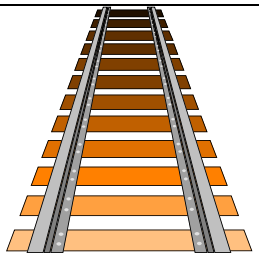
No. G.275/WSSR - 191920 / 2019-20

	**WORK STUDY TO REVIEW THE STAFF STRENGTH AT SSE / P.WAY // AJJ CHENNAI DIVISION**

SOUTHERN RAILWAY

PLANNING BRANCH

G. 275 / WSSR-191920 / 2019-20

WORK STUDY TO REVIEW THE STAFF STRENGTH AT SSE / P.WAY / AJJ CHENNAI DIVISION

STUDIED BY

WORK STUDY TEAM
OF
PLANNING BRANCH

FEBRUARY 2020

(i)

INDEX

(i)

ACKNOWLEDGEMENT

The study team acknowledges the valuable guidance and co-operation given by the co-ordinating officer (ADEN/AJJ) and Co-ordinating Supervisor (SSE/PW/AJJ) for completing the study in time.

(ii)
AUTHORITY

Annual programme of work studies approved by SDGM/HQ for the year 2019-20.

(iii)
TERMS OF REFERENCE

To review the staff strength at the office of SSE/PW/AJJ– MAS Division

(iv)
METHODOLOGY

1) Collection of data
2) Observation of present system of working.
3) Interaction with ADEN/AJJ and SSE/PW/AJJ.
4) Reassessed the manpower requirement in the light of TRMS formula of CMCNTM and Need base.

(V)

SUMMARY OF RECOMMENDATIONS

Recommendation:-

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

(16 posts)

Sl. No.	Category	Grade pay/Level	No. of posts	Money Value	Annual Financial savings
1	JE/PWay	4200/6	1	86463	1037556
2	Blacksmith Tech III	1900/2	1	48614	583368
3	Track Maintainer Gr IV	1800/1	14	43817	7361256
TOTAL			**16**		**89,82,180**

CHAPTER – I

1.0 INTRODUCTION

1.1 Engineering Department performs "Ways" and "Works" functions. The "Ways" functions viz., track maintenance which forms a major activity of Railways. The gang men who perform this duty constitute a major portion of Engineering Department. The strength of gang men is entirely governed by the gang strength norms prescribed. Any change in executing the norms may have significant effect on the number of staff with corresponding financial implications.

Now-a-days the zonal administration has been giving instructions to explore the feasibility in the sections of their respective divisions for implementing KRCL system of Track maintenance. i.e, those sections which are having traffic density below 10 GMT and are Single/branch line in order to improve the cost economy on the lines of ECKM (Equated Cost per Kilometer).

1.2 In the early days of company railways and State railways, the gang strength of permanent way was calculated in various ways. In 1931, Mifflin formula was first introduced. Then in 1959, Lobo Committee appointed by Railway Board brought "Modified Maflin Formula". But due to some inbuilt contradictions, this was not implemented. Again two more committees appointed in 1971, 1972 had not seen the light of the day at all. The special committee formula of 1976 was implemented in 1979. But this special committee covered only 12 activities and other activities were carried by contract/casual labourers. So no uniformity was adopted in arriving at the gang strength of P.Way. This resulted in undue absorption of casual labourers into railways due to various judicial judgments and consequently the expenditure increased.

1.3 In all above formulae, ETKM was adopted as the basic input. ETKM is the transformed physical length of track, to represent the work measure by attributing certain weightage to the parameters which control the maintenance requirement of P.Way. Some of the parameters are :

i) Traffic density
ii) Rainfall.
iii) Curves.
iv) Formation of track.

Some of the parameters which were not taken care by above formula includes :

i) Monsoon patrollings.
ii) Increased Mechanisation.
iii) Security patrolling.
iv) Attending SEJs
v) Increased use of PSC sleeper and hence financial strains varied from railway to railway.

1.4 In the last formula (special committee formula), equated track kilometer is used as the performance unit for matching the manpower or the expenditure against the revenue activity of track maintenance.

In the pre-modernisation area, ETKM would have served the purpose with accuracy. Maintenance cost and ETKM were defined to be proportional to each other.

As track modernization is spreading over the part of system, the manpower/ETKM was reduced as per the correction factor K for the modernized length of the track, whereas corresponding ETKM remains unchanged. Thus the linearity between gross manpower and gross ETKM got vitiated. Thus ETKM has lost its relevance as the performance unit.

1.5 In order to cover all aspects of maintenance of P.Way, Railway Board started adopting a new procedure based on a new formula to calculate gang strength. Over the years there have been tremendous changes in maintenance of P.Way and also recruitment of gangmen.

The new formula was initially called Committee on Manpower and cost norms for manpower (MCNTM) and the long name was changed as the formula adopted was called as rational formula, to convey the meaning that the gang strength of P.Way can be calculated on rational basis. The formula was approved by Railway Board on 06.03.2006.

1.6 The new formula is adopted in various railways to have a uniform pattern in assessing gang strength of P.way in sections.

