

PROPOSED REVISIONS – STORMWATER

From Sec 98-7. Definitions.

Best Management Practice (BMP) means a practice, or combination of practices and design criteria, that comply with the most recent edition of the following publication or its replacement: EGLE NPS BMP Manual.

City means the City of Houghton, a municipality and, by extension its Planning Commission, City Council, Zoning Board of Appeals; or employees/agents acting on behalf of the City of Houghton.

Channel Protection Volume means the volume of runoff from a 1-year, 24-hour storm event that must be temporarily detained to prevent an increase in long-term downstream channel erosion.

Design storm means a precipitation event of a designated duration, type and return frequency. Typically used in a regulatory setting to designate required design parameters for stormwater facilities.

Detention basin means a stormwater management facility which captures, stores and detains runoff and releases it through an outlet structure at a controlled rate where the bottom is designed to dry between runoff events.

Develop means to change zoned land or property by altering its physical, structural, or functional use or drainage characteristics by acts such as construction, renovation, expansion, subdivision, regrading, clearing, or change of use.

Developer means the owner of, or entity contracted by the owner to develop, property.

Development means the result of any human-made change to zoned land or property that alters its physical, structural, or functional use such as construction, renovation, expansion, subdivision, regrading, clearing, or change of use.

Discharge means the rate of flow of water passing a given point.

Disturbed area means the surface of land from which vegetation has been disturbed, removed and/or subjected to earth moving activities.

Drainage means the collection, conveyance, or discharge of ground water and/or surface water.

Drainage area means the contributing watershed.

EGLE means the Michigan Department of Energy, Great Lakes, and Environment or successor organization. This department includes the former Michigan Department of Environmental Quality (MDEQ).

Erosion means the process by which land is worn away by action of wind, water, gravity or a combination thereof.

First-flush means the term given to the initial runoff quantity, having the highest pollutant concentration, which is defined as the first ½ inch of runoff.

Forebay means a depression near the entrance to a basin where coarse sediments are deposited.

Impervious means the surface condition which does not allow percolation or infiltration of precipitation, which results in nearly 100% runoff (paved roads, paved parking lots, sidewalks, and rooftops, etc.)

Infiltration means the movement of water downward into and through the soil profile; the rate of which is expressed in inches per hour.

Land Use is the characterization of land based on what can be built on it and what the land can be used for.

MDOT means the Michigan Department of Transportation.

NOAA means the National Oceanic and Atmospheric Administration or its successor organization.

Peak discharge rate means the maximum rate of storm water flow from within a drainage area expressed as cubic feet per second.

Predevelopment means existing site conditions prior to proposed activity on a site.

Redevelopment means changes (demolition, new construction or installation, reconfiguration, slope change, repaving, additional paving, or similar activities) to a previously developed site.

Retention basin means a stormwater management facility, either natural or manmade, which captures and holds runoff directed into it until it infiltrates the soil or evaporates.

Runoff means the portion of precipitation or snowmelt which does not infiltrate into the ground or evaporate and moves over the land.

Sediment means any solid particulate matter which has been moved from its site of origin by erosion, by water, is being transported by water, is in suspension in water, or has been deposited in a water body, wetland or floodplain.

Site means any tract, lot, or parcel of land or combination of tracts, lots, or parcels, which compose an area proposed for development.

Soil erosion and sedimentation control means employment of BMPs and/or any other installation, temporary or permanent, designed to minimize and prevent erosion and off-site sedimentation.

Storm drain means a system of open or enclosed conduits and appurtenant structures intended to convey or manage stormwater runoff, ground water and drainage.

Stormwater facility means structures, areas, or related items, which are used to control, store, receive, infiltrate, or convey runoff or a similar technique identified in a BMP.

Stormwater runoff means the surface drainage of precipitation resulting from rainfall, snowmelt, or other natural event or process.

Watershed means the total land area which contributes runoff, or land that is within such an area, to a common outlet. Also known as the drainage area or catchment.

