

WEST CENTRAL RAILWAY

**General Managers' Office
Engineering Branch
Jabalpur**

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**Senior Divisional Engineer (Co)
West Central Railway
Jabalpur, Bhopal & Kota**

Sub : PROCEDURE ORDER FOR DEEP SCREENING BY BCM

(A) General

Due to presence of bad formation, ballast attrition, excessive rainfall and dropping of ashes and ore, ballast gets choked up and track drainage is impaired. In such situation it becomes necessary to screen the ballast right up to the formation level/sub ballast level. Further through screening restores the resiliency & elasticity of the ballast bed, resulting in improved running quality of track.

Deep screening should be carried out in the following situations by providing full ballast cushion:

- Prior to CTR
- Prior to TSR
- Where the caking of ballast has resulted in unsatisfactory riding.
- Before converting existing track, fish plated or SWR into LWR or CWR.

The entire track must be deep screened at least once in 10 years

(B) Operations Prior To Deployment of Machine:-

i) Foot by foot survey of the section shall be conducted as per para 238(2) of IRPWM to see the condition of track components, ballast, cess width and availability of land for waste disposal & Additional ballast required should be unloaded in advance((unloading at least @ 1 rake of 30 hoppers per 2 kms). Adequate arrangement should be made for supply & training out of ballast so that ballast recoupment can be done from locally available source.

ii) The daily output should be pre-determined depending on the time allowance, availability of labour, extent of ballasting/screening to be done.

iii) Taking the length to be deep screened daily, planning of SR should be done. As per provision of manual, Normal sectional speed can be resumed on the eighth day. So for one BCM machine, minimum length of SR will be 2.8 Kms (taking average progress as 350 meters in a block of 3 hrs) & this length will increase proportionately if more than one BCM deployed. Ballast will be required for relaxing the cautions. Normally, local ballast depots should be able to cater to the needs of one BCM machine. However, if two or more BCMs are deployed to work together, ballast may have to be brought from other depots of the division involving longer leads. In such cases division should arrange a dedicated loco and crew for smooth movement of ballast.

- iv) Depth of cutting/magnitude of track should be decided on the basis of proposed rail level. The longitudinal section showing formation level, existing and proposed rail levels should be plotted on a graph sheet. Otherwise, aid of computer alongwith suitable software may be taken. The final rail level shall be transferred on pegs or traction masts.
- v) The pockets of the ballast beyond the reach of cutter chain shall be transferred in its cutting width before commencement of deep screening.
- vi) It should be ensured that there is no obstruction in the width of 4100 mm to avoid infringement to cutter chain. Rail pegs of LWR, creep posts etc should be removed. Pucca drain walls, if infringing, should be dismantled, alternatively the track can be slewed temporarily.
- vii) In electrified section, distance of foundation of mast from track centre will have to be accurately measured to ensure free movement of cutting chain.
- viii) Any signal rodding or cable which is likely to interrupt the work should be temporarily removed.
- ix) Approaches to bridges which cannot be screened by the machine should be screened manually in advance of the machine working.
- x) Level crossings should be opened in advance so as to enable machine to work.
- xi) Sleepers should have all the fittings intact so that no sleeper becomes loose and come in the way of cutter chain while the ballast is being excavated
- xii) Gas cutting equipment should be available at site to cut any obstruction like rail pieces, pipes etc, which might get entangled with cutting chain.
- xiii) Spoil disposal units should be attached with the machine while working in station yards, cuttings or multiple line section where of dumping of the spoil along the cess is not feasible. If waste is to be disposed off across any adjacent track, the adjacent track shall also be blocked for traffic.
- xiv) A trench of 30 cm depth and one metre width should be made for lowering cutter-bar by removing one sleeper or re-spacing of sleepers.
- xv) Traffic block of adequate duration to be ensure (minimum 3 hours per day)
- xvi) One JE/SSE each is also to be stationed with walkie-talkie on both the adjacent stations. They shall co-ordinate with the staff of Operating and other Departments so that machines are properly marshaled and ready before granting block. They shall also ensured that points are properly set so that minimum time is wasted for dispatching of the machine after granting block. Similarly they shall also ensured that points are again reset to receive the machine at the closing of the work and time loss is avoided

