दक्षिण पूर्व मध्य रेलवे
SOUTH EAST CENTRAL RAILWAY

कार्यालय
वरिष्ठ उपमहाप्रबंधक, बिलासपुर

Office of the
Sr. Dy. General Manager, Bilaspur.
Tel.No. 64006(Rly), 07752-414229

पत्र सं. No. WS/Engg/BSP/1402

दिनांक Dated: 27.06.2019

The Divisional Railway Manager,
S.E.C. Railway,
Bilaspur.

Sub: Work study on "Review of existing cadre strength vis-a-vis workload of SSE (P. Way) Unit/Khongsara of Engineering Department in Bilaspur Division."

Ref.: (i) This office letter no. WS/Engg./BSP/18-19/369 dated 12.02.2019.
(ii) Sr. DEN(Co)/BSP office letter no. SECR/BSP/ Engg./Gen/522/Work Study/Pt.II/26 dated 26.04.2019.

The work study of SSE(P-Way) Unit/Khongsara of Engineering Department in Bilaspur Division has been conducted to review the existing cadre strength in view of present work load, outsourcing of some works of P-way, track maintenance through Track Machines, need base requirement and optimum utilization of manpower. Draft study report vide letter under reference was sent to DRM/BSP followed by one reminder addressed to Sr. DEN(Co)/BSP to furnish the remarks on the draft report. In response to it, Sr. DEN(Co)/BSP vide his letter dated 26.04.2019 requested to review the work study report. The remarks of Sr. DEN(Co)/BSP was examined carefully and a reply to this effect has been given vide this office letter dated 27.05.2019 with advice to implement the recommendation made by Work Study team.

The work study report contains recommendation for surrender of 22 surplus vacant posts [21-Track Maintainers and 01-Painter] out of total sanctioned of 477 of SSE (P-Way) Unit/Khongsara of Bilaspur Division. Besides this, some suggestions are also made to improve the efficiency.

Therefore in view of above, it is requested that suitable instructions may be given to concerned officers for implementation of the work Study report and copy of surrender memorandum may be sent to this office so that progress of implementation of work study can be advised to Railway Board accordingly.

This has the approval of SDGM.

Pattnaik 27/6/2019
(S. N. Pattnaik)
Asst. Work Study Officer
For Sr. Deputy General Manager

Encl: 1 work study report.

Copy along with one copy of work study report is forwarded to:-

1) The Executive Director, E&R (ME), Railway Board for kind information.
2) Secretary/SECR for kind information of GM.
3) PCE/SECR/BSP for kind information and necessary action please.
4) Sr. DEN(Co)/BSP, Sr. DPO/BSP for kind information and necessary action.

WORK STUDY REPORT ON EXISTING CADRE STRENGTH VIS-À-VIS WORK LOAD OF SSE (P. WAY) UNIT/KGS OF ENGINEERING DEPARTMENT IN BILASPUR DIVISION

कार्यअध्ययन प्रकोष्ठ

दक्षिण पूर्वमध्य रेलवे

SOUTH EAST CENTRAL RAILWAY

BILASPUR

WORK STUDY CELL

WORK STUDY REPORT ON EXISTING CADRE STRENGTH VIS-À-VIS WORKLOAD OF SSE (P. WAY) UNIT/KGS OF ENGINEERING DEPARTMENT IN BILASPUR DIVISION

GUIDED BY
SRI AMIT KUMAR SINGH
SR. DY. GENERAL MANAGER

LED BY
SRI S.N. PATTNAIK
ASST. WORK STUDY OFFICER

CONDUCTED BY

SRI A.C. BEHERA
CH. WORK STUDY INSPECTOR

SRI ANSHUMAN HALDER
WORK STUDY INSPECTOR

कार्यअध्ययन प्रकोष्ठ
दक्षिण पूर्वमध्य रेलवे
बिलासपुर
अध्ययन संख्या
SEC/06/2019-20

CONTENTS

SUMMARY OF RECOMMENDATIONS & SUGGESTIONS

Rec. No.	Description	Para Reference
	RECOMMENDATIONS:	
1.	Considering the existing work load, it is recommended that as per details given in Para 3.4.1 to 3.8, the requirement of staff under SSE/P-Way/KGS unit comes to 455 against sanction of 477 staff. ***Thus 22 identified surplus vacant posts [01-Painter and 21-Track Maintainer] should be surrendered from SSE/P-Way/KGS unit of Engineering Department in Bilaspur Division.***	3.11.1
2.	The money value resulting after surrendering of vacant posts of Track Maintainer can be utilised for creation of posts required for Track Machine maintenance work as per need.	3.11.2
3.	The vacant post of SSE/JE in Supervisors category, Artisan category, Track Maintainer category should be filled up for better monitoring of contractual and departmental civil engineering works.	3.11.3
4.	Some activities of P- Way like deweeding of track & cleaning of drain, painting of Boards/Rails, overhauling of LC Gate and tree cutting for visibility may be outsourced upto 80% and rest 20% through departmental.	3.11.4
Suggestions:		
1.	Traffic Block is very crucial issue for maintenance of tracks; it was informed that due to lack of coordination between departments It is very tough task to get the block approved. Coordination between departments needs to be increased for blocks as and when required.	3.11.5
2.	Departmental Road vehicle should be allotted at SSE/P-Way office Khongsara to facilitate transporting of man and materials to work site.	3.11.6
3.	Mobile Maintenance Gang may be set up to cater the emergency work as per need.	3.11.7

CHAPTER – I

1.0 Introduction:

Civil Engineering infrastructure is the largest static infrastructure of Indian Railways comprising of track, bridges, land, etc. Civil engineering department of Indian Railways manages and maintains all these infrastructures.

The P. Way organization is a part of Civil Engineering department at divisional level, functions under the administrative control of Sr. DEN (Co). Officers having entrusted with a particular section comprising of sectional CPWIs/PWIs are in-charge of P. Way Units/depots and responsible for up-keeping of track**.** The track is maintained with the help of Trackman, Mate, Keyman & Artisan staff. The maintenance of track is a vital activity in the working of train in relation to safety & punctuality and it is duty of engineering department to keep up the standard of track using engineering parameters for the safe running of trains. In this way Engineering Department is the backbone of Railway system.

Permanent way maintenance is largely done by gangs consisting of Gangman under the supervision of a Gang-mate. The gang goes down its assigned section (gang beat), inspecting track and performing normal routine maintenance. A patrolman is being separately deputed to perform visual inspections along the length of a section of track by walking alongside it.

The schedule and track sections to be monitored by Gangman and patrolmen are specified in a Patrol Charts prepared by the Divisional Engineer. These charts also indicates when and where the drivers of trains running to schedule may expect to meet Gangman/Patrolmen and gangs carry Patrol Books in which they record the status of the track and any maintenance they perform on it.

The gang is equipped to deal with minor problems such as fixing small deviations in gauge or elevation of the rails, deweeding of track, replacement of damaged sleepers, rearranging ballast, etc. If problems are discovered with the permanent way that cannot readily be fixed by the gang, the details are reported to the station master of one of the adjacent block stations, and temporary engineering speed restrictions are put in place for the track. Trains going through that section are then subject to caution orders issued by the stations at either end.

The permanent way inspector (PWI) for a section has ultimate responsibility for the maintenance of the permanent way under his jurisdiction. The PWI and his staff undertake separate regular inspection tours of the various lines, often in a trolley. In the past manually pushed trolleys were used quite often, but their use is declining now.

1.1 Present Scenario:

In present days of modernization, the traditional method of performing P. Way activities related to up-keepings of Railway track has been upgraded by improvising the P. Way Assets (such as introduction of PSC Sleeper, utilization of modern Tools & plants etc.) and by adopting the latest technology/Work culture (such as introduction of Mechanized Maintenance, implementing Outsourcing, elimination of redundant activities etc.). Being Modernization in railway system has become necessity of today so as to haul heavier and longer trains at faster speeds safely and conveniently to achieve better productivity and render better consumer service to rail users. Modernization of track involves use of heavier track structure, long welded rails, modern mechanized methods of track maintenance and quick renewals of track structure etc.

1.2 Benchmarking:

As per Railway Board's instructions, the manpower is to be brought down at the level of IRABM. As per latest Benchmarking of Manpower Productivity Ratios Report of September'2018 issued by the Director (E&R)/ Railway Board, the IR Benchmark of P. Way Department is 0.77 Men per ETKM whereas Benchmark of P. Way Department of Bilaspur Division is 1.04 which is higher than IR Benchmark manpower ratio. The current IR Average Benchmark of Engineering Gatemen as per Benchmarking report, Sep'2018 issued by Railway Board is 2.30 Men per Gate whereas Benchmarking of Gateman of Bilaspur Division is 2.76 Men per Gate which is above than IRABM.

1.3 Details of SSE/P. Way Unit/Khongsara in Bilaspur Division:

The Engineering (P. Way) Department /BSP Division is divided into seventeen SSE (P. way) units and these Units are further sub-divided in to various no. of Gang sections to execute the related works. The jurisdictions along with the no. of DTM/Gangs existing under SSE/P. Way/KGS Unit are given as under:

S#	Item	Particulars
1.	Section	Double Line/Single Line (BG section)
2.	Jurisdiction	720/4-796/43
3.	Length (KM)	129.120
4.	Total No. of DTM/Gang under the P- Way Unit	DTM-06, Gang-08 Store Gang-01
5.	Jurisdiction of one Gang	6-8 Km
6.	No. of Engineering LC Gates	10

1.3 Terms of Reference:

The following terms of reference were adopted for conducting the study:-

I. Review of staff strength vis-à-vis existing workload.
II. Outsourcing activities.
III. Identifying redundant/unproductive activities to eliminate wastages.
IV. Suggesting ways and means to improve the standard in view of modernization and system improvement.

