

CITY OF WASHINGTON

PLANNING & DEVELOPMENT DEPARTMENT

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MEMORANDUM

TO: Public Works Committee
FROM: Jon R. Oliphant, AICP, Planning & Development Director
SUBJECT: Erosion Control Discussion
DATE: November 2, 2018

As a follow-up to the prior request by an Ernest Street resident concerning a neighbor filling in the ditch and causing water damage in his basement, staff has reviewed the City Code to help determine if any amendments could be done to eliminate this possibility in the future or to establish an enforcement/permitting mechanism.

Per Chapter 53.002 of the City Code, the the City's stormwater regulations are applicable for any subdivision involving one acre or larger and any multi-family residential, commercial, institutional, or industrial development where the total area of the lot or parcel of land on which the planned development is to occur is one acre or larger. Consideration could be given to including single-family and duplexes among those uses that would also fall under the stormwater runoff regulations. That would grant the City the ability to enforce violations where a resident has filled in a flood route indicated in Chapter 53.005.

Additionally, consideration could be given to requiring the submittal and approval of drainage plans for all non-single-family residential developments regardless of size. The City of East Peoria is one such municipality that requires this.

General discussion is scheduled for the November 5 Public Works Committee meeting to gain direction on such code amendments.

Attachment

CHAPTER 53**STORM WATER RUNOFF CONTROL*****General Provisions***§53.001 Definitions§53.002 Applicability§53.003 General Considerations§53.004 Design Criteria§53.005 Flood Route Required***GENERAL PROVISIONS*****§53.001 DEFINITIONS**

For the purpose of this chapter the following definitions shall apply unless the context clearly indicates or requires a different meaning.

CONTROL STRUCTURE. A structure designed to control the flow of storm water runoff that passes through it during a specific length of time.

DEVELOPMENT. Construction, reconstruction, expansion or placement of a building or structure; construction of parking lots or roads; filling, dredging, grading, excavating or other non-agricultural alterations of the ground surfaces; any other activity that might change the direction, velocity or rate of storm water runoff. Development does not include maintenance of existing buildings and facilities, gardening, plowing and similar agricultural practices.

DRY BOTTOM DETENTION BASIN. A facility designed to be normally dry and maintained with a grass vegetative cover that will contain water only when excess storm water runoff occurs.

EXCESS STORM WATER. That portion of the rate of storm water runoff from a specific watershed at a specified rainfall frequency, which exceeds the transportation capacity of storm sewers, natural drainage channels or the runoff rate from the area in its existing or natural undeveloped state.

IMPERVIOUS SURFACE. A relatively non-porous surface over which water will readily pass without any appreciable amount of the water soaking into the surface.

NATURAL DRAINAGE WAYS. Channels formed in the existing surface topography prior to changes made by unnatural causes.

NATURAL UNDEVELOPED STATE. The condition of the existing surface topography and vegetative cover of a parcel of land prior to any development having occurred, with exception of typical agricultural practices.

STORM WATER DETENTION FACILITY. An area designed and designated to store excess storm water.

STORM WATER DRAINAGE SYSTEM. The complete system of pipes, culverts, channels, swales and structures employed to convey and control storm water runoff.

STORM WATER RUNOFF. The flow of water resulting from precipitation, which is not absorbed by the soil or plant material.

STORM WATER RUNOFF RELEASE RATE. The rate at which storm water runoff is released from dominant to subservient land.

TRIBUTARY WATERSHED. All the land area that contributes storm water runoff to a given point.

UNIMPROVED LOT OR PARCEL. Property on which there is no existing building or structure.

WET BOTTOM DETENTION BASIN. A facility designed to be maintained as a pond with a free water surface, and which has capacity to contain excess storm water runoff.

X-YEAR STORM. The average recurrence interval within which a rainfall of given intensity and duration will be equaled or exceeded only once. A one hundred (100) year storm would have an intensity of rainfall which would, on the average, be equaled or exceeded only once in one

hundred (100) years. This does not imply that it will occur only once in one hundred (100) years, or having occurred, will not happen again for one hundred (100) years.

§53.002 APPLICABILITY

The provisions of this chapter shall apply to:

- (A) Any subdivision involving one (1) acre or more of property.
- (B) Any multi-family residential, commercial, institutional or industrial development where the total area of the lot or parcel of land on which the planned development is to occur, is one (1) acre or more.

