

## 207-R-616 SUBGRADE TREATMENT

(Adopted 02-20-14)

The Standard Specifications are revised as follows:

SECTION 207, BEGIN LINE 1, INSERT AND DELETE AS FOLLOWS:

**SECTION 207 – SUBGRADE****207.01 Description**

This work shall consist of the construction of the subgrade in accordance with 105.03.

**MATERIALS****207.02 Materials**

Materials shall be in accordance with the following:-

Chemical Modifiers	
Fly Ash.....	901.02
Lime .....	913.04(b)
Portland Cement, Type I.....	901.01(b)
Coarse Aggregate, Class D or Higher, Size No. 11, 12, 53, or 73 .....	904
Geogrid, Type IB .....	918.05(a)
Water .....	913.01

Recycled concrete pavement meeting the requirements of coarse aggregate size No. 53 may be used when crushed stone size No. 53 is specified.

**CONSTRUCTION REQUIREMENTS****207.03 General Requirements**

The subgrade shall be constructed uniformly transversely across the width of the pavement including shoulders or curbs unless shown otherwise on the plans, by one of the following methods:

- (a) chemical modification in accordance with 215;
- (b) aggregate No. 53 in accordance with 301;
- (c) geogrid in accordance with 214 placed under aggregate No. 53 in accordance with 301, or
- (d) soil compaction to 100% of maximum dry density.

Longitudinally, the treatment may vary depending on the method of construction.

Soils containing greater than 3% by dry weight calcium-/magnesium carbonate or organic material, or with a maximum dry density of less than 100 lb/cu ft, or with liquid

limit of greater than 50, *or with a soluble sulfate content greater than 1000 ppm*, will not be allowed within the specified thickness of the subgrade treatment in cut sections and will not be allowed within 24 in. of the finished subgrade elevation in fill sections. Density ~~shall~~*will* be determined in accordance with AASHTO T 99 *or AASHTO T 272* and loss of ignition ~~shall~~*will* be determined in accordance with AASHTO T 267. Liquid limits ~~shall~~*will* be determined in accordance with AASHTO T 89. *Calcium/magnesium carbonate will be determined in accordance with ITM 507. Sulfate content will be determined in accordance with ITM 510.*

Coal within the specified thickness of the subgrade shall be excavated if directed, and disposed of in accordance with 202.05. Coal or coal blossoms that are allowed to remain shall be mixed thoroughly with subgrade soils and compacted in accordance with 207.04.

All rock greater than 6 in. shall be removed or broken off at least 6 in. below the *specified* subgrade surface. Holes or depressions resulting from the removal of unsuitable material shall be filled with an acceptable material and compacted to conform with the surrounding subgrade.

During subgrade preparation, adequate drainage shall be provided at all times to prevent water from standing on the subgrade.

Even though the subgrade has been previously accepted, the condition of the subgrade *shall be in accordance with 105.03 and 207.04* at the time paving material is placed ~~shall be in accordance with 105.03 and 207.04~~. Just prior to placing the base course on the subgrade, proofrolling in accordance with 203.26 shall be completed. Undue distortion of the subgrade shall be avoided. If limits of the work make mechanical preparation of the subgrade impractical, appropriate hand methods may be used.

The grade and cross section of the subgrade shall be finished within a tolerance of 1/2 in. from the true subgrade. Finishing within this tolerance by blading or other mechanical means without the use of side forms will be allowed. If these methods do not finish within this tolerance, side forms shall be used.

#### **207.04 Subgrade Treatments**

The subgrade treatment type shall be as specified on the contract plans. *If required, the subgrade foundation shall be corrected as directed by the Engineer prior to the subgrade treatment.*

~~Within each of the following subgrade treatment types, the Contractor shall choose from the listed options for each type.~~

Type I      ~~14 in. chemical soil modification, 12 in. of the subgrade excavated and replaced with coarse aggregate No. 53, or by 24 in. of soil compacted to density and moisture requirements.~~

Type IA      ~~14 in. chemical soil modification or 12 in. of the subgrade excavated and replaced with coarse aggregate No. 53.~~

