

SOUTH EASTERN RAILWAY

*Chief Engineer's Office
Garden Reach
Calcutta 700043.*

Dtd. 01.01.1999

CE's Circular No.152/99

Sub: Project Report for Track Renewal Works.

1. Preamble:

Systematic and meticulous planning for various items of execution of track works is very important to achieve quality, economy and timely completion of the same as per target. This should cover all the 5 'M's of the work i.e. materials, manpower, machinery, methods and money.

There should be a separate detailed project report to cover each sanctioned work of track renewal covering complete track renewals, through sleeper renewals, through rail renewals, deep screening, through bridge timber renewals, through rail ends cropping and welding, major curve realignment works, regrading of track, work of conversion to SWR/LWR etc.

2. Details of sanctioned work:

This should cover the name and scope of work, PWP/FWP/Pink Book references, locational details, cost as per Pink Book, allocation of cost to various heads, outlay, Estimate number, estimated cost, details of sanctioning authority, variation in cost from the original cost of work, brief reasons of variations. It should be specifically indicated if the work of bridge timbering or channel sleepers on a bridge and renewal of points and crossing is included in the scope of the work.

3. Existing and Proposed track structure:

Inventory of existing track structure including rails, type and density of sleepers, fittings, ballast quantity/cushion, type/width of formation should be indicated in detail as prescribed in P.way diagram (This inventory is to be taken jointly by PWI/OL, PWI/Renewal and Construction as per extant instructions on S.E.Railway). The diagram should also contain details of level crossings, bridges, electrical crossings, curves, height of bank/cuttings, yards, sidings etc. The classification of released material must be got approved by competent authority as per existing approved procedure reflected in this report so as to take advance appropriate action for disposal of released material. The action plan drawn for stacking/storage and disposal of released material should form a part of report.

4. Pre-Execution Planning :

4.1 Existing gradient diagram and proposed profile :

Existing levels of track should be thoroughly surveyed taking levels at every 20 metres and a gradient diagram should be prepared to a vertical scale of 1cm to 100 cm (can be even 1 cm = 20 or 50 cm) and horizontal scale of 1 cm to 10 m. Need of regrading of track and introduction of vertical curves should be critically examined with a view to remove local sags and level off the high points. The proposed profile of the track should be shown in bold red line indicating the grades and lifting of track at 20 metre interval. Heavy regrading should be planned by adding to the ballast cushion. Lowering of track should be avoided at all cost. Exact lifting of track at girder bridges should be worked out and separate scheme should be developed for lifting of girders at each of the affected bridges. Similarly, at the level crossings, the amount of lifting of track should be worked out and indicated in the diagram. In case of a double line section, lifting of one track may cause difference in top surface of the road which should be eliminated by planning the lifting of track on the other line also and suitably ramping it off on the approaches of the level crossing. The DEN/Sr.DEN in-charge is personally responsible for approving revised levels.

4.2 P.Way diagram of the affected length.

After having collected the details as per para-3 above, existing track diagram showing inter alia, Level Crossings, electrical crossing, curves, height of the bank/cuttings, yards/sidings etc. should be indicated with type and dimensions of each. The complete details of rails, sleepers, fittings, ballast and formation should get reflected through the P.Way diagrams. In the same format 'Proposed P.Way diagram of the affected length' should be prepared and incorporated in the Project Report.

4.3 Realignment of curves:

All curves should be measured afresh irrespective of the values of versines shown in the curve register and slews worked out wherever there is need for realignment of the curves, keeping in view the obligatory points such as bridges, platforms and other structures.

5. Methods of execution :

It has to be kept in view that the work has to be executed 'bottom upwards' i.e. the sequence of execution of work will be in the following order :-

Formation → Ballast → Sleepers → Rails.

5.1 Formation :

i) Repair and widening of cess:

With the adoption of concrete sleepers which need more ballast cushion, the minimum required width of formation is now 6.85 metres for single line and 11.58 metres for double line. This should also ensure adequate width of cess for use for cycling by the gangmen. In most of the cases, it would require widening of existing formation. Project report should therefore indicate clearly the requirement and plan of

widening of formation in both bank and cuttings. Provision of pucca drains in cuttings should be planned as per existing instructions.

ii) Formation treatment:

In case area covered under CTR needs formation treatment in some stretch(es), details regarding availability of solution, method for executing the formation treatment and also planning of calling tenders etc. should be highlighted in the Project Report.

5.2 Ballast:

The complete requirement against the track renewal work should be worked out indicating whether hand crushed or machine crushed or combination of the two, mode of procurement and mode of training out/spreading.

5.3 Transportation of Rails & Sleepers :

Mode of transportation of rails and sleepers to site and mode of transportation of release material back to PWI's depot should be included in the Project Report apart from the method of agency of renewal.

5.4 Welding requirement, renewal of turnouts, bridges :

The complete details of welding requirement, its quantity, mode and agency should be furnished. If renewal of turn outs or bridges is also covered by the estimate, the complete details regarding their mode and agency of renewal should be indicated. The Project Report should also include the mode and agency for overhauling, relaying and making up of road service at level crossings.

