GREENE COUNTY, TENNESSEE

PROPOSED STORMWATER DESIGN STANDARDS

Proposed for Adoption

December 2026

DRAFT STATUS. This document is a proposed technical standard for review by Greene County. It does not replace the current Zoning Resolution, Subdivision Regulations, floodplain requirements, or state/federal permits unless and until formally adopted.

Basis in current County regulations. Section 512 of the Greene County Zoning Resolution requires a drainage plan with discharge calculations and plans for discharge and detention for sites over one acre, sites with more than 40% impervious cover, and all commercial and industrial uses, together with an erosion control plan. The Subdivision Regulations separately require drainage plans, drainage easements, storm drainage facilities, and allow the Planning Commission to require storm sewers, additional ditching, and culverts.

Purpose of this draft. The following criteria fill the principal technical gaps in those existing requirements by defining design storms, allowable peak discharge, detention criteria, conveyance standards, downstream protection, and long-term maintenance.

1. PURPOSE AND APPLICABILITY

1.1 Purpose. Stormwater systems shall be designed to safely convey runoff, limit increases in peak discharge caused by development, protect downstream property and public infrastructure, reduce erosion, and provide reasonable long-term access and maintenance.

1.2 Applicability. These standards shall apply when a drainage plan is required by the County, including:

- all commercial and industrial site plans;
- sites greater than one (1) acre;
- sites with more than forty percent (40%) impervious surface;
- subdivisions for which construction plans or drainage improvements are required; and
- other developments where the County Engineer, Planning Commission, or Enforcing Officer determines that runoff may materially affect a public road, drainage system, watercourse, or adjoining property.

1.3 Exemptions. Routine maintenance, interior renovations, and minor improvements that do not materially alter drainage patterns or increase impervious area may be exempted from these technical calculations. An exemption does not authorize obstruction of a natural drainage way or discharge that damages adjoining property.

2. DRAINAGE PLAN SUBMITTAL

A drainage plan shall be prepared and sealed by a Tennessee licensed professional engineer when engineering calculations are required. The plan shall include, as applicable:

- existing and proposed contours at intervals appropriate to the terrain and complexity of the proposed development, generally not exceeding five (5) feet, with two-foot intervals or finer where necessary to adequately evaluate drainage patterns;
- existing and proposed drainage basins, flow paths, receiving ditches, streams, culverts, storm sewers, and outfalls;
- existing and proposed impervious areas and land cover assumptions;
- pre-development and post-development drainage areas and peak-flow calculations;
- plans, profiles, sizes, slopes, materials, inverts, and hydraulic grade information for proposed stormwater facilities;
- detention/retention basin stage-storage-discharge calculations, routing calculations, outlet details, emergency spillway, and overflow route;
- identification of drainage easements and permanent maintenance access;
- an erosion prevention and sediment control plan; and
- a brief narrative identifying the ultimate discharge point and any known downstream constraint that affects the design.

3. HYDROLOGIC AND HYDRAULIC METHODS

3.1 Rainfall data. Rainfall depths and intensities shall be based on current NOAA precipitation-frequency data applicable to the project location. The same rainfall source and consistent assumptions shall be used for pre- and post-development comparisons.

3.2 Accepted hydrologic methods. The NRCS runoff methodology (TR-55/TR-20 or an accepted computer implementation such as HEC-HMS or equivalent) is recommended for detention analysis. The Rational Method may be used for small, relatively uniform drainage areas where its use is technically appropriate. The engineer shall identify the method, parameters, times of concentration, runoff coefficients or curve numbers, and supporting assumptions.

3.3 Existing-condition assumptions. Pre-development calculations shall represent the lawful condition immediately before the proposed development. Existing impervious surfaces shall not be treated as undeveloped land unless the County specifically requires a different baseline as a condition of approval.

4. PEAK FLOW CONTROL AND DETENTION

4.1 Peak discharge standard. For the 2-year, 10-year, and 25-year, 24-hour storm events, the post-development peak discharge from the site shall not exceed the corresponding pre-development peak discharge at each principal discharge point, unless the County Engineer approves an alternative based on a documented downstream analysis.

