



ENGINEERING DEPARTMENT

CITY OF COLUMBIA

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Minimum Requirements for Detention, Drainage & Infrastructure Design

Project Name: _____ Engineer/Date: _____

This is a guideline of the minimum requirements needed for drainage and detention infrastructure design review by the Engineering Department. **This checklist must be submitted along with all projects where detention is required.** Check all items addressed or N/A (Not Applicable) if the comment does not apply. Additional information may be required (by the discretion of the City Engineer).

- Infrastructure Design:** For sites that contain a drainage area of 25 acres or less, onsite drainage design (swales, pipes, inlets, etc.) shall be provided using a 10-year (post development) design storm. Pipes or structures under a City (public or private) road shall be designed for the **25-year storm**. Pipes or structures under roads built in the 100 Year Floodplain (provided that compensatory storage measures are accomplished) shall pass the 100-Year Storm Event (allowing 1 foot of freeboard). Design cross sections, with method of stabilization, shall be shown on the plans for all proposed ditch work. Indicate ditch design flow and actual site flow calculations for each ditch. Provide proposed and actual pipe flow rates.
- Detention Design:** For any and all developments within the City of Columbia and UGB where post-developed flows are increased by 1 cfs or more, detention is required. Detention **may** be waived if regional detention for the development has already been provided elsewhere on or near the site. An **explicit note** shall be provided on the design drawings if detention is provided offsite for the project. Existing sites undergoing additions or redevelopment will be handled on a case by case basis at the discretion of the City Engineer.
- Applicants shall provide the detention calculations for the **2, 5, 10, 25, 50, and 100-year storm events** (use Metro Nashville rainfall data). A reinforced emergency overflow for the basin shall be provided to divert greater storm events in a down stream direction.
- In the detention report, provide a narrative addressing pre-developed and post-developed site conditions.** The narrative shall also include a table equivalent to the one below and the report shall be signed, sealed and dated by a professional civil engineer registered in the state of Tennessee. A delineated watershed map shall be included with the drainage calculations. The map shall include pre and post onsite, offsite, and bypass drainage areas and surface flow calculations.

Storm Event (Yr)	Rainfall IN/HR	Post-developed Flow (CFS)	Pre-developed Flow (CFS)	Pond Outflow CFS	Basin Elev. (FT)	Pond By-Pass CFS (if applicable)
2	4.75					
5	6.25					
10	6.97					
25	8.00					
50	8.90					
100	9.72					

5. The report shall include a **reduced map of the proposed project**, inflow and outflow hydrographs, time(s) of concentration calculations, and the **outlet control structure details**. A detail of the outlet control structure shall also be shown in the construction plans.
6. Provide maps and/or statements and calculations showing that the downstream drainage structures can handle the proposed flows (for at least 2 downstream structures).
7. All detention facilities shall be located within a drainage easement for access by the City of Columbia if conditions warrant corrective measures.
8. **A box or manhole weir structure shall be used to attenuate the basin outflows.** "V" notch or other open multi-stage weirs are preferred.
9. **The minimum basin outlet pipe size allowed is 15" RCP with energy dissipation and/or scour protection (reinforced turf preferred) at the outlet end. Provide the velocity at the outlet.**
10. Emergency spillways for detention ponds shall be provided to permit safe passage of water due to an obstructed outlet pipe or from storms producing runoff in excess of the pond's storage capacity. The overflow area should be "rip-rapped" or otherwise protected to prevent scour and or erosion.
11. Design cross sections, with method of stabilization, shall be shown for all proposed ditch work. Indicate ditch design flow and actual site flow calculations for each ditch.
12. **A note shall be added to the plans and final plats stating the party or entity responsible for the maintenance of the detention facility.**

OTHER INFO:

1. Underground detention systems are also allowed where grades are sufficient and surface area is limited. They are also allowed to keep from disturbing natural areas.
2. Drainage shall be intercepted so that it does not flow through a street intersection.
3. No more than 1 cfs (10-year storm event) shall flow from the paved area of a site onto any street.
4. Provide information and sections for all proposed onsite/offsite ditch work. **"V" ditch sections are not permitted.** Indicate ditch bottom width, depth, side slopes and methods of stabilization. **Indicate all required easements on the grading plans and final plat.**
5. Detention basins and structures shall be bonded as part of the drainage infrastructure to ensure proper construction.

After the initial plan and report items are reviewed and returned, the applicant shall address each item with a **yellow highlighter marker**. Items not addressed, shall have comments written next to them so we will know why the item was not acknowledged. **Failure to return the check set** along with four (4) sets of the revised plans may result in one or more of the following actions:

- 1) Removal from the planning commission agenda.
- 2) A new review from scratch, which will delay the approval process.
- 3) Loss of position of priority on the Engineering Department's review list.

Submit four (4) corrected copies of corrected plans for approval by the Engineering Department.

After the corrected copies are received and reviewed, a "pre-construction meeting" will be scheduled before work shall begin.

Perimeter silt fence and erosion control along with a construction exit/access shall be installed, and inspected before a Land Disturbance Permit is issued.

The items discussed above are provided as a guide to aid in your design. Addressing all the items will help expedite the approval process of your project. We thank you in advance for your cooperation.

See the Attached detail of a preferred detention pond layout.

