

a glance. The dates on which the measurements are made should also be entered.

Datum  
Levels.

5. The same general Datum should be carried throughout the whole Line; but as this may at present be found impracticable or inconvenient, each District Engineer will only be required to see that a uniform Datum is adopted on the several Divisions of the work within his District. When the levels meet at the ends of Districts, the exact differences will be ascertained, and placed on record.

6. The first duty of the Division Engineer will be to establish, with perfect accuracy, Bench Marks and Reference Stakes throughout the Contract under his immediate charge.

Bench  
Marks.

7. Bench Marks should be established about every 1000 feet, and always at the two-ends of heavy cuttings, for easy reference; and positions should be selected for them so that they will not be destroyed in the clearing of the Railway lands. They should be numbered consecutively on each contract, and their numbers and heights above datum distinctly and permanently marked thereon with blue paint, and on timber with a cooper's-marking tool. Where the line does not pass through timbered land, and no suitable object can be had convenient to the work for Bench Marks, substantial posts must be sunk in the ground at least 5 feet, and completely prevented from being raised by the frost.

Reference  
Stakes.

8. Reference Stakes should be placed at least at the beginning and end of each curve, and on tangents at every 20 chains; their object is to facilitate the finding of the centre line in the event of the stakes being destroyed by fire or otherwise. They should be placed at an angle of  $45^\circ$  to the line of tangents, and at even distances of say 100 feet from the centre stake, at the intersection of diagonal lines connecting them, as in Fig. 1. Where the Railway runs along the edge of a River, or for any other reason, Reference Stakes can only be placed at one side of the line; they should be driven as shown in Fig. 2: the intermediate Stakes being placed exactly at right angles with the centre line, and respectively 30, 60, and 100 feet from it.