

# CHAPTER 1048

## Stormwater Management

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### 1048.03 DEFINITIONS.

Definitions of terminology used in this chapter shall be as follows:

(a) "Base Flood Elevation (BFE)" means the elevation delineating the level of flooding resulting from the 100-year frequency flood discharge.

(b) "Building" means a structure that is principally above ground and is enclosed by walls and a roof. The term includes a gas or liquid storage tank, a manufactured home, carport, mobile home or a prefabricated building. This term also includes recreational vehicles and recreational vehicles to be installed on a site for more than 180 days.

(c) "Calhoun County Enforcing Area" (CCEA) means the county agency or a conservation district designated by a county board of commissioners under MCL 324.9105.

(~~ed~~) "City" means the City of Battle Creek, including staff and elected officials.

(~~ed~~) "Compensatory storage" means an excavated, hydraulically equivalent volume of storage used to offset the loss of natural flood storage capacity when artificial fill or structures are placed within a floodplain.

(~~fe~~) "Construction" means any on-site activity that will result in the creation of a new stormwater management system, including the building, assembling, expansion, modification, or alteration of the existing contours of the property; the erection of buildings or other structures, or any part thereof, or land clearing.

(~~gf~~) "Control device" means the element of a discharge structure that allows the gradual release of water under controlled conditions, sometimes referred to as bleed-down.

(~~hg~~) "Control elevation" means the lowest elevation at which water can be released through the control device.

(~~ih~~) "Control structure" means a structure designed to control the rate of flow that passes through the structure, given a specific upstream and downstream water surface elevation.

(~~ji~~) "Director" means the Department of Public Works Director~~City Engineer~~ and ~~his or her~~ the Director's designees.

(~~kj~~) "Detention" means the collection and temporary storage of stormwater in such a manner as to provide treatment through physical, chemical, or biological processes with subsequent gradual release of the stormwater.

(~~lk~~) "Development" means any of the following:

(1) Construction, installation, alteration, demolition, or removal of a structure impervious to surface stormwater management system; or

(2) Clearing, scraping, grubbing or otherwise removing or killing the vegetation of a site; or

(3) Adding, removing, exposing, excavating, leveling, grading, digging, dumping, or otherwise disturbing the soil or rock of a site in a manner that is contrary to the requirements of this chapter.

(~~m~~) "Discharge structure" means a structural device usually constructed of a material such as concrete, metal or timber through which water from a stormwater management system is discharged from a site to a receiving water.

(~~n~~) "Drain" means a channel, natural depression, slough, stream, creek or pipe in which storm runoff and floodwater can flow. This includes systems installed to carry urban storm runoff.

(~~o~~) "Drainage area" means the entire upstream land area from which stormwater runoff drains to a particular location. For a particular development, the drainage area shall include any upstream (offsite) areas that drain to and through the development. the land area above a given point that contributes stormwater to that point.

(~~p~~) "Dry detention" means water storage with the bottom elevation at least one foot above the control elevation. Sumps, swales, and other minor features may be at a lower elevation.

(~~q~~) "Elevation" means the height in feet above mean sea level according to the National Geodetic Vertical Datum.

(~~r~~) "Engineer" means a professional engineer registered in Michigan who is competent in the fields of hydrology and stormwater management.

(~~s~~) "FEMA" means the Federal Emergency Management Agency and its regulations.

(~~t~~) "Floodplain (regulatory)" means for a given flood event, that area of land adjoining a continuous watercourse that has been covered temporarily by water. The term floodplain includes all physical floodplains whether or not they have been officially mapped by FEMA. floodplains that may be either riverine or non-riverine depressional areas.

(1) "Riverine floodplains" are those areas contiguous to a lake, pond, or stream whose elevation is greater than the normal water pool elevation but equal to or lower than the projected 100-year flood elevation.

(2) "Non-riverine floodplains" are depressional storage areas not associated with a stream system which surrounding lands drain causing periodic inundation by storm waters. In certain cases, the floodplain may also be known as the Special Flood Hazard Area (SFHA).

(~~ut~~) "Flood Protection Elevation (FPE)" means the elevation of the base flood or 100-year frequency flood plus a minimum 1 foot of freeboard at any given n location in the Special Flood Hazard Area (SFHA).