1.7 **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.

1.8 With the introduction of heavy concrete sleeper tracks, the use of Track machines has become inevitable leading to the requirement of gangmen 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. 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 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.

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 overall financial position of the Railways and to evolve standardized cost norms.

1.9 VARIOUS TYPES OF TRACK MACHINES IN VOGUE :

UNIMAT/DUOMAT -Used for tamping all plain track including points and crossings (Once in two years)

BCM	-	Used for deep screening of the ballast in the track (Once in 10 years)
CSM	-	Used for tamping all plain track excerpt 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.
DTS	-	Used to consolidate the track.
SBCM	-	Used to clean the ballast in the shoulder area.

1.10 KRCL SYSTEM OF TRACK MAINTENANCE:

Now-a days, it is recommended to implement the method of Track maintenance followed by KRCL i.e., Centralised Mobile Maintenance gang system having all lines which are below traffic density of 12 GMT.

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.

1.11 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 TRMS calculations and need base.

CHAPTER - II

2.0 PRESENT SCENERIO

2.1 ORGANISATION :

The Engineering department of MAS division is under the control of Sr.DEN/ Co-ord/MAS. The PW section of AJJ which is managed by SSE/AJJ is under the direct and general control of ADEN/AJJ and Sr.DEN/West/MAS respectively.

2.2 The SSE/P.Way/AJJ section lies in MAS-JTJ section comprising of AJJ Yard, MLPM Yard, EWS/AJJ, ELS/AJJ and FBW/AJJ.

2.3 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

The total failures during 2017-2018 & 2018-19 is 10, out of which 4 are Weld failures and 6 are Rail failures.

2.4 SANCTION, ACTUAL, VACANCY, EXCESS PARTICULARS:-

The staff strength of SSE/P.Way/AJJ is given in Annexure– 1.

Sanctioned strength	=	162
Actual strength	=	109
Vacancy	=	66
Excess	=	13
Net Vacancy	=	53

2.5 GANG JURISDICTION:-

Unit	Gang No./Location	Section/ Km.
1	Gang No.1 & 2 - East Yard	Km. 67/000-67/800 AJJ-JTJ Up Fast, Dn Fast & Up slow, Dn slow & ELS/AJJ all lines.
		67/800-69/000 AJJ-JTJ Up & Dn, MRV siding and OHE siding
2	Gang No.3 & 4 - Near YM office	67/19 (III line)-68/25 RU line (Rd 3,4,5,6,7,8,9 &10 of AJJ yard)
		68/25-69/000 (Ru line), North yard (Rd 1 -2), South Yard (Rd 1 –Rd 4), EWS All lines, Sick lines.
3	Gang No. 5 & 6 - Near RPF office	65/200-67/300, CGL-AJJ 68/12 (Rd 1A)-67/300 (Rd 1A) AJJ Yard.
		Rd. 10, Rd 11, AJJ Yard FBW/AJJ All lines (Rd 1 to Rd 6)
4	Gang No. 7 & 8 - Km 70/000	69/000 – 70/000 SWL Up & Dn, GL 3 AJJ yard
		70/000-71/500 (Ru line) Up & Dn GL 4 AJJ yard
5	Gang No. 9 & 10 - MLPM yard	Bye Pass line Up & Dn (MLPM- AJJ`N`); (AJJ`N`-MLPM)
		71/100-72/500 AJJ-JTJ Up & Dn line, MLPM yard Rd 1 to 6

2.6 UTILISATION OF TRACK MAINTAINERS/TRACKMATE/KEYMAN/GATE KEEPERS/ARTIZANS

Gang No.1 & 2	12
Gang No.3 & 4	13
Gang No.5 & 6	11
Gang No. 7 & 8	9

Gang No. 9 & 10	11
Ladies Gang	10
Gate Keeper	3
Trolleyman	7
Artizans	8
Store watchman & Office purpose	10
USFD	1
DSK	2
Sr. DEN/Co-ord/O/MAS	3
Long Absent	2
TOTAL	102
Supervisory SSE/JE	**7**
Grand Total	**109**

2.7 The number of available track maintainers is 102 as against the sanction of 147. The available artisans is 5 against 8. Overall sanction of this unit including all categories is 162 out of which the Actual is 109 leaving behind a vacancy of 53 posts.

2.8 **REGULAR DUTIES OF TRACK MAINTENANCE:**

- Through packing
- Shallow screening
- Picking of slacks
- Lubrication of Rail joints
- Minor attention to cess
- Clearing of catch water drains, side drains
- Water ways of bridges
- Casual renewal of Rails
- Casual renewal of Sleepers
- Opening & Examining and Overhauling of LC gates
- Attention to Points & Crossings
- Misc. items like renewal of bridge timbers.

2.9 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

2.10 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.

2.11 TRACK MAINTENANCE ACTIVITIES

The activities of Track Maintenance are categorised as follows.

I Primary Maintenance activities which are directly related to P.Way maintenance requiring manpower based on continuous length of track, further classified as follows.