Whether the turnouts are to be laid manually or by mechanised means, it is to be ensured that pre-assembly is done in depot or on cess. The assembly shall be laid in situ, after the same has been technically checked and passed by AEN in depot or on cess. The locations of pre-assembly of turnouts should be indentified and indicated in the report.

For AT welding, the arrangements made to put certified welders on job should be highlighted indicating whether AT welding would be done departmentally through contract.

5.5 Use of machines :

The Project report shall indicate for each activity, the agency whether Contractor or Departmental team and extent of mechanisation to be adopted keeping in view the various types of machines available on the Railway and their deployment which shall be decided in consultation with the Headquarters office. In case of track renewal works, it should be mentioned whether the work will be done by deploying PQRS, Track Relaying train or manually. Similarly for renewal of points and crossings, specific mention should be made if the work would be done manually or by using T-28 machine.

For mechanised renewal, the requirement & proposed action for additional traffic facilities (PQRS, Yd. etc.) should be covered in detail.

5.6 List of contracts required to be finalised for execution of works, should be highlighted.

6. Material planning :

The material requirement should clearly indicate separately the materials to be arranged by the Headquarters office and by the Division. Details of the materials, rail section & its quality (such as 90 UTS, Head hardened), type of sleepers (PRC, 60/52 Kg), rail to rail and rail to sleeper fittings, material for turnouts & level crossings and material for any other features on the section e.g. signages, curve boards, SEJs, dead ends etc. should be indicated. Requirement of welding should be assessed in consultation with the headquarters office who will decide the extent of welding to be done for track works by each Division keeping in view the overall capacity of the flash butt welding plant available on the Railway. Requirement of ballast should indicate whether from mechanised quarry or from hand broken and should indicate the name of quarry with its capacity. Divisions will take advance action for procurement of different type of materials and to fix up agencies for welding work and other activities related to the Project to ensure that all materials and executing agencies are available as and when the same are required. The strategy should be evolved for accountal, stocking and movements of materials/consumables/tools/safety equipment, lighting arrangements etc should be covered in detail with the objective of ensuring economy in movement and transit time.

7. Manpower planning:

Requirement of manpower including the officers, supervisors, artisan staff should be worked out indicating the grade, number of persons and duration for each group of persons. Project report should clearly indicate the requirement and its source and any special requirement of training such as for USFD testing, welding work etc. The manpower requirement should take into account the mechanised working such as use of Track relaying train, PQRS, ballast cleaning machine and tie tamping machines etc. Proposed Headquarters of different supervisors should also be indicated in the Project Report. The camping and mobilisation arrangements planned for manpower deployment should be highlighted.

8. LWR/CWR plans:

For welding of track into longwelded rails or continuous welded rails, it is necessary to have approval of the LWR plans by the appropriate authority of the Headquarters office and therefore it is necessary to obtain this approval well in advance. The LWR plans should also be included in the Project report which should indicate the

position of SEJs and critical locations such as level crossings, bridges, sharp curves, points and crossings etc.

9. Requirement of speed restriction, traffic blocks and material train :

Speed restrictions are very costly to the traffic and the management of the same should be done with utmost care ensuring that the overall time loss is within the permissible limit for each section and they are kept far and apart. The Project report should therefore indicate the requirement of speed restrictions and traffic blocks and the same should be done in consultation with the Operating officers of the Division and should have the approval of the DRM. The speed restrictions should not be allowed to remain over longer stretches and for longer durations than bare minimum requirement. Traffic block requirement should be planned very meticulously. Effort should be made to plan works in such a way that most of the activities which can be done without traffic blocks, must be completed without traffic blocks.

9.1 Requirement of hoppers for ballast training out for the work & corresponding requirement of powers, path & blocks should be worked out & incorporated in Project Report in consultation with SR.DOM and with approval of DRM.

9.2 Similarly, requirement of other wagons for material transportations by DMT should be worked out clearly indicating the requirement of stock(s), period of requirement, availability of power & crew.

9.3 Requirement of captive blocks for the work & their availability vis-à-vis corridor blocks provided in the working time table should be indicated in the Project Report.

10. Bar charts and network analysis:

The list of all activities involved in track renewal work should be prepared. The time estimates for each of the activities should be made based on the previous experience of similar works, local conditions, resource planning etc. These activities should be sequenced and co-related in logical manner and network diagram should be prepared using CPM method. The critical activities should thus be identified. The above details should also be included in the Project report.

It is felt that the field staff down below may not be able to fully understand the activity network thus prepared. Therefore, after identification of critical path and critical activities, bar charts on time scale should be prepared for use and guidance by the field staff. These bar charts shall also be included in the Project report.

11. Preparation of Project Report:

The Project report should be prepared as soon as Divisions are advised of Board's approval to include the work in the Final Works Programme and should be submitted to the Headquarters by the time the work appears in the Pink Book. As far as the track works are concerned, inclusion of the same in the Pink Book is known much in advance at the time of submission of the Final Works Programme and therefore it must be ensured that the Project Report is ready by the time the work is included in the Pink

Book and some of the advance actions can be taken to make arrangements for supply of materials and fixing up of contractual agencies.

(S.P.S.Jain)
Chief Engineer

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