



**SPECIAL PROVISION
FOR
LEVEE CONSTRUCTION**

**Pottawattamie County
IM-NHS-029-3(102)48--03-78**

**Effective Date
December 16, 2014**

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

120217.01 DESCRIPTION.

The work covered by this Special Provision consists of furnishing all labor and materials, and performing all operations in connection with the construction of the "piggy-back levee" adjacent to US 275 Bridge Pier No. 3, restoration of the levee alignment in the area of the I-29 bridge over Mosquito Creek abutments, restoration of the levee alignment in the area of the US 275 bridge over Mosquito Creek abutments, and construction of the trail embankment adjacent to the levee, as shown in the contract documents.

120217.02 MATERIALS.

A. General.

The earthen embankment shall be constructed entirely of impervious fill which shall be obtained from off site and approved borrow areas. Earth used in construction of embankments shall be free of unsuitable materials.

B. Impervious Fill.

1. Impervious fill shall consist of cohesive materials having at least 50% passing the U.S. Standard 200 mesh sieve size. Cohesive materials consist of materials classifying as lean (CL), having a Plasticity Index of 10 or greater, and falling between the "U" line and the "A" line on Figure 3 in ASTM D 2487 – Standard Tests for Classifications of Soils for Engineering Purposes and a Liquid Limit less than 50.
2. This material will be furnished by the Contractor.

C. Unsuitable Materials.

Unsuitable materials are materials containing debris, brush, roots, sod, organic matter or stones with dimensions greater than one-half the loose layer thickness and shall not be used in the levees. Frozen earth, snow, or ice shall not be used in the levees. In addition, fat clays, silts, sands, and gravels are considered unsuitable.

D. Suitable Materials.

Suitable materials for construction of the levee embankment will include materials described in this Article. A material will not be classified as unsuitable based on its moisture content. See Article 120217.02.E.

E. Pre-Construction Testing of Proposed Borrow Materials.

Submit to the Engineer for approval the results of grain size tests (ASTM D 422) and plasticity tests (ASTM D 423 and D 424) for the impervious fill. The estimated quantity and location of materials proposed for use in the levee embankment shall also be submitted. These submittals must be approved by the Engineer prior to the placement of materials within the levee section.

120217.03 CONSTRUCTION.

A. Notifications.

The following shall be notified at least 1 week prior to beginning any excavations within the existing levee section, at least 1 week prior to construction of the piggy-back levee and scour restoration, and at the completion of the piggy-back levee and scour restoration construction operations.

City of Council Bluffs.

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Iowa DOT District 4 Construction Engineer.

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Section 408 Engineer.

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B. Subgrade Preparation.

1. General.

After stripping and removal of unsuitable foundation material, cavities or other depressions shall be broken down to flatten out the slopes. Immediately prior to the placement of fill material the entire earth surface on or against which fill is to be placed, shall be thoroughly broken to a depth of 6 inches and the area to be occupied by the embankments shall be

compacted in accordance with the provisions specified in Article 120217.03, C. If for any cause, this foundation surface or other fill surface that is to receive fill becomes compacted in such a manner that, in the opinion of the Engineer, a plane of seepage or weakness might be induced, it shall be scarified to a depth of 6 inches before the depositing of material thereon.

2. Requirements.

The depth of stripping on the existing slopes of levees and roadway embankments shall not exceed 6 inches. All slopes upon which fill is to be placed shall be notched and broken up so that the fill material will bond with the existing material. Water shall be added as needed to achieve compaction requirements. All notching, scarifying, and breaking of ground surface shall be done parallel to the centerline of the embankment being constructed. All foundation preparation shall be approved by the Engineer prior to placement of embankment. No fill shall be placed upon frozen ground.

3. Existing Embankments.

At locations where the levee or other embankments tie to existing earth embankments to complete the levee construction, such embankment surface slopes shall be notched, scarified and compacted as specified herein. When directed by the Engineer, such operations shall be accomplished parallel to the axis of the existing embankment.

C. Embankment Construction and Testing.

1. General.

- a. Apply Section 2107 of the Standard Specifications, except when amended by requirements of this specification. Verify embankment placed with moisture and density control meets the requirements of Article 2107.03, I of the Standard Specifications.
- b. Fill material, as specified in Article 120217.02, shall be placed in successive horizontal layers not more than 8 inches in depth prior to compaction. Each layer shall be spread uniformly on the previously compacted surface; plowed, disked, or otherwise broke up; moistened or aerated as necessary; thoroughly mixed and compacted to produce embankments having the following moisture and density requirements. If in the opinion of the Engineer, the surface of any compacted layer is too smooth to bond properly with the succeeding layer, it shall be scarified to the satisfaction of the Engineer before the succeeding layer is placed thereon. The Contractor must use equipment which achieves the compaction specified below and which will not create seams between embankment lifts.

2. Quality Control Program (Embankment Construction).

- a. Provide and maintain a Quality Control Program (Embankment Construction). This is defined as process control sampling, testing, and inspection as described in Materials I.M. 540 for construction of embankments with moisture and density control.
- b. Provide a Quality Control Technician who is responsible for all process control sampling, testing, and inspection. The Quality Control Technician shall obtain Soils Technician certification through the Iowa DOT Technical Training and Certification Program (TTCP).
- c. Provide a laboratory facility and necessary calibrated equipment to perform required tests.
- d. Notify the Engineer when a moisture content falls outside specified control limits or density falls below required minimum. If a moisture content falls outside control limits, fill material in this area will be considered unacceptable for compaction. Perform corrective action(s) to bring uncompacted fill material within control limits. If material has been compacted, disk it, bring to within control limits, and re-compact. When project has a density requirement, if an in-place density does not meet the requirements, compacted fill material in this area will be considered unacceptable. Perform corrective action(s) to material to meet density requirements. Compensation will not be allowed for delays resulting from moistening, disking, or re-compacting.

3. Test Procedures.

- a. Use test procedures complying with Materials I.M. 204, Appendix A.
- b. Atterberg Limits (ASTM D 4318) and grain size analysis (ASTM D 422) shall also be determined for each of the representative materials. Copies of all test results made for and used as a basis for moisture and density control shall be furnished to the Engineer in advance of the time that materials are to be placed in the embankments.

4. Moisture and Density Control.

Cohesive materials placed in embankments shall be compacted to a density of at least 95% of the maximum dry density and be within -1% to +4% of the optimum moisture content at the time the compactive effort is applied which may require the addition of water or aeration of materials. Non-cohesive materials used in the embankments will be placed in a moist condition and compacted with approved equipment to a density of at least 95% of the maximum dry density.

D. Levee Embankment.

The levee embankment shall be constructed entirely of impervious fill as shown in the Details on B.15 and B.16 sheets and the cross sections X.27 through X.40 and X.48-X53 of the contract documents, and shall meet the material requirements of Article 120217.02, B, placed and compacted as specified in Article 120217.03.

120217.04 METHOD OF MEASUREMENT.

Measurements will be as specified in the pay item Embankment-In-Place.

120217.05 BASIS OF PAYMENT.

- A. All costs associated with the Contractor furnishing Impervious Fill (lean clay), excavating in preparation for filling, and filling with moisture and density control shall be included in the price bid for Embankment-In-Place.
- B. Payment is full compensation for furnishing a Quality Control Technician, sampling and testing, process control inspection, drying material, furnishing and applying water, controlling moisture content of the materials, and compacting the materials, as specified.