Activities `T` (Affected by Traffic density) aimed at achieving safety and acceptable running quality, in commensurate with the loads and speeds carried.

Activities `R` (Unaffected by Traffic density) for maintaining the track, formation and other integrated assets, which are of routine nature, but quite important for operation and for achieving reliability and long life assets.

II Auxillary Maintenance activities to upkeep the P.Way section in operational condition needing manpower based on localised problems, special features and geographical nature of the section.

Activities `M` (Miscellaneous) related to requirement of man days based on the quantum of work arising in the P.Way section on universally adoptable method.

Activity `S` (Site specific) generally based on past experience and the quantum of work varies from location to location depending upon Site-specific features of the section.

2.12 **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	

2.13 **ACTIVITY 'R'** – 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.

2.14 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

2.15 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

2.16 Other particulars of the section

Max. Axle load (AJJ-RU) - 22.30 (Elec Locos)

- 21.50 (Dsl Locos)

- 22.86 (BHS Wagons)

- 20.32 (All Wagons)

Traffic density (AJJ-RU) - 28.55/20.78

Points and crossings - 190 No.

Number of curves	-	14 Nos.
Major bridges	-	4 No.
Minor bridges	-	76 No.
Track	-	71.3 Kms
Monsoon Patrolling	-	1st October to 30th November
No. of LWR/Length	-	4.2 Kms
Minimum Rail Temperature	-	21
Maximum Rail Temperature	-	42

2.17 **DUTY HOURS:**

The normal working hours of the gang staff is 7.00 to 12.00 hrs and 14.00 to 17.00 hrs.

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.

3.2.1 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

One push trolley and two mopeds are available with SSE/PW/AJJ. He had put the push trolleys for 25 days per 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 JE/P.Way shall inspect the entire section by push trolley at least once in a fortnight or more often as necessary.

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

Sl. No.	Detail	Data	Composite factor
1	Total Track KMs	31.22	-
2	Segment No.1	7.26 DN, GMT – 43.4	1.0079
3	Segment No.2	7.66 UP, GMT – 29.7	1.0078
4	Segment No.3	4.99 DN, GMT – 20.80	1.0501
5	Segment No.4	4.49UP, GMT – 28.06	1.0557
6	Segment No.5	1.70 DN, GMT – 0.00	1.0632
7	Segment No.6	1.80 UP, GMT – 0.00	1.0597
8	Segment No.7	1.80 SL, GMT – 1.70	1.1222
9	Segment No.8	0.9 III- line, GMT – 41.1	1.0000
10	Segment No.9	0.60 IV - line, GMT – 32.9	1.0000
`M` Activity			
11	Monsoon patrolling	No of beats -6	-
14	Hot/Cold weather patrolling	-	Required if td+20 or td-20
15	Vulnerable location	-	-
16	Gate Keepers	No of Engg manned gates -2	1 Spl class
17	Rest giver for keymen	18 Gangs	Actual - 10 Gangs
18	Waterman	No of Gangs 18	Not in vogue
19	Store watchman	No of store – 2	Actual- 1

`S` Activity			
20	Tunnel data	Nil	-
21	Bridge structure maintenance	66	Linear water way – 458.35m
22	Long Girder bridge	Nil	-
23	Extra very sharp curve	4.21Kms	-
24	Extremely bad formation	Nil	-
25	Fog signal Man	Nil	Nil
26	Filth removal	Nil	-
27	Security patrolling	Last 3 years Average	900 mandays

3.12 **The following inferences are obtained through MCNTM formulae**:

Activity ' T ' – Affected by the Traffic Density:

T = (80 + 2.3 GMT) x (1 + A + B + C) L

Segment	GMT	Track km.	Composite Factor	Mandays
1	43.4	7.26DN	1.0079	1315.81
2	29.7	7.66 UP	1.0078	864.61
3	20.80	4.99DN	1.0501	669.88
4	28.06	4.49 UP	1.0557	685.12
5	0	1.7 DN	1.0632	144.60
6	0	1.80 UP	1.0597	152.60

7	1.7	1.80 SL	1.1222	169.50
8	41.1	0.92 III- line	1.0000	160.57
9	32.9	0.60 IV- line	1.0000	93.40
Total Mandays for `T` Activity				**4256.09**

The total mandays as per TRMS Sheet in `T` activity is 5345.89 which includes correction for Shallow Screening i.e., 1089.80 mandays has to be deducted as Shallow screening is not being done to the entire stretch.

3.13 Activity ` R ' – Unaffected by the Traffic Density:

The Total Manpower required to carry out 12 types of "R" activities is derived as 159 per km per annum.

