SP-155016
(New)

SPECIAL PROVISIONS
FOR
SAND LEVEE EMBANKMENT

Louisa County
BRS-C058(43)--60-58

Effective Date
June 19, 2018

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

155106.01 GENERAL.

1.1 Description.

This specification identifies the contractor's responsibilities for constructing the embankment at the east end of the bridge following removal of the existing east abutment, for constructing the levee adjacent to the bridge following completion of the bridge construction and backfilling between the wings of the east abutment. The specification also identifies the contractor's responsibilities for protecting the levee and repairing any damage to the levee at the east end of the bridge during construction activities.

1.2 Equipment.

All plant, equipment, and tools used in the performance of the work will be subject to approval before the work is started and shall be maintained in satisfactory working condition at all times. The equipment shall be adequate, capable, and suitable for accomplishing excavation, filling, shaping and grading as set forth herein and as indicated on the drawings.

1.3 Damage to Existing Levees.

The Contractor shall be responsible for any damage caused by its operations and repair of such damage shall be at the responsibility and expense of the Contractor. Damaged areas of levees shall be returned to pre-project grade and cross section.

155106.02 MATERIAL.

Materials for construction of levee embankment and backfill between the wings of the east abutment shall consist of existing levee sand material or sand borrow. Pervious (sand) material to construct the levee shall optimally be material classified as SP or SW (clean medium to fine sand) with not less than 70% by weight passing the No. 4 sieve and not more than 5% by weight passing the No. 200 sieve. All roots, vegetation, trash, garbage, and other debris shall be removed from the stockpiled sand material.

Materials containing sod, other organic or perishable material, trash, debris, and frozen materials shall not be used in the embankment.

155106.03 CONSTRUCTION.

3.1 Excavation.

Perform excavation of every type of material encountered within the work area limits of the project to the lines, grades, and elevations indicated. Materials shall be shaped so that its surface is free from abrupt changes in grade and shall be sloped to drain. During construction, perform excavation in a manner and sequence that will provide proper drainage at all times. Maintain the final excavation free from detrimental quantities of leaves, brush, sticks, trash, garbage, and other debris. Ensure that excavation of any area or disposition of materials results in minimum detrimental effects on natural environmental conditions.

3.2 Subgrade Preparation.

Do not place material on surfaces that are muddy, frozen, contains frost, or where unsatisfactory material remains in or under the fill. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment. Moisten material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used.

During construction, keep embankments shaped and drained. Maintain ditches and drains along subgrade to drain effectively at all times. Do not disturb the finished subgrade by traffic or other operation. Protect and maintain the finished subgrade in a satisfactory condition. Do not permit the storage or stockpiling of materials on the finished subgrade. Do not lay subbase until the subgrade has been checked and approved, and in no case place subbase on a muddy, spongy, or frozen subgrade.

3.3 Levee Embankment

Construct sand levee embankment from sand materials free of organic or frozen material. The distribution of materials throughout the embankment shall be such that the embankment will be free from lenses, pockets, streaks, and layers of material differing substantially in texture or gradation from surrounding materials. If lenses, pockets, or layers of materials differing substantially in texture or gradation from surrounding material occur in the spread material, the layer shall be mixed by harrowing or any other approved method to blend the materials. During the placing and spreading process, maintain at all times a force of workers adequate to remove all roots, trash, garbage, and debris from the fill materials. No fill shall be placed upon a frozen surface, nor shall snow, ice, or frozen earth be incorporated in the embankment.

Equipment shall be routed so as to prevent excessive rutting of the embankment surface. Sand embankment material shall be placed and spread in layers not more than 6 inches in uncompacted thickness. Layers should be started full out to the slope stakes and shall be carried substantially horizontal and parallel to the levee centerline with sufficient crown or slope to provide satisfactory drainage during construction. After a layer of material has been dumped and spread it shall be harrowed as required to break up and blend the fill materials and to obtain uniform moisture distribution. Each lift shall be placed, worked, and compacted in a saturated state with spreading equipment and vibratory rollers (with spray bars) over the entire area of each layer to a minimum 70 percent relative density in accordance with ASTM D 4253 and ASTM D 4254. Dumping, working, spreading, sprinkling, and compacting may be performed at the same time at different points along a section when there is sufficient area to permit these operations to proceed simultaneously. Compaction equipment shall be operated such that the strip being traversed by the roller shall overlap the rolled adjacent strip by not less than 3 feet.

3.3.1 Sprinkling Equipment.

Sprinkling equipment shall consist of tank trucks, pressure distributors or other equipment designed to apply water uniformly and in controlled quantities to variable width of surface.

3.3.2 Miscellaneous Equipment.

Scarifiers, disks, spring-tooth or spike-tooth harrows, spreaders, and other equipment shall be suitable for use in fill construction. Equipment used for blending fill material shall be capable of penetrating the full loose lift thickness of the specific material type.

