MODERN METHODS OF CONSTRUCTION & MAINTENANCE

Modern methods of construction Aim

Allowing heavier trains to run safely and economically.

At fast speeds of improving productivity

providing better customer service, etc.,,

Futures in track

✓Using of rail weights 52Kg/m and 60Kg/m

✓Use of wear resistance and increase the life of rails

✓Use of curved switches 1 in 16 and 1 in 20 type may be used for smooth arrival at yards.

✓Use of pre-stressed concrete sleepers

✓Use of long welded rail

Machineries used in modern constructions

1. *Ballast cleaning machines*
2. *Temping machines*
3. *Catnery inspection and maintenance car*
4. *Geo-textiles*
5. *Non-Ballast track*
6. *Construction of ballast-less track*

Track recording machineries

1. *Track recording trolley*
2. *Track recording cum research car*
3. *Oscillograph car*
4. *Ultrasonic rail – flow detector*
5. *Halleck track recorder*
6. *Portable accelerometer*

Modern methods of maintenance

The following are the main modern methods of track maintenance

1. Mechanized Maintenance or Mechanical Tamping
2. Measured Shovel Packing
3. Directed Track Maintanence

1. Mechanised maintanence

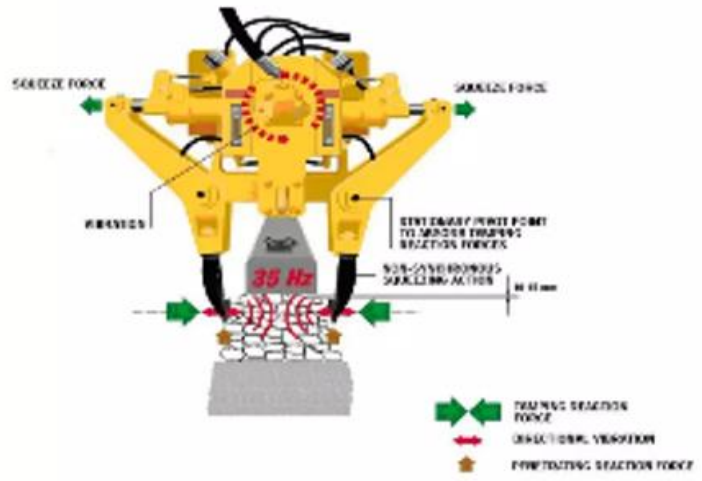
✓It makes use of track machines namely tampers for day to day track maintenance

✓This method is relatively more effective, economical, and efficient to cater the needs of high speed and heavier axlle loads.

Methods of Mechanical Tamping

- ❑ Off -Track Tamping
- ❑ On- Track Tamping

Off -Track Tamping



Off -Track Tamping

✓Off-track tampers which are portable & can be taken off the track within a short period of time are used.

✓They work in pairs from opposite sides of the sleepers diagonally under the rail seat to ensure maximum consolidation of the ballast.

✓It requires no blocking of the traffic

Demerits

✓Maintenance of tampers is difficult

✓High standard of maintains cannot be achieved

✓Intensive supervision is needed

✓Transportation of tampers with power unit is difficult

Types of Off-Track Tampers

1. Self-contained
   - ❑ Percussion type
   - ❑ Vibratory type
2. Off-track tampers worked from a common power unit

On-Track Tampers

✓On-track tampers which are self-propelled vehicles are used to tamp the sleepers automatically through various controls provided in the operator's cabin

✓These are superior to off-track tampers in respect of control, efficiency, quality of work and retention of tamping.

✓Automatic aligning, lifting, cross and longitudinal leveling and packing are simultaneously possible

On-Track Tampers




2. Measured Shovel Packing

In this method, the track defects like unevenness and voids , are accurately measured , the track is lifted by means of jacks and measured quantities of small broken stone chippings are placed under the sleeper, to bring the track to the predetermined level.

Merits

✓No traffic block is neede for carrying out maintanence job

✓More output

✓Less materials are needed

✓Packing retentively of fish joined sleepers are more

✓Less tedious

Demerits

- ✓Suitable for only flat bottom sleepers like wooden & concrete.
- ✓Special sized stone chipping may not be readily available.
- ✓Even for daily maintenance skilled labour is needed.
- ✓Cannot be used for newly screened track.

Equipments used for M.S.P

1.Dansometer	2.Canne-a-boule	3.Fleximeter
4.Viseur & Mire	5.Gauge-cum-level	6.Lifting shovel
7.Packing shovel	8.Dosing shovel	9.Measuring can

Applications of M.S.P

- ✓Maintenance of flat bottom wooden sleepers.
- ✓Packing of joint wooden sleepers in metal sleeper track.
- ✓Through packing of turnouts.
- ✓Dehogging of the hogged rail ends.

3.Directed track maintenance (D.T.M)

✓It is a method to maintain the track as directed by day-to-day requirements but not as prescribed routine.

✓It is also called Track Maintanence System or TMS

It consists of 3 stages:

✓Proper identification of defects in track geometry by means of measuring and recording devices

✓Rectification of these defects only at indicated locations in order to maintain the track to predetermined standards

✓Checking the quality of work and output by the supervisor in charge of maintenance

Objectives of D.T.M

✓To maintain the track to a high standard of maintenance as per the prescribed tolerances

✓To achieve economy in maintenance by avoiding unnecessary work involving men and materials

Procedure for D.T.M

1. Identification of defects
2. Record of observation
3. Rectification of defects
4. Record of maintenance work
5. Quality of control