Segment	GMT	Track km	Multiplication Factor	Mandays
1	43.4	7.26DN	159	1154.34
2	29.7	7.66 UP	159	1217.94
3	20.80	4.99DN	159	793.41
4	28.06	4.49 UP	159	713.91
5	0	1.7 DN	159	270.30
6	0	1.80 UP	159	286.20
7	1.7	1.80 SL	159	286.20
8	41.1	0.92 III- line	159	146.28
9	32.9	0.60 IV- line	159	95.40
Total Mandays for ` R`Acitivity				**4963.98**

3.14 **Yard Maintenance:**

The mandays required for Running Yard lines, Non Running Yard Lines & turnouts (for composite sections)

Machine Packed RYL(Equivalent) - 28.30 Km BG

Manually packed RYL(Equivalent) - 8.40 Km BG

Manually packed NRYL(Equivalent) - 79.12 Km BG

Mandays required for RYL (M/c Packed)- 177 x 28.30 = 5009

Mandays required for RYL(Manual) - 297 x 8.40 = 2495

Mandays required for NRYL (Manual) - 198 x 79.12 = 15666

Total mandays for complete Yard section = 23170

This mandays is already included in R activities. Therefore the total mandays of R activities will be **28134** (23170 for yard+4964 for Routine maintenance))

Mandays for `M` Activities			
1	Monsoon patrolling	732	6 beats
2	Hot/Cold weather patrolling	0	LWR-2.66 Km
3	Vulnerable location	0	-
4	Gate Keepers (2 LC gates)	1460	Man power assessed, by class of manned gates
5	Rest giver for keymen	1278	For 18 Keymen
6	Waterman (10 gangs)	2940	Nowadays 2 litres Milton made container provided
7	Store watchman	2190	For 2 stores
	Total	**8600**	

Mandays for `S`Activities			
1	Tunnel maintenance	0	-
2	Bridge Sub Structure maintenance	148.23	68 bridges- Linear waterway -458.35 m
3	Long Girder bridge	0	-
4	Extra very sharp curve	1237.74	4.21 Km
5	Extremely bad formation	0	-
6	Look out man	1294.08	-
7	Fog signal Man	0	-
8	Filth removal	0	-
9	Security patrolling	900	Assessed by last three years average
	Total	**3580.05**	

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

Sl. No.	**Activity**	**Mandays**
1	**T**	4256.09
2	**R**	28134.00
3	**M**	8600.00
4	**S**	3580.05
Total Mandays of 'T R M S'		**44570.14**

Total man days required - 44570.14 / year say 44570

The total maydays is arrived as 44570 mandays. Based on the field inspection during the 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.

3.16 **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 derived as 159 Man Days per KM per annum.

R 2 – Shallow Screening:

After the implementation of Heavy Track Machines in Track maintenance the need of unit/gang maintenance for Shallow Screening need not be fully required as per rational formulae, rather is mainly used for LC gates, road side approaches i.e the length of 30 Sleepers, creepers and grass penetrated areas 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, the Man power required for the Shallow Screening is not allowed fully.

Moreover, the Man power requirement for shallow screening is 55 Mandays/Km in MCNTM (Total Mandays requirement for R activity is 159/Km), which is equal to 35% of R activities if done fully. Hence, the study team recommended to deduct the mandays of shallow screening and shallow screening correction also from TRMS formula.

However, the study team allowed 20% of 35% of shallow screening in `R `activities. Only after every monsoon and unexpected rain in the approach of LC gates, Station approaches, drainages nearby the track etc, the shallow screening is being done to avoid choking of ballast and prevent Rail and Weld fractures.

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

Total mandays for shallow screening	=	55/Km
20% of 55 mandays	=	11/Km
Total track 31.22Km is (11 x 31.22)	=	**343.42 say 500** mandays

Therefore, 500 mandays is allowed for shallow screening.

3.17 **`M` - Activities:**

M6 - Water man duty.

As per the records maintained by SSE/P.Way/AJJ, it is observed that no waterman has been provided exclusively to supply the water for 10 gangs since decades. The daily duty hours of the gang staff is 8 hours. By utilizing one staff exclusively to bring the water is not justified.

The requirement is projected as 2940 man days per year for exclusively bringing drinking water for the Unit staff while on duty.

Since, this jurisdiction is not an isolated and all the areas are having copious water supply, waterman duties is not at all justified. Moreover, individual water bottles (Milton Brand – 2 litres.) is being supplied to every Track man by the department. Hence, the work study team has not considered for allowing of 2940 man days exclusively for water man duties, but these mandays can be allowed to other works such as material handling, office uses like maintenance of registers/ledgers on condition basis.

M4 - Gate Keeping duty:

1460 mandays is allowed in TRMS formula for gate keeping of 2 manned LC gates, but, only one Spl class LC gate is available at present. But the work study team has calculated the requirement of manpower separately based on LC gate Yardstick as per the classification of LC gates. Hence, the 1460 mandays shown in TRMS formula is reduced .

M5- Rest giver for Keyman duty:

The mandays allowed in TRMS formula is 1278 for 18 Keymen. But the actual number of gangs is 10 i.e., one keyman for each gang. Hence the workstudy team has calculated the requirement as per the utilisation. So, 1278 mandays for Rest giver of keyman is reduced from the TRMS formula.

