



Concrete pavement stakes are set for either formed or slip-formed pavement operations. This item includes the staking of dense and open graded base course. Staking for subgrade is a separate item.

Construction stakes for concrete pavement must be placed at a maximum interval of 25 feet. Urban projects with rolling profiles should have paving stakes set at all high and low profile points in addition to stakes set at stations and other regular intervals. Additional stakes must be set and maintained as necessary to establish location and grade along intersecting road radii, auxiliary lanes, vertical curves, horizontal curves, and curve transitions in accordance with the plan.

The number of construction stakes required per cross section should be determined by the concrete pavement contractor to achieve the required accuracy and satisfy the concrete pavement contractor's method of operations.

The process of setting paving stakes involves making horizontal and vertical measurements. Accuracy in the grades is critical to obtaining a smooth pavement surface, particularly in transition sections and in super-elevated sections.

Grade stakes may be used for more than one course if undisturbed between operations. If used for more than one course, the grade stakes must be checked and may be used again if found to be within acceptable tolerance. The checks must be documented in the survey notes.

The method of operation (formed concrete pavement or slip-form concrete pavement) used in the field will determine the staking requirements.

7-45.1 Suggested Procedure

The staking contractor should always consult with the concrete paving contractor and check with the engineer for changes to the approved plans before doing any staking or grade computations.

The staking contractor should follow these steps when staking concrete pavement:

1. Re-establish reference line from control points when needed.
2. Obtain and compute paving profile line information from the plan or, if available, obtain from the engineer.
 - Typical sections identify point referred to on the profile and the cross slopes for grade computations for typical and super-elevated sections.
 - The plan and profile sheet lists the finish profile grade elevations and super-elevation information.
 - Grade computations should include the profile line elevation from the plan and computed edge of pavement elevations.
 - Additional elevations for the offset location should also be shown. These elevations (and distance offset) are dependent on the concrete paving contractor's operation.
 - This elevation may be based on the pavement cross slope extended or some other method.
 - It is essential that grades be determined in consultation with the concrete paving contractor. It is also essential that super-elevation transitions be computed accurately. Do not interpolate slopes shown in the cross sections.
3. Set out tacked hubs and/or stakes and flags.

Stakes are generally a tacked hub with guard stake but steel pins or rods may also be used.

Formed Concrete Pavement

- Paving stakes for the construction of formed concrete pavement reference the elevation on the top of the concrete form.
- The offset distance from the form line should be discussed with the concrete paving contractor but is generally set at two to three feet outside the form line. Check with the contractor's superintendent for paver limitations or requirements and for the preferred offset before beginning to stake. Once defined, offset should be consistent throughout project.

Slip-form Concrete Pavement

- Stake grades for slip-form paving are used as references to set one or two string lines that guide the auto grading of the base course or open graded base course and the concrete paver.

- Slip-form concrete pavement grade stakes are generally set from three to ten feet from the edge of pavement, depending on the equipment and methods used for slip-form.
4. Establish elevation of tacked hubs or stake.
 - Record computations in field book.
 5. Mark guard stakes or flag accordingly (see [Figure 1](#)).
 - Grade should be shown by marking or taping the top or side of the stake.
 - Grade shown appears as the value of the cut (C) or fill (F) from the top of tacked hub as marked on the guard stake or accompanying flag.
 - Guard stake or flag should include:
 - Station
 - Offset from item
 - Grade cut (C) or fill (F)
 6. Maintain neat and accurate field notes of the work being performed. Survey notes and computations must be made available to the engineer within 24 hours upon request as the work progresses.
 - Refer to [CMM 7-15](#) for general field note information.

Figure 1: Labeling Concrete Pavement Stakes

