

CHAPTER 1193 - Stormwater Management Policy<sup>40</sup>

Footnotes:

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**Cross reference**— Drainage - see Ohio R. C. Ch. 6131; Driveway drainage - see S. & P. S. Ch. 909; Obstructing drainage - see S. & P. S. Ch. 911

1193.01 - ENFORCEMENT AND COMPLIANCE.

- (a) The City Engineer shall be responsible for enforcement of the Stormwater Management Policy and shall not allow any development of land area exceeding one acre in size unless such development meets the design requirements herein.
- (b) The Planning Commission shall not approve the final plat of any development or subdivision over which it has jurisdiction without certification from the City Engineer that such development or subdivision shall be in full compliance with the design requirements herein.

(Ord. 0021-2010. Passed 2-1-10.)

1193.02 - DESIGN STANDARDS.

- (a) Purpose. These standards (1193 & 1195) are to establish stormwater management using best management practices and conservations practices to minimize the impact to public waters from accelerated soil erosion and stormwater runoff caused by earth disturbance activities, subsurface drainage and land use changes connected with activities within a development area, and shall include, at a minimum, all requirements of the OEPA construction general permit for construction activities (CGP).
- (b) The design standards contained in the Ohio Department of Natural Resources (ODNR) Rainwater and Land Development Manual, latest edition, shall be used to determine the technical acceptability of land development stormwater management methods as applicable and shall be used as technical guidance. The City Engineer shall determine the acceptability of all hydraulic and hydrologic engineering and design.
- (c) The United States Department of Agriculture Natural Resource Conservation Service (NRCS) soil classification mapping of the City shall be used to determine soil classification for the purpose of all stormwater management design unless more detail data is prepared by a competent authority and accepted by the City Engineer.
- (d) The condition of property prior to earth disturbing activity shall be used to determine predevelopment runoff coefficients and runoff curve numbers based on the most recent NRCS values.

(Ord. 0021-10. Passed 2-1-10.)

1193.03 - STORMWATER RUNOFF POLICY.

- (a) The Stormwater Runoff Policy requires that land uses and developments which increase the runoff rate or volume shall control the discharge rate of runoff prior to its release to off-site land. The purposes of this policy are to:
  - (1) Permit development without increasing the flooding potential of other lands;

- (2) Reduce damage to receiving streams and impairment of their capacity which may be caused by increases in the quantity and rate of stormwater discharge; and
  - (3) Establish a basis for design of stormwater drainage systems on lands below undeveloped areas which shall preserve the rights and options of both dominant and servient property owners and assure long-term adequacy of storm drainage systems.
- (b) The Stormwater Runoff Policy applies to all land developments not specifically exempted under Section 1193.04 or granted a waiver as provided by Section 1193.05.
  - (c) Other sections of this chapter specify the performance requirements of on-site drainage systems and runoff control standards.

(Ord. 0021-2010. Passed 2-1-10.)

#### 1193.04 - EXEMPTIONS.

Exemptions are appropriate for certain land use activities which clearly do not generate significant increases in stormwater runoff. Where exemptions are granted under this section, they shall apply to the requirements for runoff control only and do not in any way imply a relaxation of requirements for adequate and proper on-site drainage or the ability of the system to accept runoff from the tributary land nor a relaxation of any other local, state or federal requirements. The following land uses and developments are exempted from stormwater runoff controls:

- (a) Land preparation for active agricultural areas, orchards, sod farms and nursery operations;
- (b) Land grading or leveling for erosion control under direction of the local soil conservation district;
- (c) Land located within the Regulatory Flood Hazard Area established under Chapter 1191 when developed for permitted or conditional uses defined under Sections 1191.13 and 1191.15.

(Ord. 0021-2010. Passed 2-1-10.)

#### 1193.05 - WAIVERS.

- (a) It is conceivable that development situations not automatically subject to exemptions under Section 1193.04 may exist such that development shall have none of the harmful effects associated with increases in runoff rates and volume. Such developments are eligible for a waiver. The waiver applies only to the requirement that runoff be controlled, and does not in any way imply a relaxation in the requirement for adequate on-site drainage or the ability to accept runoff from land tributary to the development.
- (b) The waiver application shall request in writing that such requirements for stormwater runoff control be waived. The application shall include sufficient detail to determine that granting a waiver shall not result in increased flooding and that the added volume of runoff shall not damage the receiving stream.
- (c) A condition of the waiver shall be that any addition, extension or modification of a development for which a waiver has been granted shall be required to provide stormwater runoff control for the entire site if preceding limitations are exceeded by subsequent additions, extensions or modifications.
- (d) The following land uses and developments are eligible to apply for a waiver on stormwater runoff control requirements contained in this chapter:
  - (1) Development areas abutting and tributary to Big Walnut Creek on which surface watershed flows directly into Big Walnut Creek.
- (e) All waiver applications shall be recommended by the City Engineer and the Planning Commission and approved by Council.