§53.003 GENERAL CONSIDERATIONS

- (A) An adequate storm water drainage system shall be constructed by the developer or owner as part of the development. If the amount of storm water detention storage can be increased to provide benefit to the City, negotiations for public participation in the cost of development may be initiated.
- (B) All components of the storm water drainage system, including conduits, channels, outlet structures, spillways, earthen structures and the like shall be built as permanent facilities and all materials and their manner of construction shall be assembled to accomplish as much permanency as is possible.
- (C) For multi-family residential, commercial, institutional and industrial developments, ownership and maintenance responsibilities of the entire storm water drainage system shall remain with the property owner or developer. For single-family residential development, the city will accept maintenance responsibility for the entire storm water conveyance system, including the pipes, culverts, channels and structures, provided that appropriate easements are provided, including adequate public ingress and egress to the storm water detention facilities from the public street. Maintenance of the vegetative cover in and around the storm water detention facilities shall remain the responsibility of the property owner.

- (D) Where in the opinion of the Public Works Director, the development of a property presents the threat of flooding or damage by runoff to downstream properties; the facilities for storm water runoff control shall be constructed as part of the first phase of construction.
- (E) During the construction phase of development, all practical measures shall be employed to minimize and control soil erosion. A soil erosion and sediment control plan shall be developed and implemented. The developer shall obtain the required State storm water discharge permit for construction site activity for any development involving the disturbance of one acre or more of land.

§53.004 DESIGN CRITERIA

- (A) The storm water drainage system, including storm sewers, shall be adequate to properly drain the development and all other upstream areas that are tributary to the development for a minimum of a 25-year rainfall event. Storm water runoff from such upstream areas shall be calculated as if they were fully developed according to the City's Land Use Plan.
- (B) The release of storm water from developments onto adjacent downstream properties shall be designed so as not to increase the rate of runoff in conformance with the drainage laws of the State. The design engineer and developer or landowner shall provide certification to this effect on the face of the construction plans and/or drainage plans for the development.
- (C) Storm Water Detention Requirements.
 - (1) Storm water detention facilities shall be provided to control the rate of storm water release from the development so as not to exceed the lesser of either the downstream storm sewer or drainage way capacity, or the storm water runoff rate from the area in its natural undeveloped state at a two (2) year rainfall event. Storm water detention facilities shall be designed to provide sufficient storage volume to detain the twenty-five (25) year rainfall event from the fully developed drainage area for any and all durations.
 - (2) In the case where the development consists only of expansion, addition or an improvement to an existing building or structure, storm water detention facilities shall be provided to control the rate of storm water release so as not to exceed the

lesser of either the downstream storm sewer or drainage way capacity, or the storm water runoff rate from the area in its existing developed condition at a two (2) year rainfall event. Storm water detention facilities shall be designed to provide sufficient storage volume to detain the twenty-five (25) year rainfall event from the developed drainage area for any and all durations.

- (3) Routing of a portion of the storm water runoff within the development away from the detention facility may be allowed where it is absolutely necessary due to topography of the site. However, provisions must be made so the release of storm water from these areas does not adversely impact adjacent property. Particular attention shall be given to the release of storm water from any impervious surfaces, including roof drains, which are not directed to the detention facility. The release rate from the detention facility must be reduced accordingly so the total release rate from the development is no greater than the runoff rate from the area in its natural undeveloped state at a two (2) year rainfall event.
- (4) Calculation of storm water discharge rates shall be made using the rational method. Design calculations and support data for storm water detention facilities shall be submitted to the Public Works Director for review and approval.
 - (a) The undeveloped storm water release rate shall be calculated using a time of concentration for the entire tributary watershed in which the development is located including all other upstream and downstream areas. In no case shall a time of concentration of less than 15 minutes be used. For large watersheds, the time of concentration may be limited to 60 minutes.
 - (b) In determining the time of concentration, a maximum velocity of three (3) feet per second shall be used for channel flow conditions, unless convincing data is provided to justify use of greater velocities.
 - (c) A maximum coefficient of runoff of twenty five hundredths (0.25) shall be used for undeveloped farm ground. The coefficient of runoff shall be reduced accordingly for natural undeveloped conditions such as grass, brush or wooded areas

