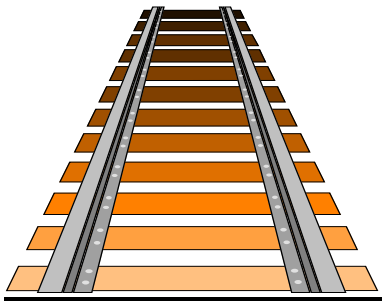

WORK STUDY TO REVIEW THE STAFF STRENGTH AT SSE / P.Way / DG MADURAI - DIVISION

SOUTHERN RAILWAY

PLANNING BRANCH

G. 275 / WSSR-101718 / 2017-18

WORK STUDY TO REVIEW THE STAFF STRENGTH OF SSE / P.Way / DG MADURAI - DIVISION

STUDIED BY

WORK STUDY TEAM
OF
PLANNING BRANCH

APRIL 2018

(i)

I N D E X

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(i)

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The work study team thankful to SSE/P.Way/DG (Co-ordinating Supervisor), other supervisors and staff for giving data in completing the study.

(ii)

AUTHORITY

Annual programme of work studies, approved by SDGM for the year 2017-18.

(iii)

TERMS OF REFERENCE

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

(iv)

METHODOLOGY

1) Collection of data
2) Observation of present system of working
3) Interaction with Co-ordinating Officer, Co-ordinating supervisor and other supervisors & staff.
4) Analysing the data collected and assessment of manpower requirement based on the TRMS Rational formula of MCNTM and need base for ground situations.

(iv)

SUMMARY OF RECOMMENDATIONS

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

Sl. No.	Category	Grade pay (Rs.)	No. of posts
1	Track Maintainer Gr-IV	1800	**15**
2	Black Smith Gr.II	2400	**01**
3	Black Smith Gr.III	1900	**01**
4	Black Smith Helper	1800	**01**
5	Helper STM	1800	**01**
Total			**19**

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CHAPTER – I

1.0 INTRODUCTION

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

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

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

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

1.5 1.6 The Third Train service made between Vysarpadi and Walajahroad opened on 1st July 1856.

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

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

1.8 Civil Engineering Department plays a vital role in maintaining the structures, Permanent Way and Works, Bridges, Level Crossings and various other assets.

Permanent Way or the track structure forms the backbone of the transportation by Railways and major of the total investment by our Organization is on track structure. Maintaining Permanent Way in fine fettle is the main prerogative of the Engineering Branch which is entrusted with among other things, periodical maintenance of track, bridges, level crossing gates etc. A well maintained track is very essential for speedy, safe and efficient train operation.

1.9 Continuous monitoring and inspection of Permanent Way on daily basis is necessary for ensuring safe, efficient and reliable service to our rail users. The manual track maintenance with axe and shovel is a thing of the past and has given way to the modern technologies and thus the track maintenance has become increasingly mechanized with track machines over Indian Railways.

Co-ordination with S&T Branch and TRD Branch is quite essential now during track maintenance. The equipments used for testing the track are sophisticated so as to trace not only the failures but also are able to detect the failures that are likely to occur. For instance, Ultrasonic Flaw Detector (USFD) detects even the minute hair line crack and flaw holes in the rail which might in due course of time develop into a rail crack and end up in train accidents such as derailments.

Many of the maintenance activities are at present outsourced and there is a wide scope for outsourcing other activities which have no bearing on safety. So, it is all the more necessary to have a close look at the man power requirement taking into consideration, the recent developments that have taken place in the overall area of track maintenance.

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

1.10 The present modern technology in permanent way, mostly used 52/60 kg rails (rarely used 90R rails), joint less (long welded rails), pre stressed concrete sleepers with elastic rail clips, high tech welding methods, mechanized packing through "on track heavy machines and maintenance", sophisticated testing's like USFD, track oscillation inspection cars and other modern techniques are helping

for reliability, carrying capacity, speed and safety of the Trains. Also lot of works are outsourced in P. Way like laying, re-laying and some of scheduled maintenance works, which are reduced the work load of Railway men. Hence it is imperative to make scrutiny of the man power requirement for track maintenance.

1.11 The man power requirements of this unit is assessed based on the Rationalised formula which was approved by Railway Board vide No.95/CE-1/CWS/2/Vol.II/Pt.11 dated 06.03.2006.

In the early days of company railways and State railways, the gang strength of permanent way was calculated in various ways. In 1931 Maflin 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 laborers. So no uniformity was adopted in arriving at the gang strength of P.Way. This resulted in due absorption of casual laborers in to railways due to various judicial judgments and consequently the expenditure increased.

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.
v) Monsoon patrolling.
vi) Increased Mechanisation.
vii) Security patrolling.
viii) Attending SEJs
ix) Increased use of PSC sleepers

Some important technical Points about Track:

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

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

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

1.13 The main components of permanent way or track are rails, sleepers, ballast, formation and fittings & fastenings. The b

1.14 asic function to perform of each components are one by one below

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

1.14 **Characteristics of a good Track:**

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

(ii) All fittings are available and properly tightened.

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

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

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

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

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

1.15 Annual programme of track maintenance

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

Period	Work
1. Post-monsoon attention. For about six months after end of monsoon.	a) Attention to run down length in the entire gang beat to restore section to good shape.
	b) One cycle of through packing from one end of the gang beat to the other end including overhauling of 1/3 to ¼ of the beat.
	c) Attention during the monsoon; For about 4 months cleaning of side drains, catch water drains, repairs to bank and picking up of slacks.
2. Pre-monsoon attention: for about 2 months prior to break monsoon.	a) Attention to track as required; picking up of slacks.
	b) Attention to side drains, catch water drains and water ways.
3. Lubrication of rail joints, gap adjustment and curve re-alignment	Patrolling of track during heavy rains.

1.16 Need for Mechanised Maintenance:

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

(i) With the introduction of concrete sleepers, the track structure has become very heave therefore it becomes difficult for the gang men to lift the track.

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

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

1.17 **Inspection of track:**

Purpose of Inspection:

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

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

1.18 **Methods of Inspections:**

Various methods adopted for inspection are as under:

(a) By Push Trolley/ Motor Trolley

(b) By Engine of a fast train

(c) By rear most vehicle of a train
(d) By Track recording Car and
(e) By Oscillograph Car and OMS instrument

(a) By Push Trolley / Motor Trolley:

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

(b) By Engine of a fast Trains:

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

(c) By Rearmost Vehicle of a train:

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

(d) By Amsler Car:

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

1.19 **Track Recording cum Research Car**

By Osillograph Car & OMS Instrument:

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

1.20 **Types of Patrolling :**

- ✓ ***Keyman's Daily Patrol*** - Every portion of the permanent way shall be inspected daily on foot by the key man of the beat in which the portion of the track falls.
- ✓ ***Gang Patrol during Abnormal Rainfall or Storm*** – In the event of abnormal rainfall or storm during day or night, the Mate should, on his own initiative organise patrolling over the length affected, independently of other patrolling, if any being done.
- ✓ ***Night Patrolling during Monsoon*** – During the monsoon, certain section of the railway line, as may be specified, shall be patrolled to detect damage by flood, such as breaches, settlements, slips and scours and immediate action taken to protect trains, when so warranted.
- ✓ ***Security Patrolling*** during Civil Disturbance and on Special occasions

- ✓ ***Hot weather Patrolling*** for LWR/CWR – Hot weather patrol is carried out when the rail temperature reaches td + 20 degree or above. The patrolling should be done in accordance with the provisions of Manual of Long Welded Rails.
- ✓ ***Cold weather Patrolling*** for LWR/CWR – Cold weather patrol is carried out when the rail temperature reaches td -20 degree or below. The patrolling should be done in accordance with the provisions of Manual of Long Welded Rails.
- ✓ ***Watchmen at vulnerable locations*** in addition to patrolmen, stationary watchmen are posted at known or likely locations of danger or trouble.

1.21 **Dindigul (Tiṇṭukkal)** is a city in the South Indian state of Tamil Nadu. It is the administrative headquarters of the Dindigul district. Dindigul is located 420 km (260 mi) southwest of the state capital, Chennai and 100 km (62 mi) away from Thiruchirapalli and the nearest city (66 km) is Madurai.

Dindigul is believed to be an ancient settlement; it has been ruled at different times by the Early Pandyan Kingdom, the Medieval Cholas, Pallava dynasty, the later Pandyas, the Madurai Sultanate, the Dindigul Sultanates, the Vijayanagara Empire, the Madurai Nayak Dynasty, Chanda Sahib, the Carnatic kingdom and the British. Dindigul has a number of historical monuments, the Rock Fort being the most prominent.

Industries in Dindigul include lock making, leather, textile spinning, administrative services, agricultural trading, banking, agricultural machinery and educational services. Dindigul is upgraded to a municipal corporation. The city covers an area of 14.01 km^2 (5.41 sq mi) and had a population of 207,327 in 2011. Dindigul is well-connected by road and rail with the rest of Tamil Nadu. It is the 12^{th} largest urban agglomeration in the state and has a population of 292,512 according to Tamil Nadu's 2011 census. Dindigul has 200,000 hectares of cultivable land, and agriculture continues to be the main occupation of its inhabitants. Located between the Palani and Sirumalai Hills, Dindigul has a reserved forest area of 85 hectares.. Vadamadurai is one of the main towns in dindigul district where alagar temple(Sri Ranganadha swamy) is located which a famous temple in south india and surrounded with hills and greens and village located nearby are Seethapati, Tennampati, etc.