1.4 Methodology Adopted:

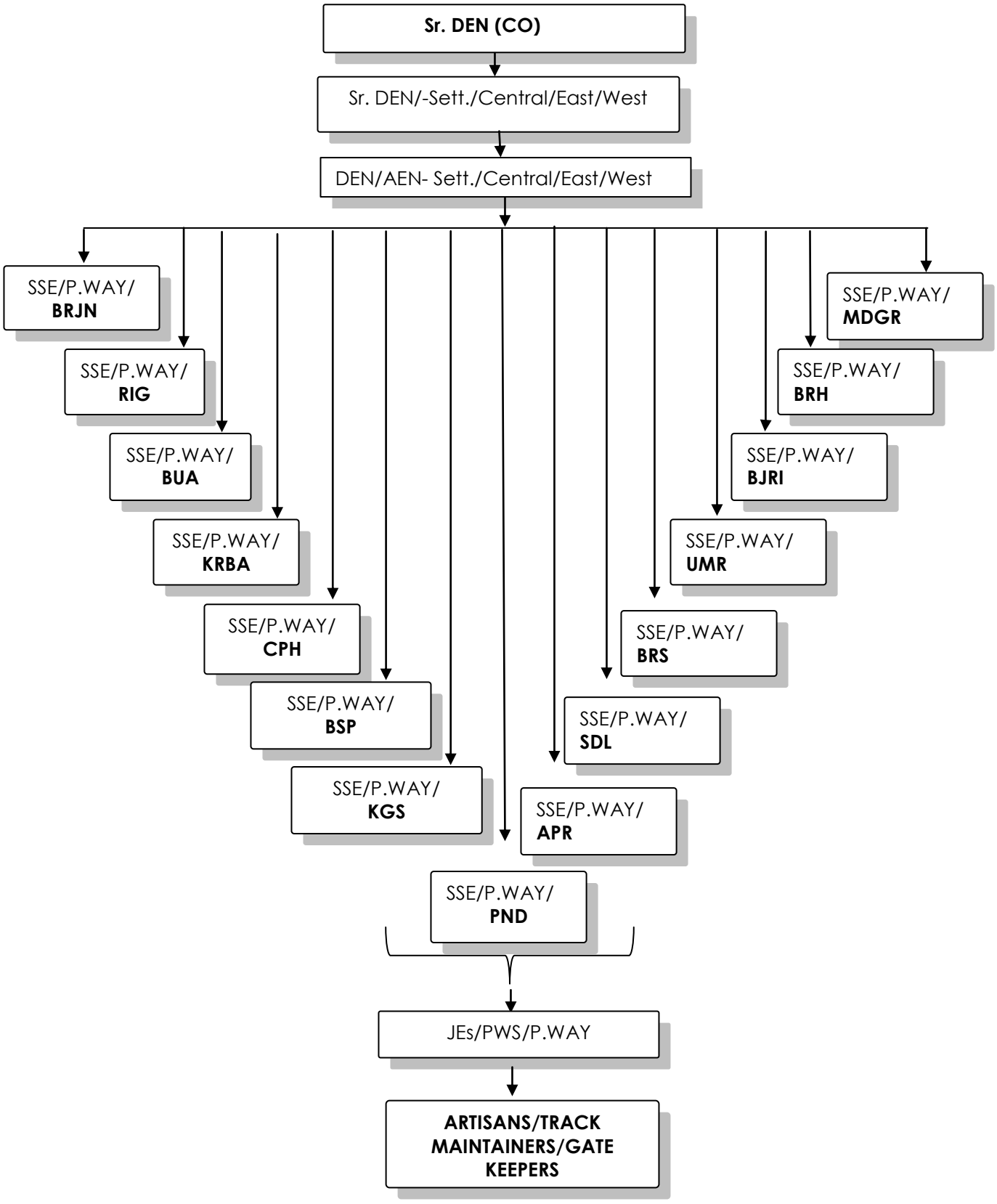
The work study team conducted a review of need based requirement of Engg. P. Way staff at Khongsara Unit of Bilaspur Division having total sanctioned strength is **477,** Actual strength is **389** and vacancy is **88.**

The work-study team has adopted the following technique to complete the study:-

- Verification of Data provided by Engineering Branch in detail with reference to quantum of work load.
- Direct observations regarding working of staff and discussion in details with officer/ Supervisor /Staff.
- Assessment of staff requirement and utilization of existing Manpower in other activities.
- Critical analysis of the data collected.
- Making recommendations for need base staff in the modern context.
- Work out financial implication involved in saving as a result of surplus staff.

1.4 Organisational Chart of Engineering Department (P.WAY) at Divisional level :

P. Way organization is a part of Engineering department at divisional level, functions under the administrative control of Sr. DEN (Co)/Bilaspur. Officers having entrusted with a particular section comprising of sectional CPWIs/PWIs/PWSs (P. Way) are in-charge of P. Way Units and are responsible for up-keeping of track**.**



1.5 Details of SSE/P. Way/ Units existing in Bilaspur Division:

The Engineering (P. Way) Department /BSP Division has been divided into fifteen SSE (P. way) units and these Units are further sub-divided into various no. of DTMs & Gangs to execute the relevant works. The jurisdictions along the no. of DTM/Gangs existing under control of these Units is given as under:

Details of existing SSE (P. Way) Units/BSP Div:						
S#	Name of P. Way Units	Jurisdiction	Length (KM)		Total no. of Engg. Gang under the Unit	
			TRACK KM	ETKM	DTM/ Gang	Store Gang
1	SSE(P. Way)/BRJN	KM.515.357 - KM.560.070 (DL KM 515.40 - 523.10 IB - JSG Bye pass 7.700 (SL)	97.126	261.456	8	1
2	SSE(P. Way)/RIG	KM.560.070 - KM.605.140 (DL)	90.140	244.283	8	1
3	SSE(P. Way)/BUA	KM.605.140 - KM.653.300 (DL	96.320	216.862	8	1
4	SSE(P. Way)/KRBA	NEW SECOND LINE (10.47 KM) (DL) KM.665.250 - KM.673.300=8.05 KM.673.300 - KM.710.500 =37.20 (DL) KM 710.500 - KM 714.00 = 3.50 (SL) KM.660.990 - 669/C/4-6 (SL) CPH BYE PASS=4.94	97.860	260.976	9	1
5	SSE(P. Way)/CPH	KM.653.300 - KM.666.300=13.000 (DL) KM.666.300 - KM.692.150 = 25.85 (TL) KM. 657.490 - 660.990 = 3.50 (SL)	107.050	255.971	9	1
6	SSE(P. Way)/BSP	KM.692.150 - KM.716.970 = 24.820 (TL) KM.716.970 - KM.722.000 = 5.03 (DL) BSP - KTE) KM 719.862 - KM 721.000 = 1.138 (SL) (CHORD LINE) KM.716.809 - KM.721.950 = 5.141(BYE PASS)	90.799	327.363	11	1
7	SSE(P. Way)/KGS	KM.720.240 - KM.760.000 = 39.76 (DL) KM.760.000 - KM.783.600 = 23.60 (SL) KM.783.600 - KM.796.600 = 13.00 (DL)	129.120	314.772	6 DTM + 8 Gang =10 DTM	1
8	SSE(P. Way)/PND	KM 796.600 - KM 808.000 = 11.40 (DL) KM 808.000 - KM 868.300 = 60.30 (SL) KM 864.100 - KM 865.100 = 1.00 (SL) CLF - MZH Bye pass line.	84.100	202.524	13	1
9	SSE(P. Way)/APR	KM.868.300 - KM.907.100 (DL)	77.600	212.423	6	1
10	SSE(P. Way)/SDL	KM.907.100 - KM.945.600 (DL)	77.000	203.428	5	1
11	SSE(P. Way)/BRS	KM.945.600 - KM.986.625 (DL)	82.050	213.183	6	1
12	SSE(P. Way)/UMR	KM.986.625 - KM.1028.600 (DL)	83.950	196.566	6	1
13	SSE(P. Way)/BJRI	KM.868.300 - KM.917.300 = 49.00 (DL) KM.865.100 - KM.876.900 (SL) = 5.150 CLF- MZH New Bye Pass KM 916.300 - KM 922.555 (SL)-BJRI-RBH =4.749	107.899	284.029	8 DTM + 2 Gang(1DTM) =9 DTM	1
14	SSE(P. Way)/BRH	KM. 951.270 - KM 1045.480 = 94.21 (SL) KM. 952.100 - KM 962.500 = 10.400 (SL)	103.940	285.637	18 Gang =9 DTM	1
15	SSE(P.Way)/ MDGR	KM.917.300 - KM.926.500 = 9.200 (DL) KM.926.500 - KM.955.760 = 29.260 (SL) KM.926.000 - KM 951.270 = 24.77 (SL)	72.070	211.653	14 Gang = 7 DTM	1
TOTAL			**1397.024**	**3691.126**	**145 (DTM+Gang) ***	**15**
Total No. of DTM (after merging existing Gang into DTM)					**124**	**15**

***Details of DTM/Gangs:-**

- Total No. of DTM + Gang over BSP Div. = 103 DTM + 42 Gang (i.e. say 21DTM)
  Thus, Total No. of DTM in BSP Div = 103 + 21 = 124 DTM
- Total No. of of Store Gang = 15 excluding DTM.
- The jurisdiction of one **DTM** for **D/L** is 6-7 Km (Up line-06 + Dn line-06), i.e 12-13 km.
- The jurisdiction of one **Gang** for **S/L** is 6-7 Km.
- Hence, 02 Gang (existing in S/L section) may be treated as one DTM for assessment of total no. of DTM over BSP Div.