Wet Detention Basin means a detention basin designed where a base water level occurs below the elevation of the outlet structure and may remain between runoff events.

Wetland means land composed of hydric soils, characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation and/or aquatic life per Section 324.30301 of Michigan Compiled Laws, part 303 of NREPA, Wetlands Protection, most recent edition thereof.

Article 3, Division 6 – Stormwater Management

DIVISION 6 – STORMWATER MANAGEMENT

Sec. 98-270. General.

1. Statement of Authority.

This Division is adopted in accordance with the authority of the City to adopt ordinances to protect the health, safety and welfare of the City, its residents, and surrounding areas.

2. Purpose.

The purpose of this Division is to establish minimum stormwater management requirements and controls to accomplish the following objectives:

- A. Protect public health, safety and welfare by requiring stormwater management as part of the Site Plan Review process whenever development is proposed.
- B. Prevent adverse hydrologic effects of stormwater runoff.
- C. Prevent overloading of existing City storm sewers.
- D. Reduce the need for future corrective projects.
- E. Ensure that all stormwater management facilities will be properly maintained.

Development work shall limit post-development peak discharge rates from a site to those which existed prior to the proposed development and shall address post-development discharge volumes in a manner that prevents erosion, damage to adjoining and downstream properties and infrastructure, and reduces the transport of contaminants and sediments.

3. Applicability

This Division 6 shall apply to any development which requires approval of a site plan pursuant to Article 6, Division 1 – Site Plan Review, or any other activity which will alter stormwater drainage characteristics of a development site.

A. Exceptions

- i. Construction of, or additions to, a single-family or two-family dwelling on a legal lot within a development that itself previously received approval under this Division, or on a

- legal lot that existed prior to the enactment of this Division, provided that less than one acre of land is cleared or graded for such construction;
- ii. Adding 5,000 square feet or less of impervious surface (new building, building addition, pavement, or combination) where such addition does not increase the impervious surface by more than 25%;
 - iii. Resurfacing an existing paved surface (regardless of square footage);
 - iv. Converting an existing gravel surface of 5,000 square feet area or less to a paved surface;
 - v. Landscaping or gardening involving less than one acre of land;
 - vi. Development within the defined Downtown Central Overlay District is exempt from meeting peak flow requirements;
 - vii. Agricultural activity or silvicultural practice that is consistent with an approved Natural Resources Conservation Service conservation plan.

B. For redevelopment sites, stormwater management requirements shall be determined by the following two categories:

- i. Category 1 – Major Additions
 - a. The addition of more than 5,000 square feet of impervious surface (new building, building addition, pavement, or combination).
 - b. Category 1 shall require treatment of the water quality, volume, and management of the channel protection volume for the total increased amount of impervious area attributed to the addition.
- ii. Category 2 – Total Reconstruction
 - a. Demolition, reconstruction, or replacement of any building, parking lot, driveway, or other impervious surfaces totaling more than 5,000 square feet.
 - b. Category 2 shall require stormwater management measures to address water quality, discharge rate, discharge volume, and stormwater detention. For the purposes of stormwater detention, the post-construction stormwater discharge rate from the site shall not exceed the release preconstruction discharge rate from the existing site.

C. Detention Exemptions

Redevelopment sites that can directly convey the 100-year storm event to the Keweenaw Waterway without passing through a city-owned stormwater conveyance are exempt from detention requirements and subject to the approval, in writing, of the authority or owner of the storm sewer. Evidence of such approval shall accompany the Stormwater Management Plan submittal.

D. Wetland, Floodplain, and Shoreline Permitting

The developer shall be responsible for obtaining any permits required pertaining to wetlands, floodplains, and shorelines as defined, delineated or regulated by the Michigan Department of Natural Resources; Michigan Department of Energy, Great Lakes and Environment; or U.S. Army Corps of Engineers.

