To: Mayor / Council
BC 6-16-09

MEMORANDUM

TO: Beverly Cameron, Interim City Manager
FROM: Kevin W. Utt, Site Development Manager
DATE: June 16, 2009
RE: Incorporating Low Impact Design Requirements for Site Development or Re-development by Amending City Code regarding Zoning

ISSUE
Shall City Council consider an ordinance amending the City's Code regarding site development or re-development to incorporate low impact design requirements?

RECOMMENDATION
Staff recommends approval of the ordinance on second read June 23, 2009.

BACKGROUND
One of the City Council "Goals and Initiatives" for 2008 includes the following:

"Adopt and begin managing a Low Impact Development Ordinance by spring 2009 to reduce negative water quality impacts of development and meet or exceed and state requirements"

Low Impact Development (LID) is an approach to site design and stormwater management that seeks to replicate the pre-development runoff characteristics of the site. By doing so, the water quality of runoff is improved and the downstream impacts of excessive runoff are decreased.

Over the past 18 months, the City, with assistance from Friends of the Rappahannock, has been working with stakeholders to develop an LID ordinance language that meets the City's goals while also remaining feasible on new and redevelopment sites.

The Focus of LID: Stormwater volume control

On an undeveloped site, a significant portion of rainfall is absorbed into the soil and never leaves the site as runoff. When a site is developed, pavement, rooftops, and soil compaction prevent infiltration and greatly increase the volume of water leaving the site. Conventional stormwater management (ponds) holds back this excess runoff and releases is at a slower rate to help prevent downstream erosion. However, after two decades of using ponds for stormwater management, research has shown that streams below the outfalls of stormwater ponds continue to degrade. The reason is that stormwater ponds

only address part of the problem. They do not infiltrate the large amount of water that used to infiltrate on the site prior to development, they only slow down its release into the stream. The result is that the stream is exposed to much more water over longer periods of time and this causes erosion and downstream sedimentation.

Low Impact Development seeks to fix this problem by infiltrating the water that used to infiltrate on the site prior to development. This can be done by limiting the amount of impervious cover on the site, and by using a variety of LID best management practices that infiltrate the first part of each rainfall event. Since that "first flush" of runoff is also the most contaminated with pollutants, LID is highly effective in improving water quality, especially for runoff from parking lots.

The Proposed Ordinance – Key Components

- The LID ordinance addresses "volume control" by requiring the first 1/2" of runoff to be "removed from the runoff flow". Removal from runoff flow can be accomplished by infiltration, evaporation, or reuse.

- If the required volume cannot be infiltrated, evaporated or reused on-site, the ordinance allows for the applicant to achieve the remainder via retrofit of an offsite facility within the same watershed, subject to the compensation guidelines set forth in a separate guidelines document **(CITY OF FREDERICKSBURG LOW IMPACT DESIGN GUIDANCE POLICY MAY, 2009).** If offsite retrofits are not available, compliance may be achieved through the payment to the City of an in-lieu fee per cubic foot of volume reduction not attained. The City shall apply all funds collected to stormwater management control projects.

- The ordinance identifies the watersheds in the City that drain to pipes, manmade channels, or directly to the main stem of the river. These watersheds do not benefit from the reduction in erosive force provided by volume control. Consequently these watersheds were designated non-volume control areas where the ordinance does not apply.

- 1-yr extended detention, releases water significantly slower than conventional ponds. Although it does not provide the groundwater recharge benefits of infiltration practices, it does provide similar protection from erosive force. Consequently, the ordinance permits 1-yr extended detention to be used for up to 70% of the infiltration requirement.

