

ITEM NO. RR 201 SUBGRADE PREPARATION

201.1 Description

Scarify, blade, roll, and compact the subgrade to provide a uniform moisture content and density for the top 8 inches of the subgrade. Repeat grading and compaction until the specified lines, grades, and cross-sections are obtained and the materials are compacted to the specified depth and density.

201.2 Submittals

The submittal requirements of this Item include:

- A. A plan identifying classification and characteristics (P.I., optimum moisture-density, etc.) of in-situ subgrade soils, as well as the source, classification and characteristics of any proposed borrow material;
- B. Type and size of equipment proposed to achieve the required compaction; and
- C. All test results for in-situ subgrade soils and/or borrow materials. Approval of borrow material is required prior to placement.

201.3 Construction Methods

Complete all operations involving Item No. RR 101, "Preparing Right of Way" and/or Item No. RR 102, "Clearing and Grubbing", prior to initiation of subgrade preparation.

Scarify and shape the surface of the subgrade in conformity with the typical sections and the lines and grades shown on the drawings. Correct any deviation in the grade greater than 1/2 inch in a length of 10 feet, measured longitudinally, by loosening, adding or removing material. Reshape and re-compact by sprinkling and rolling.

Remove and replace all unsuitable material, as directed by Engineer, with approved material. Remove all foundations, walls or other objectionable material in accordance with Item No. RR 100, "Preparing Right of Way" to a minimum depth of 24 inches under all structures and 12 inches under areas to be vegetated. Fill all holes, ruts and depressions with approved material and compact.

Prepare subgrade sufficiently in advance to insure satisfactory prosecution of the work. Set blue tops for the subgrade on the centerline, at the quarter points and along the curb lines or edge of pavement at maximum intervals of 50 feet. Proof roll and use density control in accordance with Item No. 216, "Proof Rolling" prior to placement of any embankment, borrow, or base material. Correct any unstable or spongy subgrade areas by additional re-working, drying and compaction, or by removal and replacement with approved material.

When directed by the Engineer, re-work the subgrade as follows (the re-work process will not be allowed for unstable organic subgrade soils. Remove unstable organic soils and replace with material approved by the Engineer):

- A. Remove the unstable subgrade to the full depth of the unstable in-situ material or to a minimum depth of 8 inches, whichever is greater;
- B. Spread the material over a sufficient area to allow reworking of the excavated

material;

- C. Disc, scarify or otherwise breakup the excavated material and allow to dry (Note: If approved by the Engineer, lime or other additive may be used to aid in the drying process or to stabilize the material);
- D. Fill the excavated area with the re-worked material and compact to specified densities; and
- E. Proof-roll the re-worked area.

All suitable material removed in accordance with Item No. 110, "Excavation", may be utilized in the subgrade with the approval of the Engineer. All other material required for completion of the subgrade, including material defined in accordance with Item No. 132, "Embankment", will be subject to approval of the Engineer.

Provide the required density and moisture control for the subgrade based on the plasticity characteristics of the approved material. Sprinkle the subgrade material and compact to the extent necessary to provide the density specified below, unless otherwise shown on the drawings. The Engineer will use TxDOT Tex-114-E to determine the maximum dry density (D_a) and optimum moisture content (W_{opt}). Meet the requirements for field density and moisture content in Table 1 unless otherwise shown on the drawings.

Table 1 - Field Density Control Requirements		
Soil Description	Density, Percent	Moisture Content
	Tex-115-E	
PI < 15	$\geq 98\% D_a^*$ and $\leq 105\% D_a$	N/A
$15 \leq PI \leq 35$	$\geq 98\% D_a$ and $\leq 102\% D_a$	$\geq W_{opt} + 3\%$
PI > 35	$\geq 95\% D_a$ and $\leq 100\% D_a$	$\geq W_{opt} + 3\%$

* Where subgrade material is not conducive to laboratory testing (e.g. solid rock), approval of subgrade shall be based on proof rolling or other information as approved by the Engineer.

Compact subgrade materials, on which planting or turf will be established, to a minimum of 85 percent of the density in accordance with TxDOT Tex-114-E. Conduct field tests for density in accordance with TxDOT Tex-115-E as soon as possible after compaction operations are completed. Rework material that fails to meet the density specified, to obtain the density required.

