

### **Section 71 Existing Drainage Facilities**

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### Section 71 Existing Drainage Facilities

#### 4-7101 General

This section provides guidelines for inspecting existing drainage facilities for work specified under Section 71, “Existing Drainage Facilities,” of the *Standard Specifications*.

#### 4-7101A Rehabilitating Drainage Facilities

Culvert rehabilitation is the practice of extending or restoring the service life of a culvert without removal of the existing culvert and typically involves placement of a smaller diameter pipe liner into a larger diameter host pipe. The liner may be a culvert or a product specifically manufactured for culvert rehabilitation. The annular space between the new pipe and the host pipe is grouted.

When the bid item list includes items for alternative drainage rehabilitation components, the contractor chooses from the type shown in the project plans or specified in the special provisions.

#### 4-7102 Before Work Begins

Before work begins, do the following:

- Inspect existing drainage facilities that are to be removed, rehabilitated, repaired, modified, adjusted, or abandoned. Document existing conditions with photos or video.
- When drainage structures to be removed belong to a city, county, or other agency, check with the applicable agency before disturbing the drainage facility.
- The district Maintenance Unit maintains existing highway facilities. Keep the maintenance area supervisor or area superintendent informed of specific needs or changes to drainage structures.

#### 4-7102A Rehabilitating Drainage Facilities

- Hold preconstruction meetings (prerehabilitation and pregrouting) to discuss the contractor’s quality control program and method for performing each element of work including the contractor’s sampling and testing of materials and inspection of the work. Remind the contractor to notify you before the start of each step identified under Section 71-3.01C(1) “General,” of the *Standard Specifications*.
- Verify that machine spiral wound polyvinyl chloride (PVC) pipeliners are marked as required under Section 71-3.09A(2), “Materials,” of the *Standard Specifications*.

#### **4-7103 During the Course of Work**

During the work, do the following:

Make sure the contractor backfills trenches, holes, depressions, and pits resulting from work on existing drainage facilities. Backfill in surfaced areas should match the thickness and quality of the roadway section.

##### 4-7103A Removing Drainage Facilities

Require removal to the specified minimum depth below finished grade. Record your observations in the daily report and note that the minimum depth requirements have been met.

##### 4-7103B Rehabilitating Drainage Facilities

- Verify culvert is cleaned before the start of culvert inspection.
- Make sure the contractor performs prerehabilitation inspections.
- Check that culvert structural repair or concrete invert paving, where shown or ordered, is placed and concrete has attained a compressive strength of 2,500 pounds per square inch before start of grouting.
- Make sure the contractor restores the lateral pipe and all openings and drainage connections within 72 hours of installing a pipeliner.
- Make sure the contractor performs postrehabilitation inspections.
- Verify that installation of machine spiral wound PVC pipeliners comply with the appropriate American Society for Testing and Materials International specification. Refer to Section 6-305, "Test Methods," of this manual for information on how to obtain these standards. Check that markings are visible from the inside of the completed pipeliner.

##### 4-7103C Modifying Drainage Structures

- For existing headwalls or end walls to be removed or moved, check that pipe is cut so that the pipe edges are smooth.
- Verify capping of inlets, utility access, and risers with minor concrete that contains at least 590 pounds of cementitious material per cubic yard.

##### 4-7103D Adjusting Drainage Structures

- Verify that the contractor lowers frames, covers, grates, and maintenance access before cold planing and raising after paving is completed to finish grade.
- For adjusting maintenance access, verify that the contractor removes the existing maintenance access to a depth of at least 3.5 feet.
- For unstable maintenance access under traffic, review and authorize the material to be used to adjust the maintenance access cover seat.

- Verify inlets are adjusted with minor concrete that contains at least 590 pounds of cementitious material per cubic yard. Check that the contractor protects grate of adjusted inlets during paving operations as required.

#### 4-7103E Abandoning Drainage Structures

Make sure that bases of maintenance access or drainage facilities are broken to prevent water from collecting in the abandoned structure. Check that pipes entering the abandoned facility are plugged as specified.

#### **4-7104 Level of Inspection**

Suggested levels of inspection for typical work activities are:

- Intermediate inspection where concrete placement is required.
- Benchmark inspection to remove, modify, adjust, abandon, and salvage work before start of backfill.
- Intermediate inspection during backfill.
- Benchmark inspection of cleaning and preparation of host culvert.
- Intermediate inspection of structural repairs or invert paving.
- Continuous inspection of sampling and field testing of grout materials for start of grouting work that can be reduced to intermittent inspection if test results consistently meet specified requirements and the grouting operation is uniform.

#### **4-7105 Quality Control**

Witness contractor sampling and testing of grout density and viscosity. Verify results meet the required density and strength values.

Verify that the contractor is monitoring grout pump pressure gauge recorder printout to assure grout pump pressure compliance with manufacturer's instructions.

Verify that the contractor performs culvert inspection by closed-circuit video recording or photography and that the quality of those records is appropriate to confirm compliance with cleaning of host culvert and installation of pipeliner.

Review the contractor's inspection and evaluation report. Prepare change order for ordered repairs.

Witness the contractor's deflection testing of pipeliner where required. Reject pipeliner that exceeds the specified deflection requirement.

#### **4-7106 Payment**

Payment for removing and reusing frames, grates, and covers is included in the payment of the various items of work.

Pipeliner is measured along the flow line of the existing culvert. No payment is made for culvert rehabilitation reinspection because of low quality recordings and cleaning. Prepare a change order where repair work or concrete invert paving for culvert rehabilitation is ordered. Deduct 20 percent of the bid amount for pipeliner 8 percent

or less of the nominal pipeliner dimension that is over-deflected and is not replaced. Deduct quantity of slurry cement backfill that is wasted, or disposed of or otherwise not used in the work.