



कार्यालय
महा प्रबंधक/इन्जीन
पूर्वोत्तर रेलवे, गोरखपुर
OFFICE OF THE GENERAL MANAGER/ENGG.
N.E. RAILWAY, GORAKHPUR

No. W/275/0/A/Pt.V/W-4A

Dated: ११.2.2004

All DENs(Co-ordination),
North Eastern Railway,
IZN, LJN & BSB.

(CE's P.Way Circular No. 88 of 2004)
Sub:- Summer Precaution on Track.

This CE's Circular No. 88 is being issued in supersession to the previous CE's Circular No. 82 of the year 2000 on summer precaution.

- 1.0 High compressive forces develop in track due to rise in temperature during summer and therefore it is essential that all precautions are taken to prevent buckling of tracks. It is also essential that deficiencies in track, which can cause buckling, should be identified and made good. In this regard track should be inspected thoroughly at all Supervisor and Officers levels.

1.1 BUCKLING AND ITS INVESTIGATION

- i) Tendency towards buckling will usually manifest itself through kinks in the track. Kinks may also arise from incorrect slewing or lifting operations. By tapping sleepers for hollowness, it may be possible to notice if there is any tendency towards vertical buckling.
- ii) As soon as the tendency for buckling is detected, the traffic shall be suspended and the track protected. The track shall then be stabilised by heaping ballast on the shoulders upto the top of the web of the rail obtaining the ballast from inter sleepers spaces between the rails. Thereafter full investigation shall be made to find out the cause of the tendency for buckling.
- iii) Each case of buckling shall be investigated by AEN soon after its occurrence and a detailed report submitted to DEN/Sr.DEN.

- 1.2 Following instructions are being reiterated (from LWR and IRPW Manual) for guidance/compliance.

2.0 BUCKLING OF TRACK

Buckling or a tendency towards buckling may occur, among others, in the following circumstances:-

- i) Failure to adhere to the temperature ranges specified for operation on LWR/CWR.
- ii) Inadequate resistance to the longitudinal, lateral and vertical movement of track due to deficiencies in ballast section or/and inadequate ballast consolidation.
- iii) Use of ineffective fastenings or missing fastenings resulting in loss of creep resistance and torsional resistance.

- iv) Excessive settlement of formation.
- v) Improper functioning of SEJ.
- vi) Existence of closure rails in LWR.
- vii) Inadequate expansion gaps in FP and SWP track.
- viii) Creep beyond permissible limits.
- ix) Carrying out special works such as deep screening, lifting, slewing etc. of track without adequate precautions.

3.0 PRECAUTION TO AVOID BUCKLING:-

- i) Operation which impair the lateral resistance of track should not be carried out when rail temperature is high.
- ii) The greasing of fish plates is done before the hot weather season.
- iii) Joint gaps should be adjusted before the hot weather after proper gap surveying.
- iv) Creep if any, should be adjusted.
- v) Over tightening of fish bolts should be avoided.
- vi) Particular attention should be paid to stretches of track which are liable to creep. Jammed joints at such locations should be adjusted. Extra shoulder ballast should also be provided at such locations.

4.0 REGULAR TRACK MAINTENANCE:-

4.1 Regular track maintenance in LWR/CWR includes following operations:-

- i) Tamping/Packing
- ii) Lifting.
- iii) Aligning including minor realignment of curves.
- iv) Shallow screening/shoulder cleaning..
- v) Renewal of fastenings requiring lifting.
- vi) Maintenance of buffer rails.

(a) Track structures consisting of other than concrete sleepers in LWR/CWR

Regular track maintenance in LWR/CWR shall be confined to the hours when the rail temperature is between $td+10^{\circ}C$ and $td-30^{\circ}C$ and shall be completed well before on set of summer. If rail temperature after a maintenance operation exceeds $td+20^{\circ}C$, then during the period of consolidation, a speed restriction of 50 Km./h on BG and 40 Km./h on MG shall be imposed when shoulder and crib compaction has been done and 30 Km/h and 20 Km/h respectively when shoulder and crib compaction has not been done, in addition to posting of mobile watchman.

(b) Track structures consisting of concrete sleepers in LWR/CWR

The regular track maintenance in LWR/CWR shall be confined to hours when the rail temperature is between $td+10^{\circ}C$ and $td-30^{\circ}C$ and shall be completed well before onset of summer. If rail temperature after the maintenance operation exceeds $td+20^{\circ}C$ during the period of consolidation then the speed restriction of 50 Kmph on BG & 40 Kmph in MG shall be imposed.