M7- Store Watchman duty:

The mandays allowed in TRMS formula is 2190 for 2 Stores. But only one Store is available that too in the office of SSE/PW/AJJ. Hence the workstudy team has allowed the manpower on Need base based on the available store. Therefore, 2190 mandays is reduced from the TRMS formula.

3.18 **Scoring through the reduced Man Days :**

Sl. No	Activity	Reduced Mandays	Remarks
1	R 2 – Shallow Screening	7878	35 % of total R activities (28134) is 9847 and 20% allowed as 1969 mandays, the net deduced value is 7878 (9847-1969)
2	M6 - Water Man Duty	2940	Given by T R M S
3	M4 - Gate keeping at level crossing	1460	Given by T R M S, but manpower requirement is based on yardstick of LCs
4	M5 – Rest giver for keymen	1278	Rest giver is calculate as pre present number of Gangs.
5	M7 – Store Watchman	2190	Calculated the manpower for the existing number of store
	Total	**15746**	

3.19 **Gang/Unit Strength Requirement :**

Total mandays of T+R+M+S (44570 – 15746) = 28824

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

i.e Total man days of (T + R + M + S) = 28824/294

Gang/Unit Strength (Track Maintainer) = 98.04 say **98** men

3.20 **Contract works undertaking for ADEN/AJJ and other units:**

Cost of Outsourcing activities:

As per the agreements for contract in position at ADEN/AJJ Sub-division, the following works were undertaken by contract staff in SSE/PW/AJJ.

Sl. No	Name of work	Name of Contractor	Awarded/ Revised Value in Rs	Date of Agreement
1	Essential Maintenance work to endure safety in loop lines in SSE/PWAY/AJJ section in ADEN/AJJ sub division	Kannan Loganathan	Rs, 94,64,249/-	02.05.2019
2	Hiring of road lorries 10MT and 2 MT capacity for a period of one year for transportation of P Way materials	M/s Sabhapathy	Rs.39,98,006/-	22.04.2019

From the above table, the total amount of contract value is Rs 1,34,62,255/-.

In addition to the above works in progress, 3 other works are proposed for the current year and is in the advanced stage of awarding the contract.

In general, 45 to 50% of the contract value is being taken for manpower

Calculation and the value is equated to Technician III Average salary.

Total amount of outsourced value - Rs. 13462255/-

45% of the total contract cost for PW/AJJ - Rs. 6058014/-

The contract cost per month (Rs. 6058014/12) - Rs. 504834 /-

Mean pay of Track maintainer III / month - Rs. 48614/-

Converted into Track maintainer(Rs.504834/48614) - 10.38

LR at 12.5% - 1.29 staff

Total staff on account of contract value - 11.67say **12 staff**

Hence, the Net Gang/Unit Strength = 98 – 12= 86

(Track Maintener)

3.21 **Supervisors :-**

There are 6 posts of SSE/JEs in the sanctioned list of which 3 SSEs and 3 JEs and the actual is 2 SSE and 1 JE. The man power requirement for supervision of this unit is as follows.

Over all in charge SSE	=	1
One Section SSE/JE for East Yard, YM & RPF	=	1
One SSE/JE for MLPM yard and Km 70/000	=	1
One SSE/JE for Store/Special works	=	1
Sub total	**=**	**4**
LR for 12.5%	=	1
Requirement of Supervisors	**=**	**5**

3.23 **Artizans :-**

8 posts of artisan staff is in sanctioned in various trades like Blacksmith, Painter, Welders and the actual is also 8. This study recommends multi skilling for these staff including training for welding, Carpentry, Painting, trolley working etc. They can be uutilised for any Artizan works for emergency especially patrolling duty when they are spare. Their movements and programmes are also show the scope for this proposal.

The failure of LC gates is very meagre for the last one year (this is achieved through good maintenance practices of track). The areas of other works for blacksmith are very limited. It is also pointed out that the TRMS calculation already contains some allocation of man power strength for LC gates overhauling and rectifying damage in R4 & R12 under R activities.

After the introduction of PSC sleeper, the carpentry works has become very less. The bridge timbers (sleepers) are also modified to channel sleepers and moreover bridge sleepers are manufactured and mounted through contract.

Moreover the manpower requirement of artisans based on CTE's letter tabulated below. (The CTE's letter No.W.OM/45/Post/General dt.26.112009.)

Sl. No.	Category	Requirement	Based on CTE's letter
1	Blacksmith	2 BS (1 LC) for LC & yard	The yardstick is for maintenance of all assets under the SSE/P.way including lifting barriers at level crossings. The average work load for each Blacksmith is taken as 10 LCs.
2	Blacksmith Khalasis	1 BS Khalasi (1 LCs) for LC & yard	The yardstick is for maintenance of all assets under the SSE/P.way including lifting barriers at level crossings. The average work load for each Blacksmith Khalasis is taken as 10 LCs.
3	Painter	1 for each SSE/P.way	-
4	Welder	1 (for each SSE/P.Way)+1 for Yard (Total=2posts)	-
5	Welder Khalasis	1 (for each SSE/P.Way)and Yard (Total=1post)	-
Total		**7 Posts**	

The requirement of artisans is 7 based on the CTE's circular. The remaining 1 vacant post may be surrendered to the vacancy bank.

