

**CHAPTER-XIII**  
**SPECIAL CONDITION OF CONTRACT**  
**(EARTHWORK)**

The work shall be executed according to the RDSO guideline RDSO/2020/GE:IRS-0004 “Comprehensive guidelines and specifications for Railway formation” and also any revised guidelines issued by Railway Board from time to time. **Guidelines to be used (for some or other block sections) for earthwork and blanketing etc. will be decided by Engineer – in – Charge as per site conditions and final binding to the contractor for the same.**

**1. Soil Exploration for formation design:**

**1.1** As formation design will primarily depend upon the type of soil being used in construction, it is essential the soil exploration is done properly for soil classification and assessment of bearing capacity as laid down in RDSO Guidelines GE:G-1, para-3.0& as per the RDSO guideline RDSO/2020/GE:IRS-0004. The results of soil exploration shall be reviewed and finally approved as this will be the basis of further design.

**1.2 Following initial activities were required to be done by the contractor-**

- (i). Geo-technical investigation/testing of Natural ground/sub-soil and submission of their report.
- (ii). Submission of sample & Geo-technical testing of proposed embankment fill soil and submission of their report.
- (iii). Sub-soil testing along the alignment, for buildings & for bridge locations etc. as per the guidelines/provisions.
- (iv). Submission of sample of fill soil & testing of such sample and testing of sub-soil sample for formation design.
- (v). Recording of initial ground levels for joint signing of cross-sections before commencement of earthwork.
- (vi). Finalization of longitudinal levels, cross-levels & L-section as per the proposed final level and finalization of cross-sections before start of earthwork.

**1.3** The soil classification shall be done as per RDSO guideline RDSO/2020/GE:IRS-0004 “Comprehensive guidelines and specifications for Railway formation”.

Table Description of soil quality class	
Description w.r.t. %age Fines (size < 75 micron)	Soil Quality Class,
Soil containing fines > 50%	SQ1
Soil containing fines from 12% to 50%	SQ2
Soil containing fines < 12%	SQ3

**2. Requirement of Blanket Layer:**

**2.1** The provision of blanket layer shall not be needed when formation/ earth fill embankment have:

- (i) Rocky beds except those, which are very susceptible to weathering e.g. rocks consisting of shale's and other soft rocks, which become muddy after coming into contact with water.
- (ii) Soil GW, SW, GW-GM, SW-SM type.
- (iii) Soils conforming to specification given in para 4 below.

The provision of separate Blanket layer shall not be necessary when Coarse granular, well graded ( $C_u > 7$ ,  $C_c$  between 1 and 3) soil/quarry dust/crushed stones material of 300 mm thickness is laid as top layer.

- 2.2 For other conditions, the system of layered construction of embankment consisting of prepared subgrade shall normally be followed. The prepared sub-grade should normally consist of good quality soils with fines less than 12% (A or B1).

**2.3 Thickness of Prepared subgrade and Blanket Layer**(as per letter no.RS/G/108/Heavy Axle Load, dated:19.10.2015):

Embankment Fill/Soil Group	Prepared Subgrade		Thickness of Blanket Layer (mm)
	Type of Soil group	Thickness (mm)	
<b>A</b>	Not Required	NIL	NIL
<b>B(B1/B2)</b>	<b>A</b>	500	NIL
	<b>B1</b> (Fines<12 %)	350	150
<b>C</b>	<b>A</b>	500	NIL
	<b>B1</b> (Fines<12 %)	500	150

The level of compaction of various layers of formation shall be ensured as defined in guidelines issued by RDSO.

