

**TRAVERSE CITY GROUND-WATER PROTECTION AND
STORM-WATER CONTROL ORDINANCE
GUIDELINES**

PREAMBLE

The guidelines were developed to be used in conjunction with the Traverse City Ground-Water Protection and Storm-Water Runoff Control Ordinance. These guidelines will be updated as needed to reflect the new technology and best management practices available to deal with ground-water protection and storm-water runoff on sites within the City of Traverse City.

A. GROUND-WATER PROTECTION

1. General-purpose floor drains shall be allowed only if they are connected to: an on-site holding tank; to the public sanitary sewer system with approved oil separator system or; a system authorized through a State ground-water discharge permit.
2. Secondary containment for above-ground areas where hazardous substances and polluting materials are stored or used shall be provided. Secondary containment shall be sufficient to store the substance for the maximum anticipated period of time necessary for the recovery of any released substance.
3. Outside storage of hazardous substances and polluting materials shall be prohibited except in product-tight containers which are protected from weather, leakage, accidental damage and vandalism and are stored within a secondary containment system.
4. Out-of-service abandoned tanks shall be emptied and removed in accordance with the State of Michigan Underground Storage Tank Rules.

B. STORM-WATER RUNOFF CONTROL FACILITIES

1. Earth changes and related improvements shall be designed, constructed and maintained to minimize the extent and duration of earth disruption and to protect the natural environment.
2. On-site storm-water runoff control facilities which protect water quality and prevent unwanted flooding shall be required for all sites. Storm-water runoff control facilities may include but are not limited to detention basins, retention ponds, infiltration trenches, infiltration basins, drainage wells, grass swales, grass swales with check dams, filter strips and other facilities.

3. Storm-water control facilities shall be planned and designed to reproduce the pre-development hydrology of the site to the maximum possible extent.
4. Infiltration trenches, perforated pipe and infiltration basins shall be encouraged provided that (a) sediment is removed from storm-water runoff before runoff reaches the infiltration facility and (b) adequate provisions for facility maintenance have been made.
5. Infiltration basins shall be lined with a vegetative cover designed to slow the flow of runoff and to trap pollutants. Sediment traps, catch basins and/or sediment basins shall be provided for the purpose of collecting sediment before storm water reaches the infiltration basin or trench. Infiltration facilities shall be designed to distribute storm-water runoff volume evenly over the floor of the basin or trench and to prevent ponding or standing water.
6. Drainage wells, commonly known as dry wells, may be used as a storm-water control method if the use of storm-water retention or detention basins, either on- or off-site, is not feasible. All drainage wells must provide the following: (1) catch basins, sediment basins, silt traps or vegetative filter strips to remove sediment from storm water flowing to the drainage well, (2) an approved overflow system and (3) adequate provisions for maintenance.
7. Detention basins shall be designed as extended detention basins to detain runoff on the site for 24 hours or more to allow for maximum settling and removal of suspended solids and other pollutants. Vegetation shall be installed and maintained in the basin to help absorb pollutants.
8. When a downstream outlet (open channel or storm sewer) is unacceptable, minimum detention, retention and infiltration basins on the site shall have the storage capacity to hold the increase in runoff volume generated by the earth change. The required volume shall be calculated by comparing the undeveloped condition to the developed condition for a 25-year 24-hour frequency storm event. Provisions for overflow shall be made. In general, this paragraph shall apply to larger open areas where storm sewers do not exist.
9. If a quantity or capacity problem exists with an outlet as may be determined by the City Engineer, the peak rate of discharge from a site shall be as determined by the City Engineer. It should be assumed for design purposes, that such problems exist with almost all storm sewers within the City. However, in general, such runoff rate will normally not be less than the pre-developed rate, and required on-site storage shall not be greater than that required for a 10-year frequency storm event with 24 hour minimum detention. In general, a short hand design method of a 2½" rain over all impervious surfaces may be used. Drainage facilities for quantity purposes shall be designed to pass a 10-year frequency storm event.

