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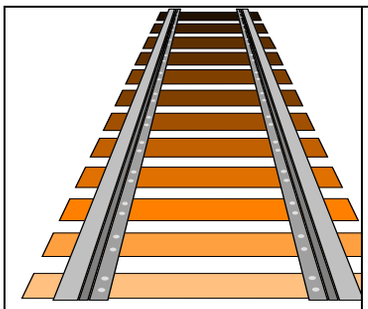

WORK STUDY TO REVIEW THE

STAFF STRENGTH

AT

SSE / P.WAY / PDKT

MADURAI DIVISION

SOUTHERN RAILWAY

PLANNING BRANCH

G. 275 / WSSR-171819 / 2018-19

WORK STUDY TO REVIEW THE STAFF STRENGTH AT SSE / P.WAY / PDKT MADURAI DIVISION

STUDIED BY

WORK STUDY TEAM
OF
PLANNING BRANCH

AUGUST 2018

(i)

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ACKNOWLEDGEMENT

The study team acknowledges the valuable guidance and co-operation given by the co-ordinating officer (ADEN/KKDI) and Co-ordinating Supervisor (SSE/PW/PDKT) which were useful in completing the study in time.

(ii)
AUTHORITY

Annual programme of work studies approved by SDGM/HQ for the year 2018-19.

(iii)
TERMS OF REFERENCE

To review the staff strength at the office of SSE/PW/PDKT– MDU Division

(iv)
METHODOLOGY

1) Collection of data
2) Observation of present system of working.
3) Interaction with ADEN/KKDI and SSE/PW/PDKT.
4) Reassessed the manpower requirement in the light of Konkan Railway system of Track maintenance and also on Need base.

(V)
SUMMARY OF RECOMMENDATIONS

Recommendation :- 31 posts of Track maintainer IV in Pay band Rs.5200-20200/- with Grade Pay Rs.1800/- is found excess to the requirement, the same may be surrendered and credited to the vacancy bank.

(31 posts)

Suggestions for improvement in Cost economy of this unit on the lines of ECKM:

Outsourcing of activities pertains to Gate keeping and Monsoon/Night Patrolling for the following reasons.

In the present changed scenario, women staff is recruited for track maintenance activities leading to under utilization of the existing manpower. They cannot be utilized for either monsoon patrolling or Night patrolling. Even Gate keeping duties in the night hours seems to be difficult to be performed by Track women. As on date, 38 women are working in this unit i.e., 26% of the total men on Roll.

It is to be mentioned at this juncture that some of the divisions of Southern Railway has initiated proposals for outsourcing the same.

Hence, the study suggests for early implementation of outsourcing of the above said activities as is being done in other Railways such as SCR, NEFR etc for effective utilization of the Actual staff of this unit.

CHAPTER – I

1.0 INTRODUCTION

1.1 The Pudukottai district, one of the Princely states of Tamilnadu which holds rich cultural heritage with palaces, fortresses and many other historical monuments is bounded by the Bay of Bengal in the east surrounded by the southern districts of Trichy, Sivagangai, Ramanathapuram and Thanjavur. Many of the villages are of ancient foundations.

Pudukottai rail line dates back to 1929, is one of the major stations of Madurai division of Southern Railway located at a distance of 454 km from Southern Railway Headquarters lies in the TPJ-KKDI-MNM single line BG section. Opening of BG for passenger traffic commenced from 05.01.2007 (TPJ-PDKT) and PDKT – KKDI on 19.05.2007. Madurai division is having a route kilometrage of 1294 out of which 1204 are BG. Total running track kilometers come to 1448.

The study of staff strength at SSE/P.Way/PDKT which comes under Permanent way of Engineering department is one of the areas of 15 activities selected by Indian Railways for Rightsizing its manpower. The Engineering Department is controlled by PCE and Sr.DEN/Co-ord in Zonal and Divisional levels respectively under the overall head of Member/Engineering at the Apex level.

1.2 **Engineering (PW) Branch:** 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 speed, safety and efficient operation of trains. Continuous monitoring and inspection on daily basis is warranted in ensuring a reliable permanent way.