- a) In case good quality soils with fines less than 12% (A or B1), are not available for preparation of subgrade economically, soils having fines between 12% to 50% (B2) can be used over embankment fill of soil group-C. In such cases, the thickness of blanket layer over prepared subgrade of 500 mm thickness shall be kept as 250mm. The thickness of blanket layer can be reduced to 150mm by use of Geotextile in consultation with RDSO.
  - b) In case, the prepared subgrade is not considered on economic consideration and use of other types of soil not covered by above clauses is required, Railways may approach RDSO for getting guidance on deciding blanket thickness depth.
  - c) Use of Geosynthetics (Geo textile/Geo grids) shall be considered at places where it is economical to use it in combination with blanket as it reduces the requirement of thickness of blanket. Use and selection of Geosynthetics should be done in consultation with RDSO.
- 2.4 The Railway Formation may be constructed with Single Layer System or Two Layer System as per RDSO guideline RDSO/2020/GE:IRS-0004 "Comprehensive guidelines and specifications for Railway formation", based on availability of local soils/materials and on economic considerations. The thickness of the prepared sub-grade and blanket layer has been rationalized based on UIC-719R calculation for ballast cushion of 350 mm. The specifications and thickness of Blanket layer,

Prepared subgrade, Subgrade (Top Layer & Lower layer) and Sub-Soil are tabulated for Single layer system and Two-layer system for 25T.

For 25 T Axle Load

Sl.No.	Soiltype Category in Sub-grade	Prepared Sub-grade		Recommended Blanket Thickness (mm)	Remark
		Soil Type	Thickness (mm)		
1.	SQ1	SQ1*	--	550	Single layer
2.	SQ1	SQ2	500	400	Two Layer
3.	SQ1	SQ3	500	300	Two Layer
4.	SQ2	SQ2*	--	400	Single layer
5.	SQ2	SQ3	350	300	Two Layer
6.	SQ3	SQ3*	--	300	Single layer

\* Subgrade soil is continued upto blanket layer.

2.5 Selection of top layers for design of formation as well as for blanket material as given in above paras and further deviations from these provisions can be finally decided on techno-economic considerations by CAO (Con.) after recording the reasons.

### 3. Specification of Blanket Material:

3.1. The material for blanket layer over prepared sub-grade should be well graded granular material. The following specifications shall be ensured at the time of laying.

(i)  $C_u > 7$  and  $C_c$  between 1 and 3.

(ii) Fines (passing 75 microns) 3% to 10%.

(iii) Minimum required Soaked CBR value 25 of the blanket material compacted at 100% of MDD.

3.2 These values can generally be obtained by following the gradation as given in GE:G-0014.

3.3 **Specification and Thickness of Formation Layers for 25T axle load: Single layer system as per RDSO guideline RDSO/2020/GE:IRS-0004 "Comprehensive guidelines and specifications for Railway formation".**

Layers	Specification	Thickness
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<b><u>Blanket</u></b>	i) $C_u > 7$ and $C_c$ between 1 and 3 ii) Fines (passing 75 microns): 3% to 10% iii) Minimum soaked CBR value $\geq 25$ , (Soil compacted at 100% of MDD * in Lab) iv) Los Angeles Abrasion value $< 40\%$ v) Field Compaction : Min. 100% of MDD * in field trial vi) Minimum $E_{v2}^{**} = 100 \text{ MPa}$ vii) Size gradation – within specified range or should lie more or less within enveloping curves. viii) Filter criteria (***) should be satisfied with sub-grade layers as given below: Criteria-1: $D_{15}(\text{blanket}) < 5 \times D_{85}(\text{sub-grade})$ Criteria-2: $D_{15}(\text{blanket}) > 4 \times D_{15}(\text{sub-grade})$ Criteria-3: $D_{50}(\text{blanket}) < 25 \times D_{50}(\text{sub-grade})$	<b>30cm</b> over SQ3 sub-grade <b>40cm</b> over SQ2 sub-grade <b>55cm</b> over SQ1 sub-grade
<b><u>Sub-grade</u></b> Top Layer	SQ1/SQ2/SQ3 soil SQ1 soils (To be used only with dispensation of PCE/CAO) i) For SQ2/SQ3 soil, $\text{CBR} \geq 6$ (soil compacted at 98% of MDD *) ii) For SQ1 soil, $\text{CBR} \geq 4$ soil compacted at 98% of MDD *	100cm
<b><u>Lower layer (fill)</u></b>	ii) Field Compaction : Min. 98% of MDD * iv) Minimum $E_{v2} = 45 \text{ MPa}$ (for SQ1) 60 MPa (for SQ2/SQ3) SQ1/SQ2/SQ3 soil (+) (a) $\text{CBR} \geq 3$ (soil compacted at 97% of MDD *) (b) Field Compaction : Min. 97% of MDD *	As per Embankment height
<b><u>Ground Soil/Sub-soil Strata</u></b>	i) Undrained cohesion of soil ( $C_u$ ) $\geq 25 \text{ KPa}$ (only for soils having particles finer than 75 micron exceeding 12%) ii) $E_{v2}$ (determined from PLT) $\geq 50 \text{ MPa}$ iii) $N$ (determined from SPT) $\geq 5$ Ground Improvement is required, if any of the above parameters not complied with	--