E. Construction Site Runoff Controls

Prior to making any earth change on a development site regulated by this Division, the developer or owner shall first obtain a soil erosion permit issued in accordance with Part 91 of Act No. 451 of the Public Acts of 1994, as amended, if one is required.

Sec. 98-271. Written Provisions, Best Management Practices, and Guidance.

1. Design, Operation, and Maintenance Compliance

Stormwater design, operation, and maintenance shall comply with the written provisions contained in this Article 3 Division 6 and the most recent edition of the State of Michigan EGLE Nonpoint Source Best Management Practices Manual. In the event of conflicts, the specific provisions written herein shall govern over the EGLE Manual.

2. Guidance

The Southeastern Michigan Council of Governments Statewide Low Impact Development Manual published in 2008 shall be used as guidance in design, operation, and maintenance unless other guidance is provided by the City.

Sec. 98-272. Stormwater Management Plan Administration.

1. Application and Approval Required

No development shall commence without first applying for and receiving stormwater management plan approval as part of required site plan approval from the City except as otherwise exempted. The stormwater management plan shall be prepared and submitted as part of a site plan pursuant to this Chapter 98, Article 6, Division 1 – Site Plan Review or Chapter 74 – Subdivisions and Land Division.

2. Planning Commission Review

The Planning Commission or Zoning Administrator for minor site plans shall review the stormwater management plan as part of a site plan or subdivision plat review to determine compliance with the conditions contained in Section 98-272. 3, below. The Planning Commission may, at its discretion, have a review of the stormwater management plan conducted by a third party.

3. Conditions of Approval

A stormwater management plan, if required, shall be submitted as part of the proposed site plan for review by the Planning Commission or Zoning Administrator for minor site plans and will be approved only upon compliance with each of the following requirements:

- A. The developer has submitted a stormwater management plan complying with this Division;
- B. The stormwater management plan conforms with all applicable design and performance standards for stormwater management systems of this Division;
- C. All stormwater facilities and construction site erosion and runoff controls are designed in accordance with BMPs published by applicable regulatory bodies, current on the date the stormwater management plan is submitted to the City;
- D. Payment of the stormwater review fee(s) pursuant to Section 98-272.5.
- E. The stormwater management plan contains a plan for both routine and long-term maintenance as well as an emergency management and maintenance plan.

4. Approved Stormwater Management Plan and Amendments

- A. Approved plans - Approval of final development plans, site plans, and final subdivision plats shall not be granted prior to approval of the stormwater management plan but may be simultaneously approved with the stormwater plan approval.
- B. Amendments - Amendments to an approved stormwater management plan may occur only under the following circumstances:
 - i. The holder of an approved plan shall notify the zoning administrator of any proposed amendment to such approved plan.
 - ii. Minor changes may be approved by the zoning administrator where the proposed revision does not alter the basic design or any specified conditions of the plan as agreed upon by the city. The zoning administrator shall consider the following to be a minor change.
 - a. Any change that does not decrease the effectiveness of approved stormwater facilities.
 - b. Any change that does not cause an increase in the runoff or discharge rate. Should the zoning administrator determine that the requested modification to the approved plan is not minor, then the applicant shall submit a new plan for review as required by this Division.
- C. Expiration – Approval shall expire one year from the date of such approval, unless construction has commenced and proceeds in accordance with the approved stormwater management plan.

5. Stormwater Permit Review Fees

The fee for reviewing a stormwater management plan or for a third-party review of a stormwater management plan shall be set from time to time by the council and is listed in Appendix A to this Code.

Sec. 98-273. Completion of Construction.

1. No Change in Completed Approved Facilities and Related Earthwork

Approved stormwater management facilities or related earthwork, after construction, shall be maintained in good condition, in accordance with the approved stormwater management plan, and shall not be subsequently altered, revised or replaced except in accordance with the approved stormwater management plan, or in accordance with approved amendments or revisions to the plan.

Sec. 98-274. Maintenance.

