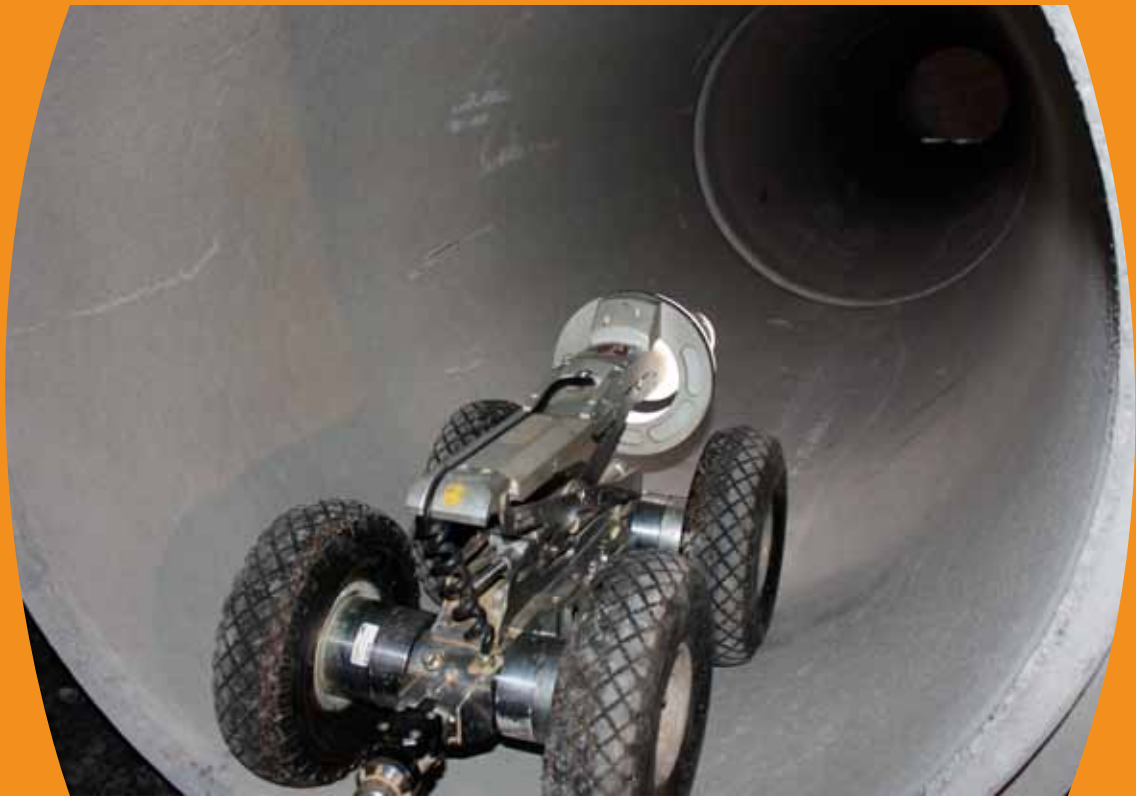


# Post Installation Inspection Basics



American **Concrete Pipe** Association  
[www.concretepipe.org](http://www.concretepipe.org)

It's in the owner's best interest to know that all pipe in their system has been properly installed and has not been damaged in some way that will threaten the structure of the system or shorten the anticipated design life of the pipeline. Post Installation Inspection provides that proof of proper installation and structural integrity to the owner prior to project close-out or final acceptance. This document highlights some of the basic pipe performance and equipment requirements that should be specified on all pipe installations.

One hundred percent of all reinforced concrete pipe installations shall be checked for joint separations, soil migration through the joint, cracks greater than 0.25 mm (0.01 inches), settlement and alignment. One hundred percent of all flexible pipes (HDPE, PVC, CMP, other) shall be checked for rips, tears, joint separations, soil migration through the joint, deflection, cracks, localized buckling, bulges, settlement and alignment.

The Post Installation Inspection shall be performed no sooner than 30 days after completion of installation and final backfill. Clean or flush all lines prior to inspection. Perform a deflection test on entire length of installed flexible pipeline on completion of work adjacent to and over the pipeline, including leakage tests (if installation is required to be leak-resistant), backfilling, placement of fill, grading, paving, and any other superimposed loads. Deflection of pipe in the installed pipeline under external loads shall not exceed limits in paragraph "e." below. Determine whether the allowable deflection has been exceeded by use of a laser profiler or mandrel. Deflection shall be based upon the certified-actual mean diameter of the flexible pipe being inspected.

- a. Post installation inspections of the pipe interior of all pipe types with Video equipment shall utilize low barrel distortion

video equipment or side scan digital camera for pipe sizes 1.22 m (48 inches) or less. Use a camera with lighting suitable to allow a clear picture of the entire periphery of the pipe interior. 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 rotating 360 degrees or review each joint by use of the side scan camera. 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. For post installation inspections for pipe sizes 1.22 m (48 inches) and larger, visual inspection may be completed of the pipe interior.

- b. Laser profiling (Deflection) Inspection: Laser profiling equipment may be utilized in conjunction with Video equipment or side scan camera as noted above to measure deflection of inside diameter of flexible pipe. Deflection measurements for laser profiling equipment shall be based upon actual inside diameter of the installed pipe.
- c. Pull-Through Device (Deflection) Inspection: Pass the pull-through device (Mandrel) through each run of pipe by pulling it by hand. The mandrel shall be rigid, nonadjustable having a minimum of 9 fins, including pulling rings at each end, engraved with the nominal pipe size and mandrel outside diameter. The mandrel shall be 5 percent less than the certified-actual pipe diameter for Plastic Pipe, 5 percent

less than the certified-actual pipe diameter for Corrugated Steel and Aluminum Alloy, 3 percent less than the certified-actual pipe diameter for Concrete-Lined Corrugated Steel and Ductile Iron Culvert as provided by manufacturer. When mandrels are utilized to verify deflection of flexible pipe products, the owner or owners representative will verify the mandrel OD through the use of proving rings that are manufactured with an opening that is certified to diameter as described above.

- d. Deflection measuring device and Video Inspection Equipment shall be approved by the project engineer prior to use.
- e. Evaluation and Remediation: Remediate or replace RCP pipes having cracks greater than 2.5 mm (0.1 inches) in width.

Replace Flexible pipe with deflection greater than the following limits:

TYPE OF PIPE	MAXIMUM ALLOWABLE DEFLECTION (%)
Corrugated Steel and Aluminum Alloy	5
Concrete-Lined Corrugated Steel	3
Ductile Iron Culvert	3
Plastic (PVC & HDPE)	5

An engineer shall evaluate all RCP with cracks greater than 0.25 mm (0.01 inches) but less than 2.5 mm (0.10 inches) to determine if any remediation or repair is required. RCP with a crack width less than 2.5 mm (0.10 inches) and located in a non-corrosive environment (pH 5.5) are generally acceptable. Any RCP exhibiting slabbing

shall be repaired or replaced. Repair or replace all flexible pipe exhibiting bulges (inverse curvature), creases (wall buckling), cracks or tears.

With inclusion of these parameters into project specifications, an owner will be able to obtain clear inspection data and a report to allow proper evaluation of the installed pipeline. The document on Evaluation and Repair Guidelines for New Drainage Pipe can be found at [www.concrete-pipe.org/pdf/guidelines.pdf](http://www.concrete-pipe.org/pdf/guidelines.pdf).