\* MDD mentioned in the above table.

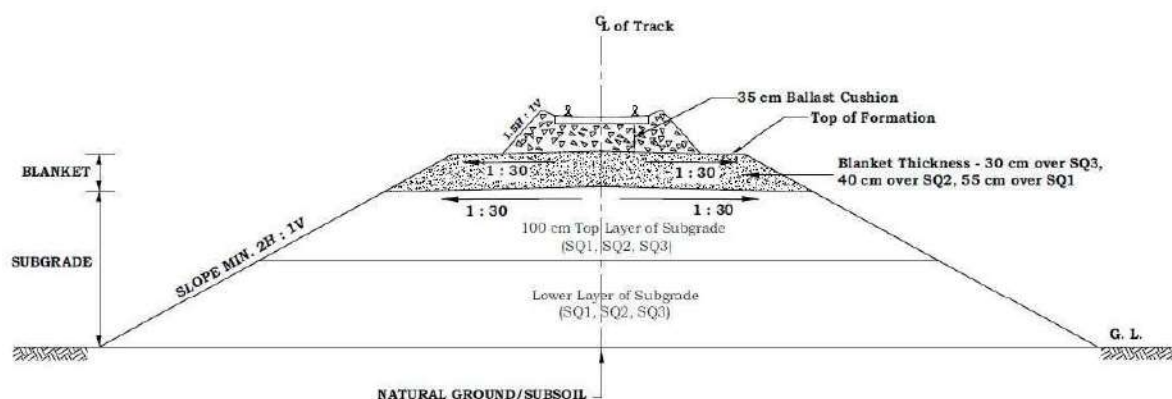
(a) For determination of CBR - MDD achieved in Lab

(b) For field compaction - MDD achieved in field compaction trials which should not be less than 98% of MDD in lab.

\*\*  $E_{v2}$  is Modulus of deformation.  $E_{v2}$  testing at field is mandatory.

\*\*\* With the application of Non-woven Geotextile as a separator layer below the blanket, filter criteria will not be required or mandatory.

+ No dispensation of PCE/CAO required for use of SQ1 soil in Lower layer (fill) of Subgrade.



### Track Formation for 25 T Axle Load (Single layer system)

#### 3.4 Specification and Thickness of Formation Layers for 25T axle load: Two layer system as per RDSO guideline RDSO/2020/GE:IRS-0004 "Comprehensive guidelines and specifications for Railway formation".