(f) In no case shall a waiver eliminate or replace any other local, state or federal permit or compliance requirements.

(Ord. 0021-2010. Passed 2-1-10.)

1193.06 - STORMWATER RUNOFF CONTROL CRITERIA.

(a) Stormwater runoff control shall address both peak rate of runoff and total volume of runoff. The peak rate of runoff from an area after development shall not exceed the peak rate of runoff from the same area before development for all return period storms from one year up to a 100-year return period; 24-hour storm. In addition, if it is found a proposed development shall increase the volume of runoff from an area, the peak rate of runoff from certain more frequent storms shall be controlled further.

There are two reasons why increases in volume of runoff require a peak runoff control standard more restrictive than controlling to the predevelopment condition. First, increases in volume mean runoff will be flowing for a longer period of time. When routed through a watershed, these longer flows may join at some point or points downstream creating new peak flows and create flooding and erosion and problems associated with increased peak flow. This is known as the "routing problem". Second, longer flow periods of large runoff quantities place a highly erosive stress on natural channels. This stress may be minimized by reducing the rate of discharge. The permissible peak rates shall be determined as follows:

- (1) Determine the total volume of runoff from a one-year return period, 24-hour storm, occurring over the area before and after development; and
- (2) Using TR-55 Methodology, or other volume based Methodology acceptable to the City Engineer (the rational method is not acceptable), determine the percentage of increase in volume due to development and using this percentage, pick the critical storm from the following table:

If the percentage of increase in volume of runoff is:

Equal to or greater than	And less than	The critical storm for discharge limitations shall be (Years)
-	10	1
10	20	2
20	50	5
50	100	10
100	250	25
250	500	50
500	-	100

(b) The peak rate of runoff from the critical storm occurring over the development shall not exceed the peak rate of runoff from a one-year return period storm occurring over the same area under predevelopment conditions. Storms of less frequent occurrence (longer return period) than the critical storm, shall have a peak rate of runoff not greater than the same storm under predevelopment conditions. As an example, if the total volume is to be increased by 35 percent, the critical storm is a five-year storm. The peak rate of runoff for all storms up to this intensity shall be controlled so as not to exceed the peak rate of runoff from a one-year return period storm under predevelopment conditions in the area. The runoff from a more intense storm, up to a ~~540~~-year return period storm must be controlled so as not to exceed the predevelopment peak rate from the same return period storm, and the one hundred year postdeveloped peak rate of runoff shall not exceed the predeveloped peak rate of runoff for the ten-year return period.

(c) Appropriate stormwater runoff control addresses both peak rate and total volume of runoff. In addition to peak rates of stormwater runoff, methods for minimizing post construction increases in stormwater runoff volumes are strongly encouraged. Methods for reducing runoff volumes may include those listed below.

- (1) Retarding flow velocities by increasing friction; for example, grassed road ditches rather than paved street gutters where practical; discharging roof water into vegetated areas; or grass and rock lined drainage channels;
- (2) Grading and construction of terraces and diversions to slow runoff and use of grade stabilization structures to provide a level of control in flow paths and stream gradients;
- (3) Induced infiltration of terraces and diversions to slow runoff and use of grade stabilization structures to provide a level of control in flow paths and stream gradients;
- (4) Provisions for retention and detention; for example, permanent ponds and lakes with stormwater basins provided with proper drainage, multiple use areas for stormwater detention and recreation, wildlife, transportation, fire protection, aesthetics, or subsurface storage areas.
- (5) Other methods for controlling post construction water quality as approved by the City Engineer.

(6) Green Infrastructure Best Management Practices shall be incorporated into the plan of development whenas directed by the City Engineer or their designee, unless the City Engineer or their designee determine that such practices are impossible or impracticable based on documentation provided by the applicant or developer. -- These practices shall include but not be limited to the following:

Permeable Pavements

Low Impact Development

Rain Gardens

Bioswales/Bioretenention

Stormwater Planter Boxes

Vegetated Swales

Filter/Buffer Strips

(67) Attenuation of runoff rates from upstream areas is not required to be provided. Flow from such areas will be routed through the drainage system in the development under consideration at a rate determined in the same manner as the on-site system. Anticipated future development,

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however, must be considered in the designers' hydrologic analysis. Off-site land uses prior to development, or anticipated to be constructed in the future, shall be considered as the pre-development condition for the purpose of calculating changes in runoff.