The history of Dindigul is centered around the fort over the small rock hill and fort. Dindigul region was the border of the three prominent kingdoms of South

India, the Pandyas, Cheras and Cholas. The Chera king Dharmabalan is believed to have built the temples of Abirami and Padmagirinathar. The ancient Tamil book, *Silappathikaram* records the city as the northern border of the Pandya kingdom whose capital was Madurai. Historian Strabo mentions about the city in his 20 A.D. work and Pillni, the great historian of the time described the Pandya king in his works.

During the first century A.D., the Chola king Karikal Cholan captured the Pandya kingdom and Dindigul came under the Chola rule. During the sixth century, the Pallavas took over most provinces of Southern India. Dindigul was under the rule of Pallavas until Cholas regained the state in the 8th century. In the 14th century, South India was invaded by the Delhi Sultanate. Dindigul was safe in the hands of VijayaNagara . The commander of the Vijaya Nagar army Kampanna Udayar played an important role in the war in capturing Madurai which was under Madurai sultanate. In 1559 Nayaks became powerful and their territory bordered with Dindigul in the north. After the death of king Viswanatha Nayak in 1563, Muthukrisna Nayakka became the king of a kingdom in 1602 A.D who built the strong hill fort in 1605 A.D.
He also built a fort at the bottom of the hill. Muthuveerappa Nayak and Thirumalai Nayak followed Muthukrishna Nayak. Dindigul came to prominence once again during Nayaks rule of Madurai under Thirumalai Nayak. After his immediate unsuccessful successors, Rani Mangammal became the ruler of the region who ruled efficiently.

In 1736 Chanda Sahib, the lieutenant of Delhi Sultanate Seized power from Vangaru Nayak. In 1742, the Mysore army under the leadership of Venkatarayer conquered Dindigul. He governed Dindigul as a representative of Maharaja of Mysore. There were Eighteen Palayams (a small region consists of few villages) during his reign and all these palayams were under Dindigul Semai with Dindiguls capital. These palayams wanted to be independent and refused to pay taxes to venkatarayer. In 1748, Venkatappa was made governor of the region in place of Venkatarayer, who also failed. In 1755, Mysore Maharaja sent Haider Ali to Dindigul to handle the situation. Later Haider Ali became the Maharaja of Mysore and in 1777, he appointed Purshana Mirsaheb as governor of Dindigul. He

strengthened the fort. His wife Ameer-um-Nisha-Begam died during her delivery and her tomb is now called Begambur. In 1783 British Army, led by Captain Long invaded Dindigul. In 1784, after an agreement between the Mysore province and British army, Dindigul was restored by Mysore province. In 1788, Tipu Sultan, the Son of Haider Ali, was crowned as King of Dindigul.

In 1790, James Stewart of the British army gained control over Dindigul by invading it in the second war of Mysore. In a pact made on 1792, Tipu ceded Dindigul to the English. Dindigul is the first region to come under English rule in the Madurai District. In 1798, the British army strengthened the hill fort with cannons and built sentinel rooms in every corner. The British army, under Statten stayed at Dindigul fort from 1798 to 1859. After that Madurai was made headquarters of the British army and Dindigul was attached to it as a taluk. Dindigul was under the rule of the British Until India got our Independence on 15 August 1947.

Dindigul Junction railway station is a junction railway station serving the city of Dindigul in Tamil Nadu, India. The station is a part of the Madurai railway division of the Southern Railway zone. It is also known by its station code: DG.

Dindigul railway station was established in 1875 when rail line for Trichy to Tuticorin was constructed. Dindigul railway junction is located in the rail head from Chennai to Madurai and Karur to Madurai. It is also connecting Dindigul to Palani. All south bound trains plying south to Madurai from Chennai pass via Dindigul. There are also passenger trains running either side from Madurai to Tiruchirapalli and Palani. The nearest local and international airport is Madurai Airport located 70 kilometres (43 mi) away.

The Dindigul Junction is located on the eastern side of the city adjacent to the city's SIDCO industrial estate. The station bears the intersection of four branching railway lines and the next nearest train stations are:

- Vellodu railway station (South)
- Tamaraipadi railway station (East)
- Akkaraippatti railway station (West)
- Eriodu railway station (North)

Lines

- BG Electrified Double line towards Madurai
- BG Electrified Double line towards Trichy
- BG Single line towards Karur
- BG Single line towards Pollachi
- Dindigul is a city in the South Indian state of Tamil Nadu. It is the administrative headquarters of the Dindigul district.
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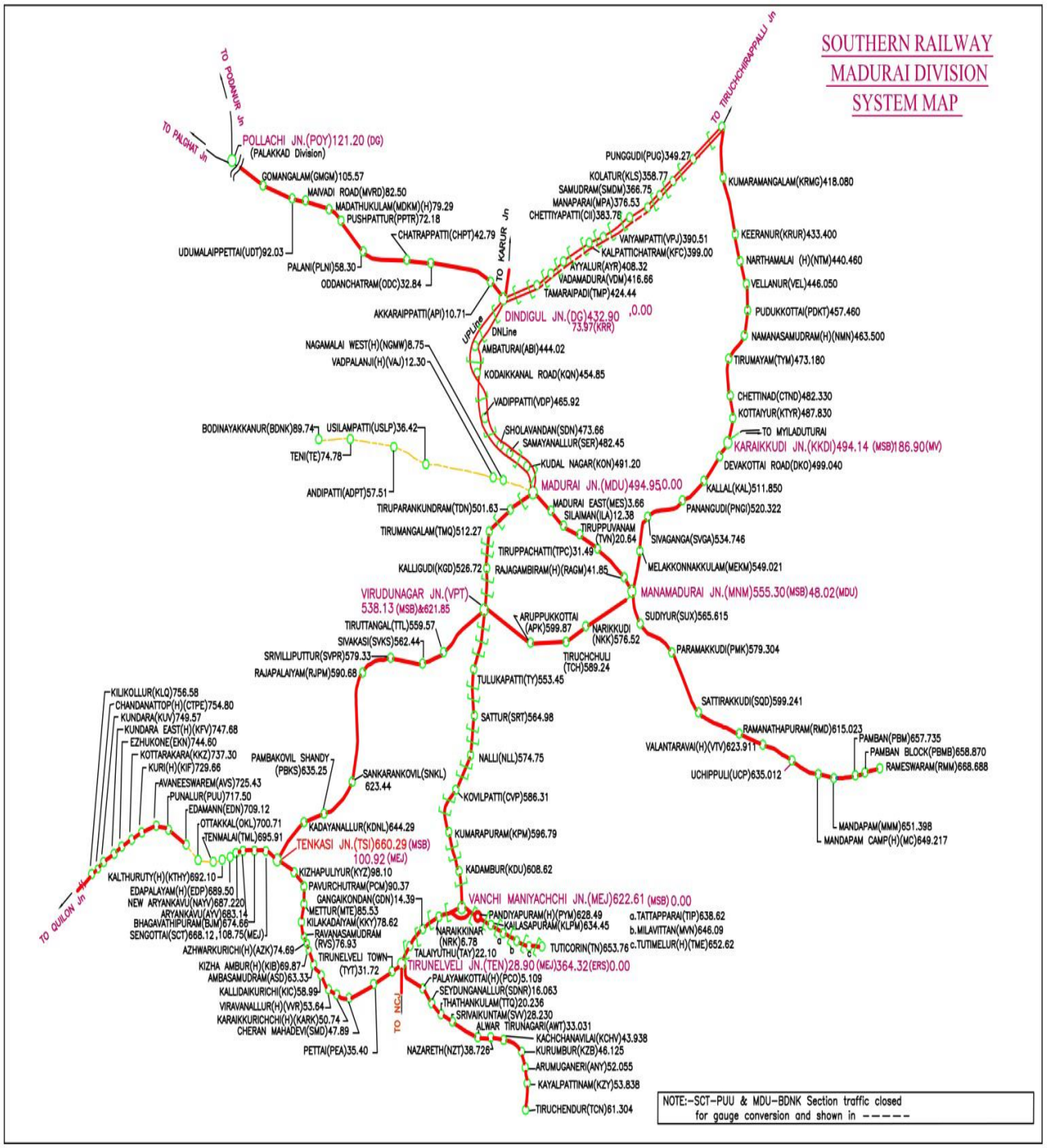
The unit of SSE/PW/DG is within the overall control of Sr.DEN/Co.ord/MDU and under the control of ADEN/DG. An analysis has been made to study the present system of working and the staff requirement has been arrived and is detailed in the subsequent chapters.



