

SUBDIVISIONS AND SITE DEVELOPMENT AN OVERVIEW OF INSPECTIONS, BONDS, PLATTING AND DEVELOPMENT STANDARDS

- February 29, 2024 -

**Prepared for the American Society of Civil Engineers –
Tuscaloosa Branch**

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The City of Tuscaloosa takes great pride in the services it provides to residents, businesses, recreational venues, and other facilities throughout the City. However, building a successful community with robust and effective infrastructure requires cooperation. Tuscaloosa relies on the expertise and quality work of not just its own workforce, but also those from outside forces. Without a combined sense of responsibility, accountability, pride, and capability, the resilience of our community is at risk of being compromised. As an engineer and leader in the efforts mentioned above, my goal is to refine how we plan, develop, and maintain community infrastructure while working cooperatively with engineers, surveyors, planners, inspectors, and technical personnel involved with development, both internally and externally.



To produce better quality work and services to our community, the City has been reviewing its existing ordinances and codes related to the regulation of subdivisions and site development. We have found there is some inconsistency and a return to more frequent/intentional oversight and better record keeping is needed. The execution of plans/drawings, management of site activity, final review, and comprehensive document submittal are needed to better adhere to the City of Tuscaloosa Subdivision Regulations.



In this presentation we will be reviewing standards and expectations going forward for the following activities:



**DEVELOPMENT
STANDARDS**



INSPECTIONS



PLATTING



BONDS

Notable revisions and emphasis will be placed on the following sections of the City of Tuscaloosa regulations, ordinances, and codes:

- **4.3 STREET DESIGN**
 - 4.3.5 - Stub Streets
 - 4.3.6 – Alleys
- **4.7 PLANNED UNIT DEVELOPMENTS**
 - 4.7.1 – Private Streets
- **5.2 STREET CROSS SECTIONS AND CONSTRUCTION STANDARDS**
 - 5.2.C – Right-of-Way Grading
- **5.7 DRAINAGE AND STORM SEWERS**
 - 5.7.2 – Gutters and Open Channels
 - 5.7.3 – Culverts
- **STORM DRAINAGE (LDP TECHNICAL STANDARDS)**
- **LOW IMPACT DEVELOPMENT**
 - Landscape Ordinance Sec. 24-255.
 - Long-term Maintenance Considerations
- **6.6 CONSTRUCTION AND INSPECTION IMPROVEMENTS**
 - 6.6.1 – Qualified Laboratory & Testing
 - 6.6.2 – Inspection Frequency & Logbook
 - 6.6.3 – Notification of Activities
- **6.7 FINAL PLAT PROCEDURES**
 - 6.7.2 – Approval by City Engineer

SECTION 4.3 STREET DESIGN

- 4.3.5 - Stub Streets: “A stub street, which provides the sole access to more than two lots shall be terminated by a temporary cul-de-sac turnaround with a paved radius not less than 20 feet (6 meters).” Stub streets greater than 150 feet must provide radius for fire apparatus.
- 4.3.6 - Alleys: “Alleys may be platted in commercial and industrial subdivisions where necessary to afford convenient access to vehicles and utilities. Alleys shall not be permitted in residential subdivisions, except in townhouse, garden house, or similar developments or portions of developments where lot widths average 60 feet or less. Where permitted, alleys shall be platted not less than 20 feet (6 meters) in width, and shall be paved to the full width.”

