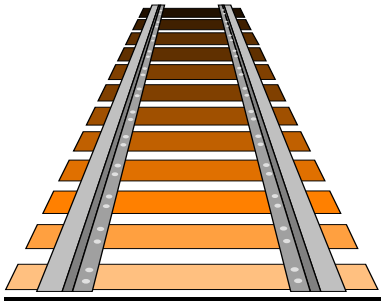

WORK STUDY TO REVIEW THE STAFF STRENGTH OF SSE / P.WAY / PUNALUR MDU - DIVISION

SOUTHERN RAILWAY

PLANNING BRANCH

G. 275 / WSSR-702021 / 2020-21

WORK STUDY TO REVIEW THE STAFF STRENGTH OF SSE / P.WAY / PUNALUR MDU - DIVISION

STUDIED BY

WORK STUDY TEAM
OF
PLANNING BRANCH

FEBRUARY - 2021

(i)

I N D E X

(i)
ACKNOWLEDGEMENT

The study team gratefully acknowledges the valuable guidance and co-operation given by ADRM, Sr.DEN/Co.ord & ADEN / SENGOTTAI for successful completion of the study.

The work study team thankful to SSE/P.Way/PUNALUR (Co-ordinating Supervisor), other supervisors and staff are giving data in completing the study rendering great co-operation in analyzing the data and thoroughly discussed the pros and corns, for proper completion of the study in time.

(ii)
AUTHORITY

Annual programme of work studies, approved by SDGM for the year 2020-21.

(iii)
TERMS OF REFERENCE

Work study to review the staff strength of SSE/P.Way/PUNALUR in the light of TRMS formula by CMCNTM.

(iv)
METHODOLOGY

1) Collection of data
2) Interaction with Co-ordinating Officer, Co-ordinating Supervisor and other supervisors & staff.
3) Analysing the data collected and assessment of manpower requirement based on the TRMS Rational formula of MCNTM and need base for ground situations.
4) Revision of Yardsticks/Norms of various O&M activities on the Railways issued by Railway Board vide letter No.11-2019/SPMPS/Yardstick/2 DT.30.06.2020

(iv)

Summary of Recommendation

The following 16 posts are found excess in various grades to the requirement and the same may be surrendered and credited to the vacancy bank.

Sl. No.	Category	Level	GP (Rs.)	Surplus
1.	Junior Engineer	6	4200	2
2.	Technician Gr.I (Bricklayer)	5	2800	2
3.	Track Maintainer Gr.II	4	2400	6
4.	Track Maintainer Gr.III	2	1900	6
Total Vacant Post				**16**

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CHAPTER – I

1.0 INTRODUCTION

1.1 Indian Railways a part and parcel of every Indian's life, which cannot imagine the India without Railways, because this system is the backbone of Indian Economy and one of the Pillars of our Nation.

1.2 The Hon'ble Prime Minister of India described as "Railways perhaps along with the Post Offices are the only two Institutions in India with deep Network which if tapped judiciously can create substantial improvement in the Inter-Land. Railways were always considered only on a transport in our Country, we want to see Railways on the back bone of India's Economy Development".

1.3 The first Rail Transport running in Steam Engine started on the year 1832 at England. East India Company made the Basement for Rail Transportation in India for receiving Cotton and Iron ore to the Ports from the Interior of the Country.

1.4 In Indian soil, the First Train started its run on track on April 16, 1853, a Saturday evening 03.35 pm between Boribundar and Thane a distance of 34 kms.

1.5 The second Train of the India connected between Howrah and Hubli on 15th August 1854.

1.6 The Third Train service made between Vysarpadi and Walajah Road opened on 1st July 1856. At present this section is under Southern Railway.

1.7 On the various developments this never rests System now reaches the World highest Passenger carrier per km.

1.8 Among the 17 zones of Indian Railways, Southern Railway was formed on 14th April 1951 by the Amalgamation of Southern India Railway, Madras and Southern Maratha Railway and Mysore State Railway. It spreads to Tamil Nadu, Kerala, Karnataka, Andhra Pradesh and Pudhucherry to the Route Kilometerage of 5075.

1.9 Among the various branches in Indian Railway, Engineering branch maintains Buildings, Bridges & Track of Railways. The track is paramount for Railway transportation and it is the prime driving factor for speed, safety and efficient operation of the trains, hence very much importance is given to engineering branch in all aspects.

1.10 The present modern technology in permanent way, mostly used 52/60 kg rails (rarely used 90R rails), jointless (long welded rails), pre stressed concrete sleepers with elastic rail clips, high tech welding methods, mechanized packing through “on track heavy machines and maintenance”, sophisticated testing’s like USFD, track oscillation inspection cars and other modern techniques are helping for reliability, carrying capacity, speed and safety of the Trains. Also lot of works are outsourced in P.Way like laying, relaying and some of scheduled maintenance works, which are reduced the work load of Railway men. Hence it is imperative to make scrutiny of the man power requirement for track maintenance.

1.11 **Some important technical Points about Track:**

Engineering (PW) Branch: In Railways, Engineering department maintains the fundamental basic structure i.e., Permanent Way. It is the major activity of the Engineering Branch which is entrusted with the periodical maintenance of the Track, Bridges, Works, Tunnels, Level crossing gates and related areas.

A well maintained track is very essential for safety, speed and efficient operation of trains. Continuous monitoring and inspection on daily basis is warranted in ensuring a reliable permanent way.

1.12 **Permanent way** is the rail-road on which the trains run. It basically consists of two parallel rails having a specified distance in between and fastened to sleepers, which are embedded in a layer or ballast of specific thickness spread over the formation.

1.13 The main components of permanent way or track are rails, sleepers, ballast, formation and fittings & fastenings. The basic function to perform by each component is detailed one by one below:

- ✓ **Rails** act as girders to transmit the wheel loads of trains to the sleepers.

- ✓ **Sleeper** holds the rails in proper position and provides the correct gauge with the help of fittings and fastenings and transfer the load to the ballast.
- ✓ **Ballast** is placed on prepared ground known as formation, which gives a uniform level surface, provide drainage and transfers the load to larger area of formation.
- ✓ **Formation** gives a surface, where the ballast rests and transmits the total load of the track and that of the trains moving on it to the ground below.

1.14 **Characteristics of a good Track:**

(i) Sound condition of rails, sleepers and fittings.

(ii) All fittings are available and properly tightened.

(iii) Adequate good quality and clean ballast under the sleepers and also around it with full shoulder width.

(iv) Wear in rails, horizontal or vertical should be within limits.

(v) Alignment of rails should be perfect, kinks or other defects should be within permissible limits.

(vi) Formation is stable with good drainage and slopes well protected by grass or stones pitching and

(vii) Longitudinal and cross levels should be in good condition and within allowable limits.

1.15 **Annual programme of track maintenance**

The following programme is normally followed annually on Indian Railways for systematic maintenance of track as per IRPWM.

Period	Work
1. Post-monsoon attention. For about six months after end of monsoon.	a) Attention to run down length in the entire gang beat to restore section to good shape.
	b) One cycle of through packing from one end of the gang beat to the other end including overhauling of 1/3 to ¼ of the beat.
	c) Attention during the monsoon; For about 4 months cleaning of side drains, catch water drains, repairs to bank and picking up of slacks.

2. Pre-monsoon attention: for about 2 months prior to break monsoon.	a) Attention to track as required; picking up of slacks.
	b) Attention to side drains, catch water drains and water ways.
3. Lubrication of rail joints, gap adjustment and curve re-alignment	Patrolling of track during heavy rains.

1.16 **Need for Mechanised Maintenance:**

The mechanised maintenance of track implies the deployment of track machines for day to day track maintenance works which are otherwise done by manual labour. The need for mechanised maintenance of track is felt due to the following reasons.

(i) With the introduction of concrete sleepers, the track structure has become very heavy therefore; it becomes difficult for the gangmen to lift the track.

(ii) There are chances of breakage of concrete sleepers if the same are hit by gangmen using the beaters.

(iii) Manual packing is very hard and strenuous job. It is not possible with manual maintenance to get good quality track which is essential for high speed operations.

1.17 **Inspection of track:**

Purpose of Inspection:

With the running trains, there is continuous degradation of track due to vibrations. The packing of sleeper gets disturbed, the fastenings become loose or sometimes come out of sleepers and there is general wear and tear in rails and sleepers.

The purpose of inspection of track is to detect various flaws such as looseness of packing, loose or missing fittings, wear in rail, disturbance in cross levels and versines in curves, deficiency of ballast, unusual movements in long welded rails, inadequate or excessive gaps at joints, defects at level crossings such as inadequate gap at check rail and condition of track and bridges in general. In IRPWM is explained in detailed inspection schedules for each Railway officials, supervisors and maintenance staff.

