

CITY OF MILFORD

**WATER MANAGEMENT
AND
SEDIMENT CONTROL
(WMSC)**

REGULATIONS

2017

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ARTICLE 1.0 WMSC GENERAL PROVISIONS

SECTION 100 TITLE

These regulations shall be known and may be cited as the City of Milford Water Management and Sediment Control Regulations and are hereinafter referred to as WMSC Regulations.

SECTION 110 STATUTORY AUTHORIZATION

These WMSC Regulations of The City of Milford are promulgated pursuant to Section 307.79 of the Ohio Revised Code, whereby a Milford City Council may adopt rules to abate soil erosion and water pollution from soil sediment.

SECTION 120 ADMINISTRATION

These WMSC Regulations of City of Milford shall be administered by the Milford Public Works Department. The Public Works Director shall enforce these regulations and issue such notices and orders as may be necessary.

SECTION 130 MEANS OF APPEAL

If a request for a permit is disapproved or if the ruling of the Public Works Director is questioned, any aggrieved party may appeal such ruling to the City of Milford Board of Zoning Appeals (BZA) in accordance with *Chapter 1131 Board of Zoning Appeals*, of the Milford Zoning Ordinance. An appeal or a variance to the BZA, lawfully and completely filed within thirty (30) days of the date of decision, shall stay enforceable action and penalties until a hearing has been held and a decision rendered by the BZA.

SECTION 140 PURPOSE AND INTERPRETATION

Milford City Council adopts these regulations to establish management and conservation practices which will eliminate or abate soil erosion and degradation of the waters of the State from sediment caused by non-farm earth disturbing activities. These regulations further intend, but are not limited, to accomplish the following:

140.1 Eliminate or minimize downstream flooding, erosion, and sedimentation damages caused by development and other earth disturbing activities.

140.2 Eliminate or reduce damage to watercourses which may be caused by increases in the volume of the runoff entering the streams or by the

sediment and pollutants contained in the stormwater runoff.

140.3 Establish a basis for the design of stormwater management systems in order to protect the current and future rights and options of both the dominant and sub-servient property owners and help assure the long-term adequacy of the stormwater management systems that will be required.

140.4 Encourage innovative design which will enhance the control of erosion and sediment in a manner consistent with the intent of the regulations. Provide for innovative design of the controlled release of stormwater from the site, in lieu of those requirements resulting from a strict interpretation of these regulations so long as the system meets the allowable discharge rates, or an equivalency is met.

SECTION 150 WMSC APPLICATIONS

These WMSC Regulations shall apply to all non-farm earth disturbing activities performed on the incorporated lands of Milford, Ohio except those activities excluded in Ohio Revised Code Section 307.79.

Exceptions:

1. Strip mining operations regulated under Section 1513.01 of the Ohio Revised Code.
2. Surface mining operations regulated under Section 1514.01 of the Ohio Revised Code.
3. Public highways, transportation, and drainage improvements or maintenance thereof undertaken by a government agency or political subdivision provided that its standard sediment control policies have been approved by City Council or the Chief of the Division of Soil and Water Conservation of the Ohio Department of Agriculture, and provided further that such sediment control practices are no less restrictive than these WMSC Regulations.

150.1 The construction of new roads and roadway improvement projects by public entities may implement post-construction BMPs in compliance with the current version of the Ohio Department of Transportation's "Location and Design Manual, Volume Two Drainage Design."

SECTION 160 DISCLAIMER OF LIABILITY

Neither submission of a plan under the provision herein nor compliance with the provisions of these WMSC Regulations shall relieve any person(s) from responsibility for damage to any person(s) or property otherwise imposed by law; nor shall it create a duty by the City Council or Public Works Director to those impacted by soil sediment pollution and stormwater runoff.

SECTION 170 SEVERABILITY

If any clause, section, or provision of these WMSC regulations is declared invalid or unconstitutional by a court of competent jurisdiction, validity of the remainder shall not be affected thereby.

SECTION 180 EFFECTIVE DATE

The WMSC Regulations shall become effective from and after the date of its approval and adoption, as provided by law.

SECTION 190 REFERENCES

1. Ohio Department of Natural Resources, *Rainwater and Land Development – Ohio’s Standards for Stormwater Management, Land Development and Urban Stream Protection*, Latest Edition.
2. Ohio Department of Transportation, *Location and Design Manual – Volume 2, Drainage Design*, Latest Edition
3. Ohio Environmental Protection Agency, *Storm Water Discharges from Small and Large Construction Activities – General Permit*, effective date April 21, 2013.
4. Natural Resources Conservation Service, U.S. Dept. of Agriculture, *Urban Hydrology for Small Watersheds (Technical Release No. 55)*, June 1986.

SECTION 191 AMENDMENTS

Whenever the public necessity, convenience, general welfare, or good water management practice requires, City Council may amend, change, or supplement these regulations in the procedure as specified in Section 307.79 of the Ohio Revised Code.

ARTICLE 2.0 WMSC DEFINITIONS

SECTION 200 INTERPRETATION OF WORDS AND TERMS

For the purpose of these regulations, certain rules or word usage apply to the text as follows:

200.1 Words used in the present tense include the future tense, and the singular includes the plural, unless the context clearly indicates the contrary.

200.2 The term “shall” is always mandatory and not discretionary; the term “may” is permissive; the term “should” is permissive but indicates strong suggestion.

200.3 Any word or term not interpreted or defined by this article shall be construed according to the rules of grammar and common usage so as to give these regulations their most reasonable application.

SECTION 210 DEFINITIONS OF WORDS AND TERMS

Administrator: Public Works Director for the City

Approved Subdivision or Development: Any development that has received design plan approval from the Clermont County Planning Commission.

Best Management Practices (BMPs): Include schedules of activities, prohibitions of practices, general good house keeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to receiving waters, or the Clermont County Separate Storm Sewer System. BMPs also include, but are not limited to, treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

Buffer: A vegetated area, including trees, shrubs, and herbaceous vegetation, which exists or is established to protect a watercourse and its floodway or floodplain.

Channel: A natural or man-made depression in the earth utilized or designed to convey water.

Clearing: Any activity which removes the vegetative surface cover

Critical Area Seeding or Planting: Temporary, permanent, or dormant seeding that is required for areas that are susceptible to erosion and sedimentation. These areas include detention basins, channels or ditches, or steep slopes, or other similar type matters

Cut: An excavation and/or the material removed in an excavation.

Detention Structure: A permanent structure used for the temporary storage of stormwater runoff and designed so as to not create a permanent pool of water.

Develop: The act of preparing a site through clearing, grading, excavation, fill, storm and sanitary sewer installation, or other similar procedures for commercial, industrial, residential, or other non-farm purposes.

Development: The end result that occurs through clearing, grading, fill, excavation, storm sewer, sanitary sewer, and utility installation, building construction and other structures, or other similar procedures for commercial, industrial, residential, or other non-farm purposes.

Development Area: Any contiguous area owned by one person(s) or entity and defined by a metes and bounds description or operated as one development unit within that contiguous area and used or proposed to be used for commercial, industrial, residential, or other non-farm purposes upon which earth-disturbances will occur.

Denuded Areas: Those areas that are stripped or cleared of all vegetative cover thereby exposing the bare soil to erosion.

Discharge: The release, addition or deposit of any fluid, liquid, solid, flowing substance, or any other material or substance to the Milford Storm Sewer System (MSSS).

Ditch: An open channel that is either natural or man-made for the purpose of drainage of stormwater runoff or irrigation.

Drainageway: Any natural or man-made stormwater conveyance system; typically a swale, ditch or an open channel.

Earth Disturbing Activity: Any clearing, grading, excavation, fill or other alteration of the earth=s surface where natural or man-made ground cover is destroyed or altered and which may result in or contribute to erosion and sediment pollution.

Enforcing Official: Public Works Department for the City or his designee, including all employees or agents designated to enforce these regulations.

Engineer (Designer): A Professional Engineer registered in the State of Ohio.

Erosion: The process by which the land surface is worn away by the action of water, wind, ice, or gravity; the detachment and movement of soil or rock fragments by wind, water, ice or gravity. Different types of erosion are defined below:

1. Channel: The erosion process whereby the volume and velocity of a concentrated flow of water wears away and alters the bed and banks.

2. **Gully:** The erosion process whereby water accumulates in narrow channels and over short periods during and immediately following rainfall or snow or ice melt, and actively removes soil from this narrow area to considerable depth such that the channels so created would not be eliminated by normal smoothing or tillage operations.
3. **Rill:** An erosion process in which numerous small channels only several inches deep are formed as a result of concentrated sheet flow, and which if not abated can become gullies.
4. **Sheet:** The removal of a fairly uniform layer of soil from the land surface by the action of wind or water.

Erosion and Sediment Control: A system of structural and vegetative measures intended to minimize soil erosion and offsite sedimentation.

Excavation: A cut or any act by which earth, sand, gravel, rock or any other similar material is dug into, cut, quarried, removed, uncovered, displaced, relocated, or bulldozed and shall include the conditions, resulting there from and the material removed there from. The difference between a point on the original ground and a designated point of lower elevation on the final grade.

Facilities: Any structures, channels, ditches, or other improvements that are to be included in the stormwater management system.

Fill: (1) Any act by which earth, sand, gravel, rock or any other similar materials placed, pushed, dumped, pulled, transported or removed to a new location above the natural surface of the ground or on top of the stripped surface or cut or an area of excavation and shall include the conditions resulting there from. The difference between a point on the original ground and a designated point of higher elevation on the final grade.

(2) The material used to create a fill.

Grading: Any stripping, cutting, filling, excavating, stockpiling, or any combination thereof and shall include any land in its cut or fill condition.

Grassed Waterway: A natural or man-made watercourse or constructed channel covered with erosion resistant grasses or similar vegetative cover materials used to conduct and convey surface water.

Grubbing: Removing, clearing or scalping material such as roots, stumps or sod.

Hazardous Materials: Any material (as defined by Ohio Revised Code 3750.02), substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Illicit Discharge: Any direct or indirect non-storm water discharge to the storm drain system, except as exempted in Section 810.2 of these regulations.

Illegal Connection: Defined as either of the following:

1. Any drain or conveyance, whether on the surface or subsurface, which allows an illicit discharge to enter the Milford Storm Sewer System, including but not limited to any conveyances which allow any non-storm water discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an Enforcing Official or,
2. Any drain or conveyance connected from a commercial or industrial land use to the storm drain system which has not been documented in plans, maps, or equivalent records and approved by an Enforcing Official.

Impervious Surface: Those surfaces that do not allow the infiltration of stormwater.

Improvements: Any modification to the existing stormwater drainage system including, but not limited to, the installation of stormwater conveyance systems such as paved or vegetation lined channels, ditches, or swales; the installation of stormwater conduits; or the installation roadway culverts.

Industrial Activity: Activities subject to NPDES Industrial Permits as defined in the EPA Phase II Storm Water Regulations 40 CFR, Section 122.26 (b) (14).

Landslide: Rapid mass movement downslope of soil material under the influence of gravity.

PWD: Public Works Department

Milford Storm Sewer System (MSSS): The infrastructure installed and maintained by the City of Milford by which the storm water is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.

Mulching: The application of suitable materials on the soil surface to conserve moisture, hold soil in place, and aid in establishment of vegetative cover.

National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit: A permit issued by EPA (or by a State of Ohio under authority delegated pursuant to the U.S. code 33 USC ' 1342(b)) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.

NRCS: Natural Resources Conservation Service (formerly known as Soil Conservation Service)

Non-Storm Water Discharge: Any discharge to the storm drain system that is not composed entirely of storm water.

Permanent Vegetation: The plant materials established for the purpose of producing long term vegetative cover of the ground surface, usually after final grading is complete.

Permit: Written permission given by the Public Works Director to proceed with the work (earth disturbing activities) stated in the WMSC plan submittal.

Permittee: Any person to whom a WMSC Permit has been issued and who is subject to inspection under it.

Person: Any individual, association, organization, partnership, firm, corporation or other entity recognized by law and acting as either the owner or as the owner's agent.

