**TECHNO-GRAM**
**001 – 2022**

**SUBJECT:** Rational Method Runoff Coefficient "C" Factors and New Zoning

**PURPOSE:** To establish revised Rational Method Runoff Coefficients (C Factors) for Sizing Storm Drain

**SCOPE:** This Techno-gram revises the Rational Method Runoff Coefficients (C Factors) related to sizing of storm drain systems

Effective immediately, the calculation of peak runoff flow to proposed storm drain systems shall be calculated based on the Rational Method Runoff Coefficients, also referred to as "C" factors, as listed in this Techno-gram. Table 8-1 of the Prince George's County Stormwater Management Design Manual has been revised and attached to this Techno-gram. Note the following:

I. Storm events have become more severe and frequent, necessitating the sizing of storm drain systems for these more excessive flow events.

II. The "C" factors in the Prince George's County Stormwater Management Design Manual have ranges depending on land slopes. It is impractical to calculate "C" factors based on varying land slopes. This Techno-gram establishes fixed "C" factors for various zones and land cover.

III. The "C" factors for sizing storm drains shall be used as shown on the attached revised Table 8-1.

a) For onsite areas and fully developed offsite areas, the engineer shall either use the "C" factors in attached Table 8-1 or calculate a composite "C" factor based on actual ultimate development using "C" factors for impervious, lawn and woods.

b) For offsite undeveloped areas, the engineer shall use the "C" factors in Table 8-1.

c) For conditions in which composite "C" factors are permitted to be calculated, the composite "C" factor shall include a 10% factor of safety. Multiply the calculated composite "C" factor by 1.1.

This approach may result in "C" factors that are higher; however, the County is requiring use of these "C" factors to allow for future alterations to properties and a more conservative method of sizing storm drain systems. It is very common for property owners to add impervious surfaces such as building additions, decks, patios, sheds, accessory structures, etcetera.

IV. As currently required by the Prince George's County Stormwater Management Design Manual, storm drain systems shall be designed using the Rational Method equation (Q = CIA), not TR-55 and not TR-20. Please refer to section 8.2.1 of the manual. Also refer to the manual with regards to exceptions for culvert crossings.

V. As currently required by the Prince George's County Stormwater Management Design Manual, all storm drain systems shall be sized for ultimate development of the entire drainage area. Storm flows for onsite **and offsite** areas must be calculated with "C" factors based on ultimate zoning. Refer to section 8.2 of the manual.

VI. As currently required by the Prince George's County Stormwater Management Design Manual, a frequency of event correction factor "C"(f) shall be multiplied for storms larger than 25-year storm (see Table 8-2). For the 100-year storm, the "C"(f) is 1.25. This correction factor shall be used to establish storm drain system flows for higher storm events.

**TECHNO-GRAM**
**001 – 2022**

VII. The County is modifying all zoning categories in Prince George's County. This Techno-gram establishes the "C" factors for these new zoning categories.

VIII. Storm drain systems that intercept a cumulative drainage area of 10 acres or more shall be designed to convey the 100-year storm flows in the pipe system, with no surcharge out of the system. Alternatively, the engineer may submit a detailed hydraulic study that demonstrates the quantity of 100-year storm flow conveyed in the pipe, and the quantity of 100-year storm flow conveyed via overland flow. Using this alternative method, the engineer shall provide hydraulic calculations to define the depth and width of 100-year overland flow. All structure entry points (doors, garages, basement windows, etcetera) shall be set at least 1 foot above the 100-year overflow elevation established by this detailed hydraulic study. All roads shall have no more than 6 inches of 100-year overflow depth in the crown of the road. Note: This does not apply to roadway culverts; roadway culverts shall pass the 100-year storm with 1 foot of freeboard from the 100-year elevation to the right-of-way line, as required by code 32-207.01.

IX. The criteria in this techno-gram shall apply to any site/road permit applied for on or after this implementation date. Previously approved technical plans older than 12 months, for which a permit was not secured, shall be revised to comply with the criteria.

| TABLE 8-1 Rational Method Runoff Coefficients | | |
|---|---|---|
| **Existing Zone** | **Proposed Zone** | **C factor** |
| R-O-S | R-O-S | Calculate composite |
| O-S | A-G | 0.35 |
| R-A | A-R | 0.40 |
| R-E | R-E | 0.40 |
| R-R | R-R | 0.50 |
| R-80 | RSF-95 | 0.60 |
| R-55 | RSF-65 | 0.65 |
| R-35 | RSF-A | 0.70 |
| R-20 | RSF-A | 0.70 |
| R-T (Townhouse) | RSF-A | 0.75 |
| R-30 (multifamily) | RMF-12 | 0.70 |
| R-30C (multifamily) | RMF-12 | 0.70 |
| R-18 and R-18C (multifamily) | RMF-20 | 0.80 |
| R-10 and R10A (multifamily) | RMF-48 | 0.85 |
| R-H (multifamily) | RMF-48 | 0.85 |
| M-X-C | LMXC | 0.90 |
| M-X-T | deleted | 0.90 |
| M-U-T-C | LMUTC | 0.90 |
| M-U-I | deleted | 0.90 |
| R-P-C | deleted | 0.70 |
| R-M-H (mobile home) | RMH | 0.70 |
| UC-1, 2, 3, 4 | deleted | 0.90 |
| R-L | LCD | 0.45<br>Or 0.70 if retirement |
| R-S | LCD | 0.60<br>Or 0.70 if retirement |
| R-M | LCD | 0.70 |
| R-U | LCD | 0.75 |
| LAC | LCD | 0.90 |

| TABLE 8-1 Rational Method Runoff Coefficients | | |
|---|---|---|
| **Existing Zone** | **Proposed Zone** | **C factor** |
| MAC | LCD | 0.90 |
| EIA | LCD | 0.90 |
| V-L | LCD | 0.45 |
| V-M | LCD | 0.50 |
| C-O | CGO | 0.90 |
| C-A | CGO | 0.90 |
| C-1 | CGO | 0.90 |
| C-2 | CGO | 0.90 |
| C-C | CGO | 0.90 |
| C-G | CGO | 0.90 |
| C-S-C | CGO | 0.90 |
| C-H | CGO | 0.90 |
| C-W | CGO | 0.90 |
| C-M | CS | 0.90 |
| C-H | CS | 0.90 |
| C-R-C | deleted | 0.90 |
| I-1 | IE | 0.85 |
| I-2 | IH | 0.85 |
| I-3 | IE | 0.85 |
| I-4 | IE | 0.85 |
| U-L-I | IE | 0.85 |
| Schools, Churches | varies | 0.85 |
| New Zones | | |
| n/a | CN | Calculate composite |
| n/a | NAC | Calculate composite |
| n/a | TAC | Calculate composite |
| n/a | LTO | Calculate composite |
| n/a | RTO-L | Calculate composite |
| n/a | RTO-H | Calculate composite |
| n/a | R-PD | Calculate composite |
| n/a | MU-PD | Calculate composite |
| n/a | NAC-PD | Calculate composite |
| n/a | TAC-PD | Calculate composite |
| n/a | LTO-PD | Calculate composite |
| n/a | RTO-PD | Calculate composite |
| n/a | MU-PD | Calculate composite |
| n/a | IE-PD | Calculate composite |
| *Impervious Area* | | *0.90* |
| *Lawns & Grass* | | *0.35* |
| *Wooded* | | *0.20* |

**TECHNO-GRAM**
**001 – 2022**

**APPROVED BY:**

Dawit Abraham
**Melinda Bolling, Director**

**March 22, 2022**

Last Edited Date 3-22-2022