

WEST CENTRAL RAILWAY

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All CEs/C, CPM/C/Kota
All Dy. CEs/C
West Central Railway

Sub: - Execution methodology for formation, track level & bridge approaches.

As directed by CAO/C/WCR, Execution methodology for formation, track level and bridge approaches (with slight modification), is enclosed herewith for implementation in the field with the immediate effect, without fail.

DA: As above (05 pages)


14/10/24
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Execution methodology for Formation, Final track profile & Bridge approaches

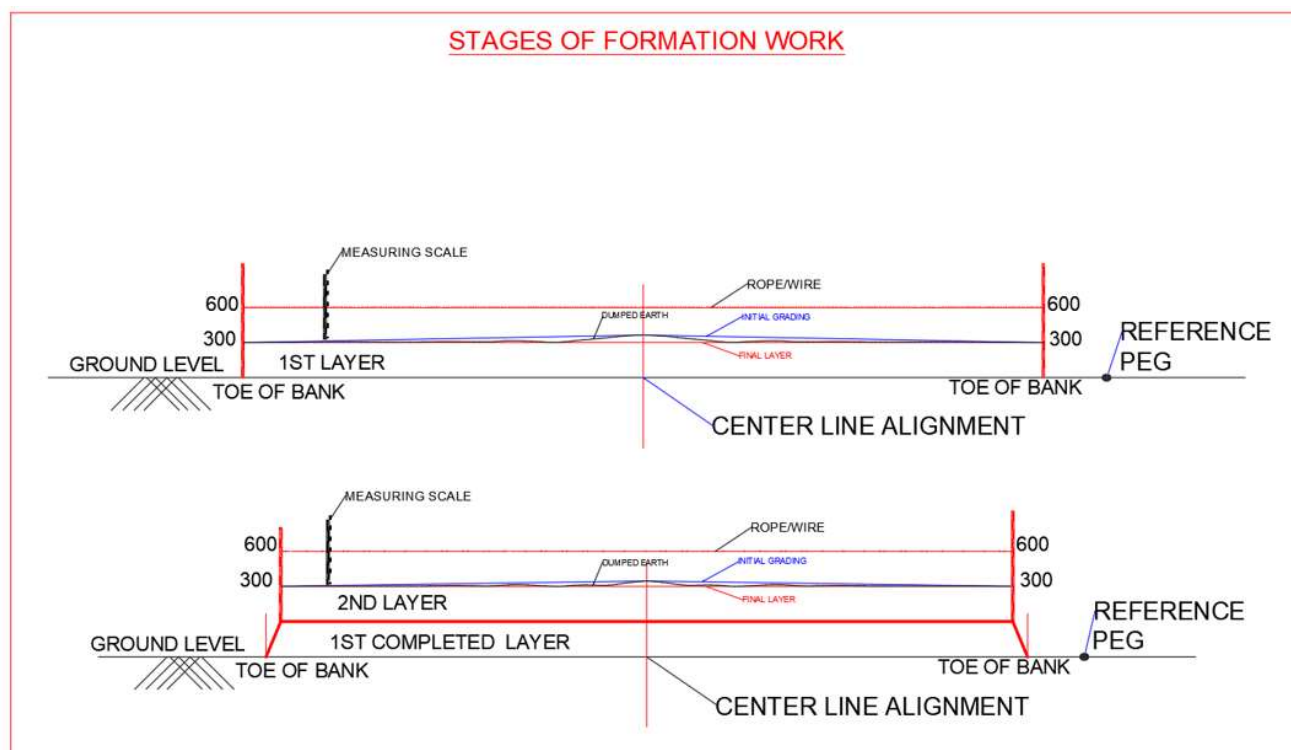
RDSO – GE: IRS 004 gives comprehensive guidelines and specifications for Railway formation. While, these field officials are aware of provisions as regards specifications and tests, standard method of execution for layer wise compaction, achieving final formation level, formation top slope and slope of the top of blanketing are not available, resulting in lack of clarity among the contractor's supervisor, engineer and Railway officials.