SE / SSE P.WAY		STATION		KILOMETRE		TRACK LENGTH	
		FROM	TO	FROM	TO	BG	MG
MPA		TPJ(EX)	AYR(IN)	341.60	408.60	67.00	
		AYYALUR DETOUR(403A,403B)				01.80	
DG		AYR(EX)	DG(IN)	408.60	439.30	30.70	
	DN line	KRR	DG LINE	70.80	73.97	03.17	
		DG(IN)	KQN(IN)	432.90	455.00	22.10	
		DG(IN)	PLKN(incl)	0.00	20.93	20.93	

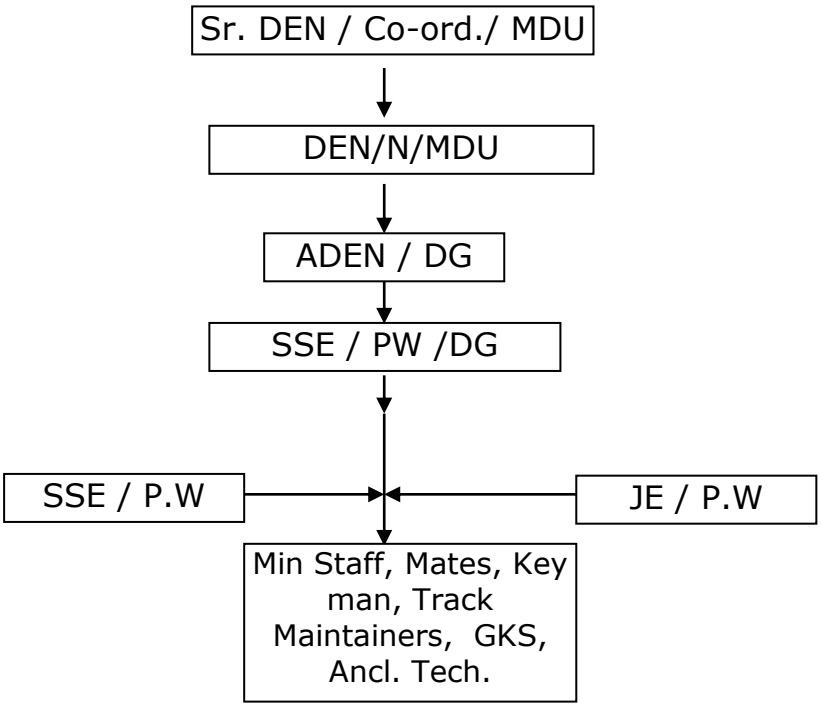
76.9KM

CHAPTER – II

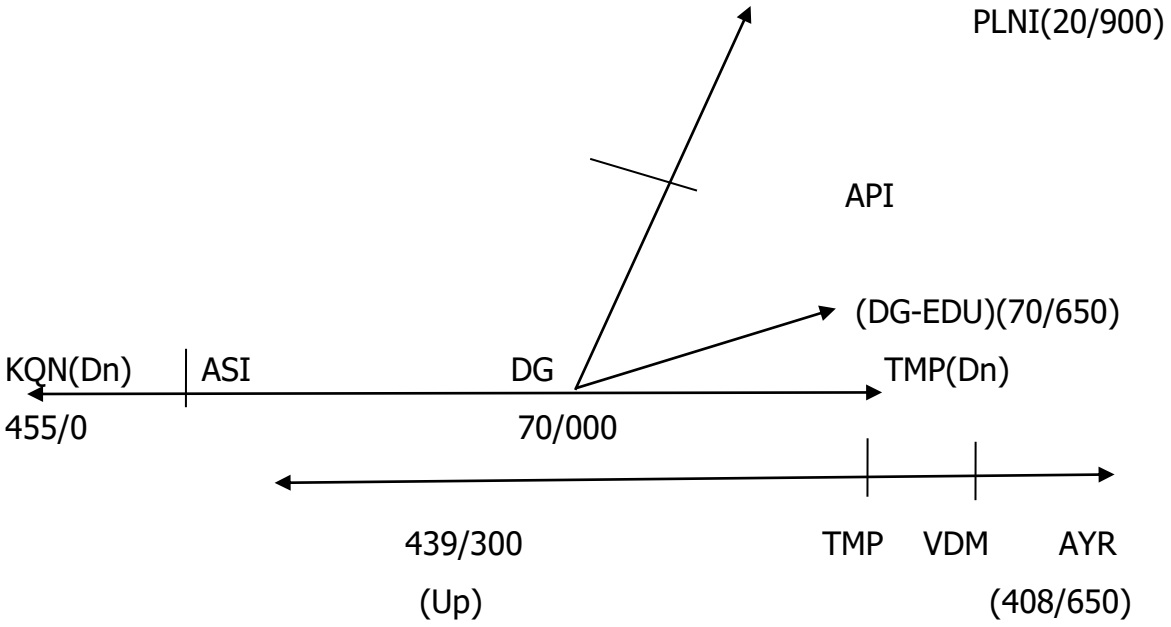
2.0 PRESENT SCENARIO:

2.1 Organization:

Engineering Branch of MDU Division is working under the control of Sr. DEN / Co-ord/MDU in the Division level. This P.way section is managed by SSE/P.way/DG with the general in charge of ADEN/DG.



DG-P.WAY SECTION



JURISDICTOIN OF DG PWAY SECTION								
Sl No	**Engine Run Section**	**Rout**	**Between Stations**	**KM**		**Leng (Km)**	**GMT As on 31/03/2016**	**Max. Speed**
				From	**To**			
1	TPJ-DG	B	AYR-DG	408/650	432/900	24.25	14.78	110 KMPH (75 KMPH FOR GOODS TRAIN AND 60 KMPH FOR GOODS LOADED ABOVE CC +6 /8 TONNES) The track was opened for traffic on06.01.1999)
2	TPJ-DG	B	TMP- DG (DOWN)	424/400	432/900	8.5		90KMPH (75 KMPH FOR GOODS TRAIN AND 60 KMPH FOR GOODS LOADED ABOVE CC +6 /8 TONNES)
3	DG-MDU (DOWN)	D	DG-KQN (DOWN)	432/900	455/000	22.1	11.89	100 KMPH (75 KMPH FOR GOODS TRAIN AND 60 KMPH FOR GOODS LOADED ABOVE CC +6 /8 TONNES)Opened for traffic from 01.10.2008
4	DG-MDU (UP)	D	DG – ABI (UP)	432/900	439/300	6.4	11.78	100 KMPH (75 KMPH FOR GOODS TRAIN AND 60 KMPH FOR GOODS LOADED ABOVE CC +6 /8TONNES)
5	DG-KRR	D	DG-EDU		72/900	2.25	8.46	100 KMPH (75 KMPH FOR GOODS TRAIN AND 45 KMPH FOR GOODS LOADED ABOVE CC +6 TONNES)
6	DG-PLNI	E	DG-ODC	0/0	20/900	20.9	3.81	75KMPH (75 KMPH for Goods) (OPEN TO TRAFFIC ON 20/11/2012)
Total						**84.4**		

The following stations are coming under the jurisdiction of SSE/P. Way/ DG

DETAILS OF GANG

SL. NO.	GANG NO.	JURISDICTION		TOTAL LENGTH IN Km
		FROM Km	TO Km	
1	1	408/650	415/000	6.350
2	2(vadamadurai-416.66)	415/000	420/500	5.500
3	3(Tamaraipadi-424.44)	420/500	425/300	4.800
4	4	425/300	431/600	6.300
5	5(DG-432.90)	431/600	433/500	1.900
		1/000	1/500	0.500
6	6(KQN-454.85)	447/900	455/000	7.100
7	7(Ambaturai-444.00)	439/600	444/600	5.000
8	8	444/600	450/100	5.200
9	9	450/100	455/000	4.900
10	10	1/500	8/100	6.600
11	11	8/100	14/500	6.400
12	12	14/500	20/900	6.400
	UNIT 1/BG/MDU	432/00	439/300	7.900
		70/650	72/900	2.250
TOTAL				**77.100**

KEYMAN JURISDICTION			
GANG NO.	FROM	TO	LENGTH (KM)
1	408/650	415/000	6.350
2	415/000	420/500	6.200
	Road 2 @ VDM Yard		
3	420/500	425/300	6.200
	Road 1& 3 @TMP Yard		
4	425/300	431/600	6.200
5	431/600	433/500	6.200
	1/000	1/500	
	Road 6,7,8 & 9 @ DG Yard		
6	433/500	439/600	6.100
7	439/600	444/600	6.000
	Road 3 @ ABI Yard		
8	444/600	450/100	5.500
9	450/100	455/000	5.500
	Road 2 @ KQN Yard		
10	1/500	8/100	6.60
11	8/100	14/500	6.400
	Road 1 & 3 @API YARD		
12	14/500	20/900	6.400

BG	433/100	436/100	3.000
	R1,R2,R3,TROLLEY PATH,OIL SIDING, DECANNIING LINE,GS LINE OLD& NEW		
BG	436/100	441/200	5.100
BG	70/650	73/000	2.350
	ROAD 2,3,4 TROLLEY PATH		

