

NORTH EASTERN RAILWAY

CE'S P.WAY CIRCULAR NO. 35 OF 1963.

CASE NO.W/67/13/W-7

RELAYING OF TRACK .

On our Railway the pace of track renewals has been accelerated. It is necessary that a uniform method of relaying is adopted so that along with progress of relaying a good quality of work is also ensured. The relaying of the track takes place once in 30 to 40 years . With the higher standards of track that are being adopted at present, the duration between relayings is expected to further increase to 50 to 60 years . Therefore, it is necessary for all P.Way men to think over it and do all that is possible to ensure laying a perfect track which will not have any defect due to mistakes in the relaying. Opportunity should also be taken to attend to all aspects of track such as gradients, curves, alignment, proper drainage etc. The track laid with all due care will give the maximum service, with less maintenance cost and decreased comfort to travelling public.

The field staff should see that the following instruction against each item of work is strictly followed:

GRADIENT AND ALIGNMENT:

Whenever complete track relaying is to be taken on hand an 'L' section of the existing rail level at every 100ft. on the section should be prepared. They should be plotted on a scale of 1" = 100' horizontal & 1" = 10' vertical. The depth of the existing bottom of ballast section should be indicated. Taking into consideration the height of the new rail section, the depth of sleepers and 8" clean ballast cushion below the bottom of sleepers, a smooth gradient should be worked out for the entire section. The steepest gradient should not be more than the ruling gradient.

With reference to the final level of the proposed gradient the depth of screening on the existing track below the bottom of sleepers should be determined. This plan should also indicate the existing cess level and the final cess level after relaying.

TRAINING OUT OF BALLAST:

Having decided upon the final gradient it will be possible to work out the quantity of ballast that will be required at almost every spot. The requirement of ballast should be worked out for each mile and a programme for training out ballast should be made. The quantity of ballast that has to be run out should be decided in advance. It would appear more economical to run out about 50 to 60% of the additional ballast ahead of the relaying viz. as preballasting. This quantity will be sufficient to give the 8" cushion below the bottom of the sleepers and also a part of the shoulder. Immediately after the relaying and within the first 10 days the remaining quantity of ballast should be run out as post ballasting. With this ballast the final section of the track can be fully made up.

SCREENING:

After the preballasting is carried out it will be necessary to take up the screening of the existing ballast section. The depth of screening below the bottom of sleepers has already been decided in the 'L' section made out as per para 1. The ballast section between 2 sleepers should be pulled out on the cess and should be screened for removing the dirt and mud. The clean ballast should be left on the cess. The length of track under screening should be just ahead of the length of actual relaying. For example the track screened on the day must be relaid the next day. While carrying out the screening between the sleepers, care should be taken not to disturb the core below the sleepers specially because the screening is carried out under traffic.

On the length of track where screening has been done, a speed restriction of 10 KMPH should be imposed. In addition sufficient Watchmen should be deputed to watch the track during the day and night.

PEGGING OUT:

After completing the screening of ballast proper measurement should be taken and the anticipated position of rail joints should be marked. At every spot, where joint is expected to fall during relaying, a peg should be driven at the centre of the track. This will be the guiding peg for stretching the spacing chain which will be utilised during relaying for spreading and positioning of sleepers for every rail length. These pegs can be driven with their top in level with the proposed rail level.

RELAYING OPERATION:

Fixing up of blocks: A block of 3 hours should be fixed up between any 2 trains in consultation with the Optg. Deptt. The duration of blocks should be preferably during the early hours of the day so that after relaying there is sufficient time during day to attend to the newly laid track.

The block message should be exchanged by the PWI/R through a field telephone from the actual site of work. If the PWI takes the blocks from the railway station personally then some time is lost before the instructions from the PWI reaches the gangs for opening the track. The PWI/R should invariably use the field telephone from the site of work.