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checked

4.2 Period of Consolidation:-

Consolidation of track is the process of building up ballast resistance to the tendency of movement of sleeper either initially before laying LWR or making up subsequent loss of resistance by any one of the following:-

- i) For the structure consisting of other than concrete sleeper.
 - (a) Passage of atleast 3,00,000 gross tones of traffic on BG or at least 1,00,000 gross tones of traffic on MG when compaction of ballast is done using hand operated compactors/consolidators or rammers.
 - (b) Passage of atleast 50,000 gross tones of traffic on BG or at least 20,000 gross tones of traffic on MG or a period of 2 days, whichever is later, when compaction is done by means of mechanized shoulder and crib compactor.
- ii) For the structure consisting of concrete sleeper, passage of at least 50,000 gross tones of traffic on BG or at least 20,000 gross tones of traffic on MG or a period of 2 days, whichever is later.
- iii) At least one round of stabilization by Dynamic Track Stabiliser (DTS).
- iv) For newly laid LWR/CWR, atleast three round of packing, last two of which should be with on-track tamping machines.

- 4.3 Standard Ballast section shall be properly maintained for LWR/CWR and SWP on BG and MG section (enclosed as per annexure) specially on pedestrian and cattle crossings, curves and approaches to level crossings and bridges. Cess level should be correctly maintained. Dwarf walls may be provided on pedestrian and cattle crossings to prevent loss of ballast. Replenishment of ballast shall be completed before onset of summer.

5.0 DESTRESSING DURING MAINTENANCE:-

Destressing shall be undertaken whenever abnormal behavior of LWR/CWR gets manifested in one or more of the followings:-

- i) When the gap observed at SEJ-
 - a) Differs beyond limits specified.
 - b) Exceeds of maximum designed gap of SEJ.
 - c) When stock/tongue rail crosses the mean position.
 - ii) After special maintenance operations.
 - a) Through Fitting Renewal
 - b) Deep Screening / Mechanised cleaning of ballast.
 - c) Lowering / Lifting of track.
 - d) Major re-alignment of curve.
 - e) Sleeper Renewal other than casual renewal.
 - f) Rehabilitation of bridges and formation causing disturbance of track.
 - iii) After restoration of track following an unusual occurrence.
 - iv) If number of locations where temporary repairs have been done exceed three per km.
 - v) At the time of through fitting renewal.
- Destressing of CWR shall be done by cutting it into LWRs of about 1-Km length which shall be joined after distressing.

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6.0 OTHER SPECIAL MAINTENANCE:-

- i) Other types of special track maintenance constitute jobs like lowering/major lifting of track, major realignment of curves, renewal of large number of sleepers or rehabilitation of formation/bridges causing disturbance to track. For carrying out such maintenance, the affected length of track may be isolated from LWR/CWR by introducing SEJs or buffer rails as needed.
- ii) Temperature records of the section shall be studied and action taken as per specified temperature.
- iii) After completion of work, the affected length of track shall be distressed at the required distressing temperature and joined with rest of the LWR/CWR.

7.0 HOT WEATHER PATROLLING:-

Period for regular hot weather patrolling shall be from 1st May to 30th June each year and Patrolling shall be organized by Section Engineer/P.way accordingly. In addition, the Section Engineer/P.way, Supervisor, Gang Mate Keyman shall be vigilant during summer and on hot days. Patrolling will also be introduced, when the rail temperature rises above $t_d + 20^{\circ} \text{C}$.

7.1 Hot weather patrolling will be carried out as follows:-

- i) On single line or where only one road in a double line section is having LWR/CWR – One patrolman for 2 Km.
- ii) On double line section when LWR/CWR exist on both road – one patrolman for 1 km length of UP and DN road. The beats of each hot weather patrolman will thus be restricted to 2 km.

7.2 The hot weather patrolman should always carry the following equipment:-

H.S.Flags – Red	2
Staff for Flags	1
Detonators	10
Canne-a-boule	1

7.3 Duties of hot weather patrolman:-

He will walk over his beat slowly over one rail in one direction and on the other rail in the return direction. On double line, he will repeat this procedure alternately on UP and DN tracks. He will be vigilant and look out for kinks in the rail especially during the hottest part of the days. When a kink is observed, he shall immediately examine at least 100 sleepers ahead and in the rear of the kink for any floating conditions of track. He should meticulously sound each and every sleeper, 100 sleepers on either side of the kink, to determine any floating condition. The sounding will be done by dropping a canne-a-boule on each end of the sleeper to determine the extent of void under the sleeper. Should the sounding reveal a 'floating' conditions, under which a buckle may be anticipated or the patrolman has detected actual buckling of track, he will take immediate steps to protect the affected portion by display of hand signals as per rules in force. After protecting the track, the patrolman will arrange to advise the Gangmate, PWM, PWI of his apprehension of a buckle/actual buckle.

