

**ORDINANCE #329  
DRAIN LID**

Adopted: 11/9/11  
Effective: 11/15/11

An Ordinance to approve alternate design standards for the regulation and control of storm water and pollution caused directly or indirectly by storm water runoff from all zoning districts within the Charter Township of Bangor; to protect sensitive areas in the community; and to encourage alternate construction standards which will implement the long range goals and objectives adopted by the Bay County Storm Water Authority which affects both storm water and natural water resources but encourages flexibility in design concepts..

**THE CHARTER TOWNSHIP OF BANGOR, BAY COUNTY, MICHIGAN, ORDAINS:**

**SECTION 1. Short Name.** This Ordinance is hereby adopted and shall be known as the Bangor Township Alternate Design for Storm Water Discharge and Preservation of Natural Water Resources Ordinance.

**SECTION 2. Repeal of Existing Ordinances.** All Ordinances, resolutions or orders, or parts thereof, in conflict with the provisions of this Ordinance are hereby repealed in their entirety.

**SECTION 3. Definitions.**

“BASWA” is the Bay Area Storm Water Authority of which the Charter Township of Bangor is a member, with the lead governmental agency being the Bay County Drain Commissioner.

“BMP” or “Best Management Practice” means a practice or combination of practice and design criteria that comply with the Michigan Department of Environmental Quality Guidebook for Michigan Watersheds and Low Impact Development Manual for Michigan or equivalent practices and criteria that minimize storm water runoff and prevent the discharge of pollutants into storm water.

“LEED” is a low impact design concept called Leadership in Energy and Environmental Design. LEED is an internationally recognized green building certification system, providing third-party verification primarily through the Washington, D.C. based U.S. Green Building Council (USGBC) which is a 501 c3 non-profit organization committed to a prosperous and sustainable future through cost-efficient and energy-saving green buildings using the concept of LEED. Leed is aimed at improving performance across all the areas involved in construction of buildings and infrastructure, including energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

“LID” means Low Impact Development which incorporates storm water management by the use of the basic principle that is modeled after nature: manage rainfall where it lands. LID uses design methods to control storm water by mimicking a site’s pre-settlement hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source. Storm water management historically focused on managing the flood effects from larger storms.

Exclusive reliance on peak rate control prevents flooding, but doesn't protect streams and water quality. Thorough storm water management should target infrequent large storms, as well as the much more frequent, smaller storms. With the change in land surface generated by land development, not only does the peak rate of runoff increase, but the *total volume* of runoff also often dramatically increases. LID focuses on both peak rates and total volumes of runoff. LID application techniques are designed to hold constant peak rates of runoff for larger storms and prevent runoff volume increases for the much more frequent, smaller storms. Thus, the natural flow pattern is kept in better balance, avoiding many of the adverse impacts associated with storm water runoff.

**SECTION 4. Purpose.** LID is often seen as a site specific storm water management practice, while smart growth is often a broader vision held at a community, county, or regional level. Wherever possible, design should be based on site specific information gathered by field investigation or other local data sources. It is the purpose of this ordinance to establish minimum storm water management requirements and controls to accomplish, among others, the following objectives:

- A. To minimize increased storm water runoff rates and volumes from identified land development;
- B. To minimize nonpoint source pollution;
- C. To minimize the deterioration of existing watercourses, culverts and bridges, and other structures;
- D. To encourage water recharge into the ground where geologically favorable conditions exist;
- E. To maintain the ecological integrity of stream channels;
- F. To minimize the impact of development upon streambank and streambed stability;
- G. To control non-storm water discharges to storm water conveyances and reduce pollutants in storm water discharges;
- H. To preserve and protect water supply facilities and water resources by means of controlling increased flood discharges, stream erosion, and runoff pollution;
- I. To reduce the adverse impact of changing land use on water bodies and, to that end, this ordinance establishes minimum standards to protect water bodies from degradation resulting from changing land use where there are insufficient storm water management controls;
- J. To ensure that storm drain drainage or storm water BMPs are adequate to address storm water management needs within a proposed development, and for protecting downstream landowners from flooding and degradation of water quality. The procedures, standards, and recommendations set forth in this Ordinance and the State of Low Impact Development Manual for Michigan are designed for these purposes; and
- K. To ensure that all storm water facilities necessary for a proposed development will have an appropriate governmental unit responsible in perpetuity for performing maintenance or for overseeing the performance of maintenance by a private entity, such as a property owners' association.