All safety precautions and protection of track as per CR and SR should be strictly followed

DISMANTLING GANG:

After the block is taken the track should be dismantled by this Gang. They should remove the fish plates and dog spikes quickly and move forward. The rails should be lifted and placed properly on the cess. They should not be thrown carelessly resulting in damage to the rails. The released wooden sleepers should be placed on the slope of the bank perpendicular to the track.

DUMPLING BREAKING GANG:

After removal of the sleepers it will be found that the resulting surface over the formation is a series of summits of ballast. With the aid of pick-axe it will be easy to strike and break this dumpling. After breaking it may be spread on the formation evenly. If it is found that the dumpling is having very little percentage of ballast then the entire dumpling may be thrown out on the slope of bank. It will be necessary to put sufficient number of Khalasis, row after row, so that the entire gang moves forward as a team. The rate of progress as well as the quality of relaying depends much on the work of this Gang. They should break the dumpling properly and should leave an even bed.

LEVELLING GANG:

This gang follows the dumpling breaking gang. With the use of fork and ballast rakes, the new ballast as well as screened ballast from the cess should be drawn in. The ballast should be spread evenly and in level. An even bed of ballast of about 8" should be made up in order to receive the new sleepers.

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LAYING OF SLEEPERS:

The spacing chain should be stretched between the locations of the proposed rail joint. As per the sleeper density the number of sleepers should be brought in within the rail length and they should be spread on the space as per the measurement on the spacing chain. As far as possible the centre line of the sleepers already marked on the sleepers should coincide with the centre line of the track.

In case of CST 9 sleepers reversed jaw CST 9 plates without Tie bars should be placed at the rate of 3 per rail length in their proper location before linking the rail and the tie bar introduced only after linking.

LINKING GANG:

The rail should be brought on the sleepers already spread. The fish plate joints should first be made. The web and the fishing angle of the rail ends and fishplates should be cleaned with a wire brush & a coat of grease graphite applied before the fishplate is fixed on the joint. The Distant pieces (Jhiri local name) should be fixed between the rail ends to ensure the correct expansion gap that has to be provided according to the rail temperature at the time of linking. The Jhiri should be so placed that it is not projecting over the top of the rail. After the fish-bolts and nuts are tightened then the Jhiri can be removed. Following this gang the rail should be slewed as necessary and fixed to the sleepers. In practice this linking work can be done faster specially in CST 9 sleepers and on Anticreep bearing plates by fixing the rail with the sleepers at every 4th. or 5th. sleeper in the first instance. After fixing this the intermediate sleepers between the 2 fixed sleepers can be done with a little more care.

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The staff in this work of linking should be trained and equipped with proper tools as the speed of relaying much depends on this gang. If this Gang delays the work in all probability the block will be burst with consequent repercussion on the running of trains.

ALIGNING AND PACKING:

By the time this work has to be taken on hand, it will be seen that the labour which proceeded with the work of dismantling and breaking the dumpling would have completed their work and would be ready to take up the work of aligning and packing. An experienced Mate with a good eye for alignment should be entrusted with this work. He should be able to align the track more or less correctly and pack up the track for correct gauge and level. At least one packing should be given for all the sleepers before the first train can be allowed to pass over it at the restricted speed of stop dead and 5 MPH.

After the packing is carried out, the PWI will release the block by issuing the safety certificate to the Station Master on either side of the station and to the traffic control. The PWI will follow all formalities and the normal safety rules while issuing the safety certificate.

MAINTENANCE OF THE RELAID LEACTH:

The maintenance of the relaid track requires much more vigilance than the relaying. Sufficient care should be taken and adequate effort must be put in so that the newly laid track is nursed properly. Since the ballast section is still to be consolidated any negligence in the maintenance will result in permanent damage to the rails which

may result in bad running perhaps throughout its life till it is again replaced. Therefore, the P.Way staff should take all timely precautions to maintain the track.

ON THE DAY OF RELAYING:

After the block is opened and the first train has passed over the relaid portion usually there is a tendency among the labourers to idle for the rest of the day. No doubt rest should be given to the labourers but it should be arranged in rotation per batches of labourers. The packing of the track immediately after relaying should receive attention.