7.3.1 The Gangmate on receipt of advice of a danger of buckle, will proceed to the site quickly with all available men. On arrival at site, he will first ensure protection of affected portion. He should then inspect the condition of track 100 m on either side of this suspected zone and commence heaping of surplus ballast, if available, on the shoulders and upto the rail head and keep on compacting the ballast with available tools. No attempt should be made to slew or align the track or disturb the existing ballast section. The mate should continue to remain at site till the arrival of P.Way Supervisor/Section Engineer (P.Way). The rail temperature will also be noted by one of these officials at the place of apprehended/actual buckle. The rail facing the sun will be covered up to the level of rail head on the outside by ballast or leaves, etc. to bring down the temperature of the rail.

7.3.2 MOBILE WATCHMAN

- a) He shall be posted, till period of consolidation is over, on stretches where after maintenance operation, rail temperature has exceeded $td + 20^{\circ} \text{C}$ during the period of consolidation as mentioned in para 4.2 above.
- b) The mobile watchman would patrol such section/beat to look for prominent kinks, incipient buckles or tendency towards buckling rail/weld fracture, and excessive gaps at SEJs.
- c) He shall protect the track at site if any of the situations as given in 7.3 above occurs and report the same to nearest Station Master/Section Engineer/P.Way/Gangmate.

8.0 DUTIES

8.1 KEYMAN

- i) He shall carry out fortnightly oiling and greasing of SEJ, checking and re tightening of fastenings at SEJ and other sleeper if necessary.
- ii) He shall replace missing fastenings not requiring lifting and slewing of track as per para 6.2.1 (iii) of LWR Manual and tightened the loose fittings.
- iii) He shall ensure that all creep anchors, where provided, but against the sleepers and in case of large scale displacement of anchors, shall report the matter to Gangmate/P.way Supervisor/S.E.(P.Way).
- iv) He shall watch for unusual features and on noticing any buckling tendency or damage to track, shall take necessary action to protect the track and report the same immediately to nearest Station Master/Section Engineer(P.Way).

8.2 GANGMATE / PERMANENT WAY SUPERVISOR:

- i) They shall carry out maintenance work under their personal supervision only if they are in possession of valid competency certificate issued by zonal/ divisional training center to work on LWR/CWR section.
- ii) They shall under take only those works of track maintenance for which they are authorised as per Annexure-VI of LWR Manual.
- iii) They shall maintain additional /special equipment issued to them in good condition and bring to the notice of PWI defective equipment requiring repairs.
- iv) They shall ensure that hot weather patrolman turn out on duty during the specified patrol period and carry out the patrolling duties correctly. They shall be vigilant during hot

- weather and order patrol if the temperature is likely to reach $td + 20^{\circ}C$ and report to their supervisors any unusual occurrences which take place on the LWR/CWR in their beat.
- v) They shall take immediate steps to secure the safety of the trains as per para 157 and 806 of IRPWM, if they consider that the track is likely to be rendered unsafe.
 - vi) They shall impose the specified speed restriction and post watchman if the temperature exceeds $td + 20^{\circ}C$ during the period of consolidation after the maintenance work had been completed.
 - vii) They shall make up the shortage of ballast at isolated/vulnerable location and report any ballast deficiency or disturbance of track to the Section Engineer/P.Way.
 - viii) They shall inspect SEJ and LWR/CWR under their jurisdiction frequently, specially during the hottest part of the afternoon in summer and report any unusual occurrences on LWR/CWR to Section Engineer/P.Way and obtain his order.
 - ix) They shall ensure that men working under them have knowledge of working on LWR/CWR.

8.3 SECTION ENGINEER/P.WAY (INCHARGE OF SECTION/SUB-SECTION)

- i) They shall be in possession of manual of instruction on LWR/CWR posted up to date at all times. They shall have a through knowledge of important pre-requisites for proper functioning of LWR/CWR and the limitations and precaution laid down for work on LWR/CWR. They shall ensure that the maintenance instructions are strictly followed by all the staff under him dealing with maintenance of LWR/CWR.
- ii) They shall supervise all track maintenance works for which they are responsible as per Annexure-VI of LWR Manual.
- iii) They shall be responsible for inspection of gaps at SEJ and creep/movement in fixed portion of LWR/CWR as per para 8.1.5 of LWR manual and recording observation of each LWR/CWR as per Annexure XI, XII, XIII A, XIII B of LWR manual in a register.
- iv) For making arrangement for patrolling of track in hot weather and post mobile watchman as and when required. They will ensure that patrolman and mobile watchman are issued proper equipments for carrying out patrolling.
- v) They shall inspect LWR/CWR under their jurisdiction frequently, specially during the hottest part of the afternoons in summer to look out for unusual features, tendency towards buckling and check patrolling.
- vi) They shall ensure that all maintenance staff under them are fully aware of their duties and responsibilities at all times with regard to maintenance of LWR/CWR.
- vii) They shall impose necessary speed restriction, in case the temperature exceeds $td + 20^{\circ}C$ after the maintenance work has been completed on LWR/CWR for the period of consolidation.
- viii) They shall ensure proper maintenance of the ballast section of the track and shall arrange to complete replenishment of ballast before the onset of summer.
- ix) They shall invariably carry PCP set with them on trolley during their inspection during summer months.

