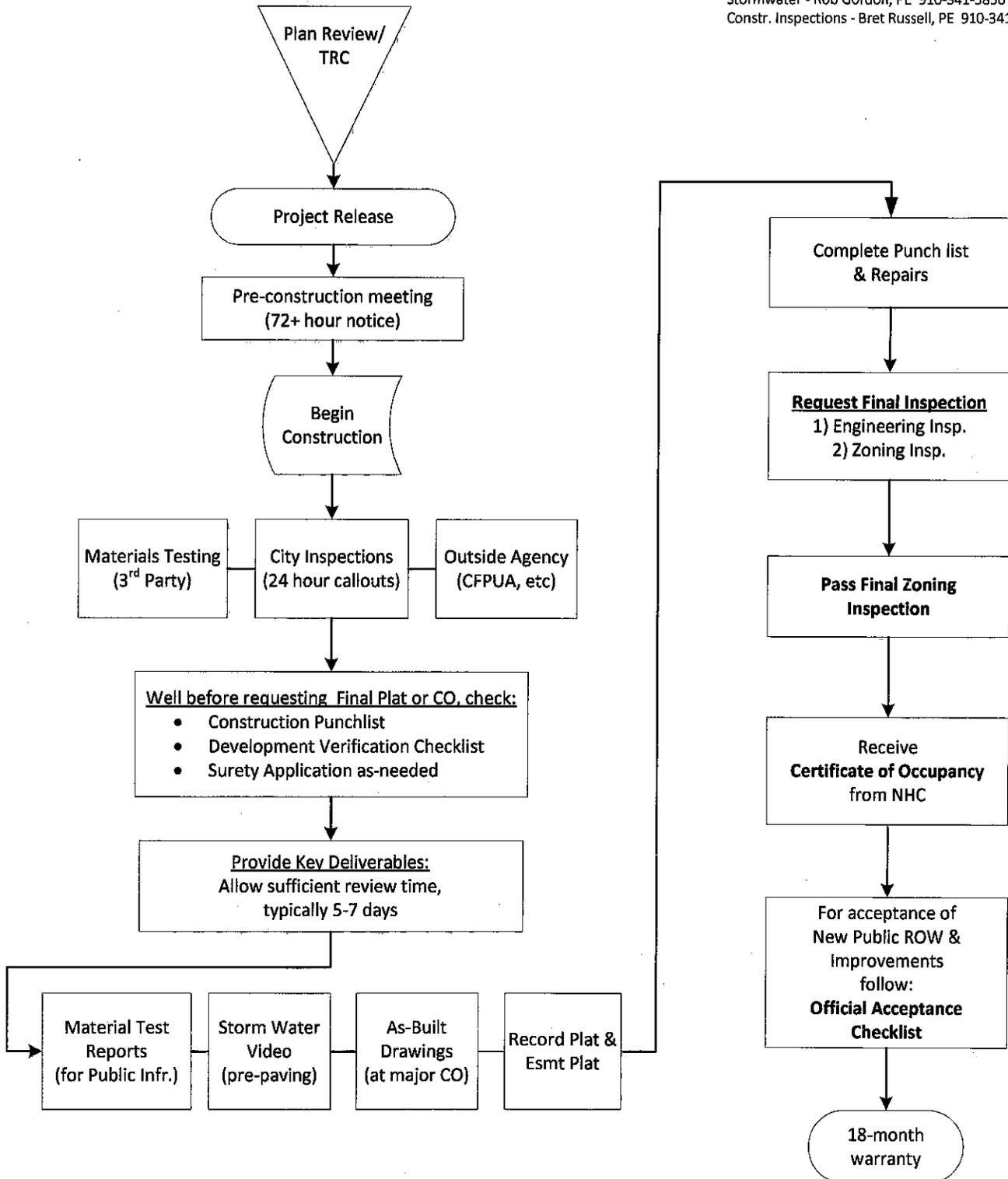




**Construction Phase Sequence
Private Development**

For questions contact:
Stormwater - Rob Gordon, PE 910-341-5856
Constr. Inspections - Bret Russell, PE 910-341-5890





CONSTRUCTION PUNCHLIST _ Private Development

Purpose: Prior to a requesting Final Inspection, all Conditions of the project shall be met and new public infrastructure shall be built to City Standards with quality workmanship. This guide is to be utilized for punch lists and walkthroughs. Where permissible, uncompleted items may be bonded.