Layers	Specification	Thickness
<b><u>Blanket</u></b>	i) $C_u > 7$ and $C_c$ between 1 and 3. ii) Fines (passing 75 microns): 3% to 10% iii) Los Angeles Abrasion value $< 40\%$ iv) Minimum soaked CBR value $\geq 25$ , (Soil compacted at 100% of MDD * in Lab) v) Field compaction: 100% of MDD * in field trial vi) Minimum $E_{v2}^{**} = 100 \text{ MPa}$ vii) Size gradation – within specified range or should lie more or less within enveloping curves. viii) Filter criteria (***) <b>Optional</b> should be satisfied with prepared sub-grade layer as given below: Criteria-1: $D_{15}(\text{blanket}) < 5 \times D_{85}(\text{prepared sub-grade})$ Criteria-2: $D_{15}(\text{blanket}) > 4 \text{ to } 5 \times D_{15}(\text{prepared sub-grade})$ Criteria-3: $D_{50}(\text{blanket}) < 25 \times D_{50}(\text{prepared sub-grade})$	<b>30 cm</b> over SQ3 Prepared Sub-grade <b>40 cm</b> over SQ2 Prepared Sub-grade
<b><u>Prepared Subgrade</u></b>	SQ2/SQ3 i) $\text{CBR} \geq 8$ (soil compacted upto 98% of MDD *) ii) Plasticity Index $\leq 12$ iii) Field Compaction : Min. 98% of MDD * iv) Minimum $E_{v2} = 60 \text{ MPa}$	<b>50 cm</b> over SQ1 fill <b>35 cm</b> over SQ2 fill

<b>Subgrade Top Layer</b>	SQ1/SQ2/SQ3 (SQ1 soils (To be used only with dispensation of PCE/CAO) i) CBR $\geq 5$ (soil compacted at 97% of MDD *) for SQ2/SQ3 soils ii) For SQ1 soil CBR $\geq 4$ (soil compacted at 97% of MDD *) iii) Field Compaction: Min. 97% of MDD * iv) Minimum $E_{v2}$ = 30 MPa (for SQ1) 45 MPa (for SQ2/SQ3)	50 cm
<b>Lower layer (fill)</b>	SQ1/SQ2/SQ3 soil (+) i) CBR $\geq 3$ (soil compacted at 97% of MDD *) ii) Field Compaction: Min. 97% of MDD *	As per Embankment height
<b>Ground Soil/Sub-soil Strata</b>	i) Undrained Cohesion of soil ( $C_u$ ) $\geq 25$ KPa (only for soils having particles finer than 75 micron exceeding 12%) ii) $E_{v2}$ (determined from PLT) $\geq 20$ MPa iii) N (determined from SPT) $\geq 5$ Ground Improvement is required, if any of the above parameters not complied with	--

\* MDD mentioned in above table

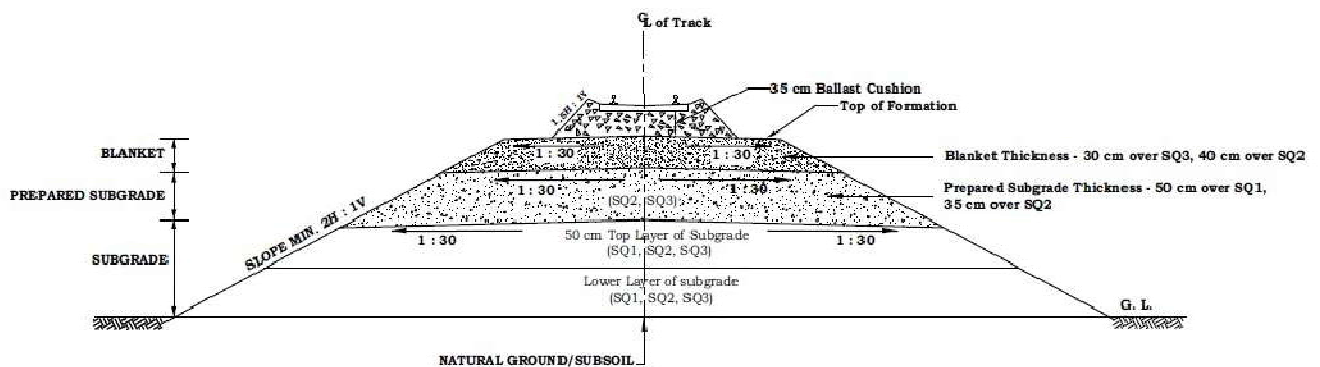
a) For determination of CBR - MDD achieved in Lab,

b) For field compaction - MDD achieved in field compaction trials which should not be less than 98% of MDD in lab.

