

SOUTHERN RAILWAY

SPECIFICATION FOR LAYING UNDERGROUND CABLE

SCOPE OF WORK: -

1. The work shall be carried out according to the Drawings approved by the Railways and the provision of IE Rules and IE Act. The contractor shall be solely responsible for the proper execution of the work as per specification.
2. The cable laying work shall strictly conform to the provision of ISS 1255/1983 or latest "Code of practice" for installation and maintenance of paper insulated power cables upto and including 33 kV as for applicable for the PVC cables to be laid under this contract.
3. The desired minimum depth of laying from ground surface to the top of cable is as follows:

a. High voltage cables, 3-3 kV to 11 kV rating	- 0.90 m
b. Low voltage and control cables	- 0.75 m
c. Cables at road crossings	- 1.00 m
d. Cables at railway level crossings (measured from bottom of sleepers to the top of pipe)	- 1.00 m
4. Trenches shall be cut to a width and depth, as directed by Section Engineer- in - charge at site, from the ground level reckoned below the parent soil. If the ground level over a place is elevated due to heaps of soils, cut wastes etc., which, are likely to be removed later, the depth prescribed should be below the parent soil.
5. The cables shall be laid at site generally following the cable layout plan. The route by which is the cable trench is to be taken shall be surveyed in advance and may be got approved by the Section Engineer- in - charge at site before commencing the work. Any specific difficulties in following the route indicated or obstructions met with shall be brought to the notice of the Section Engineer- in - charge. The trenches should be excavated as far as practicable in a straight line.
6. The cables if required to cross the Railway track or roads the arrangements as directed by Section Engineer- in - charge at site shall be followed. The crossing shall be at 90 degree to the track/road angular crossing of the tracks/road should normally be avoided.
7. Where the crossing of track is involved, the pipe required to be laid for crossing portion below the track shall be carried out only in the presence of Railways authorized representative. The crossing shall be through RCC/GI/CI/HDPE pipes of appropriate dia.
8. The Railway, if specifically indicated in the schedule of work, shall supply pipes required for the track crossing/road crossing work. The pipe and the method of laying shall be as directed by Section Engineer- in - charge at site wherever threading of cable is required below the track, below the road or elsewhere sand cushioning and protective covering is not required. This may be taken into account while quoting rates for cable laying.

9. Adequate care shall be taken while cutting the trenches in the platform area so that passenger may not fall inadvertently into the trenches dug either during the day or night. Such portions of the trenches, which, may affect the movement of traveling public/movement of trolleys etc. should be closed on the same day of cutting duly laying of cables/pipes as the case may be.
10. Adequate care shall be taken to ensure that the platform coping is not damaged due to the cutting of the trenches.
11. No cable trench shall be cut within 2 meters from the centerline of any main line track. No cutting of the trenches near the main line shall be carried out without the presence of the Railways representative. Where long lengths of trenches have to be cut parallel and close proximity to the track, the laying of cables should be completed at one stretch at the quickest time possible to avoid any sinkage of track and consequent train accidents.
12. The contractor has to take a 'Works permit' to work in the station area for the movement and working of man. The contractors shall take all precaution to ensure that the life and safety of the men working under them is taken care of. They are solely responsible for accident if any to occur to the staff working under them. Railways will in no way stand responsible for any such accidents.
13. No trenching work shall be carried out in the night hours (18.00 hours to 06.00 hours) without prior approval from Sr. DEE/G/MAS.
14. The cut trenches will be inspected by a Railways representative after which only, subsequent operation such as laying of pipes, laying of cables etc. shall be commenced.
15. At intermediate or termination points, spare loose length of cables shall be coiled and buried in the soil also at the specified depth. The Railways representative will indicate the location, where such coils shall have to be laid.
16. If the cable is to be supplied by the Railways, the cables required to be laid, would be supplied to the contractor at the stations specified. The contractor may make his own arrangements for proper storage of the cable, guarding and subsequent transportation to site for laying etc. Care shall be taken to avoid damage to the cable during transportation, spreading out and subsequent laying operations. Adequate manpower shall be employed by the contractor due for this purpose. The UG cable is likely to be damaged due rough handling to sharp bending, hanging over pivots etc. The cables should not be allowed to be twisted while spreading and laying.
17. The cable should be inspected before and at the time of spreading out for the insulation strength and look for any mechanical injury to the insulation of the cable etc., so that appropriate caution can be taken before laying of the cable and closing of the trenches. No cable, which does not pass the acceptance levels of insulation strength, shall be laid in the trench.