1.18 **Methods of Inspections:**

Various methods adopted for inspection are as under:

(a) By Push Trolley/ Motor Trolley

(b) By Engine of a fast train

(c) By rear most vehicle of a train

(d) By Track recording Car and

(e) By Oscillograph Car and OMS instrument

(a) By Push Trolley / Motor Trolley:

This is the age old method of inspecting the track visually by SSE/JE and ADEN. All visual defects of track such as loose packing, missing or loose fittings, broken sleepers, deficiency of ballast are noted during the inspection.

(b) By Engine of a fast Trains:

This inspection gives an idea of running quality of track. This inspecting officer keeps standings in the engine and records all jerks, vertical or lateral which are mainly due to loose packing, uneven cross level or misalignment.

(c) **By Rearmost Vehicle of a train:**

By travelling at the rear end of the last coach in running trains, one gets an idea of the running quality of track just as travelling in an engine. Main difference is that lateral alignment defects and cross level defects get amplified in the rear most coach.

(d) By Amsler Car:

Amsler car is an instrumented car which records defects like misalignment, gauge, vertical unevenness of both the rails, twist i.e., difference in cross levels and super elevation at curves. The recording is done in a continuous form and defects are shown as peaks. By taking note of defects and kilometerage, the defects can be attended later on.

1.19 **Track Recording cum Research Car**

By Osillograph Car & OMS Instrument:

Oscillograph car records accelerations in vertical and lateral direction when the train is running at full speed. The probes are kept at pre-determined locations which carry the acceleration through electric cables to the recording machines. This method of recording gives a very fair idea of various defects generated by rail wheel interaction due to track defects. OMS is the short name of

Oscillation Monitoring System, which is portable machine which records both vertical and lateral accelerations.

1.20 **Types of Patrolling :**

- ✓ ***Keyman's Daily Patrol*** – Every portion of the permanent way shall be inspected daily on foot by the keyman of the beat in which the portion of the track falls.
- ✓ ***Gang Patrol during Abnormal Rainfall or Storm*** – In the event of abnormal rainfall or storm during day or night, the Mate should, on his own initiative organised patrolling over the length affected, independently of other patrolling, if any being done.
- ✓ ***Night Patrolling during Monsoon*** – During the monsoon, certain section of the railway line, as may be specified, shall be patrolled to detect damage by flood, such as breaches, settlements, slips and scours and immediate action taken to protect trains, when so warranted.
- ✓ ***Security Patrolling*** during Civil Disturbance and on Special occasions
- ✓ ***Hot weather Patrolling*** for LWR/CWR – Hot weather patrol is carried out when the rail temperature reaches td + 20 degree or above. The patrolling should be done in accordance with the provisions of Manual of Long Welded Rails.
- ✓ ***Cold weather Patrolling*** for LWR/CWR – Cold weather patrol is carried out when the rail temperature reaches td -20 degree or below. The patrolling should be done in accordance with the provisions of Manual of Long Welded Rails.
- ✓ ***Watchmen at vulnerable locations*** in addition to patrolmen, stationary watchmen are posted at known or likely locations of danger or trouble.

1.21 **Trent of Track maintenance system (TMS):**

The modern technologies have taken the track maintaining techniques from the era of pick axe and shovels to the era of mechanised track maintenance. 60 kg rails are the norm of the day. The equipments for testing the track have become sophisticated so as to trace all sorts of failures of the track. The interconnections with S&T branch and TRD branch is a new development to be considered during track maintenance. The computerization and TMS, the

ubiquitous use of various hues of track machines, testing techniques etc., has reduced the manual labour and hence man power required for maintenance. Many of the maintenance activities are now outsourced or are proposed for it.

1.22 So it has become imperative to have a hard look at the man power requirement for the following reasons.

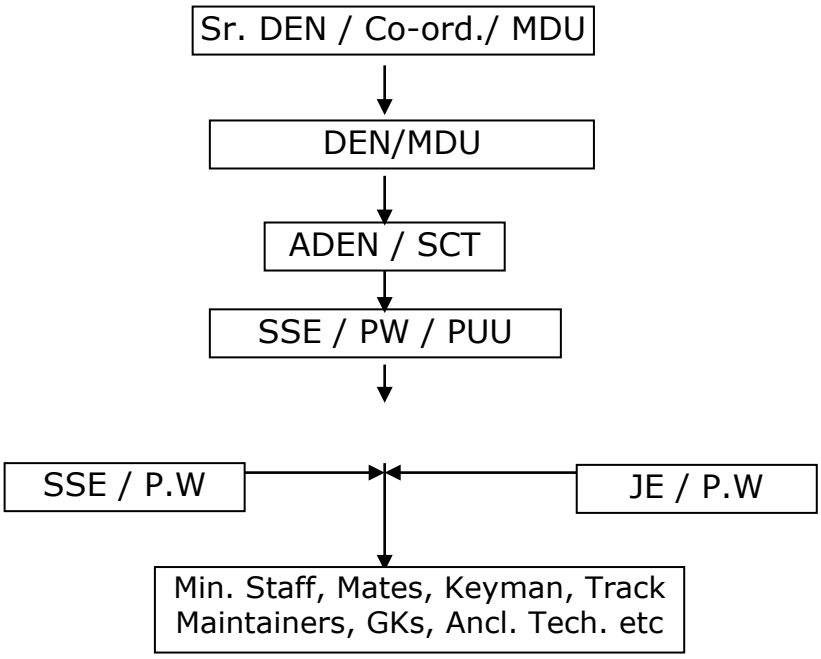
- To tailor in the cost of mechanical maintenance to improve productivity.
- To create required man power for mechanised operations by matching surrender of trackmen.
- To improve the overall financial position of the Railways and to evolve standardized cost norms.

CHAPTER – II

2.0 PRESENT SCENARIO:

2.1 Organization:

Engineering Branch of MDU – Division is working under the control of Sr. DEN /Co-ord/MDU in the Division level. This P. Way section is managed by SSE/P.Way/PUU with the general in charge of ADEN/SCT through the direct control of DEN/MDU.



2.2 The following stations and staff distribution are coming under the jurisdiction of SSE/P.Way/PUU:

Brief out line of Jurisdiction and Units/Gangs distribution:

Gang No.	Jurisdiction			Staff deputed for each gang			
	From (Km)	To (Km)	Actual (Km)	Mate	Keyman	Track Maintainer	Total
1/KTHY	688.600	693.20	4.6	1	0	8	9
2/TML	693.200	698.350	5.15	1	1	6	8
3/OKL	698.350	703.150	4.8	1	1	6	8
4/EDN	703.150	708.150	5.0	0	1	8	9
5/EDN	708.150	712.800	4.65	1	1	10	12
6/PUU	712.800	717.200	4.4	1	1	9	11
7/PUU	717.200	721.200	4.0	1	1	9	11
8/AVS	721.200	726.300	5.1	0	1	2	3

9/LC No.521 at KM 728/0-100	726.300	733.100	6.8	0	1	7	8
10 KKZ	733.100	738.100	5.0	1	1	8	10
11/EKN	738.100	744.400	6.3	1	1	5	7
12/LC No.524 KM – 745/500-600	744/400	749.200	4.8	1	1	7	9
13 /KM 748/800/KUV	749.200	755.100	5.9	1	1	5	7
14/KM 755/800/KLQ	755.100	760.150	5.05	1	1	8	10
TOTAL			**71.55**	**11**	**13**	**98**	**122**

2.3 **Track Structure**:

The entire length is an absolute block system of double line section, both traction and diesel operation. The track structure is 52/60 KG, PSC with sleeper density of M + 7 sleepers with long/continuous welded rails. The yard, stabling, station lines are laid with 52 KG or may use 72DH/90R, m+4, PSC, SWP. The Rail structure is properly maintained by Track machines and some of maintenance activities are being carried out by manual also. Generally, deep screening of Ballast for the whole section was carried out by Track machines periodically.

2.4 **Details of section**:

2.4.1 **Number of Level Crossing Gates:**

Engineering LC	Traffic LC	Total
8	5	13

There are 13 LC gates available in this section, in which 8 LC gates (7 Special class and 1 ‘A’ class) manned by engineering staff and 5 LC gates manned by traffic staff.

2.5 The duties of Supervisors (SSE/JE)/Trackmate/Keyman etc. are mentioned in Detail IRPWM – 2020.

2.6 **The present staff deployment of SSE/P.Way/PUU unit :**

As per DPO/MDU, the book of sanction of the Unit is 212 and the actual is 175 as per Book of Sanction as on 01.04.2020 and the vacancy is 37. As per SSE/PWAY/PUU the sanction is 218 (including Ministerial staff, Lascar & Colony Gang woman) and the actual is 176 as on 20.10.2020 and the vacancy

is 42. The DPO/MDU BOS and SSE/PWAY/PUU scale check Statements are placed as **Annexure –I & II** respectively.

