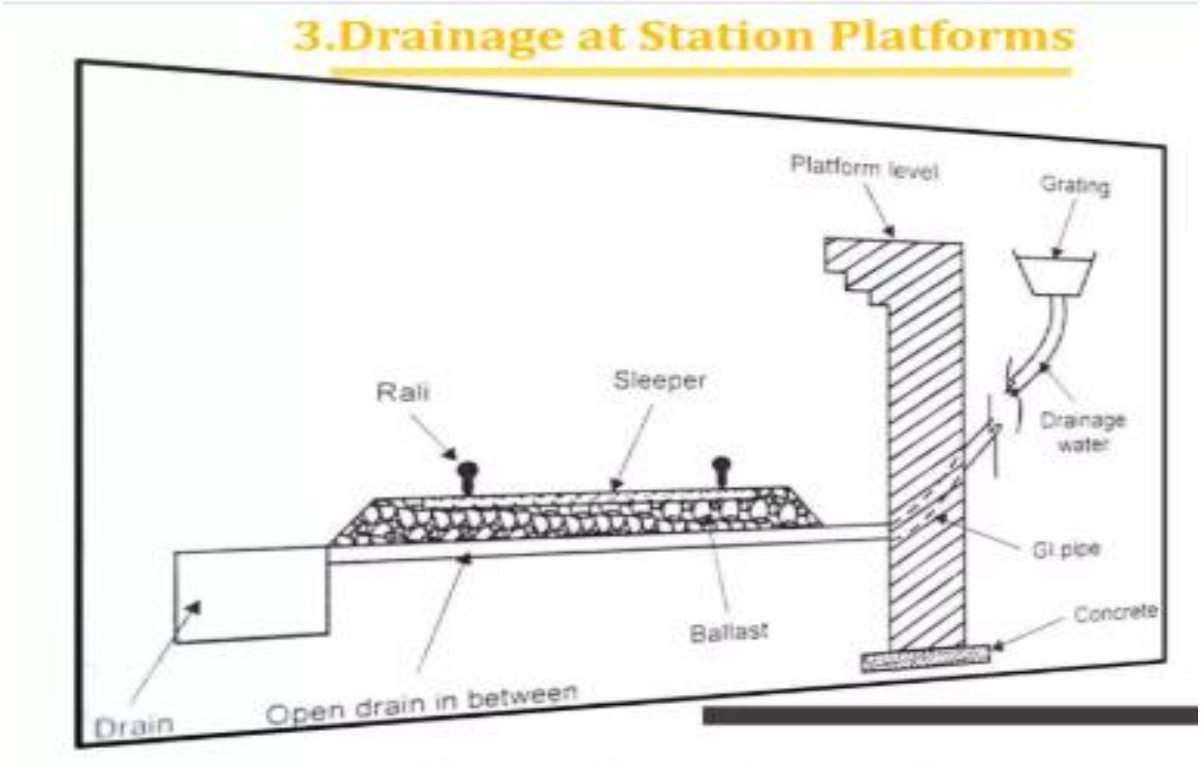
- Slopes away From the track
- Discharge on non-Track Side
- Discharge not towards Ruin-through lines

✓In general all end of platforms should be sloped away From the Track.

✓All other Discharges Form tea Stalls, Toilets, Water taps.

✓If there is need be , covered longitudinal Drains Should Be Provided .

✓Incase of island platforms, all Drains Should discharge on the less important side of the track



SUB SURFACE DRAINAGE

✓Sub-surface water is due to the capillary water.

✓Other sources are seepage from adjacent areas percolation of rain water.

✓ The sub grade and the formation are immediately affected by the Sub-Surface irrigation

a. **Provision of an inverted fillers**
b. **Sand piling**
c. **Laying of Geo-textiles**
d. **Other Methods**

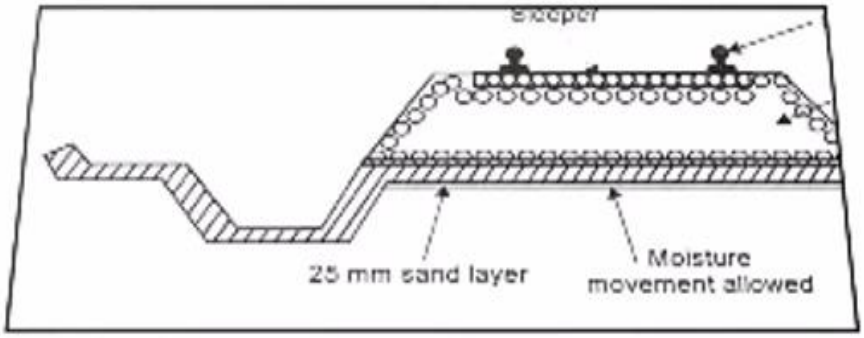
PROVISION OF AN INVERTED FILLERS

✓An inverted filter blanket of adequate thickness is provided between the ballast and the week formation.