CHAPTER-II

2.0 OBSERVATIONS :

Consolidated Staff strength Unit wise:

The consolidated cadre strength of KGS SSE (P. Way) Unit of Bilaspur Division as furnished vide Sr. DEN/Co. office & as per data provided by SSE (P. Way) is given below:

2.1

SSE/P. Way/KGS:

Category	S#	Designation	Scale	GP	Sanctioned	Actual	Vacancy
Supervisory	1	SSE	9300-34800	4600	8	4	4
	2	JE	9300-34800	4200	4	5	-1
	SUB TOTAL				**12**	**09**	**03**
Ministerial	3	Jr .Clerk	5200-20200	1900	1	0	1
	4	OS	9300-34800	4200	1	2	- 1
	SUB TOTAL				**02**	**02**	**00**
Artisan	5	Painter-I	5200-20200	2800	1	0	1
	6	Welder- I	5200-20200	2800	1	0	1
	7	Welder-III	5200-20200	1900	0	1	-1
	8	Grinder-MCM	9300-34800	4200	0	1	- 1
	9	Grinder-I	5200-20200	2800	1	0	1
	10	Luter-II	5200-20200	2400	1	1	0
	11	MCM- EBS	9300-34800	4200	1	1	0
	12	EBS- I	5200-20200	2800	1	1	0
	13	EBS- III	5200-20200	1900	1	0	1
	14	Chowk1dar	5200-20200	1800	2	0	2
	SUB TOTAL				**09**	**05**	**04**
Track Maintainer	15	Track Maintainer-I	5200-20200	2800	29	22	7
	16	Track Maintainer-II	5200-20200	2400	55	43	12
	17	T rack Maintainer-III	5200-20200	1900	102	89	13
	18	Track Maintainer-IV	5200-20200	1800	268	219	49
	SUB TOTAL				**454**	**373**	**81**
TOTAL					**477**	**389**	**88**

2.2 Duties of P. Way staff

The duties of P. Way staff category-wise are as under:

(i) SSE/JE (P. Way):-

SSE/JE(P. Way) perform their duties in office as well as in field units which are broadly mentioned as follows:

Inspections and maintenance of track in his jurisdiction in a safe condition for traffic. Inspections and maintenance of Engg. L/C Gate in his jurisdiction. Accountal, procurement and periodical verification of stores & tools required for regular maintenance. Execution of new/sanctioned works including zonal works. Measurements and bills pertaining to p. way works including correspondence, if any. Periodical inspection of new works and inspections as specified in Engineering Manual.

(ii) PWS:-

They supervise the works carried out by Gang Mate.

(iii) Mate:-

He is assigned for the work that the prescribed system of track maintenance is adhered to and the task allotted to him either verbally or through gang chart/diary are carried out efficiently, ensure the tools & equipment as prescribed available at site of work, ensure his length of line is kept safe

for the passage of trains and any unsafe condition is reported immediately, inspect the whole gang length once a week for on the spot supervision regarding track condition.

(iv) Keyman:-

The keyman inspects by foot his entire beat once a day, both the tracks and bridges for lookout of defects like loose spikes, keys, chairs, fish bolts, fittings on grinder bridges/culverts, broken/burnt sleepers, broken plates/tie bars etc. and attend them as necessary and report it to Mate/PWS/JE.

(v) Trackman:-

They are assigned the work of track maintenance like packing, casual renewal of rail/sleeper, lubrication of rail joints, attention to point & crossing, drain cleaning, vegetation cleaning, loading/unloading of materials, patrolling, protecting line in emergency etc.

(vi) Trolley man:-

These staff are engaged for operation of Trolleys available with SSE/JE.

(vii) Black Smith:-

These staff are engaged for smithy related activities.

(viii) ECR:-

These staff are engaged for carpentry related activities as and when required. However, at present the work of Carpenter has been reduced in view of no wooden sleeper.

(ix) Welder:-

Welder are utilized for welding work

(x) Luter:-

Luter are utilized for luting during welding work.

(xi) Chowkidar:-

Chowkidar staff are utilized in EI roster as care taker in the offices, stores etc.

2.3 Classification of Track Maintenance Activities as per MCNTM report:

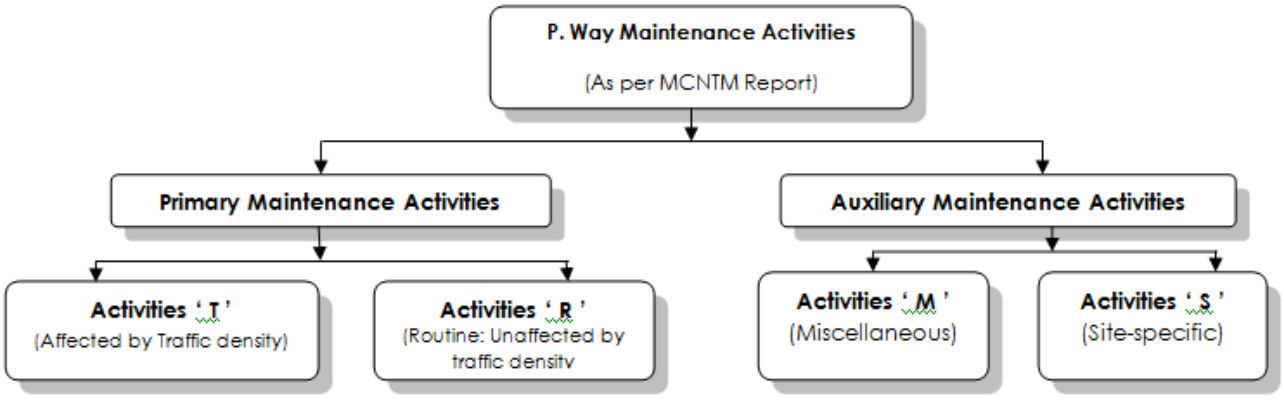
The Rational Formulae (MCNTM):

These formulae were developed because the Special Committee Formula was felt inadequate to account for differing manpower availability (skill sets, age distribution) in different regions or zones, increasing use of casual labour and private contractors for certain track maintenance activities, etc. In 1996, another committee was constituted by the Railway Board to look into this matter and to recommend changes to the Special Committee Formula.

These new Rational Formulae are much more involved, and account for a wide variety of factors in terms of the nature of the maintenance work, the type of track and traffic carried on it, the distribution of casual and contracted labour for permanent way operations, etc. The Rational Formulae are actually many different formulae, for each kind of maintenance operation, and they also specify the equivalence of different kinds of work for the purposes of computing wages and so on. The latest set of Rational Formulae was adopted in 2006 on the basis of recommendation of "The Committee on **M**anpower and **C**ost **N**orms for **T**rack **M**aintenance" (**MCNTM** Committee).

In order to cover certain gang activities left out which affect track maintenance effort and to take into account the effect of machine packing and track modernization, the Committee on Manpower and Cost Norms for Track Maintenance (MCNTM) found it more logical and rational to adopt zero based approach. The Committee recommended that the Railway may sanction Casual/Seasonal labour for all these works as and when required on the basis of volume of work.

As per MCNTM report the track maintenance activities are categorized as Primary maintenance and Auxiliary maintenance given as under:



PRIMARY MAINTENANCE ACTIVITIES:

These activities are directly related to P. Way maintenance, needing manpower based on continuous length of track, further classified as follows:

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

Activities R (Routine: Unaffected by traffic density):
These are for maintaining track, formation and other integrated assets, which are of routine nature, but quite important for train operation and for achieving reliability and long life of assets.

AUXILIARY MAINTENANCE ACTIVITIES :

These are related to upkeep of P. Way section as a whole, needing manpower based on localized problems, special features and geographical nature of P. Way section, further classified as follows:

Activities M (Miscellaneous):
For these activities, the quantum of work arising in the P. Way section can be assessed on a universally adoptable basis and the yardstick relating mandays requirement to output is rationally stipulated for each sub-activity.

Activities S (Site-specific):
For these activities, the quantum of work arising varies from location to location depending on site-specific features of the P.Way section and the yardstick is stipulated generally based on past experience.

2.4 The details of activities and sub-activities mentioned in MCNTM report under T, R M, & S categories are given as under:

List of activities & sub-activities under T,R,M &S as per MCNTM Report			
PRIMARY MAINTENANCE ACTIVITIES		AUXILIARY MAINTENANCE ACTIVITIES	
Activities 'T' (Affected by Traffic density):	**Activities 'R'** (Routine: Unaffected by traffic density	**Activities 'M'** (Miscellaneous)	**Activities 'S'** (Site specific)
Machine packed track (non-suburban): ***T1.Slack attention to*** a. Bad spots b. Low joints, (FP or welded), Glued joints c. SEJ (1 No. per km.) d. Minor curve realignment	**Machine packed track (non-suburban):** **R1**. Lubrication of ERCs **R2.** Shallow Screening (1/5 length) **R3.** Loading, leading, unloading **R4.** Overhauling of level crossing **R5**. Watching caution spots & Miscellaneous **R6.** Tree cutting for visibility **R7**. Lubrication of rails in curves	**Sub-activities:** **M1.** Monsoon patrolling **M2.** Hot weather patrolling for LWR track	**Sub-activities:** **S1.** Tunnel maintenance **S2.** Bridge substructure maintenance

