

**WORK STUDY TO REVIEW THE
STAFF STRENGTH AT
SSE/P.WAY/VPT
MADURAI - DIVISION**

SOUTHERN RAILWAY

PLANNING BRANCH

G.275 / WSSR- 321920/ 2019-20

**WORK STUDY TO REVIEW
THE STAFF STRENGTH
AT
SSE/P.WAY/VPT
MADURAI - DIVISION**

STUDIED BY

**WORKSTUDY TEAM
OF
PLANNING BRANCH**

FEBRUARY 2020



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(i)

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(ii)

TERMS OF REFERENCE

Work study to review the staff strength at SSE/P.WAY/VPT – MADURAI Division.

(iii)

METHODOLOGY

The following methodology has been adopted while conducting the above study.

1. Collection and compilation of data.
2. Discussion with field Officials.
- 3) Applying rational formula to arrive at the requirement of gang strength as per the data furnished by SSE/P.WAY/VPT, and also on need basis.

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(iv)
SUMMARY OF RECOMMENDATIONS

Revised Recommendation No.1

Fourteen posts of **Track maintainer/IV** in Pay Band Rs.5200-20200 G.P. 1800/-, are found excess to the requirement may be surrendered and credited to the vacancy Bank.

(14 posts)

Revised Recommendation No.2

Five posts of **Track maintainer/III** in Pay Band Rs.5200-20200 G.P. 1900/-, are found excess to the requirement may be surrendered and credited to the vacancy Bank.

(5 posts)

Revised Recommendation No.3

Five posts of **Track maintainer/II** in Pay Band Rs.5200-20200 G.P. 2400/-, are found excess to the requirement may be surrendered and credited to the vacancy Bank.

(5 posts)

Revised Recommendation No.4

Four posts of **Track maintainer/I** in Pay Band Rs.5200-20200 G.P. 2800/-, are found excess to the requirement may be surrendered and credited to the vacancy Bank.

(4 posts)

Revised Recommendation No.5

One vacant posts of JE in Pay Band Rs.9300-34800 G.P.4200/-, is found excess to the requirement may be surrendered and credited to the vacancy Bank.

(1 post)

Revised Recommendation No.6

One vacant post of SSE in Pay Band Rs.9300-34800 G.P.4600/-, is found excess to the requirement may be surrendered and credited to the vacancy Bank.

(1 post)

TOTAL (30 POSTS)

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CHAPTER – I**1.0 INTRODUCTION**

- 1.1 Indian Railways is one of the world's largest railway network consists of freight, passengers, tourist, suburban rail systems, toy train and luxury trains.
- 1.2 Indian Railways transports almost 2.5 crore passengers daily.
- 1.3 Indian Railways is one of the world's largest employer with over 1.4 million staff.
- 1.4 The first train on Indian soil ran between Bombay and Thane on 16 April 1853.
- 1.5 New Delhi Railway station has secured a place in the Guinness Book of Records for having the world's largest RRI system.
- 1.6 If the tracks of Indian Railways were to be laid out ,they would circle the earth almost 1.5 times.
- 1.7. Mathura junction has the maximum number of routes emerging from it.
- 1.8. The Diamond/Square crossing in Nagpur is one of its kind in India, from where trains go East, west, North and South.
- 1.9. Nilgiri Mountain Railway a single track and only rack and pinion rail system operates in Southern Railway.
- 1.10. The Southern Railway headquartered at Chennai, is one of the 18 Zones of Indian Railways.
- 1.11. Southern Railway has six divisions
 - 1.Chennai
 - 2.Tiruchirapalli
 - 3.Madurai
 - 4.Salem
 - 5.Thiruvananthapuram
 - 6.Palakkad
- 1.12 Southern Railway zone operates both passenger and freight trains.
- 1.13 The biggest station is Puratchi Thalaivar Dr.M.G.Ramachandran Central Railway Station.
Major Stations of the zone includes Chennai Egmore, Mangalore Junction, Coimbatore, Salem, Palakkad, Kozhikode, Villupuram, Ernakulam, Tirunelveli, Madurai, Trichy, Thiruvananthapuram, Nagercoil, Vellore, Erode, Kollam, Thrissur, Tirur, Kannur, Shoranur and Puducherry.

1.14 **MADURAI Division**

- Madurai Railway division is a railway division belonging to Southern Railway.
- Created in 1956 ,it spans over 1356 km .
- Headquarters is Madurai
- Largest railway division of Southern Railway.
- It Covers up to 12 districts of Tamilnadu and 1 in Kerala.

1.15 **VIRUDHUNAGAR**

- Virudhunagar junction is located on the eastern side of the city adjacent to the town's SIDCO industrial estate.
- The station bears the intersection of four branching railway lines .
- B.G single line towards Madurai junction.
- B.G Single line Tenkasi Jn & Kollam Jn.
- B.G single line towards Manamadurai Jn.
- B.G single line towards Vanchi Maniyachchi Jn.

1.16 **ENGINEERING BRANCH**

a. ZONAL LEVEL

- The Principal Chief Engineer is the head of Engineering department in Zonal Railways.
- Chief Engineers at HQ are incharge for Track, Bridge, Planning, Track Machines, General Matters etc.
- CAO is the head of Construction unit responsible for major construction works such as new lines ,doubling, gauge conversions etc..
- Chief Engineers (Construction) are coordinate with CAO

b. DIVISION LEVEL

- Engineering department is headed by Sr.DEN/Coordination.
- Division consists of some number of sections which are managed by Sr.DEN/DEN/ADEN
- Each Permanent way section is maintained by Senior section Engineer(P way).
- Assisted by Junior Engineers(P Way)
- Assisted by staff of Track maintainers, Artizans etc..