ATTACHMENTS

1. **CITY OF FREDERICKSBURG LOW IMPACT DESIGN GUIDANCE POLICY MAY, 2009**
   Revision Date: 6.8.09

CITY OF FREDERICKSBURG
LOW IMPACT DESIGN GUIDANCE POLICY
MAY, 2009

PURPOSE: The purpose of this policy is to provide guidance for implementing the low impact design storm water requirements contained in Fredericksburg Subdivision Ordinance section 78-1180 and Fredericksburg Zoning Ordinance sections 78-1063 and 78-1060. This guidance policy is for the implementation of the in-lieu compliance option.

GUIDANCE: If, after implementing on-site volume controls to the maximum extent practicable, the stormwater volume reductions required by 78-1060 (21) or (22) or 78-1180 (i) and (j) cannot be fully achieved on- site, the remainder may be achieved through retrofit of off-site impervious areas within the same watershed. In the alternative, compliance may be achieved through the payment to the City of an in-lieu fee per cubic foot of volume reduction not attained. The City shall apply all funds so collected to stormwater control projects. City staff may approve either the off-site retrofit within the same watershed or the payment of the in-lieu fee, as appropriate for any particular project.

Generally speaking, the off-site retrofit is the preferred means of alternative compliance. If the fee is too small to justify the accounting and administration, the City may administratively waive the in-lieu fee.

The volume control area regulations apply to the Deep Run, Hazel Run, Kenmore Flume and Fredericksburg Canal watersheds. The areas of exclusion are Fall Quarry Run and the Fredericksburg down town area adjacent to the Rappahannock River not currently identified as a watershed on the City's watershed map.

Implementation:

- Off-site retrofit compliance will be based on cubic feet of volume required multiplied by the appropriate mitigation ratio.
- On new development sites, volume shall be mitigated at a ratio of 1.5:1
- On redevelopment sites, volume shall be mitigated at a ratio of 1.25:1

Implementation Agreements:

- Developer must sign a modified BMP agreement agreeing to install, inspect, and maintain the off-site facility, and authorize the City to perform and charge the developer if developer defaults. Landowner will also sign this agreement to indicate his consent to the installation of the facility and acknowledge that the volume control is not credited to the overall stormwater management requirements for any present or future development or redevelopment of the off-site in-lieu compliance option location. The agreement shall also provide the developer and the City a perpetual right of entry for the purpose of inspection, maintenance, repair and replacement of the facility. Landowner may agree to be responsible for the ongoing inspection and maintenance, but developer is responsible if owner does not volunteer.
- The fully executed BMP agreement shall be recorded in the land records of the Fredericksburg Circuit Court Clerk, showing the landowner as the "grantor" and the developer and City as the "grantees."
- The City may authorize off-site compliance in headwater watersheds in Spotsylvania County, subject to development of a Memorandum of Understanding with Spotsylvania County.

Right of entry for maintenance and repair:

- Handled through modified BMP agreement which shall be recorded to put future purchasers on notice of the presence of the facility, and of the developer's and the City's right of entry.

Fee Calculations:

- The in-lieu of fee will be calculated using the figure of $37.50 per cubic foot of volume reduction not attained, multiplied by two.
- The Director of Building &Development Services will update this figure annually, using the relevant consumer price index.

Performance:

- The performance of construction of on-site or off-site improvements shall be guaranteed in the physical improvements bond posted by the applicant per City Code §78-1278.

Applicability:

- The new LID regulations apply to any site plan submitted after the date the ordinance becomes effective (the ordinance adoption date). Any site plan submitted prior to the adoption date of the ordinance will be reviewed under the regulations in effect on the date of submittal.

