

**RECORD DRAWINGS
AND APPENDIX**

Street and Storm Drainage "Record Drawings" Submittal Requirements

The following identifies the requirements, information, and format for submitting Record Drawings to the Engineering Division of the Public Works Department for review and approval. Record Drawings shall be submitted for any street and city storm drainage infrastructure proposed for maintenance by the City of Greenville. Record Drawings shall be submitted and approved prior to scheduling of the pre-final street acceptance inspection.

All Record Drawings shall include, but not necessarily limited to, the following:

- 1) Streets
 - a. Horizontal alignment of the centerline (changes to be noted)
 - b. Centerline final surface elevation:
 - i. intersections - crossing of street centerlines
 - ii. points of vertical inflection (pvi) - street centerline at point of inflection
 - iii. radius points of cul-de-sacs
 - iv. radius points for "hammerheads"
 - v. end of pavement construction (street centerline)
 - c. Width (Verification with approved plans)
- 2) Sidewalks (Verification with approved plans)
 - a. Width
 - b. Length
 - c. Thickness
 - d. Material
 - e. Location
- 3) Stormwater Pipes
 - a. Size
 - b. Shape
 - c. Material
 - d. Length
 - e. Slope
- 4) Structures (Junction Box, Drop Inlets, Catch Basins, Interference Boxes, Outlet Structure)
 - a. Rim/hood elevation
 - b. All pipe invert elevations
 - c. Material
 - d. Construction type (pre-cast, masonry block, or cast-in-place)
 - e. Interior bottom elevation of structure
 - f. Cover (lid/grate) dimensions

- g. Weirs
 - i. Type
 - ii. Invert elevation
 - iii. Top of weir elevation
 - iv. Length

- 5) Level Spreaders / Flow Diffusers
 - a. Length
 - b. Material
 - c. Depth
 - d. Width

- 6) Flared End Sections
 - a. Material
 - b. Invert
 - c. Size
 - d. Outlet/Inlet Protection
 - i. Dimensions

Note:

- The "Record Drawings Submittal Process" outlines the submittal requirements and formats for submitting the Record Drawing information.
- Initial submittals may be submitted as either a contractor's red-lined mark-ups of approved construction drawings or an electronic submission of approved construction drawings with changes to the above "clouded" based on the contractor's red-lined mark-ups.
- Upon receipt of approval of the "Record Drawings", a licensed professional engineer with the State of North Carolina (either the engineer of record or one hired by the developer) will be required to submit final electronic documents with the following certification statement:

"I, _____, as a duly registered Professional Engineer in the State of North Carolina, hereby certify that construction of the street(s) and storm drainage infrastructure as presented on these Record Drawings has been completed in substantial accordance with the approved plans and specifications and that the information pertaining to said infrastructure provided by _____ and prepared under the supervision of _____ is correct to the best of my knowledge and belief."

Record Drawing Submittal Process

The submittal process for the review and approval of Record Drawings is as follows:

1) Submittal of Record Drawings

- a) Submit two (2) copies of either a contractor's "red-lined" mark-ups of approved construction drawings or an electronic submission of approved construction drawings with changes to the above "clouded" based on a contractor's "red-lined" mark-ups to the Engineering Division's Capital Improvement Section.
 - i) Only changes from the approved construction drawings need to be presented.
 - ii) The "red-lined" information will have a single line placed through it with the revised information or measurement placed next to it.
 - iii) If an electronic drawing is submitted in place of the contractor's red line drawings, then a single line will be drawn through the errant information. The correct information will be placed next to the errant information and a "cloud" will surround both.
 - iv) A licensed professional engineer with the State of North Carolina (either the engineer of record or one hired by the developer) shall also be responsible for reviewing the contractor's red line mark-ups of approved construction drawings prior to submittal to the City of Greenville.
- b) Submit storm drainage calculations
 - i) The engineer shall review the Record Drawings to determine and establish if any construction deviations will impact positive storm drainage flow throughout the system or place the system out of compliance with the City of Greenville requirements.
 - ii) If there is not positive drainage throughout the storm drainage system or if the system is not in compliance with the approved construction drawings or the City of Greenville requirements, the engineer must submit revised storm drainage calculations based on the record drawings for review and evaluation by the Engineering Division, as well as discuss the issue(s) with the City Engineer to determine a viable solution(s).
- c) Record Drawings shall be reviewed within ten (10) working days after date of receipt.
 - i) The benchmark(s) and datum used for measurements of the record drawings shall be conveyed and easily interpreted on the submitted drawings and shall be the same as used for the design of the original approved construction drawings and for construction.

(1) If the referenced benchmark(s) used for design and construction and shown on the approved construction drawings have been compromised, new benchmark(s) must be reestablished to an accuracy on the site from published NGS monuments in accordance with the **Standards of Practice For Land Surveyors in North Carolina**, N.C.A.C. Title 21, Chapter 56, Section 1600, and by either conventional survey methods or Global Positioning Systems survey methods (21 NCAC 56.1607).

** Revisions to the record drawing submittals or requests for additional information may be required by the City of Greenville staff and may delay approval.*

ii) Any exceptions or deviations from the approved construction drawings determined as acceptable by the City Engineer shall be noted on and incorporated as part of the final Record Drawings.