(78) All stormwater management and sediment control practices shall be designed, constructed and maintained with consideration for the proper control of mosquitoes and other vectors. Practices may include, but are not limited to:

A. There should be no depressions in a normally dry detention facility where water might puddle when the water level is receding. Underdrains are encouraged where appropriate.

B. All structures shall be designed in accordance with ODNR'S rainwater and land development handbook (most recent edition).

(d) Numerous methods of rainfall-runoff computation are available on which the design of storm drainage and flood control system may be based. The rational method, the NRCS hydrologic methods (available in TR-20, TR-55 and HEC-1) are accepted as adequate for determining peak runoff rates for drainage areas. USGS methodologies are also acceptable. Other methods may be accepted with the concurrence of the City Engineer.

The total watershed that produces stormwater runoff across the site proposed to be developed shall be included when estimating flood discharge runoff. Dependent on watershed size, the following principal methods shall be considered acceptable to estimate design discharge.

(1) For small watersheds of 25 acres or less, the design runoff may be determined by the rational method. This method may also be used for catch basin hydrology. The rational method shall not be used for sizing attenuation basins or any other facility that requires estimation of runoff volumes.

(2) For five-100 acres of an urbanizing watershed, the design runoff may be estimated by using the method as Published, Urban Hydrology for Small Watersheds (TR55). This method may be applicable to areas up to 300 acres depending upon the topography. TR-20 and HEC-1 may be acceptable for larger areas. The designer is encouraged to meet with the City Drainage Engineer prior to selecting a methodology for large watershed.

(3) Other method approved by the City Engineer.

(Ord. 0021-2010. Passed 2-1-10.)

#### 1193.07 - STORMWATER SYSTEM DESIGN CRITERIA.

(a) *Design Storms/System Design.*

(1) *Initial drainage system.* The initial drainage system is the part of the storm drainage system which is used regularly for collecting, transporting and disposing of stormwater runoff, snowmelt and miscellaneous minor flows. The capacity of the initial drainage system should be equal to the maximum rate of runoff expected from a design storm of established frequency.

A. All new storm sewer systems must be adequate to convey anticipated runoff of a watershed from a five-year storm at just full flow. Pressure flows for five year design storms are unacceptable.

B. The storm sewer hydraulic grade line shall be determined for the ten-year storm event. The hydraulic grade line at the ten-year storm shall be below the grate and/or cover of all structures. The hydraulic grade line should never be below the normal depth of flow in the conduit. If calculations illustrate this condition, then the designer shall use the normal depth of flow elevation as the hydraulic grade line (HGL) elevation.

C. Discharge outlets must be adequate to accept additional runoff from the proposed development without overloading. If the existing outlet is inadequate for such additional flow, an improved outlet or some time-release method of discharge (detention), satisfactory

to the City Engineer, must be provided. A tailwater analysis must be completed and used as part of all hydraulic design.

- D. Culverts shall be designed to easily convey the ten-year design storm. Headwater depth shall not be within 12 inches of the final pavement (lowest point in road) elevation for the 50-year storm.
- E. All culverts shall be designed with a uniform barrel cross section throughout their length. Location alignment, material specifications, and end treatments (e.g., headwalls, wingwalls, riprap, apron slabs), shall be approved by the City Engineer.

(2) *Major drainage system.* The major drainage system is that part of the storm drainage system which carries the runoff which exceeds the capacity of the initial drainage system. The major drainage system shall have the capacity to carry runoff from a storm with a return period of not less than 100 years without posing significant threat to property or public safety.

- A. Major system design shall be considered and accomplished for all development to alleviate potential adverse impact from flooding due to infrequent storms. Sufficient easements shall be provided to protect the major flow paths from being filled, blocked or otherwise disturbed.
- B. Where a system outlets to an erodible channel, measures shall be taken to lessen potentially destructive velocities. Maximum velocities for discharge into erodible channels shall flow ODOT standards.