1.17 **Engineering (P.Way) Branch:**

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.

- 1.18 The present modern technology in permanent way, mostly used 52/60 kg rails, jointless (long welded rails), prestressed 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.

Track of permanent way is the single costliest asset on Indian Railways. It basically consists of rails, sleepers, fittings and fastenings, ballast and formation.

Permanent Way is the major activity of the Engineering Branch which is entrusted with the periodical maintenance of the track, bridges, 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.

- 1.19 But the modern technologies have taken the track maintaining techniques from the era of pick axe and shovels to the mechanized track maintenance. 60 kg rails are the norms of the day. The equipments for testing the track have become sophisticated so as to trace all sorts of failures of the track.

The computerization, ever-present use of various types of track machines, testing techniques etc., has reduced the manual labor and hence man power required for maintenance is reduced. Many of the maintenance activities are now outsourced or are proposed for it.

1.20 So it has become essential to have a glance at the man power requirement for the following reasons.

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

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

1.22 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 as below :-

- ✓ **Rails** act as girders to transmit the wheel loads of trains to the sleepers
- ✓ **Sleeper** hold the rails in proper position and provide 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

1.23 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 lawn or stones pitching and
- (vii) Longitudinal and cross levels should be in good condition and within allowable limits.

1.24 Various track machines and their periodicity of working are Detailed below:-

Sl. No.	Name of the Machine	Work done	Frequency
1.	BCM-Ballast Cleaning Machine	Deep screening of track	Once in 10 years
2.	DUOMAT/CSM – Continuous Action Tamper	Tie Tamping LWR work	Once in 2 years
3.	DGS - Dynamic Track stabilizer	For consolidating track after works affects core stability	Once in 10 years along with BCM
4.	UNIMAT/MPT	Tamping Points & crossing	Once in 2 years
5.	BRM - Ballast Regulating Machine	Boxing of track	As per requirement
6.	UTV - Utility Track Vehicle	Leading and stacking materials	As per need
7.	T-28 - T28 cranes – One job crane (PRC laying Machine)	For re-laying of Points & crossing	As per requirement
8.	PQRS	For re-laying track	-do-
9.	TRT	For CTR of track	-do-

1.25 Actual Unit (Gang) Performance :

In the various Units/gangs daily performance record it is observed that the following works are repeatedly allotted by the Supervisor and carried out by the Gangs/Units ;

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. .



CHAPTER –II

2.0 PRESENT SCENARIO

SSE/P. Way/VPT section is a single line covering a total track length of 78.30 km

2.1 The present staff deployment of SSE/P.Way/VPT

The book of sanction of the Unit is 210 and the actual is 170 as on Scale Check Statement of APO Lr., Dated on 18.07.2019. The Scale check Statement SSE/PWAY/VPT is placed as **Annexure -I.**

As per SSE/PWAY/VPT statement Dated 23.10.2019, Actual strength is 167 against sanction staff strength of 210. i-e 2 SSEs, 1 JE, 5 Artizan, 158 Track maintainer, Gate keepers, Trolleyman, Watchman, Office attendant, and 1 OS/Personnel .

The actual strength of SSE/P.WAY/VPT Section is placed in **Annexure - II.**

In addition to that, 22 Track maintainer-IV has newly joined after completion of their training through Lr.NO113/I/WP/2019, dated 17.09.2019. Hence, the actual staff strength is 189 against sanctioned staff strength of 210.

2.2 SSE/ PWAY/VPT SECTION:

This section is in between MDU outer and NLL outer. MDU-VPT–MEJ line. The following main stations are in this section namely,

1. Tirupparankundram
2. Thirumangalam.
- 3.Sivarakottai
- 4.Kalligudi
- 5.Virudunagar
- 6.Tulukapati
- 7.Satur
- 8.Nalli

2.3 Jurisdiction:

This section is between MDU-NLL from kms 495/650 to 573/950

Designation	Gang/Km	
SSE/PWAY/VPT (INCHARGE)	495/650-573/950	
SSE/PWAY/MDU- VPT (sub section)	Gang No-1 to 8	495/650-539/000
JE/PWAY/VPT-NLL (Sub section)	Gang No-8A-14	539/000-573/950

2.4 The jurisdiction covered by SSE/P.Way/VPT is divided into (15) Gang Sections .

2.5 Gang Details :-

GANG STRENGTH AND LENGTH

GANG NO	GANG STAFF STRENGTH	LENGTH IN KM
1	1+1+8=10	5.750
2	1+1+6=8	5.800
3	1+1+9=11	5.700
4	1+1+2=4	6.400
5	0+1+7=8	6.400
6	1+1+3=5	6.200
7	1+1+5=7	5.000
8	1+1+8=10	1.700+5 Roads@VPT
8A	1+0+1=2	1.830+4 Roads and Ballast sidings
9	1+1+4=6	6.500
10	1+1+4=6	6.500
11	0+1+5=6	4.400
12	1+0+1=2	6.500
13	1+1+8=10	6.00
14	1+1+4=6	5.050

- 2.6 Senior Section Engineer/P.Way/VPT is the in charge for maintaining the track with the help of his assistants.

This section is divided into Gang Section (or) Gang beats of about 5 to 5.5km per Gang Section/Beats and kept under the in-charge of P.Way Supervisors for day-to-day maintenance. P.Way Supervisors are assisted by skilled labour i.e., Track Maintainers, Artizans for identifying and correcting the track defects.