SECTION 4.7 PLANNED UNIT DEVELOPMENTS

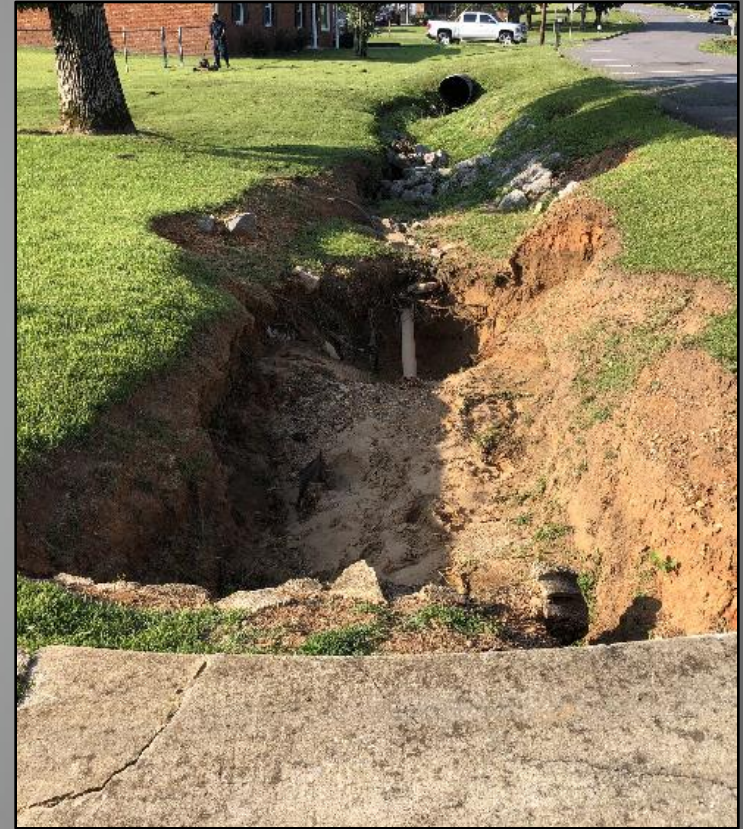
- **4.7.1.a.** – The private streets shall be designed and constructed prior to final approval, and to the same standards required for design and construction of public streets.

SECTION 5.2 STREET CROSS SECTIONS AND CONSTRUCTION STANDARDS

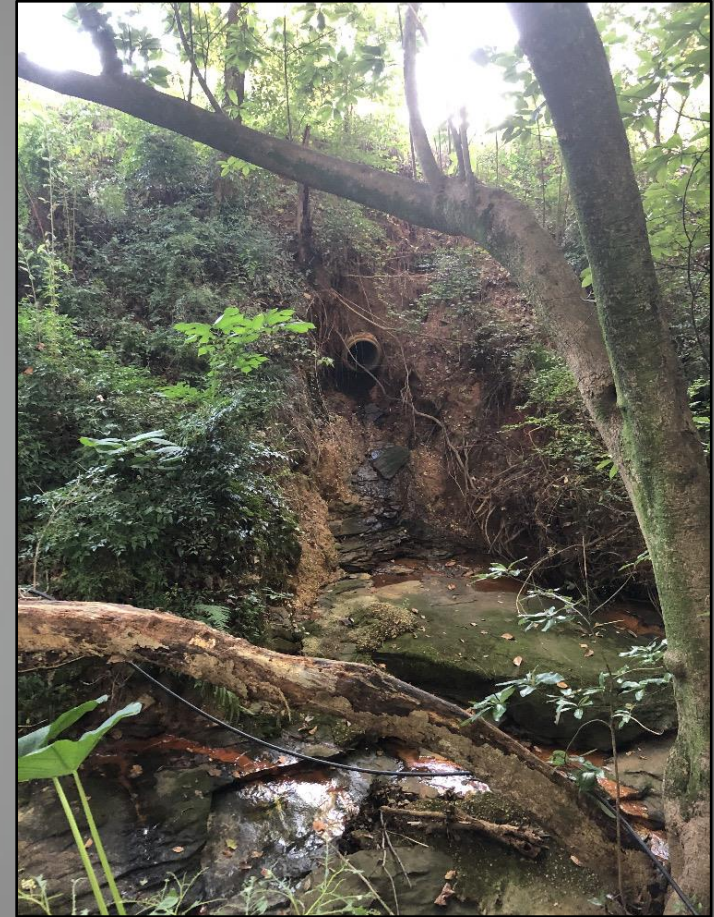
- **5.2.1.c.** – That rights-of-way shall be graded to their full width, so as to produce proper drainage, a pleasing appearance, reasonable grades for driveways, and where required, a sidewalk grade substantially on the same elevation as the top of the curb.

SECTION 5.7 DRAINAGE AND STORM SEWERS

- **5.7.2 – Gutters and Open Channels:** “Street gutters and other open channels shall be so designed that the velocity in the deepest part of the gutter or channel shall not exceed ten (10) feet per second ... No ditch or flume section shall be constructed which, in the opinion of the City Engineer, lacks the capacity, structural strength, or erosion resistance to discharge runoff from the design storm without suffering damage or requiring more routine maintenance.”



