City of Canton, Ohio

Storm Water Management Manual

March 6th, 2020

Table of Contents

PART 1. INTRODUCTION

This "City of Canton Storm Water Management Manual" has been prepared to supplement *Chapter 961: Storm Water Management* of the City of Canton Codified Ordinances by providing further standards, applicability, design criteria, requirements, recommendations, and guidance for the application of storm water management regulations in the City of Canton that are not otherwise provided in Chapter 961. It is adopted as part of Chapter 961 and is referenced in Chapter 961 as "Exhibit A". Therefore, application and adherence to the contents within this manual are subject to all parts of Chapter 961.

This manual has been prepared by the City of Canton Engineering Department. The latest edition may be found at:

http://www.cantonohio.gov/217/Stormwater-Management

Questions regarding all parts of this manual *except Part 4* should be directed to:

City of Canton Engineering Department - Civil Division
2436 30th Street NE
Canton, Ohio 44705
Phone: 330-489-3381
Email: Engineering@cantonohio.gov

Questions regarding *Part 4 (Storm Water Quality Management)* should be directed to:

Stark Soil & Water Conservation District
2650 Richville Drive SE, Suite 100
Massillon, Ohio 44646
Phone: 330-451 SOIL (7645)
Email: info@starkswcd.org

A. Applicability

As appropriate, each part describes how and when it applies to various aspects of storm water management in the City of Canton. In general, Part 2 is always applicable regardless of the type of activity involved. Parts 3 and 4 are generally only applicable to development activities. Conditions for exemptions from specific standards and requirements are provided accordingly. The current content of this manual at the time in which regulated activities take place shall apply.

Unless otherwise stated or implied, the phrases "this manual" and "these regulations" herein shall be considered synonymous and refer to the entirety of the contents, as applicable.

B. Waivers and Variances to Regulations

Waivers or variances may be requested from certain requirements of these regulations. A regulated party may submit a waiver or variance request if certain conditions exist which the regulated party believes may make adherence to certain requirements of these regulations difficult or impossible, create unnecessary hardship, or otherwise do not satisfy the intent of these regulations.

Waiver/variance requests from meeting requirements of any part of these regulations except Part 4 shall be submitted to the **City of Canton Engineering Department**.

Waiver/variance requests from meeting requirements of **Part 4** of these regulations shall be submitted to **Stark SWCD**.

The request shall state the specific requirement(s) for which a waiver/variance is requested and the corresponding reason(s) with applicable supporting information. As appropriate, City Engineering or Stark SWCD will review the request and respond accordingly with an approval or rejection. Approval will only be granted upon satisfaction that the request has been justified by the reasons provided. Waivers/variances will be approved or denied on a case-by-case basis. Adverse economic conditions shall not be a valid reason to grant a waiver/variance.

Any waivers/variances granted do not relieve the regulated party from satisfying other applicable requirements of these regulations unless otherwise specifically stated.

C. Violations, Enforcement, and Penalty

Non-compliance with any conditions of these regulations may be considered a violation of Chapter 961 Storm Water Management of the City of Canton codified ordinances and/or Stark SWCD standards and orders and therefore may be subject to respective enforcement and penalty as allowed by law.

Violations associated with these regulations may include, but are not limited to:

- Discharge of pollutants from a regulated activity to a City of Canton MS4;
- Regulated activities being conducted without an NPDES permit;
- Regulated activities being conducted without an approved SWP3;
- Regulated activities being conducted without other applicable permits;
- Regulated activities being conducted without having a pre-construction meeting;
- Incorrect installation, implementation, use, or maintenance of BMPs on a regulated activity;
- Discharge of pollutants from a post-construction BMP to a City of Canton MS4;
- Non-compliance with orders from Stark SWCD or the City of Canton

Enforcement provisions include:

- Notice Of Violation
- Administrative Hearing
- Stop Work Order
- Injunctive Relief
- Civil Proceedings

Penalty provisions include:

- Administrative penalties/fees

As appropriate, the City Service Director, Law Department, City Engineer, and/or Stark SWCD will be consulted for proper and appropriate escalation of enforcement measures on a case-by-case basis.

D. Revisions to Regulations

These regulations may be revised from time to time, at the discretion of City Engineering, based on government mandates and/or improvements in engineering, science, monitoring and local maintenance experience, or to improve clarity and/or make corrections. Any requirements of or revisions made to this manual may be reviewed by the City of Canton Director of Public Service, who may affirm, modify, or rescind the same. When revisions are made, the cover page will always have the date that reflects the latest revisions. In addition, “Part 6 REVISIONS” will contain a summary of changes made. The latest version of this manual will always be available for download on City Engineering’s website. Previous versions are available upon request.

E. Additional Guidance and Resources

General information:

- City of Canton website:
  http://cantonohio.gov/
- City Engineering Department webpage:
  http://www.cantonohio.gov/210/Engineering

General storm water drainage information:

- City of Canton Storm Water Management webpage:
  https://www.cantonohio.gov/217/Storm-Water-Management

Storm water quantity management:

- City of Canton Storm Water Management webpage: http://www.cantonohio.gov/217/Stormwater-Management

Storm water quality management:

- Ohio EPA's Storm Water Program webpage: http://epa.ohio.gov/dsw/storm/index.aspx
- Ohio's Rainwater and Land Development Manual: http://epa.ohio.gov/dsw/storm/technical_guidance.aspx
- Ohio EPA's Construction Storm Water Permit: https://epa.ohio.gov/dsw/permits/GP_ConstructionSiteStormWater
- Ohio EPA's Post-Construction Q&A Document: http://epa.ohio.gov/dsw/storm/CGPPCQA.aspx
- Stark SWCD's website: https://www.starkswcd.org/
- City of Canton Storm Water Management webpage: http://www.cantonohio.gov/217/Stormwater-Management

PART 2. GENERAL STORM WATER DRAINAGE STANDARDS

A. Applicability of General Storm Water Drainage Standards

Unless otherwise stated herein, Part 2 shall be applicable at all times and to all storm water runoff within the City of Canton. All correspondence and inquiries regarding Part 2 should be directed to:

City of Canton Engineering Department – Civil Division
2436 20th St NE – Building A
Canton, Ohio 44705
Phone: 330-489-3381
Email: Engineering@cantonohio.gov
Website: http://www.cantonohio.gov/216/Civil-Engineering

B. Exemptions from General Storm Water Drainage Standards

Storm water runoff associated with the following activities is exempt from these regulations:

1. ***Civil matters*** between private parties involving private actions not otherwise regulated by any parts of this manual.

2. ***Any emergency project***, as determined by the City of Canton Director of Public Service, that is immediately necessary for the protection of life, property, or natural resources;

Certain requirements as stated within respective parts of these regulations may not apply to all regulated activities.

C. Duties

Any person who undertakes any regulated activities shall ensure that soil erosion, sedimentation, increased pollutant loads, and changed storm water runoff flow characteristics resulting from the activity are controlled so as to reduce or eliminate associated pollution of receiving waters and flood damage or nuisance to other properties and/or infrastructure.

1. ***Duty to Comply:*** The regulated party shall comply with all applicable conditions of these regulations. Any non-compliance constitutes a violation of "Chapter 961 Storm Water Management" of the City of Canton's codified ordinances and is grounds for enforcement action. It shall not be a defense for a regulated party in an enforcement action that it would have been necessary to halt or reduce the regulated activity in order to maintain compliance with the conditions of these regulations.

2. ***Duty to Mitigate:*** The regulated party shall take all reasonable steps to minimize or prevent any discharge in violation of these regulations which has a reasonable likelihood of adversely affecting human health or the environment. All properties adjacent to the regulated activity shall be protected to the maximum extent practicable from soil erosion, sediment runoff, and associated drainage including, but not limited to: public and private properties, natural and artificial waterways, wetlands, and storm and sanitary sewers.

3. ***Duty to Provide Information:*** As directed, the regulated party shall furnish any information which may be requested by the City of Canton or Stark SWCD to determine compliance with these regulations. When the regulated party becomes aware that they have failed to submit any relevant facts or submitted incorrect information related to requirements of these regulations, they shall promptly submit such facts or information.