LC GATES

DETAILS OF LC BETWEEN AYR-DG –KQN SECTION									
295	AYR-VDM	410/700-800	AYR	C	E	M			
296	AYR - VDM	411/200-300	AYR	C	E	M			
297	AYR - VDM	412/200-300	AYR	C	E	M			
298	AYR - VDM	414/200-300	AYR	C	E	U	LUSvidePBNo.328/13-14 Size 1 X 4.50 X 3.60m	N	RDO/PLNI requires GAD for his joint inspection
302	VDM-TMP	418/500-600	VDM	C	E	M			
303	VDM-TMP	419/800-900	VDM	C	E	M			Manned on 06.09.14
303A	VDM-TMP	421/500-600	TMP	C	E	M			
304	VDM-TMP	423/300-400	TMP	C	E	U	LUS Vide LAW 408/12-13 Size 1x4.60x3.60m	Y	As per Collector's approval, size is 1x4.60x3.60m
306	TMP-DG	427/400-500	TMP	B	E	M			
307	TMP-DG	428/300-400	TMP	C	E	M			
308	TMP-DG	431/100-200	DG	S	E	M	ROB & LUS		ROB work in progress by CN/MDU. LUS proper completed by CN/MDU, and approach yet to be done by State Govt.
311	DG-ABI	435/200-300	DG	C	E	M			
312	DG-ABI	437/100-200	DG	C	E	M			
313	DG-ABI	438/200-300	DG	C	E	M			
313A	DG-ABI	439/300-400	ABI	C	E	M			
316	DG-ABI	442/800-900	ABI	A	E	M			
318	ABI-KQN	445/500-600	ABI	C	E	U	LUS Vide PB 417/16-17size 1X4.60X3.60m	Y	As per Collector's approval,size is 1x4.60x3.60m
320	ABI-KQN	446/600-700	ABI	C	E	U	LUS (size 1x4.60x3.60m)	Y	As per Collector's approval, size is 1x4.60x3.60m
322	ABI-KQN	450/600-700	ABI	C	E	U	LUS Vide PB 417/16-17Size 1x4.60x3.60m)	y	As per Collector's approval, size is 1x4.60x3.60m
323	ABI-KQN	451/700-800	KQN	C	E	M			
324	ABI-KQN	452/200-300	KQN	C	E	M			
325	ABI-KQN	453/400-500	KQN	C	E	M			
27	DG-EDU	72/200-300	DG	A	E	M	ROB & LUS		ROB work in progress by CN/MDU. LUS proper completed by CN/MDU and approach yet to be done by State Govt.

DETAILS OF LEVEL CROSSINGS IN DG-PLNI-POY SECTION As on 01-12-2016										
LC No.	Between Stations	Location	Station	Class	Dept. E/T	M/ UM	Proposal & size	PB No & year	Collector Approval obtained	Remarks
3	DG-API	2/300-400	DG	C	E	U	Manning			LUS is not feasible
4	DG-API	2/600-700	DG	A	E	M				
6	DG-API	3/100-200	DG	Spl	E	M	RUB/LHS size 1x11.20x3.75M (cast in situ Box)	280/16-17	Yes	Work awarded by CN/ MDU to Sri Shanmugam / Karur. On 29.03.16 For a value of Rs.1.78 Crore.
8	DG-API	5/300-400	API	Spl	E	M	ROB Size 1X45.00M (Clear Span) Composite Girder + Pedastrian sub way of 1x4.50x2.75M (Cast in situ Box)	264/16-17	Yes	Work awarded by CN/ MDU to M/S MP Construction, Chennai on 20.07.16 For a value of Rs.4.76 Crore.
9	DG-API	6/800-900	API	C	E	M				
10	DG-API	9/000-100	API	C	E	U	LUS 1 X 4.5 X 3.60m	328/13-14	yes	Work awarded by CN/MDU on 22.11.16 to M/S Pavithra Constructions,Kuddapah.
11	DG-API	9/600-700	API	C	E	M				
12	DG-API	11/90-12/00	ODC	C	E	M				
13	DG-API	12/500-600	ODC	C	E	M				
14	API-ODC	13/90-14/00	ODC	C	E	U	LUS 1 X 4.5 X 3.60m	328/13-14	yes	Work awarded by CN/MDU on 22.11.16 to M/S Pavithra Constructions,Kuddapah.
15	API-ODC	15/300-400	ODC	C	E	U	LUS 1 X 4.5 X 3.60m	328/13-14	yes	Work awarded by CN/MDU on 22.11.16 to M/S Pavithra Constructions,Kuddapah.
17	API-ODC	16/600-700	ODC	C	E	M	LUS 1 X 4.5 X 3.60m	328/13-14		(Est.under vetting by CN) (Not feasible as per CN)
18	API-ODC	17/600-700	ODC	B	E	M				
19	API-ODC	19/300-400	ODC	C	E	U	LUS 1 X 4.5 X 3.60m	328/13-14	yes	Work awarded by CN/MDU on 22.11.16 to M/S Pavithra Constructions,Kuddapah.

CURVE DETAILS

DETAILS OF CURVE IN SSE/P.WAY/DG SECTION Bet TMP -DG (DN) SECTION											
Sl No	Curve No	Between stations	KM		Type of Curve	RH / LH	Degree of curve	Radius of curve (m)	Total length of curve (m)	Length of Transition (m)	Super Elevation (mm)
			From	To							
1	105G	TMP-DG	425.160	425.309	Simple	LH	0.5	3500	149	80	20
2	105H	TMP-DG	425.405	425.555	Simple	RH	0.5	3500	150	80	20
3	105 I	TMP-DG	425.825	425.964	Simple	RH	0.5	3500	139	80	20
4	105J	TMP-DG	426.075	426.205	Simple	LH	0.5	3500	130	80	20
5	106	TMP-DG	428.154	429.361	Simple	LH	1.09	1610	1207	160	40
6	107	TMP-DG	429.814	430.902	Simple	RH	1.07	1640	1088	160	40
7	107A	TMP-DG	431.335	431.409	Simple	RH	0.35	5000	74	90	20

2.6 **Duty Hours:**

The normal working hours of the Ministerial and Artisans & Gang staff is given below.

Ministerial staff:

07.00 to 17.30 hours from Monday to Saturday

Lunch break 30 minutes.

Artisans and Units staff:

Morning: 07.00 to 12.00 hours

Evening: 14.30 to 17.30 hours

Sunday is rest.

2.7 **Track Structure**:

The entire length is an absolute block system of Single and double line operation. The track structure is 52/60 kg, PSC with sleeper density of M + 7 & M + 8 sleepers with long/continuous welded rails and PSC and M + 4 and M + 3 for CI POT in yard lines. The stabling, station lines are laid with 72DH/90R, m+4, PSC, SWP. The Rail structure is properly maintained by Track machines and some of maintenance activities are being carried out by manual also. Deep screening of Ballast for the whole section was carried out by Track machines periodically.

2.9 The duties of Supervisors and Technical staff in PW section are:

i. Duties of SSE/ P.Way [prescribed in para118 -135 of Part-B of IRPWM]

- ✓ Responsible for maintenance and inspection of track and safe Condition for traffic.
- ✓ Execution of all works incidental to track maintenance including track relaying works.
- ✓ Accountal and periodical verification of stores and tools.
- ✓ Maintenance of land boundary between stations and at unimportant stations.
- ✓ Co-ordination with the works, Bridge, Signaling and Electrical staff.
- ✓ Accompanying on Inspection of higher officials.
- ✓ Testing of Running qualities of track.
- ✓ Inspection of Gangs, Level Crossings, points and crossing, curve Inspection
- ✓ Foot plate inspection, Rear vehicle inspection, Foot inspection.
- ✓ Accompanying OMS/TRC (RDSO) Inspection.
- ✓ check on patrolling
- ✓ Maintenance of station yards.
- ✓ Witnessing payment to staff
- ✓ Maintenance of Records
- ✓ Custodian of stores etc.
- ✓ Apart from above P. Way maintenance activities Staff Welfare viz. promotion, claiming of salary, supply of equipment and uniform, procurement of materials, issuing of materials scrap delivery (DS8)

ii. Duties of JE/P.way: [prescribed in para136 -145 of Part-B of IRPWM]

- ➢ Inspection and maintenance of track in a safe and satisfactory condition for traffic, including execution of all works, incidental to track maintenance.
- ➢ Execution of special works, such as a) Renewal, Directed Track maintenance curve re-alignment, deep screening etc.
- ➢ To assist the SSE/P.way.
- ➢ Co-ordination with Works, Bridge and staff of other departments.
- ➢ Inspection of Gangs, Level crossings, Points and Xings, Curves, foot plate inspection, rear vehicle inspection and foot inspection.

iii. P.Way Mistry /Track mate: [prescribed in para136-166 of Part-B of IRPWM]

- Knowledge of Rules and Signal
- Safety of the Track
- Equipments at site of work
- Muster and Gang Charts/Diary Books
- Observance of sleepers packing during passage of train.
- Precaution when view is obstructed
- Tidiness of section and Safe custody of tools
- Action when line is unsafe or in the event of accident
- Patrolling during abnormal Rainfall
- Commencing work affecting safety of train
- Weekly inspection of Gang length by mate.
- Preventing Tress pass and theft of P.way fittings
- Relief arrangements in emergencies
- Assistance to P&T staff
- Assistance in protection of train and Assistance in placing fog signals
- Responsibilities of the mate in LWR track

iv. Duties of Key-man: [prescribed in para167 -170 of Part-B of IRPWM]

- Key-man's daily inspection
- Equipment of key-man
- Rectifying the defects whichever possible by him.
- Reporting to Mate and PWI about the defects which require assistance for attending.
- In case of serious defects protection of Track & informing as per rules.
- Work at unmanned level crossings.
- Assisting mate after completing his routine inspection.
- Any materials found fallen safe custody and disposal.
- Apart from daily inspection, he should ensure tightness of fittings in systematic manner.