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*** **ii. Manually packed track (non-suburban):** ***T1. Through packing*** ***T2. Slack attention to*** a. Bad spots b. Low joints, insulated joints c. Minor curve realignment ***T3. Casual renewal of*** a. Rails b. Sleepers c. Fasteners (includes attention) ***T4. Creep pulling*** **iii. Machine packed track (high density suburban):** ***T1. Slack attention to*** a. Bad spots b. Low Joints c. SEJs d. Minor Curve attention ***T2. For Tie tamper working*** a. Pre-tamping attention b. Along with tamper c. Post tamping attention **T3. Casual renewal of** a. Rails b. Sleepers c. Fastenings ***T4. Repair welding***	**R8**. Accident relief and carcass removal in run-over cases **R9**. Bridge sleeper attention & renewal **R10**. Pre monsoon attention, such as clearing of drains and waterways, cess repairs, de-weeding of track and attention to cuttings and trolley refuges. **R11.** Creep pulling (approaches of bridge, turnout) **R12.** Rectifying damage to L/C posts and gates **ii. Manually packed track (non-suburban):** **R1.** Lubrication of rail joints **R2.** Shallow screening (1/5 length) **R3.** Loading, leading, unloading **R4.** Overhauling of level crossings **R5.** Watching caution spots & miscellaneous **R6.** Tree cutting for visibility **R7.** Lubrication of rails in curves **R8.** Accident relief and carcass removal in run-over cases **R9.** Bridge sleeper attention & renewal **R10.** Pre-monsoon attention such as clearing of drains and waterways, cess repairs, de-weeding of track and attention to cuttings and trolley refuges **R11.** Rectifying damage to LC posts and gates **iii. Machine packed track (high density suburban):** **R1**. Through packing **R2.** Shallow screening(1/5 length) **R3**. Loading, leading & unloading **R4**. Lubrication of ERCs(Jts.) **R5**. Overhauling of level crossings **R6**. Watching caution spots and look out men **R7**. Tree cutting **R8**. Lubrication of rails in curves **R9**. Bridge sleeper attention & renewal **R10**. Accident relief and carcass removal **R11**. Pre-monsoon attention **R12**. Creep pulling **R13**. Rectifying damage to LCs **R14**. Painting of weld collars **R15**. Emergency attention **R16**. Extra assistance to Keymen &B/Smith **R17**. Extra work in night blocks **R18**. Extra assistance for S&T items	**M3.** Cold weather patrolling for LWR track **M4.** Watching of vulnerable locations **M5.** Gate keeping at Engineering level crossings **M6.** Rest giving for keymen **M7.**Waterman duty (to serve the gang) **M8.** Store watchman duty (at isolated locations of P. Way material store)	**S3.** Long girder bridge maintenance **S4.** Extra workload due to very sharp curves, deep cuttings and steep gradients. **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 Department) **S8.** Filth removal from track (within city limits) **S9.** Security patrolling **S10.** Watching of water level in suburban section (mostly in Mumbai area) during monsoon and stopping of trains as soon as found necessary.

2.5 As per MCNTM report, the following track maintenance works can be earmarked for execution through contracts**:**

Table –A: List of activities that can be executed through contract system

S#	Activities
1	Formation treatment works
2	Collection of ballast, training out of ballast by material train, leading ballast stack to track, insertion of ballast in track and profiling.
3	Deep - screening of ballast in track, carrying out manually or by deploying BCM in which case manpower support is provided by contractor.
4	Introduction of sub ballast and ballast layer.
5	Heavy repairs to track including lifting.
6	Complete realignment of curved track.
7	Through renewal of rails, sleepers and fasteners.
8	Complete renewals of points & crossing, SEJs, traps, etc.
9	Resurfacing of machines and switch rails.

10	Loading and unloading of P. Way materials in bulk.
11	Lorrying of P. Way materials for other than casual renewal.
12	Security of materials in 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, side drains and catch water drains.
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 vicinity of tracks in coaching and goods yards, repairs depots and workshops of Engineering, Mechanical, Electrical and S&T departments.

Table –B: List of activities for machine packed track to be maintained departmentally

Activities under 'T' (Affected by traffic density):	
T.1	Slack attention to; a) Bad spot b) Low joints (FP or welded) & Glued joints c) SEJ d) Minor curve alignment.
T.2	For tie tamper working; a) Pre-tamping operations b) Along with tamper c) Post tamping operations.
T.3	Casual renewal of; a) Rails b) Sleepers c) Fasteners along with re-gauging.
T.4	Repair welding.
Activities under 'R' (Unaffected by traffic density):	
R. 1	Lubrication of ERCs.
R.2	Shallow Screening (1/5 length)
R.3	Loading, leading, unloading
R.4	Overhauling of level crossing
R.5	Watching caution spots &Miscellaneous
R.6	Tree cutting for visibility
R.7	Lubrication of rails in curves
R.8	Accident relief and carcass removal in run over cases
R.9	Bridge sleeper attention & renewal.
R.10	Pre monsoon attention, such as clearing of drains and water ways, cess repairs, de-weeding of track and attention to cuttings and trolly refuges.
R.11	Creep pulling (Bridge approaches/Turn-out)
R.12	Rectifying damage to L/C posts and gates.
Activities under 'M':	
M.1	Monsoon patrolling.
M.2	Hot weather patrolling of LWR track
M.3	Cold weather patrolling of LWR track
M.4	Watching vulnerable locations.
M.5	Gate keeping at level crossings
M.6	Rest giving for Key man
M.7	Waterman duty
M.8	Store-watchman duty at isolated location of P.way material store.
Activities under 'S' (Site specific):	
S.1	Tunnel maintenance(Subject to works/bridge staff not being available for this work)
S.2	Bridge sub-structure maintenance (Subject to works/bridge staff not being available)
S.3	Long girder bridge maintenance (No. of bridges each having more than 150m lineal waterway)

S.4	Extra workload due to very sharp curve, deep cuttings and steep gradients.
S.5	Maintenance of track on extremely bad formation. (No. of locations where track needs more than12 attentions in a year)
S.6	Look-out man duty (for the safety of gang)
S.7	Fog signal man duty to assist Traffic Deptt(Man days utilized in past 3 years for this)
S.8	Filth removal from track (within city limits)
S.9	Security patrolling(Mandays utilized in past 3 years for this duty)
S.10	Watching of water level in suburban section (mostly in Mumbai area)

2.6 Average %-Break-Up of present Track Maintenance work executed by Departmentally & Through Contract

(Percentage Break-UP)

S#	Activities	Being carried out by (in %-age)	
		Departmental	Contractual
1	Attention to bad spots	100	00
2	Attention to low joints	100	00
3	Attention to SEJ	90	10
4	Attention to minor curve realignment	100	00
5	Pretamping operations	50	50
6	Along with tamper	Not Applicable	
7	Post tamping operations	00	100
8	Casual renewal of rails	100	00
9	Casual renewal of sleepers	100	00
10	Renewal of fasteners (along with regauging)	00	100
11	Repair Welding	50	50
12	Lubrication of ERC	50	50
13	Shallow screening	00	100
14	Loading, leading, unloading	00	100
15	Overhauling of level crossing	00	100
16	Watching caution spots and misc.	100	00
17	Tree cutting for visibility	100	00
18	Lubrication of rails in curves	100	00
19	Accident relief and carcass removal in run over case	100	00
20	Bridge sleeper attention and renewal	00	100
21	Premonsoon attention such as cleaning of drains and water ways, cess repair, deweeding of track and attention to cuttings and trolley refuges	50	50
22	Creep pulling (approaches of bridge and turnout)	100	00
23	Rectifying damage to LC posts and gates	100	00
24	Monsoon patrolling	100	00
25	Hot weather Patrolling	100	00
26	Cold weather Patrolling	90	10
27	Watching Volnerable location	100	00
28	Waterman duty	100	00
29	Site store chowkidar	100	00
30	Gate Keeping at Level crossing	100	00
31	Tunnel maintenance	Not Applicable	
32	Bridge structure maintenance	Not Applicable	
33	Long girder maintenance	Not Applicable	
34	Extra for very sharp curve	100	00
35	Extra for very bad formation	100	00

36	Look outman duty	100	00
37	Fog signalman duty	Not Applicable	
38	Filth removal	100	00
39	Security Patrolling	100	00
40	Painting & Writing work	20	80

2.7 Field Observation of DTM/Gang of SSE (P. Pay) Unit of SSE(P. Way)/KGS under ADEN/PND of BSP Div.:

2.7.1 Sectional data of sample gangs:

Sectional data of 01 sample gang of SSE(P-Way) unit under ADEN/PND as provided by SSE are summarized as under:

Items	DTM/14K (SSE/P. Way/KGS)
Division	BSP
Track Maintenance	Mechanized
Jurisdiction	790/33-793/33
Gang length	03 Km
TKM (M/L)	(6 + 6) Km
RYL	-
GMT	47.67/Up, 29.71/Dn
Poor visibility	3.00 Km
LWR length	7.449 Km
No. of curves	12
Degree of curve	$4\text{-}5.67^0$
Length of curve	1125 mtr.
Girder bridge	03
Length of G/Bridges	97.6 m
Station yard	-
L/C Gate	-
Distressing Temp.	42°C
Rail Temperature	(7° - 62°)
Stationary Patrolling	Nil

2.7.2 Cadre Position & Jurisdiction of DTM/Gang under SSE(P. Way)/KGS :

S#	DTM/ Gang No.	Km.	Sanction Track Maintainer					Actual Track Maintainer					Vacancy				
			I	II	III	IV	Total	I	II	III	IV	Total	I	II	III	IV	Total
1	DTM 1BA	720/4-726/39	3	7	18	15	**43**	2	7	18	14	**41**	1	0	0	1	**2**
2	DTM 2BA	726/39-733/35	3	2	10	19	**34**	3	2	10	18	**33**	0	0	0	1	**1**
3	DTM 3BA	733/35-739/27	2	1	10	22	**35**	1	1	9	17	**28**	1	0	1	5	**7**
4	DTM 4BA	739/27-746/25	1	5	4	24	**34**	1	5	4	22	**32**	0	0	0	2	**2**
5	DTM 5BA	746/25-752/5	3	9	20	25	**57**	3	8	18	21	**50**	0	1	2	4	**7**
6	DTM 6BA	752/5-759/25	2	2	4	27	**35**	2	2	2	26	**32**	0	0	2	1	**3**
7	Gang No.7K	759/25-765/4	2	3	5	8	**18**	2	1	4	8	**15**	0	2	1	0	**3**
8	Gang No.8K	765/4-771/14	2	4	2	11	**19**	1	3	0	10	**14**	1	1	2	1	**5**
9	Gang No.9K	771/14-778/6	2	2	4	10	**18**	1	2	1	9	**13**	1	0	3	1	**5**
10	Gang	778/6-	2	8	5	18	**33**	2	5	4	14	**25**	0	3	1	4	**8**

	No.10K	784/33															
11	Gang No.11K	Store Gang	0	3	6	9	**18**	0	1	6	5	**12**	0	2	0	4	**6**
12	Gang No.12K	784/33-787/33	2	2	4	7	**15**	1	0	4	5	**10**	1	2	0	2	**5**
13	Gang No.13K	787/33-790/33	2	2	4	11	**19**	1	2	4	8	**15**	1	0	0	3	**4**
14	Gang No.14K	790/33-793/33	1	2	2	19	**24**	1	1	2	16	**20**	0	1	0	3	**4**
15	Gang No.15K	793/33-796/43	2	0	1	19	**22**	1	0	0	18	**19**	1	0	1	1	**3**
	F-8		0	0	2	18	**20**	0	0	1	3	**4**	0	0	1	15	**16**
	F-9		0	3	1	6	**10**	0	3	1	6	**10**	0	0	0	0	**0**
Total			**29**	**55**	**102**	**268**	**454**	**22**	**43**	**88**	**220**	**373**	**7**	**12**	**14**	**48**	**81**

2.7.3 **Level Crossing Position under SSE(P. Way)/KGS :** There are 10 Engineering gates under the jurisdiction of SSE/P-Way/KGS. 04 Track Maintainers are utilized in 08 hrs shift (01 TM/shift + 01 RG/LR) per LC gate.