D. Property Rights

Compliance with these regulations does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

E. Permits, Other Laws and Regulations, and Fees

Various permits, laws, regulations, and associated fees may be applicable for activities subject to any part of these regulations. As such, all fees as required by any City department, Stark SWCD, or any other agency pursuant to satisfying any part of these regulations or associated permits, laws, or other regulations shall be paid by the regulated party. Contact the City Engineering Department for the current fee schedule and any permits that may be required by the City Engineering Department, or see http://www.cantonohio.gov/210/Engineering. Any work requiring a City Engineering Department permit is subject to inspection by the department.

All requirements, reviews, permits, coordination, or fees referenced or otherwise required by Ohio EPA's Construction Storm Water Permit or Stark SWCD's Storm Water Quality Regulations shall also apply to these regulations by reference.

1. ***Proof of Compliance with Other Regulations/Permits:*** Proof of compliance with various permits and documentation relevant to regulated activities may be required to be submitted as directed, including, but not limited to:

    a. ***Construction Storm Water Permit*** administered by Ohio EPA. Proof of compliance shall be a copy of Ohio EPA's letter granting approval for coverage under the Construction Storm Water Permit.

    b. ***Section 404 of the Clean Water Act*** as administered by the US Army Corps of Engineers for streams, wetlands, and waterways. Proof of compliance shall be a copy of the US Army Corps of Engineers project approval letter. Wetland delineations must be verified by the US Army Corps of Engineers.

    c. ***Ohio Dam Safety Law*** administered by ODNR Division of Water. Proof of compliance shall be a copy of the ODNR project approval letter. As applicable, if a dam is exempt from Ohio Dam Safety Laws, a letter from the regulated party certifying and explaining the criteria for exemption is required.

    d. ***Section 401 of the Clean Water Act*** as administered by Ohio EPA. Proof of compliance shall be a copy of the Ohio EPA Certification application tracking number, public notice, project approval, or a letter from the regulated party certifying that a qualified professional has surveyed the site and determined that Section 401 of the Clean Water Act is not applicable. Wetlands and other waters of the United States shall be delineated by protocols accepted by the US Army Corps of Engineers at the time an application is made under these regulations.

F. Perpetuation of Existing Watercourses

Existing watercourses on a regulated site shall be discharged from the site as nearly as possible with respect to the locations that existed prior to the regulated activity. Surface water from one watershed cannot be diverted, channeled, piped, or otherwise re-routed to another watershed unless approved by City Engineering and/or Stark SWCD, accordingly. For regulated sites in which it is desired to "separate" off-site runoff from entering the site, a storm water conveyance system must be provided and designed such that the existing contributing 100-year offsite discharge can be contained entirely within the conveyance system's section and without creating the potential to cause adverse effects to other properties.

G. Alternative Planning, Design, or Development Methods

"Green" concepts, low impact development concepts, "smart growth", and other alternative planning, design, or development concepts that promote alternative approaches to storm water management and the preservation of natural resources may be encouraged or allowed upon the review and approval of the City of Canton and/or Stark SWCD and in accordance with applicable Planning and Zoning regulations and other parts of these regulations.

Alternative methods may be allowed only if it can be demonstrated that they are sufficient to protect the overall integrity of receiving streams and the watershed. Such methods will be approved or denied on a case-by-case basis, and may also require approval by Ohio EPA.

H. Adequate Outlet Required

Unless otherwise approved, all storm water runoff from activities covered by Parts 3 and 4 of these regulations shall be drained to an "adequate outlet".

A regulated site may have more than one adequate outlet, depending on topography. The adequate outlet shall consist of a stream, ditch, storm sewer, pond, lake, or other approved water body or water course having the capability to accommodate existing and proposed runoff rates and volumes without causing unapproved flooding or excessive erosion. If drainage maps are required, each adequate outlet must be shown on the maps.

If the adequate outlet is not accessible within the regulated site, City Engineering and/or Stark SWCD may require that easements having adequate conveyance systems be obtained through the respective adjacent properties to provide means for the regulated site's runoff to ultimately discharge to the adequate outlet. The conveyance system from the site to the adequate outlet must consist of a conveyance system able to adequately convey the respective 100-year post-developed flow from the site. Other measures may be required to protect the conveyance system and/or its outlet from erosion.

Other provisions may also need to be made, such as requiring more stringent detention criteria or making physical improvements to the downstream drainage system, to ensure that the outlet can accommodate all post-developed runoff from the development and thus be determined to be "adequate" by City Engineering. The regulated party may also be required to submit survey data and detailed calculations demonstrating the capacities (flow rate and/or volume) and/or the erosion potential of the downstream outlet.

I. Site Plan/Construction Plans

Activities covered by Parts 3 and 4 of these regulations typically require the submission and approval of a site plan in accordance with the City of Canton Planning and Zoning Code. There may be circumstances in which a site plan is not required in accordance with the Planning and Zoning Code, but construction plans or some other type of plan is still required by the City of Canton as directed.

1. ***Plans required for storm water quantity management:*** City Engineering must review and approve all aspects of storm water *quantity* management as required in accordance with Part 3 of these regulations. Typical reviews include: site plans/construction plans, storm water conveyance design, detention design, calculations, and supporting information. Approval of storm water quantity management by City Engineering is required before overall approval of plans can be granted by the City of Canton.

2. ***Plans required for storm water quality management:*** Stark SWCD must review and approve all aspects of storm water *quality* management as required in accordance with Part 4 of these regulations. Typical reviews include: site plans/construction plans, Storm Water Pollution Prevention Plans (SWP3s), calculations, supporting information, and Long-Term Maintenance Plans (for permanent post-construction BMPs). Approval of storm water quality management by Stark SWCD is required before overall approval of plans can be granted by the City of Canton.

J. Plan Notes for City Engineering Permits

Any work within City street right-of-way (or public easement) or work that otherwise requires a permit from City Engineering *and* in which a site plan/construction plans must be submitted for review.

Appropriate notes to obtain required permits must be included on applicable site plans/construction plans. See http://www.cantonohio.gov/227/Permits-Fees.

K. City-Licensed Contractors

Only City-licensed contractors are eligible to perform work on City-owned storm and sanitary sewers and to perform other work within City right-of-way. See *Chapters 907* and *939* of the City of Canton Codified Ordinances for further details. The City Engineer's Office maintains a current list of approved, licensed contractors.

L. City Engineering Standard Drawings

The City Engineering Department maintains standard drawings for certain standards and requirements associated with the following within City right-of-way:

- Catch basins and manholes
- Conduits and trenches (sanitary laterals, utility trenches, downspouts and sump pump connections, etc.)
- Driveways, curbs, and pavement (drive approaches, curbs, sidewalks, pavement repair, pavement buildup, wheelchair ramps, crosswalks, etc.)
- City streetscape (various standards and details)

All public projects and infrastructure as well as private work within public right-of-way shall abide by applicable standards.

City of Canton Standard Drawings are available at the Engineering Department and on the Engineering page of the City website at www.cantonohio.gov. These standard drawings shall be used and applied as necessary for all public projects and infrastructure as well as private work within public right-of-way unless otherwise required by the City Engineer. Where City Standard Drawings and Notes do not address a specific application, the most recent versions of the State of Ohio Department Of Transportation (ODOT) Standard Construction Drawings, Construction and Material Specifications, or other applicable resource shall govern, unless otherwise directed by City Engineering.

M. Storm Pipe Standards in City Right-of-Way

Storm Pipe Standards within City Right-Of-Way				
Type	**Public or Private?**	**Purpose**	**Minimum Diameter**	**Material**
Storm sewer main	Public	Drainage of City street and contributing areas	15”	As allowed by ODOT[1], but HDPE[2] preferred
Storm sewer lateral	Public	Drainage of City street and contributing areas	12”	
Storm sewer	Private	Drainage of private property	As approved	
Driveway culvert	Private	Drainage conveyance for access to private driveway	12”	
Culvert under City street	Public	Drainage conveyance under City street	15”	
Other (as applicable)	(As approved)	Drainage conveyance	As approved	

[1] Ohio Department of Transportation Construction and Material Specifications, latest edition
[2] High-Density Polyethylene, smooth-wall

N. Flood Zone Requirements

All applicable Flood Zone requirements shall be met in accordance with the City of Canton’s Flood Zone Ordinances. See *Chapter 1166: Flood Hazard Zoning District* of the City of Canton Codified Ordinances or contact the City Zoning Inspector for further details.