With the introduction of heavy concrete sleeper tracks, the use of Track machines has become inevitable leading to the requirement of gang men confined to routine light maintenance activities. During the last 15 years, Indian Railways have developed a reasonably good force of manpower to operate the track machines and for regular maintenance activities.

The equipments for testing the track have become sophisticated so as to trace all sorts of failures of the track and 60 kg rails are the norm of the day. The interconnections with S&T branch and TRD branch is a new development to be considered during track maintenance. The computerization, the ubiquitous use of various hues of track machines, testing techniques etc., has reduced the manual labour and thereby less man power required for maintenance. Even many of the maintenance activities are now outsourced or are proposed for it.

1.3 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 specialised man power for mechanised operations by matching surrender of trackmen.
- To improve the regular Repairs and maintenance activities of the track through centralized planning as is being done in Konkan Railway.

1.4 VARIOUS TYPES OF TRACK MACHINES :

UNIMAT	-	Used for tamping all plain track including points and crossings.
BCM	-	Used for deep screening of the ballast in the track.
CSM	-	Used for tamping all plain track except points and crossing.
TRT	-	Used to replace the complete track with new rails and Sleepers.
BRM	-	Used to regulate the ballast available in the track.
T-28	-	Used to replace the existing points and crossing portion with new assembled points and crossings.
UTV	-	Used to pick up the released sleeper & rails lying side of the Track and unload the same for further disposal.
DGS	-	Used to consolidate the track.
SBCM	-	Used to clean the ballast in the shoulder area.

1.5 KRCL SYSTEM OF TRACK MAINTENANCE:

As per the system, the Track activities comprises of three-tier maintenance system viz., Top tier (ADEN level), Middle tier (SSE level) and Bottom tier (JE level).

- The activities coming under the Top tier is mainly the works done by Track machines such as UNIMAT, BRM, CSM etc.
- The Middle tier consists of Mobile Maintenance Gangs (MMG) with a jurisdiction of 70-80 Kms under the head of SSE. The main activities include tamping of isolated spots and other Repairs and maintenance.
- The Bottom tier comprises of monitoring activities such as Monsoon patrolling, Security patrolling with a jurisdiction of 35-40 Km under the head of JE.

  Details of workforce along with other data is explained in **Chapter III**.

1.6 An attempt has been made to arrive at the manpower requirement based on the existing workload, deployment of workforce for various activities on the lines of KRCL formula for track maintenance activities. It is to be mentioned that the SSE/P.Way/PDKT unit is one among the six P.Way sections identified by Southern Railway Headquarters to implement the KRCL system of Track maintenance vide CTE's letter No. W.506/14/Track Maintenance dated 29.03.2018.

CHAPTER - II

2.0 PRESENT SCENERIO

2.1 ORGANISATION :

The Engineering department of MDU division is under the control of Sr.DEN/ Co-ord/MDU. The Permanaent Way section of PDKT which is managed by SSE/PDKT is under the direct and general control of ADEN/KKDI and DEN/N/MDU respectively.

2.2 The SSE/P.Way/PDKT section lies in the TPJ-KKDI-MNM Section having a route kilometrage of 83.57 Kms.

The following are the stations in this section

1) Kumaramangalam (KRMG) - 418.080 Km (Block Station)
2) Keeranur (KRUR) - 433.400 Km (Block Station)
3) Vellanur (VEL) - 446.050 Km (Block station)
4) Pudukottai (PDKT) - 457.46 Km (Block Station)
5) Namanasamudram (NMN) - 463.50 Km (Halt Station)
6) Tirumaiyam (TYM) - 473.18 Km (Block Station)
7) Chettinad (CTND) - 482.33 Km (Block Station)
8) Kottaiyur (KTYR) - 487.83 Km (Block Station)

Maximum sectional speed for passenger trains is 90 KMPH and 75 KMPH for Goods trains. The ruling gradient is 1 in 200 and line capacity is 59%. Permanent speed restriction for this section is 60 Kmph on an average. The Traffic density (GMT) is 4.57.

