



**SPECIAL PROVISIONS  
FOR  
LEVEE CONSTRUCTION**

**Pottawattamie County  
IM-NHS-080-1(428)0--03-78**

**Effective Date  
June 18, 2013**

**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.**

**120060.01 DESCRIPTION.**

- A. 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 RCB culvert, as shown in the contract documents.
- B. The geotechnical information for the RCB culvert is provided in the document entitled "Modifications to Agricultural Levee Unit L627 – Sections 1, Proposed Culvert Extension, Council Bluffs Interstate System – Segment 2, Project No. IM-029-3(67)54—13-78, Pottawattamie County, Iowa," prepared by HDR, Inc., dated March 2013, which can be obtained from the Office of Contracts.

**120060.02 MATERIALS.**

- A. **General.**  
Material will be provided by Iowa DOT and stockpiled at a location no more than 1,000 feet from the project site.
- B. **Cohesionless Material.**
  - 1. **Backfill Below RCB Culvert.**  
Cohesionless material obtained from the soils overexcavated below the RCB culvert or from the stockpile provided by Iowa DOT.
  - 2. **Backfill Around and Above RCB Culvert.**  
Cohesionless material obtained from the stockpile provided by Iowa DOT, which meets the requirements of 47B Fine Aggregate for Concrete, Class B Aggregates Table 1033A of the Nebraska Department of Roads Standard Specifications for Highway Construction - 2007 Edition.

**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, silts and clays are considered unsuitable.

**D. Suitable Materials.**

Suitable materials will include materials described in Paragraphs A and B of this section. A material will not be classified as unsuitable based on its moisture content. Apply Section 2105 of the Standard Specifications for the topsoil.

**120060.03 CONSTRUCTION.**

**A. Subgrade Preparation.**

**1. General**

After stripping, subgrade soils to a depth of 1.5 feet below and 2 feet laterally beyond the RCB culvert shall be overexcavated. The base of the overexcavation shall be proofrolled with a vibratory compactor or a front end loader with a loaded bucket. Any soft, loose or excessively wet soils shall be completely removed. Cavities or other depressions shall be broken down to flatten out the slopes. Immediately prior to the placement of fill, 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 backfilled shall be compacted in accordance with the provisions specified in Paragraph 120060.03.B- "RCB Culvert Backfill and Testing" of this section. 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.

**B. RCB Culvert Backfill and Testing.**

**1. General.**

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.

Fill material, as specified in Paragraph 120060.02, 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 backfill 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 backfill lifts.

**2. Quality Control Program (RCB Culvert Backfill).**

- a. Provide and maintain a Quality Control Program (RCB Culvert Backfill), defined as all activities of sampling, testing, process control inspection, and necessary adjustments for construction of embankments to meet the requirements of this Special Provision.
- b. As part of the Quality Control Program (RCB Culvert Backfill), provide a Quality Control Technician to perform testing on all soils placed with Compaction with Moisture and Density Control. As a minimum, the Quality Control Technician shall have a high school education. The Technician shall obtain 'Soils Technician Lab Certification' from the Iowa DOT.
- c. Ensure the Quality Control Technician is present on the project when backfill is being placed with 'Compaction with Moisture and Density Control.'
- d. Provide a laboratory facility and all the necessary calibrated equipment to perform the required tests.

**3. Test Procedures.**

- a. Use test procedures and equipment complying with applicable Materials I.M.'s, Iowa DOT Materials Laboratory Test Methods, or equivalent standards of AASHTO or ASTM.
- b. Allow the Engineer to review equivalent standards. Use equivalent standards only if approved by the Engineer.
- c. Acceptable test methods for determining moisture content and density are:
  - Oven drying - AASHTO T 265
  - Pan drying - ASHTO T 265 (modified to use an open burner)
  - Microwave - ASTM D 4643
  - Nuclear gauge - Materials I.M. 334
  - Sand Cone Test - ASTM D 1556
- d. Use AASHTO T 265 oven drying method for the reference method for calibration.

**4. Moisture and Density Control.**

- a. Moisture and density control of the backfill shall be based on the standard Proctor compaction test (Materials I.M. 309). Cohesionless materials placed below the RCB culvert shall be compacted to a density of at least 95% of the maximum dry density and in a moist condition at the time the compactive effort is applied which may require the addition of water or aeration of materials. Cohesionless materials placed around and above the RCB culvert shall be compacted to a density of at least 90% of the maximum dry density and in a moist condition at the time the compactive effort is applied which may require the addition of water or aeration of materials.
- b. Determine the optimum moisture content and maximum density by Proctor testing of soil being placed.
- c. Test and verify that moisture content and density of material placed under the item 'Compaction with Moisture and Density Control' is within the optimum moisture content range for the soil being placed and greater than or equal to the required density.
- d. Disk to reduce moisture if, after initial disking to break down lumps greater than 12 inches as required by Article 2107.03, D, 2, d, of the Standard Specifications, the deposited soil material contains moisture in excess of the specified moisture limits.
- e. If, after initial disking as required by Article 2107.03, D, 2, d, of the Standard Specifications, the material is dry to the extent that it is not within the range of the optimum moisture of the soil to allow satisfactory compaction by rolling, uniformly moisten the material to the required limits before it is compacted.
- f. Proceed with aeration, watering, and compaction operations in an orderly fashion without unreasonable and unnecessary delay. Compensation will not be allowed for delays resulting from the ordering of moistening or disking.
- g. Verify all soil accepted for final placement is within the specified moisture control limits and meets the in-place density requirements.