2.10 **The present staff deployment of SSE/P.Way/DG unit :**

The book of sanction of the Unit is 207 and the actual is 211 as on17-08-2017. The Scale check Statement is placed as **Annexure -I.**

2.11 The para 228 of IRPWM prescribes the system of maintenance for concrete sleeper track as given below. The following 3-tier system of track maintenance shall be adopted on sections nominated for mechanized maintenance.

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

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

MMU-1:- One for each PWI section

MMU-2:- One for each Sub-division

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

MMU-2 shall be a road vehicle based unit with each sub-division for reconditioning of turnout and minor repairs to the equipments of MMU.

2.13 Existing Maintenance Practices on IR

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

(a) In sections where relaying with PSC sleepers has been done,
   i. Tamping with machines as and when machines are available, plus Conventional system of maintenance

(b) In sections where relaying has not been done,
   i. Only conventional system of maintenance is being used.

2.14 Annual programmed regular track maintenance is as follow:

Sl. No.	Period	Work
1.	Post monsoon attention for about six months	Attention to run down stretches, one round of through packing
2.	Pre-monsoon attention for about two months	Clearing of drains
3.	Attention during monsoon for about four months.	Attention to track as required.

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

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

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

2.17 The provisions of "Small Track Machines Manual":-

The para1.3.2 says that the "Requirement of Manpower doesn't include Leave reserve". Further, the para1.3.3 stipulates that the Creation of posts for operation and maintenance of small track machines should be done by surrender of equivalent money value of live revenue charged posts of Track maintainer/other category involved in the track maintenance. The component of unskilled staff being created should be barest minimum. The proportion of skilled personnel should form at least 75% of the total posts to be created.

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

Sl. No.	Name of the Machine	Work done	Frequency
1.	BCM-Ballast Cleaning Machine	Deep screening of track	Once in10 years
2.	DUOMAT/CSM – Continuous Action Tamper	Tie Tamping LWR work	Once in 2 years

3.	DGS - Dynamic Track stabiliser	For consolidating track after works affects core stability	Once in 10 years along with BCM
4.	UNIMAT/MPT	1.Tamping Points & crossing	Once in 2 years
5.	BRM - Ballast Regulating Machine	Boxing of track	
6.	UTV - Utility Track Vehicle	Leading and stacking materials	As per need
7.	T-28 - T28 cranes – One job crane (PRC laying Machine)	For re-laying of Points & crossing	As per requirement
8.	PQRS	For re-laying track	-do-
9.	TRT	For CTR of track	-do-

2.19 **Actual Unit (Gang) Performance** :

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

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

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

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

2.21 **IR adopted various efforts to standardize in the past.**

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

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

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

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

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

They are:

a) Activity 'T' - Affected by Traffic Density
b) Activity 'R' - Not affected by Traffic Density } Primary activities
c) Activity 'M' - Miscellaneous
d) Activity 'S' - Site specific } Auxiliary activities

Activity 'T' - Affected by Traffic Density

T_1 - Slack attention to a) Bad spots
b) Low joints (FP, welded, glued joints)
c) SEJ (1 No. / Km)
d) Minor curve alignment

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

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

T_4 - Repair Welding

Activity ' R ' – Not affected by Traffic Density

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

Activity 'M' – Miscellaneous

M_1 - Monsoon patrolling

M_2 - Hot weather patrolling

M_3 - Cold weather patrolling

M_4 - Watching vulnerable locations

M_5 - Gate keeping of LC gates

M_6 - Rest giving for key man

M_7 - Water man duty

M_8 - Store watch man duty

Activity 'S' – Miscellaneous

S_1 - Tunnel Maintenance

S_2 - Bridge substructure maintenance

S_3 - Long girder maintenance

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

S_5 - Maintenance of track on extremely bad formation

S_6 - Look out man duty

S_7 - Fog signal man duty

S_8 - Filth removal from track

S_9 - Security patrolling

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

2.23 Based on Rational Formula the Track Maintainers [Gang strength] requirement of SSE/P.Way/DG section is arrived as follows: Number of working Days in a year for P.Way Gang is 294 days

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

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

2.24 **Norms for Man days Requirement per km (CMCNTM):**

For Mainline BG machine packed

For Activity T : (80+2.3GMT) x (1+A+B+C)

For Activity R : 159

Correction : 28(increase in Manpower on PRC Track for shallow screening

For Mainline BG Manually packed

For Activity T : (223 +8.42GMT) x(1+A+B+C)

For Activity R : 168

Correction : 28(increase in Manpower on PRC Track for shallow screening

For Mainline MG Manually packed

For Activity T : (160 +13.56GMT) x(1+A+B+C)

For Activity R : 128

For Mainline NG Manually packed

For Activity T : (105 +188GMT) x(1+A+B+C)

For Activity R : 91

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

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

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

$: Lines on which trains are received on Signal

: Non Running yard lines, marshalling lines, sidings

2.26 **M - Activity :**

Sub activity	Norm	Legend	Authorisation
1. Monsoon patrolling	D x No. of men engaged in 24 hrs cycle Or $\sum_{1 \text{ to } N}$ (Dxbxsxm)	D :No. of days needing patrolling in a year N : Total No. of beat-lengths b: No. of beats in the n^{th} beat length S : No of shifts in the nth beat length m : No of men in each shift in the n^{th} beat length m = 2 in area infested with wild animals / terrorists otherwise m =1	CTE/CBE
2. Hot Weather Patrolling	30xL	L = Length of LWR requiring hot weather patrolling	
3. Cold weather patrolling	12xL	L = length of LWR requiring cold weather patrolling	
4. Watching vulnerable location	$\sum_{1 \text{ to } N}$ (sxd)	N : Total No of vulnerable locations S : No of shifts in the nth location d: No of days watching at the n^{th} location in a year	CTE/CBE
5. Gate keeping at level crossings	365x $\sum_{1 \text{to} N}$ s –(Mx294)	N : No of Engg. level crossings s : No of shifts at the n^{th} LC M : man days available per annum due to regular Engg. Gate keepers	-
6. Rest Giver for key men	n (365-294)	n : No of sanctioned key men posts	-
7. Waterman duty	N x 294	N : No of gangs	-
8. Store – watchman duty	N x 3 x365	N : No of stores locations in addition to Sr. DEN's HQ stores N is not to exceed 2.	Sr.DEN/ Co-ord.

2.27 **S- Activity :**

Sub activity	**Norm**	**Legend**	**Authorisation**
1.Tunnel maintenance	1.2 x 294 x $\sum_{1 \text{ to } N}$ (1 x r)	N :No of tunnels l : Length of the n^{th} tunnel in km r : No of tracks in the n^{th} tunnel	Subject to work, bridge staff not being available for this work
2. Bridge substructure maintenance	1.1 x 0. 294 x $\sum_{1 \text{ to } N}$ (b x r)	N :No of tunnels b : Lineal water way of the n^{th} bridge, in metre r : No of tracks in the n^{th} bridge	Subject to work, bridge staff not being available for this work
3. Load girder maintenance	0.64 x $\sum_{1 \text{ to } N}$ b	N : No of bridges each having more than 150 m lineal water way	-
4. Extra maintenance due to very sharp curves deep curves deep cutting and steep gradients	Lcx 294	Lc : Total length of curves in km Sharper than 3 degree on BG/6 degree on MG(NG track does not need extra manpower on this reasons	CTE
5. Maintenance of extremely bad formation	0.6x $\sum_{1 \text{ to } N}$ l	N : No of locations where track needs more than 4 attentions in a year l : Length of track in the n^{th} location, in metres	-
6. Look out man duty	294 $\sum_{1 \text{ to } N}$ v / g	N : No of gangs v : Length of track with poor visibility in the nth gang – length g : Length of the n^{th} gang – length	-
7. Fog signal man duty	Mf /3	Mf : Total man days actually utilized in the past 3 years for this duty	Sr.DEN/Co-ord.
8. Filth removal from track	f x 294	f : No of gangs having this kind of problem	Sr.DEN/Co-ord.
9. Security patrolling	Ms / 3	Ms : Total man days actually utilized in the past 3 years for this duty.	Sr.DEN/Co-ord.

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

2.28 **Activities recommended for outsourcing by rational formula.**

1. Formation of treatment Works:
2. Collection of ballast, training out ballast by material train leading ballast from stack to track, insertion of ballast in track
3. Deep screening of the ballast in track, carried out manually 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 is bulk
11. Loading out of P. Way materials for other than casual renewal
12. Security of materials kin a depot which is closed and locked
13. Painting of Rails and weld collars
14. Painting of bridge girders
15. Heavy repairs(Measurable) to formation cutting bides drains and catch water
16. Heavy repairs (measurable)to bridges, bridge protection works, river training works and tunnels
17. Providing (Repairing road surface at level crossings including speed, breakers
18. Removal of major sand breaches
19. Works arising due to restoration following breach or accident
20. Clearing of rank vegetation in platforms and in the insanity of tracks in coaching and goods yards, repair depots and workshops or Engineering/Mechanical/Electrical and S & T depts.

CHAPTER – III

3.0 CRITICAL ANALYSIS

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

i) Primary Maintenance

ii) Auxiliary Maintenance

iii) Activities that can be contracted out.

3.2 Primary Maintenance Activities

a) Activities T (affected by traffic density)

b) Activities R Routine – not affected by traffic density.