2.3. LC GATES:-

Sl. No.	LC No.	Section/ Km/Class	Train Vehicle Units
1	LC 326	TPJ- KRMG @ 407/2-3 Km –B class	26880
2	LC 327	TPJ-KRMG @ 407/8-9 Km - C class	15890
3	LC 330	TPJ-KRMG @ 409/8-9 - A class	49840
4	LC 332	TPJ-KRMG @ 411/6-7- C class	18200

5	LC 337	TPJ–KRMG @ 415/2-3- C class	4480
6	LC 343	KRMG-KRUR @ 422/2-3 - C class	10220
7	LC 347	KRMG-KRUR @ 426/1-2 - C class	2520
8	LC 349	KRMG-KRUR @ 428/2-3 - B class	28140
9	LC 351	KRMG-KRUR @ 429/3 - Special class	124320
10	LC 353	KRMG-KRUR @ 431/4-5 - C class	1260
11	LC 358	KRUR-VEL @ 437/2-3 – C Class	3892
12	LC 360	KRUR-VEL @ 440/0-1 –C Class	8300
13	LC 361	KRUR-VEL @ 441/7-8 – C Class	4620
14	LC 366	VEL-PDKT @ 447/4-5 – C Class	5054
15	LC 372	VEL-PDKT @ 452/9-453/0 – Special Class	104132
16	LC 376	VEL-PDKT @ 455/8-9 – Special Class	71792
17	LC 384	PDKT-TYM @ 462/4-5 – C Class	2100
18	LC 385	PDKT-TYM @ 463/0-1 – Spl Class	107380
19	LC 386	PDKT-TYM @ 463/7-8 – C Class	5586
20	LC 389	PDKT-TYM @ 467/4-5 – C Class	7840
21	LC 401	TYM-CTND @ 478/2-3 – C Class	672
22	LC 403	TYM-CTND @ 479/7-8 – Special Class	80640
23	LC 407	CTND-KKDI @ 484/1-2 – C Class	9170
24	LC 411	CTND-KKDI @ 489/3-4 – Special class	84336

2.4 **WELDING TECHNIQUES:**

A1 - Air petrol preheating

A2 - Compressed air petrol preheating

A3 - Oxy-LPG preheating

AT - AluminoThermit welding

SKU is one type of Thermit Welding

2.5 WELD / TRACK Failures of SSE/P.Way /PDKT Section:-

Year	Weld Failure
2016 -17	17
2017-18	5

2.6 SANCTION, ACTUAL, VACANCY, EXCESS PARTICULARS:-

The staff strength of SSE/P.Way/PDKT is given in Annexure– 1 as on 20.05.2018.

Sanctioned strength = 190

Actual strength = 147

Net Vacancy = 43

2.7 GANG JURISDICTION:-

Sl. No.	Units	Section/ Km.	Length in mts
1	Unit No.1 (UDP)	Km. 406/795 – 412/500	5705
2	Unit No.2 (KRMG)	Km.412/500 – 418/700	6200
3	Unit No.3 (LC 422)	Km. 418/700 - 425/200	6500
4	Unit No.4 (TNLR)	Km. 425/200- 431/300	6100
5	Unit No. 5 (KRUR)	Km. 431/300 – 437/600	6300
6	Unit No. 6 (NTM)	Km. 437/600 – 443/900	6300
7	Unit No. 7 (VEL)	Km. 443/900 - 450/100	6200
8	Unit No. 8 (LC 455)	Km.450/100 – 456/900	6800
9	Unit No. 9 (PDKT)	Km. 456/900 – 463/100	6200
10	Unit No.10 (NMN)	Km. 463/100 – 469/900	6800
11	Unit No.11 (TYM)	Km. 469/900 – 476/400	6500
12	Unit No. 12 (CTND)	Km. 476/400 – 483/000	6600
13	Unit No. 13 (KTYR)	Km. 483/000 – 489/520	6520

2.8 UTILISATION OF TRACK MAINTAINERS/GANG MATE/KEYMAN/GATE KEEPERS

Unit No.1	16
Unit No.2	8
Unit No.3	9
Unit No.4	10
Unit No. 5	9
Unit No. 6	8
Unit No. 7	4
Unit No. 8	13
Unit No. 9	10
Unit No. 10	9
Unit No. 11	6
Unit No.12	8
Unit No. 13	14
Total	**124**
Others	
Trolleyman	11
Store Watchman	2
Artizans	3
Technician III – STM	2
Ministerial staff	0
SSE/JE	4
Colony gangman	1
Grand Total	**147**

2.9 The number of available track maintainers is 137 as against the sanction of 180. The available artisans is 5 against 5 (Including Technician/STM). Overall sanction of this unit including all categories is 190 out of which the Actual is 147 leaving behind a vacancy of 43 posts.