O. Total Maximum Daily Load Requirements

The City of Canton is located within the Nimishillen Creek watershed. The watershed appears on Ohio’s 303(d) list of impaired waters based on findings from Ohio EPA’s monitoring program. Impairments have been found for biological communities as well as elevated phosphorous, nitrates, and bacteria. As such, Ohio EPA has approved Total Maximum Daily Loads (TMDLs) for phosphorus, habitat (sediment), and bacteria within the Nimishillen Creek watershed in an effort to restore the Nimishillen Creek to acceptable standards.

The Northeast Ohio Storm Water Training Council has recommended Best Management Practices (BMPs) for both construction site storm water runoff control and post-construction storm water management that can be implemented by regulated parties to address TMDLs for the Nimishillen Creek watershed.

Unless otherwise required per these regulations or by the City of Canton or Stark SWCD, *appropriate* recommended

BMPs to address TMDLs should be implemented for all activities covered by any parts of these regulations.

Recommended *Construction Site* Storm Water Runoff Control BMPs to Address Nimishillen Creek Watershed TMDLs			
TMDL			**BMP Description**
Habitat	**Nutrients**	**Bacteria**	
	✓	✓	Protect and maintain wetlands in their natural states – wetlands filter nitrogen as well as other nutrients and pollutants
		✓	Protect and maintain natural vegetative buffers to filter storm water runoff
	✓	✓	Ensure portable toilets are maintained and emptied without spills
✓	✓		Physically mark on-site protected areas (i.e. wetlands, riparian areas, other valuable resources) in the field prior to commencement of earth-disturbing activities
✓	✓		Maintain 50-ft natural vegetative buffers between the limits of disturbance and water resources
	✓	✓	Ensure proper storage of landscape materials on construction sites

Recommended *Post-Construction* Storm Water BMPs to Address Nimishillen Creek Watershed TMDLs			
TMDL			**BMP Description**
Habitat	**Nutrients**	**Bacteria**	
✓	✓		Physically mark on-site protected areas (i.e. wetlands, riparian areas, other valuable resources) in the field prior to commencement of earth-disturbing activities
	✓		Implement any of the following types of post-construction BMPs: • Infiltration basins and trenches • Dry extended detention basins • Bioretention with internal water storage • Constructed wetlands • Permeable pavement with internal water storage
✓			Implement any of the following typed of post-construction BMPs: • Wet extended detention basins • Dry extended detention basins with forebays and micro pools • Infiltration basins and trenches with appropriate pretreatment, e.g. vegetated swales, filter strips, etc. • Bioretention areas • Constructed wetlands that provide extended detention of the water quality volume (WQv) • Permeable pavement • Tree box filters
✓	✓	✓	Implement conservation development
✓	✓	✓	Implement riparian and wetland setbacks
✓	✓	✓	Implement downspout disconnections (redirect flow to rain gardens, rain barrel systems, and/or filter strips)
✓			Implement alternative parking provisions (e.g. decrease overall number of spaces, allow alternative pervious materials, shared parking, etc.) as allowed by Planning and Zoning Code
	✓	✓	Retrofit storm water management control systems to increase infiltration and to function as constructed wetlands
✓	✓		Reduce impervious surfaces and replace them with storm water practices that infiltrate, capture and reuse, or otherwise reduce storm water runoff such as permeable pavement, cisterns, infiltration basins and trenches, bioretention with internal water storage, etc.
	✓	✓	Implement practices that deter waterfowl around storm water ponds
✓			Retrofit storm water management control systems to treat the WQv and/or increase infiltration
		✓	Select post-construction BMPs that eliminate or minimize bacteria, such as bioretention and constructed wetlands (as recommended by Ohio's Rainwater & Land Development Manual)

P. Residential Site Plan Drainage Reviews

As part of the individual home building permit for single or two-family residential development, the City Zoning Inspector may require a "Residential Site Plan" to be submitted for review and recommendation of applicable proposed downspout and sump pump/groundwater discharge points and connections as well as general runoff patterns for the lot. The Residential Site Plan may be reviewed by City Engineering and/or Stark SWCD. Pursuant to the review, certain permits and other conditions may apply.

Q. Drainage Easements

Depending on a site's drainage characteristics and maintenance responsibility for storm infrastructure, drainage easements may be required for activities covered by these regulations.

1. Permanent, legally-recorded drainage easements shall be provided in the following cases, or as otherwise required by the City Engineer:

a. When the "adequate outlet" for the site's proposed drainage is not located on site and is not in public right-of way. The easement shall be from the respective site to the "adequate outlet";

b. When, in the opinion of the City Engineer, a sufficient amount of runoff from public right-of-way is managed outside of public right-of-way before discharging to the "adequate outlet". The easement shall be from the public right-of way to the "adequate outlet" or as otherwise determined by the City Engineer;

c. When any portion of a respective site's storm water management system(s) is to be located off-site (on another property);

d. When, in the case of subdivisions, it is necessary to convey storm water runoff along designated routes from uphill lots through downhill lots and the runoff path through such lots (based on final grading) will not drain through public streets or public drainage easements. This provides the ability for all lots within the subdivision to have positive and legal means to adequately discharge water from the sites;

e. When required by the City Engineer or Stark SWCD for post-construction storm water quality BMPs implemented per Part 4 of these regulations.

2. ***General standards and requirements for all drainage easements:***

a. The limits and dimensions of drainage easements must be shown on an approved easement plat and/or otherwise described on an approved easement document, which must be recorded with the property deed. It is recommended that both a plat and document be recorded;

b. The limits and dimensions of drainage easements must be shown on the applicable site plan, construction plans, and/or storm water pollution prevention plan for the respective site;

c. Drainage easements shall cover the footprint of any respective storm water detention facilities and/or storm water quality BMPs and shall extend at least 20 feet beyond facility's/BMP's outside perimeter, unless otherwise required or approved by the City Engineer;

d. Drainage easement shall be a minimum of 20 feet in width and should be centered over any respective storm water conveyance systems, unless otherwise required or approved by the City Engineer;

e. Drainage easements shall contain language that clearly describes all operation and maintenance rights and responsibilities of all parties. Such language should coincide, at a minimum, with the content required for Long-Term Maintenance Plans;

f. Overlapping of drainage easements with other easements should be avoided as much as possible, except where such easements intersect or are otherwise approved by the City Engineer and other respective easement grantees;

g. Wherever possible, in subdivisions, the drainage easements shall be placed along and adjacent to property lines

and in straight alignment without angle points;

h. Restricted grading provisions may be necessary as determined by the City Engineer.

3. ***"Public" versus "Private" drainage easements:*** Depending on drainage characteristics of the site and the origins of any runoff from off-site drainage areas that may be conveyed through the site, any necessary drainage easements will need to be recorded as either "Public Drainage Easement" or "Private Drainage Easement". Since various scenarios are possible for each site, the following shall be used as general guidelines, and the final determination of "public" or "private" in each case shall be subject to the City Engineer's discretion.

a. ***"Public Drainage Easements":***

(1) Easements shall be recorded as "Public Drainage Easements" in the following cases:

(A) When a public project necessitates installation of a new or rerouted storm water management system through private property;

(B) When otherwise considered by the City Engineer to be for the health and welfare of the general public or otherwise in the best interests of the City of Canton to be recorded as a "Public Drainage Easement".

(2) Additional standards and requirements for "Public Drainage Easements":

(A) If necessary, public access from the nearest public street shall be provided in the form of a separate access easement and shall coincide with the drainage easement where possible. This access shall consist of a gravel access drive or gravel base topped with topsoil, seed, and mulched (per City standards);

(B) Public Drainage Easements shall include a language on the easement plat and/or easement document describing how long-term maintenance of the respective storm water management system(s) will be performed. This language should coincide with the information required for Long Term Maintenance Plans per these regulations.

b. ***"Private Drainage Easements":***

(1) Easements shall be recorded as "Private Drainage Easements" in the following cases:

(A) When the drainage area contributing to the respective storm water management system is substantially comprised (as in the opinion of the City Engineer) of runoff from private properties;

(B) When a private project necessitates installation of a new or rerouted storm water management system through private property;

(C) When considered by the City Engineer to not be for the health and welfare of the general public or otherwise to be in the best interests of the City of Canton to be recorded as a "Private Drainage Easement".