3.4 Finishing.

Finish the surface of the embankment to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. Finished surfaces shall be relatively smooth and free from irregular surface changes (humps, depressions, bulges, etc.). During construction, excavation and fill shall be performed in a manner and sequence that will provide proper drainage at all times.

3.5 Field Quality Control.

3.5.1 General

The Contractor shall establish and maintain field quality control for foundation preparation and embankment operations to assure compliance with contract requirements and maintain detailed records of field quality control for all operations including but not limited to the following:

a. Equipment.
   Record the type, size, number of units and suitability for construction of the prescribed work.
b. Foundation Preparation.
   Identify the methods of preparing the foundations in advance of embankment construction.

3.5.2 Testing

The Contractor shall perform sufficient testing by a certified testing laboratory to ensure that the embankment is being constructed as specified. The testing program specified below shall be considered the minimum acceptable frequency of testing. This does not relieve the Contractor from the responsibility of performing additional testing, if required to ensure compliance with these specifications.

a. Soil Classification Tests.
   Soil classification tests shall be performed in accordance with ASTM D 2487. One initial classification test shall be required for each different classification of material to be utilized as embankment fill. As prescribed in ASTM D 2487, grain size analyses in accordance with ASTM D 422 shall be performed on each different classification. The Contractor shall run not less than one specific gravity test in accordance with ASTM D 854 for the type of soil. Additional tests will be required if noticeable changes in the material occur.
b. Material Testing.
   (1) Compaction Tests. The Contractor shall run not less than one relative density test for every 1000 cubic yards of embankment in accordance with ASTM D 4253 and ASTM D 4254.
   (2) In-Place Density Tests. The in-place density of the cohesionless materials shall be determined in accordance with ASTM D 1556, ASTM D 2167, and ASTM D 6938. The Contractor shall run not less than one field in-place density test for every 500 cubic yards of completed embankment. Horizontal locations shall be randomly staggered in the embankment. When nuclear method is used for in-place density testing according to ASTM D 6938, the first test and every tenth test thereafter for

each material type shall include a sand cone or rubber balloon correlation test in accordance with ASTM D 1556 or ASTM D 2167. The sand cone or rubber balloon test shall be performed adjacent to the location of the nuclear test, and shall include a nominal 6 inch diameter sand cone or 12 inch diameter rubber balloon, and shall include a minimum wet soil weight of 6 pounds extracted from the hole. The density correlations shall be submitted with test results. Each transmittal including density test data shall include a summary of all density correlations for the job neatly prepared on a summary sheet including at a minimum:

- Meter serial number and operators initials.
- Standard count for each test.
- Material type.
- Probe depth.
- Moisture content by each test method and the deviation.
- Wet density by each test method and the deviation.

(3) Water (Moisture) Content Tests. Determination of water content shall be performed in accordance with ASTM D 2216. ASTM D 4643 may be used when rapid moisture content results are needed. All rapid results obtained by ASTM D 4643 shall be confirmed by a test on a duplicate sample performed in accordance with ASTM D 2216. In the event of disagreement between the results, ASTM D 2216 shall govern. One water content test will be performed for each 1000 cubic yards of material placed. The use of moisture content testing equipment such as Model No. 276-B Moisture Teller as manufactured by Dietert Foundry Testing Equipment, Detroit, MI for rapid results, or equivalent, is recommended.

(4) Percent Passing No. 200 Sieve Test. The Contractor shall run one minus 200 wash test (ASTM D 1140) for every 1000 cubic yards or portion thereof of embankment placed.

(5) Sieve Analysis. The Contractor shall run on sieve analysis (ASTM C 136) for every 1000 cubic yards or portion thereof of embankment placed.

c. Additional Testing.
Additional tests may be requested if there is reason to doubt the adequacy of the compaction, or materials change, or if it is determined that the Contractor's testing is inadequate or the Contractor is concentrating fill operations in a relatively small area.

3.5.3 Reporting.

On a daily basis, the Contractor shall furnish the inspection records and all material testing results, the quantity of fill placed, as well as the records of corrective action taken.

155106.04 METHOD OF MEASUREMENT.

The item Sand Levee Embankment will be measured as a Lump Sum unit of work.

155106.05 BASIS OF PAYMENT.

Sand Levee Embankment will be paid at the contract lump sum price. This price shall be full payment for all costs associated with, or incidental to, construction of the sand levee embankment within the designated work limits with satisfactory material. Such price for construction of sand levee embankment shall constitute full compensation for performing all placement, spreading, grading, and compaction required for construction of the sand levee embankment. Price for sand levee embankment construction shall include costs associated with measurement surveys, as well as any dewatering necessary to complete construction of the sand levee embankment. Price for sand levee embankment construction shall also include costs associated with maintaining sufficient materials on site to restore the levee embankment fill limits to the preexisting grade established by the existing roadway.