

1113 GRADE STAKES (BLUE TOPS)

The first use of grade stakes will normally be to determine that required excavation for drainage structures has been achieved. Following this, as each section of roadway subgrade is brought to approximate grade, it shall be "blue topped" and the surface finished to conform to the grade established. "Blue tops" are normally placed at all stations and plus 50 foot (15 meter) stations. They are always placed on centerline and at right angles to the centerline on each shoulder. Very often it is necessary to set additional stakes between the centerline and the shoulder grade stakes due to the greater width of the roadway as for interstate construction.

All grades for "blue tops" shall be computed to the nearest 0.01 feet (3 millimeters); the Height of Instrument (H.I.) levels and Bench Marks (B.M.) shall be carried to the nearest 0.01 feet (3 millimeters), and the "blue tops" shall be driven until they are within nearest 0.01 feet (3 millimeters) of the required grade. In moving ahead during the "blue topping" operation, it is always good practice to check back on the last row of stakes driven as a double check on the new H.I. and grade calculations. No writing is placed on the "blue top" stakes. "Blueing" the top of the stake indicates the desired grade at that point. It is standard practice to place a quarter lath at each "blue top" driven to serve as a guard stake to the "blue top". The guard lath placed at the centerline "blue top" should show the station designation. It is very important that these stations be shown for several reasons; among them the continuity of the surveying operation through cross checks, the ability of the level person to always know where he is, and the ability for those working on the project to keep track of locations for work and quantities. Often the first "blue top" stakes set for the rough subgrade will be partially or totally destroyed by grading equipment, and will have to be reset. When resetting these grade stakes, it is possible that those which are still in place are not correct due to having been disturbed, therefore, they should be checked for grade as they are encountered. Stakes less than 8 inches (20 centimeters) in length should not be used as blue tops since lesser length is subject to disturbance by equipment and can result in erroneous elevations after the grade has been worked.

"Blue tops" shall be set for each course of surfacing material; for example, the top of select material, top of aggregate base, etc.

On completion of the grading and draining, the survey crew shall check all references to the centerline and see that the locations, distances and angles are properly shown in the field notebook and on the "as-built" plans. All permanent bench marks shall be checked for elevation and all brass or aluminum caps marked with the proper elevation and recorded in the proper field book and on the as-built plans.