4.2 One-hundred-year event. The stormwater system shall safely route the 100-year storm through or around the site without flooding a building, causing an unsafe roadway condition, or creating an uncontrolled discharge onto adjoining property. Detention facilities shall have a defined emergency overflow path.

4.3 No adverse impact. Compliance with peak-rate criteria does not authorize a change in the point of discharge, concentration of runoff, increase in erosive velocity, or other condition that causes reasonably foreseeable damage to a downstream road, ditch, culvert, channel, structure, or property. The point, direction, width, concentration, and velocity of runoff leaving the site shall not be materially altered to the detriment of adjoining property unless an approved drainage easement or adequate receiving drainage system is provided. Where a downstream capacity problem is identified, the County may require additional analysis or mitigation.

4.4 Detention basin criteria. Unless otherwise approved:

- provide at least one (1) foot of freeboard above the routed 100-year water-surface elevation to the top of an impounding embankment;
- provide a stabilized emergency spillway or overflow route capable of safely conveying the design overflow;
- use outlet structures that are accessible for inspection and resistant to clogging; a minimum four-inch controlled outlet is recommended unless a smaller opening is specifically justified and protected;
- provide positive drainage so that extended standing water does not occur unless the facility is intentionally designed as a wet pond or permanent stormwater control measure;
- where extended detention is used, release the stored volume within approximately 24 to 72 hours; and
- provide a stable discharge point and energy dissipation where needed to prevent erosion.

5. CONVEYANCE SYSTEMS

5.1 Roadside ditches and swales. Open channels shall have adequate capacity and stable lining for the design discharge. Side slopes, depth, and velocities shall be suitable for the proposed lining and maintenance method. Existing subdivision requirements for rural swale lengths and stabilization remain applicable unless formally amended.

5.2 Storm sewers. Closed storm sewer systems serving development shall be designed for at least the 10-year storm without surcharge that causes surface flooding of buildings or critical access. The hydraulic grade line shall be checked at structures where surcharge is possible.

5.3 Road culverts and cross drains. New or replaced road-crossing culverts shall be designed to convey at least the twenty-five-year (25-year) storm event using accepted hydrologic and hydraulic engineering methods. The one-hundred-year (100-year) storm event shall be evaluated for potential roadway overtopping, erosion, and safe overflow conditions. Hydraulic analysis shall consider inlet and outlet control, headwater depth, tailwater conditions, and downstream impacts, as applicable. Cross-drain pipes installed in subdivisions shall have a minimum diameter of eighteen (18) inches, consistent with the Greene County Subdivision Regulations. All culverts and cross drains shall be designed to provide adequate capacity, prevent unreasonable increases in upstream flooding, and avoid adverse downstream impacts.

5.4 Building protection. Finished floors shall be located above adjacent drainage paths and outside the anticipated 100-year overland flow path. Concentrated runoff shall not be directed toward building foundations.

6. DRAINAGE EASEMENTS AND OUTFALLS

6.1 Easements. The existing Subdivision Regulations require a minimum 7.5-foot drainage and utility easement along side and rear lot lines, with greater widths where necessary. Where a pipe, ditch, basin, channel, or other stormwater facility requires access or occupies additional width, the easement shall be widened as needed for the facility, maintenance equipment, and safe access.

6.2 Natural drainage paths. Existing watercourses and significant drainage paths shall be preserved where practical. Filling, piping, relocating, or concentrating a drainage path may require additional hydraulic analysis and any applicable state or federal permits.