Type IB	14 in. chemical soil modification.
Type IC	12 in. of the subgrade excavated and replaced with coarse aggregate No. 53.
Type II	<del>8 in. chemical soil modification,</del> 6 in. of the subgrade excavated and replaced with coarse aggregate No. 53, <del>or 12 in. of soil compacted to density and moisture requirements.</del>
Type IIA	8 in. chemical soil modification <del>or 6 in. of the subgrade excavated and replaced with coarse aggregate No. 53.</del>
Type III.	6 in. of soil compacted to the density and moisture requirements, <del>or 6 in. of subgrade excavated and replaced with coarse aggregate No. 53.</del>
<del>Type IIIA</del>	<del>6 in. of subgrade excavated and replaced with coarse aggregate No. 53.</del>
Type IV	12 in. of the subgrade excavated and replaced with coarse aggregate No. 53 on Type IB geogrid.
Type V	3 in. of subgrade excavated and replaced with 3 in. coarse aggregate No. 53.

*In areas where shallow utilities are encountered or chemical modification is not allowed, the Contractor may submit a request to the Engineer to substitute Type IC for Type IB.*

Where the density and moisture control option is used, compaction of embankment areas shall be in accordance with 203.23. In cut and transition areas, the top lifts shall be removed, and the bottom 6 in. compacted in-place to comply with the specified density and moisture requirements. The excavated material shall then be replaced and compacted in 6 in. lifts to comply with the specified density and moisture requirements. Removal of the ~~upper~~ lifts may be waived and only the upper 6 in. treated in accordance with 207.03 when it is determined, through testing in accordance with 203.24, that the lower lifts comply with the specified density and moisture requirements.

In sections where shale or shale and rock mixtures are encountered, these materials shall be undercut 12 in. below the subgrade elevation and replaced with coarse aggregate No. 53 or No. 73 and compacted in accordance with 301.06. All irregularities and holes shall be graded to provide positive drainage. Where necessary, finishing to subgrade elevation shall be accomplished using No. 11 or No. 12 crushed stone.

The existing railroad ballast and railroad bed material shall be excavated to the depth specified for subgrade treatment, ~~†~~Type V and graded as shown on the plans, or as directed by the Engineer, in order to provide the subgrade width required for the

proposed pavement section, including side slopes. Excavation and grading of the ballast and bed material shall include any cuts and fills necessary to account for erosion or degradation of the ballast in localized areas. Cuts and fills shall be balanced within sections approximately 300 ft in length along the profile of the pavement. The graded ballast and bed material shall be compacted in accordance with the applicable provisions of 203 prior to placement of the coarse aggregate No. 53. The 3 in. compacted aggregate as part of the subgrade treatment ~~†~~Type V shall be compacted to 100% prior to the placement of the pavement.

When conditions are encountered below the specified subgrade treatment depth that prevents achieving the specified subgrade compaction, such conditions shall be ~~treated~~corrected as directed.

#### **207.05 Method of Measurement**

Subgrade treatment will be measured in both cut and fill areas by the square yard per type. Chemicals for modification, excavation, aggregates, and geogrid materials will not be measured.

The undercutting of rock, where encountered, will be measured in accordance with 203.27(b).

#### **207.06 Basis of Payment**

The accepted quantities of subgrade treatment will be paid for at the contract unit price per square yard per type, complete in place. *In areas where shallow utilities are encountered or the Contractor elects to use Type IC for Type IB, payment will be made at the price of Type IB.*

The undercutting of rock, where encountered, will be measured in accordance with 203.27.

Payment will be made under:

#### **Pay Item**

#### **Pay Unit Symbol**

Subgrade Treatment, Type \_\_\_\_\_ SYS

The cost of subgrade treatments including testing, sampling, aggregates for cut or at-grade areas, chemicals for modification, geogrid, water, and the excavation required for the methods chosen by the Contractor shall be included in the cost of the pay item for subgrade treatment, type.

The cost of excavation and grading of existing railroad ballast and railroad bed material shall be included in the cost of subgrade treatment, ~~†~~Type V.

~~Compacted aggregate used for subgrade treatment in fill areas will also be measured and paid for as either embankment or as borrow, as appropriate, in accordance with 203.27 and 203.28.~~

Where conditions exist below the specified subgrade compaction depth that prevent achieving the specified compaction, payment for correcting such conditions will be made based on the directed method of treatment.

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