An effort has been made for standardizing the method for achieving final formation level, blanketing top level & the rail top level. Step by step execution methodology is elaborated as under: -

1. Earthwork in formation.

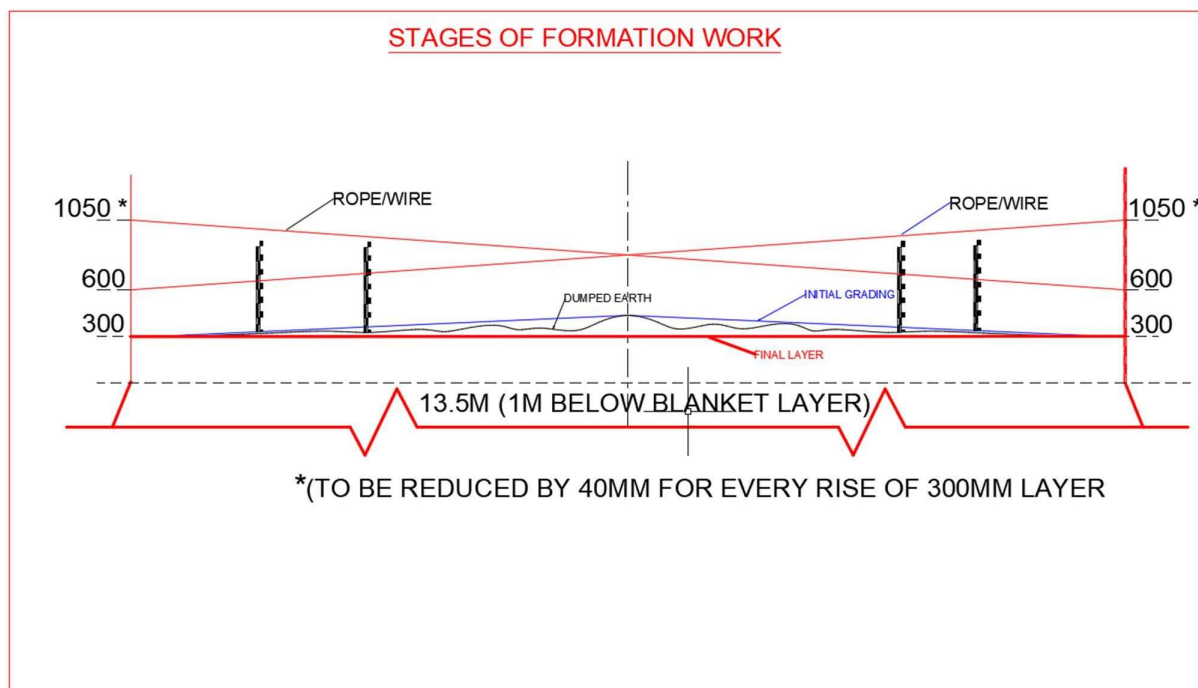
While guidelines for **Central marking and the alignment reference pegs** are available in **para-6.2.1B of GE-IRS-004**, which needs to be implemented at site, after **Clearing & Grubbing** vide para- 6.2.1A (1). Along with central lines and the reference pegs fixing, field trial for **Compaction and OMC** needs to be done as per **para-6.2.3C**.

- Before laying of earth start, multiple wooden/Iron pegs should be arranged with marking of 300 mm and 600 mm and fixed at the toe on the prepared level surface.
- These pegs should be fixed on both sides at every 25 m intervals and earth for approximately 250-350 mm should be laid by Dumpers and graded with proper Graders along with compaction and water sprinkling as per trial test results, dividing the width in two parts and the passing of rollers to be done from edge towards the centre.
- After compaction and grading suitable rope/thread/wire to be fixed at 600 mm mark on the wooden/iron pegs and measurement stick to run across the formation width to find necessary cut and fill.
- With the help of measuring stick with clearly marked 300mm, any measurement below 300 needs to be cut and measurements above 300mm need to be filled. These minor cuts and fills to be attended by the Grader, including dumping extra earth if required and then grading, rolling & compacting.
- Once the first layer is complete wooden/iron pegs to be removed from the bottom and fixed on the top of the layer and the procedure as above to be adopted.
- The above to be continued till the top 01 m of formation is balance.