8.4 ASSISTANT ENGINEER:-

- (i) He shall inspect all SEJs and movement in fix portion of LWR/CWR at every six month and record his observation in the LWR/CWR register.
- (ii) He will scrutinized /analyzed LWR/CWR register to investigate the reasons of unsatisfactory performance of LWR/CWR and shall give directions to his staff to take remedial action, if any.

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- (iii) He shall ensure that all remedial action for LWR/CWR's showing unsatisfactory behavior are taken in time.
 - (iv) He shall give certificates that all the LWR/CWR in his jurisdiction are behaving satisfactory. He would arrange to send the LWR/CWR register for scrutiny of DEN/Sr.DEN once in a year before summer.

8.5 DIVISIONAL ENGINEER/SENIOR DIVISIONAL ENGINEER:

- i) He shall be responsible for ensuring that AENs and Supervisors working under him are fully conversant and comply with provision in LWR manual and such other supplementary instruction issued by Chief Engineer from time to time.
- ii) He shall make arrangement for sufficient quantity of ballast required for LWR/CWR sections.
- iii) He shall scrutinize LWR/CWR registers of his jurisdiction every year in the month of February and record his certificate about satisfactory behavior of LWR/CWR in his jurisdiction. He shall refer the details of all LWR/CWR to territorial Chief Engineer where he requires his orders/decision.

9.0 REPAIRS TO BUCKLED TRACK

EMERGENCY REPAIRS:-

If a buckling does occur or appears imminent, the track should be protected immediately with hand signal flags and detonators as per the protection rules laid down. Effort should be made to bring down the rail temperature by covering the rails with leaves or sprinkling the water etc. The buckled rails shall then preferably be cut adequately apart not less than 6.5 metres. The track shall then be slewed to the correct alignment and cut rails of the required length shall be inserted to close the gaps making due provision for welding of joints on both rails. The cut rails shall then be connected by use of special fish plates and screw clamps and the line open to traffic with speed restriction of stop dead and 20 kmph for first train and subsequent train non stop 20 kmph.

Particular care must be taken to see that the factors which contributed to the buckling i.e. jammed joints, seized fishplates or shortage of ballast received appropriate attention without delay.

PERMANENT REPAIRS:-

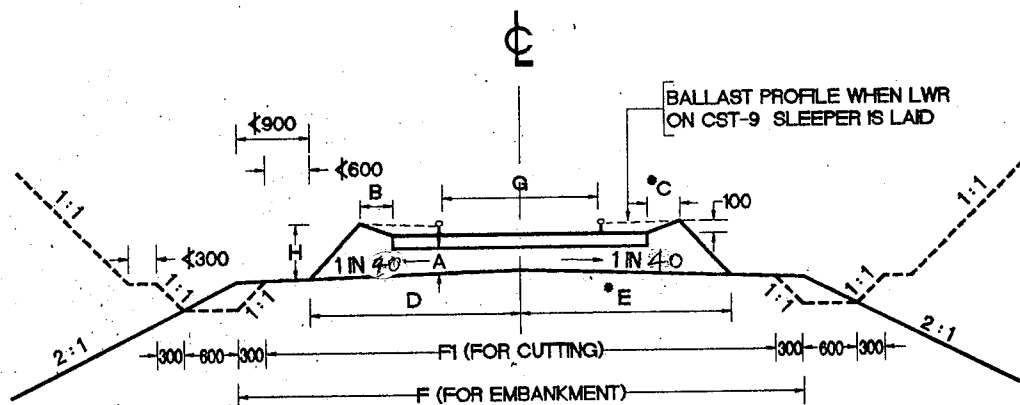
- i) As soon as possible the clamped joints shall be welded adopting the procedure laid down in para 7.2.4 & 7.2.5 of the LWR Manual.. Additional pair of cut rails and rail cutting equipment shall also be required to adjust to gaps in case they have been disturbed in the intervening period. The speed restriction shall be removed after welding.
- ii) The entire panel shall be distressed as soon as possible.

DA: As above-6 Pages

30/2/04
(SURESH GUPTA)
CHIEF TRACK ENGINEER

BALLAST PROFILE (SINGLE LINE BG)

Fig 4.2.1(a)



G GAUGE	TYPE OF SLEEPER	A	B	*C	D	*E	F	F1	H
1676	WOODEN	250	350	500	2270	2420	6850	6250	540
		300	350	500	2270	2420	6850	6250	590
		200 OVER 150 SUB-BALLAST	350	500	2270	2420	6850	6250	640
	STEEL TROUGH	250	350	500	2280	2430	6850	6250	550
		300	350	500	2280	2430	6850	6250	600
		200 OVER 150 SUB-BALLAST	350	500	2280	2430	6850	6250	650
	PRC	250	350	500	2525	2675	6850	6250	640
		300	350	500	2525	2675	6850	6250	690
		200 OVER 150 SUB-BALLAST	350	500	2525	2675	6850	6250	740