Auxiliary Maintenance Activities

a) Activities M Miscellaneous

b) Activities S Site specific

- As referred in Para 0.25 of MCNTM Report, the Performance unit of ETKM (Equated Track kilometer) hitherto accepted, will be replaced as EMKM (Equated Manpower Kilometre). EMKM is defined as numerically equal to 0.6 times of the number of gangmen required for the section for all the activities in TRMS as per rational formula.

- In future, ECKM (Equated Cost Kilometre) can be evolved based on the Rational Formulae as Performance unit for track maintenance cost.

- Whenever Annual review of gang strength for Activities `T` and `R` is undertaken, it is necessary to reassess the manpower requirement for activities `M` and `S`due to the developments effected from time to time in the fields of `M`& `S`such as:

- Number of monsoon patrol beats adjusted as per changed train service.
- Vulnerable locations eliminated due to works carried out.
- Level crossings replaced by ROB & RUB.
- No.of stores depots reduced.
- Jurisdiction of gang lengths reorganized.

The list is only indicative and not exhaustive.

3.3 External factors:

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

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

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

3.4 It is also observed in TRMS manpower calculation that the following activities do not requires the arrived man power and some of the activities can be reduced and the man power will be right sized.

- The study MCNTM itself was conducted during the period 1996-2000 though the RB order was issued in 2006. There were sea changes in the maintenance of track during the last 13 years and the committee report itself had advised that the norms are to be renewed according to the programme of Mechanised maintenance and at least once in 5 years.

- Many of the calculations are based on the situation existing on single line, which was simply multiplied by 2,3,4 etc for double and multiple lines. The quantum of activity for the man power requirement for single line and multiple lines are linear in nature. For example, the formula assumes that there is one LC gate for every 1.5 route km and this is not true for double and multiple lines. The requirement of staff for tree cutting, painting, waterman etc are calculated on the same basis.

- The activities given for outsourcing is not accounted in TRMS calculations. The man days requirement assessed from the rational formula is on the higher side mainly because of the factors and activities not practically undertaken by the P.way units which are included in the formula. Also, certain activities have considerably reduced on account of system improvement and modernization. This certainly has a bearing on the 'R' factor in the rational formula. Similarly, most of the T and R activities are sourced out through contract works.

3.5 The man days calculation based on the T,R,M, and S activities arrived in the rational formula as per MCNTM as on 04 Jan' 2015 is considered for arriving the required manpower at SSE/P.Way/DG Unit.

3.6 'T' activities

The total claims for 'T' activities (track related) in TRMS is shown as 11056.19 man days. But, the column total in the T column is only **8782.31** The difference of 2273.88 man days is on account of shallow screening which is coming under 'R2' (regular activities).

In fact, the four sub activity under 'T' has come down due to technological improvements in Track maintenance, welding etc,.

T1- slack attention to
bad spots,
low joints,
SEJ's
minor curve attentions
are carried out in this section whenever the necessity arises.

T2- for Tie Tamper working

a) Pre tamping operations

b) Along with tamper

c) Post tamping operations

No contract exists and carried out by Department through machanised mode.

T-3 Casual Renewal of

a) Rails

b) Sleepers

c) Fasteners along with re-gauging

3.7 For this activity three contracts are exists.

(i) KRR-DG Sec: Through Rail Renewal (Primary) of exiting 52 kg (90Units) Rails with new 52 kg (90UTS) class I rails from 70.650 to 71.650 for a length of 1.00km in between Eriouydu & Dindigul stations.

Ref: Agt. No.MDU/155/2016 dt 09.05.2016.(F.No.(15-44)

LOA No.U/w.496/I/13/2015/07 dt 26.02.2016 (F.No. 6-12)

Contractor:- Sri.C.Govindhan,T.Govindhampalayam Namakkal Dt.

With reference to the above, the agreement was awarded to, Sri.C.Govindhan, T.Govindhampalayam for an agreement value of Rs.6,52,500/-

(ii) Description of work

Tiruchirappalli-Dindigul Section: Proposed Through Rail Renewal (P) of exiting 52 Kg (90UTS) rails with new 52 (90UTS) class I rails form Km 421.0000 to 423.840 & 428.300 for a length of 6.10 kms in between stations Vadamadurai and Dindigul.

Ref: Agt.No. MDU/273/11 dt 27.04.2015 (F.No. 8-41)

LOA No.U/W.196/I/16/2014/2 dt 20.01.15 (F.No. 4-5)

Contractor: Sri. D.Elumalai, Kannigapuram, Arakonam T.K

Value 1897,000/- agt closed

(iii) Description of work

1) Tiruchirappalli-Madurai (BG) section: Proposed conversion of exg.52kg/90 SWRrails into LWR at Km.415.600-417.100in Vadamadurai Road No.1 main line for length of1500m and Road No.2 loop line for a length of 860m-Total length 2.360Kms.

2) TPJ-DG(BG) Section: Proposed Random renewal of exg. Broken 52 Kg PSC sleepers with 52 Kg. PSC Class II sleepers at isolated locations in between km.341.000 and 375.500 between stations TPJ-MPA in SE/P.Way/MPA section.

3) TPJ-MDU (BG) Section: Proposed Random sleeper renewal of exg.Broken 52 kg PSC sleepers at isolated locations between km.376.000 to 493.000 in between MPA and MDU Stations- Total - 3550nos.

Ref: Agt.No. MDU/196/2011 dt 16.06.11. (F.no.7E-12)
LOA No.U/W.496/I/9/2013/16 dt 12.12.13 (F.no.4A-4H)
Contractor: Sri.N.Narayanasamy, Dindigul.
Agt value:44,67,000/-

1. Name of work	: Tiruchirapalli-Dindigul Station: Renewal of exiting switch Expansion Joints with new improved switch Expansion Joints Total-40Sets.
2. Agt. No. & date	: MDU/48/2014 dt 13.02.2014.(F.No.19-37)
3. Name of the contractor	: Sri.J.Abdur Rahman, Dindigul.
4. LOA reference	: U/w.496/I/5/2013/5 dt 16.09.13.(F.No.8-10)
5. Agreement value	: Rs.13,25,371/-
6. Physical Progress	: 55%
1. Name of work	:Tiruchirappalli-Dindigul Section- Through Rail Renewal (Secondary) of Exg.90R rails with 52Kg class II rails for a length of 3.10km at Road No.1 & 3 of Pungudi station and road No.1 & 3 Kalpattichatram station in Sr.Section Engineer/P.Way/Manaparai section.
2. Agt. No. & date	: MDU/242/16 dt 15.07.16 (F.no.71-97)
3. Name of the contractor	: Sri. M.Rajiv Gandhi, Kiethureddipatti,Dharmapuri Dt.
4. LOA reference	: U/W.496/I/14/2015/05 dt 17.03.16 (F no. 10-15)
5. Agreement value	: Rs.14,00,086/-

T-4 Repair welding

This is done by the mechanized mode and in rare case (in emergency only) done by manually.

Hence the man days requirement will be less.

In SSE/ P.Way /DG section the rail/ weld failure for the past three years is an average of three only

In consideration of the above facts, and contract activities the man days required for 'T' activities may be reduced to **8292 man days** (75% of the total value of 11056 man days).

3.8 'R' activities

For R activities 17278.28 man days is arrived in TRMS calculation. But, the column total is only 12920.32 (5487.09+5677.89+3378.75), thereby having the difference of 2838.21. Even if the man days for shallow screening (2549man days)is included it will be around **17092 man days** only. But it was added in the T activities.

3.9 Discussion on activities under 'R':

R1 -Lubrication of ERCs-

Done by department staff.

R2 -Shallow screening(1/5th of Length)

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

Done by the P.Way staff with the help of the Track machine unit.

R3 -Loading, Leading, Unloading

For this activity a contract is existing.

Description of work

Transportation of P.way materials in DEN /N jurisdiction

Agreement no. & date : 28/TVC/13 dt.11.07.2013

Contract value : Rs.41,05,000/-

R4 -Overhauling of LC gates

Description of work:

replacement of worn out wheels, winches, booms, and booms locking locked level crossing gates in DEN/N portion

Contract value: Rs.33,90,506./-

Further as per SSE/P.way /DG statement the attention to LC gates is once in a month

R5 -Watching of caution spots & misc.

It is a regular activity done by gangs.

R6 -Tree cutting for visibility

A contract was made in to clear the vegetation and the work was completed.

(i) Description of work:

Uprooting of weeds and cleaning vegetation to improve the visibility at Level crossings in between at Ayyalur-Dindigul ,Dindigul-Kodairoad (DN),Dindigul KM 439/300(Up) and Dindigul-Km 20/900.

Ref: Agt.No. MDU/23/2015 dt 21.01.2015(F.no.18-30)

LOA No.U/W.496/I/11/2014/6 dt 14.10.14 (F.no.5-6)

Contractor: Sri.Iemadhiyathulla, Vellalapatti post, Salem.

Agreement value: Rs.11,19,804/- agt closed.

R7 -Lubrication of Rails in Curves

Done by gang staff whenever it is required.

R8 -Accident Relief and carcass renewal in run over cases

The no. of accidents is drastically reduced in this section and the necessity of man days for this activity is very minimum. Cattle are generally not allowed to wander on the tracks in Kerala, comparing to other parts of India and the credit given for R8 can be minimized.