There are numerous instances where scour and erosion have caused a failure of infrastructure:



FAILURES DUE TO VELOCITY

Design considerations should factor in both outlet velocities and ditch velocities. Some of our more commonly observed infrastructure failures are the result of:

- High exit velocities
- Inadequate scour protection
- Steep/excessive slopes



STORM DRAINAGE (LDP TECHNICAL STANDARDS)

DITCHES:

- **A. All ditches must have a stand of grass established, or be rip-rap lined or be concrete lined in accordance with velocities specified below.**
- **B. Ditches lined with rip-rap will be lined with erosion control matting and the rocks placed at a maximum of a 2 to 1 slope (not steeper than 2:1).**
- **C. Ditches that are not rip-rap or concrete lined will be sloped at a maximum of 4 to 1 (not steeper than 4:1)**

STORM DRAINAGE (LDP TECHNICAL STANDARDS)

VELOCITY REQUIREMENTS:

- **A. Minimum velocity for piped and open channel flow structures is two feet per second (2 fps).**
- **B. Maximum velocity for metal pipe is ten feet per second (10 fps). There is no maximum velocity for concrete pipe.**
- **C. Maximum velocity for rip-rap cross-sections is dependent on the average size of stone. The maximum velocity is fourteen and one half feet per second (14.5 fps). The latest edition of the National Stone Association guidelines must be used to determine stone sizes for velocities less than 14.5 fps.**
- **D. Maximum velocities for open channel flow are dependent on the ground cover used. The maximum velocity is six feet per second (6 fps) for Bermuda grass. The latest edition of the Design Charts for Open Channel Flow (Federal Highway Administration HD3) will be used to determine the maximum velocity for different grasses.**

SECTION 5.7 DRAINAGE AND STORM SEWERS

- **5.7.3 – CULVERTS:** “Types of culverting to be placed under the roadbed of a public street may include bituminous coated corrugated steel pipe, pipe arch, aluminum pipe, reinforced concrete pipe, and reinforced concrete pipe box culverts designed and constructed according to the latest edition of the Standards and Specifications for Road and Bridge Construction of the Alabama Department of Transportation.”

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** All these types of pipes will now require written permission from the City Engineer before they can be considered for use*

LOW IMPACT DEVELOPMENT

Low Impact Development and Green Infrastructure practices help to manage both water *quantity* and often water *quality*. These types of features include:

- Detention facilities (open ponds and below ground structures)
- Permeable coverage techniques
- Inlet devices (snouts, etc.)
- Raingardens, bioswales, and other vegetated swales



LOW IMPACT DEVELOPMENT

The City of Tuscaloosa's Landscape Ordinance is a key component in providing guidance for addressing stormwater quantity and quality in design. Section 24-255 Landscaping Requirements includes the following items:

- Perimeter planting requirements for parking areas:
 - “Stormwater inlets shall be located within a perimeter planting strip and incorporate bioswales, rain gardens or other staff –approved stormwater mitigation techniques to promote infiltration and reduce stormwater runoff and nonpoint source pollution.”
- Internal Planting Requirements:
 - “The integration of low impact development techniques as part of the landscape plan shall be required and may be used to meet these requirements.
 - “All stormwater inlets shall be located within a landscape island and incorporate rain gardens, bioswales or other staff approved stormwater mitigation techniques to promote infiltration and reduce stormwater runoff and nonpoint source pollution.”

LOW IMPACT DEVELOPMENT

The below are some examples of where effective LID has been implemented:



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LOW IMPACT DEVELOPMENT

Although these practices are encouraged by City staff and ordinances, often there is a lack of consideration given to long-term maintenance. The City of Tuscaloosa's Municipal Separate Storm Sewer System (MS4) Permit requires "adequate long-term operation and maintenance of BMP's."



Operation and Maintenance Considerations for LID & GI should include:

- Is the selected practice appropriate for the site?
- Who is responsible for performing maintenance? (short and long-term)
- When and how will maintenance be done?
- Is the one responsible for assessment and maintenance knowledgeable, equipped, and qualified?

DETENTION FACILITIES

In addition to the neglected maintenance of Low Impact Development features, Detention Facilities have become increasingly neglected and improperly maintained. The following items are the City's standards and shall be incorporated into design.

"detention facilities will be required to have fences, railings, walls, bolt down lids or other structures to limit access.

"The plans shall include sufficient information indicating positive drainage for dry basins"

"ensure the safe, proper and continued function of the facility."

"If the outlet device utilizes a low flow orifice opening, a trash rack protecting the orifice from blockage from debris may be required."

"It shall be unlawful to allow a permitted detention facility to function improperly."

DETENTION FACILITIES

The condition of the pictured detention facility is a symptom of poor management, which largely stems from a failure to consider long-term maintenance.



