SECTION 02221

EMBANKMENT

PART 1 G E N E R A L

1.01 SECTION INCLUDES

A. Construction of embankments with excess excavated material and borrow.

1.02 UNIT PRICES

A. No separate payment will be made for embankment. Include cost in the unit price for work in related item.

1.03 TESTS

A. Tests and analysis of soil properties will be performed in accordance with ASTM D4318, ASTM D2216, and ASTM D698 under provisions of Section 01410 - Testing Laboratory Services.

1.04 PROTECTION

A. Protect trees, shrubs, lawns, existing structures, and other features outside of embankment limits.

B. Protect utilities above and below grade, which are to remain.

C. Repair damage.

PART 2 P R O D U C T S

2.01 MATERIALS

A. Topsoil: Conform to requirements of Section 02920.

B. General Backfill: Excavated material, graded free of roots, lumps greater than 6 inches, rocks larger than 3 inches, organic material, and debris.

C. Structural Backfill (under pavement or structures): Select general backfill material from excavation or borrow meeting the following requirements:

1. Plasticity Index: not less than 12 or more than 20.

2. Maximum Liquid Limit: 45 unless approved by Owner’s Representative.

PART 3 E X E C U T I O N

3.01 EXAMINATION

A. Verify borrow and excess excavated materials to be reused are approved.

B. Verify removals, and clearing and grubbing operations, have been completed.

3.02 PREPARATION

A. Fill test pits, or stump holes and other surface irregularities such as small swales: Backfill with embankment materials and compact in proper lift depths to requirements for embankment compaction.

B. Remove and dispose of muck and other unsuitable materials which will not consolidate. Backfill with embankment materials and compact to requirements for embankment.

C. Complete backfill of new utilities below future grade.

3.03 EMBANKMENT

A. Do not conduct placement operations during inclement weather or when existing ground or fill materials exceed 3 percent of optimum moisture content. Contractor may manipulate wet material to facilitate drying, by disking or windrowing at Contractor's expense.

B. Do not place embankment fill until density and moisture content of previously placed material comply with specified requirements.

C. Scarify areas to be filled to a minimum depth of 4 inches to bond existing and new materials. Mix with first fill layer.

D. Spread fill material evenly, from dumped piles or windrows, into horizontal layers approximately parallel to finished grade. Place to meet specified compacted thickness. Break clods and lumps and mix materials by blading, harrowing, discing, or other approved method. Each layer shall extend across full width of fill.

E. Each layer shall be homogeneous and contain uniform moisture content before compaction. Mix dissimilar abutting materials to prevent abrupt changes in composition of fill.

F. Layers shall not exceed the following compacted thickness:

1. Areas indicated to be under future paving or shoulders, to be constructed within 6 months: 6 inches when compacted with pneumatic rollers, or 8 inches when compacted with other rollers.

2. Other areas: 8 inches.

G. Where shown on plans for steep slopes, cut benches into slope and scarify before placing fill. Place increasingly wide horizontal layers of specified depth, to the level of each bench.

H. Build embankment layers on back slopes, adjacent to existing roadbeds, to level of old roadbed. Scarify top of old roadbed to minimum depth of four inches and recompact with next fill layer.

I. Construct to lines and grades shown on drawings.

J. Remove unsuitable material and excess soil not being used for embankment from the site in accordance with requirements of Section 01564 - Waste Material Disposal.

3.04 COMPACTION

A. Maintain moisture content of embankment materials to attain required compaction density.

B. Compact to following minimum densities at a moisture content of optimum to 3 percent above optimum as determined by ASTM D698, unless otherwise indicated on the Drawings:

1. Areas under future paving and shoulders: Minimum density of 95 percent of maximum dry density.

2. Other areas: Minimum density of 90 percent of maximum dry density.

3.05 TOLERANCES

A. Top of compacted surface: Plus or minus 1/2 inch in cross section, or in 16 foot length.

3.06 FIELD QUALITY CONTROL

A. Compaction Testing will be performed in accordance with ASTM D1556 or ASTM D2922 and ASTM 3017 under provisions of Section 01410 - Testing Laboratory Services.

B. For roadways, a minimum of three tests will be taken for each 1,000 linear feet per lane or 1000 square yards of embankment per lift for all other areas.

C. If tests indicate work does not meet specified compaction requirements, recondition, recompact, and retest at Contractor's expense.

3.07 PROTECTION

A. Conform to protection requirements of Section 02225 - Roadway Excavation.

END OF SECTION