MOTION: _____, 2009
Regular Meeting

SECOND: **Ordinance No. 09-**

RE: **INCORPORATING LOW IMPACT DESIGN REQUIREMENTS FOR SITE DEVELOPMENT OR RE-DEVELOPMENT, BY AMENDING CITY CODE CHAPTER 78, "ZONING, PLANNING AND DEVELOPMENT", ARTICLE III, "ZONING", DIVISION 33, "SITE PLANS"**

ACTION: **APPROVED: AYES ; NAYS ;**

First reading: _____ **Second reading:** _____

IT IS HEREBY ORDAINED by the City Council of the City of Fredericksburg, Virginia, that Chapter 78 of the City Code, relating to zoning, planning and development, is hereby amended as follows:

SEC. I. **Introduction.**

In 2001, the City of Fredericksburg joined Spotsylvania County and Stafford County in adopting Model Development Principles for the Central Rappahannock. These Model Development Principles were generated through the Rappahannock Roundtable, which included representatives of the three localities, plus the Virginia Department of Conservation and Recreation, Fredericksburg Area Builder's Association, Friends of the Rappahannock, the Virginia Department of Transportation, the U.S. Army Corps of Engineers, and local developers, architects, and engineers. The Rappahannock Roundtable was funded by the U.S. EPA Chesapeake Bay Program, and chaired by the Friends of the Rappahannock and the Center for Watershed Protection.

The goal of the twenty-one Model Development Principles was to improve site design at the local level, to reduce negative water quality impacts of the development process. Principle Number 5 states: "Where density, topography, soils and slope permit, vegetated open channels should be used in the street right-of-way to convey and treat stormwater runoff." Principle Number 10 states: "Require stormwater treatment for parking lot runoff. Encourage the use of bioretention areas, filter strips, and/or other practices that can be integrated into required landscaping areas and traffic areas."

The purpose of this ordinance is to begin to incorporate the Model Development Principles into the City's site plan regulations. New development or redevelopment will be required to control not only the rate of stormwater runoff from the site, but also the volume of stormwater runoff, under these new regulations. The goal of the ordinance is to establish realistic requirements which accomplish real gains in water

quality, at a reasonable expense or even cost savings for the developer or redeveloper. Additionally, this ordinance seeks to facilitate the use of market mechanisms for achieving compliance with stormwater volume control requirements.

The City Manager and his staff shall implement these requirements by reference to the "City of Fredericksburg Low Impact Design Guidance Policy," dated May, 2009, which is hereby approved by the City Council for this purpose.

SEC. II. <u>City Code Amendment</u>.

1. Section 78-1 of the City Code shall be amended by the addition of the following new definitions:

Parking lot: means an area not within a building where licensed and operable motor vehicles may be stored for the purpose of temporary, daily or overnight off-street parking. For the purpose of article III, division 4 of this chapter, a parking lot shall include automobile and truck display lots, lots for the display of other types of vehicles, lots for the storage of vehicles and commercial parking lots. *For the purposes of the stormwater management provisions of §§78-1063 and 78-1180, "parking lot" shall mean all parking areas, parking lot travel lanes, and at-grade loading areas.*

Redevelopment: *For the purposes of the stormwater management provisions of §§78-1063 and 78-1180, redevelopment means the addition or removal of impervious cover on a parcel with existing impervious cover of 5% or greater.*

Removed from runoff flow: *For purposes of the stormwater management provisions of §78-1063 and 78-1180, this phrase means stormwater that is infiltrated, evaporated, or re-used on-site. For bioretention/biofiltration practices, the surface impoundment volume (not to exceed 6" depth for bioretention or 12" depth for biofiltration) and the void space of the soil and gravel media shall be considered "removed from runoff flow."*

2. Section 78-1060, of the City Code shall be amended as follows:

Sec. 78-1060. <u>Required Information</u>.

[Subsections 1 through 16 and 18 through 29 shall remain the same.]

(17) Plans and profiles detailing the provisions for the adequate disposition of natural water and stormwater in accordance with the city's design and construction standards shall be submitted, indicating the location, size, type and grade of ditches, catchbasins and pipes and connections to existing drainage systems, and on-site stormwater retention where deemed appropriate and necessary by the city, with supporting contributing area and design computations as may be required. *Data, computations and calculations shall be submitted detailing the provisions for implementation of stormwater volume management.*

3. Section 78-1063, of the City Code shall be amended as follows:

Sec. 78-1063. Minimum design standards.