(~~vt~~) "Floodway (regulatory)" means the channel, including onstream lakes, and that portion of the floodplain adjacent to a stream or watercourse as designated by the FEMA floodplain maps, which is needed to store and convey the existing and anticipated future 100-year frequency flood discharge with no more than a 1 foot increase in stage due to the loss of flood conveyance or storage.

(~~wv~~) "Historic discharge or volume" means the peak rate or volume at which stormwater runoff leaves a parcel of land in an undisturbed, natural site condition by gravity, or the legally allowable discharge at the time of permit approval.

(~~xw~~) "Impervious surface" means a surface that prevents the infiltration of water into the ground such as all roofs, streets, sidewalks, driveways, parking lots, and compacted soils and gravel. ~~has been compacted or covered so that it is highly resistant to infiltration by water.~~

(~~yx~~) "Overflow elevation" means the design elevation of a discharge structure at which or below which, water is contained behind the structure except for that which leaks out or bleeds out through a control device down to the control elevation.

(~~zy~~) "Retention" means the prevention of or to prevent the discharge of a given volume of stormwater runoff into surface waters by complete on-site storage.

(~~aa~~~~z~~) "Soil conservation plan" means a document prepared or approved by the Calhoun County Enforcing Area ~~local Soil and Water Conservation District Board~~ that outlines a system of management practices to control stormwater and soil erosion, reduce sediment loss, or protect receiving water quality on a specific parcel of property.

(~~baa~~) "Special Flood Hazard Area (SFHA)" means any base flood area subject to flooding from a river, creek, stream, or any other identified channel or ponding and shown on a Flood Hazard Boundary Map or Flood Insurance Rate Map as Zone A, AO, A1-30, AE, A99, AH, VO, V30, VE, V, M, or E.

(~~cbb~~) "Stormwater" means water resulting from precipitation, including without limitation rain, snow, and snowmelt. Also referred to as "runoff". ~~the flow of water that results from and occurs immediately following a rainfall event.~~

(~~dde~~) "Stormwater management plan" means ordinances, orders, rules, regulations, and other mechanisms that provide for the management of stormwater to prevent flooding, improving water quality and ensuring restoration and/or protection of surface waters. ~~a plan for receiving, handling, and transporting stormwater and surface waters within the City stormwater management system.~~

(~~eed~~) "Stormwater management system" means any structure, feature, or appurtenance subject to the TRM, or rule promulgated pursuant to the TRM, that is designed to collect, detain, retain, treat, or convey stormwater runoff, including without limitation buffer strips, swales, gutters, catch basins, closed conduits, detention systems, pretreatment systems, wetlands, pavement, unpaved surfaces, structures,

~~watercourses, or surface waters, whether public or private, and includes all natural and man-made elements used to convey stormwater from the first point of impact with the surface of the earth to a suitable outlet location internal or external to the boundaries of the City. The stormwater management system includes all pipes, channels, streams, ditches, wetlands, sinkholes, detention/retention basins, ponds, and other stormwater conveyance and treatment facilities, whether public or private.~~

(~~ff~~ee) "Structure" means the results of a man-made change to the land constructed on or below the ground, including the construction, reconstruction or placement of a building or any addition to a building; installing a manufactured home on a site; preparing a site for a manufactured home or installing a recreational vehicle on a site for more than 180 days; and includes retaining walls, tanks and manholes.

(~~gg~~ff) "Surface water" means a body of water, including without limitation seasonal and intermittent waters, in which the surface of the water is exposed to the atmosphere, including without limitation lakes, open detention basins, forebays, watercourses, bioretention areas, retention basins, wetlands, and impoundments.~~water that finds its way to an open channel without infiltrating into the soil.~~

(~~hh~~gg) "Swale" means a man-made trench that:

(1) Has a top depth-to-width ratio of the cross-section equal to or greater than 1:6, or side slopes equal to or greater than 3 feet vertical to 1 foot horizontal; and

(2) Contains contiguous areas of standing or flowing water only following a rainfall event; and

(3) Is planted with or has stabilized vegetation suitable for soil stabilization, surface water treatment, and nutrient uptake; and

(4) Is designed to take into account the soil erodibility, soil percolation, slope, slope length, and drainage area so as to prevent erosion and reduce pollutant concentration of any discharge.