3.24 **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 PW Supervisor (at present PWS post is abolished and their duties are shouldered into Trackmate) and one Trackmate.

Such being the case, the 10 gangs are converted in 5 units. Therefore the number of trackmates required for these sections is 5 and study team also allowed **5** trackmate posts. The LR provision for trackmate has been given while calculating the requirement of gang strength.

Eventhough, the six categories viz., Trackmate, Keyman, Gangman, Gate keeper, Trolleyman, Store watchman in the Track maintenance is merged and named as Track Maintener I,II,III and I, the study has allowed separate manpower for Trackmate, Gatekeeper, Storewatchman and Trolleyman.

3.25 **Trolleyman**

One trolley / lorry require 4 trolleymen for its 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.

3.26. **Trolley Inspection Schedule:**

SSE/P.Way (in charge) – once in a month (CS No.132 Para 124(a), Dt.: 08.04.2013). SSE/JE (section in charge) – once in a fortnight (CS No.132 Para 139, Dt.08.04.2012). The section supervisor normally take two days to inspect the section in trollies in the fortnight period.

For the movement of a push trolley four persons are required in which, two will physically push the trolley and the other two will sit and watch front side of the movement.

Three trolleys are available of which One is Push trolley and two are Moped trolleys in PW/AJJ section. 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 trolley men. The trolley working in this section is 25 per month for all supervisors/Officers.

The trolley working time is surely 3 or 4 hours per trolley inspection due to line block problem and also this section have multiple lines and Junction staton. But the supervisor movement for regular track inspection and accompanying with higher officials, other departmental purposes, etc. are limited, and one gang of trolleymen is required for the entire track inspection.

Hence, the study team allowed one gang of 4 trolleymen. Presently, the utilization for trolley movement is 4 and the same can be continued. The LR provision for trolleymen has been given while calculating the requirement of gang strength.

The latest correction slip for manpower requirement of push trolley is 4 + 1. The additional staff is allowed for carrying and maintaining of Tool Box at the time of Trolley movement. The fifth staff may be allowed from the staff already utilized for stores/office duties.

The requirement of Trolleymen posts is 4

3.27 **Gate Keepers:**

The only LC gate available in this section is one which is Special class traffic gate but it is manned by Engineering staff. So the work study team has allowed the required man power as per classification which is detailed below.

For 1 Special LC gates (1 x 3)	=	3
RG at 16.66% (0.5 say 1)	=	1
Total	**=**	**4**

The LR provision for Gate keepers will be provided while calculating the requirement of total strength.

The requirement of Gate keepers for 1 manned LC gate is 4.

3.28 **M5 – Rest Giver for Keymen:**

The mandays given in the TRMS is 1278 for provision of RG for 18 Keymen. But the number of gangs is 10. The work study has allowed 10 keymen at the rate of 1 for each gang. Hence the RG for 10 Keymen is 1.67 say 2 staff. The LR provision for Gate keepers will be provided while calculating the requirement of total strength.

The requirement of Keymen is 12 including RG.

3.29 **M7 – Store Watchmen at SSE/PW/AJJ:**

The mandays given in the TRMS is 2190 for provision of Store Watchman for 2 locations. But the number of available store is one at the office of SSE/PW/AJJ. The work study allows 2 staff for day and night and one for RG. The LR provision for Gate keepers will be provided while calculating the requirement of total strength.

The requirement of Store Watchmen is 3 including RG.

3.30 **Requirement of ministerial staff:**

At present, one Ministerial staff in the capacity of Ch.OS is available to look after the Personnel matters and Actual is also one and the same may be continued. Presently, the works matters are being looked after by Trackmainteners utilised in the office. There is no designated staff for dealing works matters of this unit.

The workstudy suggests posting of 1 Works branch clerk on matching surrender and the existing Gang staff utilised in the office can be continued till the posting of one Works branch clerk.

Requirement of Ministerial staff – 1 staff.

3.31 **Requirement of Track maintainers:**

Track maintainer	-	86
Trackmate	-	5
Trolley men	-	4
Gate keepers including RG	-	4
Keymen including RG	-	12
Store Watchmen including RG	-	3
Sub Total	**-**	**114**

3.32 The total Sanction Vs Requirement of SSE/P.Way/AJJ

Sl. No	Category	Sanc (a)	Act. (b)	Req. (c)	Surplus (a-c)
	Supervisors				
1	SSE	3	4	3	0
2	JE	3	1	2	1
	Total (A)	**6**	**5**	**5**	**1**
	Ministerial Staff				
3	OS	1	1	1	0
	Total (B)	**1**	**1**	**1**	**0**
	Artisans Staff				
4	Sr.Tech. (Black smith)	1	2	7	1
5	Tech. Gr.I (Black smith)	2	1		
6	Tech. Gr.II (Black smith)	0	1		
7	Tech. Gr.III (Black smith)	1	0		
8	Tech. Gr.I (Welder)	2	0		
9	Tech. Gr.II (Welder)	1	0		
10	Tech. Gr.III (Welder)	0	3		
11	Sr.Tech (Painter)	1	0		
12	Tech.I (Painter)	0	1		
	Total (C)	**8**	**8**	**7**	**1**
	Track Maintainer (Mate, Key man, Gangmen, Gate Keeper, store watchman & Trolley men)				
17	Track Maintainer Gr-I	16	14	114	14
18	Track Maintainer Gr-II	33	24		
19	Track Maintainer Gr-III	32	33		
20	Track Maintainer Gr-IV	66	18		
21	Trainee Trackman	0	5		
22	SNP	0	1		