2.10 **REGULAR DUTIES OF TRACK MAINTENANCE:**

Through packing

1. Shallow screening
2. Picking of slacks
3. Lubrication of Rail joints
4. Minor attention to cess
5. Clearing of catch water drains, side drains
6. Water ways of bridges
7. Casual renewal of Rails
8. Casual renewal of Sleepers
9. Opening & Examining and Overhauling of LC gates
10. Attention to Points & Crossings
11. Misc. items like renewal of bridge timbers.

2.11 **OTHER DUTIES:**

1. Loading and unloading of materials
2. Lorrying out of materials
3. Monsoon Patrol
4. Security Patrol
5. Repair of Bridges
6. Clearing of Goodshed Platforms
7. Stock verification
8. Repair of ash pits, water columns, CC aprons, etc.
9. Painting of Rails in station yards and elsewhere
10. Deep screening
11. Resurfacing of Points and Crossings
12. Watching of materials
13. Painting of Bridges
14. Heavy repairs to track including lifting
15. Complete renewal of Points & Crossings
16. Complete realignment of curves

2.12 As per executive summary of the said MCNTM report para 0.13, 12.5 % LR is allowed for all non-supervisory and non-secretarial category staff. The Rational formula covers all activities as per para 0.14 of the report.

As per para 0.20 Annual Review of gang strength is to be conducted on every 1st of April continuously. IRICEN will be custodian of software for calculating man power.

EMKM (Equated Man power Kilometre) will replace ETKM (Equated Track Kilometre) as performance unit.

Equated Cost Kilometre (ECKM) can be evolved as performance unit in future.

EMKM is defined as numerically equal to 0.6 times of the number of track men required for the section for all the activities T, R, M & S as per rational formula.

2.13 **TRACK MAINTENANCE ACTIVITIES**

The whole activities connected to Track Maintenance are clubbed under four main categories under CMCNTM studies. They are:

a) Activity 'T' - Affected by Traffic Density

b) Activity 'R' – Routine but not affected by Traffic Density

c) Activity 'M' – Miscellaneous

d) Activity 'S' - Site specific

2.14 **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 regauging

T_4 - Repair Welding

2.15 **ACTIVITY 'R'** – Routine but Not affected by Traffic Density

R_1 - Lubrication of ERCs

R_2 - Shallow screening

R_3 - Loading, Leading, 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 runover cases

R_9 - Bridge, Sleeper attention & Renewal

R_{10} - Pre-monsoon attention such as clearing of drains and Water ways, 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.

2.16 **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 watch man duty

2.17 **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 **The number of running lines of the stations in this section is as follows:-**

Kumaramangalam (KRMG)	-	3 lines
Keeranur (KRUR)	-	3 lines
Vellanur (VEL)	-	3 lines
Pudukkotai (PDKT)	-	4 lines
Tirumaiyam (TYM)	-	3 lines
Chettinad (CTND)	-	4 lines
Kottaiyur (KTYR)	-	3 lines

2.19 **Other particulars of the section**

Max. Axle load		- 21.5 for Diesel loco 22.86 for BHS wagons 20.32 for all wagons
Traffic density	-	04.57
Points and crossings	-	56 Nos.
Number/Length of LWR	-	14/80.381 Km

Major bridges	-	6 Nos.
Minor bridges	-	267 Nos.
ROB/RUB/FOB	-	6 Nos.
RKM	-	83.57 Kms
Total TKM	-	97.55 Kms
ETKM	-	102.95 Kms
Monsoon Patrolling	-	October 15th to December 15th
Push trolleys	-	3 Nos.
Ruling gradient	-	1 in 200
Curves	-	25 Nos.
Length of curves	-	13.65 Kms

2.20 **TRACK PARTICULARS:-**

The running line track is 52 kg- 90 UTS rails with PSC sleepers of density M+7.