✓The Blanket is of non-Cohesive material with enough bearing capacity to sustain the load thereon.

✓The inverted fillers Blanket is a very effective method of improving the bearing capacity.

✓It serves as a porous medium to drain off the Surface Water and Serves as a barriers for the upward movement of fine Grained particles.



LAYING OF GEO TEXTILES

✓Geo-textiles are made of polymers which are Extensively as a new Technique in improving the Soil Properties and Drainage

✓On Indian railways Geo-textiles are Extensively used.

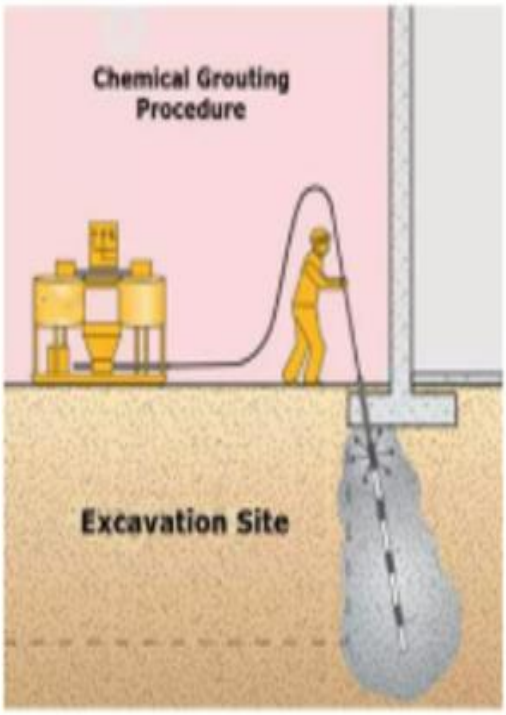
✓Geo-textiles are having the unique property to allow water to pass through but not the soil fines.

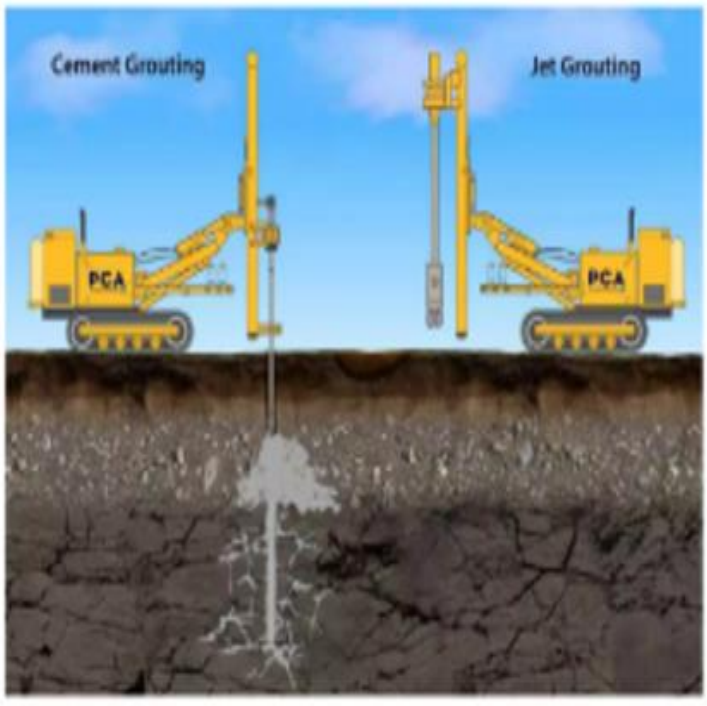
✓They not only Work as separate and filters But also as reinforcement bed

✓Geo-textiles are either laid directly below the ballast or sandwich between a 50mm layer of sand on top and a 25mm layer sand below so that the ballast directly does not rest on Geo-textiles and thereby preventing tear and puncture of textiles

OTHER METHODS

✓All other methods Which are used to for Soil Stabilization may be used to arrest Sub-Soil water. Cement Grouting , Chemical Grouting





DRAINAGE OF TUNNELS

✓The sources of water for this purpose include ground water and water collected from the washing of bore holes.

✓Water seeping in up through the ground as well as from the washing of bore holes is collected in sump wells and pumped out.

✓ If the tunnel is long, a number of sump wells are provided for the collection of water.

✓After the construction is over, drainage ditches are provided along the length of the portion of the tunnel that slop from the portal towards the sump well and are used for pumping the water out.