
7 Preparation of the Grade

Grade Preparation

Subgrade

Subbase

CHAPTER SEVEN: PREPARATION OF THE GRADE

A concrete pavement is only as good as the grade on which the pavement is placed. In this chapter, the importance of grade preparation, the various types of subbase that may be used under the pavement, maintaining the constructed grade until paving begins, and the final trimming of the subgrade and subbase are discussed.

GRADE PREPARATION

The preparation of the subgrade, subbase for full depth sections, and base course for overlays are very important steps since these materials have a considerable impact on the riding quality of the finished concrete pavement. Full depth concrete pavement or bases are placed on subbase constructed on a treated subgrade. A concrete overlay is usually placed on a thin asphalt bond breaking layer placed directly on an existing pavement.

SUBGRADE

Subgrades are treated in accordance with Section **207.04** by one of the following methods to achieve the desired support for a concrete pavement or base:

- a) Soil
- b) Chemical Modification
- c) Compacted Aggregate
- d) Compacted Aggregate with Geogrid

The subgrade treatment is required to be compacted in accordance with Section **203** for soils, in accordance with Section **215** for chemical modified soil, and in accordance with Section **301** for aggregates. Figure 7-1 is a typical section for soil subgrade treatment of fill and cut sections.

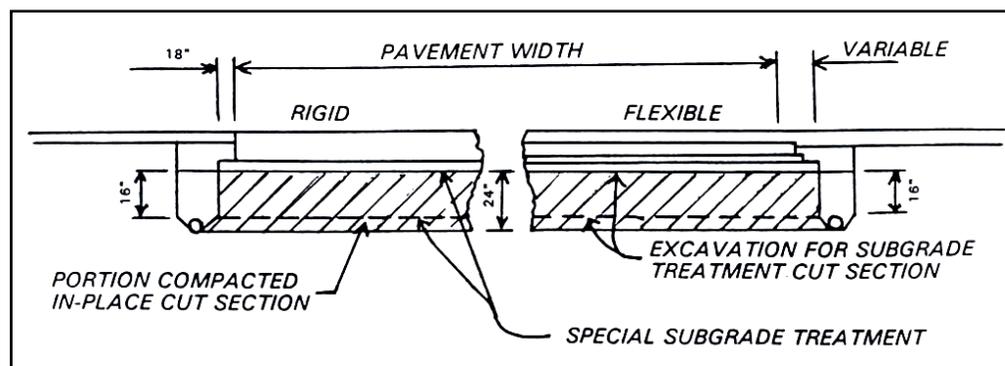


Figure 7-1. Soil Subgrade Treatment Fill and Cut Sections

The subgrade is to be constructed so that the material has a uniform density or stiffness throughout. Any soft, yielding, or other unsuitable material is required to be removed and replaced if corrective measures are not effective. Proof rolling is done just prior to placing the subbase in accordance with Section **203.26**.

The uniform compaction, correction of unstable areas, and proof rolling of the subgrade should receive special attention at the form lines when forms are used for paving and at the track lines when the slip-form method is used. Settlement of the forms or tracks of the slip form paver due to poor subgrade stability results in a poor riding pavement.

The subgrade is required to be well drained at all times. No pavement or subbase may be placed if the subgrade is frozen or muddy.

The subgrade is required to be finished to within 1/2 in. of the true grade. There is a pay deduction for construction of thin pavement and this deduction may be made for deficiencies greater than one tenth of an inch. In form paving, these tolerances are usually accomplished with a machine called a sub-grader which rides on the forms (Figure 7-2). The subgrade may be trimmed with a conventional grader. In slip form paving, an auto-grade machine with an automatic grade control sets the grade from a string line.



Figure 7-2. Form Paving Spreader

No equipment or traffic is allowed on the finished subgrade because distortion of the subgrade may occur if a weak soil condition exists or the subgrade is overly wet after a rain.

SUBBASE

Subbase is a foundation course that is placed and compacted on a prepared subgrade. Section **302** lists the materials and construction requirements for subbase.

Subbase for PCCP consists of 3 in. of an aggregate drainage layer placed over an aggregate separation layer. For all alignments, the thickness of the separation layer is required to be 6 in. The drainage layer consists of coarse aggregate size No. 8 in accordance with Section **904.03** and may be crushed stone or air-cooled blast furnace slag. The separation layer consists of coarse aggregate size No. 53 in accordance with Section **904.03**.

Dense graded subbase consists of a 6 in layer of compacted coarse aggregate size No. 53 in accordance with Section **904.03**.

The preparation and placement of subbase is required to be in accordance with the applicable requirements of Section **302**. Compaction of the drainage layer requires two passes with a vibratory roller before trimming and one pass with a tandem roller after trimming.

After the final trimming and compacting of the subbase, depth determinations are made for each layer. These measurements are taken at a minimum frequency of one depth determination per each traffic lane for each 500 linear ft of each layer of subbase. A permanent record is required to be made of all depth checks that includes the date, location, and thickness of all checks. This record accompanies the final construction record and is required to verify the quantity of material actually placed. If deficiencies are found in the thickness, appropriate measures are required to be taken. If more material is required, the additional material is mixed with the layer and the layer is re-compacted. Additional depth determinations are then obtained.

The width of the subbase is also checked and recorded. These checks are required to verify the quantity of material in cubic yards that were actually placed.