Unit	S#	Section	LC No	Location	Duty Roster
SSE/P-Way/KGS	1	BSP-USL	BK-3	724/9-11	8 Hrs.
	2	USL-GTK	BK-6	729/19-21	8 Hrs.
	3	GTK-KLTR	BK-9	735/ 9-11	8 Hrs.
	4	GTK-KLTR	BK-10	738/7-9	8 Hrs.
	5	KLTR-KGB	BK-13	743/ 21-23	8 Hrs.
	6	KLTR-KGB	BK-15	747/ 7-9	8 Hrs.
	7	KGB-SLKR	BK-18	751/13-15	8 Hrs.
	8	KGB-SLKR	BK-19	753/1-3	8 Hrs.
	9	KGB-SLKR	BK-21	756/11-13	8 Hrs.
	10	TGQ-KGS	BK-29	781/4-5	8 Hrs.

2.7.4 **Push Trolley Position under SSE(P. Way)/KGS :**

Sr.No.	Designation	MT/PT	Headquarter	Existing Numbers	New Allotted Numbers
1	JE (Pway) KGB	PT	KGB	37	BSP 40
2	Sr. SE (Pway) KGS	PT	KGS	117	BSP 41
3	JE (Pway) KGS	PT	KGS	112	BSP 42

04 Track Maintainers are utilized in normal section (Sl. No.-1) and 06 Track Maintainers are utilized in ghat section(Sl. No.-2 and 3) for Push Trolley activity.

2.7.5 **Stores under SSE(P. Way)/KGS :** There are two Stores under SSE/P-Way/KGS. One is at KGS and other is at Uslapur. There are 1188 Store items (both Stock and Non-Stock) present in each Store. In the year 2018-19, materials received from Track, DSD/BSP and other P-Way units is 312 times, and materials issued for Work site is 1355 times in a year.

The staffs deployed in Store section are dealt with loading/unloading of store items, arranging in proper order, maintaining of concerning registers, transporting of materials to the site etc. Materials released from Track for DS-8 is 49 times and materials consumed in track is 147 times. Besides it, 3-4 staffs per day are deployed to look after the movable store items at site.

2.7.6 Site observation of DTM/ Gang No.14K under SSE(P. Way)/KGS :

The position of gang No 14K of SSE(P-Way)/KGS under ADEN/PND during field observation are summarized as under:

I. As per cadre position available with SSE/P. Way/KGS, 389 Track maintainers on roll are deployed against sanctioned cadre of 477. DTM No.-14K has 20 on roll Track maintainers against total sanction of 24 which is deployed between KGS-BHTK section (Km 790/33-793/33)

II. Out of 20 Track maintainer on roll as per Attendance Register available with Gang No.14K, Average Trackman on leave/sick/absent per day is 3.

III. Average Trackman being utilized as Mate/Key man/Patrolman per day is 6.

IV. Average Trackman found engaged with track maintenance activities per day is 11.

V. During last one year, the gang worked for 309 days and 4433 Trackman days are engaged in that period.

VI. As the section is completely Ghat section, Moonson/Cold weather Patrolling, De-weeding of track & drain cleaning becomes a major part of maintenance activities.

VII. Lubrication of rail joints/ curves is a regular activity, and 01 Trackman per day is being utilized for this activity.

2.7.7 Performance of Track Machine under SSE(P. Way)/KGS :

Sectional Tamping Detail in the jurisdiction of : SSE/PW/IC/KGS Line : UP Location : 720 km 540 m to 796 km 910 m Track Length : 75.306 km Line : DN Location : 720 km 540 m to 796 km 910 m Track Length : 74.846 km							
Line	Location From		Location To		Length (in meter)	Last Tamping	Machine Type
	km	m	km	m			
DN	720	540	720	710	170	08/2016	WST
DN	720	710	721	972	958	08/2017	WST
DN	721	972	722	130	168	08/2016	WST
DN	722	130	722	280	150	11/2016	UNIMAT4S
DN	722	280	722	285	5	09/2013	UNIMAT4S
DN	722	285	722	400	115	11/2016	UNIMAT4S
DN	722	400	722	910	510	08/2016	UNIMAT4S
DN	722	910	723	180	233	08/2016	WST
DN	723	180	723	620	440	08/2017	WST
DN	723	620	723	690	70	08/2016	WST
DN	723	690	724	31	323	12/2014	CSM
DN	724	31	724	340	309	04/2013	UNIMAT4S
DN	724	340	724	910	570	01/2016	CSM
DN	724	910	725	190	310	12/2014	CSM
DN	725	190	725	300	110	11/2014	UNIMAT4S
DN	725	300	725	470	170	12/2014	UNIMAT
DN	725	470	725	615	145	09/2017	UNIMAT
DN	725	615	725	630	15	11/2016	UNIMAT
DN	725	630	725	650	20	12/2014	UNIMAT4S
DN	725	650	725	830	180	11/2014	UNIMAT4S
DN	725	830	726	130	332	10/2014	UNIMAT4S
DN	726	130	726	250	120	09/2013	UNIMAT4S
DN	726	380	727	70	648	10/2014	UNIMAT4S
DN	727	70	727	450	380	10/2014	CSM
DN	727	450	727	520	70	02/2016	UNIMAT4S
DN	727	520	727	700	180	10/2016	UNIMAT4S
DN	727	700	728	10	281	02/2016	WST
DN	728	10	729	560	1570	08/2017	WST
DN	729	560	729	620	60	02/2016	WST
DN	729	620	731	320	1635	07/2017	WST
DN	731	320	733	370	1915	08/2017	WST
DN	733	370	733	660	290	05/2013	WST
DN	733	660	733	850	190	11/2014	UNIMAT4S
DN	733	870	733	950	80	02/2015	UNIMAT4S
DN	733	950	734	140	260	11/2016	UNIMAT4S
DN	734	140	734	650	510	02/2015	CSM
DN	734	900	734	930	30	05/2013	CSM
DN	734	930	735	200	225	02/2015	CSM
DN	735	200	736	10	748	11/2016	WST

Line	Location From		Location To		Length (in meter)	Last Tamping	Machine Type
	km	m	km	m			
DN	736	10	737	100	1070	08/2017	WST
DN	737	100	738	310	1118	06/2016	WST
DN	738	310	740	290	1932	06/2016	CSM
DN	740	290	740	320	30	02/2015	CSM
DN	740	320	741	160	831	06/2016	CSM
DN	741	160	741	852	692	06/2016	UNIMAT
DN	741	852	742	190	302	10/2017	UNIMAT
DN	742	190	742	900	710	01/2015	UNIMAT
DN	742	900	743	150	292	10/2017	UNIMAT
DN	743	150	744	38	788	11/2016	CSM
DN	744	38	744	490	452	01/2015	CSM
DN	744	490	747	230	2598	11/2016	CSM
DN	747	230	747	240	10	05/2016	CSM
DN	747	240	747	770	530	11/2016	CSM
DN	747	770	748	680	855	05/2016	CSM
DN	748	680	748	970	290	02/2015	WST
DN	748	970	749	290	303	02/2015	CSM
DN	749	290	749	500	210	02/2015	UNIMAT
DN	749	500	749	620	120	10/2015	UNIMAT
DN	749	630	749	750	120	10/2015	UNIMAT
DN	749	800	750	580	792	02/2015	UNIMAT
DN	750	580	750	850	270	10/2015	UNIMAT
DN	750	850	750	910	60	02/2015	CSM
DN	750	910	751	440	467	11/2016	CSM
DN	751	440	751	460	20	02/2015	CSM
DN	751	460	753	50	1550	11/2016	CSM
DN	753	50	753	80	30	11/2016	WST
DN	753	80	754	920	1794	08/2017	WST
DN	754	920	754	990	70	11/2016	WST
DN	754	990	755	590	590	08/2017	WST
DN	755	590	755	900	310	11/2016	WST
DN	755	900	756	700	789	11/2016	CSM
DN	756	700	757	120	404	02/2015	CSM
DN	757	660	758	460	777	02/2015	CSM
DN	759	210	760	0	790	02/2017	CSM
DN	760	0	764	928	4928	09/2017	CSM
DN	765	180	765	295	115	10/2017	UNIMAT
DN	765	365	766	121	756	09/2017	CSM
DN	766	340	766	661	321	09/2017	CSM
DN	766	720	771	500	4780	09/2017	CSM
DN	772	339	775	161	2822	05/2018	CSM
DN	775	370	776	100	730	05/2018	CSM
DN	776	370	779	60	2690	05/2018	CSM
DN	779	140	783	340	4200	05/2018	CSM
DN	783	400	784	500	1100	05/2016	CSM
DN	784	540	784	710	170	12/2016	UNIMAT4S
DN	784	840	785	1000	1181	05/2016	CSM
DN	785	1000	786	40	9	07/2013	CSM
DN	786	50	786	950	900	07/2013	CSM