Sl. No.	Category	San.	Act.	Vac.	Excess
1	SSE	3	3	0	0
2	JE	5	1	4	0
3	OS/PB	0	1	0	1
4	Technician Gr.I (Smithy)	1	0	1	0
5	Technician Gr.I (Bricklayer)	0	2	0	2
6	Technician Gr.II (Bricklayer)	2	0	2	0
7	Technician Gr.III (Bricklayer)	0	0	0	0
8	Bricklayer Khalasi	0	1	0	1
9	Technician (STM)	0	1	0	1
10	Track Maintainer Gr-I	21	11	10	0
11	Track Maintainer Gr-II	42	24	18	0
12	Track Maintainer Gr-III	42	23	19	0
13	Track Maintainer Gr-IV	96	107	0	11
14	Lascar	0	1	0	1
15	Colony Gang Woman	0	1	0	1
Total		**212**	**176**	**54**	**18**

There are 7 unsanctioned posts are available in various grades as per Personnel Branch BOS. Therefore, the work study team has taken the sanction of 212 for this work study.

2.7 In chapter –II, Para No. 228 of IRPWM prescribes the system of maintenance for concrete sleeper track as given below. The following 3-tier system of track maintenance shall be adopted on sections nominated for mechanized maintenance.

1. On track machines (OMU)
2. Mobile Maintenance unit(MMU)
3. Sectional gangs

2.8 The mobile maintenance units shall comprise of two groups:-

MMU-1:- One for each PWI section

MMU-2:- One for each Sub-division

MMU-1 shall be a Rail cum road vehicle with a PWI in-charge with a jurisdiction of 40-50 Km double line and 90-100 Km for single line for various works including need based spot tamping and in situ rail welding.

MMU-2 shall be a road vehicle based unit with each sub-division for reconditioning of turnout and minor repairs to the equipments of MMU. The MMUs equipments and functions are explained in Para 228(3).

2.9 Existing Maintenance Practices on IR

As on date, the practice of maintenance can be briefly summarized as follows;

(a) In sections where relaying with PSC sleepers has been done,

i. Tamping with machines as and when machines are available, plus Conventional system of maintenance

(b) In sections where relaying has not been done,

i. Only conventional system of maintenance is being used.

2.10 The role of open line organization of Engineering Department in IR mainly meant for maintenance/strengthening/modification of existing infrastructure i.e. track for permitting higher speeds and heavier Loads.

2.11 The manual maintenance of the track has given way to highly mechanized maintenance practices that has become inevitable for the following reasons.

a) The high safety standards that can be achieved
b) The capability for higher axle load, speed etc.,
c) The overall economy in cost of maintenance
d) The accuracy in testing, checking and inspections that can be achieved through mechanization.
e) The necessity to avoid harsh physical work under inclement weather and isolated locations.
f) The speed of maintenance
g) The need to carry out the maintenance works within the constraints of time for line block etc.,

2.12 The provisions of “Small Track Machines Manual”:-

The para1.3.2 says that the “Requirement of Manpower doesn’t include Leave reserve”. Further, the para 1.3.3 stipulates that the Creation of posts for operation and maintenance of small track machines should be done by

surrender of equivalent money value of live revenue charged posts of Track maintainer/other category involved in the track maintenance. The component of unskilled staff being created should be barest minimum. The proportion of skilled personnel should form at least 75% of the total posts to be created.

2.13 **Some of the track machines and their working are Detailed below:-**

Sl. No.	Name of the Machine	Work done
1.	BCM-Ballast Cleaning Machine	Deep screening of track
2.	DUOMAT/CSM – Continuous Action Tamper	Tie Tamping LWR work
3.	DGS – Dynamic Track stabilizer	For consolidating track after works affects core stability
4.	UNIMAT/MPT	Tamping Points & crossing
5.	BRM – Ballast Regulating Machine	Boxing of track
6.	UTV – Utility Track Vehicle	Leading and stacking materials
7.	T-28 – T28 cranes – One job crane (PRC laying Machine)	For re-laying of Points & crossing
8.	PQRS	For re-laying track
9.	TRT	For CTR of track

2.14 **Actual Unit/Gang Performance**:

The various Units/gangs daily performance diaries were observed and noticed the following works are repeatedly allotted by the Supervisor and carried out by the Gangs/Units are;

1. De-weeding
2. Weld collar painting
3. Cleaning
4. Boxing ballast working
5. ERC renewal / greasing.
6. Changing Rubber pad
7. Changing liners
8. Assisting various track machine activities.
9. Packing – manual at points, SEJ and other required areas.
10. Collecting store items.
11. Steel sleepers, chair plates changing.

2.15 **Man power calculation for Track maintenance a brief History:**

Permanent way gang strength was calculated by various methods right from 1931 through Maflin formula. Over the years there has been lot of changes in Track maintenance practice, according to the timely changes the man power requirements also varied.

2.16 **<u>IR adopted various efforts to standardize in the past.</u>**

1.	Maflin formula	-	1931
2.	Lobo committee or modified Maflin formula	-	1959
3.	Modified Maflin formula freezed in	-	1965
4.	Committee Report I in	-	1971
5.	Committee Report II in	-	1972
	No action taken on (4) & (5)		
6.	Appointment of special committee	-	1976
7.	Submission of Report by Spl. Committee	-	1979
	Though Rly. Board did not give any direct clearance for this formula of 1979; it was implemented with a 5% reduction in many Zones.		
8.	Committee for machine and manpower Deployment for Track Maintenance appointed in	-	1989 (Not accepted by Railway Board)
9.	(CMMDTM) Report submitted in	-	1995
10.	Kapoor committee appointed on	-	05.01.1996
11.	Reconstituted committee on	-	12.11.1997
12.	Renamed as CMCNTM – (Committee for Man power and Cost Norms for Track Maintenance)	-	13.08.1998
13.	Finalization of the Report	-	May 2000
14.	Acceptance of the Report by Rly. Board	-	March 2006

The committee of "**Man power and Cost Norms for Track Maintenance"** (MCNTM) is the latest which covers all the Track parameters and arrive the required track maintainer strength.

2.17 **Evaluation of Man power through MCNTM formulae:**

The man power requirements of Gangs (Trackman, Gatekeeper, Store watchman) are regularly calculated by division level through TRMS activities. IRICEN will be the custodian of the software for calculating man power.

The whole activities connected to Track Maintenance are clubbed under four main categories under MCNTM studies.

They are:

a) Activity 'T' – Affected by Traffic Density
b) Activity 'R' – Not affected by Traffic Density

} Primary activities

c) Activity 'M' – Miscellaneous
d) Activity 'S' – Site specific

} Auxiliary activities

Activity 'T' – Affected by Traffic Density

T_1	- Slack attention to	a) Bad spots b) Low joints (FP, welded, Glued joints) c) SEJ (1 No. / km) d) Minor curve alignment
T_2	- For Tie Tamper Working	a) Pre tamping operations b) Along with tamper c) Post tamping operations
T_3	- Casual Renewal of	a) Rails b) Sleepers c) Fasteners along with re-gauging
T_4	- Repair Welding	

Activity ' R ' – Not affected by Traffic Density

R_1	-	Lubrication of ERCs
R_2	-	Shallow screening
R_3	-	Loading, Leading and Unloading
R_4	-	Overhauling of LC gates
R_5	-	Watching of caution spots & misc.
R_6	-	Tree cutting for visibility
R_7	-	Lubrication of Rails in Curves
R_8	-	Accident Relief and carcass renewal in run over cases
R_9	-	Bridge, Sleeper attention & Renewal
R_{10}	-	Pre-monsoon attention such as clearing of drains and Waterways, Cess repair, de-weeding of track and Attention to cuttings & Trolley refuges
R_{11}	-	Creep pulling approaches to bridges, turnout
R_{12}	-	Rectifying damage to LC posts and gates.

Activity 'M' – Miscellaneous

M_1 - Monsoon patrolling

M_2 - Hot weather patrolling

M_3 - Cold weather patrolling

M_4 - Watching vulnerable locations

M_5 - Gate keeping of LC gates

M_6 - Rest giving for key man

M_7 - Water man duty

M_8 - Store watchman duty

Activity 'S' – Miscellaneous

S_1 - Tunnel Maintenance

S_2 - Bridge substructure maintenance

S_3 - Long girder maintenance

S_4 - Extra maintenance due to very steep curves, deep cutting, steep gradient

S_5 - Maintenance of track on extremely bad formation

S_6 - Look out man duty

S_7 - Fog signal man duty

S_8 - Filth removal from track

S_9 - Security patrolling

S_{10} - Watching of water level in suburban section

2.18 Based on MCNTM Formula the Track Maintainers [Gang strength] requirement of SSE/P.Way/PUU section is arrived as follows: Number of working Days in a year for P.Way Gang is 294 days (vide above Rly. Bd. Order No.95/CE1/GNS/2.Vol.II/Pt.11 dt.6.3.2006–Item No.4).