18. The contractor is solely responsible for damage if any to happen in the process of spreading out the cable and laying especially within the station area. Particular attention would be required in this respect in view of the continuous rail traffic that may take place in the close vicinity.
19. The contractor shall take adequate precaution to ensure that the staffs working near the running tracks are adequately warned of approaching trains. They shall be removed from such areas well before the arrival of the train. They shall not cause any type of detention to the trains or in any way dislocate the train operation. No materials, tools, accessories, cables shall be left over in between under or in the close vicinity of the track. No open fire or other inflammable materials shall be kept on the track nearby.
20. If the rain affects trenching operations, the trenches should not be left open to rain water which, may prone to hazardous for the train movement nearby. Such trenches, if further work is likely to be delayed, shall be closed.
21. The back filling of the earth should be made fully packed and rammed well so that the filled soil is well consolidated. Out soils should not be wasted away. They shall be used for back filling only.
22. Where the cable changes route, the change of direction should not be sharp but follow a smooth curve.
23. Where more than one cable pass through the same route they shall be laid on the same trench with a common covering, except in the case of cables different voltages are required to be laid. In the case of two or more HT cables, adequate separating distance not less than 300 mm shall be maintained between them and in the case of HT and LT cable if they are laid on the same trench, they shall be separated by a distance of 300 mm. In all these cases separate protective covering shall be employed.
24. The Station yard/Platform area is likely to have signal cable and other power cables. Therefore, care shall be exercised to avoid damage to the cables already available below the ground. Generally cables are laid 750 mm to 1000 mm below the ground level.
25. Where the cable raise above the ground to be fixed against a wall or rail post or other structures the vertical portion of the cable shall be protected by means of GI pipe of appropriate dia. The length of GI pipe shall be such that it shall be 300 mm below the ground level and atleast 2000 mm above the ground level. The portion of the GI pipe below the ground level shall be covered by cement concrete. The GI pipe encasing, the cable shall be secured by suitable clamps fixed at 1000 mm intervals and one at the top. The open end of the pipe shall be covered with bituminous cable compound.
26. The cables above 2000 mm from ground level can be taken in open state either over the building walls/trusses or roof columns etc. They shall be clamped at 1000 mm intervals and secured to the structural/walls/posts etc. as the case may be wooden cleats shall be used along with the clamps for securing the UG cables to avoid damage to the cables.

27. The cable leads brought out at the cable and boxes should be provided with lugs/sockets adopting crimping methods and finished as suitable for termination on to the switches cut outs etc. as the case may be.
28. The route length of the trenches excavated will be taken as the linearly at the centerline of the trench. In the case of trenches excavated for the purpose of laying spare length of cables, the same methods shall be adopted for the purpose of measurements.
29. All the cable armour shall be connected to earth in an approved manner as desired by Section Engineer-in-charge.
30. On completion of work the cable shall be tested by the contractor, if required by Section Engineer-in-charge for insulation strength etc.
31. Clamping of the cables/pipes along the drops of the girder or elsewhere shall be such that they take the weight of the cable/pipe without damaging the cable/pipe.
32. The drops of the cable covering the stanchions shall be taken through GI pipe of sufficient dia.
33. The contractor, on completion of the cable laying, have to submit an **as laid drawing** for the cable route clearly indicating the approx. clearance from fixed land marks, in original tracing, preferably made in “**CAD**”. On approval of the same, the contractor has to submit 3 copies of drawings and a soft copy of the same in a CD or DVD.

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