- At 1 m beneath the Top Level, width of formation is approximately 13.5 m ($7.85 + 2 \times 2 \times (0.4 + 1)$) and the wooden pegs of sufficient height with mark at 600 mm & 1.05 m. ($600 + 13500/30$) to be fixed at both ends.
- Earth to be dumped in such a way that central portion gets more earth and the Grader to run with blades at approximately 35 degrees along with compaction in two parts of the width.
- Top surface to be checked by fixing rope/wire at 600 mm on side 1 & 1050 mm on side 2 for half part of the width (side 1 to centre) and similarly 600 mm on the side 2 and 1050 mm on side 1 for the other half of width (side 2 to centre).
- Measurement stick to run across the formation width to find necessary cut and fill. Any measurement below 300 to be cut and measurements above 300mm to be filled. These minor cuts and fills to be attended by the Grader, including dumping extra earth if required and then grading, rolling & compacting.

- The above to be adopted for subsequent layers with marking as (600 mm, 1010mm), (600mm, 970mm), (600mm, 930mm) i.e. reducing second markings by 40 mm ($2 \times 2 \times 300 / 30$) for every 300mm lift.



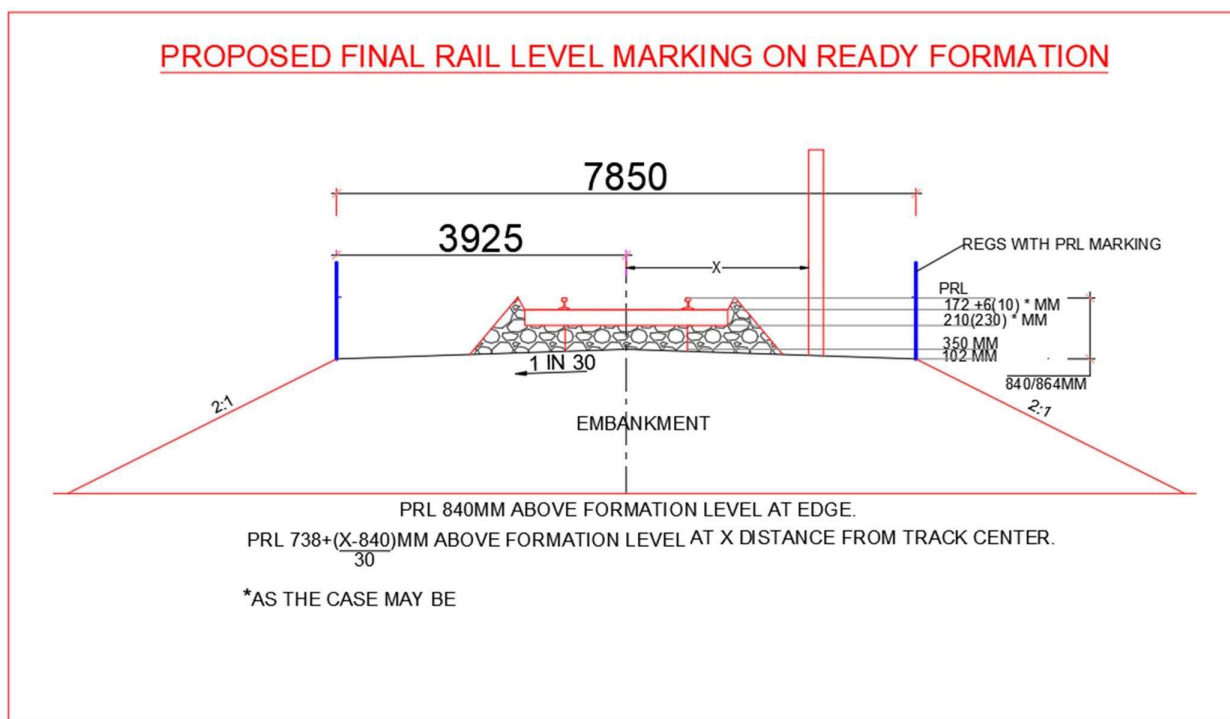
- This way the layer wise compaction and the slope at top of formation and blanketing would be achieved.

2. Monitoring of multiple lifting and packing for final Rail level

Once the blanketing top level is with the stipulated tolerance and checked with theodolite/total stations, it is to be handed over to the P-Way team for track works.

Once the formation has been handed over to P-Way team, Pegs on both end of the formation across the width and at every 25 m interval to be fixed. These Pegs should be sufficiently strong and grouted with CC to last next 3-4 months for multiple lifting and packing and achieving final rail level.

Marking on the pegs should be done as under:



The above marking will guide the P-way team for successive lifting and achieving final rail level this will also ensure proper ballast utilization.