2.7 **Duty Hours**

The normal working hours of the gang staff is 07.00 to 12.00 hrs and 14.30 to 17.30 hrs, but during November, December and January, it is 07.30 to 12.30 and 14.00 to 17.00 hrs.

2.8 **Rest for Staff**

Saturday rest for Odd gang (1,3,5,7, 9,11,13)

Sunday rest for even gang (2,4,6,8,8A,10,12,14)

2.9 **Track Maintenance :**

2.9.1 Regular Duties of Track Maintenance

1. Through packing
2. Shallow screening
3. Picking of slacks
4. Lubrication of Rail joints
5. Minor attention to cess
6. Clearing of centre water drains, side drains
7. Casual renewal of Rails
8. Casual renewal of Sleepers
9. Opening & Examining and Overhauling of LC gates
10. Attention to Points & Crossings

2.9.2 Works Outside Regular Duties

1. Loading and unloading of materials
2. Stocking of materials
3. Monsoon Patrol

4. Security Patrol
5. Repair of track in Bridges
6. Stock verification
7. Painting of Rails in station yards and elsewhere
8. Deep screening
9. Resurfacing of Points and Crossings
10. Watching of materials
11. Heavy repairs to track including lifting
12. Complete renewal of Points & Crossings
13. Complete realignment of curves

2.10 SSE/P.Way/VPT-TROLLEY DETAILS

Sl.No	Designation	No.of Trolley	Type of Trolley
1	SSE/PWay/VPT (INC)	1	Push Trolley
		1	Motor Trolley
2	SSE/PWay/MDU-VPT (SUB-SEC)	1	Push Trolley
3	SSE/PWay/VPT-NLL (SUB-SEC)	1	Push Trolley
Total Trolley		4	

2.10.1 Trolley Movements last one year -2018-19

Sl.No	Designation	No. of Trolley Inspection	Remarks
1	SSE/PWay/VPT (INC)	48	MDU-TMQ-VPT-SRT-NLL
2	SSE/PWay/MDU-VPT	24	MDU-TMQ-VPT
3	SSE/PWay/VPT-NLL	24	VPT-SRT-NLL

2.10.2 Track Machine working for the year – 2018 -2019

Track Machine	No.of days working	
	2018	2019 Upto october
Unimate	32	14
CSM	17	54
UTV	49	19
DGS	39	54
DUOMATIC	48	29

2.11 ATTENTION OF LC GATES

Total No.of Level crossing-30

Engineering LC-21

Traffic LC -9

Interlocked LC-17

Non-Interlocked LC-13

LC attention (Maintenance) 2 LC per day.

No.LC failure recorded due to good maintenance.

2.12 No. of Point & Crossing = 77

2.13 No. of Curves = 26

2.14 No of.LWR = 30

2.15 Ruling Gradient 1 in 200

2.16 Maximum Permissible speed

100 kmph for coaching,
75 kmph for goods

2.17 Bridge details

Major Bridges - 12

Minor Bridges - 113

Total - 125

2.18 VULNERABLE LOCATION - 10 nos

2.19 Monsoon Patrolling. - 20 beats

2.20 Special works

Whenever Track machines like TRT, BCM ,CSM,UNIMATE,UTV are working,
staff deputed for assisting the track activity.

2.21 Security Patrol

NIL

2.22 Emergency patrol

At the time of unforeseen circumstances like heavy rain, flood, to
safeguard and ensure the safety of the track Emergency Patrol is
implemented. Staff will be deputed accordingly whenever necessary.

2.23 **Temperature recorded.**

In this section, Maximum Temperature recorded 55 degree centigrade in, and Minimum Temperature recorded 30 degree centigrade .

2.24 **Location of stores**

One store is available in SSE/PWAY/O/VPT

It is Adjacent to SSE/PWAY/O/VPT

SSE/PWAY/VPT is the In charge of Stores .

Track maintainers (Gang staff) are utilized for collection of stores from various Depots.

1 Staff deputed to watch stores/office in night.

2 Staff deputed to watch and work in stores/office

2.25 **Store Activities.**

Daily material transaction.

Maintenance of DBI/DBR/kachcha book

Preparing Balance return statement

Maintenance of Kerosine, Diesel, Grease and fittings books & registers.

Issuing Uniforms for staff register

Cash imprest

Preparation of chellans & Gatepasses

Collection of materials from various Depots, with lorry/without lorry

DS-8

Books & Forms from GSD/PER

GJ, SEJ, Curved Switches, Trolleys, Rail dolly, Track items, Crow bar, Fish plates & Powerah etc. from EWS/AJJ

Indent preparation, Material Chasing, collection of materials, Issuing materials for day today work.

2.26 **Welding Materials with Accessories**

Blower for Thermit welding

Hydraulic trimmer

Disc cutting machine

Drilling machine

Grinding machine Power drills

Generators for power supply @ mid section for welding, Grinding, Drilling, Filing etc..

2.27 **Rail Fractures/ Weld failures :-**

Sl. No.	Year	No. of Rail Fractures	No. of Weld failures
1	2014	1	2
2	2015	-	1
3	2016	-	-
4	2017	1	-
5	2018	1	-
6	2019	2	2

3.0 CRITICAL ANALYSIS

3.1 As per the Rational Formula, the activities to be done by gang staff (Track Maintainers) were identified and the activities which can be contracted out if necessary, were also identified. The activities of track maintenance are categorized as follows:

- i) Primary Maintenance
- ii) Auxiliary Maintenance
- iii) Activities that can be contracted out.