(2) Additional standards and requirements for "Private Drainage Easements":

(A) Private Drainage Easements required pursuant to these regulations shall include language on the easement plat and/or easement document describing how long-term maintenance of the respective storm water management system(s) will be performed. This language should coincide with the information required for Long Term Maintenance Plans per Part 4 of these regulations;

(B) All Private Drainage Easements required pursuant to these regulations should expressly state that the City has entrance, inspection, maintenance, and enforcement rights as described in Chapter 961 of the Codified Ordinances of the City of Canton.

R. Qualification Requirements for Information Submission

All applicable information submitted pursuant to these regulations shall be prepared and/or signed by qualified individuals in accordance with the following:

Qualification Requirements for Information Submission	
Item	**Minimum Qualifications**
Site plans	(as allowed by Zoning ordinance)
Construction plans not requiring submission of site plan	Prepared by: PE
Runoff Analysis[1]	Prepared by: (as approved by City Engineering)
Storm water *quantity* management calculations (conveyance systems, detention, etc.)[1]	Prepared by: PE
Storm water *quality* management calculations (construction site BMP design and post-construction BMP design)[1]	Prepared by: PE or CPESC or CPSWQ
Storm Water Pollution Prevention Plan (SWP3)	Prepared by: PE or CPESC or CPSWQ Responsible for implementation: Per Construction Storm Water Permit
Long-Term Maintenance Plan (LTMP) (for post-construction storm water BMPs)	Prepared by: PE or CPESC or CPSWQ Responsible for implementation: Responsible person[2]
As-built survey	Prepared by: PS (preferred) or PE
Certification statement[3]	Per Construction Storm Water Permit
Easement plats/documents	Prepared by: PS or PE
Other items as may be required	(As directed)

[1] All supporting information must be included.

[2] A responsible person is an individual or a position having responsibility for the overall operation of the regulated activity, facility, or site (i.e. owner, manager, operator, superintendent, position of equivalent responsibility, individual or position having overall responsibility for environmental matters, chairman or president of homeowners association, etc.). A responsible person must be approved by City of Canton and/or Stark SWCD.

[3] As required per Construction Storm Water Permit

S. Plan Review Process

The plan review process for any regulated activities requiring storm water quantity management (Part 3) or storm water quality management (Part 4) is as follows:

1. ***When a Site Plan is required (per Chapter 1195 of Zoning Regulations):***

   a. See "City of Canton Site Plan Review Process" flowchart at: http://www.cantonohio.gov/216/Civil-Engineering.

   b. Submit electronic files (.pdf) of storm water management calculations and supporting information as directed to the City Engineering Department (and Stark SWCD, as applicable per Part 4 of these regulations).

2. ***When a Site Plan is <u>Not</u> required:***

   a. ***If < 1 acre of total land disturbance (only storm water quantity management applies; storm water quality management does not apply):***

      (1) Submit plans and other information as directed by the City of Canton for review.

      (2) Submit electronic files (.pdf) of storm water management calculations and supporting information as directed to the City Engineering Department.

      (3) Pay any/all required plan review fees.

      (4) Revise and submit plans, calculations, and other required information as needed for approval by reviewing departments/agencies. Any revisions must be submitted as directed to all affected reviewing departments to ensure consistency of plans and reviews.

(5) The City of Canton will issue overall approval of plans upon assurance that all requirements have been met and other applicable approvals have been granted.

b. ***If ≥ 1 acre of total land disturbance (both storm water quantity and storm water quality management apply):***

(1) Submit plans and other required information as directed by the City of Canton for review.

(2) Once the Storm Water Pollution Prevention Plan is completed, submit it to the Civil Engineering Department and Stark SWCD as directed.

(3) Submit electronic copies (.pdf) of Storm Water Management Report (which includes calculations and supporting information for storm water quantity and storm water quality management; see Parts 3 and 4 of these regulations) to the Civil Engineering Department and Stark SWCD as directed. Civil Engineering will review the storm water *quantity* management and Stark SWCD will review the storm water *quality* management.

(4) Submit proof of coverage under an NPDES Construction Storm Water Permit to Stark SWCD and other City Departments as directed.

(5) Submit a Long-Term Maintenance Plan (in accordance with Part 4 of these regulations) to Stark SWCD for review. If the LTMP names the City of Canton (or a specific City department) as the responsible party, submit it to Civil Engineering for review as well. Upon approval of LTMP, submit a copy to responsible party for signature. Provide a copy of signed LTMP to Stark SWCD.

(6) Provide any other information as required by the City of Canton and Stark SWCD.

(7) Pay any/all required plan review fees.

(8) Revise plans, calculations, and other required information as needed for approval by each reviewing department. Any revisions must be submitted as directed to all affected reviewing departments to ensure consistency of plans and reviews.

(9) Approval by Stark SWCD is required before overall approval of plans can be granted by the City of Canton.

(10) The City of Canton will issue overall approval of plans upon assurance that all requirements have been met and other applicable approvals have been granted.

T. Conditions to be Met to Commence Regulated Activities

All of the following conditions shall be met before the commencement of regulated activities requiring storm water quantity and/or storm water quality management:

1. ***Plan approval***: Site plan/construction plans must be approved in accordance with the Plan Review Process.

2. ***Pre-construction meeting with City of Canton*** may be required as directed.

3. ***Pre-construction meeting with Stark SWCD*** is required (*if* storm water quality management applies).

4. ***Notification by City of Canton of approval to proceed*** may be required as directed upon satisfaction of any other applicable requirements.

U. As-Built Survey

As required per conditions of any part of these regulations or otherwise by City Engineering or Stark SWCD, an as-built

survey shall be performed and submitted as directed. The as-built survey shall show the locations, elevations, and other relevant information to substantiate that the construction and/or function of storm water infrastructure is in satisfactory conformance with the approved design.

If the as-built survey demonstrates that the respective infrastructure is not in satisfactory conformance with the approved design, then redesign, revised calculations, and/or reconstruction of the infrastructure may be required to the satisfaction of City Engineering and/or Stark SWCD.

V. Inspection and Entry

1. ***General Authority:*** Regulated parties shall allow authorized representatives of the City of Canton, upon the presentation of credentials and other documents as may be required by law, to:

    a. Enter upon the regulated party's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of these regulations;

    b. Have access to and copy at reasonable times, any records that must be kept under the conditions of these regulations;

    c. Inspect at reasonable times regulated activities, sites, and any associated facilities or equipment (including monitoring and control equipment).

2. ***Inspections During Construction Activities:*** City Engineering and/or Stark SWCD may conduct inspections of the regulated activity to ensure compliance with these regulations.

3. ***Post-Construction Inspections:*** City Engineering and/or Stark SWCD may conduct inspections of storm water infrastructure installed pursuant to these regulations after construction activities cease.

W. Operation and Maintenance

Regulated parties/responsible parties shall at all times properly operate and maintain ("O&M") all storm water practices, facilities, and systems of treatment and control (and related appurtenances) which are installed or used to achieve compliance with the conditions of these regulations.

1. ***O&M of Temporary Storm Water Infrastructure and BMPs:*** All temporary storm water management infrastructure and related appurtenances installed or used to achieve compliance with the conditions of these regulations must at all times be properly operated and maintained by the regulated party (i.e. contractor).

2. ***O&M of Permanent Storm Water Infrastructure and BMPs:*** As applicable:

    a. All permanent storm water quantity management infrastructure and related appurtenances installed per Part 3 of these regulations must be maintained by the respective owner or responsible party.

    b. All permanent storm water quality BMPs and related appurtenances installed per Part 4 of these regulations must be maintained in accordance with a Long-Term Maintenance Plan which has been approved by Stark SWCD.

    c. Appropriate legal mechanisms such as easements or deed restrictions may be required.

Stark SWCD may periodically offer workshops for operation and maintenance of storm water BMPs.