2) Upon approval of all Record Drawings

a) One (1) copy shall be returned by the Engineering Division to the engineer with an approval stamp.

b) The engineer shall submit an electronic copy of the drawing in "pdf" format with the following certification:

"I, _____, as a duly registered Professional Engineer in the State of North Carolina, hereby certify that construction of the street(s) and storm drainage infrastructure as presented on these Record Drawings has been completed in substantial accordance with the approved plans and specifications and that the information pertaining to said infrastructure provided by _____ and prepared under the supervision of _____ is correct to the best of my knowledge and belief."

c) The engineer shall also be submit an electronic drawing in a version of AutoCAD "DWG" format compatible with the City of Greenville's current system.

d) The Owner's and Engineer's Certification of Completion forms shall be submitted to Engineering Division.

3) A pre-final street acceptance inspection shall be scheduled following approval and completion of all submittal requirements stated above.

Street Acceptance Timeline

The following is a summary of the Street Acceptance Process. Details on the Record Drawing Submittal Process can be found within the document named "Street and Storm Drainage Record Drawing Submittal Requirements". Details on the Final Inspection Process can be found within the document named "Final Inspections – Subdivision".

- 1) Developer completes all construction infrastructure proposed for continuous maintenance by the City of Greenville.*
- 2) The Record Drawing Submittal Process is initialized with the submission of the developer's contractors' red-lined drawings or electronic drawings with "clouded" changes to the approved construction drawings.
- 3) A licensed professional engineer with the State of North Carolina (either the engineer of record or one hired by the developer) will verify that the street(s) and storm drainage infrastructure as presented on these Record Drawings has been completed in substantial accordance with the approved plans and specifications. The engineer will review this information to confirm that positive drainage exists throughout the system and meets the City of Greenville requirements. If the storm drainage system is not in compliance with the approved construction drawings or the City of Greenville's requirements, the engineer will submit revised storm drainage calculations based on the Record Drawings for review and evaluation by the Engineering Division, as well as discuss the issue(s) with the City Engineer to determine a viable solution(s).
- 4) Red-lined drawings and stormwater calculations are reviewed within ten (10) working days, unless additional information is required.
- 5) A pre-final inspection may be scheduled by the contractor with the City Engineer or his designee upon: approval of the Record Drawings; the submittal of the electronic Record Drawings with the certification statement by the engineer; and the submittal of the Owner's and Engineer's Certification of Completion forms.
- 6) After the pre-final inspection is performed and all punch-list items from the pre-final inspection are completed, the final inspection with the City Engineer may be scheduled – this will be coordinated through the City Engineer or his designee. Upon notification, the date of the final inspection will be scheduled within three (3) working days.
- 7) The Contractor has thirty (30) days to complete any additional items found deficient during the final inspection or a re-inspection will need to be performed.

(*) Developer is responsible for meeting all acceptance and inspection requirements for infrastructure proposed for continuous maintenance by the Greenville Utilities Commission.

Final Inspections - Subdivisions

INTRODUCTION

As subdivision development nears completion, it becomes necessary for the City of Greenville to conduct a "final inspection" of work performed in anticipation of street acceptance for continuous maintenance by the City. This inspection will encompass review of all aspects of subdivision construction to ensure compliance with approved plans, applicable regulations and standards. So as to maintain consistency and thoroughness in conduction of the "final inspection", the following guidelines are to be followed:

Single family, Industrial, Multi-family, and Innovative Subdivisions:

- A. Once the subdivision has been completed. Record Drawings of the subdivision (as identified in the Street and Storm Drainage Record Drawing Submittal Requirements) shall be completed and sent to the City Engineer or his designee for acceptance. These drawings will be reviewed within ten (10) working days after date of receipt.
- B. After the Record Drawings have been accepted by the City Engineer and the electronic Record Drawings with the certification statement by the Owner's engineer and the Owner's and Engineer's Certification of Completion forms have been submitted, the subdivision developer shall formally request a pre-final inspection through the Engineer Division's Subdivision Inspector, which may be presented in writing or by telephone. This will allow for the subdivision to be prepared for the final inspection to be conducted by City Engineer. After all items are identified in the pre-final process are addressed, the final inspection may be requested.
- C. It will be the responsibility of the subdivision developer or representative to formally request a final inspection through the City Engineer's Office. This shall be done in writing by the developer or representative thereof.
- D. The Subdivision Inspector will verify status of the involved subdivision to the City Engineer. It will be the Subdivision Inspector's responsibility to ensure the subdivision is constructed according to the approved preliminary subdivision plan and Manual of Standard Designs and Details, unless approved through an official variance or plan revision.
- E. Once the subdivision is determined ready for final inspection, the Subdivision Inspector will schedule the final inspection with the subdivision developer or his appointed designee at a time convenient for himself and the City Engineer. It will be the Subdivision Inspector's responsibility to notify the aforementioned persons of the confirmed inspection time within three (3) working days once it has been determined that the subdivision is ready for final inspection.
- F. Should the subdivision not be ready for inspection, the Subdivision Inspector will work with the developer to bring the involved subdivision into conformance. This will include, but not be limited to:
 1. Streets shall be swept clean up to the gutter line of the curb.
 2. Check asphalt pavement, all concrete ramps, sidewalks, and curb and gutter for cracks, alignment, and settlement. The developer is responsible for testing and providing test results to verify the specified thickness.
 3. Check storm drain manholes and catch basins for proper construction. Pipes within the manholes and catch basins shall be broken off flush with the wall of structure and the end of the pipe grouted and brushed smooth.
 4. Look through the pipe to check alignment and to determine if pipe is free of debris.
 5. Check headwalls, end walls, and flared end sections. Pipe to be broken flush with face of the wall and grouted and brushed smooth.