SECTION 6.6 CONSTRUCTION AND INSPECTION IMPROVEMENTS

SECTION 6.6.1: “The developer shall employ a qualified testing laboratory to perform compaction tests on street subbase and base before placement of the first layer of pavement. The results of these tests may initially be reported to the Engineering Division by convenient means, but a written report must follow.”

SECTION 6.6 CONSTRUCTION AND INSPECTION IMPROVEMENTS


SECTION 6.6.2: “The developer’s engineer shall ensure that a qualified inspector, experienced in street and sewer construction, conducts an inspection not less frequently than daily during construction of improvements. The inspector shall maintain a logbook of all inspections, which shall be furnished to the Engineering Department upon completion of construction.”

SECTION 6.6 CONSTRUCTION AND INSPECTION IMPROVEMENTS

SECTION 6.6.3: “The developer’s engineer shall notify the City Engineer before work begins on each of the following steps.” A minimum of 24 hours notice is required before the commencement of each activity listed below:

Clearing and grubbing	Grading	* Laying of Sanitary & Storm Sewer Pipe
Utility Trench Compaction Tests Within Streets	Roadbed Processing	* Under Curb Compaction Test
Pouring Curb & Gutter	* Sub-grade Compaction Test	Placing Base Material
* Base Compaction Test	Placing the first layer of Asphalt	Placing the final layer of Asphalt
* Air and Mandrel Test on Sanitary Sewer Lines	Video Inspection of Sanitary Sewer Lines	

* These items shall require the attendance of representatives from both the developer’s engineer and the City Engineer’s Office



Work Activity Notification Form

Project Name: _____ City LDP Ref: _____

Engineer of Record: _____

***Min. 24 hr. Notice Prior to Activity**

Activity	Notification Date	Date/Time of Activity	Notification By
Cleaning & Grubbing			
Grading			
Laying of Sanitary Sewer Pipe			
Storm Sewer Pipe			
Utility Trench Compaction Tests Within Streets			
Roadbed Processing			
Under Curb Compaction Test*			
Pouring Curb and Gutter			
Sub-grade Compaction Test*			
Placing Base Material			
Base Compaction Test*			
Placing the first layer of Asphalt			
Placing the final layer of Asphalt			
Air and Mandrel Test on Sanitary Sewer Lines*			
Video inspection of Sanitary Sewer Lines			

*These items shall require the attendance of representatives from both the developer’s engineer and the City Engineer’s office.

Send to:

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dsellers@tuscaloosa.com

canderson@tuscaloosa.com

Contact Information

205-248-5380

P.O. Box 2089 Tuscaloosa, AL, 35401

SECTION 6.6 CONSTRUCTION AND INSPECTION IMPROVEMENTS

Poor installation combined with a lack of oversight & inspections has resulted in the routine failure and subsidence of City streets:



STREET CUTS

In addition to a Land Development Permit (LDP), a Street Cut Permit will be required, and will be obtained by the contractor.



ACCEPTANCE AND BONDING IMPROVEMENTS

PERFORMANCE BOND: “If, in the opinion of the City Engineer and Planning Director, special circumstances necessitate the delay of the installation of the final wearing surface layer of a street or the required sidewalks for subdivisions intended for multi-family lots and nonresidential subdivisions in the corporate limits until after the final plat is signed, a performance bond shall be required. The performance bond shall not exceed two (2) years in duration, and shall be required prior to the signing of the final plat.

ACCEPTANCE AND BONDING IMPROVEMENTS

MAINTENANCE BOND: “In addition, the City Engineer or County Engineer where applicable shall also require before signing the final plat, a maintenance bond on a form provided by the City for public improvement (excluding sidewalks within the right of way)”

...

“The surety for the maintenance bond shall be for a period of at least fifteen (15) months from the date of acceptance of improvements by the City and/or county.

SECTION 6.7 FINAL PLAT PROCEDURES

SECTION 6.7.2: “The City Engineer shall not approve the Final Plat until the following has been provided to the Office of the City Engineer.”

AS-BUILT PLANS WITH SEWER STUB LOCATION/DEPTH

COPIES OF ALL COMPACTION TEST RESULTS

AIR/MANDREL & MANHOLE VACUUM TESTS

CCTV SEWER INSPECTION (PERFORMED BY CITY)

ONE (1) CAD RECORD DRAWING

PDF OF RECORDED DRAWINGS

COPIES OF ALL DAILY INSPECTION REPORTS

BOND(S)

THANK YOU

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