Line	Location From		Location To		Length (in meter)	Last Tamping	Machine Type
	km	m	km	m			
DN	786	950	787	38	65	05/2016	WST
DN	787	38	787	455	417	02/2017	WST
DN	787	455	789	440	1942	02/2017	CSM
DN	789	440	789	571	131	02/2017	WST
DN	789	571	791	170	1638	05/2016	WST
DN	791	170	793	140	1772	05/2016	CSM
DN	793	140	795	640	2500	04/2016	CSM
DN	795	640	796	410	770	05/2016	UNIMAT
DN	796	410	796	430	20	11/2013	CSM
DN	796	430	796	730	300	06/2016	CSM
DN	796	730	796	880	150	05/2016	CSM
UP	720	540	721	4	614	08/2017	WST
UP	721	4	721	480	476	08/2017	CSM
UP	721	480	721	590	110	02/2018	CSM
UP	721	590	721	660	70	09/2017	CSM
UP	721	660	722	70	395	02/2018	CSM
UP	722	70	722	130	60	09/2017	CSM
UP	722	130	722	250	120	02/2018	CSM
UP	722	250	722	450	200	08/2017	CSM
UP	722	450	722	475	25	11/2014	WST
UP	722	475	726	50	3576	08/2017	WST
UP	726	50	726	170	120	08/2016	WST
UP	726	170	726	190	20	10/2014	CSM
UP	726	190	726	210	20	10/2014	UNIMAT4S
UP	726	210	726	270	60	05/2013	UNIMAT4S
UP	726	270	726	400	130	10/2016	UNIMAT4S
UP	726	400	727	180	747	08/2016	UNIMAT4S
UP	727	180	727	300	120	11/2016	UNIMAT4S
UP	727	300	729	600	2264	08/2016	CSM
UP	729	600	729	634	34	05/2013	WST
UP	729	634	730	130	478	02/2016	CSM
UP	730	130	730	240	110	02/2016	WST
UP	730	240	730	750	510	07/2017	WST
UP	730	750	731	350	589	08/2017	WST
UP	731	350	732	50	630	07/2017	WST
UP	732	50	732	80	30	08/2016	WST
UP	732	80	732	940	860	07/2017	WST
UP	732	940	732	977	37	02/2016	WST
UP	732	977	733	735	754	07/2017	UNIMAT
UP	733	735	733	840	105	09/2017	UNIMAT
UP	733	840	733	950	110	11/2016	UNIMAT
UP	733	950	734	810	856	03/2015	UNIMAT4S
UP	734	810	735	70	203	11/2016	UNIMAT4S
UP	735	70	735	150	80	03/2015	WST
UP	735	150	735	640	490	07/2017	WST
UP	735	640	736	330	629	08/2017	WST
UP	736	330	736	970	640	06/2016	WST
UP	736	970	736	975	5	03/2015	CSM
UP	736	975	737	320	321	06/2016	WST

Line	Location From		Location To		Length (in meter)	Last Tamping	Machine Type
	km	m	km	m			
UP	737	320	737	670	350	08/2017	UNIMAT
UP	737	670	737	800	130	09/2017	UNIMAT
UP	737	800	738	860	943	08/2017	WST
UP	738	860	739	30	216	06/2016	WST
UP	739	30	739	430	400	07/2017	WST
UP	739	430	739	440	10	05/2016	WST
UP	739	440	741	310	1794	07/2017	WST
UP	741	310	741	902	592	08/2017	WST
UP	741	902	741	910	8	03/2015	WST
UP	741	910	742	50	164	10/2017	UNIMAT
UP	742	150	742	600	450	03/2015	UNIMAT
UP	742	600	742	760	160	10/2017	UNIMAT
UP	742	760	742	990	230	03/2015	UNIMAT
UP	742	990	743	210	262	10/2017	UNIMAT
UP	743	210	744	540	1221	08/2017	UNIMAT
UP	744	540	746	40	1444	08/2017	WST
UP	746	40	746	380	340	02/2015	WST
UP	746	380	746	980	600	11/2016	WST
UP	746	980	749	620	2589	08/2017	WST
UP	749	620	749	640	20	05/2013	WST
UP	749	750	750	440	702	02/2015	UNIMAT4S
UP	750	440	750	740	300	12/2016	UNIMAT4S
UP	750	740	750	920	180	11/2016	UNIMAT4S
UP	750	920	751	90	91	02/2015	CSM
UP	751	90	751	430	340	11/2016	CSM
UP	751	430	751	460	30	02/2015	CSM
UP	751	460	752	500	1036	11/2016	CSM
UP	752	500	753	60	511	02/2015	CSM
UP	753	60	753	80	20	02/2015	WST
UP	753	80	757	130	3877	08/2017	WST
UP	757	130	757	450	320	02/2015	WST
UP	757	450	757	490	40	12/2015	UNIMAT
UP	757	490	757	590	100	02/2013	UNIMAT
UP	757	700	757	760	60	12/2015	UNIMAT
UP	758	520	758	550	30	03/2015	UNIMAT
UP	758	550	758	610	60	12/2015	UNIMAT
UP	758	610	758	660	50	11/2015	UNIMAT
UP	758	660	758	740	80	12/2015	UNIMAT
UP	758	740	758	820	80	11/2015	UNIMAT
UP	758	920	759	978	1018	09/2017	CSM
UP	759	980	760	2	22	02/2017	CSM
UP	760	2	760	600	598	09/2017	CSM
UP	760	600	764	300	3700	02/2017	CSM
UP	764	300	765	190	890	08/2016	CSM
UP	773	360	774	7	647	01/2018	MPT
UP	774	10	774	120	110	02/2017	CSM
UP	774	120	775	130	1010	09/2017	CSM
UP	775	170	776	280	1110	04/2016	UNIMAT
UP	776	364	777	450	1086	05/2018	CSM

Line	Location From		Location To		Length (in meter)	Last Tamping	Machine Type
	km	m	km	m			
UP	778	510	778	990	480	05/2018	CSM
UP	783	360	783	590	230	05/2018	UNIMAT4S
UP	783	670	784	320	650	08/2013	UNIMAT4S
UP	784	320	784	450	130	05/2018	UNIMAT4S
UP	784	450	784	500	50	08/2013	UNIMAT
UP	784	500	784	685	185	11/2017	UNIMAT
UP	784	685	784	820	135	08/2013	CSM
UP	784	820	785	420	614	07/2013	CSM
UP	785	420	788	40	2542	05/2016	CSM
UP	788	40	788	300	260	07/2013	CSM
UP	788	440	788	465	25	07/2013	CSM
UP	788	465	789	170	686	04/2016	CSM
UP	789	170	790	0	835	05/2016	CSM
UP	790	0	790	480	480	02/2017	CSM
UP	790	480	790	690	210	05/2016	CSM
UP	790	750	791	100	387	07/2013	WST
UP	791	100	791	140	40	07/2013	CSM
UP	791	140	792	200	962	05/2016	CSM
UP	792	200	792	440	240	07/2013	CSM
UP	792	440	793	200	760	05/2016	CSM
UP	793	200	793	920	720	04/2016	CSM
UP	793	920	793	1170	250	07/2013	CSM
UP	793	1170	795	50	804	02/2017	CSM
UP	795	50	795	330	280	04/2016	CSM
UP	795	330	796	252	898	02/2017	CSM
UP	796	252	796	260	8	04/2016	CSM
UP	796	260	796	380	120	04/2016	UNIMAT
UP	796	380	796	410	30	04/2016	CSM
UP	796	410	796	510	100	02/2017	CSM
UP	796	510	796	730	220	04/2016	CSM
UP	796	730	796	800	70	09/2013	UNIMAT
UP	796	800	796	910	110	05/2016	WST
Total					130998		

2.8 Monthly Work Progress of sample DTM/Gang beat 14K under SSE (P. Way) Unit/KGS of last one year (01.12.2017 – 30.11.2018):

Track Maintainers involved in various type of maintenance activities is mainly classified in four categories. Such are Activities affected by Traffic Density(T), Routine Activities Unaffected by Traffic Density(R), Site Specific Activities(S) and Auxiliaries Maintenance Activities (M). The monthly work progress of sample gang No.25 under SSE(P-Way)/BRH unit of last one year (January'18- December'18) are as given below:
The monthly work progress of sample gang of SSE(P-Way)/KGS under ADEN/PND of last one year (December'17-November'18) are as given below:

2.8.1 Monthly Work Progress of DTM/Gang beat 14K (December 2017):

Activities affected by Traffic Density(T)	
Duty	**Trackmen**
Slack Attention Bad Spots	11
Through Packing/Attention	6
Total	**17**

Routine Activities Unaffected by Traffic Density(R)	
Duty	**Trackmen**
Deweeding Of Track	30
On Keyman Duty	17
On Usfd Work	7
With Keyman	1
Total	**55**

Site Specific Activities(S)	
Duty	**Trackmen**
Bridge Maintenance	4
Trolly Refuge Repair Work	12
Work Site Protection	4
Total	**20**

Auxiliaries Maintenance Activities (M)	
Duty	**Trackmen**
Patrolling-Cold Weather	55
Watchman	34
Total	**89**

Hence Total Trackman-days utilized =17+55+20+89=181

2.8.2 Monthly Work Progress of DTM/Gang beat 14K (January 2018):

Activities affected by Traffic Density(T)	
Duty	**Trackmen**
Gauging Work	3
Slack Attention Bad Spots	19
Total	**22**

Routine Activities Unaffected by Traffic Density(R)	
Duty	**Trackmen**
Deweeding Of Track	9
On Keyman Duty	17
Total	**26**

Site Specific Activities(S)	
Duty	**Trackmen**
Bridge Maintenance	9
Work Site Protection	6
Total	**15**

Auxiliaries Maintenance Activities (M)	
Duty	**Trackmen**
Patrolling-Cold Weather	61
Watchman	34
Total	**95**

Hence Total Trackman-days utilized =22+26+15+95=158

2.8.3 Monthly Work Progress of DTM/Gang beat 14K (February 2018):

Activities affected by Traffic Density(T)	
Duty	**Trackmen**
Casual Sleepers Renewal	6
Cleaning , Dressing ,Boxing Of Ballast	69
Slack Attention Bad Spots	17
Total	**92**

Routine Activities Unaffected by Traffic Density(R)	
Duty	**Trackmen**
Loading Leading Unloading Of P Way Material	2
On Keyman Duty	17
Total	**19**

Site Specific Activities(S)	
Duty	**Trackmen**
-	0
Total	**0**

Auxiliaries Maintenance Activities (M)	
Duty	**Trackmen**
Patrolling-Cold Weather	51
Watchman	15
Total	**66**

Hence Total Trackman-days utilized = 92+19+0+66=177.