Pollutant: Any element or property of sewage, agricultural, industrial, or commercial waste, runoff, leachate, heated effluent, or other matter whether originating at a point or non-point source. Pollutants may include, but are not limited to:

1. paints, varnishes, and solvents
2. oil and other automotive fluids
3. non-hazardous liquid and solid wastes and yard wastes
4. refuse, rubbish, garbage, litter, or other discarded or abandoned objects, regulations, accumulations, and floatables
5. pesticides, herbicides, and fertilizers
6. hazardous materials and wastes
7. sewage, fecal coliform and pathogens
8. dissolved and particulate metals
9. animal wastes
10. wastes and residues that result from constructing a building or structure
11. noxious or offensive matter of any kind

Premises: Any building, lot, parcel of land, or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.

Project Area: The land lying within the geographical limits of the tract(s) or parcel(s) under consideration and on which the work (earth disturbing activities) will be performed.

Public Works Department: PWD

Qualified inspection personnel: A person knowledgeable in the principles and practice of erosion and sediment controls, who possesses the skills to assess all conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activity.

Redevelopment: The process of developing an area previously developed. Usually involves demolition of existing structure(s) and/or infrastructure.

Retention Structure: A permanent water control structure that provides for the temporary storage of stormwater runoff above the normal water level of a permanent pond.

Runoff: The portion of rainfall, snow and ice melt that flows across the ground surface and is eventually returned to streams.

Sediment: Soil material, both organic and inorganic, that is in suspension, is being transported or deposited, or has been moved from its original site or origin by the action of wind, ice or gravity as a product of the erosion process.

Sedimentation: The process of action of transporting or depositing sediment.

Sediment Basin: A barrier structure built across an area of water flow to settle and retain sediment conveyed by runoff water before it can leave the project area or development site.

Sensitive Area: An area or body of water that requires special management because of its importance to the well-being of the surrounding communities, region, or the State, and includes the following:

1. Wetlands, as regulated by the Ohio EPA and/or the United States Army Corps of Engineers, discovered during on-site assessments and as noted on the National Wetlands Inventory. Note: The Public Works Director shall not be held responsible for determining or monitoring wetland areas.
2. Permanent and intermittent streams, ponds or lakes as determined by PWD.
3. Aquifer Protection Zones

Settling Volume: The volume within the sediment storage zone of the settling ponds which shall either be 1000 cubic feet per disturbed acre within the watershed of the basin or shall be the volume necessary to store the sediment as calculated with Revised Universal Soil Loss Equation (RUSLE) or similar generally accepted erosion prediction model. (See section 630.4-1)

Site Development Permit: This permit is required before any earth disturbing activities can be initiated, for the purpose of developing a commercial, industrial, or subdivision development, on the development site (see development area).

Sloughing: A slip or downward movement of an extended layer of earth resulting from the undermining action of water or the earth disturbing activities that occur during construction.

Start of Construction: The first land-disturbing activity associated with a development, including land preparation such as clearing, grading and filling; installation of streets and walkways, excavation for basements, footings, piers or foundations; erection of temporary forms;

and installation of accessory buildings such as garages.

Storm Water: Any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.

Storm Water Management System: The combination of land grading pavement slope, open channels, underground conduits (storm sewers, culverts, underdrains), catch basins, manholes, dams, detention or retention facilities, or similar type improvements, designed according to acceptable engineering practice to properly transport, detain, store, or dispose of stormwater.

Storm Water Pollution Prevention Plan: A document which describes Best Management Practices and activities to be implemented by a person to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to storm water, storm water conveyance systems, and/or receiving waters to the maximum extent practicable.

Subarea Delineation: Indication of the separate drainage areas and their approximate sizes - *both on and off site* - that contribute to the drainage of the project area or site.

Surface Waters of the State: All streams, lakes, reservoirs, ponds, marshes, wetlands or other waterways which are situated wholly or partially within the boundaries of the state, except those private waters which do not combine or effect a junction with natural surface or underground waters.

Surveyor: A Professional Surveyor registered in the State of Ohio.

Temporary Vegetation: Short term vegetative cover used to stabilize the soil surface until final grading and installation of permanent vegetative cover.

Wastewater: Any water or other liquid, other than uncontaminated storm water, discharged from a facility.

Watercourse: A permanent, intermittent, perennial or ephemeral stream, river, brook, or creek for conveying water whether natural or man-made.

Watershed: The total drainage area contributing stormwater runoff to a single point or watercourse. Some project areas and development sites may have more than one contributing watershed.

WMSC: Water Management and Sediment Control

WMSC Plan: Indicates the specific measures and sequencing to be used controlling sediment and erosion on a development site before, during and after construction.

WMSC Structures: Shall include all detention/retention basins, lined channels, spillways/release structures, pipes/conduits, headwalls, outlet protection, and all similar type improvements.

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ARTICLE 3.0 WMSC REGULATIONS GENERAL REQUIREMENTS

SECTION 300 SCOPE

300.1 The purpose of these regulations is to provide for control and management of stormwater drainage, stormwater detention or retention, and soil erosion and sedimentation. No person shall cause or allow earth disturbing activities on a development area except in compliance with the criteria and requirements established by these regulations.

300.2 These Water Management and Sediment Control Regulations shall apply to all earth disturbing activities involving clearing, land grading, excavation, cut, fill or other alteration on land used or being developed for commercial, industrial, residential, or other non-agricultural purposes, and shall establish criteria for the determination of the acceptability of such stormwater management and sediment and erosion control practices.

SECTION 310 GENERAL REQUIREMENTS

310.1 The City of Milford WMSC Regulations separates earth disturbing activities into four (4) types of site development.

310.1-1 **Site development for subdivisions, commercial developments, and industrial developments.** These types of developments require a WMSC permit for site development prior to the issuance of a Building Permit. Each project will require two separate permits. A WMSC Site Preparation Permit will be issued upon approval of the plans that include the construction entrance, any BMPs such as silt fence and other erosion control measures, and any sediment traps that are required during the construction of the project. These measures are to be installed prior to any clearing and grading associated with the site other than clearing and grading associated with the installation of the BMPs. Once the work associated with the site preparation permit is completed, inspected and approved by the PWD, a WMSC Construction Permit for the balance of the construction of the site can be issued. If the initial submittal includes all the work necessary for the entire project and the entire project is found to be in compliance with the regulation, the WMSC Construction Permit for the balance of the construction will be issued without a further submittal and review being required. Phased approval may be granted, when requested, after a separate submittal meeting the requirements of Section 410.1-1 is made and the submittal is found to be in compliance with the regulations. The sale of individual lots or sections within the development does not relieve the permit holder from the continued responsibility to maintain the site in compliance with these regulations until one or more of the following conditions are met:

1. Final stabilization has been achieved on all portions of the site for which the permittee is responsible;
2. Another operator has assumed control over all areas of the site that have not been finally stabilized;
3. (For residential construction only), temporary stabilization has been completed and the lot, which includes a home, has been transferred to the homeowner.

A. Residential subdivision development shall include all proposed developments that are intended to divide existing tracts or parcels into a number of lots, streets, and open areas.

B. Residential subdivisions that are of sufficient size to necessitate their further being developed in blocks or sections shall require a separate WMSC plan for each of the particular blocks or sections unless prior approval from the PWD has been given releasing the developer from this requirement.

C. Multi-family and commercial/industrial developments shall include all proposed developments that are intended to divide existing tracts or parcels or to use the entire tract or parcel for apartment/condominium projects, commercial or industrial developments, and other such similar uses.

310.1-2 **Site development for single commercial or industrial buildings, including additions and accessory buildings.** These buildings require a WMSC plan whose complexity is dependent on the requirements and characteristics of the building site and proposed development. The WMSC plan required will be submitted along with the building plans and each set of building plans submitted will require a site plan.

310.1-3 **Construction of residential homes that are located in approved subdivisions and residential homes on single lots of any size, including additions and accessory buildings.** An approved subdivision is one that has received prior formal or final approval from Milford Planning Commission

310.1-4 **Cut, Fill or Grading on existing parcel(s) or lot(s) includes, but is not limited to, the following factors and requirements:**

A. Includes grading for maintenance measures, landscaping purposes, improvements, etc.

- B. A Permit may be required, if the existing surface drainage is altered or if the proposed work within the project area constitutes a potential erosion hazard or acts as a source of sediment subject to any watercourse or adjacent lands.
- C. A permit shall be obtained when the cut or fill required in connection with a drainage improvement not in the public right-of-way exceeds 100 cubic yards, or when the area of land disturbed is one acre or greater.

310.2

Detention Requirements: Each development shall provide for the detention of excess stormwater runoff resulting from that development. Excess stormwater runoff shall include all additional runoff resulting from increases in the impervious surfaces of the site, including all additions of buildings, roads, and parking lots; modification in contours, including excavation of fill, alteration of drainage ways, and re-grading of slopes, as compared to the condition of the site prior to development.

Exception #1: Detention structures may not be required if the requirements of 310.2.1 are met in an approved innovative manner.

Exception #2: On-site detention may not be required in systems approved in accordance with Section 500.4.

310.2.1

For the purposes of these regulations, stormwater detention shall be required when the critical storm is equal to two (2) years or greater.

Exception: Design and performance criteria for existing or proposed stormwater management facilities (both subdivision and individual building sites) with construction drawings that have been approved prior to the effective date of these regulations, shall comply with the WMSC regulations in force on the date originally approved.

If no detention is required, the offsite runoff velocities must be equal to or less than either the one (1) year pre-developed rate or rates specified in State stormwater guidance manuals, whichever is more protective of the receiving stream as determined by the PWD.

310.2.2

Post-construction BMPs cannot be installed within a surface water of the State (e.g., wetland or stream) unless it's authorized by a CWA 401 water quality certification, CWA 404 permit, or Ohio EPA non-jurisdictional wetland/stream program approval.

310.2.3

Capacity of detention shall be determined by the amount of runoff draining to the detention structure, including that coming from off-site.

The release point(s) of any detention/retention basin and/or other stormwater management system shall be designed such that the post-development released stormwater flow emulates the pre-developed flow volume and characteristics as it is released onto the adjacent property for the 1-, 2-, 5-, 10-, 25-, 50-, and 100-year rainfall events. If the pre-development flow characteristics cannot be emulated, the engineer must demonstrate that there is adequate capacity in the downstream storm sewer system, ditch, culvert, stream, overland flow route, etc. to accept the discharge from the above rainfall events and that the downstream topographic features will not be eroded or flooded by modifications to the storm flow characteristics. It may be necessary for the engineer to provide a detailed hydraulic analysis of the downstream stormwater system or overland flow route to demonstrate that there is adequate capacity in the downstream system. "Adequate capacity" is determined by engineering analysis to confirm that downstream structures, if properly maintained, would be capable of accommodating the flow, velocities would not increase to erosive speeds, and proposed uses of off-site properties would not be impaired. If analyses indicate that the downstream system is properly maintained and would not be able to accommodate the change in flow rate or characteristics, or is not adequate to accept the proposed peak discharges, the allowable detention/retention basin discharge must be reduced or the downstream system must be modified to accommodate the changed flow characteristics by the applicant as part of the overall development. If the downstream stormwater system is not properly maintained, the engineer shall notify the administrator. This analysis shall extend to the convergence with the first downstream perennial stream.

Exceptions: Existing culverts that are within the Road Right of Way and installed in compliance with ODOT or other locally approved standards.

310.2.4 Stormwater BMPs may only be installed in the public right of way if they conform with specifications contained in the current version of the Ohio Department of Transportation's "Location and Design Manual, Volume Two Drainage Design."

310.2.5 No retention or detention shall be permitted in the public right of way.

SECTION 320 WMSC PERMIT EXEMPTIONS

320.1 Any person(s) or entity(s) responsible for developing property must comply with the provisions of these regulations. Submittal of specific information shall be required to determine compliance with these regulations. However, a WMSC Permit will not be required for the following:

- A. Any emergency activity which is immediately necessary for the protection of life, property or natural resources. After the immediate conditions which created the emergency are abated, but not less than three (3) calendar days, an application submittal of specific information shall be required to determine compliance with these regulations.
- B. Excavations below finished grade for drain fields accessory to one, two or three family dwellings (including household sewage disposal systems permitted by the Clermont County Public Health), tanks, vaults, tunnels, equipment vaults, swimming pools or similar earth moving activities. The placement of the spoils from such excavation shall be subject to the regulations contained within this document.
- C. Excavation or removal of vegetation in public utility easements by a public utility for the purpose of installing underground utilities. where the public utility has standard sediment control practices that have been approved by Council or the Chief of the Division of Soil and Water Conservation of the Ohio Department of Agriculture, and provided further that such sediment control practices are no less stringent than these WMSC regulations.