One year	=	365 days.
Sundays	=	52 days.
National Holidays	=	9 days.
Casual leave	=	10 days.
Total No. of Holidays	**=**	**71 days.**
Available man days per year	365 – 71 =	**294** days.

$$\text{No. of Track maintainer} = \frac{\textbf{T+R+M+S} \text{ Activities (in man days)}}{\text{Available mandays per year (}\mathbf{294}\text{)}}$$

2.19 **Norms for Mandays Requirement per km (CMCNTM) :**

For Mainline BG **Machine** packed
For Activity T : (80+2.3GMT) x (1+A+B+C)
For Activity R: 159
Correction : 28 (increase in Manpower on PRC Track for shallow screening

For Mainline BG **Manually** packed
For Activity T : (223 +8.42GMT) x(1+A+B+C)
For Activity R : 168
Correction : 28 (increase in Manpower on PRC Track for shallow screening

For Mainline MG Manually packed
For Activity T : (160 +13.56GMT) x(1+A+B+C)
For Activity R : 128

For Mainline NG Manually packed
For Activity T : (105 +188GMT) x(1+A+B+C)
For Activity R : 91

2.20 **For Running Yard Lines $(RYL) & Non- Running Yard lines #(NRYL)**

Lines	**BG**		**MG**	**NG**
	Machine packed	Manually packed	Machine packed	Manually packed
RYL	177	297	228	153
NRYL	-	198	152	102

1km of manually packed NRYL is equivalent to 2/3 km of manually packed RYL, as regards mandays requirement

$: Lines on which trains are received on Signal

: Non Running yard lines, marshalling lines, sidings

2.21 M – Activity :

Sub Activity	**Norm**	**Legend**	**Authori Sation**
1. Monsoon patrolling	$\sum_{1 \text{ to } N}$ (Dxbxsxm)	N : Total No. of beat-lengths D :No. of days needing patrolling in a year in the n^{th} beat length b: No. of beats in the n^{th} beat length S : No of shifts in the n^{th} beat length m : No of men in each shift in the n^{th} beat length m = 2 in area infested with wild animals / terrorists otherwise m =1	CTE/CBE

2. Hot Weather Patrolling	30xL	L = Length of LWR requiring hot weather patrolling	
3. Cold weather patrolling	12xL	L = length of LWR requiring cold weather patrolling	
4. Watching vulnerable Location	Σ (sxd) 1 to N	N : Total No. of vulnerable locations s : No. of shifts in the n^{th} location d : No. of days watching at the n^{th} location in a year	CTE/CBE
5. Gate keeping at level crossings	365 x Σ s)-294xNg 1 to N	N : No. of Engg. Level crossings s : No. of shifts at the n^{th} LC Ng : mandays available per annum due to regular Engg. Gate keepers	-
6. Rest giving for keymen	K (365-294)	K : No. of keyman-beats	-
7. Waterman duty	N x 294	N : No. of gangs	-
8. Store –watchman duty	N x 3 x365	N : No. of stores locations in addition to Sr.DEN's HQ stores N is not to exceed 2.	Sr.DEN/Co-ord.

2.22 S- Activity :

Sub Activity	Norm	Legend	Authori-sation
1.Tunnel maintenance	1.2 x 0.29 x Σ (1 x r) 1 to N	N : No of tunnels l : Length of the n^{th} tunnel in km r : No of tracks in the n^{th} tunnel	Subject to works/ bridge staff not being available for this work
2. Bridge substructure maintenance	1.1 x 0. 29 x Σ (b x r) 1 to N	N : No. of tunnels b : Lineal water way of the n^{th} bridge, in metre r : No. of tracks in the n^{th} bridge	Subject to works/ bridge staff not being available for this work
3. Load girder maintenance	0.64 x Σ (bxr) 1 to N	N : No of bridges each having more than 150 m lineal water way b: Lineal waterway of the n^{th} bridge, in metre r : No. of tracks in the n^{th} bridge	-
4. Extra maintenance due to very sharp curves deep curves deep cutting and steep gradients	Lcx 294	Lc : Total length of curves in km sharper than 3° on BG/6° on MG(NG track does not need extra manpower on this reasons)	CTE
5. Maintenance of extremely bad formation	0.6 x Σ l 1 to N	N : No of locations where track needs more than 12 attentions in a year l : Length of track in the n^{th} location, in metres	-

6. Look out man duty	294 $\sum$ v / g 1 to N	N : No of gangs v : Length of track with poor visibility in the n^{th} gang-length g: length of the n^{th} gang-length	Sr.DEN/Co-ord.
7. Fog signal man duty	Mf /3	Mf : Total mandays actually utilized in the past 3 years for this duty	Sr.DEN/Co-ord.
8. Filth removal from track	f x 294	f : No of gangs having this kind of problem	Sr.DEN/Co-ord.
9. Security patrolling	Ms / 3	Ms : Total mandays actually utilized in the past 3 years for this duty.	Sr.DEN/Co-ord.
10. Watching of water level in sub-urban sections.	$\sum$ (s x d) 1to N	N: No. of locations where flooding of track occurs in rainy season, due to water entering from built-up area outside. S: No. of shifts required at the n^{th} location. d : No. of days requiring watching at the n^{th} location. Normally s = 2; d = 60 in Mumbai suburban sections.	

Also the MCNTM Committee recommended that Railway Board may order to review the Rational Formulae once in 5 years to incorporate the effects of Modernization to assess the Right Man Power which is on the anvil.

2.23 Activities recommended for outsourcing by MCNTM/Rational formula.

1. Formation of treatment Works:
2. Collection of ballast, training out ballast by material train leading ballast from stack to track, insertion of ballast in track
3. Deep screening of the ballast in track, carried out manually by deploying BCM in which case man power is provided by the contractor
4. Introduction of sub ballast and ballast layers
5. Heavy repairs to track, including lifting
6. Complete realignment of curved track
7. Through renewal of rails, Sleepers and fasterers
8. Complete renewal of points and crossings, SEJs, traps etc
9. Resurfacing of crossings and switch rails
10. Loading and unloading of P.Way materials is bulk
11. Loading out of P.Way materials for other than casual renewal

12. Security of materials kin a depot which is closed and locked
13. Painting of Rails and weld collars
14. Painting of bridge girders
15. Heavy repairs(Measurable) to formation cutting bides drains and catch water
16. Heavy repairs (measurable)to bridges, bridge protection works, river training works and tunnels
17. Providing (Repairing road surface at level crossings including speed, breakers
18. Removal of major sand breaches
19. Works arising due to restoration following breach or accident
20. Clearing of rank vegetation in platforms and in the insanity of tracks in coaching and goods yards, repair depots and workshops or Engineering/Mechanical/Electrical and S & T depts.

CHAPTER – III

3.0 CRITICAL ANALYSIS

3.1 In respect of Track maintenance, Railway Board stipulated the yardstick and guideline for man power assessment in the form of CMCNTM (Committee on Manpower and Cost Norms for Track Maintenance) formula through software. This formula will ensure Zero base review as per the actual traffic, and other related conditions to arrive the optimum staff requirement. The committee has also recommended outsourcing certain activities.

3.2 The work study team after scrutinizing the activities has made suitable changes in certain data provided by the division to arrive the manpower requirement through the MCNTM formulae. The data taken for calculation along with remarks is tabulated below.

3.3 **The Data applied from T R M S in "MCNTM" formula of Mechanized maintenance type in BG section:**

Sl. No.	Detail	Data	Composite factor
T & R – ACTIVITIES			
1	Segment No.1	2.06 Single Line, GMT – 1.0	5.6146
2	Segment No.2	45.55 Single Line , GMT-4 .4	1.1906
M – ACTIVITY			
3	Monsoon patrolling	No of beats 14	-
4	Hot/Cold weather patrolling	Length of LWR 39.72 Kms. each for Hot & Cold patrolling	
5	Vulnerable location	15 Locations	-
6	Gate Keepers	No of Engg. Manned gates -8	Actual available manned 8 Engg. LC Gates and 5 Traffic LC gates.
7	Rest giver for keymen	For 14 Keymen	-
8	Waterman	No of Gangs 14	Not use in site
9	Store watchman	Nil	One Store at site.
S – ACTIVITY			
10	Tunnel data	5 locations	0.682 Kms.
11	Bridge sub-structure maintenance	266 Bridges	Linear water way 1559.07 M
12	Long Girder bridge	NIL	-

13	Extra very sharp curve	34.28 Kms	-
14	Extremely bad formation	NIL	-
15	Fog signal Man	Last 3 years average	Nil
16	Filth removal	6 – locations	-
17	Security patrolling	Last 3 years average	-

3.4 **The following output obtained through MCNTM formulae**:

Activity ' T ' – Affected by the Traffic Density:

Man days for 'T' activity = (80 + 2.3 GMT) x (1 + A + B + C) L

Segment	GMT	Track km.	Composite Factor	Mandays (T)
1	1.0	2.06	5.6146	951.88
2	4.4	45.55	1.1906	4887.37
Total Mandays				5839.25

3.5 **Activity ' R ' – Unaffected by the Traffic Density:**

The Total Manpower required to carry out for "R" activities is derived as 159 per km per annum.