\*\*  $E_{v2}$  is Modulus of deformation.  $E_{v2}$  testing at field is mandatory.

\*\*\* With the application of Non-woven Geotextile as a separator layer below the blanket, filter criteria will not be required or mandatory.

+ No dispensation of PCE/CAO required for use of SQ1 soil in Lower layer (fill) of Subgrade.

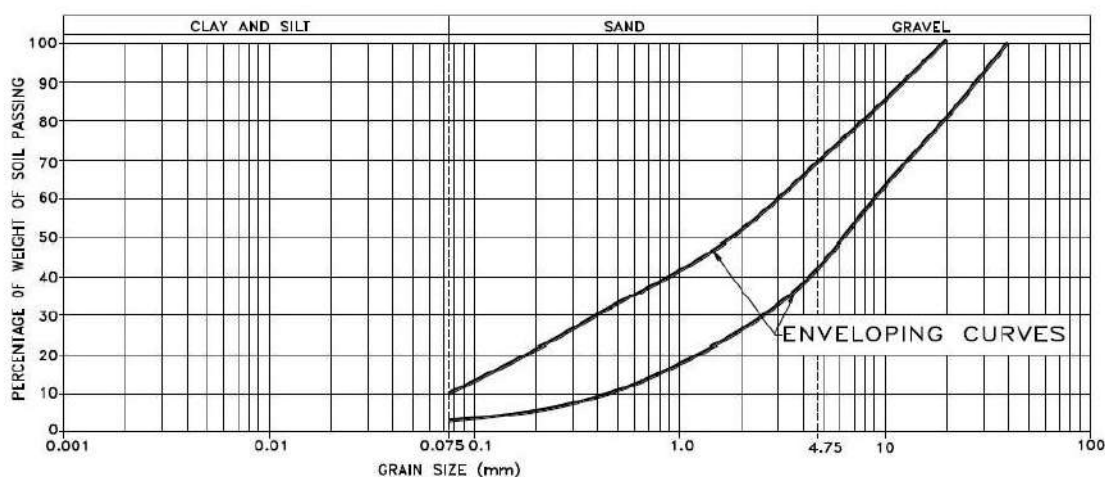


**Track Formation for Two layer system (for 25 T Axle load)**

3.5 Gradation Percentage of Blanket Material (as per RDSO guideline RDSO/2020/GE:IRS-0004 "Comprehensive guidelines and specifications for Railway formation"):

SL	ISSieveSize	PercentPassing (by weight)
1.	40mm	100

2.	20mm	80–100
3.	10mm	63–85
4.	4.75mm	42–68
5.	2mm	27–52
6.	600micron	13–35
7.	425micron	10–32
8.	212micron	6–22
9.	75micron	3–10



### Enveloping Curves for Blanket Material

- 3.6 When the subgrade/prepared subgrade is of SQ1 or SQ2 category soil, a suitable non-woven geo-textile layer may be used as “separator layer” on the top of subgrade to prevent upward migration of the fines from subgrade/prepared subgrade causing contamination of blanket layer on top of it and also to prevent penetration of coarse particles of layer on top of subgrade into soft/fine grained particles of subgrade below.
- 3.7 Design of formation, including adoption of single layer or two layer system, and use of SQ1 soil (in top layer of subgrade) as given in above paras shall be decided by PCE/CAO (Con) on the basis of soil investigation. In case of the projects being executed by PSUs, the powers of PCE/CAO shall be exercised at appropriate level of authority as nominated by CMD/MD of the PSU.
- 3.8 In case of cutting also, blanketing shall be provided as required & as specified above, based on the type of soil just below the blanket.
4. **Quantity payable under this item shall be arrived at by cross sectional area of standard finished profile. In case of Mechanically compacted bank 5% of the gross quantity shall be deducted to arrive at payable quantity. And in case manual compaction is done then 10% of the gross quantity shall be deducted to arrive at payable quantity.**
5. Following stipulations shall further apply for earthwork.

