SECTION 302 -- SUBGRADE PREPARATION AND SHOULDER SUBGRADE PREPARATION

302.01 -- Description

1. The Contractor shall complete the following requirements under the "Subgrade Preparation" bid item:

a. (1) Furnish and place subgrade materials as shown in the plans.

(2) Bring the roadbed to the plan profile when the roadbed was graded under a separate contract, the grade is less than 60 mm low, and material is available on the right-of-way within the minimum free-haul distance specified in Section 209.

b. Adjust grade lines to meet intersections, pavements, bridge ends, railroad crossings, or any other physical features designated by the Engineer.

c. Lower the grade, if necessary, to provide adequate width.

d. Dispose of surplus, excavated material.

e. Scarify, mix, adjust the moisture content, shape, and compact the soils as necessary to conform to the plans and specifications.

2. In addition to the above requirements for "Subgrade Preparation", "Shoulder Subgrade Preparation" shall also include adjustment of the shoulder elevations and the construction of the earth portion of the shoulder outside the surfaced shoulder width to conform to the typical cross sections shown in the plans.

302.02 -- Material Requirements

1. Soil materials shall be obtained from the sources shown in the plans.

2. Soils shall meet the requirements prescribed in Subsection 205.02.

302.03 -- Construction Methods

1. Subgrade Preparation and Shoulder Subgrade Preparation:

a. The Contractor shall shape the subgrade to the typical cross sections shown in the plans. In the event the subgrade width is less than the width shown on the typical cross sections, the widening shall be accomplished by either:

(1) Lowering the grade.

(2) Placing additional embankment on the shoulder slopes.

b. Embankments will be constructed in accordance with Section 205.

c. Widening by placement of additional embankment material on the shoulder slopes to provide the minimum width will be allowed only if the existing slope is 1 vertical to 4 horizontal or flatter.

d. After placing, shaping, and compacting the material, the slope shall be no steeper than 1 vertical to 3 horizontal.

e. (1) After stepping and shaping the slopes, the Contractor shall scarify the upper 150 mm of the subgrade in all areas to be surfaced.

(2) The scarified material shall be completely mixed vertically and horizontally to insure a uniform material throughout the area to be surfaced.

(3) Immediately before placing material on the subgrade, all areas to be surfaced shall be shaped and compacted. The upper 150 mm of the subgrade in these sections shall conform to the cross section requirements shown in the plans.

f. If, after the upper 150 mm of the subgrade has been thoroughly mixed, sections of the subgrade are too sandy to provide a firm and stable foundation for the subsequent construction operations, these sections shall be stabilized, in accordance with the requirements of Section 303, using cohesive soil from sources approved by the Engineer.

g. Intersection and driveway preparation shall also include salvaging and reapplying the salvaged aggregate beyond the surfaced area.

h. Excess excavated material may be wasted, used for filling eroded shoulder slopes, flattening embankment slopes, or temporarily stored for use in shoulder construction. Material stored for shoulder construction shall be placed so that it will always be adequately drained. Ditch drainage in cut sections shall be maintained.

i. In sandy regions, the Contractor shall compact the shoulder subgrade and then place the surface material with a shoulder widener which rides on the traveled way.

2. Subgrade and Shoulder Subgrade Profiling:

a. The Contractor shall profile all subgrades after they are properly compacted. Automated profiling equipment will not be required for intersections, driveways, or other irregular areas.

b. Profiling for Flexible and Rigid Pavement:

(1) Subgrades shall be profiled with an automated, electronically controlled machine. The machine must provide accurate vertical and horizontal control. Profiling is done before placement of:

(i) Flexible pavement.

(ii) Rigid pavement.

(iii) Foundation and base courses.

(2) The prescribed elevation for any point shall be based on the specified line, grade, and cross section information. The Contractor shall dispose of excess material removed in profiling.

(3) A motorgrader with automatic blade control may be used for profiling shoulders, medians, and the roadbed for flexible pavement, but not for the subgrade or base course for the traveled way or auxiliary lanes of rigid pavement. However, the Engineer may allow its use with rigid pavement after determining that satisfactory results are obtainable.

(4) When profiling the subgrade of a mainline roadway, a reference line shall be located along both outer edges of the section being profiled. The reference line shall be maintained until the specified tolerances have been attained.

(5) (i) When there is no overlay of the traveled way, the existing roadway surface may be used as a reference when profiling shoulders.

(ii) When the traveled way does receive an overlay or an entirely new surface, then at least one lift of the surface course shall be placed and used as the reference for profiling the shoulder.

(6) The final profile shall match the plan profile with a tolerance of ±15 mm for each point, and the distance between any two points when measured perpendicular to the plan profile shall not exceed 15 mm.

302.04 -- Method of Measurement

1. a. (1) When the unit for payment is the square meter, subgrade, intersections and driveways, and shoulder subgrade preparation will not be measured directly.

(2) The quantity for payment will be the number of overlying square meters of rigid or flexible pavement, including intersections and driveways.

(3) Deductions will be made for all areas not prepared.

b. When the unit of payment is the station, "Subgrade Preparation" and "Shoulder Subgrade Preparation" are measured as follows:

(1) Stations shall be measured horizontally along the project centerline between the beginning and ending points.

(2) Full length stations will be 100 m.

(3) Deductions will be made for all areas not prepared.

(4) The areas outside the plan typical cross sections, except intersections and driveways, will not be measured for payment but shall be considered subsidiary to "Subgrade Preparation" or "Shoulder Subgrade Preparation".

(5) Each shoulder will be measured separately in stations of 100 m without regard to width. Stations will be measured horizontally along the project centerline between the beginning and ending points. Areas where no shoulder is required are deducted from the total measured length of shoulder.

c. Preparation of intersections and driveways, including compacting the subgrade and adjusting grade lines for intersections and driveways, will be measured by the square meter for the areas outside the surfaced traveled way roadbed.

d. The work of salvaging, stockpiling, and replacing the existing aggregate surfacing on intersections and driveways will not be measured for payment but will be considered subsidiary to "Subgrade Preparation of Intersections and Driveways".

2. Water will be measured by the kiloliter, applied. Excess or wasted water will be estimated by the Engineer and deducted from the volume applied.

302.05 -- Basis of Payment

1.

Pay Item	Pay Unit
Subgrade Preparation	Station (StaM)
Subgrade Preparation	Square Meter (m^2)
Preparation of Intersections and Driveways	Square Meter (m^2)
Shoulder Subgrade Preparation	Station (StaM)
Shoulder Subgrade Preparation	Square Meter (m^2)
Water	Kiloliter (kL)

2. When subgrade stabilization is required but not shown in the plans, then, except for areas greater than 250 m^2, furnishing cohesive soil for subgrade stabilization will be considered subsidiary to subgrade preparation, shoulder subgrade preparation, and/or preparation of intersections and driveways if suitable cohesive material is available on the right-of-way within the minimum free haul distance specified in Section 209.

3. The work of adjusting shoulder subgrade elevations and constructing the earth portion of the shoulders will not be paid for directly but shall be considered to be subsidiary to shoulder subgrade preparation.

4. The disposal of surplus excavated material will be paid for as "extra work" when the following conditions exist:

a. The roadbed was graded under a separate contract.

b. The required excavation exceeds 60 mm.

c. Suitable disposal areas are not located within the minimum free haul distance specified in Section 209.

5. In all cut areas, those fill areas graded under a separate contract, and under existing approach slabs, the work of correcting faulty subgrade conditions below the 150 mm in depth will be done as "extra work" unless such conditions are caused by the Contractor's operations.

6. Payment is full compensation for all work prescribed in this Section.