23	For office & material handling, Contract related works, trainee reserve, LC census etc., as need base			4	
	Sub total	147	95	118	
24	L.R @ 12.5% for 118 staff 14.75 say 15			15	
Total (D)		**147**	**95**	**133**	**14**
26	**Grant Total (A+B+C+D)**	**162**	**109**	**146**	**16**

3.33 **Sanction Vs Requirement:**

Sanction	Actual	Requirement	Surplus
162	109	147	16

3.34 **Summary of Recommendation**

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

1. JE post in GP. Rs. 4200/- - 1
2. Tech-III (Black smith) post in GP. Rs. 1900/- - 1
3. Track maintainer – IV In GP Rs.1800/- - 14

Total - 16 posts.

CHAPTER – IV

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

Co-ordinating Officer's views were received vide ADEN/AJJ letter No.AJJ/Misc./WSR/P.Way/AJJ dt. 18.02.2020 and the remarks of the Planning Branch on the co-ordinating officer's views/comments are given below.

1. Co-ordinating Officer`s Views/comments:

In AJJ, new assets have been created during NI period which are as follows.

a) Passenger running lines Road 1A, 1B, 1C lines have been commissioned during NI period in the month of April 2018.

b) New AJJ-MLPM – TKO detour line have been commissioned during May 2019.

c) New sick line to be commissioned shortly (2 km track length and 3 new P&C).

Therefore, presently jurisdiction of SSE/PW/AJJ section has been extended upto mileage 65/200 on this line duly resulting in extension of 2.5 kms and 5 numbers of new P&Cs (excluding new sick line). However, no additional posts were sanctioned for the maintenance of newly created assets.

For maintenance of these new assets, twenty new numbers of staff are required.

Whereas Para 2.2 of this work study analysis, this additional increase in mileage of track and P&C have not been considered.

Planning Branch remarks:

Though the Para No. 2.2 has given only the main locations under SSE/PW/AJJ, the study has given the gang distribution in detail (Para 2.5)

Moreover, with regard to additional manpower, the division may create the same from the available vacancy bank.

2. **Co-ordinating Officer`s Views/comments:**

AJJ yard is having 5 diamond crossings and 15 numbers of wooden P&C which requires daily and frequent attention, to avoid any kind of safety related issues. As AJJ yard is having almost 190 numbers of P&C, maintenance of these points is as important and cumbersome task.

Whereas Para 2.8 of this work study Analysis, this aspect has been neglected.

Planning Branch remarks:

Noted and necessary corrections has been made in the report

Co-ordinating Officer`s Views/comments:

Every SSE incharge and Sub-section SSE/JEs are having their own set of inspection schedule apart from higher official inspection. So, they need their separate trolleymen to complete inspection and to ensure safety of track. AJJ being a major yard, there are frequent visits of higher officials from HQ and Division.

It is very difficult to manage with only 4 trolleymen to carry out movement for regular individual track inspection schedules for all existing SSE/JEs and accompanying with higher officials which directly affect safe running of trains. Moreover, three more staff are required each for carrying relevant records along with one each at from and back of the push trolley to ensure safety apart from 4 number of trolleyman as per guidelines.

Hence total 7 numbers of trolleyman are required for one push trolley inspection, which cannot be compromised.

Therefore para 3.4, 3.25 & 3.26 of this work study analysis, may be updated accordingly.

Planning Branch remarks:

Not agreed to. The manual itself allows only 4 staff for the requirement of push trolley. The latest correction slip for manpower requirement of push trolley is 4 + 1. The additional staff is allowed for carrying and maintaining of Tool Box at

the time of Trolley movement. The fifth staff may be allowed from the staff already utilized for stores/office duties as mentioned earlier.

Co-ordinating Officer`s Views/comments:

The cadre statement of blacksmith category may be updated as one number of blacksmith has been transferred temporarily from SSE/P.Way/CJ section (within ADEN/AJJ sub-division) due to heavy workload at AJJ section.

The scale check of SSE/P.Way/AJJ as on date may be obtained from the section or Personnel Branch as incorporated at Annexure – I of work study analysis.

Planning Branch remarks:

Noted. The correction is only in the Actual and the sanction remains the same.

Co-ordinating Officer`s Views/comments:

This section does not have the cadre for Drivers or departmental vehicles to carry out loading/unloading works. Hence, the calculation of manpower may be revised accordingly excluding the agreement amount of Rs.39,98,006/- for item 2 at para 3.20.