(~~ii~~hh) "Watershed area" means any drainage area contributing surface and stormwater runoff to the City stormwater management system.

(~~jj~~ii) "Wet detention" means water storage with the bottom elevation ~~lower than one foot~~ lower than~~above~~ the control elevation of the system.

(~~jj~~kk) "Water course" means a natural or artificial channel for flowing water.~~a natural or artificial channel, whether lined or unlined, in which a flow of storm water, ground water or clean water occurs, either continuously or intermittently.~~

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## **1048.05 EXEMPTIONS.**

The following activities shall be exempt from the requirements of this chapter:

(a) Single-family or duplex homes built on individual lots that are part of a larger subdivision with a City~~n~~-approved stormwater management permit.

(b) Maintenance activity that does not change or affect the quality, rate, volume, or location of stormwater flows on the site or runoff from the site.

(c) Bona fide agricultural pursuits for which a soil conservation plan has been approved by the Calhoun County Enforcing Agency (CEA)~~local Soil and Water Conservation District~~.

(d) Action taken under emergency conditions to prevent imminent harm or danger to persons or to protect property from imminent fire, violent storms, tornadoes, flooding, or other hazards, whether man-made or naturally occurring.

(e) Known contaminated sites, as identified by the Michigan Department of Environment, Great Lakes and Energy, provided the parcel is currently in compliance with its due care plan.

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#### **1048.07 NONCONFORMING AREAS.**

When any of the following improvements are made to an existing development, such improvements shall comply with this chapter, whether or not the existing development has received a prior approval pursuant to Section 1048.06.

(a) Floor area expansion: The gross floor area of a structure is expanded by more than ten percent or more than 4,000 square feet, whichever is less. Repeated expansions of a development constructed over a period of time commencing with the effective date of this chapter shall be combined in determining whether the threshold has been reached.

(b) Use change: The use of a development changes to a more intense classification.

(c) Site alteration: A site alteration activity requires the submission of a development plan or an amended development plan and involves ten percent or more of the site area.

(d) Reconstruction: A structure is reconstructed following substantial destruction by fire or other calamity. A structure is considered substantially destroyed if the cost of reconstruction is fifty percent or more of the fair market value of the structure before the calamity.

#### **1048.08 SUBMITTALS.**

A stormwater management plan shall be submitted to the City as part of the site development approval process. The plan shall conform with the requirements as set out in the Technical Reference Manual, incorporated by reference pursuant to below section 14.~~The following specific items are minimum submittal requirements.~~

~~—(a)— Owner information, including the name, address, and telephone number and proof of ownership for the property.~~

~~—(b)— Aerial photograph of the project vicinity, taken not more than three years before the application date, covering the project area and the total lands that contribute runoff.~~

- ~~—(c) Topographic map of the project area, showing the location and elevation of benchmarks, including at least one benchmark for each control device.~~
- ~~—(d) Land use map showing both current and proposed conditions for the watershed area that contributes runoff.~~
- ~~—(e) Soils and vegetation map displaying the most recent Natural Resource Conservation Service (NRCS) information and encompassing both the project area and the watershed area that contributes runoff.~~
- ~~—(f) Proposed grading, drainage, paving, and building plan showing details of proposed grading, drainage, paving, and buildings.~~
- ~~—(g) Erosion and sediment control plan identifying the type, location, and schedule for implementing erosion and sediment control measures, including appropriate provisions for maintenance and disposition of temporary measures.~~
- ~~—(h) Technical report, prepared by an engineer, describing the assumptions, calculations, and procedures used for determining compliance with the performance criteria established by this chapter.~~
- ~~—(i) Operation and maintenance plan, prepared by an engineer, describing the activities and schedule required to operate and maintain the permitted facilities.~~

#### **1048.09 PERFORMANCE CRITERIA.**

(a) Generally. Except as otherwise provided herein, a development must be designed, constructed, operated, and maintained to comply with the performance criteria set forth in this chapter and the Technical Reference Manual, incorporated by reference pursuant to below section 14.