6. Right of way monuments shall be placed as required.
 7. Right of way to be graded to the proper slope and seeded and mulched before a final inspection can be made.
 8. Detention basins shall be completed and functioning.
 9. All erosion control measures shall be removed in stabilized areas and maintained in non-stabilized areas.
 11. Barricades shall be placed as required.
 12. The area from the back of the curb to the right of way is to remain clear of all obstructions other than those permitted by existing policies.
- G. The final inspection will be performed under the supervision of the City Engineer or his designee. It will be the Subdivision Inspector's responsibility to be familiar with the approved plan, revisions, variances, bond status, and all other administrative details related to the involved development.
- H. It will be responsibility of the Subdivision Inspector to ensure that all deficiencies are properly noted on the Project Inspection Report Form. The form will be completed and signed by the appropriate persons.
- I. The Subdivision Inspector will present a copy of the completed Project Inspection Report Form to the Developer (or his representative) and the Contractor upon completion of the final inspection, but no later than the next working day.
- J. After each inspection, the developer will have a thirty (30) day limit to correct the deficiencies noted on the Project Inspection Report Form. Otherwise a re-inspection will be scheduled the day after the time limit expires and an updated Project Report Form will be processed.
- K. It will be the responsibility of the subdivision developer to notify the Subdivision Inspector once the deficiencies noted on the aforementioned Project Inspection Report Form are corrected.
- L. It will be the responsibility of the Subdivision Inspector to ensure the deficiencies are corrected and in conformance with the approved plan, the Manual of Standard Designs and Details, or as noted on the Project Inspection Report Form. Once the Subdivision Inspector is satisfied that the deficiencies have been corrected, he will so notify the City Engineer.
- M. The Subdivision Inspector will distribute the Acceptance of Physical Improvements Form to the Public Works Director, City Engineer and the designated representative for Greenville Utilities Commission. Upon return receipt of these forms, the City Engineer will begin proceedings for continuous maintenance, approval of involved record plats, and release of posted bonds. Permanent record will be maintained by the Engineering Division.

ENGINEER'S CERTIFICATE OF COMPLETION

To: City of Greenville, Engineering Division

From: _____

Date: _____

RE: Certification of Completion

Name of Development: _____

Project No: _____

I, the undersigned, hereby certify:

- 1 That based upon my periodic inspection, the construction of the street(s) and storm drainage infrastructure for the referenced development has been completed in substantial accordance with the approved plans and specifications on record with the City of Greenville dated _____ and contains positive drainage throughout the storm drainage system. (Any exceptions must be approved by the City Engineer.)

- 2 That street(s) and storm drainage infrastructure for the referenced development have been installed as shown on the Record Drawings submitted to the City of Greenville Engineering Division.

SIGNATURE OF PROFESSIONAL ENGINEER

DATE

COMPANY

LICENSE NO.

SEAL

OWNER'S CERTIFICATE OF COMPLETION

To: City of Greenville, Engineering Division

From: _____

Date: _____

RE: Certification of Completion

Name of Development: _____

Project No: _____

I, the undersigned, hereby certify:

1. That I am the owner/or authorized representative of the referenced project.
2. That the street(s) and storm drainage infrastructure for the referenced development are in accordance with the approved construction drawings dated _____ and/or subsequent plan modifications as approved by the City of Greenville.
3. That I hereby convey ownership, upon acceptance by the City of Greenville City Council, of all street(s), easements, and storm drainage infrastructure to the City of Greenville as called for on the Record Drawings prepared by (Name of Consulting Engineer).
4. That I guarantee the materials and installation of the street(s) and storm drainage infrastructure including restoration of any disturbed areas for a period of one (1) Year and shall make repairs as deemed necessary by the City. The one year period shall begin at the date the street(s) and storm drainage infrastructure is formally accepted by the City of Greenville. If, for any reason that we cannot make repairs within an amount of time accepted by the City of Greenville, we will reimburse the City of Greenville for the cost of any repairs it that it deems necessary to make with its own forces including the cost of materials, labor, and equipment.
5. I further warrant to the City that all fees and liens have been paid by the owner such that there is not outstanding indebtedness remaining and holding the City harmless in each instance.
6. That I hereby convey all necessary easements for the street(s) and storm drainage system to the City of Greenville as recorded with the Pitt County Register of Deeds and as described in Plat Book _____ Page _____.

NAME (PRINT)

DATE

SIGNATURE/TITLE