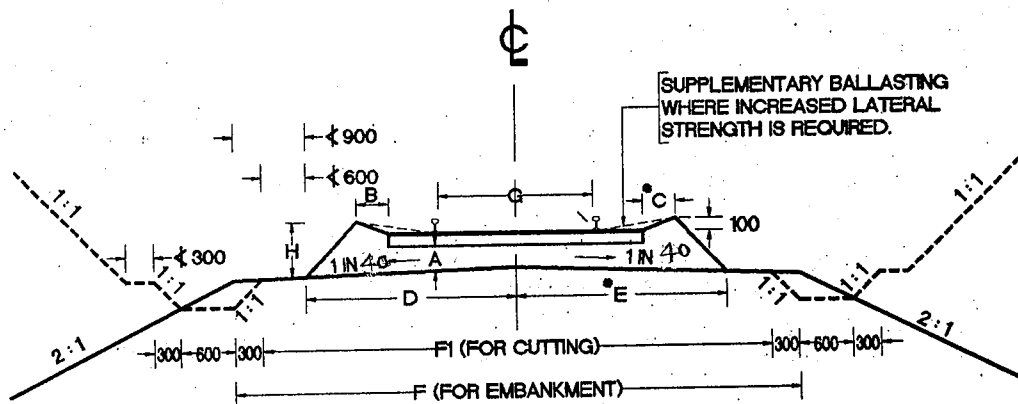
NOTE :

1. THE MINIMUM CLEAN STONE BALLAST CUSHION BELOW THE BOTTOM OF SLEEPER ie A = 250 mm
2. FOR ROUTES WHERE SPEEDS ARE TO BE MORE THAN 130 kmph, A = 300 mm OR 200 mm ALONG WITH 150 mm OF SUB-BALLAST.
3. * ON OUTER SIDE OF CURVES ONLY
4. SUITABLE SLOPE SHALL BE GIVEN FOR SIDE SLOPE OF BALLAST PROFILE
5. DIMENSIONS FOR FORMATION WIDTH (F AND F1) ARE GIVEN FOR STRAIGHT PORTION ONLY. THIS SHOULD BE SUITABLY INCREASED TAKING INTO ACCOUNT EXTRA BALLAST SHOULDER ON OUTSIDE OF CURVES AND FOR SUPER-ELEVATION
6. ALL DIMENSIONS ARE IN MILLIMETRES.

Corrected as per C. S. Ma 7 of LWR Manual
 at 2002 issued Fig 4.2.1(a)

BALLAST PROFILE (SINGLE LINE MG)

Fig 4.2.1(b)



G GAUGE	TYPE OF SLEEPER	A	B	*C	D	*E	F	F1	H
1000	WOODEN	250	350	500	1760	1930	5850	5270	510
		300	350	500	1760	1930	5850	5270	560
		200 OVER 150 SUB-BALLAST	350	500	1760	1930	5850	5270	610
	STEEL TROUGH	250	350	500	1790	1940	5850	5270	520
		300	350	500	1790	1940	5850	5270	570
		200 OVER 150 SUB-BALLAST	350	500	1790	1940	5850	5270	620
	PRC	250	350	500	2025	2175	5850	5270	510
		300	350	500	2025	2175	5850	5270	560
		200 OVER 150 SUB-BALLAST	350	500	2025	2175	5850	5270	610
	CST-9	250	350	500	1730	1880	4880	5270	510
		300	350	500	1730	1880	4880	5270	560
		200 OVER 150 SUB-BALLAST	350	500	1730	1880	4880	5270	610

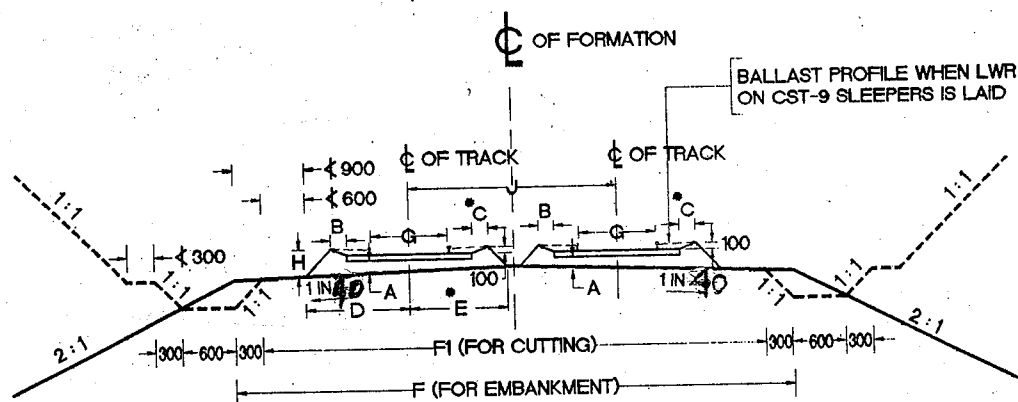
NOTE :