Check the in-place density and moisture content of the top 8 inches of compacted subgrade prior to placement of any base material. If the tests indicate that the relative density and moisture do not meet the requirements specified in Table 1 above, rework the subgrade, from the closest passing test at one end of the failed area to the closest passing test at the other end of the failed area, to achieve the requirements. The Contractor, at his own expense, may have more tests performed to narrow the limits of the failed area. Unless otherwise accepted by the City of Round Rock, at least two tests shall be taken on each street being worked and at intervals not to exceed 1,000 square yards. If subgrade material changes within the 1,000 square yard interval, two tests shall be taken on each such change in material. Testing locations will be subject to the Engineer's discretion. All initial testing shall be paid by the Owner/Developer. Any retesting of failed areas shall be paid by the Contractor.

201.4 Measurement

When included in the Contract as a pay item, subgrade preparation will be measured by the square yard. The measured area includes the entire width of the roadway for the entire length as indicated on the drawings.

201.5 Payment

Payment for this Item will be considered subsidiary to Item No. 110, "Excavation" unless included as a separate pay item in the contract. When included as a pay item, it will be paid for at the unit price bid for "Subgrade Preparation". This price is full compensation for furnishing all material; hauling; placing, compacting, finishing, and reworking; disposal of waste material; and equipment, labor, tools, and incidentals.

When included as a pay item, payment will be made under:

Subgrade Preparation	Per Square Yard
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All sprinkling and proof rolling will not be paid for directly but will be considered subsidiary to this Item, unless otherwise shown on the drawings.

Where subgrade is constructed under this contract, correction of soft spots will be at the Contractor's expense. Where subgrade is not constructed under this contract, correction of soft spots in the subgrade will be paid in accordance with RR Article 10.

End

<u>SPECIFIC</u> CROSS REFERENCE MATERIALS
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Specification Item RR 201, "SUBGRADE PREPARATION"

City of Round Rock Standard Specifications

<u>Designation</u>	<u>Description</u>
Item No. RR 101	Preparing Right of Way

Texas Department of Transportation: Current edition of Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges

<u>Designation</u>	<u>Description</u>
Item No. 110	Excavation
Item No. 132	Embankment
Item No. 204	Sprinkling
Item No. 210	Rolling
Item No. 216	Proof Rolling

Texas Department of Transportation: Current edition of Testing Procedures

<u>Designation</u>	<u>Description</u>
Tex-103-E	Determination of Moisture Content of Soil Materials
Tex-104-E	Determination of Liquid Limit of Soils
Tex-105-E	Determination of Plastic limit of Soils
Tex-106-E	Method of Calculating the Plasticity Index of Soils
Tex-114-E	Laboratory Compaction Characteristics & Moisture Density Relationship of Subgrade & Embankment Soil
Tex-115-E	Field Method for Determination of In-Place Density of Soils & Base Materials

Standard Specifications Manual Change Control Record

SERIES 200 - SUBGRADE AND BASE CONSTRUCTION

CoRR Item	Title	Revision	Status	TxDOT Item	Title
RR 201	Subgrade Preparation <i>(Subsidiary-not a pay item)</i>	5/21/2018	Revised	None	
202	Hydrated Lime and Lime Slurry	5/21/2018	Replaced	Item 260	Lime Treatment (Road Mixed)
203	Lime Treatment for Materials in Place	5/21/2018	Replaced	Item 260	Lime treatment (Road Mixed)
204	Portland Cement Treatment for Materials in Place	5/21/2018	Replaced	Item 275	Cement Treatment (Road Mixed)
206	Asphalt Stabilized Base	5/21/2018	Replaced	Item 292	Asphalt Treatment (Plant Mixed)
210	Flexible Base	5/21/2018	Replaced	Item 247	Flexible Base
211	Recycling Existing Aggregate	5/21/2018	Replaced	Item 251	Reworking Base Courses
220	Sprinkling for Dust Control	5/21/2018	Replaced	Item 204	Sprinkling
230	Rolling (Flat Wheel)	5/21/2018	Replaced	Item 210	Rolling
232	Rolling (Pneumatic Tire)	5/21/2018	Replaced	Item 210	Rolling
234	Rolling (Tamping)	5/21/2018	Replaced	Item 210	Rolling
236	Proof Rolling	5/21/2018	Replaced	Item 216	Proof Rolling
281	Termite Control	5/21/2018	Deleted	None	-