R9 -Bridge, Sleeper attention & Renewal

The ban on the use of wooden sleepers has brought reduction in the R9 activities that of bridge sleeper renewal.

From the statement of SSE/P.Way /DG the sleeper renewal is carried out by the contract and dept staff whenever necessary.

R10 -Pre-monsoon attention such as clearing of drains and waterways, cess repair, de-weeding of track and attention to cuttings & Trolley refuges

Description of work: Improvements to the Trolley refuges, deep cutting and height banks in DEN/N

Contract value: 1,06,63,651/-

Agreement No.& date: 33/TVC/09 Dt.22.06.2009

R11 -Creep pulling approaches to bridges, turnout.

Done by the gang staff whenever necessity arises.

R12 **-**Rectifying damage to LC posts and gates.

R4 and R12 connected with the overhauling of LC damage attendance seem to have justification for some reduction in these activities.

3.10 While observing the above activities pertaining to 'R' is reduced / minimised due to the modern technologies, Equipment and contract activities.

Taking into consideration of the above factors, the requirement of men for 'R' activity is reduced by 50 %.

In the light of the above observation a reduction of 50% overall 'R' activities (12920.32 man days) is suggested. That is only **6460 man days**

'M' activity

M1-Monsoon patrolling-2074 man days

M1 - Monsoon patrolling $\sum_{1 \text{ to } N} (D \times b \times s \times m)$

N = No. of beat lengths

D = No. of days of M. Patrol in an year

b = No. of beats

s = No. of shifts

m = No. of men (1 normally, 2 as per DRM's special orders for areas affected with wild animals / terrorists.)

For this activity 2074 man days is calculated in the TRMS calculation. It is claimed that there are 11 beats in this section and monsoon patrolling is carried out from 01st June to 15th August every year.(30+31+15=76 days in a year).

As per statement of SSE/DG the monsoon patrolling will be planned from the gang itself and the man power is deputed from the respective gang itself. However, the surplus days can be considered for the occasional hot/cold weather patrolling.

The DG section is less prone to monsoon effects and the rain fall in the recent years is comparatively less to the previous years.

Hence, 900 man days is allowed.

M2 & M3 -Hot/Cold weather patrolling 2636 (1883&753) man days.

2637 man days is **allotted in the TRMS** formula.

Hot Weather Patrol is the patrol carried out when the rail temperature exceeds td + 20^0 C.

Cold Weather Patrol is the patrol carried out during cold months of the year in specified sections as per the instructions of Chief Engineer.

In this section the Hot/Cold weather patrolling is done as per the requirement form time to time and there is no any CE approved instruction is available**.**

Hence, 900 man days is allowed.

M4-Vulnerable Locations - 915 man days

M4 pertains to watching of vulnerable location. For this activity 915 man days are arrived in TRMS calculation.

This cannot be more than 180 man days for 4 locations. This will cover 30 days in a year in 2 shifts. So, calculation in this regard will be 990 – 240 = 750 man days are shown in excess.

Since this jurisdiction requires attention at the vulnerable locations, **300 man days** is allowed.

M5-Gate keeping shortage- 7626 man days

The TRMS formula provides trackmen for the shortfall of number of LC gates keepers and there is no need to include in gate keepers in the track man strength. i.e., all the 7626mandays shall be deducted in TRMS formula in column 'm' of "M" activities.

And the man power for the same will be calculated separately.

M6-RG for Key men (923 man days)

There are 13 gangs and it requires 13 key men. For 13 key men the RG is provided from TRMS @ rate of 1:6. For this the requirement is 2.17 where as 882 man days are allowed for about 3 men. Hence, RG for key men is 3 x 294 = **882 man days**

M7-water man – 4998 man days

For water man post 4998 man days are allotted which is equal to 17 posts. There is no need of keeping one water man for all the 13 gangs because of the reduced no. of track staff, mechanized works and frequent movement of track machines in which water can be carried.

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

These gangs available for which the requirement is projected as 4998 man days per year for exclusively bringing drinking water for the Unit staff while on duty.

Since, this jurisdiction is not isolated open area also the whole section stations all have water facility. Also, to carry required water individual water bottles (Milton made – 2 liters.) was supplied to every Track man by the department. Hence, the work study team has not considered for allowing of 4998 man days exclusively for water man duties, but these man days is allowed to work as need base such as materials handling from other depots, official uses for registers maintenance etc. Also water can be taken in track maintenance machines and kept in LC gates up to 1 week.

Supplying water to track man with 17 staff means The cost of supplying water by maintaining waterman post will amount a min of Rs. 2000/- per month for every trackman. Savings in this effect can be 10 staff.

This is highly expensive and the water supply position is far better now days.

M8- Store activity- **2190 man days**. (i.e.2190/291=7.5 men).

It is observed that there are two stores functioning at the HQ i.e at DG and AYI for which store men are required in EI roster.

The max. requirement is 4 and one RG/LR. The store watch men is classified in EI roster in almost all the depots.

So the man days required is 5x294=**1470 man days**.

3.11 Hence, the total requirement for 'M' activities is as follows

Sl. No.	Activity	Man days required
M1	Monsoon patrolling	900
M2/M3	Hot/Cold weather patrolling	900
M4	Watching vulnerable location	300
M5	Gate keeping shortage*	---
M6	RG for Key man	882
M7	Water man	---
M8	Store watch man	1470
	Total	**4452**

Note: - * separate calculation is arrived for gate keeping staff.

3.12 Activity 'S' – Miscellaneous

S1 -Tunnel Maintenance

Since there is no tunnel in this jurisdiction, no man days is arrived in TRMS.

S2 -Bridge substructure maintenance- 251 man days

251 man days is arrived in TRMS calculation and the same is allowed.

Say **251 man days**

S3 -Long girder Bridge maintenance

No man days is arrived in TRMS

S4 -Extra maintenance due to very steep curves, deep cutting, steep gradient. No man days is arrived in TRMS

S5 -Maintenance of track on extremely bad formation

3.66 man days is arrived in TRMS. **4 man days is allowed.**

S6 -Look out man duty(for the safety of gang)

No man days is arrived in TRMS

S7 -Fog signal man duty(to assist traffic Dept)61 man days

61 man days is arrived in TRMS calculation and the same is allowed.

S8 -Filth removal from track(within city limits)

No man days is arrived in TRMS calculation.

S9 -Security patrolling-65 Man days

65 man days are calculated in the TRMS formula and the same is allowed.

S10 - Watching of water level in suburban

Not applicable

3.13 The man days for 'S' activities

Sl. No.	Activity	Man days required
1	Bridge sub structure maintenance	251
2	Sharp curves	---
3	Extremely Bad formation	4
4	Lookout man duties	---
5	Filth removal	---
6	Security patrolling	65
7	Fog signal	61
Total man days		**381**

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

Sl. No.	Activity	Man days required
1	**'T'**	8292
2	**'R'**	6460
3	**'M'**	4452
4	**'S'**	381
	Total man days	**19585**

Hence, the need of man power is reduced to a greater extend.

The men required as per TRMS

19585/294 =66.61

LR = 12.5 X 66.61

100

LR = 8.32 TOTAL = 66.61+8.32 = 74.93 say **75 men. -----A**

3.15 Requirement of Track mate &Key man

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 one Track mate. Such being the case, the 13 gangs are converted in 7 units, therefore the number of track mates required for these sections is 7 working posts. One RG allowed at the rate of 1/5th and one LR for these 6 posts is allowed at the rate of 1/6th. Then the total 7 track mate posts are more than sufficient. (Eligibility of RG is 1/6th and LR sanction is 1/8th where the study allowed 1/5th for RG and 1/6th for LR calculation).

Moreover, the latest **Railway board order is conversion from track mate, key man, trolley man, gate keeper, etc. to track maintainer I, II, III, & IV.** Fourteen Gang sections (BG) are available at SSE/P.Way/DG.

Total **8 men**

As per CMCNTM(Committee on Manpower and Cost Norms for Track Maintenance) rational formula is allowed manpower for one key man per Gang, so 15 key men is sufficient to this P.way unit (15 Gangs).

The total requirement of Track mate & Key man is 23 men------B

3.16 Gate Keepers :

Gate keeping activity is a part of 'M' activity (M5), which is not calculated in the TRMS calculation.

There is total of 7 gates in DG-PLNI-POY section consists of A class-1, B class-1 and C class-5 is available and manned by Engineering P.way /DG Unit. And in TPJ-DG-KQN section total of 18 Gates Comprises of A class-2, B class -1, C class-15 is manned by P.way DG unit.

The requirement for 25 gates (3 A class, 2 B class and 20 C class gates) is arrived below.

22(20 C class + 2 B class) x2 shift = 44 men

3 A class x3 shift =9

RG @1/6 for 53 posts= 9 posts.

Total 62 posts

LR @ 12.5% =7.75 say 8 posts

The grand total is 70 men. -----c

3.17 Requirement of Trolley Man

There are three trolleys are available with the SSE/PWAY/DG to carry out the regular track inspection and other track related activities. trolley movements are carried out by both SSE /HQ and sub section JE/AYR two batches of trolley/ track men is working with trolleys.

One trolley / lorry require 4 trolley men for its working. Due to the mechanical maintenance and improvement in road traffic facilities, the movement by trolleys 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.