3.2 Primary Maintenance Activities

- a) Activities T (affected by traffic density)
- b) Activities R Routine – not affected by traffic density.

Auxiliary Maintenance Activities

- a) Activities M Miscellaneous
- b) Activities S Site specific

- Whenever Annual review of gang strength for Activities `T` and `R` is undertaken, it is necessary to reassess the manpower requirement for activities `M` and `S` due to the developments effected from time to time in the fields of `M` & `S` such as:
- Number of monsoon patrol beats adjusted as per changed train service.
- Vulnerable locations eliminated due to works carried out.
- Level crossings replaced by ROB & RUB.
- No. of stores depots reduced.
- Jurisdiction of gang lengths reorganized.

The list is only indicative and not exhaustive.

3.3 **External factors:**

Certain external factors have also got a bearing on the man power requirements especially under R, M & S activities.

- a. The improvements in road transport and vehicles
- b. The improved availability of water, residence, etc.
- c. The substitution of manual checking / testing / inspection due to the use of machines like USFD, WILD, etc.
- d. The longevity ensured due to mechanized laying of track and construction / Inspection methods
- e. The supervisory element of work in the contracts

Keeping in view of the objectives of MCNTM report which was evolved by studying the conditions existed during 1996-2000, when the concept of mechanization was in the initial stage, the Workstudy has made an attempt to commensurate with the technological improvements, as the MCNTM Report itself is issued way back in 2000, though implemented in 2006.

3.4 **Track Maintenance Activities**

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

They are:

Primary activities :-

Activity 'T' - Affected by Traffic Density

Activity 'R' - Not affected by Traffic Density

Auxiliary activities :-

Activity 'M' - Miscellaneous

Activity 'S' - Site specific

3.5 **Activity 'T' - Affected by Traffic Density**

T1- Slack attention to

- a) Bad spots
- b) Low joints (FP, welded, Glued joints)
- c) SEJ
- d) Minor curve alignment

T2 - For Tie Tamper working

- a) Pre tamping operations
- b) Along with tamper
- c) Post tamping operations

T3- Casual Renewal of

- a) Rails
- b) Sleepers
- c) Fasteners along with re-gauging

T4- Repair Welding

Man days requirement for T is decided as $(80 + 2.3 \text{ GMT}) (1 + A + B + C)$ per year per km and Man days for "T" will be 168 per year per km for non-suburban mechanized track and $(115 + 2.3 \text{ GMT}) (1 + A + B + C)$ for suburban mechanized track.

Where A = Formation factor

(0 for stable, 0.1 for bad and 0.2 for very bad soil).

B = Alignment factor (0 to 0.25 for 1° to 2° curves)

C = Rain fall factor (0 for 150-300 cm & 0.2 for 300 cm & above rain fall)

3.6 **Activity ' R ' – Not affected by Traffic Density**

- R1 - Lubrication of ERCs
- R2 - Shallow screening (1/5th of Length)
- R3 - Loading, Leading, Unloading
- R4 - Overhauling of LC gates
- R5 - Watching of caution spots & misc.
- R6 - Tree cutting for visibility
- R7 - Lubrication of Rails in Curves
- R8 - Accident Relief and carcass renewal in run over cases
- R9 - Bridge, Sleeper attention & Renewal
- R10 - Pre-monsoon attention such as clearing of drains and Waterways, cess repair, de-weeding of track and attention to cuttings & Trolley refuges
- R11 - Creep pulling approaches to bridges, turnout
- R12 - Rectifying damage to LC posts and gates.

3.7 Activity 'M' – Miscellaneous

- M1 - Monsoon patrolling $\Sigma (D \times b \times s \times m)$ - 1 to N
 N = No. of beat lengths
 D = No. of days of M. Patrol in an year
 b = No. of beats
 s = No. of shifts
 m = No. of men (1 normally, 2 as per DRM's special orders for areas affected with wild animals / terrorists.)
- M2 - Hot weather patrolling
- M3 - Cold weather patrolling
- M4 - Watching vulnerable locations
- M5 - Gate keeping of LC gates
- M6 - Rest giving for key man
- M7 - Waterman duty
- M8 - Store watchman duty

Activity 'S' – Site specific

- S1 - Tunnel Maintenance
- S2 - Bridge substructure maintenance
- S3 - Long girder maintenance
- S4 - Extra maintenance due to very steep curves, deep cutting, steep gradient
- S5 - Maintenance of track on extremely bad formation
- S6 - Look out man duty (for the safety of gang)
- S7 - Fog signal man duty (to assist traffic Dept)
- S8 - Filth removal from track (within city limits)
- S9 - Security patrolling
- S10 - Watching of water level in suburban section

3.8 The Rational formula categorized the following activities for contract works.

- Formation of treatment works.
- Collection of ballast Loading/unloading.
- Deep screening of ballast.
- Through Renewal of rails, sleepers, fasteners.
- Re-surfacing crossing and switch rails.
- Loading and unloading of P.Way materials in bulk.
- Heavy repairs to formation, bridges.
- Repairing Road surface of LCs.
- Removal of major sand breaches.
- Works arising due to restoration following freak accident.
- Cleaning of vegetation in Platform and in the vicinity of track, in yard and in workshops.

3.9 Based on the above Rational Formula the Gang strength requirement of SSE/P.Way/VPTis arrived as follows:

As per Railway Board Order No.95/CE1/GNS/2.Vol.II/Pt.11 dt.6.3.2006 – Item No.4).