Segment	GMT	Track km	Multiplication Factor	Mandays
1	1.0	2.06	159	327.54
2	4.4	45.55	159	7242.45
3	Man days required for RYL & NRYL (177 x 20.909)			3700.89
Total Mandays				**11,270.88**

Mandays for M – Activities			
	Activity	**Mandays**	**Remarks**
1	Monsoon patrolling	10440	14 beats
2	Hot weather patrolling	1191.60	Required if td+25
3	Cold weather patrolling	476.64	Required if td-25
4	Vulnerable location	5250	15 Locations
5	Gate Keepers (8 LC gates)	8030	Man power assessed, by class of manned gates
6	Rest giver for keymen	994	For 14 keymen
7	Waterman (14 gangs)	4116	Nowadays, 2 litres Milton made container provided
8	Store watchman	0	Nil
	Total	**30498.24**	

Mandays for S – Activities			
	Activity	**Mandays**	**Remarks**
1	Tunnel maintenance	239.76	-
2	Bridge Sub Structure maintenance	513.45	143 bridges
3	Long Girder bridge	0	0
4	Extra very sharp curve	10078.61	34.28 Kms
5	Extremely bad formation	0	--
6	Look out man	2330.07	-
7	Fog signal Man	231.67	-
8	Filth removal	1764	6 Gangs
9	Security patrolling	340.67	Assessed by last three years average
	Total	**15498.23**	

3.6 **The Total Man Days Calculated / Year:**

Sl. No.	Activity	Mandays
1	**T**	5839.25
2	**R**	11,270.88
3	**M**	30,498.24
4	**S**	15,498.23
5	**Correction for section**	1571.92
Total Mandays of 'T R M S'		**64,678.52**

Total man days required - 64,678 / year

All T,R,M,S activities listed are included in MCNTM formula and arrived the total maydays requirement as 64,678. Based on the field inspection and study, it is understood that some of the activities are left out by the section and some other works are dealt through contracts. Hence, such activities are considered to the extent of actual staff deployment while evaluating the man power.

3.7 As per executive summary of the MCNTM report, para No.0.13 says 12.5% L.R. is allowed for all Non-supervisory and Non-Secretarial category staff. The rational formula covers all activities as per para No.0.14 of the report.

3.8 **The following activities are altered to suit the present level of requirement.**

As per rational formula the total manpower required to maintain for all the "R" activities is derives as 159 Man Days per KM per annum.

R 2 – Shallow Screening:

After the utilization of Heavy Track Machines Maintenance, the need of unit/gang maintenance in Shallow Screening is not fully required as rational formulae; it is mainly used for LC gates road side approaches i.e., the length of 30 Sleepers, creepers and grass penetrated area inside formation etc are being done by the Railway Staff. Also, yard areas in this zone an agreement is in progress for this activity by private agent; hence, Man power required for the Shallow Screening is not allowed fully.

Moreover, the Man power requirement of shallow screening is 55 Mandays/Km in MCNTM in page No.129 (Total Mandays requirement for R activity is 159/Km), which is equal to 35% of R activities if deed fully. Hence, the study team recommended deducting the mandays of shallow screening and shallow screening correction also from TRMS formula.

However, the study team allows 20% of shallow screening in R activities for, after every monsoon, unexpected rain in the approach of LC gates, Station approaches, track where nearby drainages etc, the shallow screen must be done to avoid choking of ballast, resulting rail fractures and weld fractures.

3.8.1 Hence, the mandays requirement for shallow screening is calculated as below.

Total mandays for shallow screening	=	55 mandays /Km
Total Mandays of R activities	=	11270.41
Shallow Screening activity (35%)	=	3945 mandays (11270.41 x 0.35)
Mandays allowed for 20% of 3945	=	789 say as 800 mandays

Therefore, **800 mandays** is allowed for shallow screening

So, the mandays disallowed in R activity is 3145 (3945-800).

3.8.2 **Activity M in M7 water man duty.**

As per the records maintained by SSE/P.Way/PUU, it was observed that no waterman has been provided exclusively to supply the water for 14 gangs (TRMS) for more than a decade. The daily duty hours for the gang strength are 8 hours. By utilizing one staff exclusively to bring the water is not justified.

These 14 gangs available for which the requirement is projected as 4116 man days per year for exclusively bringing drinking water for the Unit staff while on duty.

Since, this jurisdiction is not isolated open area also the whole section stations, inside the yards all have water facility. Also, to carry required water individual water bottles (Milton made – 2 liters.) was supplied to every Track man by the department. Hence, the work study team is not considering the 4116 man days exclusively for water man duties, therefore 4116 mandays has been reduced on account of water man duties.

However some mandays is allowed to work on need base, such as materials handling from other depots, official uses for registers maintenance etc. on condition basis.

3.8.3 Gate Keeping:

In M activity, 8030 mandays is allowed in TRMS formula for gate keeping of 8 manned Engineering LC gates, but the work study team is calculating the requirement of manpower separately based on classification of LC gates Yardstick on need basis.

So, the gate keeping of 8030 mandays is deduced from the TRMS formula.

3.8.4 Rest giver for Keymen:

In M activity, 994 mandays is allowed in TRMS formula for RG for Keymen, but work study team arrived the man power requirement separately based on HOER.

Thus, RG for Keymen of 994 mandays is deduced from TRMS formula.

3.9 **<u>Total deduced Man Days</u> :**

Sl. No	Activity	Reduced Mandays	Para Ref.
1	R 2 – Shallow Screening	3145	3.8.1
2	M7 – Water Man Duty	4116	3.8.2
3	Gate keeping at level crossing	8030	3.8.3
4	RG for Keymen	994	3.8.4
	Total	**16285**	

3.10 **Gang/Unit Strength Requirement :**

Total mandays of T+R+M+S (64678 – 16285) = 48393

Gang/Unit Strength calculation is based on T R M S formula

i.e Total man days of (T + R + M + S) = 48393/294

Gang/Unit Strength (Track Maintainer)

= 164.60 say **165** men

Therefore, Gang/Unit Strength = 165 men
(Track Maintainer Excluding RG for Keyman)

3.11 **Contract works undertaking for ADEN/PUU and other units:**

Cost of Outsourcing activities:

As per the agreement in position at ADEN/PUU Sub-division, the following works were undertaken of ongoing and proposed through contract in SSE/PW/PUU.

<u>On going contract:</u>

Sl. No	Description of Work	LOA	Commencement date	Estimated cost of work Rs.	Contractor
1	Maintenance of Track between KM 688.600 to 709.600 in between stations Edapalayam & Edaman for a period of one year.	No.U/W.496/I/25 /2018/04	27.03.2019 **(Extended upto 31.03.2021 due to Corona)**	2,30,86,928	M/s. C. Gopalan, Namakkal

From the above table, the total amount of maintenance contract for ongoing value is Rs.2,30,86,928/-. For this study purpose, from the above amount the work study team has taken the 70% of the contract value alone which works out to Rs.1,61,60,850/- for labour cost.

So, this value is taken and converted into monthly mean pay of Track Maintainer/Gr.III for outsourced activities that can be reduced from the sanctioned strength of track maintainer to arrive the net requirement of track maintainer after outsourced activities based on TRMS formula.

Outsourced value (70% of proposed contract value)	-	Rs.1,61,60,850/-
The contract cost per month (Rs.1,61,60,850/12)	-	Rs.13,46,737/-
Mean pay of Track maintainer III / month	-	Rs. 48,614/-
Converted into Track maintainer(Rs.13,46,737/48,614)	-	27.7 say 28 staff
L.R. at 12.5%	-	3.5 say 4
Total staff on account of outsourcing	-	**32** staff

Hence, the Net Gang/Unit Strength = 165 – 32 = 133 TRMNTR (Track Maintainer)

3.12 **Supervisors :-**

There are 3 posts of SSEs and 5 posts of JEs in the sanctioned list and the actual is 3 & 1 (+1 under training) respectively leading to 3 surplus post. The man power requirement of supervisors of this unit is calculated as follows:

Over all in charge SSE	=	1
Section SSE/JEs	=	3
Special Works SSE	=	1
LR Supervisor	=	1
Total	**=**	**6**

Hence, the requirement of Supervisor is 6.

3.13 **Artizans :-**

Category	San.	Act.	Requirement	Surplus
Technician Gr.I (Bricklayer)	2	2	0	2
Technician Gr.I (Smith)	1	1	1	0
Technician Gr.III (STM)	0	1	0	0
Total	3	4	1	2

This study recommends multi skilling for these staff including training for welding, trolley working etc., and they can be used for emergency patrolling also when they are spare with proper training. Their movements and programmes are also show the scope for this proposal.

