

ORDINANCE NO. 1010

AN ORDINANCE TO AMEND CHAPTER 54, SECTION 54.09, OF THE CITY CODE REGARDING MINIMUM DESIGN REQUIREMENTS FOR STORM DRAINAGE SYSTEMS.

The City of Mt. Pleasant Ordains:

Section 1. Amendment. Chapter 54, Section 54.09, of the City of Mount Pleasant Code of Ordinances, entitled "Minimum Design Requirements for Storm Drainage Systems," is amended to read as follows:

§ 54.09 MINIMUM DESIGN REQUIREMENTS FOR STORM DRAINAGE SYSTEMS

This section outlines the requirements for the design of storm water management systems. Engineering judgment must be utilized to accomplish the overall goals of this chapter.

(A) General requirements.

- (1) Storm water detention requirements for any new construction development, redevelopment, or land use change occurring within Isabella County will be determined according to the storm water discharge permit procedure.
- (2) The peak runoff rate during a 25-year storm event from a developed or redeveloped site shall not exceed the allowable discharge rate (Qa). This rate is determined using the design impervious factor (IF). The impervious factor of demolished sites is assumed undeveloped. Either detention storage with a regulated discharge must be provided or all impervious surfaces must be removed from the site.
- (3) There shall be no detrimental effect on the floodway or the floodplain elevation during a 25-year design storm upstream or downstream of the proposed development area as a result of the proposed development. All required detention volumes must be stored above 100-year floodplain.
- (4) The drainage area used for computation will be the total area tributary to the site outlet, including off-site properties that drain onto the site.
- (5) Engineering calculations must be submitted with the storm water discharge permit application. The calculations shall follow the procedures outlined in the Appendix to Ordinance No. 992, passed 1-12-15. (A copy of the ordinance is available for public inspection in the office of the City Clerk during normal business hours.)
- (6) Roof drains may be connected to a storm sewer system if the flow through the outlet to the AHJ's system is properly restricted. Unrestricted runoff from roof drain will not be accepted; there are no exemptions.
- (7) The AHJ and/or designee shall in the case of a proposed subdivision, make a determination as to those control elevations that shall be entered on the final plat or make a determination as to the necessity for deed restrictions on any particular lot in the subdivision requiring the preservation of mandatory drainage facilities. Where a non-subdivided parcel of land is proposed for development, the AHJ and/or designee shall make a determination as to the need for covenants to maintain responsibility for mandatory drainage facilities. All the facilities in the subdivision shall be located in easements dedicated to the public, and shall be subject to continual inspection during the construction period. Detention facilities within proposed subdivision or condominium developments may be established as county drains under the Drain Code of 1956, M.C.L.A. §§ 280.1 *et seq.*, as amended.

- (8) Proposed storm sewer enclosures must be designed so they will not adversely impact any adjacent properties, upstream or downstream, and must be designed to the impervious factors of the lands based upon future land use, not necessarily existing conditions.
- (9) SESC measures must be implemented.
- (B) Allowable discharge (Qa)/detention requirements.
- (1) The peak storm water discharge rate from any proposed development or redevelopment site as required in this chapter shall be restricted to an allowable discharge (Qa). The allowable discharge from the proposed area of development or redevelopment cannot exceed the calculated discharge from the proposed site based on one of the following methods. The method resulting in the lowest allowable discharge from the site shall be used in determining the required detention.
 - (2) 0.15 cubic feet per second per acre of contributing area. <i.e. 0.15 cfs/acre*10 acre site = 1.5 cfs Qa.
 - (3) Excess storm water runoff must be detained on site. Equations for determining the required volume of detention storage are outlined in the Appendix to Ordinance No. 992, passed 1-12-15. (A copy of the ordinance is available for public inspection in the office of the City Clerk during normal business hours.) Detention storage calculations must be included with review submittals.
- (C) Storm water detention requirements.
- (1) The storm water detention storage required for a site is to be calculated using the Appendix to Ordinance No. 992, passed 1-12-15. (A copy of the ordinance is available for public inspection in the office of the City Clerk during normal business hours.) This must meet the 25-year minimum storage storm. The allowable discharge is a maximum of 0.15 cfs per acre.
 - (2) If there are known existing flooding problem areas that will be impacted by a proposed development, the required detention volume will be determined by the AHJ.
- (D) Discharge restrictor requirements. Restrictors are required to regulate the discharge of storm water to the allowable discharge rate established for a site. The circular in-line restrictor is sized based on the orifice formula. The minimum restrictor size shall be two inches.
- $$a = Qa/[0.62 (64.4(h))^{1/2}]$$
- a - area of orifice (square feet).
- Ah = head differential from center of orifice to Hydraulic Grade Line of detention pond at maximum capacity, (feet).
- (E) Storm sewer piping requirements.
- (1) Proposed storm sewer shall be designed to have capacity to pass ten-year design storm runoff rate (Qd).
 - (2) All storm sewer materials must comply with the construction standards adopted by the AHJ.
 - (3) Provide two feet of minimum cover over the storm drainage system.
 - (4) Provide 18-inch vertical separation between all other utilities including, sanitary sewers and water mains.