No. of Gang men	=	$\frac{\text{T+R+M+S Activities (in mandays)}}{\text{Available mandays per year (291)}}$
One year	=	365 days.
Sundays	=	52 days.
National Holidays	=	12 days.
Casual leave	=	10 days.
Total No. of Holidays	=	74 days.
Available man days per year	=	$365 - 74 = 291\text{days.}$

The study MCNTM itself was conducted during the period 1996-2000 though the RB order was issued in 2006.

There were sea changes in the maintenance of track; the committee report itself had advised that the norms are to be renewed according to the programme of Mechanized maintenance and at least once in 5 years.

- **The quantum of activity for the man power requirement for single line and multiple lines are linear in nature. The requirement of staff for tree cutting, painting, waterman etc are calculated on the same basis.**
- **The activities given for outsourcing is not accounted in TRMS calculations. The mandays requirement assessed from the rational formula is on the higher side mainly because of the factors and activities not practically undertaken by the P.way units, which are included in the formula.**

Also, certain activities have considerably reduced on account of system improvement and modernization. This certainly has a bearing on the 'R' factor in the rational formula. Similarly, most of the T and R activities are outsourced through contract works.

3.10 'T' activities

- The total claims for 'T' activities (track related) in TRMS is shown as 31,478 man days. T1, T2, T3 activities are done in contract agreement. It is not coming under regular work. However, the staff of gang in their area is doing minimum work if any.
Moreover, the sub activity T4 under 'T' has come down due to technological improvements in welding (T4- repair welding). During the last 6 years the weld failure/rail fracture is 9 only ie. an average of 1.5/year in SSE/PWAY/VPT.
- Eventhough the above said activities are carried out by the contract agreement, the study team has allowed 10% of the mandays for considering the hard ship work nature .
- Hence, 3200 Man-days ($31478 \times 10/100$) is considered for manpower calculation T activities.

3.11 'R' activities

For R activities 22992 man days is given in TRMS calculation. It is observed that more than 75% of the activities are carried out through agreement contract.

1. R6 Clearing of vegetation for improving the visibility at LC's is done by gang staff. Now a days mechanized grass cutters and other equipments are utilized to improve the quality of work and to reduce the hard labour and thereby reducing in the time /man days.

2. R8 is relating to accident relief and carcass removal etc., is reduced drastically and carried out when and where necessary .

3. Similarly the requirement for Loading, Leading, and Unloading (R3), and Bridge sleeper attention and renewal (R9) is carried out by contract .

4. R10 is related to monsoon attention clearing of drains and water ways, cess repair, de-weeding of track, and attention to cutting and trolley refuge. These works are being carried out by Zonal contract, Hence there is no need of providing any manpower for R10 activities.

On Need basis 25% of Man days is allowed from the total man days arrived(22992) in TRMS.

Hence, 6000 Man days ($22992 \times 25/100$) is considered manpower calculation for R activity.

3.12 'M' activity

M1) Monsoon patrolling

This is coming under M1 activity

As per TRMS given is 40 beats and mandays 2695.

But, as per the data given by SSE/PWAY/VPT is 20 beats .

Based on the calculation for 20 beats , the arrived mandays is 1348 .It is claimed that there are 20 beats in this section and monsoon patrolling is carried out whenever necessary.

Now a days the average rain fall has come down and the need for monsoon patrolling is reduced to a distinct level..

However, duly considering the need of this section and the **need of man power for other activities, 1348 mandays for 20 beats is allowed**
M2,M3) Hot/Cold weather patrolling – $2283+914=3197$ man days in TRMS

But, as per the record, the maximum and minimum temperature recorded in the section is 55 and 30 degree centigrade .Hot weather patrolling is to be conducted whenever the temperature reaches $td+20$ also Cold weather requires during the temperature of $td-30$,hence for hot and cold weather patrolling is not required to this unit.

Hence, No mandays is required

M4) Watching vulnerable locations-456 mandays is arrived in TRMS is allowed.

M5) Gate keeping -14,841 (21 gates requires 51Men- including RG) man days allowed whereas 13,968 man days given in TRMS.

M6) RG for Key men-1065 mandays arrived in TRMS.

For 15 keyman RG is calculated as 2.5 men as per ratio. But, Considering as 3 men and equivalent man days of **873 mandays** is allowed

M7)Water man

For water man post 4416 man days are allotted in TRMS which is equal to 15 posts. There is no need of keeping one waterman for each gang because of the reduced no. of track staff, mechanized works and frequent movement of track machines in which water can be carried while work.

Moreover the gang length is situated in between the stations and gates. Water can be stored in containers and kept with them.

The concept of waterman is necessary only when the gang working together at a particular place on a specific task like manual shallow screening, deep screening rail renewal, sleeper renewal etc., now a days, most of the activities are mechanized and outsourced.

Hence the necessity for a separate waterman for the entire year for each gang is fritter away.

M8) Store watchman duty- 2190 man days is arrived in TRMS for two stores.

It is observed that there is only one store effectively functioning at the HQ. i.e at VPT and for which only two store men are deputed plus one Track maintainer is also there for in three shifts. (Total 3 staff).

But, study team recommends two staff for managing store one in day and another in night.

For store activity 582 mandays is allowed which is equal to two staff.