CONSTRUCTION ITEMS TO BE COMPLETED PRIOR TO A FINAL INSPECTION:

Deliverable

- 3RD PARTY MATERIALS TESTING IS REQUIRED BY POLICY AND A SUMMARY OF FINDINGS SHALL BE CHECKED BY ENGINEER AND SUBMITTED TO THE CITY.
- STORM WATER STRUCTURES SHALL BE BUILT TO GRADE, WITH PROPER CONCRETE MORTAR AND JOINT ALIGNMENT. PUBLIC STORM SYSTEMS ARE TO BE CLEANED AND VIDEOED, GENERALLY PRIOR TO PAVING, WITH A DVD AND FINDINGS REPORT CHECKED BY THE ENGINEER AND DELIVERED TO THE CITY IN PROPER FORMAT.
- SUBMITTAL OF AS-BUILT DRAWINGS TO FOLLOW POLICY

Site Work

- CONCRETE SHALL HAVE CORRECT FINISH, EXPANSION AND TOOL JOINTS, & THICKNESS. REPLACE ALL NON-STANDARD, CRACKED OR UNDERMINED SIDEWALK, CURB & GUTTER (5-FOOT MINIMUM) OR DRIVEWAY.
- REPLACE ALL NON-ADA COMPLIANT SECTIONS OF SIDEWALK, PAVEMENT, ETC.
- CLEAN STREETS, SIDEWALKS, GUTTER, PLAZA AREAS AND CASTINGS OF ANY CONSTRUCTION DEBRIS, TRASH, SEDIMENT AND ALL EXCESS ASPHALT AND TACK.
- PLAZA AREA SHOULD BE BACKFILLED TO TOP OF SIDEWALK AND CURB, ALSO FERTILIZED AND SEEDED.
- ALL METER BOXES, CLEANOUTS, CASTINGS, HYDRANTS, ETC. IN THE RIGHT OF WAY OR CITY EASEMENTS SHALL BE LOCATED OUT OF THE SIDEWALK AND A MIN. OF 18-INCHES OFF CURBLINE AND ADJUSTED TO FINISHED GRADE; BURY LINE ON HYDRANT TO BE FLUSH WITH SOIL GRADE.
- STORMWATER PONDS/DETENTION FACILITIES SHALL BE GRADED & ESTABLISHED WITH VEGETATION, MAINTAINED AND FREE OF TRASH.
- TRAFFIC AND LIGHT POLES & SIGNAGE SHALL BE INSTALLED, AS REQUIRED.
- PAVEMENT MARKINGS SHALL BE INSTALLED, AS REQUIRED.
- LANDSCAPING SHALL BE INSTALLED, AS REQUIRED.

PROJECT: _____

CONTRACTOR: _____

OBSERVER: _____

DATE: _____



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wilmingtonnc.gov
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Construction Material Testing and Documentation Policy

The City of Wilmington promotes the development of sustainable infrastructure and provides the following guidance on construction materials testing (CMT) and documentation practices for roadway and underground utility construction.

Materials Testing and Documentation Guide

This policy will help guide quality control (QC) efforts during construction by providing the minimum expectations for where testing will be applied, i.e. quality assurance (QA). Generally, CMT services shall be provided by the Utility/Owner separate from the construction contractor, i.e. 3rd party. The various testing reports and materials documents shall be complimentary so as to provide complete assurance. Other unique conditions or design specifications such as NC DOT may apply and would supersede this policy. Without other specific instructions, the following guidelines include:

- ❑ Table 1 is attached as a minimum guide to assist with a CMT plan and managing testing resources on a project. Other needs not listed may exist.
- ❑ Utility/Owner may submit a CMT plan for review by the City.
- ❑ Utility/Owner shall provide oversight of testing activities and ensure coordination of test schedules and outcomes with City Inspector or other responsible personnel.
- ❑ Utility/Owner shall manage failing/non-passing tests to rectify situation with contractor(s) and ensure a passing result is obtained.
- ❑ Where failing tests occur or no conclusive passing tests exist, the City reserves the right to require further testing or retests, at no costs to the City.
- ❑ As part of construction/permitting compliance, copies of test reports and documents shall be furnished to the City upon request. Such reports shall be professional, organized and shall typically contain the following:
 - Written Summary (owner, scope, schedule)
 - Test Reports- (compiled/quantified by test type, time, etc)
 - Materials Received Reports – (submittals, certifications, truck tickets, etc)
- ❑ This guide does not release the utility, owner or contractor from completing all the necessary construction steps, inspection and testing necessary to meet the standard details, policies and specifications required for materials.

Table 1 - Materials Testing and Documentation Guide

Test Type:	Location For:	Test Target:	Spec:	Frequency and Test Sections:	Documentation:
Soils					
Soil Proctors	For use with soil density tests	Optimum Moisture and maximum dry density results	Standard Proctor - ASTM D698-A	each project, where soils change	Soil Profile Tests (lab)
Density - Nuclear Gauge	embankments	≥ 95% compaction	Nuclear Gauge - ASTM D6938	1 / block or every 500'	On delivery - collect tickets Density reports.
	pipe trench and overfill	≥ 95% compaction		Per lift (12" max) every 100'	
	subbase (final 12" fill)	≥ 98% compaction		4 / block or every 500' where pvmt < 32' width or 8 / block or every 500' where pvmt > 32' width	
Density - alternates	for all, see above	see above	Sand Cone Method - ASTM D1556 or; Ballon Density - ASTM D2167	see above	Density reports.
Proofroll	subbase at grade	visual check of stability / moisture	Loaded Tandem Truck	all areas under road	Proofroll Report.
Dynamic Cone Penetrometer	excavation backfills	# blows per 1.75' (Typ. 25-30)	ASTM D6951	any area to check for relative compaction	Report.
Stone Base					
ABC Gradation	stockpile or in place	NCDOT Section 1005	AAHSTO T27	every 2000 Tons	Gradation Reports. On delivery - collect tickets
Density - Nuclear Gauge	road base (ABC)	each ≥ 95% with avg. ≥ 98%	Nuclear Gauge - ASTM D6938	4 / block or every 500' where pvmt < 32' width or 8 / block or every 500' where pvmt > 32' width	Density reports.
	curblines (ABC)	each ≥ 95% with avg. ≥ 98%		4 / block or every 500'	
Proofroll	stone base at grade	visual check of stability / moisture	Loaded Tandem Truck	all areas under road	Proofroll Report.
Concrete					
Sampling, Making & Curing Test Specimens	curbing, sidewalks, driveways	Proper collection and curing in field and laboratory	Sampling Concrete - ASTM C172; ASTM C31; ASTM C39	4 cylinders per day/batch for every 50 Cubic Yards	Form 312U Mix design. Verify JMF on-site.
Air Test Slump Test	see above	up to 8%, per mix design	Pressure Air Meter - ASTM C231	Truck #1; air, slump, temp, cylinders	NCDOT M&T 903 (Batch Tix) 250 Daily Plant Report when needed
	see above	up to 5%, per mix design	Slump Test - ASTM C143	Trucks #2-4; air Truck #5; air, slump	
Compressive Strength	curbing, sidewalks, driveways	breaks results ≥ required strength (i.e 3000psi)	ASTM C39	7 day break (typ ≥ 75% of strength), 28 day break ≥ design strength	Concrete Break Reports.
Asphalt					
Asphalt Mix (Job Mix Formulae)	roadway/path	surface up to 3" depth intermediate up to 4" depth base up to 8" depth	Pvmt Design or City Policy	For Control Strip when needed, ref. NCDOT 2012 Standard Specifications Section 609-7	Verify JMF on-site. On delivery - collect tickets Asphalt Roadway Daily Report - (NCDOT M&T 605 form)
Asphalt Temperature	air temperature surface temperature	40° in the shade and rising, 50°	NCDOT Section 610-4	test before placement Also, no wet pavement affecting bonding	
Density - Nuclear Gauge Control with Core checks	roadway/path	90% compaction - 9.5A	Nuclear Density Tests - ASTM D2960	QC = 5 Nuclear Gauge slots per 500'/each paver laydown width / lot QA = verification, test requests and location	Forms - City or NCDOT QC-5, 516QC, QA-515, etc
(Core control and control strips when needed)		92% compaction-surface other, intermediate, base	Bulk Density (Cores) - ASTM D2726	QC = 1 core check per 500'/each paver laydown width. Primarily in base layers. Use core control when requested.	Certifications: Gauge calibration QMS Roadway Technician, Nuclear Gauge Operator, etc