(b) Maintenance. Operation and maintenance activities, as specified in the approved operation and maintenance plan, shall be executed routinely, with scheduled reporting to the Director, as long as the operation permit is in effect.

(c) Modifications. If the activity authorized by the permit is not completed according to the approved schedule and permit conditions, the Director shall be notified by City Inspections officials. For revisions resulting in a schedule extension of more than of thirty days, or if deviations from the permit conditions are expected to occur, the applicant shall be required to obtain approval of thea permit modification ~~is required~~.

#### **1048.10 FLOODPLAIN MANAGEMENT.**

The floodplain management criteria shall be as follows:

##### **(a) Base Flood Elevation and Location of Floodplain and Floodway.**

(1) The Base Flood Elevations (BFE) shall be as delineated on the 100-year profile and floodplain maps as noted on the FEMA Flood Insurance Study maps and profiles, or the best available information as determined by the Director.

(2) The location of the regulatory floodway and its accompanying flood elevation shall be as delineated on the FEMA regulatory floodway maps.



(3) When no base flood or 100-year frequency flood elevation information exists, the base flood or 100-year frequency flood elevation shall be determined by the ~~registered~~licensed professional-engineer using an appropriate model or technique as approved by the Director.

(4) Nothing contained herein shall prohibit the application of these regulations to land that can be demonstrated by engineering survey to lie within any floodplain. Conversely, any lands (except for those located in a regulatory floodway) that can be demonstrated by a topographic survey certified by a ~~state licensed~~registered professional engineer or ~~state licensed professional~~registered land surveyor to lie beyond the floodplain, and to the satisfaction of the Director, to have been higher than the base flood elevation as of the effective date of the first regulatory floodplain map denoting the site to be in a floodplain, or for unmapped floodplains as of the effective date of the ordinance, shall not be subject to the regulations of this section.

(5) In the case of a site located in the regulatory floodway that is higher than the BFE, it is subject to the regulations of this section until such time as a letter of map revision is received from the FEMA.

(b) Performance Standards Applicable to all Floodplain Development.

(1) Modification and disturbance of natural riverine floodplains shall be avoided to protect existing hydrologic and environmental functions. Such disturbances shall be minimized and all negative impacts mitigated as described in a mitigation plan.

(2) No development shall be allowed in the floodplain that shall singularly or cumulatively create a damaging or potentially damaging increase in flood heights or velocity or threat to public health, safety and welfare or impair the natural hydrologic functions of the floodplain or channel.

(3) For all projects involving channel modification, fill, or levees, the flood carrying capacity of the regulatory floodplain shall be maintained.

(4) Compensatory storage is required for all lost floodplain storage as follows:

A. Hydraulically equivalent compensatory storage requirements for fill or structures in a riverine floodplain shall be at least equal to 1.2 times the volume of floodplain storage lost. Such compensation areas shall be designed to drain freely and openly to the watercourse and located opposite or adjacent to fill areas. The floodplain volume lost below the existing 10-year frequency flood elevation must be replaced below the proposed 10-year frequency flood elevation. The floodplain volume lost above the 10-year existing frequency flood elevation must be replaced above the proposed 10-year frequency elevation.

B. Hydraulically equivalent compensatory storage requirements for fill or structures in a nonriverine floodplain shall be at least equal to 1.0 times the volume of floodplain storage lost.

(c) Public Health Protection Standards.

(1) No developments in the floodplain shall include locating or storing chemicals, explosives, buoyant materials, animal wastes, fertilizers, flammable liquids, pollutants, or other hazardous or toxic materials below the FPE.

(2) New and replacement water supply systems, wells, and sanitary sewer lines may be permitted providing all manholes or other above-ground openings located below the Flood Protection Elevation (FPE) are watertight.

(d) Building Protection Requirements.

(1) All new buildings, building alteration that either increases the first floor area by more than twenty percent or the building's market value by more than fifty percent, the installation of a manufactured home on a new site or a new manufactured home on an existing site or installing a recreational vehicle on a site for more than 180 days and located within a 100-year floodplain shall be protected from flood damage below the flood protection elevation.