- (d) In the case of commercial, and industrial developments, calculations shall be based upon the assumption of one hundred percent (100%) of the useable lot area having impervious surface.
- (5) Outlet Control Structures and Emergency Spillways.
 - (a) Outlet control structures and emergency spillways shall be designed and constructed to fully protect the public health, safety, and welfare. Storm water runoff velocities shall be kept to a minimum and turbulent conditions at the outfall will not be permitted without complete protection for the public safety. The use of fences shall be kept to a minimum and used only when no other method of protection is feasible.
 - (b) Outlet control structures shall be designed as simply as possible and shall require little or no attention for proper operation. The primary outlet shall be designed to operate at full capacity with only a minor increase in the water surface level.
 - (c) The outlet control structure shall be designed to pass the post-developed fifty (50) year rainfall event without engaging the emergency spillway.
 - (d) Provisions shall be made to pass the post-developed one hundred (100) year rainfall event through an adequately sized emergency spillway. The emergency spillway shall be designed to function without attention or maintenance and shall become part of the natural or surface channel system.
 - (e) Design provisions, including erosion protection, shall be made to insure that no damage to immediately adjacent downstream property or facilities occurs from the discharge from a one hundred (100) year event.
 - (f) Hydraulic calculations for the outlet control structure and emergency spillway to substantiate all design features shall be submitted to the Public Works Director for review and approval.
- (6) Dry Bottom Detention Basins.

- (a) Earthen-type dry bottom storm water detention basins shall have a concrete paved channel or pipe capable of conveying low flow through the basin and where necessary a system of under drains to prevent soggy areas.
 - (b) The embankments around any earthen-type detention basin or swale located in residential developments shall have a slope of no greater than 4 to 1, horizontal to vertical, to allow for safe and easy mowing. Slopes up to 3 to 1 may be allowed for commercial, institutional, or industrial developments.
 - (c) For large developments, such as subdivisions, consideration should be given to designing dry bottom detention basins to serve a secondary purpose such as providing open space, recreation facilities, or other types of uses that will not be adversely affected by intermittent flooding.
 - (d) For small developments, consideration should be given to use of well-defined detention swales.
 - (e) For commercial and industrial developments, consideration should be given to detaining storm water in parking lots and in underground oversized culverts.
 - (f) No enclosed or habitable structures shall be constructed within detention basins. However, parking facilities, playgrounds and open spaces, and utility easements shall be considered compatible primary uses of these areas. Additional volume must be provided to compensate for the volume occupied by the placement of any structures, trees, etc. within the detention basin.
- (7) Wet Bottom Detention Basins.
- (a) Wet bottom basins shall have a minimum normal water depth of four (4) feet. If fish are to be maintained, some portion of the pond area should be a minimum of nine (9) feet deep.

- (b) The surface area at minimum normal water depth shall not exceed one fifteenth (1/15) of the tributary drainage area.
- (c) Only that portion of the detention area above the normal water level shall be used in calculating the storage volume.
- (d) Shoreline protection shall be provided to prevent erosion from wave action.
- (e) The embankments around the detention basin shall have a slope of no greater than 4 to 1 horizontal to vertical to allow for safe and easy mowing.

§53.005 FLOOD ROUTE REQUIRED

- (A) A flood route consisting of natural and/or man-made surface channels shall be provided with adequate capacity to convey through and from the development the storm water runoff from all tributary upstream areas with due consideration to the planned degree of upstream development. This channel system shall be designed to carry the peak rate of runoff from a one hundred (100) year rainfall event. An allowance may be made for upstream detention when evidence of such detention can be shown.
- (B) Existing natural waterways in subdivisions shall be preserved or improved as part of the flood route channel system. The use of streets, parking areas, permanent open spaces and utility easements may be employed as part of the flood route channel system. Where streets are used for the lateral passage of flood waters, depth of water in the streets shall not exceed the top of curb at the one hundred (100) year rainfall event.
- (C) No structures, including fences, landscaping, or trees, shall be constructed within these flood route channels. Appropriate surface drainage easements shall be provided for any flood route channels that traverse private property.

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