1. Responsibility

- A. Responsibility for maintenance - Maintenance of stormwater facilities shall be the responsibility of the owner of the property except as listed below. The owner is responsible for the operation, maintenance, and repair of stormwater facilities and compliance with BMPs in accordance with the approved plan. An option other than the property owner is a property owner's association which shall include provisions for financing necessary maintenance by deed restrictions.
- B. Recordkeeping - Persons or entities responsible for the operation and maintenance of stormwater facilities shall make records of the installation and of all maintenance and repairs and shall retain the records for at least five years after the maintenance or repairs are

completed. These records shall be made available to the City upon request.

2. Access

When any new stormwater facilities are constructed on private property, or when any new connection is made between private property and a public drainage system, the property owner shall grant to the City the right to enter the property at reasonable times and in a reasonable manner for the purpose of periodic inspections. This access includes the right to enter a property when the City has reason to believe that a violation of this Division is occurring or has occurred, or to enter when deemed necessary for the abatement of a public nuisance, hazard, or correction of a violation of this Division. That right does not oblige the City to abate any public nuisance or hazard; or correct any violation of this Division.

3. Easements and Other Approvals

The owner shall provide all easements or approvals necessary to implement the stormwater management plan and to otherwise comply with this Division in form and substance as required by the City.

98-275. Enforcement.

1. Violations

A person who violates any provision of this Division is responsible for a municipal civil infraction, subject to payment of a civil fine as set forth in Chapter 51 of the city code.

2. Stop Work Order

- A. Stop work order – Where there is work in progress that causes a violation of any provision of this Division, the City is authorized to issue a stop work order to prevent further or continuing violations.
 - i. All persons or entities to whom the stop work order is directed, or who are involved in any way with the work or matter described in the stop work order shall fully and promptly comply with this order.
 - ii. The City may also undertake or cause to be undertaken any necessary protective measures to prevent violations of this Division or to avoid or reduce the effects of noncompliance.
 - iii. The cost of any such protective measures shall be the responsibility of the owner of the property.
- B. Emergency measures - When emergency measures are necessary to mitigate a nuisance, to protect public safety, health and welfare, or to prevent loss of life, injury or damage to property, the City is authorized, but not required, to carry out or arrange for all such emergency measures. Property owners shall be responsible for the cost of such measures made necessary as a result of a violation of this ordinance and shall promptly reimburse the city for all such costs.

3. Restoration

Any violator of this Division may be required to restore land to its predevelopment condition and/or repair and stabilize damaged areas. In the event that restoration or repairs are not undertaken within a reasonable time after notice, the City may take necessary corrective action, the cost of which shall be the responsibility of the property owner, to the extent permitted by law.

4. Delinquent Fees and Fines

- A. If any billing for fees or fines related to City maintenance of, or noncompliance with requirements of this ordinance shall remain unpaid, the amount unpaid thereof shall constitute a lien on the property to which such service is provided to the extent permitted by law.
- B. If any bill remains unpaid for 60 days from the date of issue, then the City shall serve notice, by certified mail with return receipt requested, that if the amount owed is not paid in full within six months of the certified letter, the nonpayment will be certified annually, on January 1, by the City official or officials in charge of the collection, to the City Assessor of the local unit the facts of delinquency, who shall place the same on the next tax roll of the local unit to the extent permitted by law.
- C. To the extent permitted by law such charges so assessed shall be collected in the same manner as general taxes of the City against such premises are collected and lien there and enforced.

98-276. Stormwater Management Plan Documentation and Contents.

1. Documentation

- A. Using maps, illustrations, reports, narrative, and calculations the stormwater management plan shall display the required information in a clear and logical sequence as part of the site plan documents. The stormwater management plan shall be sufficiently detailed, including calculations, to specify the type, location, and size of all erosion control, stormwater facilities and stormwater structures.
- B. The stormwater management plan shall be drawn to a scale consistent with other site plan review documents.
- C. If the stormwater management plan is reliant on easements or permission from entities (other than the City) for conveyance or discharge, evidence of such (e.g.: registered easements, permits, etc.) shall be included in the documentation submitted for review.