1. THE MINIMUM CLEAN STONE BALLAST CUSHION BELOW THE BOTTOM OF SLEEPER ie A = 250 mm
2. FOR ROUTES WHERE SPEEDS ARE TO BE MORE THAN 100 kmph, A = 300 mm OR 200 mm ALONG WITH 150 mm OF SUB-BALLAST.
3. * ON OUTER SIDE OF CURVES ONLY
4. SUITABLE SLOPE SHALL BE GIVEN FOR SIDE SLOPE OF BALLAST PROFILE
5. DIMENSIONS FOR FORMATION WIDTH (F AND F1) ARE GIVEN FOR STRAIGHT PORTION ONLY. THIS SHOULD BE SUITABLY INCREASED TAKING INTO ACCOUNT EXTRA BALLAST SHOULDER ON OUTSIDE OF CURVES AND FOR SUPER-ELEVATION
6. ALL DIMENSIONS ARE IN MILLIMETRES.

Corrected as per CS NO 7 of 2000 issued Fig 4.2.1(b)

BALLAST PROFILE (DOUBLE LINE BG)

Fig 4.2.1(c)



G GAUGE	TYPE OF SLEEPER	A	B	*C	D	*E	F	F1	H	J
1676	WOODEN	250	350	500	2300	2340	12155	11555	570	5300
		300	350	500	2300	2340	12155	11555	620	5300
		200 OVER 150 SUB-BALLAST	350	500	2300	2340	12155	11555	670	5300
	STEEL TROUGH	250	350	500	2310	2350	12155	11555	580	5300
		300	350	500	2310	2350	12155	11555	630	5300
		200 OVER 150 SUB-BALLAST	350	500	2310	2350	12155	11555	680	5300
	PRC	250	350	500	2525	2460	12155	11555	700	5300
		300	350	500	2525	2460	12155	11555	750	5300
		200 OVER 150 SUB-BALLAST	350	500	2525	2460	12155	11555	800	5300

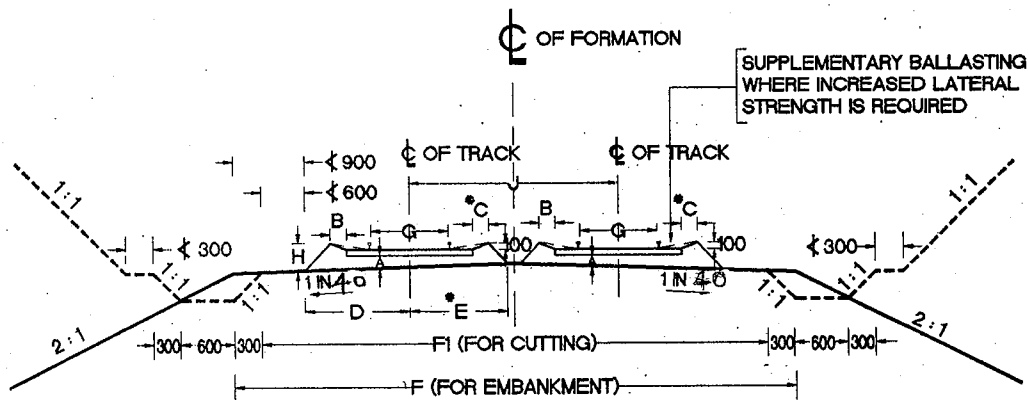
NOTE :

1. THE MINIMUM CLEAN STONE BALLAST CUSHION BELOW THE BOTTOM OF SLEEPER ie A = 250 mm
2. FOR ROUTES WHERE SPEEDS ARE TO BE MORE THAN 130 kmph, A = 300 mm OR 200 mm ALONG WITH 150 mm OF SUB-BALLAST.
3. * ON OUTER SIDE OF CURVES ONLY
4. SUITABLE SLOPE SHALL BE GIVEN FOR SIDE SLOPE OF BALLAST PROFILE
5. DIMENSIONS FOR FORMATION WIDTH (F AND F1) ARE GIVEN FOR STRAIGHT PORTION ONLY. THIS SHOULD BE SUITABLY INCREASED TAKING INTO ACCOUNT EXTRA BALLAST SHOULDER ON OUTSIDE OF CURVES AND FOR SUPER-ELEVATION
6. ALL DIMENSIONS ARE IN MILLIMETRES.