2.21 **DUTY HOURS:**

The normal working hours of the gang staff is 7.00 to 12.00 hrs and 14.30 to 17.30 hrs.

2.22 Out of the 180 gang staff, 38 are Track women and extraction of work is limited. They cannot be utilised for monsoon patrolling, key man duty and other works done with heavy tools, leading to under utilisation of Track women. The study is of opinion and suggests minimising the intake of women in the Permanent Way duties and other similar duties like Signalling and Electrical so that optimum utilization of the existing manpower can be achieved.

2.23 Likewise, LCs are maintained by both Engineering and Traffic department. The Study is of the opinion that it can be manned by Traffic department as the LCs within the station limit should be under the control of SMs.

2.24 The mid station LCs can also be handed over to Traffic department under the Traffic Inspector concerned. It may be justifiable for the following reasons.

- The nature of duties performed by Gatemen manned by Traffic and Engineering is one and the same ie., Train Passing duty and in no way concerned with the track maintenance work.
- The Bench marking figures issued by E& R Directorate of Railway Board doesn`t include Gatemen for the manpower to be arrived on the basis of Equated Track Kilometer (ETKM), instead shown separately.

CHAPTER – III

3.0 CRITICAL ANALYSIS

3.1 The laying and maintenance of P.Way is a laborious task right from survey, sanction of funds, acquisition of land, construction through undulated and difficult terrains of mountains, rivers, ravines etc. Bridges, tunnels cuttings, gradients, curves, draining of water etc., pose big challenges not only for construction but also for maintenance.

3.2 Engineering Branch in Indian Railways has progressed by leaps and bounds from the time of Clark and Robert Stephenson. Bridges and tunnels running to a length of even 7 kilometers and 350m height, underground track running for long stretches etc., has become the order of the day. The gruesome manual maintenance of the track has given way to highly mechanized maintenance practices.

3.3 Such mechanization 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.,

3.4 PUSH TROLLEY

Three push trolleys are available with SSE/PW/PDKT. The movement of these trolleys is 21 days/month on an average. Trolleys can work without block protection during day, view clear and they require 4 persons.

As IRPWM Rule No.124, the PWI shall inspect the entire section by push trolley at least once in a fortnight or more often as necessary. The corridor block line is about 03.00 hrs for TPJ – PDKT UP lines and about 02.00 hours for Down line, whereas it is about 3 hours for PDKT-KKDI line.

3.5 TRACKMACHINE UTILISATION

UNIMAT, CSM, WST and MPT have worked in this section during the last three years.

UNIMAT	-	50 days
MPT	-	4 days
CSM	-	62 days
WST	-	5 days

The very idea of enhanced mechanization of track maintenance was to achieve cost economy and enhanced safety. And surely the savings of staff cost is the main factor in achieving cost economy.

3.6 SOME REFERENCES FROM MCNTM REPORT 2000

(a) The MCNTM Committee recommends that the effort to improved rail welds should receive adequate thought and that a review should made after 5 years from now, so as to avoid reduction factors to be applied for the yard stick of man power requirement for SWR/LWR track (Para 0.4).

(b) Rational formula can be amended easily by recasting the relevant tables. The Committee recommends that the Rational Formula can be reviewed once in five years and amended (Para 0.8 & 4.15)

(c) Possible man power savings by deploying on track tampers for machine hacking on BG

(d) The Pilot study has given confidence that the implementation of Rationalised formula will only result in savings in manpower and expenditure, at the same time ensuring equitable distribution of manpower in accordance with workload (Para 9.5 to 9.7 of MCNTM)

(e) As and when modernisation in various sub-activities progresses, some of the sub-activities may reduce in part or vanish, or these many require less man power (Para 4.13 of MCNTM).

(f) The Committee recommended the Railway Board may order review of the Rational formula once in 5 years to incorporate the effects of modernisation, such as introduction of more number of shoulder ballast cleaners, improving Rail weld technology, maintenance free level crossing track structures etc. (para 4.15 of MCNTM).

(g) **Hot Weather patrolling**

In zones of less temperature variation and in the case of track structure with adequate lateral strength, hot weather patrolling can be dispersed with as decided by CTE (Para 6.2.2 of MCNTM).