PART 3. STORM WATER QUANTITY MANAGEMENT

Storm water quantity management is the design and implementation of detention/retention facilities, conveyances (storm sewers, ditches, etc.), and/or other practices to control the rate and/or volume of storm water runoff from a site.

Part 3 is not intended to provide an exhaustive list and descriptions of all requirements necessary to prepare plans, specifications, reports, calculations, and other information needed for applicable storm water quantity management. The designer shall follow generally accepted standards for engineers, architects, and surveyors, as applicable.

All correspondence and inquiries regarding Part 3 should be directed to:

City of Canton Engineering Department – Civil Division
2436 20th St NE – Building A
Canton, Ohio 44705
Phone: 330-489-3381
Email: Engineering@cantonohio.gov
Website: http://www.cantonohio.gov/216/Civil-Engineering

A. Applicability of Storm Water Quantity Management

All applicable standards and requirements of Part 2 apply. Except for exempted activities and as otherwise stated herein, standards and requirements of Part 3 apply to:

1. All proposed developments, uses, or activities that require the submission of a site plan per the City of Canton Planning and Zoning Code;

2. Any proposed developments, uses, or activities that may not require the submission of a site plan per the City of Canton Planning and Zoning Code but will otherwise result in a change to runoff patterns or increase runoff from existing conditions;

3. Public roadway, infrastructure, flood control, or other capital improvement projects.

Examples of regulated activities include, but are not limited to:

- Commercial, industrial, or institutional construction/development projects
- Subdivision (residential and industrial) construction/development projects
- Recreational projects
- Public projects (roadway, infrastructure, capital improvements, parks and trails, etc.)
- Redevelopment projects
- Parking lot construction or reconstruction

B. Exemptions from Storm Water Quantity Management

Activities exempted from Part 2 are exempted from Part 3 of these regulations.

C. TMDL Requirements for Storm Water Quantity Management

See Total Maximum Daily Load Requirements in Part 2 of these regulations. Unless otherwise required by City Engineering, *appropriate* recommended BMPs to address TMDLs should be implemented for regulated activities.

D. Runoff Analysis

A Runoff Analysis is required for regulated activities that will create > 6,000 square feet of new impervious surface. A Runoff Analysis consists of three (3) components which must be submitted to City Engineering:

1. ***Peak Discharge Analysis:*** Must be performed showing existing and proposed peak runoff rates for the 2-, 5-, 10-, 25-, 50-, and 100-year storm events. Acceptable methods to calculate peak flows are:
    - Rational Method – suitable (and recommended) for small drainage areas (typically less than 30 acres);
    - Soil Conservation Service (SCS) Method;
    - USGS regression equations as described and referenced in the current edition of ODOT's L&D Manual – Volume II – Drainage Design;
    - Other methods may be used pre-approved by City Engineering.

    All values, assumptions, and other data used must be clearly shown and, where appropriate, supported by calculations.

2. ***Drainage Maps:*** Scaled pre- and post-developed drainage maps must be provided and shall contain the following, at a minimum:

    a. *Existing/proposed elevation contours* with the contour interval not exceeding two feet. Proposed grading within regulated sites shall provide positive drainage for all areas, unless otherwise approved by the City Engineer. Contour lines and elevations shall be provided to clearly indicate existing and proposed drainage patterns. Major flood paths and ponding for the 100-year runoff (including surcharging of storm sewers) shall be considered. Grading and/or infrastructure shall be able to convey the 100-year post-developed runoff safely from all locations to an adequate outlet.

    b. *Natural and man-made drainage features and water resources;*

    c. *Point(s) of analysis:* A point of analysis is an identified particular point on the earth's surface where pre- and post-developed storm water runoff is evaluated. The point of analysis should be the point where post-developed runoff will discharge from the site. Depending on topography, there may be several directions that runoff discharges from the site and therefore several points of analysis.

    d. *Delineated drainage areas* (including off-site areas that drain onto the project site, as applicable) contributing to each point of analysis, including the size of each respective area (in acres). Enough contouring should be shown beyond the drainage divides to confirm the watershed boundaries;

    e. *Flow paths* of the hydraulically most distant points within each individual drainage area to the respective point of analysis. The segments of this path that are overland/sheet flow, shallow concentrated flow, open channel flow, and pipe flow shall be clearly indicated by using different colors, line types, or labeled accordingly. The upper and lower elevations along each respective flow segment and the length of each segment must be provided. Calculations showing how the time of concentration was determined for each area must be provided;

    f. The *various types of surface areas* within each of the individual drainage areas and their associated runoff coefficients or curve numbers, etc. This shall be done by using different colors of shading or another pre-approved method. Calculations showing how weighted runoff coefficients or curve numbers were determined for each drainage area must be provided;

    g. *Downstream drainage system(s)* that will be used to convey flows from all proposed storm conveyance systems. Calculations or assumptions of the capacity of this outlet should be provided to be used as a check for its adequacy to convey the proposed flows from the development;

3. ***Downstream Capacity Evaluation:*** The regulated party shall identify *and* evaluate the downstream drainage system within the immediate vicinity of the regulated activity that will accept runoff from the site. This information is needed to help determine if storm water detention is needed and the respective detention criteria:

    a. At a minimum, the downstream system shall be shown or referenced on a post-developed drainage map and should be shown on a site plan/construction plan.

    b. A brief narrative description of the downstream system shall be provided. If storm water detention is required, this description shall be provided in a Storm Water Management Report.

c. If information is insufficient to determine actual flow capacity, an estimate of the most restrictive storm event capacity (2-yr, 5-yr, 10-yr, 25-yr, 50-yr, or 100-yr) of the downstream systems shall be provided. This helps to determine the corresponding maximum allowable flow contribution from the regulated activity.

For example: *"The site will discharge by direct connection to an existing catch basin at SE corner of Market Ave North and 5th St NE. The catch basin has an existing 12" storm sewer outlet which is estimated to have a 10-yr storm capacity."*

Unless otherwise directed or approved by City Engineering, the following assumptions can generally be made regarding storm event capacities of downstream systems:

Assumptions of Storm Event Capacities of Drainage Systems	
Drainage System	**Storm Event Capacity**
Public storm sewer	10-yr
Creek	100-yr
Roadside ditch	5-yr
Private storm sewer or other conveyance	As directed or as approved

It is recommended to also use and submit the **"Runoff Analysis Summary"** spreadsheet on City Engineering's Storm Water Management webpage at http://www.cantonohio.gov/217/Stormwater-Management. This spreadsheet will assist in determining detention criteria, if applicable.