SECOND & THIRD DAY:

A gang with an experienced Mate should be engaged for aligning the track perfectly for giving all the finer adjustments. He should be assisted by the 2nd packing gang. This party should be formed of sufficient trained men to complete the packing at the rate of half a mile per day.

After the 2nd packing on the 3rd day, the speed may be relaxed to 10 MPH.

FIFTH DAY:

The 3rd packing gang should attend to the relaid track on the 5th day. They should carry out mass packing maintaining the progress of half mile a day. After this packing, the speed may be considered for relaxation to 20 MPH.

Following this, the track should be maintained for one week by the PWI/R. A maintenance gang for packing up of slacks should be formed, which will be ultimately handed over to the open line. P.Way Mate of the section at the time when the maintenance of the section is handed over by the PWI/Relaying to the open line PWI. This post maintenance gang will assist the permanent gang of the section for 2 months.

After one week of the maintenance that is on or about 11th day from the date of relaying the relaxation of the speed to 30 MPH should be considered. During this period the post ballasting should also be carried out to give sufficient ballast for boxing and making up the shoulders. The open line PWI should ensure that the post maintenance gang given for assisting the permanent gang should be properly utilised to ensure atleast one turnover per month and in 2 months' period each gang length would have two turnover of through packing. The PWI/OL should endeavour to relax the speed to the full sectional speed as early as possible after the track is taken over by him.

RELEASED MATERIALS:

Just ahead of screening or during screening the track to be relaid should be examined and the classification done as per IRWW Manual para 716.

PACKING UP OF RELEASED MATERIALS:

No relaying will be deemed to have completed until the released materials are picked up, properly stacked, and finally disposed off. It is also not conducive to safety of traffic to leave stray and loose materials near the track. Therefore, arrangement should be made for packing up the released materials in an organised manner.

It would be desirable to bring the material train inside the block section during the same block period taken for relaying. Thus the maximum advantage of the block time can be taken. During the 3 hours block it should be possible to pick up the materials from a length of half mile to $3/4$ mile.

TRAINING OUT OF NEW MATERIALS:

The training out of new materials should also be done in a organised manner. In about 3 hours block period it is possible to run out about 3/4 to one mile of track materials. In co-ordination with Optg. Department and by proper planning, the materials train should be utilised for training out of materials and picking up of materials on alternative days.

LABOUR CAMP:

It is necessary to keep up the morale and spirit of labourers for carrying out the relaying with a team spirit. Proper arrangements should be made for the shelter, welfare and comforts of the labourers. It has been found by experience that it is most desirable to form labour camps near the site of work. The PWIs can have tents, tarpaulins or huts for this purpose. Necessary provision is usually made for all these materials.

The PWI should think well in advance about the camping site during the course of relaying. The camp should be so located that it would not be necessary for the labourers to walk more than 4 to 5 miles from the site of work. The timing should be so fixed that the labourers leave the camp in the early hours of the morning and start the work early so that they can be given rest during the hot hours of the day. The out put of the labourers will also be more in the early hours.

MEDICAL FACILITIES:

Medical facilities must be provided in the camps. Invariably provision is made in the estimate for an Assistant Surgeon with necessary staff for residing in the camps. The field staff should see that all the above facilities are fully utilised so that a good team is formed to carry out the relaying work at a fast rate. A first aid box should always be kept at the site of work.

EXTRA ALLOWANCE:

The field staff should also stay in the labour camp. The staff should be made aware of the relaying allowance admissible for the staff engaged in relaying residing in camp.

REGISTER OF THE RELAYING:

A Register should be maintained by the P.W.I. giving the details of the relaying every day. This should be maintained in the enclosed proforma at Appendix 1.

PROGRESS REPORTS:

A progress report in the enclosed proforma at Appendix 2 should be sent every Saturday addressed to the Chief Engineer, N.E. Railway, Gorakhpur so as to reach him on Monday morning. This should be strictly followed so that the progress of relaying can be watched by the Head Office.