(h) **Cold weather patrolling**

CTE should authorise the need for this activity (Para 6.2.3 of MCNTM).

(i) **Gate keepers**

Only RG need be given from Trackman (para 6.2.5 of MCNTM).

3.7 The MCNTM Committee had not differentiated the requirements for SWR and LWR due to the problems then experienced in SEJ (Switch Expansion Joints) on account of poor welding technology. But the situation has now improved, and a distinction is warranted now between SW & LW track.

3.8 **MCNTM & TRMS FORMULA**

The report of MCNTM & TRMS Formula will convince us the need for rightsizing the manpower for track maintenance. It should be kept in mind that the very TRMS formula was evolved by studying the conditions existed during 1996 – 2000 period ie., when the mechanization was only in the nascent or experimental stage and when a good portion of the lines were in MG. Though the report was accepted in 2006 only, the basic points in the report are drawn from the above period.

3.9 INFERENCES :

a) The TRMS formula was approved in 2006 and it should have been implemented everywhere now.

b) The TRMS formula itself is 16 years old and requires periodical review.

c) The CMCNTM REPORT itself calls for annual review of staff strength based on the progressive mechanization and new technologies.

d) The very discarding of basic unit of the ETKM (Equated Track Kilometer) and the replacement of the same by Equated Manpower Kilometer (EMKM) and suggestions to transform it on Equated Cost Kilometer (ECKM) underscores the stress on manpower economy and cost economy in this field. So the work study is supposed to exercise a review on the TRMS formulae itself.

e) The CMCNTM report had recommended many activities for outsourcing which is not implemented fully. And in certain areas, the technology and practices are developed beyond the MCNTM Report period. So the proposal for outsourcing has a great relevance in this study.

3.10 EXTERNAL FACTORS

Certain external factors have also got a bearing on the manpower requirements especially under R, M & S activities, they are –

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.

3.11 ARTISANS CATEGORY:

Category	Sanction	Actual	Vacancy
Blacksmith	2	2	0
Painter	1	1	0
Fitter (STM)	2	2	0
Total	**5**	**5**	**0**

The number of Artizans is 5 and the same can be retained as such.

3.12. **MANDAYS T&R FOR TRACKMEN :**

Under `T` activity, almost all the activities has already been carried out by the Track machines. Reduction of 50% from the total mandays is inevitable.

Under `R` activity, more than half of the activities have been outsourced. Hence a reduction of 50% of the total man-days given in the TRMS Sheet can be taken into account.

Further, under `M` activity, the man days for waterman is given as 3822. In the present changing scenario, this duty is no longer in existence anywhere in Southern Railway. Hence the man days allotted for waterman duty seems to be excess, the same has to be deducted from the total man days.

3.13 **Coming to the conclusion, the revised man days and requirement is as per MCNTM formula:**

Man days for `T`activity	=	5367.78
Man days for `R`activity	=	6643.81
Man days for `M`activity	=	6404.00
Man days for `S`activity	=	5723.05
Total Man days	**=**	**23971.80 or say 23972.00**

Number of working days = 291

Number of men required for track related duties = 23972/291 = 83
LR @ 12.5% for 83 is 10 = 93
Number of Gatemen required (Incl of LR @12.5%) = 60
Total = 153

Requirement Vs Surplus as per MCNTM formula:

Sl. No.	Category	Sanction	Actual	Requirement including LR	Surplus
1	Track maintainers	180	137	153	27
2	Artizans	5	5	5	0
3	SSE/JE	3	4	4	0

4	Ch.OS/PB	1	0	1	0
5	Ch.OS/W	1	0	1	0
6	Colony gangman	0	1	0	-1
	Total	**190**	**147**	**164**	**26**

3.14 **Calculation as per the KRCL Formula:**

Since the section is already on the process of implementation of KRCL system of Track maintenance, the study team also adopts the same to arrive at the manpower requirement.

Before coming to the requirement, it is necessary to elaborate the deployment of workforce as per the Konkan Railway System.