E. Storm Water Conveyance Systems

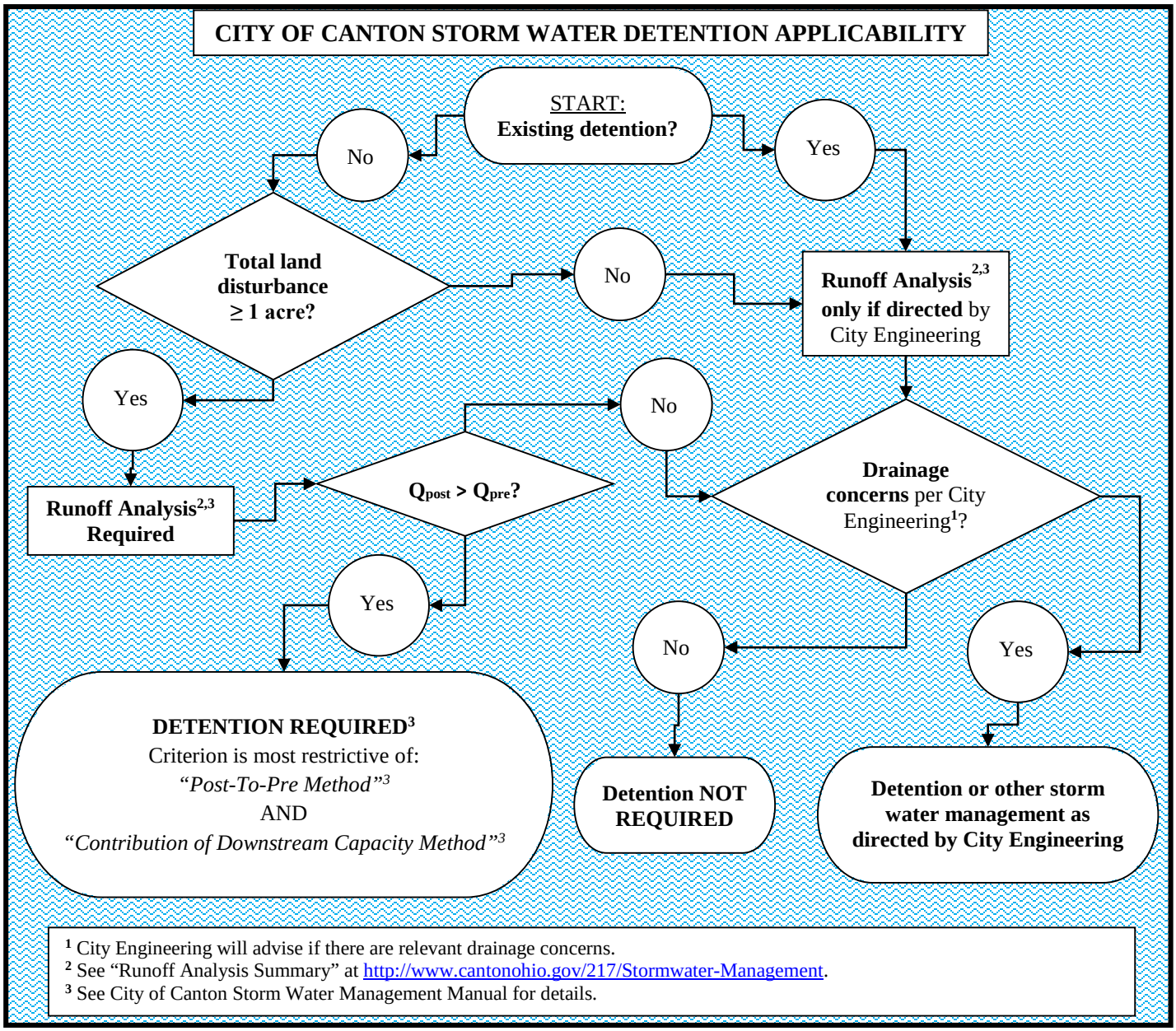
As applicable and unless otherwise required by City Engineering, the following design standards apply to regulated activities with proposed storm water conveyance systems:

1. ***Public storm sewers, open-water conveyances (ditches, channels, etc.) and culverts*** shall be designed according to Ohio Department Of Transportation (ODOT) standards as found in the current edition of the Location and Design – Volume II – Drainage Design Manual. Scaled drainage maps shall be provided showing contributing drainage areas as well as contours, elevations, flow paths, runoff coefficients, times of concentration, etc. Design calculations shall be provided accordingly.

2. ***Private storm sewers, open-water conveyances (ditches, channels, etc.) and culverts*** are *recommended* to be designed to the same standards as public systems.

F. Storm Water Detention

Detention applicability is per the following flowchart:



Requirements:

1. ***Detention Criteria:*** When detention is required, storm water runoff from the 2-, 5-, 10, 25-, 50-, and 100-year storm events must be detained to the *most restrictive* respective discharges from a *combination* of both of the following methods:

   a. *"Post-To-Pre Method":* Post-developed discharges shall not exceed pre-developed discharges to the point of analysis.

   b. "*Contribution of Downstream Capacity Method":* Post-developed discharges shall not exceed the existing discharge contributions from the regulated site based on the site's percentage of overall drainage area to the point of analysis and the most restrictive capacity of the downstream drainage systems.

      (1) Determine the total drainage area to the point of analysis.

      (2) Determine the site's contributing drainage area that is within the total drainage area.

      (3) Calculate the site's contributing drainage area as a percentage of the total drainage area discharging to the point of analysis.

(4) Determine the most restrictive capacity of the downstream drainage conveyance in one of two ways:

(A) Using surveyed or as-built information, determine the most restrictive downstream "just full" flow capacity; or

(B) Approximate the most restrictive downstream storm event capacity (2-, 5-, 10-, 25-, 50-, or 100-yr storm) and identify the corresponding discharge from the total drainage area to the point of analysis.

(5) Multiply the site's percentage of total drainage area by the most restrictive downstream conveyance capacity. The result is the maximum allowable discharge contribution from the site.

Example: A site discharges to an existing storm sewer and ultimately to the Middle Branch Nimishillen Creek. The total drainage area to the point of analysis is 5.27 acres. The site's portion of the total drainage area is 4.75 acres. The existing peak discharges from the total drainage area to the point of analysis are: Q2=3.44cfs, Q5=5.17cfs, Q10=8.68cfs, Q25=13.55cfs, Q50=18.83cfs, and Q100=24.92cfs. Proposed peak discharges from the total drainage area to the point of analysis are: Q2=5.84cfs, Q5=8.15cfs, Q10=12.98cfs, Q25=17.23cfs, Q50=22.77cfs, and Q100=29.64cfs. There is insufficient information to determine the most restrictive "just full" capacity of the downstream storm sewer. Therefore, it is assumed that the storm sewer was designed for a 10-yr storm capacity (based on existing conditions) while the creek has a 100-yr storm capacity. Thus, the most restrictive downstream conveyance capacity is the 10-yr storm with a corresponding peak discharge of 8.68cfs based on existing conditions. The site's percentage of overall drainage area is: 4.75acres/5.27 acres = .901 or 90.1%. Accordingly, the allowable flow contribution from the site is 90.1% x 8.68cfs = 7.82cfs.

It is recommended to use the **"Runoff Analysis Summary"** spreadsheet on City Engineering's Storm Water Management webpage at http://www.cantonohio.gov/217/Stormwater-Management and to submit it with appropriate supporting information for review.

2. ***General Design Standards:*** The following general requirements apply to the design of all storm water detention facilities:

a. The design of all storm water detention facilities shall conform to all dam laws, permits, and other regulations, as applicable;

b. All supporting calculations and other information used for the hydrologic and hydraulic design of detention facilities must be provided, preferably in a Storm Water Management Report.

c. *Storm Water Detention Facilities:* Storm water detention may be accomplished by using above-ground detention, retention, or infiltration basins, underground storage tanks or pipes, storage or pavement areas, rooftop storage, or other means as approved by City Engineering:

(1) *Prohibition of Detention Facilities within Waters of the State:* Detention facilities shall not be installed within jurisdictional limits of a surface water of the state (e.g., wetland or stream) unless authorized by a CWA 401 water quality certification, CWA 404 permit, or Ohio EPA non-jurisdictional wetland/stream program approval.

(2) *Prohibition of Detention Facilities within Special Flood Hazard Areas:* Detention facilities shall not be located in Special Flood Hazard Areas (regulated flood zones).

(3) *"Off-line" Detention:* (serving only the regulated site) is preferable over "on-line" detention because off-line facilities are easier to design and review, are smaller, and therefore will cost less to construct and maintain.

(4) *"On-line" Detention:* (regional; serving multiple sites beyond the regulated site) may be utilized only if it is designed to accommodate the volume of the entire contributing drainage area with the assumption that the drainage area is fully developed in accordance with the current zoning of contributing areas.