- (i) Organic clay, organic silt, peat, chalks, dispersive soils, poorly graded gravel and sand with uniformity co-efficient less than 2, shall not be used in embankment. Clay and silt having WL more than 50%(CH & MH) are prohibited in top 3 m of embankment. Cutting in these types of soils, shale's and soft rocks which become muddy after coming in contact with water, should be avoided. If this is not possible, special investigation and measures will be necessary according to final decision by Engineer in Charge. The minimum dry density of the soil shall not be less than 1.70 gm/cc. In case soil having minimum dry density of 1.70 gm/cc is not locally available, then with permission of tender accepting authority soil having minimum dry density of 1.65gm/cc can may be allowed with condition that the rate reduction of 10% will be done.
  - (ii) Water content as desired, and densities should be specified as obtained in the field trials as per I.S. 10379 –1982. For guidance during field trials to determine the thickness of layers, dry density to achieve and optimum moisture content, Laboratory test for heavy compaction as per I.S.2720 (Pt. VIII)-1983 should be carried out for obtaining these.
  - (iii) The soil proposed to be brought from out-side Railway land will have to be initially tested either at railway lab or some other reputed lab and further testing may be done at the Contractor's site laboratory established prior to commencement of work. Frequency of conducting such tests should be at the discretion of the Authority's Engineer.
  - (iv) Only approved quality of earth after test and certification is to be used. Such test should invariably be conducted as and when quarry/ colour & texture of soil changes.
  - (v) The embankment should be progressed in layers and completed as per the standard profiles including dressing of slopes to final shapes.
  - (vi) Quantity payable under this item shall be arrived at by cross sectional area of standard finished profile. In case of Mechanically compacted bank 5% of the gross quantity shall be deducted to arrive at payable quantity. And in case manual compaction is done then 10% of the gross quantity shall be deducted to arrive at payable quantity.
6. The rate quoted in the schedule include picking up and setting out alignments, drawing of cross sections based on levels recorded by Railway's representative in presence of Contractor on Railway level book, all bushes clearance, crossing one or more Railway lines, making service dog bells and reference pillars bailing out water or pumping out water with Contractor's pump, removal of slush where encountered, dressing of spoil heaps, bank and cuttings to final dimensions, carting out the cutting spoils, benching side slopes of existing bank etc. as directed by the Engineer etc.
- The classification of the soil met with in cuttings shall be determined by the Engineer and rates shall be paid based on the type of soil classified, i.e. all classifications of soils, rock not required blasting and rock requiring blasting.
1. If soil from cutting is of good quality it can be used in embankment. Cutting spoils not used for formation of bank shall be led to form a spoil bank or filling in low-lying areas at site nominated by the Engineer or his representative within the section.



2. Rate for earthwork in cutting shall also include proper stacking of moorum, boulders and other useful materials met with during excavation at places as directed by the Authority's Engineer at site.