SECTION 330 VIOLATIONS, ORDERS, AND PERMIT REVOCATIONS

330.1 Inspections shall be conducted as determined necessary by the Public Works Director. If, at any time during the course of construction, it is evident to the PWD that the construction or earth disturbing activity has caused the existing drainage in the general area to be impaired, created an erosion hazard, or become a source of sediment to any adjacent storm water drainage system, public watercourse or any land, PWD shall:

330.1-1 Verbally notify the responsible person that such activities are deficient and to take measures necessary to correct the situation within a specified length of time.

330.1-2 If permittee continues work in violation of these regulations, action shall be taken by the PWD in accordance with *Section 1303.07, Stop Work Order* of the codified Ordinance

330.1-3 When corrective measures are not completed, the Milford Building Department shall withhold the issuance of a Certificate of Occupancy for any building constructed on the project area until measures are taken to bring the activities into compliance with these regulations.

330.2 Permit revocation may be required if the steps taken in Section 330.1-3 are not sufficient to assure compliance of the permittee with these regulations

or if the development of the site is done in such a manner as to adversely affect the health, safety, or welfare of person(s) residing or working in the vicinity of the project area, or if the development is detrimental to the public health or welfare.

330.3 Work stopped or abandoned by the owner in an incomplete manner for a period of one (1) year shall cause the permit to become invalid. The PWD shall require the owner to provide all necessary precautions to ensure that the incomplete work does not become a hazard or a nuisance.

SECTION 340 NUISANCES

340.1 No persons(s) or entity(s) shall create conditions that cause increased stormwater flow onto adjacent lands, impair the existing drainage system, create an erosion hazard, or become a source of sediment to any adjacent stormwater drainage system, public watercourse or any land in the incorporated areas of Milford, nor shall any person(s) or entity(s) create a nuisance in regard to Water Management and Sediment Control policies in the incorporated lands of Milford.

340.2 These regulations shall not be construed as authorizing any person(s) or entity(s) to maintain a private or public nuisance on property, and compliance with the provisions of these regulations shall not be a defense in any action to abate such a nuisance.

SECTION 350 RESPONSIBILITY

350.1 Failure of the PWD to observe or recognize hazardous or unsightly conditions or to recommend corrective measures shall not relieve any person(s) or entity(s) from the responsibility for the condition or damage resulting there from, and shall not be construed to result in the City of Milford or PWD, its officers, employees, or agents being responsible for any condition or damage resulting there from.

ARTICLE 4.0 WMSC PLAN SUBMITTAL REQUIREMENTS

SECTION 400 SCOPE

400.1 In concurrence with Section 310 of the General Requirements, the WMSC plan submittal requirements will be separated into four types of site development: **(1)** those requiring a Site Development Permit to begin earth disturbing activities prior to obtaining building permits for the individual buildings; **(2)** construction of single commercial and industrial buildings; **(3)** construction of residential housing within an approved subdivision, located on single lots of any size, or located in a subdivision development with lots that are greater than five (5) acres in size (those not requiring Planning Commission approval); and **(4)** cut, fill, or grading on existing parcel(s) or lot(s) that exceeds 100 cubic yards or disturbs one acre or more of land and relates to site development or drainage improvement, or if the existing drainage is altered or impaired and the earth disturbing activities constitute an erosion/sediment hazard.

400.2 All lots, tracts, or parcels shall be graded to provide proper drainage away from buildings and convey it to a stable receiving outlet at non-erosive velocities as defined in Section 630.2-4. Each lot shall be graded in accordance with an approved stormwater management plan. All grading and drainage shall be subject to approval by the Public Works Department.

400.3 All drainage improvements shall be as such designed to adequately handle stormwater runoff according to the requirements of these WMSC Regulations. Concentration of surface water runoff shall only be permitted in swales or watercourses where calculations indicate (prove) there is no adverse impact on the receiving swale or watercourse or increased flooding potential downstream.

SECTION 410 WMSC PLAN (DESIGN) REQUIREMENTS

410.1 **Requirements for Site Development Permit** (to be obtained before any earth disturbing activities can be initiated)

410.1-1

Preliminary (Design Plan Review) Plan Requirements

- A.** Preliminary Review Fee
- B.** Site Development Permit application form
- C.** Project Description Form or Narrative.
- D.** Vicinity Map
- E.** Total area of the site and the area of the site that is expected to be disturbed.
- F.** An estimate of the impervious area and the percent imperviousness created by the construction activity.
- G.** Site Plan
 - (1) Two (2) foot maximum contour intervals for existing and proposed condition(s). These regulations recognize the fact that these contours are not final and are subject to change at the final design stage. Interpolation of USGS maps is acceptable. Also, five (5) foot contour intervals may be appropriate for steeply sloping areas.
 - (2) A 1" = 100' maximum scale.
 - (3) Indicate existing or man-made watercourses.
 - (4) Show proposed locations of stormwater management systems or features such as:
 - (a) Detention/retention basins
 - (b) Stormwater conveyance systems
 - (c) Stream buffers
 - (d) Other stormwater management practices
 - (e) Proposed easements for WMSC structures, where applicable.
 - (5) Show approximate limits of proposed grading or stripping.
 - (6) Indicate onsite and offsite watershed routing and drainage sub areas.
 - (7) Indicate all lots or units.
 - (8) Indicate previous land use.
 - (9) Indicate the extent of and provide a description of any wetlands.
- F.** Subarea Delineation
 - (1) Required when more than one (1) drainage sub area is to be included in the stormwater calculations.
- G.** Indicate areas and locations of adjacent watersheds that will be critical to the onsite stormwater management design.
- H.** Data Resource Map (soils map)
 - (1) Required if more than one type of soil is present on site.

410.1-1

Preliminary (Design Plan Review) Plan Requirements *(Continued)*

- I.** Stormwater Analysis
 - (1) Indicate Design Method
 - (a) SCS-TR55 Method
 - (b) SCS-TR20 Method
 - (c) Rational Method - valid for areas of fifty (50) acres or less.
 - (d) Other methods can be submitted with previous approval before submittal.
 - (2) Calculate Critical Storm from Section 510
 - (3) Calculate estimated volume of detention when possible.
- J.** Requests for public (City) maintenance of specific WMSC facilities shall follow the requirements set forth in the current edition of the Milford Subdivision Ordinance, and shall be submitted along with the preliminary design plan.
- K.** One (1) copy of the preliminary design plan and calculations shall be submitted to the PWD for review.
- L.** The preliminary design plan submittal shall not be limited to the items listed in Section 410.1-1. Any additional information submitted to the PWD for the preliminary plan will be reviewed.

410.1-2

Final Construction & Improvement Plan Requirements

- A.** Permit Fee
- B.** Site Development Permit Application
- C.** Project Description Form or Narrative
- D.** Vicinity Map showing the following:
 - (1) Drawn to a scale of not less than 1" to 2000'.
 - (2) The proximity to ponds, lakes, and streams, (both onsite and offsite) whose quantities and qualities could be affected by the proposed development.
 - (3) Areas that could be affected by stormwater runoff from the project site or offsite areas that will affect the drainage patterns of the project site and/or the offsite areas.
 - (4) Offsite areas of the watershed that are included in the stormwater calculations for backwater stream analysis. This information should be submitted as a separate map for more complicated development sites.

Final Construction & Improvement Plan Requirements *(Continued)*

- E.** Site plan shall include, but not be limited to, the following items:
- (1) Drawn to a scale of not less than 1" = 50'.
 - (2) Certified by a registered Professional Engineer or Surveyor in the State of Ohio.
 - (3) Name of proposed project, title, scale, north arrow, legend and date of all plan maps, name and address of the person(s) preparing the plan, the owner(s), and the person(s) responsible for developing the area.
 - (4) Name and contact information of the construction site operator
 - (5) Delineation of tracts, parcels, or lots of land, including previous land use.
 - (6) Indicate the existing topography of the development site with a maximum distance of two (2) feet between contour intervals. It may be necessary to indicate one (1) foot intervals for areas that are predominantly flat and five (5) foot contour intervals for steeply sloping (ravine or valley) locations; discretion is left to the designer and subject to approval by the PWD.
 - (7) Indicate the area and show the limits of the site to be disturbed (i.e. grubbing, clearing, excavation, filling or grading, including off-site borrow areas.
 - (8) Soil types shall be depicted for all areas of the site, including locations of unstable or highly erodible soils.
 - (9) Show elevations of finished grade, lowest (first) floor of buildings, and other structures. First floor elevations for individual residential homes are not required unless it is critical for proper drainage.
 - (10) Show project areas profiles for, but not limited to, the following:
 - (a) Cut and fill areas (or can indicate finished slopes directly on site plan if adequate).
 - (b) Existing and proposed drainage systems.
 - (c) Existing and proposed final grades.
 - (11) Show cross-sections of, but not limited to, the following:
 - (a) Emergency spillway
 - (b) Paved, sod, or rip-rap channels
 - (12) Show all existing and proposed easements for sanitary/ stormwater runoff piping and structures - including detention or retention facilities and 100 year storm elevation for flood determination.
 - (13) Show all existing drainage areas, patterns, and facilities such as natural or man-made watercourses, retention/detention basins, or similar improvements.

Final Construction & Improvement Plan Requirements *(Continued)*

- (14) Indicate the location for all proposed detention or retention facilities and include (at a minimum) the following, when needed:
 - (a) Inlet details; invert elevations, pipe sizes.
 - (b) Emergency overflow limits and facilities.
 - (c) Erosion protection for all outlets into basin.
 - (d) Headwall details at inlets/outlets.
 - (e) Anti-seep collar and riser details where required (typically for retention basins).
 - (f) Release structure details including:
 - 1. Orifice or restrictor plate sizes and invert elevations.
 - 2. Weir shapes, sizes, and elevations.
 - 3. Window sizes and elevations.
- (15) If more than one (1) drainage area is used for the stormwater runoff calculations, indicate all drainage sub areas on the site plan. This typically requires the areas to be shown on a separate copy of the site plan for plan clarity.
- (16) Indicate watershed routing through the site on the plan or in the narrative/description of project form.
- (17) Erosion and sediment control notes to be recorded on the site plan include, but are not limited to, the following:
 - (a) Construction Sequence
 - (b) Temporary, permanent, and dormant seeding specifications and mulching specifications for critical areas.
 - (c) Filter barrier, and silt fence placement notes and details where required.
 - (d) Storm drain inlet protection notes and details where required.
 - (e) Jute mat protection (or its equivalent, does not need to be biodegradable) for final slopes greater than three (3) horizontal to one (1) vertical is required.
 - (f) Erosion and Sediment Control Plan Criteria (see Section 620 of the WMSC Regulations) and general notes.

Final Construction & Improvement Plan Requirements *(Continued)*

- (18) The locations of all erosion and sediment control, stormwater conveyance, and structural practices are to be shown and labeled on the site plan. This includes all temporary erosion and sediment controls, such as protection and all permanent stormwater best management practices to be used to control stormwater runoff and pollutants after construction practices have been completed, including retention and detention ponds, stream buffers and other controls.
 - (19) The location of designated construction entrances where vehicles will access the construction site.
 - (20) The location of any in-stream activities including stream crossings.
 - (21) The location and description of discharges associated with dedicated asphalt and/or concrete plants and the BMPs.
 - (22) The settling volume of the basin.
 - (23) Indicate the extent and provide a description of any wetlands. If the project contains any surface natural watercourses or wetlands, the permittee must contact the appropriate U.S. Army Corps of Engineer's District Office.
- F.** Subarea delineation map.
 - G.** Indicate offsite watershed contributions to design calculations and their locations.
 - H.** Areas designated for the storage or disposal of solid, sanitary and toxic wastes, including dumpster areas, areas designated for cement truck washout, and vehicle fueling. No solid or liquid waste, including building materials, shall be discharged in storm water runoff. Under no circumstances shall concrete trucks wash out directly into a drainageway, storm sewer or watercourse.
 - I.** Data Resource Map required for sites with multiple soil types. Please include this information on the Project Description Form or the Narrative if a Data Resource Map is deemed unnecessary.
 - J.** Stormwater analysis as described in Sections 510 and 520.
 - K.** Design calculations and details of required WMSC facilities as described in Sections 530.1 and 530.2.
 - L.** The applicant shall submit (2) sets of formal plan construction drawings and related details and (1) set of stormwater design calculations to the PWD for review.
 - M.** The formal (final) design submittal shall not be limited to items A. through L. listed in Section 410.1-2. Additional calculations and details may be required by the review agency.