3.13 **The total requirement for 'M' activities is as follows**

Sl. No.	Activity	Man days required
1	Monsoon patrolling	1348
2	Hot/Cold weather patrolling	--
3	Watching vulnerable location	456
4	Gate keeping	14841
5	RG for Key man	873
6	Water man	---
7	Store watch man	582
Total		18100

3.14 **'S' activities**

S1) Tunnel Maintenance- **No mandays is arrived in TRMS.**

S2) Bridge sub structure maintenance- **106 mandays arrived in TRMS**
But, bridge sub structure maintained by bridge staff. So, No mandays required.

S3) Long girder bridge maintenance – **No mandays is arrived in TRMS**

S4) Extra very sharp curve – **No mandays is arrived in TRMS**

S5) Extremely bad formation – 2910 mandays i.e 10 men arrived in TRMS.

But, bad formations already exists are regularly attended by Trackmachines.

But, Extremely bad formation is a critical task for Engineering Department which helps in smooth running of Rolling stocks. There are improved methods and Machines are available so as to minimize the burden and to be more effective than manual work.

It would be effective if the Track Machine with the support of Trackmen carries out the activity. Moreover, this activity requires strenuous work and tools and equipments if done manually which costs more comparing to mechanized.

It is recommended to utilize mechanized process whenever possible for this activity and duly considering future conditions to support the activity
2910 Mandays i-e 10 men allowed.

S6) Look out man duties-967 man days arrived in TRMS .Not required

S7) Fog signal - No man days is arrived in TRMS

S8) **Filth removal** -No man days arrived in TRMS-

S9) **Security Patrolling.- 90 man days is arrived in TRMS-allowed**

3.15 **The man days for all other 'S' activities are found justified.**

Sl. No.	Activity	Man days required
1	Tunnel maintenance	00
2	Bridge sub structure maintenance	00
3	Long girder bridge maintenance	00
4	Extra very sharp curves	00
5	Extremely bad formation	2910
6	Lookout man duties	00
7	Fog signal attention	00
8	Filth removal	00
9	Security patrolling	90
Total man days		3000

Sum of the man days of T,R,M,S.

Sl. No.	Activity	Man days required
1	'T'	3200
2	'R'	6000
3	'M'	18100
4	'S'	3000
Total man days		30300

3.16 **Requirement of Gang mate and Key men**

15 Gang sections are available at SSE/P. Way/VPT. Each gang section is supervised by one P. Way gang mate, allotted with one Key man. Hence, 15 Gang mates and 15 Key men are allowed on need base.

RG for Key man is already arrived in TRMS calculation

Total = 30 men (15 gang mate + 15 key man)

3.17 **Requirement of Track maintainers:**

The Sum of TRMS as per study team is for SSE/PWay/VPT depot is
 $30300/291=104$

No.of Mates & Key men	= 30	
Total	= 104+30	= 134 MEN
LR	= $\frac{12.5}{100} \times 134$	
LR		= 16.75 say 17
TOTAL	= 134+17	= 151

3.18 **Requirement of Trolley Man**

There are 4 trolleys(motor Trolly 1 , push Trolly 3) available with the SSE/PWAY/VPT to carry out the regular track inspection and other track related activities. The trolley inspection details for the last one year 2018-2019 is given as,

SSE/P.Way/VPT(INCHARGE)	= 48 days
SSE/P.Way/ Subsection /MDU-VPT	=24 days
SSE/P.Way/VPT -NLL	=24days.

Altogether it comes around 96 days in a year trolley movement /inspection was carried out. On an average **8 days per month** the movement is carried out.

If the movement is planned by duly coordinating with other supervisors, it will be effectively carried out by one trolley gang of 4 men.

However, duly considering the importance of the trolley inspection, two gang of trolley men is allowed. i.e. **8 men is allowed.**

The idle time of trolley men can be utilized for other track related activities.

Total men required as per calculation by study team

Track maintenance	=151
Trolley inspection	= 8 men
Total	= 159 men

3.19 **Requirement of Artizan Staff activities**

The manpower required for other activities are assessed on need basis is as follows:

Sl. No.	Designation	San.	Act.	Vac.	Req.	Excess
1	Blacksmith Sr.Tech	1	1	0	1	0
2	Blacksmith I	1	1	0	1	0
3	Blacksmith II	1	0	1	1	0
4.	Blacksmith III	2	2	0	1	1
5	Welder	1	0	1	1	0
6	PainterGr-I	1	0	1	1	0
7	Painter Helper	1	1	0	1	0
8	Techniciam-III(STM)	1	0	1	1	0
Total		9	5	4	8	1

3.20 **Requirement of Supervisors & clerks**

At present 2 SSEs and 1 JE are working in the section. One SSE looking after over all supervision of the office and other track maintenance work. Another SSE is presently working at Sub section of VPT-MDU and 1 JE is looking after the sub section at VPT-NLL

By duly considering the workload and various activities the existing **2 SSEs and 1 JEs are allowed to continue.**

One O.S/personnel branch, is working in this office to cater the need of Staff and Stores. The same may be allowed.

3.21 **Sanction Vs Requirement (Supervisor & Clerical Staff)**

Sl. No.	Designation	San.	Act.	Vac.	Req.	Surplus
1	SSE	3	2	1	2	1
2.	JE	2	1	1	1	1
3.	MINISTERIAL STAFF OS	1	1	0	1	0
TOTAL		6	4	2	4	2

3.22 **Composite Requirement of SSE/PWAY/VPT**

Category	Sanction	Actual	Requirement	Surplus
Track Maintainer/ GateMan/Gangmate/ Keyman /Trolley Man	195	189	159	36
Artizan Staff	9	5	8	1
SSE	3	2	2	1
JE	2	1	1	1
OS/Personnel	1	1	1	0
Total	210	198	171	39

3.23 **Summary for overall sanction vs Requirement**

SL.No	DESIGNATION	SANCTION	REQUIREMENT	SURPLUS
1	Track maintainer	195	159	36
2	Artizan staff	9	8	1
3	SSE	3	2	1
4	JE	2	1	1
5	Ministerial staff	1	1	0
TOTAL		210	171	39

Recommendation No.1

Twenty six posts of **Track maintainer/IV** in Pay Band Rs.5200-20200 G.P. 1800/-, are found excess to the requirement may be surrendered and credited to the vacancy Bank.