Corrected as per correction slip no 7 of LWR manual

BALLAST PROFILE (DOUBLE LINE MG)

Fig 4.2.1(d)



G GAUGE	TYPE OF SLEEPER	A	B	*C	D	*E	F	F1	H	J
1676	WOODEN	250	350	500	1790	1850	9810	9210	535	3960
		300	350	500	1790	1850	9810	9210	585	3960
		200 OVER 150 SUB-BALLAST	350	500	1790	1850	9810	9210	635	3960
	STEEL TROUGH	250	350	500	1810	1860	9810	9210	540	3960
		300	350	500	1810	1860	9810	9210	590	3960
		200 OVER 150 SUB-BALLAST	350	500	1810	1860	9810	9210	640	3960
	PRC	250	350	500	2025	1970	9810	9210	595	3960
		300	350	500	2025	1970	9810	9210	645	3960
		200 OVER 150 SUB-BALLAST	350	500	2025	1970	9810	9210	695	3960
	CST-9	250	350	500	1750	1810	9810	9210	535	3960
		300	350	500	1750	1810	9810	9210	585	3960
		200 OVER 150 SUB-BALLAST	350	500	1750	1810	9810	9210	635	3960

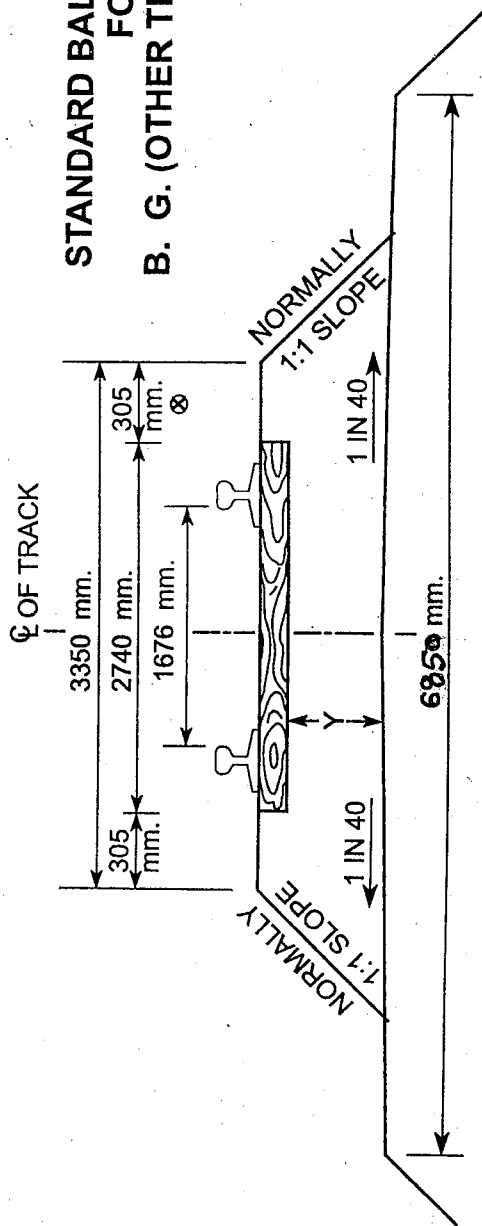
NOTE :

1. THE MINIMUM CLEAN STONE BALLAST CUSHION BELOW THE BOTTOM OF SLEEPER is A = 250 mm
2. FOR ROUTES WHERE SPEEDS ARE TO BE MORE THAN 100 kmph, A = 300 mm OR 200 mm ALONG WITH 150 mm OF SUB-BALLAST.
3. * ON OUTER SIDE OF CURVES ONLY.
4. SUITABLE SLOPE SHALL BE GIVEN FOR SIDE SLOPE OF BALLAST PROFILE
5. DIMENSIONS FOR FORMATION WIDTH (F AND F1) ARE GIVEN FOR STRAIGHT PORTION ONLY. THIS SHOULD BE SUITABLY INCREASED TAKING INTO ACCOUNT EXTRA BALLAST SHOULDER ON OUTSIDE OF CURVES AND FOR SUPER-ELEVATION
6. ALL DIMENSIONS ARE IN MILLIMETRES.

Corrected as per CS No 7 of 2000 issued 19/4/21 (d)

ANNEXURE 2/13 – Para 263

STANDARD BALLAST PROFILE
FOR
B. G. (OTHER THAN LWR/ CWR)



Note – Over all width of formation Corrected as per IRPWM correction Slip no-49.