REQUIREMENTS FOR VIDEO INSPECTION OF STORM SEWER SYSTEMS

General

1. All equipment used for cleaning and video inspection shall be specifically designed for the work described herein. All cameras shall be self-powered units with color, pan-and-tilt, minimum resolution of 640x480, and the ability to operate in 100% humidity conditions. The lens shall have not less than a 65-degree viewing angle with either automatic or remote focus and iris controls.
2. All work described herein shall be completed in accordance with NASSCO Pipeline Assessment and Certification Program/ Manhole Assessment and Certification Program (PACP/MACP) guidelines.
3. The City of Wilmington (COW) reserves the right to refuse any recording or report on the basis of substandard quality.

Execution

1. All storm pipe installations shall be completely installed a minimum of 30 days prior to video inspection. Generally, inspections shall occur 30 days prior to asphalt paving.
2. The contractor's cleaning operations shall be performed prior to the video inspection, and shall fully clean the pipes and structures as well as remove all sediment, roots, debris, etc.
3. Inspections of each pipe segment shall begin in the center of the start drainage structure and end in the center of the end drainage structure. The camera shall be moved through the line in either direction at a uniform rate but not greater than 30 feet per minute (0.5 ft/sec).
4. The camera shall be stopped at each pipe joint, defect, imperfection, etc. At these locations, the camera shall be panned, tilted and rotated to fully view and document the condition of the joints, defects, imperfections, etc.
5. The digital recording shall be free of electrical interference and shall produce a clear and stable image.
6. Video overlay shall include, at a minimum, the owner name, project name, street name, diameter of pipe, pipe material, date and time of inspection, direction of video (upstream or downstream), drainage structure number designation for each drainage structure on the pipe segment inspected that corresponds to the construction plans. A constant overlay display of the street name, drainage structure designations (i.e. MH start#/MH end#), date and distance shall appear on the screen. The inspector shall move the constant overlay display so it does not interfere with the inspection review.
7. Inspection of each pipe segment shall be provided in a separate video file. In situations where reverse inspection is necessary, the reverse inspection shall be provided in a separate video file.
8. All observations/defects shall be noted by the inspector, where a text display shall appear describing the observation/defect. Text shall display for a minimum of 4 seconds. The video file recording shall pause as the operator selects the observation/defect notation, eliminating "on hold" video.
9. An inspection form shall be completed and submitted for each pipe segment and drainage structure inspected and videoed. At a minimum, observation/defect notes shall include general info, distance within the pipe segment, description, a severity rating, and a still photograph.

Deliverables

1. Correspondence from the Engineer of Record confirming that he/she has reviewed the video inspection package for compliance to content and has made an evaluation with recommendations for repair as needed per the City guidelines.
2. Video inspections captured live off of the inspection camera to be submitted to on a DVD compatible with Windows Media Player. The inspections must be in order and complete.
3. All inspection reports completed for each pipe segment and drainage structure whether videoed or not shall be submitted.

This document provides minimum video-inspection and submission requirements for contractors to ensure consistency and quality of work being submitted for COW review and approval. Certain conditions may warrant equipment beyond that specifically noted above. Failure to adhere to COW requirements, or the identification of defects during an inspection, may result in the contractor being required to conduct additional video-inspection(s).