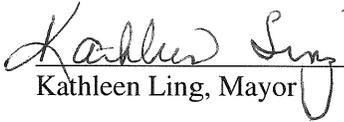
- (5) Provide ten-foot horizontal separation from other utilities.
 - (6) Manholes/catch basins shall be placed at a maximum distance of 400 feet from any other manholes/catch basins for access/maintenance purposes.
 - (7) Provide a sump discharge outlet for each individual lot in all developments. This outlet shall be a catch basin (minimum four-foot diameter) and/or provide a storm water lead to each lot. Manufactured cored and booted wye leads six-inch minimum to each lot are acceptable.
 - (8) Minimum pipe grades must be such to produce minimum scouring velocity of two and one-half feet per second when pipe is flowing full without surcharging.
 - (9) For storm drainage systems, plastic pipe may be used. This plastic pipe shall be either schedule 80 PVC, smooth walled HDPE, or SDR 35. If pipe is perforated, a manufacturer's "sock" shall be used over the pipe.
 - (10) Minimum pipe diameter for catch basin leads is 12 inches.
 - (11) Minimum pipe size for storm sewer main is 12 inches.
 - (12) Pipe should be sized for a ten-year design storm without surcharging when possible.
 - (13) When two pipes or more of different sizes come into a structure, the 8/10th flow lines shall match when possible.
 - (14) Catch basins should have a minimum sump depth of 24 inches.
- (F) Detention requirements.
- (1) Proposed storm drainage detention facilities shall be designed to have capacity to detain at minimum the 25-year recurrence interval design storm runoff volume in excess of the allowable discharge from the site. The detention requirement must be discussed with the AHJ and/or designee.
 - (2) The maximum design storage elevation in a detention area must be a minimum of one foot below the lowest ground elevation adjacent to the detention area.
 - (3) The design maximum storage elevation in a detention area must not be less than 12 inches below the minimum finish floor elevation of the proposed structure(s) or existing facilities.
 - (4) Design of detention facilities will incorporate features that facilitate their inspection and maintenance. The designer shall submit an Operation and Maintenance (O & M) Plan and/or provide a maintenance agreement, as necessary, for any detention facility prior to its acceptance by the AHJ.
 - (5) Designs of detention facilities shall incorporate safety features, particularly at inlets, outlets, on steep slopes, and at any attractive nuisances. These features may include, but not be limited to, fencing, handrails, lighting, steps, grills, signs, and other protective or warning devices so as to restrict access. Liability for the detention facilities will be the responsibility of the owner/developer.
 - (6) Side slopes and the bottom of detention basins shall be top soiled, to a minimum of four inches, and seeded. Soil erosion control blankets must be installed to protect slopes if adequate vegetation does not exist between September 1 and May 1.
 - (7) The side slopes and bottom of the basins shall be shaped with maximum slopes of one vertical to four horizontal to allow mowing of these surfaces.

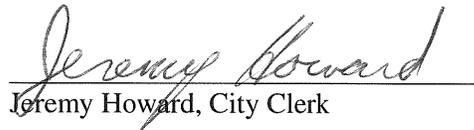
- (8) Detention basins and restrictors shall be maintained as necessary. The owner will have 30 days to complete necessary maintenance on a detention basin that has not been maintained or a restrictor that has been removed or not maintained. If this maintenance is not completed, the AHJ will have any necessary maintenance completed at the owner's expense, unless other arrangements have been agreed to in writing in an executed maintenance agreement.
 - (9) Detention basins shall be constructed with the top of banks a minimum of five feet from any pedestrian walkway (i.e., public and private sidewalks/bike paths).
 - (10) Underground storm water detention systems will be accepted. Storm water cleaning structures will be required at the inlets of these basins.
 - (11) Concrete walled systems will also be considered.
- (G) Rear lot drainage requirements.
- (1) Rear lot tile drains with contributing drainage areas up to one-half acre shall have a minimum diameter of six inches and a minimum pipe slope of 0.5%.
 - (2) Rear lot tile drains with contributing drainage areas greater than one-half acre and less than one acre shall have a minimum diameter of eight inches and a minimum pipe slope of 0.3%.
 - (3) Rear lot tile drains with a contributing area greater than one acre shall be considered main line storm sewer and shall be designed according to corresponding requirements. Calculations shall be submitted to verify the rear lot drains have the capacity to pass the ten-year design storm event.
 - (4) All lots must be provided with rear lot drainage.
 - (5) Rear lot drainage tiles shall have a minimum cover of two feet.
 - (6) The AHJ and/or designee shall approve rear lot drainage tile and catch basin material. The minimum diameter of a rear lot catch basin shall be 24 inches.
 - (7) An easement must be granted for rear lot drainage serving more than one owner. For drainage improvements from private property across other private property, easements must be obtained from property owners to assure perpetual drainage rights and maintenance commitments by participants sufficient to assure perpetual maintenance of the system. Copies of all executed easements and agreements must be submitted to the AHJ.
- (H) General compliance guidelines. The following guidelines are required minimum and maximum, unless written justification is provided and approved.
- (1) The minimum surface slopes for overland drainage are as follows:
 - (a) For bituminous paved surfaces, 1%.
 - (b) For concrete paved surfaces, 1%.
 - (c) For concrete curb and gutter, 0.4%.
 - (d) For drainage swales and valley shaped ditches, 0.5%.
 - (e) For rear lot drainage swales and valley shaped ditches, 0.5%.
 - (f) Landscape grading, 2%.
 - (2) The maximum surface slopes for overland drainage are as follows:
 - (a) For bituminous, concrete paved surfaces, 5%.
 - (b) For concrete curb and gutter, 5%.

- (c) For drainage swales and valley shaped ditches, 5%.
- (d) For rear lot drainage swales and valley shaped ditches, 5%.
- (e) Drainage swales and valley shaped ditches shall have maximum side slopes of four horizontal to one vertical.
- (f) Landscape grading, one vertical to four horizontal.

(3) Site designer is responsible to meet all ADA requirements.

Section 2. Publication and Effective Date. The City Clerk shall cause to be published a notice of adoption of this ordinance within 10 days of the date of its adoption. This ordinance shall take effect 30 days after its adoption.


Kathleen Ling, Mayor


Jeremy Howard, City Clerk

Introduced: May 9, 2016
Adopted: May 23, 2016
Published: May 31, 2016
Effective: June 22, 2016