2.8.4 Monthly Work Progress of DTM/Gang beat 14K (March 2018):

Activities affected by Traffic Density(T)	
Duty	**Trackmen**
Casual Sleepers Renewal	23
Cleaning , Dressing ,Boxing Of Ballast	54
Slack Attention Bad Spots	35
Sleeper Carrying	9
Total	**121**

Routine Activities Unaffected by Traffic Density(R)	
Duty	**Trackmen**
Deweeding Of Track	22
Loading Leading Unloading Of P Way Material	1
Lubrication Of Erc	9
Material Stacking/Collection	9
On Keyman Duty	28
Total	**69**

Site Specific Activities(S)	
Duty	**Trackmen**
Bridge Maintenance	18
Total	**18**

Auxiliaries Maintenance Activities (M)	
Duty	**Trackmen**
Patrolling-Cold Weather	2
Watchman	6
Total	**8**

Hence Total Trackman-days utilized = 121+69+18+8= 216.

2.8.5 Monthly Work Progress of DTM/Gang beat 14K (April 2018):-

Activities affected by Traffic Density(T)	
Duty	**Trackmen**
Cleaning , Dressing ,Boxing Of Ballast	52
Slack Attention Bad Spots	31
With Welding Team	16
Total	**99**

Routine Activities Unaffected by Traffic Density(R)	
Duty	**Trackmen**
Clearance Of Catch Water Drain	8
Clearance Of Side Drain	62
Erection Of Caution Board	4
On Keyman Duty	30
Watching Caution Spots	10
Total	**114**

Site Specific Activities(S)	
Duty	**Trackmen**
Bridge Maintenance	8
Work Site Protection	23
Total	**31**

Auxiliaries Maintenance Activities (M)	
Duty	**Trackmen**
Patrolling-Hot Weather	9
Watchman	27
Total	**36**

Hence Total Trackman-days utilized = 99+114+31+36= 280

2.8.6 Monthly Work Progress of DTM/Gang beat 14K (May 2018):-

Activities affected by Traffic Density(T)	
Duty	**Trackmen**
Rail Carrying	3
Slack Attention Bad Spots	4
Total	**7**

Routine Activities Unaffected By Traffic Density(R)	
Duty	**Trackmen**
Clearance Of Side Drain	76
Loading Leading Unloading Of P Way Material	2
Material Stacking/Collection	9
On Keyman Duty	25
Watching Caution Spots	2
With Keyman	1
Total	**115**

Site Specific Activities(S)	
Duty	**Trackmen**
Total	**0**

Auxiliaries Maintenance Activities (M)	
Duty	**Trackmen**
Patrolling-Hot Weather	25
Training/Ic/Rc	36
Watchman	23
Total	**84**

Hence Total Trackman-days utilized =7+115+0+84 =206

2.8.7 Monthly Work Progress of DTM/Gang beat 14K (June 2018):-

Activities affected by Traffic Density(T)	
Duty	**Trackmen**
Gauging Work	8
Slack Attention Bad Spots	6
With Welding Team	5
Total	**19**

Routine Activities Unaffected By Traffic Density(R)	
Duty	**Trackmen**
Attention To Rain Cuts	33
Clearance Of Side Drain	31
Deweeding Of Track	16
Loading Leading Unloading Of P Way Material	25
On Keyman Duty	24
On Usfd Work	3
Watching Caution Spots	2
With Keyman	5
Total	**139**

Site Specific Activities(S)	
Duty	**Trackmen**
Total	0

Auxiliaries Maintenance Activities (M)	
Duty	**Trackmen**
Patrolling-Hot Weather	4
Patrolling-Monsoon	28
Training/Ic/Rc	8
Watchman	19
Total	**59**

Hence Total Trackman-days utilized =19+139+0+59=217.

2.8.8 Monthly Work Progress of DTM/Gang beat 14K (July 2018):-

Activities affected by Traffic Density(T)	
Duty	**Trackmen**
Slack Attention Bad Spots	3
Total	**3**

Routine Activities Unaffected By Traffic Density(R)	
Duty	**Trackmen**
Clearance Of Side Drain	21
Deweeding Of Track	7
Loading Leading Unloading Of P Way Material	4
On Keyman Duty	20
On Usfd Work	21
Total	**73**

Site Specific Activities(S)	
Duty	**Trackmen**
Bridge Maintenance	7
Work Site Protection	6
Total	**13**

Auxiliaries Maintenance Activities (M)	
Duty	**Trackmen**
Patrolling-Monsoon	101
Total	**101**

Hence Total Trackman-days utilized =3+73+13+101=190

2.8.9 Monthly Work Progress of DTM/Gang beat 14K (August 2018):-

Activities affected by Traffic Density(T)	
Duty	**Trackmen**
Slack Attention Bad Spots	23
Total	**23**

Routine Activities Unaffected By Traffic Density	
Duty	**Trackmen**
Clearance Of Side Drain	5
On Keyman Duty	27
Total	**32**

Site Specific Activities	
Duty	**Trackmen**
Total	**0**

Auxiliaries Maintenance Activities (M)	
Duty	**Trackmen**
Patrolling-Monsoon	265
Total	**265**

Hence Total Trackman-days utilized = 23+32+0+265= 320.

2.8.10 Monthly Work Progress of DTM/Gang beat 14K (September 2018):-

Activities affected by Traffic Density(T)	
Duty	**Trackmen**
Slack Attention Bad Spots	0
Total	**0**

Routine Activities Unaffected By Traffic Density(R)	
Duty	**Trackmen**
Deweeding Of Track	3
On Keyman Duty	24
On Usfd Work	10
Total	**37**

Site Specific Activities(S)	
Duty	**Trackmen**
Total	**0**

Auxiliaries Maintenance Activities (M)	
Duty	**Trackmen**
Patrolling-Monsoon	188
Total	**188**

Hence Total Trackman-days utilized = 0+37+0+188=225.

2.8.11 Monthly Work Progress of DTM/Gang beat 14K (October 2018):-

Activities affected by Traffic Density(T)	
Duty	**Trackmen**
Slack Attention Bad Spots	7
Total	**7**

Routine Activities Unaffected By Traffic Density(R)	
Duty	**Trackmen**
Deweeding Of Track	55
Loading Leading Unloading Of P Way Material	3
On Keyman Duty	10
Total	**68**

Site Specific Activities(S)	
Duty	**Trackmen**
Total	**0**

Auxiliaries Maintenance Activities (M)	
Duty	**Trackmen**
	0
Total	**0**

Hence Total Trackman-days utilized = 7+68+0+0=75.

2.8.12 Monthly Work Progress of DTM/Gang beat 14K (November 2018):-

Activities affected by Traffic Density(T)	
Duty	**Trackmen**
Slack Attention Bad Spots	28
With Welding Team	6
Total	**34**

Routine Activities Unaffected By Traffic Density(R)	
Duty	**Trackmen**
Deweeding Of Track	31
Loading Leading Unloading Of P Way Material	4
On Keyman Duty	18
On Usfd Work	13
With Keyman	1
Total	**67**

Site Specific Activities(S)	
Duty	**Trackmen**
Total	**0**

Auxiliaries Maintenance Activities (M)	
Duty	**Trackmen**
Patrolling-Cold Weather	33
Training/Ic/Rc	7
Watchman	4
Total	**44**

Hence Total Trackman-days utilized =34+67+0+44 = 145

CHPTER-III

3.0 CRITICAL ANALYSIS & RECOMMENDATIONS :-

3.1 The actual staff strength of SSE (P. Way) unit Khongsara over Bilaspur Division is **389** as against the sanctioned strength of **477** along with vacancies of **88** as on 01.11.2018. The requirement of P. Way staff (Trackman) has been assessed based on the present workload, in view of mechanization of track, direct observations and discussion held with SSE/JE/PWS/Mate(P. Way). Major works of SSE(P. Way) are being carried out under Zonal contract, however the repair works like attention to bad spots, lubrication of rails, patrolling duty, attending accident relief/run over cases etc. are attended by P. Way staff. Thus, the workload of SSE(P. Way) units has reduced and as such the present review of workload has been undertaken.
Introduction of Track Machine has reduced the workload of Track Maintainers drastically. In the year 2018, about 131Km track length maintenance was done by various Track Machines.(Para 2.7.6).

In view of above facts, the assessment of need base requirement of Gang Strength (Trackman) for SSE(P.Way) Khongsara unit in Bilaspur Division has been assessed as under:

3.2 Monthly progress of sample DTM/gang No.14K under SSE/P-way/KGS for one year (December 2017- November 2018) is tabulated as follows:-

Month	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Total**
Trackman - days	181	158	177	216	280	206	217	190	320	225	84	145	**2399**

3.3.1 Requirement of Track maintainers under SSE/P-way/KGS :-

Summary of Track Maintainer Performance for last one year (01.12.17 to 30.11.18) of sample Gang No./14K is as under:-

Type of Activity	**Total Trackman utilized**
Yearly utilization for total activities (T+R+ S +M)	2399
Avg. Trackman utilized per day	**08**

As per existing work load of above one sample Gang, average Track Maintainers utilized for track maintenance per day per Gang is 2399 mandays / 294 working days =**08** including Mate and Keyman.

Beside the above Track maintenance activities, an average of **05** Track Maintainers per day from each Gang/DTM are being utilized for patrolling duty, assisting Artisan staff/welding team etc. It is found that patrolling duty is carried out in 08 Gangs and 06 DTM in Monsoon season only under this P-Way unit for which 112 mandays (14 Gang/DTM x 2 TM x 4 month=112 mandays) are required.

01 Track Maintainer per Gang/DTM is being utilized required for chasing of Engineering Block and coordination between SM/SCR on duty and site Supervisors.