- The middle tier consists of one Maintenance Gang (MMG) with a Rail mounted vehicle headed by a JE/MMG which moves over a jurisdiction of 70-80 Km. The ***MMG comprises of 6 Multi Skilled Men (MSM) and 4 Trackmen***.

- The Bottom tier consists of sectional gang which carries out maintenance works for a track length of 35-40 Km with ***gang strength of 12 Trackmen*** with Pick up van mounted with all types of tools.

- One Keyman (Track Safety Man) for each beat comprises of 6-7 Kms.
- One Gangmate for each section.
- Gate Keepers according to the total number and classification of LC gates.
- One Store Watchman as per the number of depots available.

Summary:

- Number of gangs are reduced to two sectional gangs, thereby maintenance activities are carried out through centralized planning.
- Reduced manpower leading to cost reduction.

- Improved transportation of P.Way materials to the site.
- Mobile Maintenance gang is recommended for all lines having traffic density 10 to 12 GMT.

3.15 **Based on the above, the requirement of manpower for PDKT unit is arrived as follows:**

Sl. No	Category	Middle Tier	Bottom Tier		Common	RG	LR	Total
			Sub-section I(KRUR)	**Sub-section II(PDKT)**				
1	SSE (IC)	1	-	-	-	-	-	1
2	JE/SSE (TMMG)		1	1	-			2
3	Motor Trolley man	1	-	-	-			1
4	Technical OA	2	-	-	-			2
5	Store Watchman	-	-	-	2			2
6	Mobile Maintenance Gang							
	i) JE/MMG	1	-	-	-			1
	ii) Multi Skilled men	6	-	-	-			6
	iii) Trackmen	4	-	-	-			4
7	Additional JE (Sub-section)	-	-	-	-			0
8	Mate	-	1	1	-			2
9	Track Safety men (TSM)	-	7	6	-			13
10	Trackmen	-	12	12	-			24
Total Requirement (Excl. Gate keeping & Night Patrolling) as per KRCL								**58**

In addition to this, the manpower required for Gate keeping & Night Patrolling is as follows:

Number of Engineering Gates - 23 Nos. (Spl & A class-7; B & C class - 16)

Requirement of Gate keepers - 60 staff (7 x 3 = 21 +16 x 2 =32 +LR @ 12.5% = 7) So, 21+ 32+7= 60

Requirement of Night Patrol men - 41 staff (includes Monsoon / Security / Hot & cold weather)

Requirement of Track maintainers as per KRCL - 58 staff

Total requirement of staff for PDKT unit -159 staff

Overall Sanction Vs Requirement:

Sanction	Actual	Requirement	Surplus
190	147	159	31

Recommendation - 31 posts of Track maintainer IV in Pay band Rs.5200-20200/- with Grade Pay Rs.1800/- is found excess to the requirement and the same may be surrendered and credited to the vacancy bank.

(31 posts)

CHAPTER – IV

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

The Co-ordinating Officer`s views were received through E-mail (ssepwaypdkt@gmail.com) on 23.08.2018 duly adding his comments on the suggestion given by the work study team on outsourcing the activities of gate keeping and night patrolling for various reasons furnished in the Summary of Recommendations as " **there is no maintenance cost involved on outsourcing during natural calamity and natural disaster in `M` activities of Track maintenance for which special arrangements is to be provided apart from the above recommendations".**

The remarks of the Co-ordinating Officer is agreed to. .Also there is no remark from the Co-ordinating Officer in the number of posts identified as surplus as shown in Summary of recommendations incorporated in the Draft Work Study report.

Hence the Final Work study Report is released without any revision.

CHAPTER – V

5.0 FINANCIAL SAVINGS

5.1 If the recommendations made in the study report are implemented, the annual recurring financial savings as per VII PC will be as follows:

Sl. No.	Category	Grade pay	No. of posts	Money Value	Annual Financial savings
1	Track Maintainer Gr IV	1800	31	40072	1,49,06,784