**SECTION 5. Procedure.**

- A. All site plans shall include a storm water management plan for the entire site being considered for development. The storm water plan shall be designed, constructed and

maintained so as to prevent flooding, minimize stream and river impacts, protect water quality and achieve the purposes of this Ordinance as set forth in Section 4 above. The design of the storm water management plan may:

1. Comply with generally accepted local requirements; or,
  2. Use LEED designs so that LID development is incorporated into the plan; or
  3. Use a combination of both A and B.
- B. Copies of the storm water management plan shall be submitted to both the Charter Township of Bangor for review by its engineering and/or planning consultants to ensure that there is compliance with all other applicable ordinances and meets the intent of this Ordinance. After review and comment is made at the local level, then both the comments and the plans shall be submitted to the Bay County Drain Commissioner for his comments. The applicant will submit five copies of final construction plans for storm water BMPs with a letter of transmittal submitted to the Charter Township of Bangor with the final site plan /subdivision plan review. Construction or building permits shall not be issued until approval of the construction plans. The construction plans shall be drawn to a scale no smaller than 1" = 50', and on sheets no larger than 24" x 36".

The scales used shall be standard engineering scales and shall be consistent throughout the plans. When plans have been completed with computer aided design technology, locations should be geo-referenced and a copy of the electronic file shall also be provided. The construction plans shall include:

1. Proposed storm water management facilities (plan and profile).
  2. Proposed storm drains including rim and invert elevations.
  3. Proposed open channel facilities including slope, cross section detail, bottom elevations, and surface material.
  4. Final sizing calculations for storm water quality and quantity treatment facilities and storm water conveyance facilities.
  5. Storage provided by one (1) foot elevation increments.
  6. Tributary area map for all storm water management facilities indicating total size and average runoff coefficient for each sub-area.
  7. Analysis of existing soil conditions and groundwater elevation (including submission of soil boring logs) as required for proposed retention and infiltration facilities.
  8. Details of all storm water BMPs including but not limited to:
    - I. Outlet structures.
    - ii. Overflow structures and spillways.
    - iii. Riprap.
    - iv. Manufactured treatment system.
    - v. Underground detention cross section and product details.
    - vi. Cross section of infiltration and/or bio-retention facilities.
  9. Final landscaping plan and details.
  10. Final easements for storm water management facilities.
  11. Maintenance plan and agreement.
- C. Construction drawings and engineering specifications shall be subject to review and

approval by the Bay County Drain Commission and Environmental Consultants to ensure that the construction plan conforms with the approved Storm water Plan and that adequate storm drainage will be provided and that the proposed storm water management system provides adequately for water quantity and quality management to ensure protection of property owners and watercourses both within the proposed development and downstream.

- D. A construction permit shall not be issued unless the detailed engineering drawings and specifications meet the standards of this Ordinance, applicable Bangor Township ordinances, engineering standards and practices, and any applicable requirements of other government agencies.
- E. An as-built certification for storm water BMPs must be provided to the Bay County Drain Commission prior to final approval of the development. The certification should include the following:
  - 1. A plan view of all detention basins, retention basins, and/or sediment forebays detailing the proposed and final as-built elevation contours. Sufficient spot elevations should be provided on each side of the basin, the bottom of the basin, and along the emergency spillway(s).
  - 2. Detention basin, retention basin, and/or sediment forebay calculations along with corresponding volumes associated with the as-built elevations. The proposed volume and final as-built volume should be indicated.
  - 3. Final as-built invert elevations for all inlet pipes and all associated outlet structure elevations, riser pipe hole sizes, and number of holes should be included. Invert elevations of the final outlet pipe to the receiving water and elevation of the final overflow structure should also be provided.
  - 4. The side slopes of all storm water basins should be identified and must meet minimum safety requirements.
  - 5. The certification should be signed and sealed by a registered professional engineer or landscape architect.

**ORDINANCE DECLARED ADOPTED**