- 410.1-3** A WMSC permit for site development, per Section 310.1-1, shall be issued to the applicant upon approval of the final construction plans and the payment of all fees. The applicant or developer is to then notify the PWD within seven (7) days of the first earth disturbing activities. The holder of the permit must be able to produce the permit with a set of approved plans and display the permit onsite.
- 410.1-4** Prior to construction, the applicant shall request a pre-construction meeting with Milford PWD, at which time the construction site operator shall sign a document indicating that he or she has been informed and understands all roles and responsibilities in complying with the WMSC Regulations.
- 410.2** **Commercial and industrial buildings that occur, typically, on single lots.** The following information shall be submitted to the Milford Public Works Department, with the appropriate fees, to fulfill the water management and sediment control requirements necessary for a Building Permit application. **A separate WMSC Permit will not be required.**
- 410.2-1** No preliminary plan submittal is required.
- 410.2-2** Final WMSC Design Plan requirements shall be submitted as described in the following statements:
- A.** One (1) copy of the following is to be submitted along with the building plans to the Milford PWD:
 - (1) Project Description Form or Narrative
 - (2) All design calculations to be stamped by a Registered Professional Engineer in the State of Ohio.
 - (3) Any additional details required for the WMSC Final Plan approval.
 - B.** A site plan stamped by a Registered Professional Engineer or Surveyor in the State of Ohio and any construction drawings containing details essential to the water management and sediment control plan must accompany each set of building permit plans submitted to the Milford PWD.
- 410.3** **Residential housing within a subdivision or an approved development, or located on single lots.**
- 410.3-1** No preliminary plan submittal is required.
- 410.3-2** A site plan, indicating sediment and erosion control measures shall be submitted with each set of building plans for One, Two and Three Family Dwellings with the appropriate fees.

- 410.4** **Cut, Fill or Grading on existing parcel(s) or lot(s).**
- 410.4-1** No preliminary plans are required.
- 410.4-2** A site plan, with the appropriate fees, indicating sediment and erosion control measures, the existing and proposed drainage systems as well as any other information required by the Public Works Department or the reviewing engineer to satisfy the requirements of these regulations.
- 410.4-3** Stormwater management calculations prepared by a Professional Engineer Registered by the State of Ohio, if necessary, to satisfy the requirements of these regulations.
- 410.5** It is the intention of these regulations that the submission requirements although specific, are to be considered minimum requirements. The Milford Public Works Department or any agency charged with enforcement of these regulations may require more detailed design specifications or plans when a particular problem is identified or if a proposed stormwater management system may jeopardize sensitive or regulated areas. Where a design may result in water management or sediment control that is not adequate to protect the health, welfare, and safety or property of an effected area, the agency enforcing the regulations may require re-submittals of revised design plans or may require submittals involving specific technical resolutions to these problems rather than to simply deny the application outright.
- 410.6** For developments that will be further subdivided into sections or phases and constructed separately with a significant amount of time between the construction of each section or phase, separate WMSC formal (final) design plans may be required for individual sections or phases, or provisions shall be made to adequately handle the stormwater runoff until completion of the entire development.
- 410.7** The permittee shall amend the WMSC plan whenever there is a significant change as determined by the PWD in design, construction, operation or maintenance. Amendments to the WMSC Plan shall be reviewed by the PWD in the same manner as the original plan.
- 410.8** A copy of the WMSC Plan must be kept on site and made available immediately upon the request of PWD personnel or PWD's authorized representative during working hours.

SECTION 420 FEES

- 420.1** Milford City Council, shall establish reasonable filing fees for plan review and site inspection.
- 420.2** A permit to begin new construction or earth disturbing activities relating to new construction will not be issued until all fees have been paid.
- 420.3** Additional review fees will be assessed when plan or design changes by the owner, contractor, developer, or engineer require another extensive plan review.
- 420.4** All proposed developments shall be required to obtain a WMSC Permit prior to beginning any earth disturbing activities.

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ARTICLE 5.0 WMSC REGULATIONS STORMWATER DESIGN CRITERIA

SECTION 500 SCOPE

500.1 Each development, redevelopment or project site shall provide for the detention of the excess stormwater runoff resulting from the proposed development. To prevent downstream damages, peak rates of runoff from an area after development or redevelopment shall be no greater than the peak rates of runoff from the area prior to the proposed development as per Table III of Section 510.3-2.

500.2 The site design shall incorporate stormwater runoff volumes that are kept to a minimum. Site development practices that reduce impervious areas, utilize infiltration and preserve the existing natural conditions are encouraged.

500.3 Stormwater runoff velocities shall be kept to a minimum through the use of rip-rap or other type of channel protection to minimize the erosion of the existing watercourse due to the increased velocities that occur from the addition of man-made stormwater conveyance systems, such as culverts, pipes, and open channels.

500.4 It is not the intent of this section or of these regulations to restrict the freedom of the design engineer to the design methods listed in this article, but these methods are recommended for the purpose of complying with these regulations. Other methods of design may be used with prior approval from the Milford Public Works Department.

SECTION 510 WMSC CRITICAL STORM CRITERIA

510.1 **Critical Storm Definition:** The Critical Storm value for a particular project or development site provides the design engineer with the following:

510.1-1 A critical storm frequency that reflects the changes in land surface that occur to a particular project area after development. **Critical storm calculations shall utilize onsite drainage areas.**

510.1-2 Offsite areas that contribute to the control basin shall be accounted for in the detention basin storage design. The offsite areas will not be used in the calculation of the Critical Storm. The offsite areas will be used in the determination of the required storage volume of the control basin.

510.1-3 Insight as to whether or not onsite stormwater detention will be required, at the preliminary design stage.

510.2

Critical Storm Determination Utilizing the SCS-TR55 Method

The engineer should have access to a copy of the *Urban Hydrology for Small Watersheds - 2nd Edition (Technical Release No. 55)*, United States Department of Agriculture, Natural Resources Conservation Service, Conservation Engineering Division. This manual will be known as NRCS-TR55 for the purposes of these specifications. To assist the designer, worksheets from the NRCS-TR55 manual have been included in these regulations in Appendix A - Exhibit II, Sheets D-2 through D-8. The Critical Storm value can then be calculated using the following step by step procedure:

510.2-1

Calculate the volume of runoff, V_{pre} , under pre-development conditions for a storm frequency equal one (1) year, of 24-hours duration.

- A.** Curve Number (CN) Determination. The Runoff curve number (CN) for the pre-developed shall not exceed those of “Open Space in Fair Condition” (i.e. A=49, B=69, C=79, D=84) as stated in Table 2-2a of the NRCS-TR55 Manual.

For areas disturbed by construction activity, post-developed runoff curve numbers shall use Hydrologic Soil Group D for all Cover Type and Hydrologic Conditions as stated in Table 2-2a of the NRCS-TR55 Manual. The runoff curve numbers found in the manual reflect the ground cover characteristics for a particular project or development site. A weighted value may be necessary because of the variety ground cover conditions that can occur on one site.

- B.** The soil storage capacity, S , of the soil is then calculated from the weighted curve number by using equation 2-4 from Chapter 2 of the NRCS-TR55 Manual:

$$S = (1000/CN) - 10 \qquad \text{Eqn. 510.2-1}$$

- C. The quantity of runoff, Q, can then be determined from the storage capacity and the rainfall intensity of the area. The rainfall intensity values, P, for Milford for twenty-four (24) hour duration storms for various frequencies are listed below in Table I. Equation 2-3 from Chapter 2 of the NRCS-TR55 Manual is as follows:

$$Q = (P - 0.2S)^2 / (P + .08S) \text{ inches} \quad \text{Eqn. 510.2-2}$$

FREQUENCY (years)	INTENSITY, P (in/acre-ft)
1	2.4
2	2.9
5	3.6
10	4.1
25	4.7
50	5.1
100	5.6

TABLE I

- D. Runoff volume determination

$$V_{pre} = [Q_{pre}^{(in)} / 12 \text{ in/ft}] * 43560 \text{ ft}^2/\text{acre} * A \text{ (acres)}$$

$$V_{pre} = \text{cubic feet}$$

510.2-2

Steps 1.A, 1.B, 1.C and 1.D are then repeated for the post-development site conditions (the post-development curve number will reflect the addition of impervious surfaces) to obtain the volume of runoff, V_{post} , for a one (1) frequency storm for the post-development conditions.

510.2-3

Equation 510.2-3 is then used to determine the percent change in volume of runoff due to the development of the site.

$$[(V_{post} / V_{pre}) - 1.0] * 100\% = PC \quad \text{Eqn. 510.2-3}$$

510.2-4

Use Table II, below, to determine the critical storm based on PC, the percent change.

□ PC □		CRITICAL STORM FREQUENCY
—	10	1 year
10	20	2 year
20	50	5 year
50	100	10 year
100	250	25 year
250	500	50 year
500	B	100 year

TABLE II (from Ohio Critical Storm Method)

510.2-5

See Appendix A - Exhibit II, Sheet D-2 for the worksheet used to determine the curve numbers and runoff for pre and post development conditions.

510.3

Critical Storm Determination Utilizing the Rational Method

The information required to calculate the pre and post development flows for a particular project using the rational method are included in these regulations. The following is a step by step procedure for determining the percent change in flow for post versus pre development conditions.

510.3-1

The Rational Method design is limited to areas that are fifty (50) acres or less for purposes of these regulations

510.3-2

Find Q_{pre} for a one (1) year frequency and a given storm duration (concentration time of runoff) under pre-development conditions, through the use of Eqn. 510.3-1 shown below:

$$Q = C * I * A \qquad \text{Eqn. 510.3-1}$$

Where:

- Q = flow in cfs
- C = runoff coefficient
- I = rainfall intensity
- A = drainage area for the project site

- A. Determination of the runoff coefficient (s), C
 Table III shows a list of runoff coefficients for various pre and post development conditions.

SITE CONDITION	COEFFICIENT, C	
	Less Than 2%	6% or Greater
Commercial/Industrial	0.80	0.90
Residential		
Single Family < 1 acre	0.50	0.60
1 acre	0.45	0.55
1+ acres	0.40	0.50
Multi-Family (A)	0.70	0.80
Parking Lots, Driveways, Etc.	0.95	0.95
Roofs, Imperious Surfaces	0.95	0.95
Redeveloped Existing Imperious Surfaces	0.30	0.30
Gravel	0.95	0.95
Lawns		
Up to a 2% Slope	0.20	
2% to 7% Slope	0.25	
Over 7% Slope		0.30
Farmland	0.30	0.40
Grassland	0.30	0.40
Woodland	0.25	0.35

(A) The runoff coefficient for multi-family residences may need to be found using a weighted value based on the amount of impervious surfaces and vegetated cover instead of using C = 0.70

TABLE III

- (1) A weighted C value will need to be calculated when more than one (1) of the above conditions exist on a particular project or development site.

B. Determination of the Rainfall Intensity, I

Table IV indicates rainfall intensity values in relation to runoff time of concentration (storm duration), t_c , and storm frequency. For areas of 30 acres or less, t_c values typically range from five (5) minutes to thirty (30) minutes.

C. Time of Concentration, t_c :

Time of concentration, t_c , is the time it takes for runoff to travel from the hydraulically most distant point to a point of reference or interest downstream. The chart in Appendix A - Exhibit I provides a graphical method for estimating overland flow time. This chart may be used to estimate the time for runoff to travel from the furthest point to an inlet or a defined channel.