ANNEXURE – I

SCALE CHECK OF SSE/P.Way/PDKT SECTION AS ON 31.05.2018

Sl. No	Category	Grade Pay (Rs.)	Sanction	Actual	Vacancy
1	SSE/PW/PDKT	4600	1	3	-2
2	JE/PW/PDKT	4200	2	1	1
3	Ch.OS/Works	1900	1	0	1
4	Ch.OS/PB	1900	1	0	1
5	Painter Gr I	2800	1	1	0
6	Blacksmith Gr.II	2400	1	1	0
8	Blacksmith Helper	1800	1	1	0
9	Tech III/STM	1900	2	2	0
10	Track Maintener I	2800	11	10	1
11	Track Maintainer II	2400	22	20	2
12	Track Maintainer III	1900	40	24	16
13	Track Maintainer IV	1800	107	61	46
14	Trainee TM IV	-	0	4	-4
15	Substitute TM IV	1800	0	18	-18
16	Colony gangman	1800	0	1	-1
TOTAL			**190**	**147**	**43**

ANNEXURE - II

ACTIVITIES RECOMMENDED FOR OUTSOURCING BY RATIONAL FORMULA.

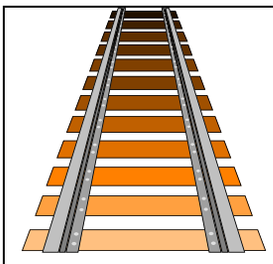
(MCNTM COMMITTEE 2000) AND APPROVED BY RAILWAY BOARD VIDE No.95/CE-1/GNS/2 Vol.11 Pt.11 dated 03/06.03.2006.

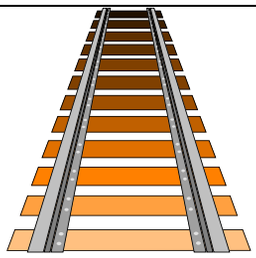
1. Formation of treatment Works.
2. Collection of ballast, training out ballast by material train leading ballast from stack to track, insertion of ballast in track.
3. Deep screening of the ballast in track, carried out manually oh by deploying BCM in which case man power is provided by the contractor.
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 fosterers.
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 in 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 Engineering/Mechanical/Electrical and S & T depts.

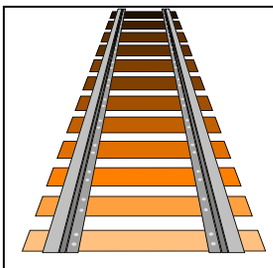
ANNEXURE –III

LIST OF ABBREVIATIONS USED IN THE REPORT

ABBREVIATION	EXPANSION
BRM	Ballast Regulating Machine
CMCNTM	Committee on Manpower and Cost Norms for Track Maintenance
CMMDTM	Committee for Machine and Manpower Deployment For Track Maintenance.
CTR	Complete Track Renewal
DTS	Dynamic Track Stabilizer
DUO	Duomatic Machine
ECKM	Equated Cost Kilometer
EMKM	Equated Manpower Kilometer
ERC	Elastic Rail Clips
ETKM	Equated Track Kilometer
FBW	Flash Butt Welding
GMT	Gross Million Tonne
IRICEN	Indian Railways Institute of Civil Engineering
IRPWM	Indian Railways Permanent Way Manual
LWR	Long Welded Rails
MCNTM	Manpower and Cost Norms for Track Maintenance
MMU	Mechanised Maintenance Unit
NRYL	Non-Running Yard Line
PET	Physical Endurance Test
PRC	Pre-stressed Reinforced Concrete
RYL	Running Yard Line
SBCM	Shoulder Ballast Cleaning Machine
SEJ	Switch Expansion Joint
SWR	Short Welded Rails
TRT	Track Relaying Train
TSR	Through Sleeper Renewal
UNIMAT	Universal Tamping Machine
USFD	Ultra Sonic Flaw Detection
UTV	Utility Track Vehicle

	**No. G.275/WSSR - 171819 / 2018-19** **WORK STUDY TO REVIEW THE STAFF STRENGTH AT SSE / P.WAY / PDKT MADURAI DIVISION**

	**No. G.275/WSSR - 171819/ 2018-19** **WORK STUDY TO REVIEW THE STAFF STRENGTH AT SSE / P.WAY / PDKT MADURAI DIVISION**

	**No. G.275/WSSR - 171819 / 2018-19** **WORK STUDY TO REVIEW THE STAFF STRENGTH AT SSE / P.WAY / PDKT MADURAI DIVISION**