10. As a minimum, all drainage control on all multi-family, commercial and industrial sites when developed shall be designed to allow infiltration or to retain in some acceptable manner all small storms or first-flush runoff which shall be the first one-half (1/2") inch of runoff. The City Engineer, at the written request of the Michigan Department of Environmental Quality, may reduce the minimum infiltration retention requirements if it is determined that the introduction of surface storm-water infiltration into the groundwater would increase and/or exacerbate the existing known pollution at a site.
11. A two-stage design for detention and retention basins shall be used on sites where parking lots and other impervious surfaces exceed five (5) acres in size as well as for other sites identified by the City Engineer or the Michigan Department of Environmental Quality as requiring special protection for water quality purposes. In such cases, a meeting will be set up between the property owner/developer and City Engineer to discuss details of design and requirements.
12. The use of Swirl Concentrator technology or other "new technology" systems in which the removal of a minimum of 80% of pollutants, including grit, oil, hydrocarbons and floating contaminants for on-site storm-water runoff control facilities, is encouraged. Where these "new technology" systems are designed within projects for areas where off-site receiving and conveyance facilities have adequate capacity, the City Engineer may reduce or eliminate on-site retention/detention requirements.

C. STORM-WATER CONVEYANCE FACILITIES AND RECEIVING WATERS

1. Unless otherwise approved, storm-water runoff shall be conveyed through swales, vegetated buffer strips or other approved facilities so as to decrease runoff velocity, to remove pollutants, to allow suspended sediments to settle and to encourage infiltration.
2. When storm sewers are determined to be necessary by the City Engineer, the applicant shall design the drainage system to mitigate any harmful impact on water quality by using appropriate structural devices or other best management methods.
3. Drain spouts from roofs and sump pumps from basements shall be directed to on-site swales, detention basins or other measures designed to slow the flow of storm-water runoff to non-erosive velocities whenever possible.

D. SITE CONSTRUCTION CONTROL

1. All earth changes shall be designed, constructed and maintained in such a manner as to minimize the extent and duration of earth disruption.

2. Soil erosion control facilities shall be designed to remove sediment from storm water before the storm water leaves the site of the earth-change activity.
3. Vegetative stabilization or other soil erosion control measures shall be installed and maintained throughout the development process. Critical areas exposed during construction shall be protected with temporary vegetation, mulching, filter fences or other methods of stabilization.
4. Storm-water runoff control and soil erosion control measures shall be installed before grading, filling or removal of vegetative cover is initiated.
5. Filter fences and other soil erosion control facilities installed at the perimeter of a development site shall be installed at least five (5') feet from the property boundary to allow for on-site maintenance.
6. Fill slope grades on the perimeter of the graded area adjacent to lakes, streams, wetlands and storm-water ponds, or adjoining properties shall not have a slope steeper than a 33 percent rise (3 feet horizontal to 1 foot vertical) unless approved by the City Engineer.
7. Retention and detention basins shall have an emergency overflow system. The overflow system shall be designed to accommodate flow from the 100-year storm event, or as otherwise required by the Michigan Department of Environmental Quality.
8. Side slopes of any storm-water retention or detention basin shall be no greater than 3:1 (horizontal to vertical) so as to prevent soil erosion and allow for basin maintenance.
9. Storm-water basins with depths greater than three feet shall have one or more of the following safety features: (a) Safety ledges at the basin perimeter which are at least eight feet wide for every three feet of vertical height; (b) aquatic vegetation surrounding the basin which discourages wading; or (c) fencing to prevent unauthorized access to the basin.
10. Soil erosion control measures shall be maintained throughout the duration of the earth change including the later stages of development. Maintenance activities include but are not limited to removal of accumulated sediment, structural repairs, reseeded or replacement of vegetative cover and lawn mowing.
11. Removal of natural vegetation and tree roots within twenty five (25) feet of the ordinary high water mark of any wetland, lake or stream shall be prohibited unless approved for recreational uses. A lake or stream buffer area greater than twenty five (25) feet may be required by the City Engineer if necessary for soil erosion control purposes.

12. Grading of land or other earth changes shall not be permitted in any flood plain unless approved by the Michigan Department of Environmental Quality as well as the City Engineer. Further, all approved grading of land or other earth changes within a flood plain or within the required buffer area of a lake or stream shall not reduce the storage capacity of the flood plain and shall meet the requirements of the City Zoning Ordinance.

E. DESIGN PARAMETERS FOR FACILITY CONSTRUCTION

1. Design parameters for ground-water protection, storm-water management and soil erosion facilities shall follow best management practices as identified by the City Engineer, the Grand Traverse County Soil Conservation Service and/or the Michigan Department of Environmental Quality.
2. The Michigan Department of Environmental Quality "Urban Storm-water Best Management Practices Manual" will be used as a reference along with other manuals such as "Controlling Urban Runoff" by the Metropolitan Washington Council of Governments and the Small Business Guide To Secondary Containment by the Clinton River Watershed Council.