(2) The lowest floor, including basements for all new construction or substantial improvements of residential structures shall be two feet or more above the base flood elevation.

A. If placed on fill, the top of the fill shall be above the flood protection elevation. The fill shall be placed at that elevation for a distance of ten feet out from the building unless the building design is certified by a state licensed~~registered~~ structural engineer as protected from damages due to hydrostatic pressures. Additionally, the fill must be demonstrated not to settle below the flood protection elevation and to be adequately protected against erosion, scour and differential settlement.

B. If elevated by means of walls, pilings, or other foundation, the building's supporting structure must be permanently open to flood waters and not subject to damage by hydrostatic pressures of the base flood or 100-year frequency flood. The permanent openings shall be no more than one foot above grade, and consist of a minimum of two openings. The openings must have a total net area of not less than one square inch for every one square foot of enclosed area subject to flooding below the BFE. The foundation and supporting members shall be anchored and aligned in relation to flood flows and adjoining structures so as to minimize exposure to known hydrodynamic forces such as current, waves, ice and floating debris. All areas below the Flood Protection Elevation shall be constructed of materials resistant to flood damage. The lowest floor (including basement) and all electrical, heating, ventilating, plumbing, and air conditioning equipment and utility meters shall be located at or above the FPE. Water and sewer pipes, electrical and telephone lines, submersible pumps and other waterproofed service facilities may be located below the flood protection elevation. No area below the flood protection elevation shall be used for storage of items or materials.

(3) The lowest floor including basement of all new construction or substantial improvements of nonresidential buildings shall be two feet or more above the base flood elevations in accordance with paragraph (2) above or be structurally dry flood proofed. A nonresidential building may be structurally dry flood proofed (in lieu of elevation)



provided that a ~~state licensed~~registered professional engineer or structural engineer shall certify that the building has been structurally dry flood proofed below the flood protection elevation and the structure and attendant utility facilities are watertight and capable of resisting the effects of the base flood or 100-year frequency flood. The building design shall take into account flood velocities, duration, rate of rise, hydrostatic and hydrodynamic forces, the effects of buoyancy and impacts from debris or ice. Flood proofing measures shall be operable without human intervention and without an outside source of electricity. (Levees, berms, floodwalls and similar works are not considered flood proofing for the purpose of this subsection.)

(4) Manufactured homes and recreational vehicles to be installed on a site for more than 180 days, shall be elevated to or above the flood protection elevation and shall be anchored to resist flotation, collapse, or lateral movement by being tied down in accordance with applicable rules and regulations.

(5) Tool sheds and detached garages on an existing single-family platted lot, may be constructed with the lowest floor below the flood protection elevation in accordance with the following:

A. The building is not used for human habitation.

B. All areas below the base flood or 100-year frequency flood elevation shall be constructed with waterproof material. Structures located in a regulatory floodway shall be constructed and placed on a building site so as not to block the flow of floodwaters.

C. The structure shall be anchored to prevent flotation.

D. Service facilities such as electrical and heating equipment shall be elevated or flood proofed to the flood protection elevation.

E. The building shall be valued at less than five thousand dollars (\$5,000.00) and be less than 500 square feet in floor size.

F. The building shall be used only for the storage of vehicles or tools and may not contain other rooms, workshops, greenhouses or similar uses.

(6) A non-conforming structure damaged by flood, fire, wind or other natural or man-made disaster may be restored unless the damage exceeds fifty percent of its market value before it was damaged, in which case it shall conform to this chapter.

(e) If the proposed development would result in a change in the mapped regulatory floodplain or 100-year frequency flood elevation on a site, the applicant shall submit sufficient data to obtain a Letter of Map Revision (LOMR) from FEMA.

(f) Any work involving construction or modification or removal of a dam or an on-stream structure to impound water shall obtain a State Dam Safety Permit or letter indicating a permit is not required prior to the start of construction of a dam.