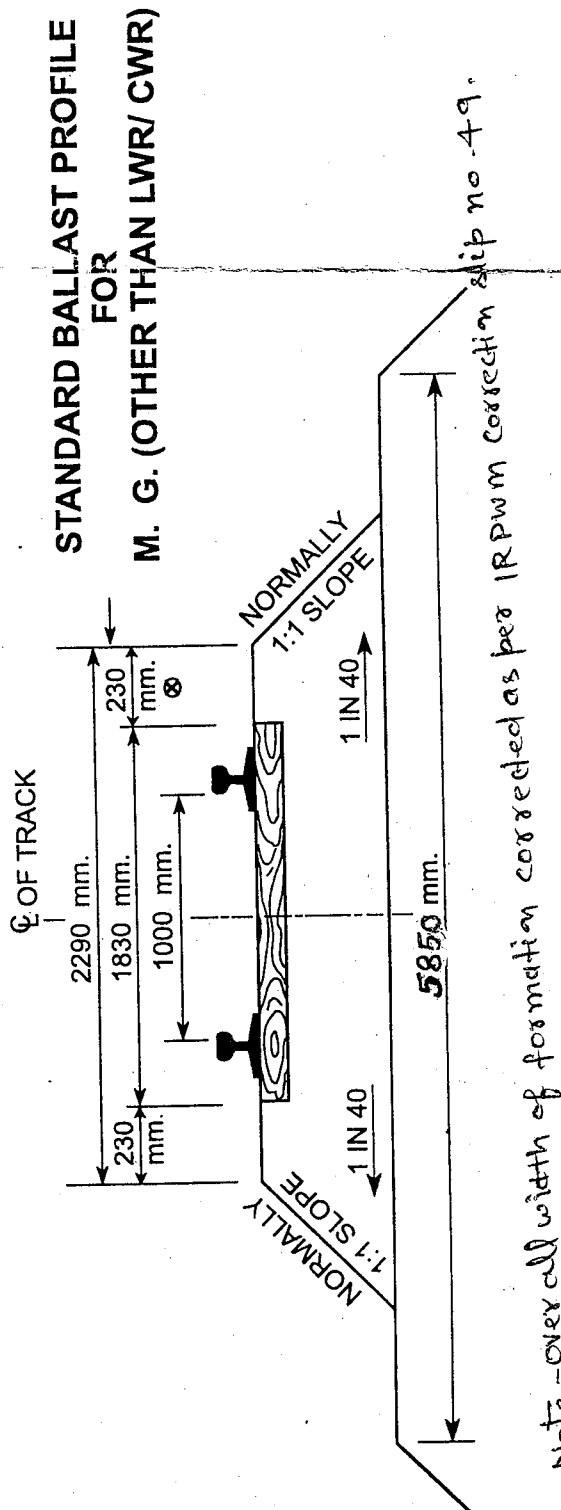
Note :-

- (1) In the case of ordinary fish-plated track : * To be increased on the outside of curves to 400 mm. in the case of curves sharper than 600 M. radius.
- (2) In short welded panel Track * To be increased to 400 mm. on outside of all curves, flatter than 875m radius and to 450mm. In the case of curves sharper than 875m. radius.
- (3) *To be increased to 550 mm. on the outside of turn in curves of turn-outs in passenger yards.
- (4) In the case of S. W. R. track, the minimum depth of cushion shall be 200 mm.

RECOMMENDED DEPTHS OF BALLAST AND
BALLAST REQUIREMENTS
FISH-PLATED TRACK

Group	Recommended Depth of Ballast Cushion Y	Quantity of Ballast Required/Metre	
		On Straight and Curves of Radius Flatter than 600 M.	Curves of Radius Sharper than 600 M.
A	300 mm.	1.588 M ³	1.634 M ³
B & C	250 mm.	1.375 M ³	1.416 M ³
D	200 mm.	1.167 M ³	1.202 M ³
E	150 mm.	0.964 M ³	0.996 M ³

ANNEXURE 2/14 – Para 263



**RECOMMENDED DEPTHS OF BALLAST AND
BALLAST REQUIREMENTS
FISH-PLATED TRACK**

Note :-

- (1) In the case of fish-plated track : * To be increased on the outside of curves to 400 mm. in the case of curves sharper than 600 M. radius.
- (2) In short welded panel : * To be increased to 330 mm. in the case of all curves flatter than 600 M. radius, and to 380 mm. in the case of curves sharper than 600 M. radius.
- (3) * To be increased to 550 mm. on the outside of turn in curves of turn-outs in passenger yards.
- (4) In the case of S. W. R. track, the minimum depth of cushion shall be 200 mm.

Routes	Recomm- ended Depth of Ballast Cushion	Quantity of Ballast required per Metre on	
		On Straight and Curves of Radius Flatter than 600 M.	Curves of Radius Sharper than 600 M.
Q Routes 100 Km. p. h.	300 mm.	1.070 M ³	1.145 M ³
Q Routes of less than 100 Km. p. h.	250 mm.	0.965 M ³	1.033 M ³
R-1 Routes	250 mm.	0.965 M ³	1.033 M ³
R-2 Routes where LWR is contemplated	250 mm.	0.965 M ³	1.033 M ³
R-2 Routes where LWR is not Contemplated.	200 mm.	0.817 M ³	0.905 M ³
R-3 Routes	200 mm.	0.817 M ³	0.905 M ³
S Routes	150 mm.	0.673 M ³	0.725 M ³