6.3 Off-site discharge. Stormwater shall not be collected or concentrated by a pipe, culvert, ditch, swale, or other drainage facility and discharged directly onto adjoining private property unless the discharge enters an existing natural drainage way, an adequate existing drainage system, or a recorded drainage easement expressly permitting such discharge. A stormwater pipe or culvert outlet shall not terminate at or immediately adjacent to a property line. Unless otherwise approved by the County Engineer, the outlet and associated energy-dissipation measures shall be located a minimum of twenty-five (25) feet from the downstream property line, and the discharge shall be dispersed or otherwise stabilized before reaching the property line so that runoff crosses the property line at a rate, velocity, and general flow pattern that does not create an adverse impact compared with pre-development conditions. The County Engineer may approve a reduced setback where the applicant demonstrates that the discharge is to an established natural drainage way, public drainage system, or recorded drainage easement and that adequate erosion protection and downstream capacity are provided. The County Engineer may require a greater setback, drainage easement, level spreader, energy dissipater, or other measures where necessary to protect adjoining property. Approval of a site plan does not grant a private drainage easement across property owned by others.

7. EROSION PREVENTION AND SEDIMENT CONTROL

7.1 Construction controls. Land-disturbing activity shall use erosion prevention and sediment controls appropriate to the size, slope, soil, and receiving drainage. Controls shall be installed before or concurrent with disturbance and maintained until permanent stabilization is established.

7.2 State permit coordination. Projects subject to the Tennessee NPDES Construction General Permit shall obtain and maintain required permit coverage and a compliant Stormwater Pollution Prevention Plan. State permit compliance is separate from County drainage-plan approval.

7.3 Reference guidance. The current TDEC Erosion Prevention and Sediment Control Handbook should be used as the primary technical reference for construction-phase BMP selection and installation.

8. LONG-TERM OPERATION AND MAINTENANCE

8.1 Ownership. Private detention basins, stormwater control measures, pipes, channels, and related facilities shall remain the responsibility of the property owner, homeowners association, or other approved private entity unless formally accepted by Greene County.

8.2 Maintenance plan. The drainage plan shall identify routine inspection and maintenance needs, including sediment removal, vegetation management, debris removal, outlet cleaning, erosion repair, and access. For shared or regional private facilities, the County may require a recorded maintenance agreement before final approval.

8.3 Access. Permanent access shall be provided to detention facilities, principal outlet structures, and other facilities that require routine inspection or maintenance.

9. CONSTRUCTION CERTIFICATION AND RECORD DRAWINGS

9.1 Certification. Before final approval or release of a performance security for major drainage improvements, the design engineer shall certify that the stormwater facilities have been constructed in substantial conformance with the approved plans or identify approved field revisions.

9.2 Record information. The County may require record drawings or surveyed elevations for detention basins, principal outlet structures, storm sewers, and other facilities where final elevations or locations are important to performance.

10. ADMINISTRATION, ALTERNATIVES, AND WAIVERS

10.1 Technical alternatives. The County Engineer may approve an alternative analysis or design criterion when the applicant demonstrates, through supporting engineering calculations and documentation, that the proposed alternative provides equal or greater protection and is consistent with the intent of these Standards. Any approved alternative shall be documented in writing, including the technical justification for the approval, and maintained as part of the project record.

10.2 More stringent requirements. Where unusual topography, karst conditions, known flooding, inadequate downstream infrastructure, impaired channels, or other site-specific conditions create a foreseeable risk, additional analysis or more stringent criteria may be required as a condition of approval.

10.3 Other permits. Nothing in these standards waives requirements of the Greene County Flood Damage Prevention Resolution, TDEC, U.S. Army Corps of Engineers, TVA, TDOT, utility providers, or other agencies with jurisdiction.

11. REFERENCE DOCUMENTS

- Greene County Zoning Resolution, Section 512, Site Plan Requirements (current County requirement).
- Greene County Subdivision Regulations, as adopted and subsequently amended (drainage plans, easements, storm sewers, storm drainage, swales, and flood-control provisions).

- Tennessee Department of Environment and Conservation, current NPDES Construction General Permit and Erosion Prevention and Sediment Control Handbook.
- Tennessee Permanent Stormwater Management and Design Guidance Manual (technical guidance; primarily developed for MS4 permanent stormwater programs).
- Tennessee Department of Transportation Drainage Manual, current edition, where appropriate for roadway drainage design.
- NOAA precipitation-frequency estimates applicable to Greene County, Tennessee.

END OF PROPOSED STANDARDS