(C) Operations during Traffic Block:-

Work must be carried out under direct supervision of SSE/ Pway. He must ensure that 60 to 70 competent personnel are available with BCM and other machine to take care of various items during the block work. This labour force along with supervisors ensures that working portion of the track is cleared from all the infringements, all the missing fittings were getting recouped, all the track parameters are safe after working of the BCM machine.

(i) When the machine reaches site, the cutter bar should be lowered in the trench, both ends of cutter bar shall be connected to guides through links. For subsequent work, cutter bar is left under the track.

(ii) When the machine starts working, cutter bar scarifies the ballast. Links of rotating chain push ballast in the inclined guides and lead the ballast to screening unit. One person on either side should move with the machine to watch for any obstruction to cutter chain, so as to arrange for stoppage of the machine immediately. Thereafter, the necessary corrective action should be taken.

(iii) Screening should be stopped well before expiry of traffic block to permit proper closing of the work and packing before resumption of traffic.

(iv) If the machine stops moving during work, it should be ensured that gates for clean ballast below screen are instantly closed. Otherwise, the screened ballast will get heaped up at one place.

(v) Utmost caution should be observed while manipulating movement of waste conveyor to avoid hitting against electrical mast/signal post. Safety switch provided to sense the mast should, therefore, be kept 'ON'

(vi) All the staff working with the machine should wear safety helmets and masks to avoid inhaling dust.

(D) Operations after BCM block:-

i) At the end of work, about five sleeper spaces are left without ballast. These should be filled manually with clean ballast.

ii) The vertical and lateral clearances for OHE, signal post and any other structures should be checked and adjusted before cleaning the BCM block.

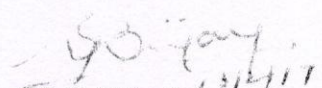
iii) Ballast recouperment activity should synchronise with deep screening activity so as to enable raising speed to normal after necessary packing.

iv) One watchman should be posted at the location where cutter bar and chain are left whenever considered necessary.

It must be ensured by SSE that the minimum backlog of work is left behind and all the post machine work is carried out on the same day itself.

- It is to be ensured that guard rail of bridges, check rail of L.C., resetting of PCC blocks of L.C. are fixed on the same day after BCM work.
- All the structural bonds, wires, junction box etc. are also fixed on the same day to provide minimum interruption to the traffic.
- **The qualitative tamping work is to be taken from the tamping machine, which makes possible to open the track at 40 kmph, which also results in less time loss.**
- Adequate supply & training out of ballast & relaxation of SR as per IRPWM must be ensured to keep length of SR in control.

DA : Annexure - I


(M.B. Vijay)
Principal Chief Engineer

C/- CTE, CBE, CE(TP), CE/G, CPDE for information and n/a.

Standard BCM Output and SR Chart								
Distance →	350	700	1050	1400	1750	2100	2450	2800
Day ↓								
1	40							
2	40	40						
3	40	40	40					
4	40	40	40	40				
5	40	40	40	40	40			
6	75	40	40	40	40	40		
7	75	75	40	40	40	40	40	
8	Normal	75	75	40	40	40	40	
9	Normal	Normal	75	75	40	40	40	40
10	Normal	Normal	Normal	75	75	40	40	40
11	Normal	Normal	Normal	Normal	75	75	40	40
12	Normal	Normal	Normal	Normal	Normal	75	40	40
13	Normal	Normal	Normal	Normal	Normal	75	75	40
14	Normal	Normal	Normal	Normal	Normal	Normal	75	75
15	Normal	Normal	Normal	Normal	Normal	Normal	Normal	75
								Normal

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