(26 posts)

Recommendation No.2

Five posts of **Track maintainer/III** in Pay Band Rs.5200-20200 G.P. 1900/-, are found excess to the requirement may be surrendered and credited to the vacancy Bank.

(5 posts)

Recommendation No.3

Three posts of **Track maintainer/II** in Pay Band Rs.5200-20200 G.P. 2400/-, are found excess to the requirement may be surrendered and credited to the vacancy Bank.

(3 posts)

Recommendation No.4

Two posts of **Track maintainer/I** in Pay Band Rs.5200-20200 G.P. 2800/-, are found excess to the requirement may be surrendered and credited to the vacancy Bank.

(2 posts)

Recommendation No.5

One vacant post of **Blacksmith - Gr.III** in Pay Band Rs.5200-20200 G.P. 1900/-, is found excess to the requirement may be surrendered and credited to the vacancy Bank.

(1 post)

Recommendation No.6

One vacant posts of **SSE** in Pay Band Rs.9300-34800 G.P.4600/-, is found excess to the requirement may be surrendered and credited to the vacancy Bank.

(1 post)

Recommendation No.7

One vacant post of **JE** in Pay Band Rs.9300-34800 G.P.4200/-, is found excess to the requirement may be surrendered and credited to the vacancy Bank.

(1 post)

TOTAL (39 POSTS)

CHAPTER – IV**4.0 PLANNING BRANCH'S REMARKS ON CO-ORDINATING OFFICER'S VIEWS:-****Co – Ordinating Officer's Views:**

T1 & T2 activities are done by gang staff only. T4 activity, according to the age of welds the attention will be increased. So, T activities require revision.

Planning Branch Remarks:

T1- Normally the works pertaining to T1 are carried out by zonal contract only. Whenever necessity arises, the Department staff will do the work at a while. The study team already allowed 10% of staff for T activities.

T2 – the activities related to T2 may be carried out by the gang staff in the jurisdiction. The study team allowed the existing gang strength. On need base it is sufficient to look after the activities.

T4 – The weld failures during the last 6 years is 9 only i.e. Less than 2 per year. Already welder post is allowed in the study report.

Hence the man days allowed for T activities is justified.

Co – Ordinating Officer's Views:

R - activities is practically most of them are being done by the gang staffs. So revision required.

Planning Branch Remarks:

Even though Some of the activities grouped in the R activity about 75% is not being done by the department staff which is not required like shallow screening and the remaining deed by outsourcing. Hence as described in para no.3.11 the permitted man days of 6000 man days which is equal to 20 staff stands good. Due to various contracts are existing in this jurisdiction , the revision of man days for R activities is not required.

Co – Ordinating Officer's Views:

M2 & M3 activities, it should be included since outsource for Hot/ Cold weather patrolling not possible.

Planning Branch Remarks:

Outsourcing is not recommended in the study report for M2 and M3 activities since the hot / cold weather patrolling is not in practise. i.e the situation not yet arisen (td+20 and td-30) .

Co – Ordinating Officer's Views:

M8 activity, P-way section is having more store materials in open stores. So, 3 staff are required in round the clock.

Planning Branch Remarks :

Store watch man duty is not involved continuously .Hence, two staff allowed in the work study report may be booked in EI roster. Moreover, store is situated in the SSE/PWAY/VPT depot where in other staff are available in day hours, also the station RPF security is available round the clock.

Hence, two staff allowed in the report is justified.

Co – Ordinating Officer's Views:

S2 & S3 activities, bridge substructures are not maintained by bridge staffs. So, revision is must.

Planning Branch Remarks :

Outsourcing is not recommended **Agreed to.**

As reiterated by Coordinating Officer, For S2 activity(bridge sub structure maintenance) 106 man days arrived in TRMS is allowed i.e 1 staff.

S3 activity , there is no man days allowed in TRMS calculation stands good.

Co – Ordinating Officer's Views:

In S5 activity 10 men for bad formation is insufficient. Because, practical troubles of weak formation is more than the theoretical calculation. Most of the time the availability of track machine is nil. So ,With the gang staff only the track is attended to run the trains safely.

Planning Branch Remarks:

In TRMS the arrived man power is more than the actual required and utilised in practical. Man days is given fully as per TRMS. Available manpower is to be planned and utilised prudently. Bad formation may be attended by track machines quickly. So, Whenever possible, available track machines are to be utilised properly to maintain the track in good condition.

Co – Ordinating Officer's Views:

S6 activity, lookout man duties required. Because, even though the contract work for JCB machine and other work to secure safety of train lookout man service is required.

Planning Branch Remarks:

Agreed to.

As reiterated by co-ordinating officer and duly considering the safety of train, 967 man days arrived in TRMS is further allowed. i.e 3 staff

Co – Ordinating Officer's Views:

S7 activity fog signal man days are required. Because, staff are nominated to station master for fixing fog signal.

