

## ORIGINATION FORM

**Date:** April 19, 2012  
**Originator:** Larry Ritchie  
**Contact Information:** (850) 414-4168

**Specification Title:** PIPE CULVERTS  
**Specification Section, Article, or Subarticle Number:** Section 430

**Why does the existing language need to be changed?** The existing language requires that pipe inspection for all pipes 48" and smaller begin upon completion of placement of concrete pavement or placement of structural asphalt but prior to the placement of asphalt friction course depending on the contract pavement type. Feedback from the CEI and Contracting Industry indicates that often there is not enough time to conduct the culvert inspections, review the findings and discuss remediation procedures before completion of placement of the asphalt friction course. This can result in project delays and potentially require the contractor to cut into new, pristine asphalt.

**Summary of the changes:** The proposed language initiates pipe culvert inspection for all pipes 48" or less upon completion of placement of the stabilized subgrade. For pipe installed within MSE wall embankments or in embankment fill greater than 3 feet, inspection is to be conducted when compacted embankment reaches 3 feet above the pipe crown. Additionally, the proposed language allows the Engineer to direct additional inspections after reviewing submitted pipe inspection reports. Finally, the proposed language removes fiber reinforced pipe from the Specification, requires the contractor to remove all silt, debris and obstructions when they are dewatering the culverts, includes a video record of the actual speed at which the camera is traveling during the inspection, and requires the inspection camera operator to position the camera head perpendicular to all defects requiring measurement by video micrometer.

**Are these changes applicable to all Department jobs? YES If not, what are the restrictions?**

**Will these changes result in an increase or decrease in project costs? If yes, what is the estimated change in costs?** The Construction Office does not anticipate any change in project costs associated with pipe inspection.

**With who have you discussed these changes?** Director of Construction, State Construction Engineer, Florida Transportation Builders Association, FDOT's Pipe Advisory Group.

**What other offices will be impacted by these changes?** None

**Are changes needed to the PPM, Design Standards, SDG, CPAM or other manual?** No

**Is a Design Bulletin, Construction Memo, or Estimates Bulletin needed?** No



## *Florida Department of Transportation*

**RICK SCOTT**  
GOVERNOR

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Tallahassee, FL 32399-0450

**ANANTH PRASAD, P.E.**  
SECRETARY

### **MEMORANDUM**

**DATE:** May 3, 2012  
**TO:** Specification Review Distribution List  
**FROM:** Duane F. Brautigam, Director, Office of Design  
**SUBJECT:** Proposed Specification: **4300202 Pipe Culverts**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

This change was proposed by Larry Ritchie of the State Construction Office to clarify the requirements for the inspection of pipe.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via email at RD967DB, or [duane.brautigam@dot.state.fl.us](mailto:duane.brautigam@dot.state.fl.us). Comments received after **June 1, 2012**, may not be considered. Your input is encouraged.

DB/dt  
Attachment

**PIPE CULVERTS.**  
**(REV 4-19-125-3-12)**

ARTICLE 430-2 (Page 446) is deleted and the following substituted:

**430-2 Materials.**

**430-2.1 Pipe:** Meet the following requirements:

Concrete Pipe .....	Section 449
Round Rubber Gaskets .....	Section 942
Corrugated Steel Pipe and Pipe Arch.....	Section 943
Corrugated Aluminum Pipe and Pipe Arch .....	Section 945
Corrugated Polyethylene Pipe.....	Section 948
Polyvinyl Chloride (PVC) Pipe .....	Section 948

**430-2.2 Joint Materials:** Use joint materials specified in 430-7 through 430-10.9 according to type of pipe and conditions of usage.

**430-2.3 Mortar:** Use mortar composed of one part ~~portland~~ *Portland* cement and two parts of clean, sharp sand, to which mixture the Contractor may add hydrated lime in an amount not to exceed 15% of the cement content. Use mortar within 30 minutes after its preparation.

**Comment [Ir21]:** Correction to reference the appropriate section of the Spec.

SUBARTICLE 430-4.8 (Pages 448 – 449) is deleted and the following substituted:

**430-4.8 Final Pipe Inspection:** ~~Based on contract pavement type, upon completion of placement of concrete pavement or the placement of structural asphalt, but prior to placement of asphalt friction course, dewater installed pipe and provide the Engineer with a video recording schedule allowing for pipe videoing and reports to be completed and submitted to the Department and reviewed prior to continuation of pavement.~~ *Upon completion of placement of the stabilized subgrade, dewater installed pipe, remove all silt, debris and obstructions and provide the Engineer with pipe videos and reports of the installed pipe. Submitted videos and reports will be reviewed by the Engineer prior to completion of placement of concrete pavement or placement of base materials. For pipe installed within MSE wall embankments or in embankment fills greater than 3 feet, including embankments confined by walls, inspection is to be conducted when compacted embankment reaches 3 feet above the pipe crown.*

For pipe 48 inches or less in diameter, provide the Engineer a video DVD and report using low barrel distortion video equipment with laser profile technology, non-contact video micrometer and associated software that provides:

1. Actual recorded length and width measurements of all cracks within the pipe.
2. Actual recorded separation measurement of all pipe joints.
3. Pipe ovality report.
4. Deflection measurements and graphical diameter analysis report in terms of x and y axis.
5. Flat analysis report.
6. Representative diameter of pipe.
7. Pipe deformation measurements, leaks, debris, or other damage or defects.

**Comment [Ir22]:** This language allows final pipe inspection to begin earlier in the project and provides the CEI and the Contractor more time to review and remediate any deficiencies.