3.17.1 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 took two days to inspect the section in trolleys in the fortnight period. For the movements of a push trolley four person are required in which, two will physically push the trolley and the other two is sitting and watching back side of the movement on safety view.

There are three trolleys available in PW/DG section, out of which one is Mobbed trolley. The normal speed of trolley is 10 kmph. The list given by SSE is also vindicating this view. 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. In fact, there is a strong case by giving multi disciplinary training for trolley men because the utilization for the prescribed activities is less than 20% of the man power on hand.

The study takes the maximum number of movements as 7 per month. Even if all the three supervisors move by trolley on 7 days/month, the total requirement will be 21 days. If the movements are well planned with the coordination among the supervisors, the trolley movement inspection can be easily fulfilled with a set of 4 trolley men.

Further, the schedule of trolley movement of SSE is only 50% of the JEs subject to one mandatory movement in a month. The trolley movements will be only for a short stretch of 2-3 hours of a day and this can be done by adjusting, according to the train timings,. Such being the case, 4 trolley men with one RG and one LR is sufficient to meet the present requirement.

A set of trackman can also be sent for trolley certificate course so that they can be used in case of simultaneous movements by SSE/JEs as multi skilled is the need of the day. In mechanized system there is enough spare days for the trackmen for this purpose.

As on date the category of Trolley man, Track mates, Key man & Track man is merged in to a single category called as Track maintainer I,II, II,IV such being the case, the calculation of Trolley men separately is not made at now. Only a skeleton strength according to the actual movement of SE/JE for the past 3 years is sufficient. For emergency duties, simultaneously duties by JE/SEs other Track Maintainers can be utilized, if they are given Trolley Men course training for 5 days at ZRTI/TPJ.

Hence the trolley gang of **5 men** (4+ LR 1) for push trolley is found sufficient **---D**

The total requirement is A+B+C+D = 75+23+70+5=173 men

Sanction Vs Requirement

category	Sanction	Actual	Requirement	**Surplus**
Track Maintainer	188	196	173	**15**

3.18 Supervisors :-

There are 3 posts of SSEs(including 1 SSE/SW) and 3 posts of JE(including1 JE/TMS/ADEN/O/DG) in the sanctioned list. The Actual is also 6. So, these six supervisors are maintained the entire jurisdiction of this section and allowed as such. Hence the man power requirement of supervision of this unit is as follow.

1. Over all in charge SSE = 2
2. Section supervisors SSE/JE = 2
3. LR/Special works (Track machines & others) = 2

Total requirement of Supervisors = 6

3.19 Artizans :-

There are 5 posts of artisan staff sanctioned in various trades like Blacksmith, Painter, Carpenter, Welders etc. and artisan helpers of 4 . But the actual is 2 only in artisan cadre and 4 in helper cadre. This study recommends **multi skilling** for these staff including training for welding, trolley working etc. they can be used for emergency patrolling also, when they are spare. Their movements and programmes are also show the scope for this proposal.

The failure of LC gates is hardly two failures per month (failure details not provided) which cannot justify 6 posts of blacksmith in various grades. The areas of other works for blacksmith are very limited and hence 2 blacksmith posts out of 6 which are already vacant can be surrendered. 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.

Also one welder and one painter are allowed for regular welding and painting works. After the introduction of PSC sleeper the carpentry works is merely less, even though the bridge timbers (sleepers) are also modified to channel sleepers and moreover bridge sleepers are manufactured and mounted through contract.

3.20 The required manpower for artisans based on CTE's letter is tabulated below. (The CTE's letter No.W.OM/45/Post/General dt.26.112009.)

Sl. No.	Category	Requirement	Remarks
1	Blacksmith	2 (17 LCs)	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	2 (17 LCs)	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	-
5	Welder Khalasis	1 for each SSE/P.Way	-
6	Bricklayer	1 each for **sub division**	These posts may be operated with any of the SSE/P.way to be decided by division and shall be shared by other SSE/P.way as per the programme to be issued by ADEN.
7	Bricklayer Khalasis	1 each for **sub division**	-Do-

3.21 Hence, the requirement of artisans staff calculation is based on the CTE's letter.

In this connection, it is to brought to your kind notice that CTE/MAS vide letter No.W/OM/45/POST/Genl. dt. 26.11.2009 that wherever the minimum of above staff are not available, such requirement is proposed to be met by creating posts duly using the staff bank provision available either at division or Headquarters or surrendering excess carpenters, brick layers and any other posts identified as necessary.

Attention of LC gates was already in the scope of contract under the activity R4 & R12 .

Description of work:

replacement of worn out wheels, winches, booms, and booms locking locked level crossing gates in DEN/N portion

Contract value: Rs.33,90,506./-

Hence, Welder post may be created by surrendering two sanctioned posts Blacksmith –I and Blacksmith-II, and one Blacksmith Helper.

The Sanction Vs Requirement of artisan staff at SSE/P.Way/DG:

Sl. No	Category	Sanc (a)	Act. (b)	Req. (c)	Surplus (a-c)
	Artisans Staff				
1	Tech.I Painter	1	1	1	0
2	Black Smith Sr.Tech	1	1	1	0
3	Black Smith Gr.I	1	0	1	0
4	Black Smith Gr.II	1	0	0	1
5	Black Smith Gr.III	1	0	0	1
6	Black Smith Helper	2	2	1	1
7	Helper STM	2	1	1	1
(C) Total		**9**	**5**	**5**	**4**

The Artisans Staff Requirement = 5 men

Further, the Co-ordinating officer during discussion has mentioned that maintenance activities are more in corroded rails. This can be addressed by maintain the rails as per the provision in the Manual. Further, in Table P page no.129 of Volume I MCNTM item no.3(a) casual renewal of rails can be done by utilizing 6 man days per km per year and R.7 & R.10 activities has to be adhered to for proper maintenance of track.

The activities like de-weeding of other than track can be done through outsourcing/imprest cash.

Moreover, welder post is not in the sanction, and the same may be created duly surrendering the surplus artisan posts.

3.22 Evaluation of ministerial staff:

At present, there are 4 Ministerial staff (1 OS ,1 Sr. Clerk and 2 OS at ADEN/O/DG) is on the sanction and 2 staff(1 OS, &1 Sr. Clerk) is looks after the Staff personal matters and other allied works and the same may be allowed to continue.

3.23 Scope of Out sourcing and the current GM approval for Permanent Way activities out sourcing:

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

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

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

"T" Activities

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

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

T_4 - Repair Welding

"R" Activities

R_4 - Overhauling of LC gates

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

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

SUMMARY OF RECOMMENDATIONS

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

Sl. No.	Category	Grade pay (Rs.)	No. of posts
1	Track Maintainer Gr-IV	1800	**15**
2	Black Smith Gr.II	2400	**01**
3	Black Smith Gr.III	1900	**01**
4	Black Smith Helper	1800	**01**
5	Helper STM	1800	**01**
Total			**19**

CHAPTER – IV

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

Draft report was handed over to the ADEN/DG (Co-ordinating Officer) to offer his remarks on 13.03.2018.

A reminder was also made on 05.04.2018 for offering his remarks on or before 13.04.2018.

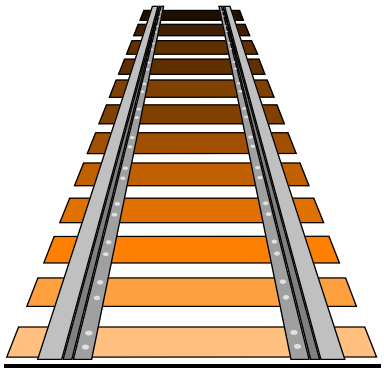
No reply has been received even after 35 days. Hence, the study report is released without the remarks of Co-ordinating Officer.

CHAPTER – V

5.0 FINANCIAL SAVINGS:

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

Sl. No.	Category	Grade Pay (Rs.)	No. of Posts	Money value Pay (Rs.)	Annual Financial savings (Rs.)
1	Track Maintainer Gr-IV	1800	15	39323	70,78,140
2	Black Smith Gr.II	2400	01	55965	6,71,580
3	Black Smith Gr.III	1900	01	43628	5,23,536
4	Black Smith Helper	1800	01	39223	4,71,876
5	Helper STM	1800	01	39323	4,71,876
Total			**19**		**92,17,008**



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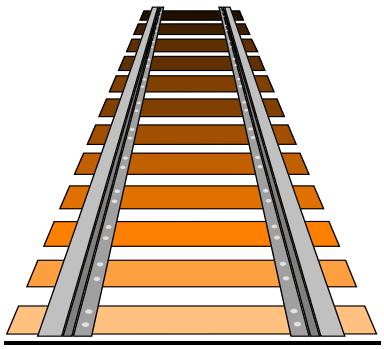
WORK STUDY TO REVIEW THE STAFF STRENGTH AT SSE / P.Way / DG MADURAI - DIVISION



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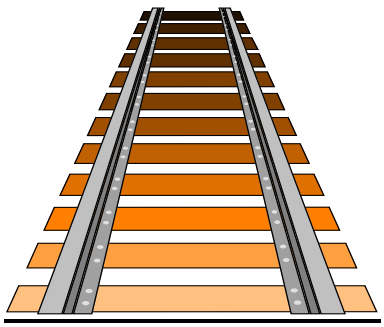

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