(5) *Above-Ground Facilities:*

(A) Only above-ground detention facilities are acceptable for subdivision developments;

(B) Soil borings and testing, when required, shall be performed by an approved soils testing laboratory. A report certifying suitability of any on-site soils for use as embankment material and basin construction shall be submitted. A minimum 6-inch clay layer may be required where soils are highly permeable. Soil borings and testing are required for subdivisions and public detention basins;

(C) The grading of basins shall be such that it reflects the surrounding topography as best as possible;

(D) For safety considerations, the interior side slopes of a basin shall not be steeper than a 4:1 slope unless a fence with at least one gate is installed around the basin's perimeter. The type of fence and gate installed as well as the size, number, and location of the gate(s) shall be approved by the City Engineer;

(E) The bottom slope of a basin shall be a minimum of 0.75% at any location. Low flow channels should be designed into the bottom of the detention/retention basin. Paved low flow channels are not permitted. These bottom slope and low flow channel requirements do not apply to basins that are also designed as water quality basins;

(F) The top width of the side embankments shall be a minimum of 8 feet for non-vehicular traffic and 12 feet for vehicular traffic;

(G) An *emergency spillway* must be provided in case the outlet structure becomes blocked, the basin otherwise fails, or the capacity of the facility is exceeded. The following criteria apply:

1) The emergency spillway shall, whenever possible, be constructed on virgin ground. When not possible, stabilization of the non-virgin soils must be approved by the City Engineer;

2) The emergency spillway must be designed to convey the 100-year post-developed flow rate that discharges into the detention facility (that is, the non-detained 100-year post-developed rate);

3) The spillway must be set at an elevation that will not allow water to back up into upstream, off-site storm water conveyance systems in which prior backups have not occurred;

4) The bottom elevation of the emergency spillway shall be a minimum of 1 foot below the lowest elevation of the top of the facility;

5) At least 6 inches of freeboard must be provided between the designed maximum 100-year water surface elevation to the lowest elevation of the emergency spillway;

6) The emergency spillway must be lined with rip-rap and/or soil stabilization fabric (and seeded) to protect against erosion;

7) The alignment of the emergency spillway must be such that discharges through the spillway will be conveyed downstream in such a manner as to not pose a threat of flooding or nuisance to downstream buildings or properties. The spillway should convey water in a direction reflecting pre-developed flow patterns;

(H) All pipes through embankments shall have the appropriate number of anti-seep collars sized accordingly.

(I) *Parking Areas Used for Detention:* If parking areas are used for storage:

1) The 100-year water surface elevation shall not exceed 6 inches at any point within the storage area and in no case shall it be within 6 inches of the finished floor elevation of any adjacent building.

2) Slopes of parking areas used for storage shall be a minimum of 1% and a maximum of 10%;

(J) *Retention only:* The applicable requirements listed for detention basins shall also apply to retention basins with the following additional requirements:

1) The outlet invert elevations of any storm sewers or pipes discharging into a retention basin should be kept at or above the permanent pool elevation.

2) Provisions may be required to prevent the permanent pool of water in the retention basin from becoming stagnant, such as installing aeration devices;

3) Provisions should be made for draining the retention basin to allow for periodic cleaning or other maintenance;

4) At the City Engineer's discretion, an aquatic safety bench may be required having a minimum width of 10 feet, maximum cross slope of 3%, and maximum water depth of 1 foot along portions of retention basins adjacent to and within close proximity to public roadways and/or other vehicular traffic;

5) At the City Engineer's discretion, fences with gates may be required to be constructed around retention basins. If applicable, the type of fence and gate installed as well as the size, number, and location of the gate(s) shall be approved by the City Engineer.

(K) *Infiltration only:* The applicable requirements for detention and retention shall apply to infiltration basins with the following additional requirements:

1) Only soil classes with infiltration rates greater than 0.30 in/hr can be considered for use;

2) The infiltration rate for an existing soil must be tested and certified by a Soils Scientist.

(6) *Underground Detention:*

(A) Underground detention facilities may, if approved by the City Engineer, be used for individual commercial or industrial developments only;

(B) Underground storage tanks or pipes shall be of sufficient strength to carry all surface loads due to vehicles or other potential surface loading. The load-bearing capacity of the adjacent soil must also be taken into account to ensure surface loads can be supported;

(C) An access hatch shall be provided of sufficient size to provide for maintenance access to the underground facility;

(D) As-built information must be provided certifying the underground facility was constructed in accordance with designer/manufacturer construction specifications.

d. *Storm Water Quality Management:* When the storm water detention facility will also be used to satisfy applicable post-construction storm water quality management (see Part 4), the outlet invert elevations of any storm sewers or pipes discharging into a storm water detention facility should be set at or above the water quality volume elevation.

e. *Outlet Structures:* can consist of a single pipe (single stage) or multiple stages. In addition, the following apply:

(1) Multi-staged outlet structures should be constructed of reinforced concrete and be a fixed structure or non-operable. The structure shall be constructed such that public health, safety, and welfare are protected. Location of the outlet structure shall be selected for ease of maintenance;

(2) For orifices or pipes less than 6 inches in diameter, anti-clogging measures (such as reverse flow pipes, trash racks, etc.) must be provided that do not reduce the designed discharge capacity of the orifice or pipe;

(3) For multi-stage outlet structures, care must be taken in determining discharge rates through the various staged outlets since water could begin rising within the outlet structure itself. This rising water could have a tailwater effect on the discharge performances of the various stages. In order to avoid this potential tailwater effect within the outlet structure and perhaps the detention facility, the following recommendations should be implemented as best as possible:

(A) Keep the bottom elevation of the detention facility above the downstream 100-year tailwater elevation.

(B) Oversize the outlet structure's outlet pipe so that the 100-year routed flow depth in the outlet structure is below the outlet pipe's crown elevation (the outlet pipe should be able to convey the routed 100-yr flow under "just full" conditions). This 100-year flow depth elevation should be the higher of:

1) The 100-year head elevation (based on inlet control or orifice flow) of the outlet pipe; or

2) The 100-year hydraulic grade line elevation in the outlet structure (thus downstream tailwater at the outlet of the outlet pipe would first need to be determined).

(C) Keep the invert of the primary stage outlet (and all others) above the crown of the outlet structure's outlet pipe.

(4) For outlet structures such as ODOT standard catch basins with grates used as one of the discharge stages, making an assumption that the discharges through the grates can be approximated as a weir having a length of the perimeter of the grate is typically not accurate as this tends to over-estimate the flows. Rather, discharges through the grate should be based on Figure 1102-1 in the Ohio Department of Transportation's (ODOT's) Location and Design (L&D) – Volume II – Drainage Design Manual or another approved resource. Many computer programs allow for a user-defined rating curve to be entered;

(5) Appropriate tailwater considerations at the downstream end of the outlet structure's outlet pipe must be made for each storm event and accounted for in the routing calculations and the design of the outlet structure. "Free outfall conditions", "no tailwater", or a "tailwater depth of 0.00 feet" are usually not acceptable as this inaccurately implies that the downstream drainage system or outlet will have no water in it during the respective storm events being considered;

(6) Discharge velocities from outlet structures shall be controlled to prevent scouring and erosion of the downstream outlet. Appropriate measures, such as rock channel protection or other approved measures, must be provided where scour velocities are present;

(7) Care shall be taken to ensure that back-up of water from any detention facility does not result in or exacerbate unapproved flooding;

(8) Access to outlet structures for maintenance and inspection shall be provided and shall follow current OSHA standards.

f. Unless otherwise approved by City Engineering, an as-built survey must be performed then signed and sealed (or stamped) by a registered surveyor and submitted showing the locations, elevations, and other relevant information as required for all storm water detention facilities that will be publicly owned or maintained or located within drainage easements.

3. ***Specific Design Requirements:*** A Storm Water Management Report shall be provided containing the following information, at a minimum:

a. A *narrative/summary section* containing:

(1) Project description;

(2) Existing and proposed land uses;

(3) Parcel size(s) (in acres) containing the project limits (this is not necessarily the area of land disturbance);

(4) Total area of land to be disturbed (in acres) for the activity;

(5) Existing and proposed drainage conveyance and storage systems within the project limits, including applicable names of streams, lakes, etc.;

(6) Runoff Analysis including existing and proposed peak flow rates, runoff volumes and preliminary storage volumes (as applicable), including any assumptions made, and the names and versions of any computer programs used;

(7) Point(s) of analysis for estimating peak runoff rates and volumes;

(8) Size(s) of pre- and post-developed watershed(s) contributing to point(s) of analysis used for drainage design. This includes all contributing off-site areas;

(9) Drainage narrative describing, in general, how storm water quantity (conveyance and storage) and quality (during construction and post-construction) will be managed, as applicable.

(10) Indication of whether the respective activity is within a Flood Hazard District according to the Official Zoning Map of the City of Canton, and if so, include the corresponding FEMA designated flood zones and Flood Insurance Rate Map (FIRM) and/or Floodway Map panel number. See Chapter 1166: Flood Hazard Zoning District of the City of Canton Codified Ordinances for further details;

(11) Indication of whether there are or may be existing wetlands or other environmental concerns on the respective site;

(12) Indication of types of storm water, environmental, or other permits that may need to be obtained for the proposed activity;

(13) The date of the City of Canton Storm Water Management Manual (SWMM) that was used to determine storm water management requirements for the respective regulated activity/activities. This date is found on the cover page of this manual. The SWMM used should be the current version available on the City Engineering Department website.