Average **02** Track Maintainers per day from each Gang/DTM are being utilized to meet the emergency/precautionary work like boulder/tree falling, surveying vulnerable

locations, embankments, cuttings, level crossings and bridges, checking sections of track for correct distance apart and right height, surveying sections to identify maintenance needs etc.

Hence, average total Track Maintainers utilized per day= 08+05+01+02=16

Average Trackman required for track maintenance / gang including LR @ 12.5 % =16+2=18.

So Average Trackman required for track maintenance/DTM =18 x 2=36.

The total DTM under SSE/P-Way KGS is 10. After applying the same for total section under SSE/P-Way/KGS division, the total requirement of Trackman comes to 36x10=360.

3.3.2 Requirement of Track maintainers for LC gate activities :-

The requirement of Trackman for each Level Crossing for dealing Level Crossing gate related activities will be 03+01 LR/RG=04. Total number of LC gate in the jurisdiction of SSE/P-Way KGS is 10 (Para-2.7.3). Hence total manpower required to deal 10 Level Crossing activities comes to 10 x 4 = **40**.

3.3.3 Requirement of Track maintainers for Push Trolley activities :-

The requirement of trackman per Push Trolley is 04+01 LR = 05. There are 03 Push Trolleys utilized under SSE/P-Way/KGS (Para-2.7.4).
Hence total manpower required to deal 03 Push Trolley activities comes to 03 x 5 = 15.

3.3.4 Requirement of Track maintainers for Store activities :-

There are two Stores under SSE/P-Way/KGS. One is at KGS and other is at Uslapur. There are 1188 Store items (both Stock and Non-Stock) present in each Store. The staffs deployed in Store section are dealt with loading/unloading of store items, arranging in proper order, maintaining of concerning registers, transporting of materials to the site, DS-8 of released materials and watchman duty of movable stores at site etc.(Para 2.7.5)

The requirement of Trackman for each store gang as assessed by Work Study team for dealing store/office related activities will be 08+01 LR = **09**. There are two stores, one at section and one at HQ office. Hence total manpower required to deal 02 gang activities comes to 09 x 2 = **18**.

So, grand total requirement of Track maintainer under SSE/P-Way KGS comes to=360+40+15+18 =433

The sanctioned cadre of Track Maintainer category in SSE (P. Way)/KGS unit is 454.
Hence, the total reduction in sanctioned cadre of Trackman will be 454 –433 = 21.

Hence, it is recommended that 21 identified surplus vacant posts of Track Maintainer should be surrendered from Engineering Department of Bilaspur Division.

3.4 Requirement of Supervisory staffs at SSE/P-Way/KGS unit :-

The jurisdiction of SSE/P-Way unit Khongsara is between 720/4 - 796/43 (Total ETKM:372.342). The total section has 06 DTM and 09 Gangs including 01 site store gang. Considering the work load of Supervisors, work study team proposed 01 SSE required for overall in-charge of office, periodical inspection, preparation of proposals and estimates and 01 SSE/JE per DTM for assisting to incharge and Site/Routine/Auxiliary maintenance work. 01 SSE/JE is utilized for

special work like Track Machine/STM programme. Hence, 12 SSE/JE is justified for smooth running of SSE/P-Way unit/Khongsara.

3.5 Requirement of Ministerial staffs at SSE/P-Way/KGS unit :-

At present 02 Sr. Clerk are utilised for dealing establishment matters of staff like preparation of Muster Roll/TA bill/ Qtr. Occupation/vacation memos, issue of pass/PTO, D&A cases, correspondence work and all works related with Stores like maintenance of DMTR/Ledger, preparation of requisition, collection/supply of material, disposal of scrap material which is justified.

3.6 Requirement of Artisan staffs at SSE/P-Way/KGS unit :-

Painter:- Painter category is utilized for painting activities of Engineering materials and at present there is no Painter at SSE/P-Way units. As Painting work comes under Non-core activity and not related with direct train movement.
Hence, **the Work Study team is proposed to outsource this activity and 01 vacant post of Painter may be surrendered**.

Welder:- Existing 01 Welder is utilized for rail welding work against total sanction of 01 which is found justified.

Grinder:- Existing 01 Grinder is utilized for grinding work against total sanction of 01 which is found justified.

Black Smith:- Existing 02 Black Smith is utilized for Smithy work against total sanction of 03. The Work Study team is found justified requirement of 03 Black Smith to cover the works of 06 DTM and 08 Gangs between USL-KGS.

Luter:- Existing 01 Luter is utilized for luting activity during welding against total sanction of 01 which is found justified.
So, grand total requirement of Artisan staff under SSE/P-Way KGS comes to=01+01+03+01 =06.

3.7 Requirement of staffs for Chowkidar activities :-

Chowkidar:- Chowkidar staff are utilized in EI roster as care taker in the offices, stores etc. Existing 02 Chowkidar is utilized for Chowkidar activity against total sanction of 02 which is found justified.

3.8 Total Requirement of staffs for for SSE(P-Way)/Khongsara:-

Section /Works	Supv. (SSE/JE)	Min. Staff (OS/Clerk	Artisan Staff (EBS/ Luter/ Grinder/ Painter)	Track maintainer				Chowkidar
				Store	LC gate	Trolley	Field main.	
For Office Work :								
In-Charge of Office	01	00	00	00	00	00	00	00
Sectional In-charge	11	00	00	00	00	00	00	00
Office/Establishment work	00	01	00	00	00	00	00	00
Store work	00	01	00	16	00	00	00	00
Office Chowkidar	00	00	00	00	00	00	00	00
Sub- Total Requirement of staff	**12**	**02**	**00**	**16**	**00**	**00**	**00**	**00**

For Field work:								
Welding, Lutering, Grinding and Smithy activities	00	00	06	00	00	00	00	00
Level Crossing activities	00	00	00	00	30	00	00	00
Motor Trolley/Push Trolley activities	00	00	00	00	00	12	00	00
Track maintenance work	00	00	00	00	00	00	290	00
Chowkidar activity	00	00	00	00	00	00	00	02
Sub- Total Requirement of staff	**00**	**00**	**06**	**00**	**30**	**12**	**290**	**02**
Total Requirement	**12**	**02**	**06**	**16**	**30**	**12**	**290**	**02**
RG/LR	-	-	-	02	10	03	70	-
Grand Total	**12**	**02**	**06**	**18**	**40**	**15**	**360**	**02**

3.9 Category wise Requirement of Staff at P-way unit/KGS:-

Supervisors	12
Ministerial staff	02
Artisan staff	06
Track Maintainer	433
Chowkidar	02
Total Requirement	**455**

3.10 Existing & Proposed deployment/Surrender of surplus staffs:-

Category	S#	Designation	Level	Sanctioned	Actual	Proposed	Surplus
Supervisory	1	SSE	L-7	8	4	8	00
	2	JE	L-6	4	5	4	00
Ministerial	3	Jr .Clerk	L-2	1	0	1	00
	4	OS	L-6	1	2	1	00
Artisan	5	Painter	L-5	1	0	0	01
	6	Welder	L-5	1	1	1	00
	9	Grinder	L-5	1	1	1	00
	10	Luter	L-4	1	1	1	00
	11	EBS	L-6	3	2	3	00
	14	Chowk1dar	L-1	2	0	2	00
Track Maintainer	15	Track Maintainer-I	L-5	29	22	29	00
	16	Track Maintainer-II	L-4	55	43	55	00
	17	T rack Maintainer-III	L-2	102	89	102	00
	18	Track Maintainer-IV	L-1	268	219	247	21
TOTAL				**477**	**389**	**455**	**22**

3.11 RECOMMENDATIONS & SUGGESTIONS:

RECOMMENDATIONS:

Assessment of requirement of Gang Strength in SSE/P-Way/KGS unit of Engineering (P. Way) department over Bilaspur Division which are as under:

3.11.1 Considering the existing work load, it is recommended that as per details given in Para 3.4.1 to 3.8, the requirement of total cadre under SSE/P-Way/KGS unit comes to 455 against

sanction of 477 staff. Thus 22 identified surplus vacant posts [01-Painter and 21-Track Maintainer] should be surrendered from SSE/P-Way/KGS unit of Engineering Department in Bilaspur Division.

3.11.2 The money value resulting after surrendering of vacant posts of Track Maintainer can be utilised for creation of posts required for Track Machine maintenance work as per need.

3.11.3 The vacant post of SSE/JE in Supervisors category, Artisan category, Track Maintainer category should be filled up for better monitoring of contractual and departmental civil engineering works.

3.11.4 Some activities of P- Way like deweeding of track & cleaning of drain, painting of Boards/Rails, overhauling of LC Gate and tree cutting for visibility may be outsourced upto 80% and rest 20% through departmental.

Suggestions:

3.11.5 Traffic Block is very crucial issue for maintenance of tracks; it was informed that due to lack of coordination between departments It is very tough task to get the block approved. Coordination between departments needs to be increased for blocks as and when required.

3.11.6 Departmental Road vehicle should be provided at SSE/P-Way office Khongsara for facilitate transporting of man and materials to work site.

3.11.7 Mobile Maintenance Gang may be set up to cater the emergency work as per need.

CHAPTER-IV

4.0 FINANCIAL EVALUATION & RESULTS:-

Savings due to surrender of 22 identified surplus posts :-

Designation	Pay Scale	Level	No. of Post to be surrendered	Mean pay	Cost per Month per staff (Mean Basic pay+ D.A. @ 07%)	Total cost per month (in Rs.)	Total cost per year (in Rs.)
Painter	29200-92300	L-5	01	60750	65003	65003	**780036**
Track Maintainer	18000-56900	L-1	21	37450	40072	440792	**9256632**
			22				**100,36,668**

Hence, total recurring savings to the tune of Rs. 100,36,668 say **Rs.100 Lakhs** can be achieved by implementing the due to surrender of **22 vacant surplus** posts (01 Painter and 21 Track Maintainer) from SSE/P.WAY/Unit Khongsara from Engineering department of Bilaspur division and surrender Memorandum may be issued by Sr. DPO/BSP/SECR accordingly.

-x-x-x-x-