Most of the Bricklayer works in PWAY are done through outsourcing. Further, if any Bricklayer work is needed, the Bricklayer may be drafted from ADEN Sub-Division Office.

There is no sanction for the post of Technician Gr.III/Small Track machine (STM).However the existing Tech.Gr.III/STM is allowed to continue for track maintenance work. Hence, the existing sanction of Blacksmith and actual one post of STM is allowed to continue.

Therefore, the 2 Bricklayer posts are identified for surrender.

3.14 **Track mate**

As per CTE's order No.3/2005 vide Circular No.W/506/14/circular dated 04.10.2005 in para 4, Two gangs constitute a unit and each unit should have one Trackmate.

Such being the case, the 14 gangs are converted to 7 units, therefore the number of Trackmates required for these sections is 7 Trackmate posts. The LR provision for Trackmate is provided while calculating the requirement of gang strength.

Moreover, as per the latest Railway board orders, the posts of track mate, Keyman, Trolleyman, Gate keeper, Store watchman etc. are re-designated as Track maintainer I, II, III, & IV.

3.15 **Trolleyman**

There are 4 trolley available in section. At present 19 trolleymen are working. Due to the mechanical maintenance and improvement in road traffic facilities, the movement by trollies by the inspecting officials has come down drastically. Since the railway materials are carried by road / lorry by the contractor and the requirement for Rail Lorries is almost non-existent.

3.15.1 **Trolley Inspection Schedule:**

According to the IRPWM, SSE/P.Way (in charge) – once in a month, the section supervisor normally took two days to inspect the section in trollies in the fortnight period. For the movements of a push trolley four person are required in which, two will physically push the trolley and the other two will be sitting and watching back side of the movement on safety view. In the latest correction slip, one man is utilized for carrying the tool box/look out duty.

There are four trolleys available in PW/PUU section out of which three are push trolley and one is material trolley. The normal speed of trolley is 10 kmph approximately. The E&R Directorate of RB had also advised the usage of trolley by turn basis and reduction in number of trolley and trolleymen.

The no. of trolley movement by three Supervisors viz. SSE/PW/PUU(IC) – 90 (Push Trollley 51 & Motor Trolley 39) including Officers;

SSE/PW/SKZ (Sub-section) – 29 and

SSE/PW/TML (Sub-section) – 36,

JE/PW/QLN(Sub-section) -40 in toto 195 trolley movements for the last one year and average movement per month is 16 (195/12). Therefore, the average movement per month is 16.

3.15.2 The average trolley movement per month is 4 per Supervisor (at 4 location x 4 =16) since each supervisor having 4 trolley movement therefore, 2 full gang of Trolleymen for 4 location(PUU, KKZ, TML & QLN) is sufficient.

The trolley working time is certainly 4 or 5 hours per trolley inspection due to line block problem. But the supervisor movement for regular track inspection and accompany with higher officials, other departmental purposes, etc. are limited, it must be two full gang of trolleymen required for track inspection.

The requirement of Trolleymen is 10.

3.16 **Gate Keepers:**

There are 8 Engineering Manned LC gates, their classification as 7 Special class and one is "A" class, which is decided on the basis of TVU. So, the manpower requirement of 8 manned LC gates is as follows:

For 7 Special Class LC gates (7x3)	=	21
For 1 A class LC gate (1 x 3)	=	3
Total	=	24
RG at 16.66%	=	4
Total	**=**	**28**

The LR provision for Gate keepers have been given while calculating the requirement of total strength.

The requirement of Gate keepers for 8 manned LC gates is 28.

3.17 **Evaluation of ministerial staff:**

At present, there is one Ministerial staff of PB is working without sanction. So, the study team is allowed as such.

3.18 **The cumulative staff strength of track maintainers:**

Track maintainer	-	133	(Para No.3.13)
Trackmate	-	7	(Para No.3.16)
Gate keepers	-	28	(Para No.3.18)
Trolleymen	-	10	(Para No.3.17)
Keyman (One Keyman for each gang)	-	14	
RG for Keyman	-	2	
Store watchman	-	2	
Sub Total	**-**	**196**	

L.R. at 12.5% (24.5)	-	25
For Trainee reserve need basis	-	2
For Office work	-	1
Total Track Maintainer	**-**	**224**
SSE + JE	-	6 (Para No.3.14)
Artisan staff	-	1 (Para No.3.15)
Total	**-**	**231**
Reduction of 15% staff (34.6)	-	35*
Total Staff Requirement	**-**	**196**

3.19 ***As per revised Yardsticks/Norms issued by Railway Board vide letter No.11-2019/SPMS/Yardstick/2 dated 30.06.2020 for various O&M activities across all departments on the Railways stand reduced by 15% on as is where is basis as an interim measure w.e.f.01.07.2020. This will however not be applicable to Electrical, Mechanical and Accounts Departments where the revised Yardsticks have already been issued in September 2019.**

3.20 The total Sanction Vs Requirement of SSE/P.Way/PUU:

Sl. No.	Category	Sanc.	Act.	Requirement	Surplus
1	SSE	3	3	3	0
2	JE	5	1	3	2
3	Technician Gr.I (Smithy)	1	0	1	0
4	Technician Gr.I (Bricklayer)	2	0	0	2
5	Track Maintainer Gr-I	21	11	21	0
6	Track Maintainer Gr-II	42	24	36	6
7	Track Maintainer Gr-III	42	23	36	6
8	Track Maintainer Gr-IV	96	107	96	0
Total		**212**	**169**	**196**	**16**

3.21 **<u>Summary of Recommendation</u>**

The following 16 posts are found excess in various grades to the requirement and the same may be surrendered and credited to the vacancy bank.

1. Junior Engineer - Level - 6 (GP Rs.4200) - 2
2. Technician Gr.I (Bricklayer) – Level - 5 (GP Rs.2800) - 2
3. Track Maintainer Gr.II - Level - 4 (GP Rs.2400) - 6
4. Track Maintainer Gr.III - Level - 2 (GP Rs.1900) - 6

<u>Total : 16 Vacant Posts</u>

3.22 **Scope of Outsourcing and the current GM approval for Permanent Way activities out sourcing:**

The CMCNTM committee ear marked about 20 track maintenance works for out sourcing in the initial report it (CMCNTM report part – I /Vol-II/Appendix 8) and it is periodical review at board level. In 2013, Railway Board has authorized General Managers to make available man power through maintenance vide Railway Board letter No.2011/CEDO/Southern Railway/15/O/Vol.I dated 16.12.2013.

On this view, GM/S.Rly. has approved the following track maintenance activities for outsourcing (CTE's letter No.W.315/94/G.Men Rational Formula/Vol.III (pt) dated 17.01.2014).

3.23 The following activities are approved by General Manager for outsourcing:

"T" Activities

T_2 - For Tie Tamper
a) Pre tamping operations
b) Along with tamper and
c) Post tamping operations

T_3 - Casual Renewal of
a) Rails
b) Sleepers
c) Fasteners along with re-gauging and

T_4 - Repair Welding

"R" Activities

R_4 - Overhauling of LC gates

R_{10} - Pre-monsoon attention such as clearing of drains and waterways, cess repair, de-weeding of track and attention to cuttings & Trolley refuges.

If the above activities are outsourced, will result in saving of hand some of manpower which is not detailed in the study but the division may initiate the out sourcing the above activities and after the achievement of out sourcing the equivalent manpower may be deduced and compile for vacancy bank.

CHAPTER – IV

4.0 PLANNING BRANCH'S REMARKS ON CO-ORDINATING OFFICER'S VIEWS:

The Draft work study report was sent through e-office to the Co-ordinating Officer (ADEN/SCT) on 23.12.2020 to offer his remarks if any in order to finalise the work study.

A reminder was also sent on 25.01.2021 to offer his remarks on or before 01.02.2021.

Till this date no remarks were received from the Co-ordinating Officer. Hence, the work study report is released without the remarks of the Co-ordinating Officer.