8. Deviation in pipe line and grade, joint gaps, and joint misalignment.

*9. A video record of the actual speed at which the camera is traveling ensuring that the rate of travel does not exceed that limit defined in 430-4.8.3 below.*

Laser profiling and measurement technology must be certified by the company performing the work to be in compliance with the calibration criteria posted at: [www.dot.state.fl.us/construction/contractorissues/laser.shtm](http://www.dot.state.fl.us/construction/contractorissues/laser.shtm) . Reports ~~may be~~ submitted in electronic media ~~if approved by the Engineer~~ *are preferred*.

~~For video recorded, laser profiled pipe that indicates deflection that appears to be in excess of that allowed by Specification, the Engineer may require further testing of the pipe. If directed by the Engineer, test pipe using a mandrel. The mandrel shall be pulled by hand and be approved by the Engineer prior to use. If use of a mandrel is selected as the means of further testing, the mandrel's diameter, length, and other requirements shall conform to 430-4.8.2. Remove, replace, and retest pipe failing to meet the specific deflection requirements for the type of pipe installed, at no cost to the Department. Should the deflection test prove that the pipe met specifications, the Department will bear the cost of the deflection testing.~~

The Engineer may waive this requirement for side drains and cross drains which are short enough to inspect from each end of the pipe.

**430-4.8.1 Video Report:** Provide a high quality DVD in a MPEG2 format video with a standard resolution of 720 x 480. Use a camera with lighting suitable to allow a clear picture of the entire periphery of the pipe. Center the camera in the pipe both vertically and horizontally and be able to pan and tilt to a 90 degree angle with the axis of the pipe and rotating 360 degrees. Use equipment to move the camera through the pipe that will not obstruct the camera's view or interfere with proper documentation of the pipe's condition.

The video image shall be clear, focused, and relatively free from roll, static, or other image distortion qualities that would prevent the reviewer from evaluating the condition of the pipe. The video will include identification before each section of pipe filmed. The identification will include the project number, the structure number corresponding to the structure number on the set of plans for the project, size of pipe, the date and time, and indicate which pipe is being filmed if multiple pipes are connected to the structure. Notes should be taken during the video recording process. Provide the Engineer with copies of these notes along with the video.

Move the camera through the pipe at a speed not greater than 30 feet per minute. Mark the video with the distance down the pipe. The distance shall have an accuracy of one foot per 100 feet. Film the entire circumference at each joint. Stop the camera and pan when necessary to document *and measure* defects. *Position the camera head perpendicular to all defects requiring measurement by the video micrometer.*

~~**430-4.8.2 Mandrels:** Use mandrels which are rigid, nonadjustable, odd-numbered legged (minimum 9 legs) having a length not less than its nominal diameter. The diameter at any point shall not be less than the allowed percent deflection of the certified actual mean diameter of the pipe being tested. The mandrel shall be fabricated of metal, fitted with pulling rings at each end, stamped or engraved on some segment other than a runner with the nominal pipe size and mandrel outside diameter.~~

***430-4.8.2 Reinspection:** At any time after reviewing the submitted pipe inspection reports, the Engineer may direct additional inspections. If no defects are observed during the reinspection, the Department will pay for the cost of the reinspections in accordance with 4-3. If defects are found that require removal and replacement or repair, cost of the*

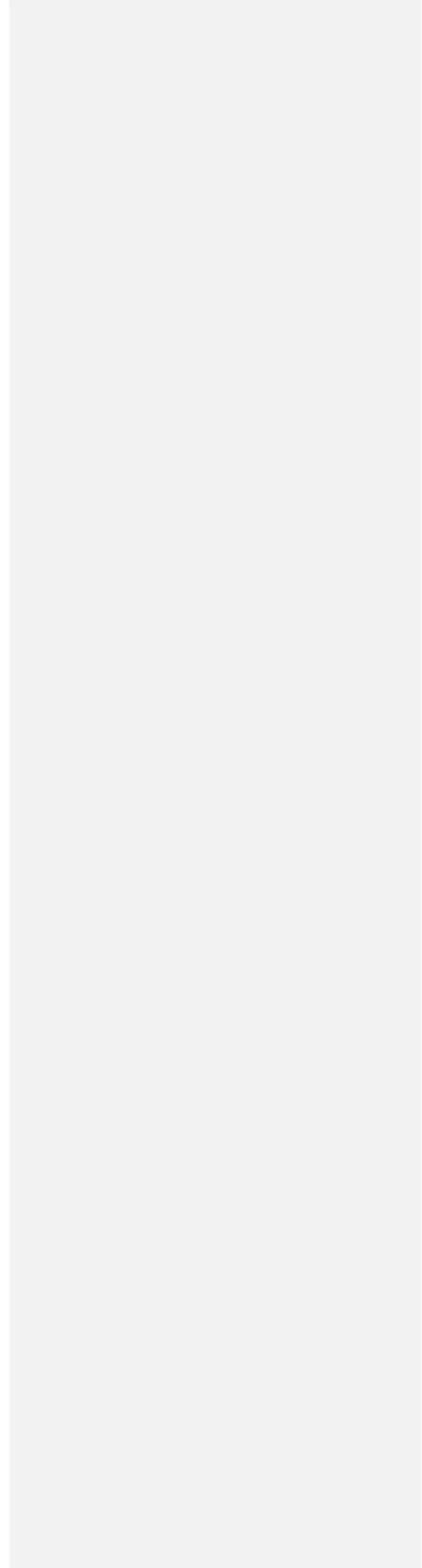
**Comment [Ir23]:** The laser profiling and video inspection report is the mechanism by which the Department accepts or rejects pipe installation.

**Comment [Ir24]:** Requirements for mandrels are no longer necessary as the Department has moved to the laser profiling and video inspection report for pipe acceptance.

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4300202  
All Jobs

*reinspection and correction of the defects are at no expense to the Department. Acceptance of all repairs will be in accordance with 431-5.*



Contact the State Specifications Office for assistance in completing this form.

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