

CUTTINGS AND EMBANKMENTS.

8. *Cuttings*.—The cuttings are to have a base at formation level of 11 feet in solid rock and 13 feet elsewhere, and are to be made in accordance with plan and section attached. The slopes shall be $\frac{1}{4}$ to 1 in solid rock, and 1 to 1 in all other material; but should the Resident Engineer require any other slopes, the difference in cost shall be added to or deducted from the contract sum. It is, however, specially provided that the Resident Engineer shall be sole judge as to what class the material in the cuttings belongs, and any alterations of the widths or slopes of cuttings will be ordered in writing. Additions or deductions shall be at schedule rates. The material obtained from the cuttings and side drains shall be used in making the embankments; and should it be insufficient for the purpose, the Contractor shall obtain the balance from side cuttings as hereinafter provided. But no side cuttings shall under any circumstances be made within the area of the station grounds. All slopes shall be neatly and uniformly trimmed off from top to bottom to the inclinations shown or specified. During the execution of the works the formation and slopes shall be properly drained, so as to prevent any lodgment of water. A drain is to be cut along the bottom of slopes of cuttings, as shown in drawings, and in all cases must be provided with a proper outfall of at least the same size. Catchwater drains shall be dug above the top of one slope of all cuttings, and where necessary above banks, at a distance not exceeding a chain from the top and foot of slopes. These ditches shall average 5 cubic feet per lineal yard and shall be true and regular to the inclinations directed; no stumps or roots to be left in them; they shall be made at the commencement of the work, with proper outfalls, and shall be cleared out from time to time as may be necessary or ordered.

Embankments.—The embankments must be carried forward uniformly of the proper shape, with such an addition to the heights and widths, to allow for subsidence and shrinkage, as the Engineer may consider necessary, so as to avoid, as far as practicable, the necessity for making subsequent additions either to the heights or widths of the embankments to bring them to the correct levels and dimensions. When not otherwise directed, the allowance for shrinkage alone is to be 1 inch to every foot in height. Whenever the foundation of an embankment is on sloping ground, steps and benches must be cut under the base of the embankment; and should the seat of the embankment be of soft material, the Contractor shall remove the same. The top of the ordinary single-line embankment at formation level is to be 12 feet wide; the slopes, where not otherwise specified or shown on drawings, to be trimmed off to an inclination of not less than $1\frac{1}{2}$ horizontal to 1 vertical, and to be maintained full and true until the completion of the contract. Whenever any change is made in the inclination of any of the slopes, it must be done gradually, and in not less than 20 yards in length. The Contractor shall not in any way interfere with or divert the existing drainage areas, unless otherwise directed, and shall leave such stops or stanks in the side cuttings, and take such other precautions, as the Engineer may think necessary for that purpose. The side cuttings for bank material must be made in a regular and approved manner, and, unless specially authorized, not less than 10 feet from the foot of any embankment, nor less than 5 feet from any fence; and where they have to act as drains they shall be taken out clear, and to a uniform inclination. No material shall be run to spoil, except with the written sanction of the Engineer. When material is run to spoil, it must be done in such a way and in such places as shall be approved by the Engineer. Behind and around the retaining walls, culverts, walls, bridge abutments, piles, struts, and all structures what kind soever, the embankments shall be wheeled in and carefully rammed. Any injury done to such culverts or other structures, by movement of the embankment, shall be repaired and made good by the Contractor.

TUNNEL.

9. A tunnel is to be excavated through the spur near 3.40. Its length and levels are defined in the general plan and longitudinal section, and dimensions and form on Drawing No. 4. The tunnel is all to be taken out to the section represented by the outside of the brick lining. One recess, 8 feet square and 4 feet deep, shall be made in the side of the tunnel for the accommodation of workmen and tools. Two 6-inch tile drains shall be carried down the sides of the tunnel as shown, and led into the formation ditches at ends. The trenches shall be taken out to a uniform section and gradient, and afterwards refilled to formation level with 3-inch bluestone road metal or clean shingle of the same size. The pipes are to be of the best manufacture, glazed both sides, well burned, and sound throughout, and provided with socket joints. They shall be bedded on clean coarse gravel or metal for their full length, and packed at the sides with metal or shingle, as specified for the filling of the trench. No packing is to be used in the joints of the pipes. The tunnel shall be lined throughout, the lining to consist of 14-inch brickwork, set in cement mortar. The longitudinal courses are to be laid perfectly straight, and parallel in every direction with the line and levels of the tunnel. The sides shall be laid in English bond, and the arch turned in three rings, with one key brick the full depth of the joint. All spaces between the outside of the lining and the excavations are to be filled up with stone shivers, or shingle, firmly rammed in. Instead of brickwork, the sides may be of rubble masonry in cement 18 inches thick. The tunnel fronts shall be constructed of masonry, set in cement mortar. The stone is to be of the best quality of bluestone, or other stone of equal quality, but the whole of each front must be of one material. The quoins, arch stones, and coping shall be ashlar, picked dressed on beds, joints, and inside, and rock-faced in front, with a