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CHAPTER – V

5.0 FINANCIAL SAVINGS:

5.1 If the recommendations made in the study report are implemented, the annual recurring financial savings will be as under:

Sl. No.	Category	Level	Grade Pay (Rs.)	No. of Posts	Money Value (Rs.)	Annual Financial savings (Rs.)
1	Junior Engineer	6	4200	2	86,463	20,75,112
2	Technician Gr.I/Bricklayer	5	2800	2	71,078	17,05,872
3	Track Maintainer Gr.II	4	2400	6	62,361	44,89,992
4	Track Maintainer Gr.III	2	1900	6	48,614	35,00,208
Total				**16**		**1,17,71,184**

ANNEXURE-I

Sanction, Actual and Vacancy position submitted by DPO/MDU & ADEN/SCT

Sl. No.	Category	Level	San.	Act.	Vac.	Excess
1	SSE	6	3	3	0	0
2	JE	5	5	1	4	0
3	OS/PB	5	0	1	0	1
4	Technician Gr.I (Smithy)	5	1	0	1	0
5	Sr. Technician (Bricklayer)	6	0	2	0	2
6	Technician Gr.I (Bricklayer)	5	2	0	2	0
7	Technician Gr.III (Bricklayer)	2	0	0	0	0
8	Bricklayer Khalasi	1	0	1	0	1
9	Technician (STM)	4	0	1	0	1
10	Track Maintainer Gr-I	5	21	11	10	0
11	Track Maintainer Gr-II	4	42	24	18	0
12	Track Maintainer Gr-III	2	42	23	19	0
13	Track Maintainer Gr-IV	1	96	107	0	11
14	Lascar	1	0	1	0	1
15	Colony Gang Woman	1	0	1	0	1
	Total		**212**	**176**	**54**	**18**

***

MANPOWER

YARD DATA

AS ON : 10-Mar-18

IV MDU

Senior Section Engineer Unit : PUNALUR

Serial No	Station	Gauge	Length of Lines (km)					No of Equivalent Turnouts				
			Running Yard Lines			Non Running Yard Lines		Running Yard Lines			Non Running Yard Lines	
			Machine Packed	Manually Packed	Laid on PRC Sleeper	Manually Packed	Laid on PRC Sleeper	Machine Packed	Manually Packed	Laid on PRC Sleeper	Manually Packed	Laid on PRC Sleeper
A	B	C	D	E	F	G	H	I	J	K	L	M
1	TML	BG	1.2	0	1.2	0	0	4	0	0	0	0
2	EDN	BG	1.2	0	1.2	0	0	4	0	0	0	0
3	PUU	BG	1.2	0	1.2	0	0	4	0	0	0	0
4	PUU	BG	4.066	0	4.066	0	0	8	0	8	0	0
5	AVS	BG	2.009	0	2.009	0	0	8	0	8	0	0
6	KKZ	BG	2.403	0	2.403	0	0	8	0	8	0	0
7	KUV	BG	1.847	0	1.847	0	0	8	0	8	0	0
8	KLQ	BG	1.784	0	1.784	0	0	8	0	8	0	0
9												
10												
11												
12												
13												
14												
15												
Total			15.71	0.00		0.00		52.00	0.00		0.00	

Yard Data Summary	Machine Packed RYL	Manually Packed RYL	Mannually Packed NRYL	RYL on PRC Sleeper	NRYL on PRC Sleeper
BG	20.91 km	0.00 km	0.00 km	19.71 km	0.00 km
MG	0.00 km	0.00 km	0.00 km	0.00 km	0.00 km
NG	0.00 km	0.00 km	0.00 km	0.00 km	0.00 km
Total	20.91 km	0.00 km	0.00 km	19.71 km	0.00 km

v2006.jun

TRACK DATA

MDU

AS ON : 00-01-00

Senior Section Engineer Unit : PUNALUR

Gauge	Line / Segment Nomen-clature	Segment Limits: From km.	To km.	Extra Length due to Detouring (Long km or Short km)	Length in km	GMT	Length in Km Laid With PRC Sleepers	Maintenance Type	Rainfall in cm	Length of LWR in the Segment	Length of LWR Requiring Hot Weather Patrolling	Length of LWR Requiring Cold Weather Patrolling	No. of Equivalent Turnouts on Main Line Segment Leading to Main Line / Running Yard Lines / Non Running Yard Lines	No. of Equivalent Turnouts on Main Line Segment on PRC Sleepers Leading to Main Line / Running Yard Lines / Non Running Yard Lines	Track km of The Segment
B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
BG	SL	695.60	696.50	0.00	0.90	0.96	9.41	MECHANISED	275	0.000	0.000	0.000	11.60	11.60	2.06
BG	SL	717.22	760.15	0.00	42.93	4.39	42.95	MECHANISED	270	39.720	39.720	39.720	26.20	26.20	45.55
					0.00										0.00
					0.00										0.00
					0.00										0.00
					0.00										0.00
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					0.00										0.00
					0.00										0.00
					0.00										0.00
					0.00										0.00
					0.00										0.00
				0.00	43.83					39.720	39.720	39.720	37.80		47.607

ry Track Data	Total Section Length		Section Length on LWR		Equivalent PRC Track Length		Turnouts on Mainline	LWR Under Hot Weather Patrolling		LWR Under Cold Weather Patrolling		Total Track km	
	43.83	km	39.72	km	56.14	km	37.80	39.72	km	39.72	km	47.61	km
	0.00	km	0.00	km	0.00	km	0.00	0.00	km	0.00	km	0.00	km
	0.00	km	0.00	km	0.00	km	0.00	0.00	km	0.00	km	0.00	km
	43.83	km	39.72	km	56.14	km	37.80	39.72	km	39.72	km	47.61	km

GANG STRENGTH

AS ON : 10-Mar-18

DIV: MDU

Senior Section Engineer Unit Name: PUNALUR

Sr. No.	Gauge	Total Track KM	Mandays T	Mandays R	Mandays M	Mandays S	Total Mandays T+R+M+S	No of Mates & Keyman	Leave Reserve	Calculated Gang Strength	Sanctioned Gang Strength Excluding Mate, Keymen and DC Gangmen	Sanctioned Decasualised Gangmen Posts	Excess(+) Shortage(-)	Available Manpower
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	BG	47.61	7408.44	11270.41	30498.24	15252.56	64429.64	28	31	250	198	0	-52	167
2	MG	0.00	0.00	0.00	0.00	245.67	245.67	0	0	1		0	-1	0
3	NG	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Total		47.61	7408.44	11270.41	30498.24	15498.23	64675.31	28	31	251	198	0	-53	167

MANDAYS S

AS ON:

Senior Section Engineer Unit Name PUNALUR

SU	Gauge	Tunnel Maintenance		Bridge Substructure Maintenance			Long Girder Bridge Maintenance			Extra for very Sharp Curves		Extremely Bad Formation		Lookout Man Mandays Required	Fog Signal Man			Mandays Required	Filth Removal		Security Patrolling			Mandays Required
		Total Length in km	Mandays Required	No. of Bridges	Lineal Water Way in meters	Mandays Required	No. of Long Girder Bridges	Lineal Water Way of Long Girder Bridges	Mandays Required	Track Km on > 3deg(BG) >6deg(MG)	Mandays Required	Length of Bad Formation	Mandays Required		No of Mandays Required Yr(-3)	No of Mandays Required Yr(-2)	No of Mandays Required Yr(-1)		No of Gangs working in Affected Area	Mandays Required	No of Mandays Required Yr(-3)	No of Mandays Required Yr(-2)	No of Mandays Required Yr(-1)	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1	BG	0.68	239.76	143	1559.07	513.45	0	0.00	0.00	34.28	10078.61	0.00	0.00	2330.07	120	120	110	116.67	6	1764.00	225	225	180	210.00
2	MG	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	105	120	120	115.00	0	0.00	140	140	112	130.67
3	NG	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0.00	0	0.00	0	0	0	0.00
Total		0.68	239.76	143	1559.07	513.45	0	0.00	0.00	34.28	10078.61	0.00	0.00	2330.07	225	240	230	231.67	6	1764.00	365	365	292	340.67

GANG STRENGTH

DIV: MDU

Senior Section Engineer Unit Name: PUNALUR

AS ON : 10-Mar-18

Sr. No.	Gauge	Total Track KM	Mandays T	Mandays R	Mandays M	Mandays S	Total Mandays T+R+M+S	No of Mates & Keyman	Leave Reserve	Calculated Gang Strength	Sanctioned Gang Strength Excluding Mate, Keymen and DC Gangmen	Sanctioned Decasualised Gangmen Posts	Excess(+) Shortage(-)	Available Manpower
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	BG	47.61	7408.44	11270.41	30498.24	15252.56	64429.64	28	31	250	198	0	-52	167
2	MG	0.00	0.00	0.00	0.00	245.67	245.67	0	0	1		0	-1	0
3	NG	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Total		47.61	7408.44	11270.41	30498.24	15498.23	64675.31	28	31	251	198	0	-53	167

AS ON: 1[illegible]

MANDAYS 5

Senior Section Engineer Unit Name PUNALUR

S.	Gauge	Tunnel Maintenance		Bridge Substructure Maintenance			Long Girder Bridge Maintenance			Extra for very Sharp Curves	
		Total Length in km	Mandays Required	No. of Bridges	Lineal Water Way in meters	Mandays Required	No. of Long Girder Bridges	Lineal Water Way of Long Girder Bridges	Mandays Required	Track Km on > 3deg(BG) >6deg(MG)	Mandays Required
A	B	C	D	E	F	G	H	I	J	K	L
1	BG	0.68	239.76	143	1559.07	513.45	0	0.00	0.00	34.28	10078.61
2	MG	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00	0.00
3	NG	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00	0.00
Total		0.68	239.76	143	1559.07	513.45	0	0.00	0.00	34.28	10078.61