[Subsections 1 through 19 shall remain the same.]

(20) The city ~~goal~~ *requirement* for stormwater management shall be to limit the rate of stormwater runoff from a developed area to that which existed before development occurred. The policies for attaining this ~~goal~~ *requirement* are more specifically addressed in the city's comprehensive stormwater facilities plan. ~~In general, on site stormwater management structures shall be constructed in concert with site development activities only where the total post-development flow exceeds one cubic foot per second. In watersheds where the comprehensive stormwater facilities plan has adopted off-site watershed management measures, a pro-rata monetary contribution towards such comprehensive drainage improvements may be substituted for an on-site stormwater management~~. The basic design criteria for stormwater management facilities employ the ten-year frequency, two-hour duration storm to determine pre-development and post-development flows. Required storage shall be computed using unit hydrograph methods. Emergency spillways shall be designed to pass the 100-year frequency, two-hour storm, Hydrographs, spillway design, embankment design and flow computations shall be submitted with the site plan.

(21) Within the Hazel Run, Rappahannock Canal, Kenmore Flume and Deep Run watersheds (the "Volume Control Area"), for new development or redevelopment, the first one-half inch of runoff from all new impervious surfaces shall be removed from the runoff flow as defined in section 78-1. A 1-year 24 hour extended detention may be used to satisfy up to 70% of this volume. The remaining 30% shall be removed from runoff flow. At least 50% of the parking lot surface shall drain to a filtration practice. The table below summarizes this requirement.

(22) For new or re-developed parking lots outside the Hazel Run, Rappahannock Canal, Kenmore Flume and Deep Run watersheds, volume control of stormwater is not required. However, at least 50% of the parking lot surface (or in the case of redevelopment, at least 50% of the additional parking lot area) shall drain to a filtration practice that is sized to treat the first one half inch of runoff. The table below summarizes this requirement.

Development Type	***Location***	***Volume Control Requirement***	***Volume Control Method***
New Development	*Within the Volume Control Area*	*½" from all impervious surface*	*Infiltration, evaporation, or reuse. Alternatively, up to 70% of required volume may be satisfied via 1-year extended detention*
	Outside the Volume Control Area	*none*	*N/A*
Redevelopment	*Within the Volume Control Area*	*½" from new impervious area*	*Infiltration, evaporation, or reuse. Alternatively, up to 70% of required volume may be satisfied via 1-year extended detention*

	Outside the Volume Control Area	*None*	*N/A*

Notes:
1. At least 50% of new parking lot surface area shall drain to a filtration practice.
2. The volume controls and filtration practices required by (21) and (22) can be utilized to satisfy the stormwater management quantity and quality control requirements for the site.

(23) If, after implementing on-site volume controls to the maximum extent practicable, the stormwater volume reductions required by (21) or (22) cannot be fully achieved on-site, the remainder may be achieved through retrofit of off-site impervious areas within the same watershed. In the alternative, compliance may be achieved through the payment to the City of an in-lieu fee per cubic foot of volume reduction not attained. The City shall apply all funds so collected to stormwater control projects.

[Re-number the remaining subparagraphs.]

4. Section 78-1067, of the City Code shall be amended by the deletion of subparagraph (4)(d), and the remaining subparagraphs re-numbered accordingly.

SEC. III. This ordinance shall be effective immediately, and shall apply to any and all applications submitted after this date; but not to applications submitted before the date of adoption.

Approved as to form:

Kathleen Dooley, City Attorney

Clerk's Certificate

I, the undersigned, certify that I am Clerk of Council of the City of Fredericksburg, Virginia, and that the foregoing is a true copy of Ordinance 09-___ duly adopted at a Council meeting held _____, 2009, at which a quorum was present and voted.

Tonya Lacey
Clerk of Council

ord .zoning 78 Div. 33-1060 & 1063, 1067