**3. Mechanical Compaction of Earthwork and Blanketing Material.**

- i) After site clearance all pockets and depressions left in the soil, if any, shall be made good and compacted. The entire area shall be rolled and compacted with suitable roller before the first layer of earth is spread and the Contractor shall obtain clearance from the Engineer in writing before spreading the first layer of the earth.
- ii) Earth work shall be done in layers not exceeding 300 mm thick in the loose state and compacted with suitable rollers to obtain the density specified as per IS: 10379-1982. The number of passes of the rollers and the optimum thickness of earth layer shall be fixed after carrying out field trials with roller proposed to be used, from time to time and from location to location the main criteria being to obtain maximum density achievable uniformly.
- iii) An additional width of 500 mm will be provided and rolled on each side or either side wherever the track center is more, which shall be removed after compaction of the core and slop dressed after achieving full height of the embankment so that compaction is achieved to the desired value till the edge of formation width. The extra width of 500 mm is to be provided confining pressure to enable compaction of soil. No payment of this extra width shall be made.
- iv) Smooth wheel self-propelled vibratory roller of three wheels of operating weight exceeding 10 T and 22.6 T Dynamic force in high amplitude having 30 (THIRTY) Hz vibrating frequency shall have to be used for compaction. Each layer shall continue to be rolled until no further compaction results. The layers will be free from ruts.
- v) Cohesion less soils shall be compacted to get a minimum density Index (relative density) of 70 percent as obtained in accordance with IS: 2720 (Part –XIV) 1983. All other types of soil when compacted shall attain at least 98% of the maximum dry-density as determined using heavy compaction in accordance with IS 2720(Pt. VIII- 1983) followed by field trials as Per IS: 10379-1982.
- vi) The density of each layer of compacted soil shall be ascertained by taking adequate number of soil samples collected mostly on both sides of the centre line at intervals of 10 meter or so, with a view taken at random using Sand replacement (as per 2720 Pt.XXVIII-1974) or core cutter method (as per IS: 2720Pt. XXIX 1975). The number of tests will of course depend on the width of the formation.
- vii) Where the moisture content of the earth in any layer is above OMC, it shall be left for drying for a suitable period to bring down the moisture content very near to OMC, before rolling is commenced. If the soil is dry, water shall be sprinkled either in the borrow pit or over the spread layer, as convenient, in order to obtain a workable moisture content before rolling is commenced. Where the natural moisture contents of borrow soil is high, compaction on higher moisture contents can be allowed by the permission of the Engineer.
- viii) Each layer shall be compacted to the specified density over its entire width commencing from the two sides before another layer is started. After completion of compaction of each layer, the nature of soil used, moisture content, densities, type of

rollers used and compaction, achieved should be recorded under signature of the Authority's Engineer or his representative and Contractor's representative before commencing work on next layers.

- ix) While compacting it shall be ensured that there is a minimum overlap of 200 mm between each run of the roller.
- x) Care should be taken during the compaction operation to slope the surface of the bank to facilitate the shedding and to minimize the absorption of rainwater, particular attention being given the prevention of pounding.
- xi) The quality of work shall be determined by considering the mean density of the samples in each layer. The mean dry density shall be equal to or exceed the minimum, specified density. In no individual case shall the density be less than the minimum value specified by more than 2% otherwise further rolling should be done at the appropriate location.
- xii) The Contractor shall be allowed to lay further layer of soil, only after the compaction of a particular layer has been found satisfactory and certified to be so by the Engineer's representative in writing.
- xiii) The top of the formation shall be finished to cross slope of 1 in 30 from one end to other towards cess/drain in multiple lines and from center of formation to both sides in single line with tolerance of 0.5%. The finished top level of soil formation should be within +/- 25 mm. The finished top of blanket layer shall be permitted from design level by +25mm.
- xiv) In parts of embankment, in accessible to the specified rolling equipment, e.g. edges and side slopes around and in contact with culverts, abutments or in proximity to structures, where it will not be possible to operate rolling equipment, compaction shall be accomplished by and tamping with hand or mechanical tampers of approved type. Roller shall not be permitted to operate within 1500mm of masonry/concrete structure and all fill within this distance shall be hand tamped. All materials to be hand tamped shall be spread in layers not over 100mm thick. The moisture content at the time of tamping shall be such as to produce a degree of compaction equal to that specified for rolled fill. Final rolling of the top layer of the fill shall be completed with a self-propelled smooth wheel power driven roller or multiple pneumatic type wheels roller or hand tamped to the required profile.
- xv) The filling over arches and pipe culverts shall be made up simultaneously from both sides.
- xvi) In back filling, above or against or in filling over masonry or other structures, the materials, shall be deposited not more than 100mm thick, sloping away from the structure with each layer carefully tamped. Only the selected materials shall be used for this purpose. Highly cohesive, wet, impervious materials shall not be employed.
- xvii) Adequate arrangements for control of compaction must be ensured during the construction so that the required degree of density is obtained in each layer of earthwork.
- xviii) All works including the surfaces of the fill shall be finished to smooth and compact profile in conformity with plans and the Contractor must not leave any depressions or irregularities that will hold water or prevent drainage. Slopes shall be finished by

hand shoveling. The inside slopes of embankment shall be neatly dressed to line as the placing of the fill progress.