#### **1048.11 REGULATORY FLOODPLAINS WITHOUT REGULATORY FLOODWAYS**

Within all riverine floodplains where the floodway has not been determined, the developer shall have an engineering study performed to determine a flood conveyance

path to demonstrate that a proposed development will have no singular or cumulative impact on flood heights or velocities, as required by this chapter. The developer shall submit that engineering study for review and acceptance. In the case of ~~riverine~~ floodplains draining greater than one square mile, it shall also be sent to MDEQ or FEMA for review and approval. Upon acceptance, the developer can then choose to locate all development activity outside of the flood conveyance path or meet the performance standards of this chapter. Should the flood conveyance path be determined so as to include land not owned by the applicant, notice to the affected property owners shall be made for comment.

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#### **1048.13 VOLUME AND FLOW RATE MANAGEMENT.**

All new and redevelopment projects in the City must comply with the ~~following~~ volume and flow rate management requirements as set out in the Technical Reference Manual, incorporated by reference in below section 14.:

~~—(a) Peak Discharge. The post-development peak rate of off-site discharge for the twenty-five year storm whose duration matches the time of concentration of the developed tributary area, must not exceed the historic off-site discharge for the twenty-five year, twenty-four hour storm, unless other allowable peak discharge limits are applicable.~~

~~—(b) Runoff Volume. The post-development volume of surface runoff must not exceed the historic volume of surface runoff for the twenty-five year, twenty-four hour storm event. For land-locked receiving water bodies, on-site storage of the 100-year, twenty-four hour storm volume is required.~~

#### **1048.14 TECHNICAL REFERENCE MANUAL.**

The technical procedures and design standards contained in the Stormwater Management Technical ~~Reference~~ Performance Manual (TRM), any amendment to it, as prepared by the Director and adopted by City Commission resolution, are incorporated by reference and shall be used for guidance to determine compliance for the performance criteria established by this chapter.

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#### **1048.18 WATER COURSE PROTECTION.**

(a) Every person owning property through which a water course passes, or such person's lessee, shall keep and maintain that part of the water course within the property free of trash, debris, and other obstacles that would pollute, contaminate or retard the flow of water through the water course. This obligation shall not extend to obstacles created by non man-made activities, events, or Furbearers, including but not limited to beavers, otters, and muskrat. In addition, the owner or lessee shall maintain existing privately-owned structures within or adjacent to a water course so that such structures will not become a hazard to the use, function, or physical integrity of the water course.

(b) A person who violates this section is responsible for a Class C municipal civil infraction and the fines set forth at Section 202.98.

#### **1048.19 POLLUTION PREVENTION.**

(a) If a previously permitted development is found to be in violation of [Chapter 1047](#), then the violating development must, per orders of the Director, implement the best management practices as set forth in the ~~Stormwater Management TR~~[Mechanical Reference Manual](#), to eliminate the offending discharge into the storm sewer system.

(b) All new and redevelopment projects in the City involving .5 acres of land or more, in addition to complying with the provisions of [Chapter 1047](#), must comply with the ~~following applicable~~ water quality requirements as set out in the TR~~Issues~~:

~~—(1) Sediment in stormwater runoff must be reduced as required by the City's specified requirements set forth in its Stormwater Management Technical Reference Manual (TRM). Erosion controls and runoff sediment reduction techniques are explicitly required for activities disturbing more than one acre of land or occurring within 500 feet of a water course and shall require the issuance of a State permit for earth change.~~

~~—(2) Environmentally sensitive areas, as defined by the City, may also require predetermined controls and techniques. Design of the appropriate best management practices as set forth in the TRM.~~

~~(13)~~ Phosphorous in stormwater runoff must be reduced as per the City's specified requirements as set forth in the TRM.

~~(c4)~~ Developments consisting of greater than fifty percent impervious surface or containing a potential source of oil and grease contamination shall include a baffle, skimmer, grease trap, or other suitable oil and grease separation mechanism as described in the TRM.

~~(d5)~~ The City may require reduction efforts on an individual site or universal basis, to be undertaken for other pollutants as they are identified to be threats to public health and safety and addressed.

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#### **1048.21 CORRECTIVE ACTION.**

A person or entity found to be in violation of this chapter, or in violation of a maintenance agreement with the City, may be required to restore any alteration of the affected property to its undisturbed condition. In the event that restoration is not undertaken within a reasonable time after notice, the City may take necessary corrective action, the cost of which shall become a lien upon the property until paid.