Therefore para 3.20 of this work study analysis, may be updated accordingly.

Planning Branch remarks:

Noted.

Co-ordinating Officer`s Views/comments:

In the meantime, one hundred and ten (110) number of posts of Track Maintainer Gr.IV in Level – 1 of 7th PC are surrendered with immediate effect and the entire money value (100%) transferred to HQ – Engineering vacancy bank for creation of posts for operation at Track machine Organisation vide Sr.DPO/MAS's surrender Memo JPO No.01/2020 & Lr.No.M/P1(W)135/surrender dt.12.02.2020.

Out of the above, twelve (12) number of posts have been deleted from scale check register and book of sanction of SSE/P.Way/AJJ section.

Planning Branch remarks:

Noted and agreed to.

Co-ordinating Officer`s Views/comments:

In para 2.1 of this work study analysis, may be corrected and read as "Chief Project Manager / MAS" & "Sr.DEN/West/MAS" in place of Sr.DEN/Co-ordn./MAS & Sr.DEN/Central/MAS respectively.

In view of the above, you are hereby requested to consider the same and arrange to incorporate suitable additional information duly reducing/minimising the number of posts proposed to be surrendered as recommendation or otherwise.

Planning Branch remarks:

Noted. It is to be mentioned that the 16 posts identified as surplus is only 9.8 % of the sanctioned strength and that too from the vacancy and the division may fill up the posts from the vacancy for the new assets as opined by the Co-ordinating officer.

Hence the number of posts identified as surplus is 16 and the study is released as such.

CHAPTER – V

5.0 FINANCIAL SAVINGS

5.1 If the recommendations are recommended, the annual recurring financial savings will be as follows:

Sl. No.	Category	Grade pay/Level	No. of posts	Money Value	Annual Financial savings
1	JE/PWay	4200/6	1	86463	1037556
2	Blacksmith Tech III	1900/2	1	48614	583368
1	Track Maintainer Gr IV	1800/1	14	43817	7361256
TOTAL			**16**		**89,82,180**

ANNEXURE – I

SCALE CHECK OF SSE/P.Way/AJJ SECTION AS ON 31.10.2019

Sl. No	Category	Grade Pay (Rs.)	Sanction	Actual	Vacancy	Excess
1	SSE	4600	3	4	0	1
2	JE	4200	3	1	2	0
3	JE/Trainee	4200	0	1	0	0
4	JE/DSK	4200	1	1	0	0
3	Blacksmith/Sr. Tech	4200	1	2	0	1
4	Blacksmith Gr I	2800	2	1	1	0
5	Blacksmith Gr.II	2400	1	0	1	0
6	Painter Sr. Tech	4200	1	1	0	0
9	Painter Tech 1	2800	0	1	0	1
10	Welder Gr.I	2800	2	0	2	0
11	Welder Gr.II	2400	1	2	0	1
12	Welder Gr. III	1900	0	1	0	1
13	Track Maintainer I	2800	16	14	2	0
14	Track Maintainer II	2400	33	24	9	0
15	Track Maintainer III	1900	32	33	0	1
16	Track Maintainer IV	1800	66	18	48	0
17	Trainee Trackman	1800	0	5	0	7
18	SNP	1900	0	1	0	1
TOTAL			**162**	**110**	**65**	**14**

ANNEXURE - II

ACTIVITIES RECOMMENDED FOR OUTSOURCING BY RATIONAL FORMULA.

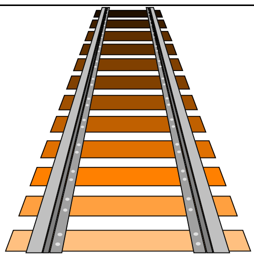
(MCNTM COMMITTEE 2000) AND APPROVED BY RAILWAY BOARD VIDE No.95/CE-1/GNS/2 Vol.11 Pt.11 dated 03/06.03.2006.

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



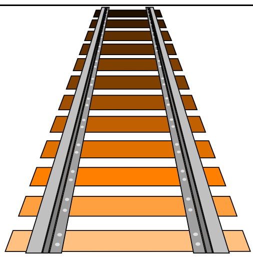
No. G.275/WSSR - 161819 / 2018-19

WORK STUDY TO REVIEW THE STAFF

STRENGTH AT

SSE / P.WAY / AJJ

CHENNAI DIVISION



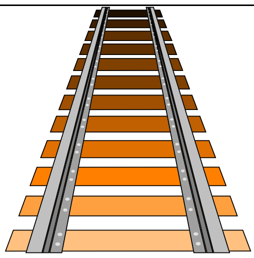
No. G.275/WSSR - 161819 / 2018-19

WORK STUDY TO REVIEW THE STAFF

STRENGTH AT

SSE / P.WAY / AJJ

CHENNAI DIVISION



No. G.275/WSSR - 161819 / 2018-19

WORK STUDY TO REVIEW THE STAFF

STRENGTH AT

SSE / P.WAY / AJJ

CHENNAI DIVISION