

Post-Installation Inspection of Storm Drainage Pipes and Culverts

The City of Monroe (City) is requiring a post installation inspection of storm drainage pipes and culverts installed through the Land Development process. This inspection, performed at the expense of the developer, shall assess the internal condition of the pipes using Closed Circuit Television Inspection (CCTV) and/or confined space entry (CSE) to verify compliance with the installation standards referenced in the current version of the Monroe Standard Specifications and Detail Manual.

The conditions and requirements of this document apply to any system (regardless of constructed material) subject to the subdivision ordinance, Unified Development Ordinance (UDO) and/or any system installed and/or modified by a developer that conveys runoff from a public right of way.

Prior to requesting acceptance of a street(s) or associated map phase(s) developer will submit to the City a complete post installation inspection report of the associated storm drainage system. Defects, if observed, shall be assessed for severity and if necessary repaired in accordance with appropriate repair methods indicated by the pipe manufacturer. Re-inspections of the drainage system will be required to verify that repairs have been properly completed. Upon satisfactory completion of repairs, the City will provide written notice of acceptance.

General Guidelines for Post Installation Inspections:

- Post installation inspections are to be completed before placing the final lift of pavement (where applicable), but no sooner than 30 days after backfill placement.
- Pipes must be clean of all debris and obstructions at the time of inspection to allow for a continuous complete inspection, partial inspections are not allowed.
- For flexible pipes, deflection testing must be performed in accordance with the City of Monroe ***Third-Party Inspection for Pipe Installation*** Document.

Closed Circuit Television Inspection Requirements (CCTV):

Applies to all pipes up to 48" in diameter or a vertical rise up to 48" in non-circular applications.

- All pipe inspections must be completed by a National Association of Sewer Service Companies (NAASCO) Pipeline Assessment Certification Program (PACP) certified professional.
 - All defects must be coded in accordance with the most recent version of the PACP.
 - Each pipe run must have a separate video and report.
- Video and associated report and infrastructure map shall identify and include the following:
 - Project and/or Street Name
 - Upstream and Downstream structures, labeled consistently with approved development plans.
 - Direction of Video
 - Pipe size and material, both to be field verified by operator.
- Camera shall be centered within the pipe, both vertically and horizontally and shall have a full unobstructed view of the entire pipe.
- Lighting shall be sufficient to produce a clear image of the entire periphery of the pipe interior.
- Video image shall be clear, focused and relatively free of distortion that would prevent the reviewer from evaluating the condition of the pipe.
- Operator shall not exceed a speed of 30 ft/min.
- Operator shall stop and complete a 360-degree assessment of each pipe joint.

Confined Space Entry Inspection Requirements (CSE):

Applies to all pipes 54" in diameter or greater or pipes with a vertical rise of 54" or greater in non-circular applications.

- Entrants/Inspection staff must conduct inspections according to OSHA requirements for confined space entry where applicable.
- Camera, Video and Lighting shall be sufficient to produce a clear image of the entire periphery of the pipe interior.
- Provide images or video of all defects. Use an appropriate measuring tool to document severity of defect.
- For Flexible Pipes, provide deflection testing at 10' intervals along pipe alignment. Provide measurements at each location in both the horizontal and vertical directions.

Post Installation Inspection Report Requirements:

A Post Installation Inspection Report (Report) summarizing the inspection results shall be submitted to the City for review. City Staff will review the report for completeness and accuracy. If staff determine that additional repairs are needed outside of what was recommended, additional video and reporting will be required. The report shall include the following:

- Project Name – Example: The Forest at Monroe
- CityView Number – Example: PREN2025-00001
- Pipe Installation Contractor – Example: ABC Development
- Plat, map or drawing identifying each pipe segment assessed/proposed for acceptance with all structure nodes labeled consistent with the approved development plans.
- Inspection Results – per pipe run
 - For pipes inspected by CCTV, standard software reporting is acceptable.
 - For pipes inspected by CSE, pipe inspection logs are required.
- Repairs
 - Where repairs were completed prior to the submission of the report to the City, provide documentation and photographs to support repair was completed satisfactorily.
- Where repairs have not yet been made, provide a remediation method for each observed defect. Remediation must be consistent with NCDOT repair recommendations and/or pipe manufacture and industry standards for each respective defect and must have a design life equal to or greater than the pipe being repaired.

The City reserves the right to randomly or at its discretion monitor, evaluate, and review videos and reports submitted by the owner or certified consultants as a quality assurance/quality control (QA/QC) practice. Any discrepancies between the report and the City review may constitute non-acceptance of the approval.