**5. Compaction.**

- Apply Article 2107.03, E, of the Standard Specifications.

**6. Equipment.**

Use:

- Pneumatic tired rollers as described in Articles 2001.05, C and 2001.05, D of the Standard Specifications, or
- Self-propelled vibratory rollers as described in Article 2001.05, F of the Standard Specifications.

**7. Test Frequency during RCB Culvert Backfill.**

Test for proctor optimum moisture content and maximum density and backfill moisture content and density at the minimum frequencies in Materials I.M. 204. Samples will be randomly selected.

**8. Field Records.**

Document all observations, records and inspection, changes in soil type, soil moisture, fill placement procedures, and test results on a weekly basis. Note the results of the observations and records of inspection in a permanent field record as they occur. Submit copies of field moisture and density tests to the Engineer on a weekly basis. Submit the original testing records (raw field and lab data sheets) and control charts to the Engineer in a neat and orderly manner within five calendar days after completion of the project.

**9. Corrective Action.**

Notify the Engineer when a moisture content falls outside the specified control limits or density falls below the required minimum. If a single moisture content falls outside of the control limits, the fill material in this area will be considered unacceptable for compaction. Perform corrective action(s) to bring the uncompacted fill material, after a retest, within the specified moisture control limits. If material has been compacted, disk it, bring it to within moisture control limits, and recompact it. Also, if a single density does not meet the requirements, the compacted fill material in this area will be considered unacceptable. Perform corrective action(s) to the material to meet density requirements.

**10. Quality Assurance.**

**a. Required Testing.**

- 1) The Contractor's Quality Control Technician shall perform all field testing and data analysis. The Quality Control Technician shall retain split samples of Materials I.M. 309 testing when requested by the Engineer. The Engineer may select any or all of the Contractor-retained split samples for independent assurance and verification testing.
- 2) The Engineer will determine the random location of verification tests and will test at the minimum frequencies in Materials I.M. 204. The Contractor Quality Control Technician shall obtain a sample at the same location as directed by the Engineer and provide the results to the Engineer. Verification test results will be provided to the Contractor within one working day after the Contractor's quality control test results have been reported.
- 3) The Engineer will periodically witness field testing being performed by the Contractor. If the Engineer observes the quality control field tests are not being performed according to the applicable test procedures, the Engineer may stop production until corrective action is taken. The Engineer will notify the Contractor of observed deficiencies, promptly, both verbally and in writing. The Engineer will document all witnessed testing.
- 4) All quality control test results become part of the project files.

**b. Verification and Independent Assurance Testing.**

- 1) The Contractor's quality control test results will be validated by the Engineer's verification test results using the criteria in Materials I.M. 216. If the Engineer's verification test results validate the Contractor's test results, the Contractor's results will be used for material acceptance.

- 2) In the event that the Contractor's results can't be validated, the Engineer will investigate the reason immediately. The Engineer's investigation may include:
  - Testing of other locations,
  - Observations of the Contractor's testing procedures and equipment, and
  - Comparison of test results of the Contractor with those of the Engineer.
- 3) Personnel and laboratories performing tests used in the acceptance of material shall participate in the independent assurance program covered in Materials I.M. 205.

**c. Referee Testing.**

If a difference in procedures for sampling and testing and/or test results exists between the Contractor and the Engineer which they cannot resolve, the Iowa DOT's Central Materials Laboratory will provide referee testing. The Engineer and the Contractor will abide by the results of the referee testing.

**11. Acceptance.**

The Engineer will base final acceptance of tests and materials on the results of the Contractor's quality control testing as verified by the Engineer's quality assurance.

**C. RCB Culvert Backfill.**

RCB culvert backfill shall be constructed entirely of cohesionless material and shall meet the material requirements of Article 120060.02, B, placed and compacted as specified in Article 120060.03. One foot of topsoil shall be spread over the RCB culvert backfill as shown in the Detail 'X' sheets of the contract documents. Apply Section 2105 of the Standard Specifications for placement of the topsoil.

**120060.04 METHOD OF MEASUREMENT.**

- A. The quantity of Embankment-In-Place for cohesionless material will be measured in cubic yards placed.
- B. The quantity of cohesionless material requiring Compaction with Moisture and Density Control, in cubic yards, will be the quantity shown in the contract documents as determined by the template fill volume. Shrinkage will not be included in moisture and density control quantity.
- C. All excavation in preparation for the RCB culvert will be included in Class 20 Excavation according to Article 2402.04 of the Standard Specifications.

**120060.05 BASIS OF PAYMENT.**

- A. The quantities accepted for payment will be paid for at the contract unit price. The contract unit price will be full and complete payment for providing all design, materials, labor, equipment, and incidentals to complete the work.
- B. Payment for Compaction with Moisture and Density Control will be the contract unit price in cubic yards for the quantity of Embankment-In-Place placed with moisture and density control.
- C. Payment is full compensation for furnishing a Quality Control Technician, sampling and testing, process control inspection, working of drying material, furnishing and applying water, controlling moisture content of the materials, and compacting the materials to the required density, as specified.