2. Contents

The following requirements are in addition to the design criteria specified in Section 98-277. Upon written request with justification by the developer or owner, or at its own initiative, the planning commission, or Zoning Administrator for minor site plans may determine that one or more of the following requirements may be waived. Waivers are only valid upon written approval by the City.

- A. Topographic base map - The existing and proposed topography of the site including the alignment and boundary of the natural drainage courses, with contours having a maximum interval of not greater than two feet. The map shall also show existing surface water drainage (permanent and intermittent) and flow direction, including streams, ponds, culverts, ditches, and wetlands; location of 100-year floodplain, if applicable to the site; current land use including all existing structures, utilities, roads, etc. and easements; designated natural areas; and any proposed environmental mitigation features.
- B. Soils Information – If infiltration is to be used as a means of disposal, the map shall contain soils information sufficient to prove design efficacy at and proximate to the proposed infiltration infrastructure. For sites larger than 3 acres the Houghton County Soils Classification Map may be used.
- C. Watershed - A map delineating the drainage boundary contributing to the proposed development, including drainage which enters the site from other properties; and each discharge point and its contributing watershed exiting the development on a topographical map.

- D. Calculations – Stormwater calculations shall be provided in accordance with the design standards referenced in Section 98-277.
- E. Sedimentation and erosion control plan - A soil erosion and sedimentation control plan shall meet the requirements as outlined in Section 98-270.3.E. This plan shall provide the effective control of construction site stormwater runoff and sediment track-out onto roadways.
- F. Maintenance plan - A document detailing the maintenance of the planned stormwater facilities including the removal of sediment materials and trash from stormwater facilities. The maintenance plan shall include a written commitment to provide routine, emergency, and long-term maintenance of the facilities and, in the event that the facilities are not maintained in accordance with the approved stormwater management plan, the written commitment shall authorize the city to maintain any onsite stormwater facility as reasonably necessary, at the owner's expense.
- G. Sealed Plans – The submitted plans shall be sealed and signed by a licensed Michigan professional engineer qualified to prepare stormwater management plans unless a waiver is granted by the City.
- H. Vegetation plan - A drawing which details the existing vegetation to remain, protective measures to be undertaken during construction, and new vegetation to be added.
- I. Phased development plans – the stormwater management plan shall include all proposed phases, order of development, schedule, and demonstrate compliance of each phase with this Division.

3. General Requirements

- A. All developments and redevelopments subject to approval under this Division, unless otherwise regulated, shall incorporate stormwater management systems which are designed, constructed, and maintained such that:
 - i. Post-development discharge rate from the site is less than or equal to pre-development discharge rate from the site.
 - ii. Post-development discharge volume is transported and managed in such a manner to prevent flooding and erosion, protect neighboring and downstream properties, protect water quality and shall not overload downstream stormwater conveyances.
 - iii. First flush is captured and managed according to current Best Management Practice.
 - iv. Established BMPs pertaining to stormwater management are followed.

98.277. Performance Standards and Design Criteria.

- A. Stormwater facilities shall be designed to prevent flood hazards and water pollution related to stormwater runoff, soil erosion and channel erosion from the proposed earth change, development, or redevelopment.
- B. Existing stormwater from upstream and offsite locations shall be safely conveyed around or through the site or stored onsite. Existing flows from offsite that contribute to onsite flow or that are currently conveyed through the site shall be addressed in the design.
- C. Developers of residential developments shall provide stormwater facilities that account for the total buildout of the lots within the development including, but not limited to, projected roof, lawn and driveway areas, all new roads, and undeveloped areas.
- D. Developers of commercial or industrial areas shall provide stormwater facilities for all proposed improvements for which planning commission approval is sought. For subdivided commercial or industrial lots, future developers/owners will be responsible for their proposed development. However, the city may request evidence that future development can reasonably accommodate facilities that meet the requirements of this Division.
- E. The following design storm events shall be used in calculating the rates and volumes used in

the design of the stormwater facilities:

Recurrence Interval (Years)	Duration (Hours)
2	24
25	24
50	24
100	24

- F. Rate of discharge: stormwater facilities for the developed site shall maintain or reduce the peak discharge rate following the same rainfall, as compared to predevelopment conditions at the site.
- G. Volume of discharge: stormwater facilities for the developed site shall address any increased volume of water discharged from the site using best management practices to avoid adverse impacts to downstream property owners and watercourses. These adverse impacts may include, but are not limited to, flooding, excessive soil saturation, crop damage, erosion, water quality impairment or wildlife habitat damage.
- H. First-Flush from impervious surfaces shall be contained within an infiltration or detention basin. Border areas, streets and rights-of-way immediately adjacent to the development site not readily served by proposed onsite stormwater runoff collection features may not need to be captured by first flush containment, provided they account for less than 25% of the calculated first-flush runoff.
- I. Detention Basins – when employed as stormwater facilities:
 - i. Shall be designed to protect public safety;
 - ii. Shall be permanently stabilized to minimize erosion;
 - iii. Shall have an emergency overflow management system;
 - iv. Shall have landscaping and be visually attractive;
 - v. Shall include a forebay depression;
 - vi. Shall be designed with no less than one foot freeboard;
 - vii. May be below ground.
- J. Infiltration facility design shall be based on the site criteria including soil permeability and stability of soil structure during saturated periods when designing stormwater infiltration components of a management system.
- K. Small projects that have less than 0.5 acre of impervious surface may base storage volume on at least two inches of runoff from all impervious surfaces in lieu of a detailed hydrologic calculation.
- L. The following areas and conditions are prohibited to use stormwater infiltration:
 - i. Fueling and vehicle maintenance and storage areas.
 - ii. Areas with less than 4 feet separation distance from the bottom of the infiltration system to the elevation of seasonal high groundwater or the top of bedrock.
 - iii. Areas with runoff from industrial, commercial and institutional parking lots and roads with less than 5 feet separation distance from the bottom of the infiltration system to the elevation of seasonal high groundwater or the top of bedrock.
 - iv. Areas where the slope exceeds 20%.
 - v. Areas within 400 feet of a community water system well or within 100 feet of a private potable water well.
 - vi. Any area where the soil between the bottom of the infiltration system and seasonal high groundwater or the top of bedrock is a clean sand.
- M. Design Storm Events – When preparing runoff calculations for locations within the city, the most recently published NOAA Atlas Precipitation Frequency Estimates for the City of

Houghton, Michigan shall be used.

N. Runoff and Routing Calculation:

- i. Methods - All existing and proposed stormwater runoff calculations shall be completed using the USDA – Natural Resources Conservation Service (NRCS) NEH Part 630 methodology (commonly known as TR-55), or equivalent methodology. Equivalent methodology can be TR-20, winTR-20 (limited to 2,000 acres) HEC-1, or HEC-HMS (any size basin) which include basin and pond routing. Other methods must be approved in writing by the city before submittals are made.
- ii. Submittals – To demonstrate compliance with this Sec. 98-277, calculations must be supplied for, at a minimum, the four storm events listed in in E. above. The engineer shall justify the stormwater management system design and which factors (discharge rate, discharge volume, time of concentration, etc.) governed the design. Give a brief description of methods used and state all assumptions. Provide flow rates, detention volumes, routing calculations, conveyance capacities, freeboard heights, and all other pertinent calculations. The design shall consider both the highest runoff rate and the highest runoff volume and address each.

O. Landscaping and Vegetation

- i. Vegetative materials used shall adhere to the city's landscape requirements per Sec. 98-230.
- ii. It is strongly encouraged that the vegetation plan includes native vegetation species whose root systems provide for maximum uptake of nutrients and water.

Secs. 98-278 - 98-399 Reserved.