Time of Concentration, t_c , is measured in minutes for use in Table IV.

FREQUENCY (YRS)	INTENSITY, I (IN/HR) $a / (t_c + b)$
1	$80 / (t_c + 14)$
2	$106 / (t_c + 17)$
5	$131 / (t_c + 19)$
10	$170 / (t_c + 23)$
25	$230 / (t_c + 30)$
50	$250 / (t_c + 27)$
100	$290 / (t_c + 31)$

TABLE IV

D. Equation 510.3-2 can then be used to find the percent change in runoff between the pre and post development conditions.

$$[(Q_{\text{post}} / Q_{\text{pre}}) - 1.0] * 100\% = \text{PC} \quad \text{Eqn. 510.3-2}$$

F. The Critical Storm value can be determined from Table II in Section 510.

510.4 Critical Storm Controls

510.4-1 The peak rate of runoff from the Critical Storm and all more frequent storms occurring on the development or project area shall not exceed the peak rate of runoff from a one (1) frequency storm of 24 hours duration that would occur under pre-development conditions. For example, if the critical storm was calculated to be a ten (10) year frequency storm, the peak rate of stormwater runoff that would occur from the two (2), five (5), and ten (10) year post-development storms could not exceed the peak rate of runoff that would occur from one (1) year frequency storm under pre-development conditions. A one (1) year critical storm value may not require detention, but the outlet velocities must be equal to or less than the one (1) year pre-development outlet velocities.

510.4-2 Storms of less frequency occurrence than the critical storm up to the one hundred (100) year storm shall have peak rates of runoff equal to or less than the peak rates of runoff for the same frequency of storms under pre-development conditions. As shown in Table II, the one (1), two (2), five (5), ten (10), twenty five (25), fifty (50), and one hundred (100) year storm frequencies are considered adequate for these regulations.

SECTION 520 WMSC DESIGN METHODS

520.1 SCS-TR55 Method

This method can be used for all project or development sizes for the purpose of these regulations. After determining the Critical Storm frequency described in Section 510 of these regulations, the following steps are needed to determine if onsite stormwater detention is needed and what volume of detention will be required.

It should be noted that the flow, Q, and volume, V, that were found during the critical storm calculation pertain to onsite drainage areas only. In designing the stormwater management system for the development site, offsite drainage areas will need to be considered for the design of culverts, open channels, storm sewers, detention/retention basins, and other drainage improvements.

520.1-1**Determine T_c , Time of Concentration**

The definition given in Section 510.3-2.C for the time of concentration is valid for the NRCS-T55 Method, but does require further explanation of the components that make up the T_c for a particular development site.

$$T_c = T_{t1} + T_{t2} + \dots + T_{tm} \quad \text{Eqn. 520.1-1}$$

Where: T_t = Travel time (in hours) for a particular segment of the stormwater conveyance system.
 m = Number of flow segments

520.1-2**Computation of Travel Time, T_t**

Water moves through a watershed as ⁽¹⁾sheet flow, ⁽²⁾shallow concentrated flow, ⁽³⁾open channel flow, or a combination of these flows. The type of flow that occurs for a particular stormwater conveyance system and development site is best determined by field inspection and engineering judgment.

A. Sheet Flow

$$T_t = [(0.007) (n * L)^{0.8}] / [(P_2)^{0.5}(s)^{0.4}] \quad \text{Eqn.520.1-2}$$

Where: T_t = travel time (in hours)
 n = Manning's roughness coefficient
 L = flow length, 300 ft. maximum
 P_2 = 2-year, 24 hour rainfall (ins.)
 s = slope of land (ft/ft)

B. Shallow Concentrated Flow

$$T_t = L / (3600 * V) \quad \text{Eqn. 520.1-3}$$

Where: T_t = travel time
 L = flow length
 V = average velocity

C. Channel Flow

$$T_t = L / (3600 * V_m) \quad \text{Eqn. 520.1-4}$$

Where: T_t = travel time
 L = flow length
 $V_m = [1.49(r)^{2/3}(s)^2] / n$

Where: V_m = average velocity (ft/sec)
 r = hydraulic radius
 s = slope
 n = Manning's roughness coefficient

- D. In watersheds with storm sewers, carefully identify the appropriate hydraulic flow path to estimate T_c . Storm sewers normally handle only a small portion of a large storm event.
- E. See worksheet in Appendix A - Exhibit II, Sheet D-3 for time of concentration calculation.

520.1-3

Peak Flow Determination

A. Graphical Method

$$q_p = q_u * A_m * Q * F_p \quad \text{Eqn. 520.1-5}$$

Where: q_p = peak flow (cfs)
 q_u = unit peak flow (csm/in)
 A_m = total site area (mi²)
 Q = runoff (ins) See Eqn. 510.2-2
 F_p = pond and swamp adjustment factor

- (1) The worksheet in Appendix A - Exhibit II, Sheet D-4 can be used to determine the peak flow for both the pre and post development site conditions.
- (2) Limitations to this method are as follows:
 - (a) Can only be used for developments and project areas that have only one distinct drainage area.
 - (b) The drainage area can typically contain only one major stream.
 - (c) Provides a determination of peak flow only.
 - (d) Cannot perform reservoir routing.

B. Tabular Hydrograph Method

- 1. This method is applicable for estimating the effects of land use change (development) in a portion of a watershed. It is effective in determining the composite hydrograph that results from the contributions of the defined subareas that are present in the watershed, while also measuring the change in runoff volume that occurs due to development of the land.

2. The entire watershed contributions to the development site or project area must be shown on the site plan and in the design calculations to achieve a better estimation of the increased stormwater flow that has occurred due to development.
3. The tabular method should be used when watershed subdivision into two (2) or more subareas is required for a particular development site or project area.
4. Follow the steps indicated in Chapter 5 of the NRCS-TR55 Manual to use the tabular hydrograph method. See Appendix A- Exhibit II, Sheets D-5 and D-6 for the worksheets used to find the peak flow for the composite hydrograph at a particular point of interest. The point of interest could be located where the stormwater runoff leaves the development site or enters a culvert.
5. The following limitations apply to the tabular hydrograph method:
 - (a) The accuracy of this method decreases as the complexity of the watershed increases.
 - (b) If the drainage areas of individual subareas differ by a factor of 5 or more, the accuracy of the method decreases.
 - (c) The travel time, T_t , for a particular sub area must be equal to or less than three (3) hours.
 - (d) The time of concentration, T_c , for a particular sub area must be equal to or less than two (2) hours.

520.1-4

Volume of Detention Determination

For all large construction activities (involving the disturbance of five or more acres of land or will disturb less than five acres, but is part of a larger common plan of development or sale which will disturb more than five acres of land), the post construction BMP(s) chosen must be able to detain storm water runoff for protection of the stream channels, stream erosion control, and improved water quality. Structural (designed) post-construction storm water treatment practices shall be incorporated into the permanent drainage system for the site. The BMP(s) chosen must be sized to treat the water quality volume (WQ_v) and ensure compliance with Ohio's Water Quality Standards in OAC Chapter 3745-1. The WQ_v shall be equivalent to the volume of runoff from a 0.75-inch rainfall and shall be determined according to one of the two following methods:

1. Through a site hydrologic study approved by the Building Inspection Department that uses continuous hydrologic simulation and local long-term hourly precipitation records; or,

2. Using the following equation:

$$WQ_v = C * P * A / 12$$

where: WQ_v = water quality volume in acre-feet
 C = runoff coefficient appropriate for storms less than 1 inch (see Table 1 below)
 P = 0.75 inch precipitation depth
 A = area draining into the BMP in acres

Table 1. Runoff Coefficients Based on the Type of Land Use

Land Use	Runoff Coefficient
Industrial & Commercial	0.8
High Density Residential (>8 dwellings/acre)	0.5
Medium Density Residential (4 to 8 dwellings/acre)	0.4
Low Density Residential (<4 dwellings/acre)	0.3
Open Space and Recreational Areas	0.2

Where the land use will be mixed, the runoff coefficient should be calculated using a weighted average. For example, if 60% of the contributing drainage area to the storm water treatment structure is Low Density Residential, 30% is High Density Residential, and 10% is Open Space, the runoff coefficient is calculated as follows: $(0.6)*(0.3) + (0.3)*(0.5) + (0.1)*(0.2) = 0.35$.

An additional volume equal to 20 percent of the WQ_v shall be incorporated into the BMP for sediment storage and/or reduced infiltration capacity.

- A.** The detention basin is the most widely used form of controlling peak stormwater flow caused by the development of the site in question. The method used in Chapter 6 of the SCS-TR55 manual assists the designer in calculating a quick estimate for the amount of storage required. The estimate is valid for both single and multiple stage outflow devices. The following constraints apply when using this method for multi-stage outlets:
 1. Each stage requires a design storm and a computation of the storage required for it.
 2. The flow(s) from the upper stage(s) must include the flow(s) from the lower stage(s).

- B.** The designer should be aware that this method is not to be used for final design if an overestimation of 25% is not satisfactory.

- C. This method has been found to be effective for final design of small detention basins.
- D. See Appendix A - Exhibit II, Sheets D-7 and D-8 for the worksheets provided to calculate the required storage volume by this method.
- E. See Section 510.4-1 and -2 for the maximum outflow rate from the detention basin. This will require the designer to calculate the pre and post development storage volumes (using the worksheets in D. above) for all storms (up to 100 year) of less frequency than the critical storm.

520.2

NRCS TR-20.

Natural Resources Conservation Service Technical Release No. 20: Computer Program for Project Formulation Hydrology (NRCS TR-20) is a storm event surface water hydrologic model applied at a watershed scale. It computes direct runoff and develops hydrographs resulting from any synthetic or natural rainstorm. Multiple storms (rainfalls by frequency) can be analyzed within one model run. Developed hydrographs are routed through stream and valley reaches as well as through reservoirs to the watershed or reservoir outlet. A Windows based version of NRCS TR-20 was created in October 2004 and can be downloaded at no cost at the NRCS National Water and Climate Center web site. Support materials are also available on the web site, including the WinTR-20 user documentation and user guide, and a WinTR-20 tutorial.

520.2

The Rational Method

This method is limited to use for development sites or project areas that are fifty (50) acres or less in size under these regulations. The limitations of this method are similar to those stated in Section 520.1-3A.2(a) through 2(d) for the NRCS-T55 graphical peak flow determination. Use of this method for larger areas is acceptable upon approval by the MPW

520.3-1

Peak flow for the project area or development site has already been determined by the rational method in Section 510.3 in determination of the critical storm frequency. Offsite drainage areas tributary to the site shall be included in the design of storm sewers, culverts, ditches/swales, and other drainageways but are not required to be detained onsite. Theoretically, they are assumed to by-pass detention.

520.3-2**Storage Volume Design for Detention or Retention Basin**

Appendix A - Exhibit III contains the worksheets required to calculate the storage volume needed when using the rational method.

A. $q_2 = A * C * i_2$

Where: q_2 = the peak flow rate due to a one (1) year frequency storm under pre development conditions.
A = the drainage area for the development
C = runoff coefficients for the predevelopment conditions
 i_2 = rainfall intensity from Section 510.3 Table IV for a two year frequency storm

B. $Q_{cr} = A * C * i_{cr}$

Where: Q_{cr} = the maximum peak flow rate due to a critical storm frequency under post development conditions
A = the drainage area for the development
C = runoff coefficients for post development conditions
 i_{cr} = the maximum rainfall intensity from Appendix A - Exhibit III for the critical storm frequency

C. The volume of storage calculated is that needed to reduce the critical storm peak flow rate under post development conditions to equal to or less than the two one (1)year pre development peak flow rate (q_2) found in step A. above.

D. The required volume of detention may also be determined from the criteria defined in Section 510.4-2.

520.4

The design methods mentioned previously are recommended by the Milford Public Works Department. This department also recognizes the availability of other design methods, such as the Hydrograph Method and the Storage Indication Method. In the interest of expedient processing of plans and construction, the use of the standard procedures, manuals, and computers programs is preferred.

