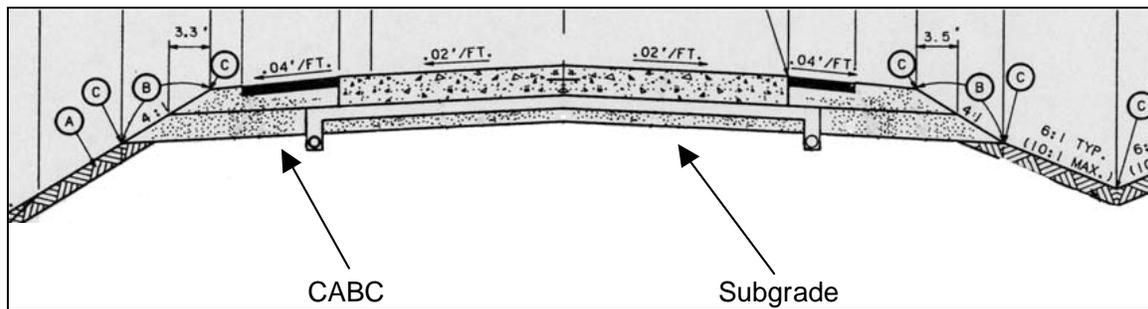




7-25.1 Construction Staking Subgrade and Construction Staking Base

The field procedures for construction staking for subgrade and crushed aggregate base course are similar. Subgrade stakes (blue tops) are set to guide the grading contractor in trimming and finishing the earth subgrade after the rough grading has been completed. Base course stakes (red tops) are included on base course and asphalt projects. This item should not be included when concrete pavement is being constructed in the same contract. Concrete pavement staking covers dense base and open-graded base course.

Figure 1 Example Highway Cross-Section



Normally, construction stakes for subgrade and crushed aggregate base course are placed at intervals of 100 feet for rural sections and 50 feet for urban sections. Refer to plans and specifications for project intervals. Commonly, urban sections refer to areas that include curb, gutter, or curb and gutter, and rural sections refer to areas with pavement and shoulders. An example rural cross section is provided in [Figure 1](#). Contact the engineer for specific project rural/urban determination.

A minimum of three stakes is required per cross section. The stakes may be set at the above interval on the centerline and at varying lateral distances from the centerline, depending on the needs of the grading contractor. Additional stakes should be set and maintained as necessary to establish location and grade along intersecting road radii and for auxiliary lanes, vertical curves, horizontal curves, and curve transitions in accordance with the plan. Urban projects with rolling profiles should have subgrade and base course grade stakes set at all high and low profile points in addition to stakes set at stations or other regular intervals. The grading contractor must determine additional stakes needed to achieve the required accuracy and to satisfy the grading contractor's method of operations.

7-25.2 Suggested Procedure

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

Steps to take when staking subgrade or crushed aggregate base course:

1. Locate grades, compute grades, or get them from the engineer or grading contractor. Refer to [Table 1](#) for an example of plan grades.

Subgrade

- The staking contractor must locate subgrade shoulder point information. Normally, the shoulder point stakes are moved in a specific width due to depth of the salvaged topsoil (this depth is shown on the typical section or is calculated using the depth and slope shown on cross sections).
- Normally, cross sections show sub-grade elevations:
 - At the reference line.
 - At breaks in the section where there is a cross slope change.
 - At the shoulder points which include the topsoil.
- Additional grade computations may be needed if subgrade stake locations desired by the contractor differ from the grades shown on the cross sections.
- If desired grades are not shown on the cross sections:
 - Find typical section/s relating to the stations required.

- Identify all cross slopes and change of slope locations and depth of salvage topsoil on the typical section.
- Obtain the project profile from the plan and profile sheets.
- Use profile to compute remaining grades.
- Compare to grades shown on cross sections.

Base course

- Offset distances for base course staking are determined by the typical section and the grading contractor's operation. Grades for these locations need to be computed based on the plan and profile reference line elevations, from a depth below finish grade and cross slope from the typical sections and cross sections.
 - Top of base course grades should be:
 - At the reference line.
 - At breaks in the section where there is a cross slope change.
 - At a distance several feet beyond the finished pavement edge.
 - This last location allows for sufficient additional room to construct the pavement on a well-prepared uniform base.
2. Re-establish the reference line from control points, if necessary.
 3. Set out hubs for the grade point with respect to the reference line at approved project intervals and offsets.
 4. Grade the hubs according to plan elevations or separate grade run computations.
 - Grade is established by driving a hub until the top is at subgrade/base course elevation. Hub should be stable.
 - Should the subgrade be either too high or too low, the side of a stake or lath may be marked with a value and either cut (C) or a fill (F).
 - Hubs at grade are marked with flag, pink crayon, paint, or whiskers (tufts of fibers that are attached to the top of stakes driven flush with the subgrade/base course surface that makes the stake location visible).
 5. Maintain neat and accurate field notes of the work being performed.
 - Refer to [CMM 7-15](#) for general field note information.
 - Staking field notes should include the following:
 - Date, time, crew, location.
 - Control used (horizontal and vertical).
 - If conventional instruments are used, include instrument heights and back sights, foresights, etc.

Table 1 Example Plan Information for Subgrade and Base Staking

Grades/Gravel Westbound Lanes STH 29 Station	17 FT LT	C/L	15 FT RT
229+50	1253.12	1253.46	1253.16
230+00	1252.01	1252.35	1252.05
230+50	1251.04	1251.38	1251.08
231+00	1250.21	1250.55	1250.25
231+50	1249.51	1249.85	1249.55
232+00	1248.95	1249.29	1248.99
232+50	1248.53	1248.87	1248.57