Planning Branch Remarks:

Necessity of Fog signal is not arisen in this case. In addition to that, no Fog signal man days is arrived in TRMS also.. Hence, no man days is allowed.

Co – Ordinating Officer's Views:

S8 activity , filth removal is not attended by gang staff in station premises only. Now a days most of the track lengths are running in residential area. They are dumping debris's in the track. So , extra man power is required to attend the same. So, revision is required for the above activities.

Planning Branch Remarks:

For S8 activity, no extra manpower is required. Each deputed gang section staff can be maintain their working area neat and clean. Dumping debris in track by people of the residential area near by the track are suitably advised and necessary action may be taken.

Co – Ordinating Officer's Views:

Man days calculation casual leave only considered. LAP & LHAP are to be considered.

Planning Branch Remarks:

Kindly refer study report. In 3.16, LR(Leave Reserve) has been given. It is to manage the duties while staff gone on various kind of leave.

Co – Ordinating Officer's Views:

Trolleying is done not only to attend the schedule inspection. But also to work with gangs to work for special work sets. . Regular number of days for trolleying cannot be predicted and trolley man are deputed. So many works other than trolley. So, each SSE/JE required 4 men.

Planning Branch Remarks:
Agreed to.

As reiterated by Coordinating officer, **4 additional men are allowed as trolley men** .Idle time of men on trolley duty, may be utilised for other works .

Co – Ordinating Officer's Views:

Various kind of special works are going on. So, SSE/JEs supervision is very essential separately. So JE/SSEs are nominated for day to day maintenance work. So surrender is not possible

Planning Branch Remarks:

1 SSE Overall incharge, 1 SSE and 1 JE for each sub section is allowed to manage SSE/PWAY/VPT section is justified.

Co – Ordinating Officer's Views:

Blacksmith service is very essential in work study itself is mentioned LC 30 Nos. , Pt & X ing 77 Nos., curve 26 Nos., Bridges 125 Nos.. frequently attentions are required practically to maintain pts., & Xings, SEJs and LCs in this section. So surrendering of Blacksmith is not possible.

Planning Branch Remarks:

As reiterated by C.O., **on need base, one more Blacksmith is allowed** as per sanction.

Co – Ordinating Officer's Views:

Due to the above, surrender of TM 36 posts , Blacksmith Gr III 1 post, SSE 1post, JE 1 post is not possible and requested to fulfil the sanctioned strength to meet out good maintenance of track.

Planning Branch Remarks:

C.O. Views are gone through wholeheartedly and considered the valuable points .

From that, On need base, the following staff are additionally allowed

- 1)For S2 activity-1 staff
- 2)For S6 activity-3 staff
- 3)For Trolley duty-4 staff
- 4)For Artizan work-1 Blacksmith

Total additional staff allowed=9 as per sanctioned strength.

Total surplus staff identified by the work study team= $39-9=30$ staff. The same may be surrendered and credited in to vacancy bank.

So, Revised Recommendations are

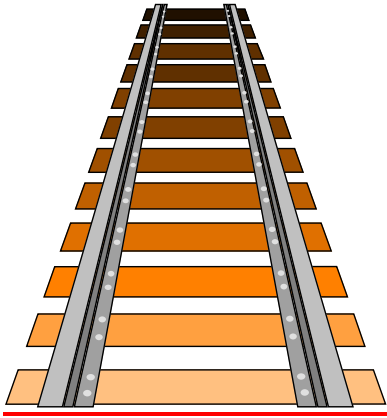
Sl. No	Designation	Sanction	Requirement	Surplus
1	SSE	3	2	1
2	JE	2	1	1
3	Track Maintainer	195	$159+8^*=167$	28
4	Artizan	9	$8+1^*=9$	0
5	Ministerial staff	1	1	0
Total		210	180	30

*Additional staff allowed based on need base after getting Co-ordinating officer's views.

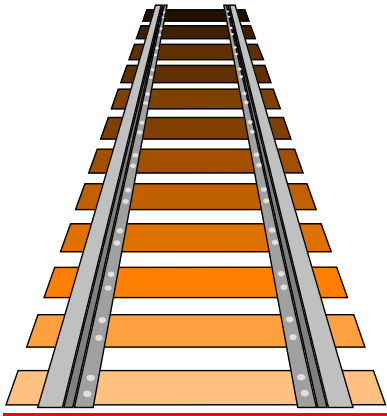
5.0 FINANCIAL SAVINGS

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

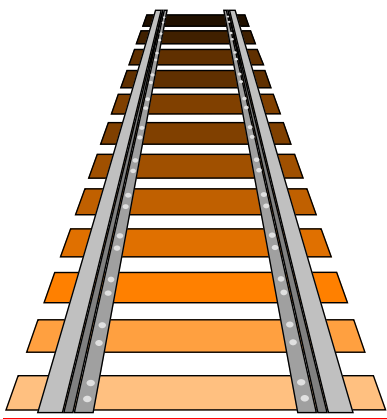
Sl. No.	Category	No.of posts	Grade Pay (Rs.)	Money value (Rs.)	Annual Savings (Rs.)
1	Track maintainer/IV	14	1800	43817	7361256
2	Track maintainer/III	5	1900	48614	2916840
3	Track maintainer/II	5	2400	62361	3741660
4	Track maintainer/I	4	2800	71078	1705872
5	JE	1	4200	86463	1037556
6	SSE	1	4600	109571	1314852
Total		30			18078036



WORK STUDY TO REVIEW THE
STAFF STRENGTH AT
SSE/P.WAY/ VPT
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