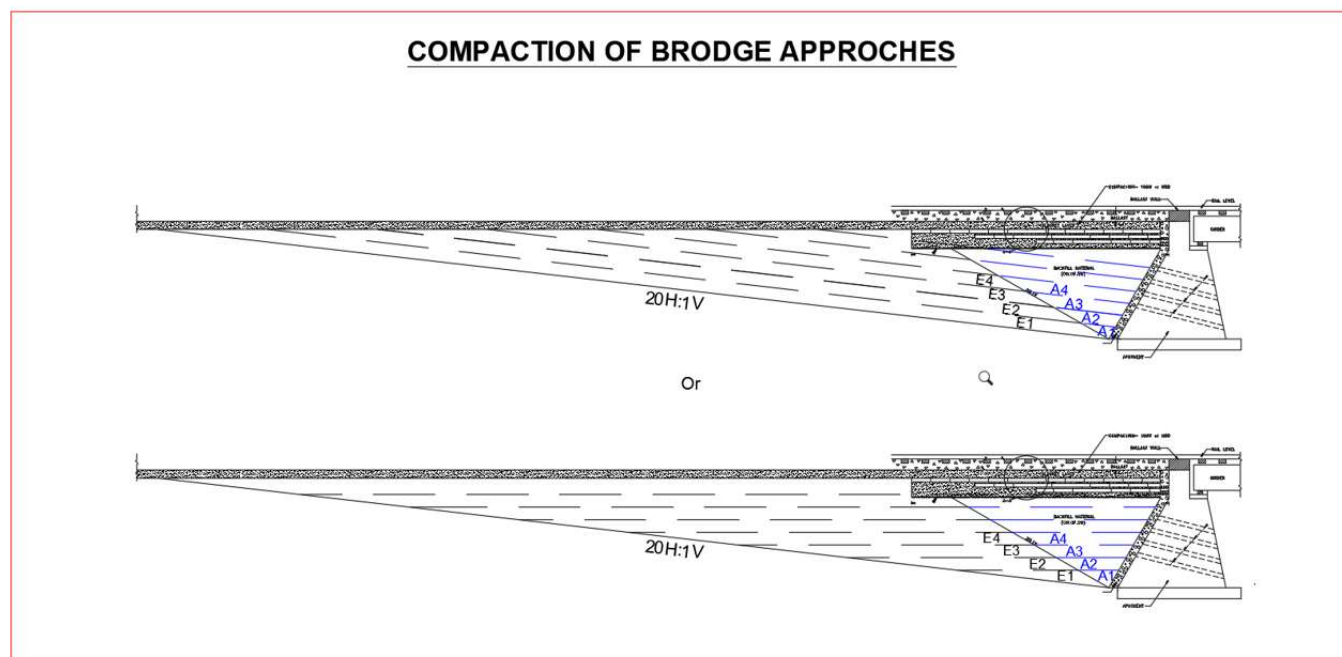
3. Compaction of Bridge approaches and approach transition

For bridge approaches specific guidelines have been issued however, it is seen that almost every bridge approaches run down after rains reflecting on improper compaction and approach transition. CRS has also commented it adversely during his inspections.

GE-R0 (Rev-2) stipulates on approach transitions on bridges however, achieving the slope of 2H:1V for backfill material (GW, GP, SP) and then its proper compaction has been a problem at site with no standard method of execution.

A method statement in this regard is given as under for implementation at all work sites:

- After the completion of abutment, approximately 15h-20h length behind it needs to be properly compacted as given below, where h is the height of the embankment immediately behind the abutment. This 15h-20 h has been taken in consideration of working of vibratory roller on slope.
- Once the 15 h-20h length space is made available, earth and backfill material to be laid in layers of 300mm and graded and compacted as given in 1 above.
- Length E1 for earth and A1 for backfill as given in the figure to be kept changing at every layer by reducing E and increasing A as E2 and A2, E3 & A3, E4 & A4 as given below.
- Rolling can be done horizontally also alternatively, as found suitable at site and shown below.
- This will ensure proper compaction of bridge approaches. Once the level reaches to 850 mm beneath the blanket top, GE-50 (Rev-2) to be followed for Proper Bridge Approach Transition.



The above would ensure proper compaction of bridge approaches along with standard bridge approach transition.