SECTION 530 WMSC DESIGN REQUIREMENTS AND SPECIFICATIONS

530.1 Detention/Retention Basins

530.1-1 Detention/Retention basins must be designed to limit the critical storm flow out of the basin to the one (1) year pre developed rate and, also have the capacity to store all storm frequencies greater than the critical value up to the 100 year storm under post developed conditions and release the outflows at the pre developed rate for like years.

530.1-2 The bottom of the basin should be constructed with slopes equal to or greater than 0.5% to facilitate interior drainage.

530.1-3 Steep slopes are to be avoided and seeding and other erosion control measures are to be used to protect the slopes.

530.1-4 Paved/concrete gutters, channels and/or swales are not permitted.

530.1-5 Anti-seep collars or reinforced concrete pads placed under the discharge pipe(s) (see detail in Appendix A- Exhibit IV) are to be used on all pipe outlets for retention basins and detention basins with wide berms when required. Show anti-seep collar spacing and details, and concrete pad details when required.

530.1-6 Spillway Design and Details

- A.** The spillway area (plan view), cross section detail, and other spillway details shall be located on the site plan or accompanying construction drawings.
- B.** All basins shall have emergency spillways that will safely pass the peak flow for a one hundred (100) year frequency storm under post development conditions at an acceptable velocity.
- C.** All outlet (release) structure details must be shown on the site plan or accompanying construction drawings. Include the following, but not limited to:
 - 1. Pipe and orifice size(s)
 - 2. Invert elevations
 - 3. Provide weir length(s), type(s), and elevation(s)
 - 4. Provide window sizes, elevations, and locations.

- D. Provide spillway crest elevations and a minimum of one (1) foot freeboard.
- E. Provide all inlet (outletting into basin) / outlet capacity and velocity calculations.
- F. Since these WMSC Regulations require that the outflow rate from a detention or retention basin be held to a one (1) year pre development rate and the detention basin must also be designed to detain the expected runoff from a one hundred year post development condition, a two (2) stage orifice control may be required on most detention or retention basins.
- G. A minimum depth of four (4) feet must be maintained in all retention basins to prevent stagnation of the pond.
- H. Parking lot detention shall be kept a maximum depth of eight (8) inches and be located in primarily non-parking areas.

530.2 Target Draw-down Times

For large construction activities of five (5) or more acres, BMPs shall be designed such that the drain time is long enough to provide treatment, but short enough to provide storage available for successive rainfall events as described in Table 2 below. It is recommended that BMPs be designed according to the methodology included in the most current edition of Ohio’s *Rainwater and Land Development Manual*.

Table 2. Target Draw Down (Drain) Times for Structural Post-Construction Treatment Control Practices

Best Management Practice	Drain Time of WQ _v
Infiltration Basin or trench ¹	48 hours
Permeable Pavement – Infiltration ¹	48 hours
Permeable Pavement – Extended Detention	24 hours
Dry Extended Detention Basin ²	48 hours
Wet Extended Detention Basin ³	24 hours
Constructed Wetland (above permanent pool) ⁴	24 hours
Sand & Other Media Filtration ⁵	24 hours
Bioretention Area/Cell ^{5, 6}	24 hours
Pocket Wetland ⁷	24 hours

¹ Practices that are designed to fully infiltrate WQ_v (infiltration basin or trench, permeable pavement) shall empty within 48 hours to provide storage for subsequent storm events.

² Dry basins must include forebay and micropool each sized at 10% of the WQ_v

³ Provide both a permanent pool and an ED_v above the permanent pool, each sized at 0.75* WQ_v

⁴ Extended detention shall be provided for the WQv above the permanent water pool.

⁵ The surface ponding area (WQv) shall completely empty within 24 hours so that there is no standing water. Shorter drawdown times are acceptable as long as design criteria in Ohio's *Rainwater and Land Development Manual* have been met.

⁶ This would include Grassed Linear Bioretention which was previously called Enhanced Water Quality Swale

⁷ Pocket wetlands must have a wet pool equal to the WQv, with 25% of the WQv in a pool and 75% in marshes. The EDv above the permanent pool must be equal to the WQv.

The permittee may request approval to use alternative structural post-construction BMPs if the permittee can demonstrate that the alternative BMPs are equivalent in effectiveness to those listed in Table 2 above.

530.2

Onsite Stormwater Drainage Systems

530.2-1

Culverts

- A.** Culvert design review and field inspection under these regulations will be conducted by MPW for those located outside the public right-of-way.
- B.** Include backwater analysis, showing the flood elevation at a 100 year storm event. Drainage easements may be necessary if headwater encroaches adjoining property.
- C.** All culverts should be designed and constructed to adequately handle velocities and discharges for the following storm frequencies:
 - (1) Twenty-five (25) year frequency storm under post development conditions for tributary drainage areas less than one hundred (100) acres.
 - (2) Fifty (50) year frequency storm under post development conditions for tributary drainage areas greater than or equal to one hundred (100) acres.
- D.** Show calculations indicating if culvert flow is governed by inlet or outlet control.
- E.** Indicate volume and velocity of inflow and outflow from all culverts.
- F.** Provide rip-rap protection when required based on the chart provided in Appendix A, Exhibit III.
- G.** Provide overflow routing plan showing all areas downstream that would be affected by a blockage or storm in excess of design capacity.

530.2-2

Open Channels

- A.** Design by standard engineering practices with the storm frequencies required as shown in 530.2-1.B (1) and (2) above.

B. Indicate volume and velocity of outflow from the open channel. Provide for a 1.0 to 2.0 percent slope in the direction of flow, with 6.0 percent being the maximum and 0.5 percent the minimum.

- (1) When the longitudinal slope is less than 1.0 percent, install a low flow channel, or if moisture is adequate, establish wetland species.
- (2) If slope is greater than 2.0 percent, use check dams to reduce the effective slope to approximately 2.0 percent.
- (3) When the land slopes more than 6.0 percent, swales can be installed to traverse the grade at a lesser slope

530.2-3

Headwalls

Standard headwalls and/or wingwalls shall be constructed for all culvert inlets and outlets in swales and at the outfall of all storm sewers.

530.2-4

Concentrated Flow to Wetlands

Concentrated storm water runoff to natural wetlands shall be converted to diffuse flow before the runoff enters the wetlands. The flow should be released such that no erosion occurs downslope. If the applicant proposes to discharge to a natural wetland, a hydrologic analysis shall be performed. The applicant shall assess whether the construction activity will adversely impact the hydrologic flora and fauna of the wetland.

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ARTICLE 6.0 EROSION AND SEDIMENT CONTROL MEASURES

SECTION 600 SCOPE

600.1 Effective erosion control planning requires a working knowledge of both the application of control measures in terms of their selection and location as well as the design and construction of the control measure. The purpose of this article of these regulations is to provide the engineer with a set of guidelines or minimum requirements that are to be used during the planning and installation of erosion and sediment control practices.

600.2 Every subdivision and non-farm commercial, industrial, and residential development shall require an erosion and sediment control system which is adequate to serve the development site or project area in order to protect the waters of the State and adjacent properties from pollution by sediment and soil erosion, and which meets the requirements of these regulations.

SECTION 610 GENERAL REQUIREMENTS

610.1 The erosion and sediment control system shall be designed such that during construction and after the development is completed, the sediment in the stormwater runoff shall be trapped and held within the development or project area until disturbed or denuded areas have been stabilized.

610.1.1 The start of construction shall not begin until sufficient sediment control devices have been installed in a manner that will maintain the design intent and have been stabilized.

610.2 The development of an erosion and sediment control system consists of providing two (2) separate and distinct systems; the erosion control system and the sediment control system.

610.2-1 The erosion control system is installed to prevent the detachment of soil particles from the soil surface and to minimize soil particle movement into the stormwater runoff system leaving the development or project area for the purpose of limiting the pollution of waters of the State and adjacent property.

610.2-2 The sediment control system is installed to prevent the conveyance or movement offsite of soil materials during earth disturbing activities and after construction of the project area is completed for the purpose of minimizing the pollution of waters of the State and adjacent property. All sediment controls must be capable of ponding runoff to be considered functional.

610.3 To control sediment pollution in waters of the State caused by sloughing, landsliding, or dumping of earth material, or placing of earth material into such proximity that it may readily slough, slide, or erode into these waters by natural forces, no person(s) or entity(s) shall, unless in conformance with these regulations:

610.3-1 Dump or place earth material into waters of the State or in such proximity thereto that it may readily slough, slide, or erode into these waters unless such dumping or placing is authorized by the approving agency for purposes such as, but not limited to, constructing bridges, culverts, erosion control structures, and other in-stream or channel bank improvement work; or

610.3-2 Grade, excavate, fill or impose a load upon any soil or slope known to be prone to slipping or landsliding thereby causing it to become unstable unless qualified engineering assistance has been employed to explore slope stability problems and make recommendations to correct, eliminate, or adequately address the problems. Grading, filling, or construction shall commence only after the approving agency has reviewed and approved the recommendations in accordance with the requirements of these regulations.

SECTION 620 EROSION AND SEDIMENT CONTROL PLAN CRITERIA

620.1 **Stabilization of Denuded Areas and Soil Stockpiles:** Stabilization of disturbed areas shall, at a minimum, be initiated in accordance with the time frames specified below

620.1-1 Permanent Stabilization

- Any areas that will lie dormant for one year or more must be permanently stabilized within seven days of the most recent disturbance
- Any areas within 50 feet of a surface water of the state and at final grade must be permanently stabilized within two days of reaching final grade
- Any other areas at final grade must be permanently stabilized within seven days of reaching final grade in that area.
- Permanent vegetation shall not considered to be adequate until the ground cover established can prevent or control erosion.

620.1-2 Temporary Stabilization

- Any disturbed areas within 50 feet of a surface water of the state and not at final grade must be stabilized within two days of the most recent disturbance if the area will remain idle for more than 14 days.

- For all construction activities, any disturbed area that will be dormant for more than 14 days but less than one year, and not within 50 feet of a surface water of the state, must be stabilized within seven days of the most recent disturbance. For residential subdivisions, disturbed areas must be stabilized at least seven days prior to transfer of permit coverage for the individual lot.
- Disturbed areas that will be idle over the winter must be stabilized prior to the onset of winter weather.

620.1-3 Soil stockpiles must be stabilized and protected with sediment trapping to prevent soil loss.

620.1-4 Watercourses during construction:

- A. When a watercourse must be crossed regularly during construction, a temporary stream crossing shall be provided, and an approval obtained from PWD.
- B. When in-channel work is conducted, the channel shall be stabilized before, during and after work.
- C. Stabilization adequate to prevent erosion must be provided at the outlets of all pipes and paved channels.

620.2 **Protection of Adjacent Properties**

620.2-1 Waters of the State and properties adjacent to the site of earth disturbing activities shall be protected from sediment deposits through the use of buffer strips, sediment barriers, filters or dikes, sediment basins, or any combination of these or similar measures.

620.2-2 If vegetative buffers are to be used as part of the sediment control plan to protect waters of the State, they should only be used on development sites or project areas where only sheet flow runoff is expected. The recommended undisturbed buffer along a surface water of the State is a minimum of 25 feet as measured from the ordinary high water mark of the surface water.

620.2-3 If vegetative buffers are to be used as part of the sediment control plan to protect properties adjacent to the site, they should only be used on development sites or project areas where only sheet flow runoff is expected. Also, the buffer strips shall be a minimum of fifteen (15) feet in width.

620.4 **Timing and Stabilization of Sediment Trapping and Erosion Control Measures**

620.4-1 Sediment and erosion control measures intended to trap and retain

sediment onsite shall be constructed as a first step in earth disturbing activities. These measures shall be fully functional before any additional earth disturbances take place. These measures shall be maintained in functional condition until full stabilization of the earth disturbing activities has been completed.

620.4-2 Earthen sediment and erosion control structures must be stabilized (vegetative cover) within seven (7) days of installation.

620.5 **Cut and Fill Slopes**

Cut and fill slopes must be designed and constructed in a manner which will minimize erosion. Consideration must be given to the length and steepness of the slope, soil type, upslope drainage, subsurface conditions, and other applicable factors. Special consideration shall be given for the following conditions:

- (1) If any newly constructed slope meets or exceeds a horizontal to vertical ratio of 3:1.
- (2) Or, if any fill will be placed on an existing slope that meets or exceeds a horizontal to vertical ratio of 5:1.