- xix) In making earthwork in embankment or due to movement of compaction equipment, if there is natural subsidence or sinking of the natural ground under the embankment due to any reason, the Contractor shall make up the deficiency in the quantity of earthwork due to natural sinking at his own cost.
- xx) The Contractor shall purchase the soil testing equipment at his own cost and as per the list given below and keep it ready at site before work commences.
  - (a) Rapid determination of moisture content kit, liquid limit, plastic limit, Density & OMC.
  - (b) Balance to weigh up to 1 gm accuracy
  - (c) Hand balance to weigh up to 0.1 gm accuracy.
  - (d) Weights ranging from 3 Kg to 0.1 gm
  - (e) Core cutters bearing I.S.I mark.
  - (f) Porcelain dishes 100mm dia.
  - (g) Steel scale
  - (h) Grafting tool
  - (i) Spatula
  - (j) Spirit as required
  - (k) Rammer (standard) bearing ISI mark.
  - (l) Kit for testing of soils by sand replacement method.

The number of above equipment to be arranged by the Contractor will be decided by the Engineer depending upon the actual site conditions and the rate at which the work progressed. The decision of the Engineer shall be final and binding on the Contractor in this regard.

- 4. The work may have to be carried out very close and over the running railway lines and electrical traction wires and the Contractors shall make all measures and precautions to protect the railway lines and structures, Contractor's labours, public properties at his own cost. Necessary barriers made by ropes and flags signals etc. at work site will have to be provided by the Contractors.

## **5. Quality Assurance of Earthwork.**

- 11.1 Quality check on earthwork- Quality of execution of formation earthwork shall be controlled through exercise of checks on the borrow material, blanket material, compaction process, drainage system, longitudinal and cross sectional profiles of the embankment.

### **11.2 Frequency of Quality Assurance Tests- (As per the extant guidelines for the earthwork following for execution):-**

CBR test for selection of blanketing material and other tests required for ensuring conformation of the materials for formation (blanket, subgrade, embankment fill) as per specifications e.g. size gradation, Cu, Cc, OMC/MDD etc. shall be conducted at the following frequency:

- (a) Embankment fill: One set of tests for every 5000 cum and at every change of soil strata.
- (b) Prepared subgrade: One set of tests for every 2000 Cum

(c) Blanket material: one set of tests for every 500 cum.

(d) Compacted earth/Blanket layers: Atleast one density check for every 200 Sqm for each blanket layer and top one meter of sub-grade and at least one density check for every 500 sqm for other than the blanket and one meter of sub-grade.

**6. Payment for earthwork/blanketing:**

12.1 12%(Twelve percentage) deduction will be made for the quantities of earth work executed (5% for each side slope & 2% for top level of formation) at the "On account" bill stage.

These quantities will be released progressively as per the following percentage as and when the following enabling works are completed.

12.2 Embankment:

- i) Dressing of side slopes including turfing/pitching = 10% (5% for each side slope)
- ii) Dressing of top level of formation = 2%.

12.3 Excavation

- i) Dressing of side slopes including turfing/pitching =10% (5% for each side slope).
- ii) Dressing of the formation after construction of side drains inside the cuttings = 2%

***Note:-**Above conditions are for guidelines and not exhaustive. Work will be executed as per the latest or extant specifications/guidelines issued by RDSO and as directed by Engineer-in-charge which will be binding to the contractor.*