(b) *Initial Storm: Physical Design Criteria for On-Site Improvements.*

- (1) Depth of flow in natural channels shall not exceed bank full stage with backwater effects considered.
- (2) Depth of flow in artificial channels shall not exceed 0.8 bank full stage. Velocity of flow shall be determined in accordance with the design criteria for open channels and shall not exceed seven feet per second. Where flows exceed this rate, special channel lining and erosion protection shall be provided. Design approach shall follow the guidelines of the ODNR Rainwater and Land Development Manual.
- (3) Depth of flow in road side ditch swales shall not exceed one foot or be of such depth that flow would extend out of the right-of-way if the side ditch is less than one foot in depth. Velocity at this depth shall not exceed six feet per second with grass swales or ten feet per second with paved ditches.
- (4) Depth of flow in streets with curb and gutter shall not exceed the curb height. Velocity of flow in the gutter at design depth shall not exceed ten feet per second. In addition to the above, the following are maximum encroachments of the minimum five-year initial design storm onto the pavement.
  - A. For minor streets carrying traffic from the individual residence to collector and secondary streets, the flow may spread to the crown of the street.
  - B. For collector or secondary streets, one lane shall be free from water.
  - C. For primary streets, one lane in each direction shall be free from water.
  - D. For freeways, no encroachment is allowed on traffic lanes.
- (5) In the design of the conduit, the conduit may be designed on the basis of flowing full with surcharge to gutter line. Backwater effects shall be considered.

(c) *Major Storm: Physical Design Criteria for On-Site Improvements.*

- (1) The major storm floodway and floodway fringe for natural streams shall be as defined by the Federal Emergency Management Agency (FEMA).

- (2) Many of the drainageways associated with the major storm system are in areas beyond those designated as floodway or floodway fringe. For these areas, the major storm flood limits shall be determined by the U. S. Corps of Engineers HEC-2 method or other accepted methods of determining water surface profiles using the major design storm runoff. One-half foot elevation shall be added to the flood profile as freeboard for protection in the event of future encroachments into the floodway fringe or in the drainageway.
  - (3) Where the street is designed as the major drainageway, the depth of flow shall not exceed eighteen inches of width at gutter line for local and collector streets and shall not exceed six inches depth at roadway crown for primary streets and freeways. The same maximum depth criteria shall apply where a major drainageway crosses the street. Where a major drainageway is located outside a street, dedicated stormwater easements shall be provided.
  - (4) In determining the required capacity of surface channels and other drainageways provided for the major storm runoff, the street storm inlets and conduit provided for the initial design storm shall be assumed to be carrying not more than one-half their design capacity. This is a safety factor to allow for the surcharged outlets, obstructed inlets or other malfunctions.
- (d) *Stormwater Detention/Retention.* Stormwater detention or retention is required for all developers unless a waiver is granted for areas designed for storage of stormwater by detention or retention incorporated into the natural features of the general area. Cooperative planning and joint owner construction of detention discharge control or retention facilities and use of natural land contours is strongly encouraged. No such facilities shall be permitted which may become aesthetically displeasing, construction or maintenance problems. The City encourages such facilities which are designed as multipurpose spaces such as open space, recreation and/or scenic areas. Detention/retention areas shall also comply with all post construction runoff requirements, including those of the Ohio EPA construction general permit.

(Ord. 0021-2010. Passed 2-1-10; Ord. No. [0017-2017](#), Exh. A, 4-3-17)

#### 1193.08 - PUBLIC NOTIFICATION OF WATERCOURSE.

Land developers shall place in all sales offices copies of the land development grading plan with graphic and written descriptive information clearly showing and describing the purpose of all drainage easements, floodway routing, flood hazard areas and other watercourses contained on or designed into the land development.

(Ord. 0021-2010. Passed 2-1-10.)

#### 1193.09 - RIGHT OF APPEAL.

Any person dissatisfied with a decision made by the City Engineer pursuant to Chapter 1193 shall have the right to appeal in writing the decision to the Board of Zoning Appeals within ten days after such decision is made. The Board of Zoning Appeals shall act upon the written appeal at its next regular meeting held after the receipt of such appeal by the Clerk of Council or the appeal is deemed to be denied. If the appeal is denied by the Board of Zoning Appeals the person filing the appeal may within ten days after such decision is made, appeal in writing such decision to Council which shall act upon the written appeal at its next regular meeting held after receipt of such appeal by the Clerk of Council, or the appeal is deemed to be denied.

(Ord. 0021-2010. Passed 2-1-10; Ord. No. [0017-2017](#), Exh. A, 4-3-17)