Otherwise, adequate and appropriate slope stabilization measures shall be provided for all cut and fill areas.

620.6 **Storm Sewer Inlet Protection**

All storm sewer inlets which are made operable during construction should be protected so that sediment-laden stormwater will not enter the stormwater conveyance system without first being filtered to remove sediment.

Exception: Storm water inlets that are designed as a part of the sediment control system or that outlet into a sediment control system.

620.7 **Disposal of Temporary Erosion and Sediment Control Measures**

620.7-1 All temporary erosion and sediment control measures shall be removed within thirty (30) days after final site stabilization is achieved as determined by the PWD or after temporary measures are no longer required as authorized by the PWD.

620.7-2 Trapped sediment and other disturbed soil areas resulting from disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.

SECTION 630 EROSION AND SEDIMENT CONTROL DESIGN STANDARDS

630.1 Scope

The most recent version of Ohio's *Rainwater and Land Development Manual* will be used as a reference for all design criteria, procedures, policy, statements, and sample calculations shall be the basis for design, construction, and implementation of all sediment and erosion control systems, unless otherwise given or noted in these regulations.

630.2 Soil Stabilization Measures

630.2-1 Critical Area Definition

An area susceptible to erosion and sediment production that requires special management to establish and maintain vegetation in order to stabilize the soil.

630.2-2 Critical Area Planting or Seeding

When planting or seeding critical areas, specifications for temporary seeding, permanent seeding and mulching as contained in the most recent version of Ohio's *Rainwater and Land Development Manual* shall be used.

630.2-3 Outlet Protection

Velocity dissipation devices (e.g., rock outlet protection, rock-lined channels, level spreaders) shall be placed at discharge locations and along the length of any outfall channel to provide non-erosive flow velocity from the structure to a watercourse in accordance with specifications contained in the most recent version of Ohio's *Rainwater and Land Development Manual*.

630.3 Runoff Control Measures

The WMSC Plan shall incorporate measures which control the flow of runoff from disturbed areas so as to prevent erosion from occurring. Such practices may include rock check dams, pipe slope drains, diversions to direct flow away from exposed soils, and protective grading practices. These practices shall divert runoff away from disturbed areas and steep slopes where practicable.

630.3-1 Natural or constructed onsite stormwater open-channel conveyance systems shall be designed to carry the peak rate of runoff as defined in

Section 530.2-2.

630.3-2 The design and necessity of other runoff control measures such as diversions and subsurface drainage, will be left to the discretion of the engineer subject to approval by the Public Works Department.

630.4 **Sediment Control Measures:** The WMSC Plan shall include a description of structural practices that shall store runoff allowing sediments to settle and/or divert flows away from exposed soils, or otherwise limit runoff from exposed areas. Structural practices shall be used to control erosion and trap sediment from a site remaining disturbed for more than 14 days.

630.4-1 **Sediment settling ponds:** A sediment settling pond is required for any one of the following conditions:

- concentrated storm water runoff (e.g., storm sewer or ditch);
- runoff from drainage areas, which exceed the design capacity of silt fence or other sediment barriers;
- runoff from drainage areas that exceed the design capacity of inlet protection; or
- runoff from common drainage locations with 10 or more acres of disturbed land.

The permittee may request approval from the Public Works Department if it can demonstrate that alternative controls are equivalent in effectiveness to a sediment settling pond. The sediment settling pond shall provide a dewatering zone of at least 1800 ft³ per acre of drainage (67 yd³ per acre) with a minimum drain time of 48 hours for sediment basins serving a drainage area of over five acres. When determining the total contributing drainage area, off-site areas and areas which remain undisturbed by construction activity must be included, unless runoff from these areas is diverted away from the sediment settling pond and is not co-mingled with sediment laden runoff. The sediment storage zone shall either be 1000 cubic feet per disturbed acre within the watershed of the basin or shall be the volume necessary to store the sediment as calculated with Revised Universal Soil Loss Equation (RUSLE) or similar generally accepted erosion prediction model. The accumulated sediment shall be removed from the sediment storage zone once it is full. The depth of the dewatering zone shall be less than or equal to five feet. If feasible, sediment settling ponds shall be dewatered at the pond surface using a skimmer or equivalent device. The configuration between inlets and the outlet of the basin must provide at least two units of length for each one unit of width.

630.4-2

Silt Fences

Silt fences are limited to sheet or overland flow. Where intended to provide sediment control, silt fence shall be placed on a level contour. The relationship between the maximum drainage area to silt fence for a particular slope range is shown in the table below:

Maximum drainage area (in acres) to 100 linear feet of silt fence.	Range of slope for a particular drainage area (in percent)
0.5	< 2%
0.25	≥ 2% but < 20%
0.125	≥ 20% but < 50%

630.4-3

No solid (other than sediment) or liquid waste, including building materials, shall be discharged in stormwater runoff. All necessary best management practices must be implemented to prevent the discharge of non-sediment pollutants to the drainage system of the site. Under no circumstance shall concrete trucks wash out directly into a drainage channel, storm sewer or other watercourse.

630.4-4

To meet the post-construction requirements of this permit, the WMSC plan must contain a description of the post-construction BMPs that will be installed during construction for the site and the rationale for their selection.

Detail drawings and maintenance plans must be provided for all post-construction BMPs. Maintenance plans shall be provided by the permittee to the post-construction operator of the site (including homeowner associations) upon completion of construction activities (prior to termination of permit coverage). Maintenance plans must include at a minimum:

- A. The entity that will be responsible for post-construction operation, inspection and maintenance,
- B. Routine and non-routine maintenance tasks that should be undertaken
- C. A recommended schedule for inspection and maintenance.

Permittees are only responsible for the installation and maintenance of storm water management measures prior to final stabilization of the site and are not responsible for maintenance after storm water discharges associated with construction activity have been eliminated from the site.

SECTION 640

EROSION AND SEDIMENT CONTROL INSPECTION REQUIREMENTS

640.1

At a minimum, all erosion and sediment controls on the site must be inspected by the permittee at least once every seven days and within 24 hours after any storm event greater than one-half inch of rain per 24 hour period. The inspection frequency may be reduced to at least once every month if the site is temporarily stabilized or runoff is unlikely due to weather conditions (e.g., site is covered with snow, ice or the ground is frozen). PWD shall waive these requirements if a waiver of inspection requirements has been obtained from Ohio EPA. Once a definable area is permanently stabilized, no further inspection requirements shall apply to that portion of the site.

640.2

The permittee shall assign “qualified inspection personnel” to conduct these inspections to ensure that the control practices are functional and to evaluate whether current controls are adequate or whether additional control measures are required.

640.3

Following each inspection, a checklist must be completed and signed by the qualified inspection personnel representative. At a minimum, the inspection report shall include:

- the inspection date;
- names of personnel making the inspection
- weather information for the period since the last inspection (or since the commencement of construction activity if the first inspection), including a best estimate of the beginning, duration and amount of rainfall for each storm event, and whether any discharges occurred;
- weather information and a description of any discharges occurring at the time of the inspection;
- location(s) of discharges of sediment or other pollutants from the site
- location(s) of BMPs that need to be maintained;
- location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
- location(s) where additional BMPs are needed; and
- corrective action required including any changes to the WMSC Plan necessary and implementation dates.

640.4 Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of or the potential for pollutants entering the drainage system. Erosion and sediment control measures identified in the WMSC Plan shall be observed to ensure that they are operating correctly. Discharge locations shall be inspected to ascertain whether erosion and sediment control measures are effective in preventing significant impacts to the receiving waters. Locations where vehicles enter and exit the site shall be inspected for evidence of off-site vehicle tracking.

SECTION 650 EROSION AND SEDIMENT CONTROL MAINTENANCE REQUIREMENTS

650.1 **When practices require repair or maintenance:** If an inspection reveals that a control practice is in need of repair or maintenance, with the exception of a sediment settling pond, it shall be repaired or maintained within three (3) days of the inspection. Sediment settling ponds shall be repaired or maintained within ten (10) days of the inspection.

650.2 **When practices fail to provide their intended function:** If the inspection reveals that a control practice fails to perform its intended function, and that another, more appropriate control practice is required, the WMSC Plan shall be amended and the new control practice shall be installed within 10 days of the inspection.

650.3 **When practices depicted on the WMSC Plan are not installed:** If the inspection reveals that a control practice identified in the WMSC plan has not been implemented, the control practice shall be implemented within 10 days from the date of the inspection. If the inspection reveals that the planned control practice is not needed, the record shall contain a statement of explanation as to why it is not needed.

650.4 Maintenance and repair of all temporary and permanent erosion and sediment control practices and or facilities as needed to assure continued performance of intended function shall be the responsibility of the developer and/or owner(s) until the development or project area is approved by the Milford Public Works Department and the development or project area is stabilized with all permanent cover to prevent erosion.

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ARTICLE 7.0 EASEMENTS, BONDS AND MAINTENANCE

SECTION 700 EASEMENTS

700.1 Drainage easements shall be provided for all stormwater conveyance systems, detention/retention structures, and drainage swales between lots, and shown on the final construction drawings and the record plat.

700.2 Drainage Easement Requirements

700.2-1 All drainage easements shall be of sufficient area to contain the facility plus allow adequate space for maintenance and repair operations. The drainage easement boundaries shall be determined by the design engineer and accepted following approval by the Milford Public Works Department. However, the following constraints are the acceptable minimums required:

- A.** A minimum drainage easement width equal to ten (10) feet for all stormwater conveyance systems.
- B.** The minimum easement for all detention or retention basins shall be the area defined by the one hundred (100) year storm elevation.
- C.** An easement for ingress and egress must be provided to the entity responsible for the maintenance of the facility between the public right of way and any drainage facility requiring maintenance. The easement must also include the structure or drainage feature requiring maintenance. The easement shall be of adequate width to perform any required maintenance but not less than twenty (20) feet.

700.2-2 All drainage easements shall be located and labeled on the development (construction) drawings and the record plat(s) by a metes and bounds description

700.2-3 No structures or facilities shall be permitted within the drainage easement except those pertaining to the function of the WMSC facility.

700.2-4 Planting and seeding for detention basins and other WMSC facilities shall be limited to the critical area planting defined in Sections 210 and 630.2.

SECTION 710

BASIN AS-BUILT CERTIFICATION

Detention/Retention Basin As-Built Certification, including a Survey, must be sealed, signed and dated by a Professional Engineer and a Professional Surveyor. The As-Built Certification shall certify that the facilities have been constructed in accordance with the approved plans.

The surveyor shall complete a field survey of the detention/retention facilities to verify as-built elevations and dimensions. The as-built drawing and as-built information of the detention/retention facilities shall include, but not limited to, the following:

- A. Storage capacity
- B. Basin side slopes (i.e. 4:1)
- C. Elevations and dimensions of the primary hydraulic control structure
- D. Elevations and dimensions of the emergency spillway; freeboard
- E. As-built release rates for each design storm
- F. As-built water surface elevations for each design storm.

The as-built drawing shall include both the design value (crossed-out) and the as-built value. The as-built drawing shall be signed and sealed by the engineer and surveyor. The following statement shall be placed on the as-built drawings: "I certify an as-built survey has been conducted for the subject stormwater management facility. The facility is expected to perform as noted hereon." The Record Plat will not be signed nor will a Certificate of Occupancy be issued until the certification is submitted and approved by the Milford Public Works Department

SECTION 720

PERFORMANCE/MAINTENANCE SURETY OR BOND

720.1

All water management and sediment control facilities that are directly related to the drainage of or from the roads, streets, alleys, ditches, sidewalks, or other such improvements located in a private development, in an incorporated area of Milford, shall be included in the Performance/Maintenance Surety (bond) as required by Milford Public Works Department.