S.	Gauge	Extremely Bad Formation		Lookout Man	Fog Signal Man				Filth Removal		Security Patrolling			
		Length of Bad Formation	Mandays Required	Mandays Required	No of Mandays Required Yr(-3)	No of Mandays Required Yr(-2)	No of Mandays Required Yr(-1)	Mandays Required	No of Gangs working in Affected Area	Mandays Required	No of Mandays Required Yr(-3)	No of Mandays Required Yr(-2)	No of Mandays Required Yr(-1)	Mandays Required
A	B	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1	BG	0.00	0.00	2330.07	120	120	110	116.67	6	1764.00	225	225	180	210.00
2	MG	0.00	0.00	0.00	105	120	120	115.00	0	0.00	140	140	112	130.67
3	NG	0.00	0.00	0.00	0	0	0	0.00	0	0.00	0	0	0	0.00
Total		0.00	0.00	2330.07	225	240	230	231.67	6	1764.00	365	365	292	340.67

MDU

MANDAYS M

AS ON: 10-Mar-1

Senior Section Engineer Unit Name : PUNALUR

Gauge	Monsoon Patrolling		Hot/Cold Weather Patrolling of LWR					Vulnerable Locations		Gate Keeping			Rest Giver for Keymen		Waterman		Store Watchman		Tot Man Req Fo Acti
	No. of Beats	Mandays Required	Total Length of LWR	Length of LWR Requiring Hot Weather Patrolling	Length of LWR Requiring Cold Weather Patrolling	Mandays Required for Hot Weather Patrolling	Mandays Required for Cold Weather Patrolling	No of Locations	Mandays	No of Engg Manned Gate	Sanctioned Cadre of Gatemen	Mandays Required	No of Keymen	Mandays Required	No of Gangs	Mandays Required	No of Site Stores	Mandays Required	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
BG	14	10440.00	39.72	39.72	39.72	1191.60	476.64	15	5250.00	10	0	8030.00	14	994.00	14	4116.00	0	0.00	3049
MG	0	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0	0	0.00	0	0.00	0	0.00	0	0.00	0.
NG	0	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0	0	0.00	0	0.00	0	0.00	0	0.00	0.
TOTAL	14	10440.00	39.72	39.72	39.72	1191.60	476.64	15	5250.00	10	0	8030.00	14	994.00	14	4116.00	0	0.00	3049

8

[illegible] Engg closed on [illegible] conversion

3 Watchm…

DIV : MDU

MANDAYS T,R

AS ON: 10-Mar-18

Senior Section Engineer Unit : PUNALUR

Segment No.	Gauge	Segment Name	GMT	Maintenance Type	Track km of Segment	Length of LWR in the Segment	Composite Factor 1+A+B+C	Mandays Required for T Activities	Mandays Required for R Activities	Mandays for T+R
A	B	C	D	E	F	G	H	I	J	K
1	BG	SL	1.0	MECHANISED	2.06	0.00	5.6146	950.82	327.54	1278.36
2	BG	SL	4.4	MECHANISED	45.55	39.72	1.1906	4885.69	7241.97	12127.66
3	0	0	0.0	0	0.00	0.00	1.0000	0.00	0.00	0.00
4		0	0.0	0	0.00	0.00	1.0000	0.00	0.00	0.00
5		0	0.0	0	0.00		1.0000	0.00	0.00	0.00
6	0	0	0.0	0	0.00	0.00	1.0000	0.00	0.00	0.00
7	0	0	0.0	0	0.00	0.00	1.0000	0.00	0.00	0.00
8	0	0	0.0	0	0.00	0.00	1.0000	0.00	0.00	0.00
9	0	0	0.0	0	0.00	0.00	1.0000	0.00	0.00	0.00
10	0	0	0.0	0	0.00	0.00	1.0000	0.00	0.00	0.00
11	0	0	0.0	0	0.00	0.00	1.0000	0.00	0.00	0.00
12	0	0	0.0	0	0.00	0.00	1.0000	0.00	0.00	0.00
13	0	0	0.0	0	0.00	0.00	1.0000	0.00	0.00	0.00
14	0	0	0.0	0	0.00	0.00	1.0000	0.00	0.00	0.00
15	0	0	0.0	0	0.00	0.00	1.0000	0.00	0.00	0.00
16		0	0.0	0	0.00		1.0000	0.00	0.00	0.00
17		0	0.0	0	0.00		1.0000	0.00	0.00	0.00
18		0	0.0	0	0.00		1.0000	0.00	0.00	0.00
19		0	0.0	0	0.00		1.0000	0.00	0.00	0.00
20		0	0.0	0	0.00		1.0000	0.00	0.00	0.00
Total					47.607	39.72		5836.52	11270.41	17106.92

Summary Mandays T,R	Activity T	Activity R	Total Mandays
BG	7408.44 Mandays*	11270.41 Mandays	18678.84
MG	0.00 Mandays	0.00 Mandays	0.00
NG	0.00 Mandays	0.00 Mandays	0.00
Total	7408.44 Mandays	11270.41 Mandays	18678.84

18

(18/1)

SOUTHERN RAILWAY

570

Headquarters office
Works Branch
Chennai 600 003
Dt. 21.11.2009

No.W.OM/45/Post/General.

Sr.DEN/Co-ord/SA, PGT, TVC,TPJ & MDU

Sub: Yardstick for skilled category in Engineering Department of SA, PGT, TVC, TPJ & MDU Divisions.

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It is proposed to adopt the following yardstick for the posts of Artizans in SA, PGT, TVC, TPJ & MDU Divisions.

S.No.	Post	Yardstick	Remarks
1	Blacksmith	2 nos for each SE/P.Way	The yardstick is for maintenance of all assets under the SE/P.way including lifting barriers at level crossings. The average work load for each blacksmith is taken as 10 LCs.
2	Blacksmith Khalasi	2 nos for each SE/P.Way	The yardstick is for maintenance of all assets under the SE/P.way including lifting barriers at level crossings. The average work load for each blacksmith Khalasi is taken as 10 LCs.
3.	Additional Blacksmith for maintenance of manned level crossings (extra over the item (1))	1 no. for every additional 25 manned LCs or part thereof over and above 20 manned LCs in each P.Way section	For e.g. in a P.Way section if there are 45 manned level crossings, the first 20 will be maintained by Blacksmiths at S.No 1 and one more additional Blacksmith shall be created for the balance 25 manned LCs

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4.	Additional Blacksmith khalasi for maintenance of manned level crossings (extra over the item (1))	1 no. for every additional 25 manned LCs or part thereof over and above 20 manned LCs in each P.Way section	For e.g. in a P.Way section if there are 45 manned level crossings, the mainatenance of first 20 manned LCs will be assisted by Blacksmith khalasi at S.No.2 and one more additional Blacksmith khalasi shall be created for the balance 25 manned LCs
5.	Additional Blacksmith for maintenance of major yards (extra over the item (1) & (3)	1 blacksmith each for major yards i.e. SA, ED in SA division (2 nos.), PGT, SRR in PGT division (2nos.) ERS in TVC division (1 no.) GOC, TPJ in TPJ division (2 nos.)	
6	Additional Blacksmith khalasi for assisting in maintenance of major yards (extra over the item (2) & (4)	1 blacksmith khalasi for assisting maintenance of each major yards i.e. SA, ED in SA division (2 nos.), PGT, SRR in PGT division (2nos.) ERS in TVC division (1 no.) GOC, TPJ in TPJ division (2 nos.)	
7	Bricklayer	1 each for sub-division	These posts may be operated with any of the SE/P.Way to be decided by Division and shall be shared by other SE/P.way as per the programme to be issued by ADEN.

18/3

8.	Bricklayer Khalasi	1 each for sub division	These posts may be operated with any of the SE/P.Way to be decided by Division and shall be shared by other SE/P.way as per the programme to be issued by ADEN.
9.	Painter	1 for each SE/P.Way	
10.	Welder	1 for each SE/P.Way	
11	Welder Khalasi	1 for each SE/P.Way	

Wherever the minimum above staff are not available, such requirement is proposed to be met by creating posts duly using the Staff Bank provision available either at division or Headquarters or surrendering excess Carpenters, Brick layers and any other posts identified as necessary.

(DANI THOMAS)
CHIEF TRACK ENGINEER

Sr. DEN/Co-ord	✓	ADEN/CTR	
Sr. DEN/ E		SSE/Drg.	
DEN/ ✓		Section	Estt
DEN/Br.		CH.OS	

1/12/09