- 720.2** A Performance/Maintenance Surety Bond of 130% (amount to be approved by the Public Works Department) will be required for work covered by the Water Management and Sediment Control Regulations before the record plat can be recorded for any subdivision and prior to the release of any permit or partial permit by the Public Works Department. The bond is to remain in effect until the project is complete and the final approval is made.
- 720.3** Periodic inspections by the PWD or authorized representative will be required throughout the project to assure the site remains in compliance with these regulations.
- 720.4** If inspections reveal the construction activities are not in compliance with these regulations, the Performance Maintenance Bond may be forfeited to achieve such compliance.
- 720.5** The bond is to remain in effect until all inspections of the site are completed and the basin verification has been submitted to and approved by the Milford PWD.

SECTION 730 MAINTENANCE

- 730.1** The owner or developer shall maintain all WMSC facilities constructed and/or installed under the WMSC Permit and in accordance with Section 710.1. All WMSC facilities shall be maintained in designed working condition to meet the design standards and the requirements of these regulations. Failure to maintain the improvement or facility could result in action against both the surety and the owner/developer.
- 730.2** The maintenance responsibility stated in Section 720.1 shall be recorded on the deed for the property and on the record plat. Also, reference is to be made to the entity or individual(s) to be responsible for the maintenance.
- 730.3** Upon expiration of the Performance/Maintenance Surety Bond, the maintenance responsibility for the WMSC facilities contained within designated drainage easements shall revert to the individual(s) or group(s) of property owners as identified on the record plat.
- 730.4** Detail drawings and maintenance plans must be provided for all post-construction BMPs. Maintenance plans shall be provided by the permittee to the post-construction operator of the site (including homeowner associations) upon completion of construction activities (prior to termination of permit coverage). Maintenance plans must include at a minimum:

- the entity that will be responsible for post-construction operation, inspection and maintenance,
- routine and non-routine maintenance tasks that should be undertaken,
- a recommended schedule for inspection and maintenance,
- any necessary legally binding maintenance easements and agreements
- a map showing all access and maintenance easements.

Permittees are only responsible for the installation and maintenance of storm water management measures prior to final stabilization of the site and are not responsible for maintenance after storm water discharges associated with construction activity have been eliminated from the site.

730.5

Petitions for Permanent Maintenance of WMSC Facilities

730.5-1

Applicants may submit a petition for permanent maintenance of WMSC facilities under Ohio Revised Code Chapter 6131. The petition shall be submitted to the Milford Public Works Department

730.5-2

Applicants may also petition the Milford City Council to establish a storm sewer district under Ohio Revised Code Chapter 6117 for the permanent maintenance of WMSC facilities.

**ARTICLE 8.0 RULES AND REGULATIONS REGARDING ILLICIT
DISCHARGES AND ILLEGAL CONNECTIONS TO THE
SEPARATE STORM SEWER SYSTEM**

SECTION 800 SCOPE

The rules and regulations regarding illegal discharges and illicit connections to the MSSS are enacted pursuant to ORC Section 6117.01. The purpose of the regulations contained herein is to reduce to the maximum extent practicable the introduction of pollutants into to the CCS4 in order to protect the health, safety, and welfare of the citizens of Milford and to comply with requirements of Ohio EPA’s National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges.

800.1 Objectives

The objectives of these regulations are:

- A. To regulate the contribution of pollutants to the MSSS by any person;
- B. To prohibit illicit discharges and illegal connections to the MSSS;
- C. To prevent non-storm water discharges, generated as a result of spills, inappropriate dumping or disposal, to the MSSS.
- D. To establish the legal authority to ensure compliance with the provisions of these regulations through the inspection, monitoring, and enforcement procedures described herein.

800.2 Applicability

These regulations shall apply to all substances entering or likely to enter the MSSS which are generated on any premises within Milford unless explicitly exempted by the Enforcing Official or allowable under a NPDES Storm Water Discharge Permit.

800.3 Compatibility with Other Regulations

These regulations are not intended to modify or repeal any other regulation, rule, or other provision of law. The requirements of these regulations are in addition to the requirements of any other regulation, rule, or other provision of law, and where any provision of these regulations imposes restrictions different from those imposed by any other regulation, rule, or other provision of law, whichever provision is more restrictive or imposes higher protective standards for human health or the environment shall control.

SECTION 810 DISCHARGE PROHIBITIONS AND EXEMPTIONS

810.1 Prohibition of Illegal Discharges

810.1-1 No person shall discharge or cause to be discharged into any portion of the MSSS any pollutants, contaminants, or waters containing any pollutants or contaminants other than storm water that cause or contribute to a violation of these regulations or the NPDES Storm Water Discharge Permit.

810.1-2 No person shall connect or cause to be connected any pipe, ditch or other outlet or accessory to any portion of the MSSS which conveys or discharges any pollutants, contaminants or substances other than storm water into the MSSS without written permission from the Enforcing Official. The un-permitted construction, use, maintenance or continued existence of such a connection is prohibited. This prohibition expressly includes, without limitation, connections made prior to the effective date of these Regulations and for which the Enforcing Official has not issued a valid and binding permit, regardless of whether the connection was previously permissible under the law or practices applicable or prevailing at the time of connection.

810.2 Exemptions to Illegal Discharges

810.2-1 The following non-storm water discharges are not considered illicit discharges and are exempt from discharge prohibitions established by these regulations:

- A. water line flushing or other potable water sources,
- B. landscape irrigation or lawn watering,
- C. diverted stream flows,
- D. rising ground water,
- E. ground water infiltration to storm drains,
- F. uncontaminated pumped ground water,
- G. foundation or footing drains (not including active groundwater dewatering systems),
- H. crawl space pumps,
- I. air conditioning condensation,
- J. springs,
- K. non-commercial washing of vehicles,
- L. natural riparian habitat or wetland flows,
- M. residential swimming pools with pH levels between 6.5 and 8.5,
- N. fire fighting activities,
- O. street wash water
- P. any other water source not containing pollutants

Q. Discharges specified in writing by the Enforcing Official as being necessary to protect public health and safety.

810.2-2 Dye testing is an allowable discharge, but requires a verbal notification to the Enforcing Official prior to the time of the test.

810.2-3 The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Ohio or U.S. Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

810.3 Home Sewage Treatment Systems

Discharges from home sewage treatment systems into the MSSS must meet the regulatory requirements under Ohio Administrative Code Section 3701-29-01 or other applicable regulatory requirements. Home sewage treatment systems which have off-lot discharges must also be designed, sited and maintained in a manner consistent with Ohio Administrative Code Section 3701-29-01 or other applicable regulatory requirements. Discharges into the MSSS from home sewage treatment systems not maintained in accordance with these regulatory requirements are not permitted under any circumstances.

810.4 Underground Storage Tanks

In conjunction with the repair, remediation or removal of underground storage tanks, groundwater can not be discharged to the MSSS unless pollutant concentrations meet or exceed criteria set forth by the Ohio Environmental Protection Agency. If pollutant concentrations exceed these criteria, the groundwater must either be:

A. discharged to a sanitary sewer system with the approval of the entity that operates the system,

B. hauled to a wastewater treatment plant for disposal, or

C. provided pre-treatment to reduce pollutant concentrations to levels that meet Ohio Environmental Protection Agency criteria.

810.5**Watercourse Protection**

Every person owning property through which a watercourse serving the CCS4 passes, or such person's lessee, shall keep and maintain that part of the watercourse within the property free of trash, debris, yard waste, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse. In addition, the owner or lessee shall maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

SECTION 820**MONITORING OF DISCHARGES****820.1****Access and Inspection of Properties and Facilities**

- A. The Enforcing Official shall be permitted to enter and inspect premises subject to supervision under these regulations as often as may be necessary to determine compliance with these regulations. If a discharger has security measures in force which require proper identification and clearance before entry into its premises, the discharger shall make the necessary arrangements to allow access to representatives of the Enforcing Official.
- B. Facility operators shall allow the Enforcing Official ready access without unreasonable delays to all parts of the premises for the purposes of inspection, sampling, examination and copying of records that must be kept under the conditions of an NPDES storm water discharge permit, and the performance of any additional duties as defined by state and federal law.
- C. The Enforcing Official has the right to require the discharger to allow the installation of monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure storm water flow and quality shall be calibrated to ensure their accuracy. These calibration records will be kept on hand and made readily available at all times.

SECTION 830**NOTIFICATION OF ACCIDENTAL DISCHARGES AND SPILLS****830.1**

As soon as any person responsible for a premises, or responsible for emergency response to a premise has knowledge or information of an unpermitted discharge from such premises into the MSSS which does not involve hazardous materials, said person shall promptly notify the

Enforcing Official and shall take all reasonable steps to ensure the expedient containment and cleanup of such discharges, protect the health and safety of the public and mitigate damage to the environment. Where an un-permitted discharge or threatened discharge involves the release of hazardous materials, said responsible person shall, in addition to the above actions, immediately notify the appropriate emergency response agencies.

830.2 In the case of an un-permitted discharge which involves the release of non-hazardous materials, "prompt notification" shall mean notification to the Enforcing Official by phone, e-mail or facsimile as expeditiously as possible, but not later than the next business day. In all cases involving un-permitted discharges, notification in person, by phone, e-mail or facsimile shall be confirmed by written notice addressed and mailed to the Enforcing Official within three (3) working days of the phone, e-mail or facsimile notice.

830.3 Where an un-permitted discharge or threatened discharge involves the release of materials from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to mitigate the effects of such release and to prevent its recurrence. Such records shall be retained for a period of not less than five years from the time of the incident.

SECTION 840 USE OF BEST MANAGEMENT PRACTICES TO ELIMINATE ILLICIT DISCHARGES

840.1 The person responsible for a premise which is, or may be, the source of an illicit discharge or illegal connection, may be required to implement, at said person's expense, additional structural and non-structural Best Management Practices (BMPs) to prevent the further discharge of pollutants to the MSSS. Compliance with all terms and conditions of a valid NPDES storm water discharge permit associated with industrial activity, to the extent practicable, shall be deemed compliance with the provisions of these regulations. These BMPs shall be part of a Storm Water Pollution Prevention Plan as necessary for compliance with requirements of the NPDES permit.

SECTION 850 ENFORCEMENT

850.1 Notification of Violation

850.1-1 Whenever the PWD finds that a person has failed to meet a requirement hereof, the PWD may order compliance by written notice of violation to the responsible person. Such notice may require without limitation:

- A. The performance of monitoring, analyses, and reporting;
- B. The elimination of illicit connections or discharges;
- C. That violating discharges, practices, or operations shall cease and desist;
- D. The abatement or remediation of illicit discharge or contamination hazards and the restoration of any affected property; and
- E. The implementation of control measures required by the Enforcing Official.

850.1-2 The requirement to implement such measures may be in addition to and not in lieu of any prosecution for fines or other remedies as may be available to the Enforcing Official under applicable law.

850.1-3 If abatement of a violation or restoration of affected property is required as a result of an un-permitted discharge, the notice of violation shall set forth a deadline within which such remediation or restoration must be completed based on the scope of the problem that requires correction. The notice may further provide that, should the violator fail to remediate or restore within the established deadline, the enforcing agency may seek to recover all remediation costs from the violator in addition to any civil and/or criminal penalties as may be recoverable under applicable laws.

850.2 **Appeal of Notice of Violation**

Any person receiving a Notice of Violation may appeal the determination of the PWD to the Board of Zoning Appeals in accordance with *Section 1131 Board of Zoning Appeals* of the Milford Zoning Ordinance.

850.3 **Injunctive Relief**

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of these Rules and Regulations. In addition to seeking civil penalties for any such violation(s), the Enforcing Official may petition the appropriate court for injunctive relief to restrain continuing or threatened future violations and/or to compel the abatement of the activities leading to any violation or threatened violation, or the remediation of the effects of any violation.

850.4 **Violations a Public Nuisance**

A condition caused or permitted to exist as a result of any violation of Article 330.0 of the City of Milford Water Management and Sediment Control Regulations which threatens the public health, safety, or welfare constitutes a public nuisance subject to abatement, restoration and/or civil action to abate or enjoin as may be available under applicable law.

850.5**Remedies Not Exclusive**

The remedies provided in Article 330.1.2 of the City of Milford Water Management and Sediment Control Regulations shall not be exclusive of any other remedies available under any applicable federal, state or local law, and it is within the discretion of the Enforcing Official to seek cumulative remedies.

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