(14) Any waivers or variances granted from applicable standards or requirements of the City of Canton Storm Water Management Manual.

(15) Detention summary: For each storm event:

(A) Detained flow rates;

(B) Detained volumes;

(C) Maximum water surface elevations (based on routing calculations) in the detention facility.

b. *Hydrographs*:

(1) Unless otherwise stated herein, three (3) sets of hydrographs for the 2-, 5-, 10-, 25-, 50-, and 100-year storms shall be provided for the following conditions:

(A) Existing peak runoff;

(B) Proposed peak runoff;

(C) Routed/detained post-developed runoff.

(2) Acceptable methods to generate hydrographs are:

(A) *Modified Rational Method:* is suitable (and recommended) for small drainage areas (less than 30 acres). Note: If using this method, four (4) sets of hydrographs for the 2-, 5-, 10-, 25-, 50-, and 100-year storms shall be provided for the following conditions:

1) Existing peak runoff hydrographs (3-point triangular hydrograph utilizing standard Rational Method);

2) Proposed peak runoff hydrographs (3-point triangular hydrograph utilizing standard Rational Method);

3) Proposed runoff hydrographs that maximize the storage volume (4-point trapezoidal hydrograph utilizing Modified Rational Method);

4) Routed/detained hydrographs (utilizing proposed runoff hydrographs that maximum the storage volume).

For assistance, see "Modified Rational Method" on City Engineering's Storm Water Management webpage at http://www.cantonohio.gov/217/Stormwater-Management.

(B) *Soil Conservation Service (SCS) Method;*

(C) *USGS Regression Equations:* as described in the current edition of ODOT's L&D Manual – Volume II – Drainage Design;

(D) *Other Methods* may be used as approved by City Engineering.

c. *Stage – Storage Relationships/Calculations:* for the detention facility. These show incremental stages (elevations) within the detention facility and corresponding volumes of storage available. A stage interval of 1 foot is preferable but should not exceed 2 feet. The storage volumes at critical elevations within outlet structures (such as orifice and pipe inverts, weir crests, top of grates, emergency overflows, etc.) should be provided. The drainage drawings showing the storm water detention facility must provide contouring and/or any other detailed information needed to verify the stage – storage relationships.

d. *Outlet Structure Design Information:* This information shall consist of the following:

(1) *Outlet Structure Connectivity Data;* This data must provide details of all orifices, weirs, pipes, grates, etc. proposed to be used for the outlet structure. All appropriate sizes, elevations, dimensions, areas, coefficients, descriptions, etc. of each component of the outlet structure must be provided. The same details for any permanent water-quality structures that utilize storm water volume/rate control facilities must also be provided. This data may consist of a printout of the input data entered into the computer program used to design the outlet structure. Enough information must be provided to be able to verify the equations, coefficients, and other design values used.

(2) *A Detailed Sketch or Drawing of Each Storm Water Detention Facility's Outlet Structure:* This detail (which should be provided in the construction plan, at a minimum) must show the connectivity of all orifices, weirs, pipes, grates, etc. proposed to be used for the outlet structure. All appropriate sizes, elevations, dimensions, descriptions, etc. of each component making up the outlet structure must be provided. The same details for any permanent water-quality structures that utilize storm water volume/rate control facilities must also be provided.

(3) *Stage – Discharge Relationships/Calculations:* for the detention facility's outlet structure. These show how much water is being discharged at incremental elevations within the detention facility. A stage interval of 1 foot is preferable but should not exceed 2 feet. The discharges at critical elevations within the outlet structures (such as orifice and pipe inverts, weir crests, top of grates, emergency overflow, etc.) should be provided. Tailwater from downstream water resources or conveyance systems must be analyzed and considered as it could affect the discharge rates of the outlet structure and therefore the outflow hydrographs. Where such analysis would be excessive, appropriate tailwater assumptions may be made as

approved by the City Engineer.

e. *Routing Calculations:* for each storm event. Routing calculations are not the same as stage-storage-discharge relationships or preliminary volume estimates used for the initial layout and preliminary sizing of the detention facility. Routing calculations result in an outflow hydrograph for each respective storm event. Proper detention routing calculations are based on an inflow hydrograph for each respective storm event and the facility's stage-storage-discharge relationships. Unlike preliminary detention volume estimates, routing calculations consider crucial factors such as tailwater effects, stage-storage-discharge relationships, hydrograph timing, etc. that could necessitate increasing or decreasing the storage volume of detention facilities beyond the preliminary estimate. The routing calculations must be consistent with the outlet structure connectivity details and the emergency spillway design as shown on the construction plans.

Exemption: Routing calculations are not necessary if *all* of the following conditions are met:

(1) The entire volume under the 100-year post-developed hydrograph (determined by an acceptable method for estimating runoff volumes) is used to size the volume of the detention facility; and

(2) The detention facility's stage-storage-discharge relationships clearly demonstrate that applicable detention criteria can still be met with respect to allowable discharge rates; and

(3) A minimum of one (1) foot of freeboard is provided between the 100-year water surface elevation and the emergency spillway elevation; and

(4) The upstream invert elevation of the outlet pipe from the detention facility's outlet structure is set above the 100-year tailwater elevation. If the 100-year tailwater elevation is unknown, appropriate estimates must be used.

f. *Calculations of Discharge Velocities:* at the downstream outlet point and the supporting calculations and documentation for the design of appropriate velocity control measures such as rock channel protection.

G. Bridges

Structures having a *span of 10 feet or greater* used to traverse water courses, ravines, roadways, etc. shall be considered bridges.

1. ***Bridges Serving Public Streets:*** shall be designed in accordance with the design criteria and requirements given in the current edition of ODOT's Bridge Design Manual. Additional requirements pertaining to construction shall be in accordance with the current edition of ODOT's Construction and Materials Specifications. All supporting plans, calculations, and other information must be provided.

2. ***All Other Bridges:*** Unless otherwise required by City Engineering, all other bridges are recommended to be designed and constructed per the same requirements as bridges serving public streets. At a minimum, it must be clearly demonstrated that such other bridges can be designed so that no other properties will experience any adverse effects (such as flooding due to backwater, etc.). In addition, the owner may be required to demonstrate acknowledgement and acceptance of the respective design and any associated adverse effects on the site.

In all cases, appropriate permits and approvals from other agencies must be obtained, as applicable, and adequate access to the site by emergency vehicles during storm events shall be provided.

H. Calculations and Supporting Information for Storm Water Quantity Management

All calculations and supporting information (i.e. drainage maps, software printouts, etc.) for storm water quantity management of regulated activities shall be submitted to City Engineering. Any additional information shall be submitted as directed. Calculations and supporting information shall be signed in accordance with Part 2.R. of these regulations.

I. Approval by City Engineering Required

All aspects of storm water *quantity* management as required by Part 3 of this manual shall be reviewed by City Engineering. Correspondence and inquiries regarding respective approvals and any fees required by City Engineering pursuant to these regulations should be directed to:

City of Canton Engineering Department
2436 30th Street NE
Canton, Ohio 44705
Phone: 330-489-3381
Email: Engineering@cantonohio.gov
Website: www.cantonohio.gov/engineering

PART 4. STORM WATER QUALITY MANAGEMENT

Storm water quality management is the design and implementation of BMPs to manage the quality of and reduce pollutants in storm water runoff from a site.

A. General Storm Water Quality Management Requirements

Storm water quality management requirements in the City of Canton can be satisfied by meeting all applicable requirements of each of the following:

- The current Ohio EPA NPDES Construction Storm Water Permit;
- The current Stark County Storm Water Quality Regulations (contact Stark SWCD);
- Part 4 of this manual.

Any perceived conflicts shall be settled at the discretion of the City of Canton and/or the Stark County Soil & Water Conservation District (SWCD).

B. Authority of Stark SWCD

Stark SWCD is contracted by the City of Canton to help satisfy certain requirements of the Small MS4 Permit on behalf of the City and is a designated representative of the City of Canton Director of Public Service for the administration of these Storm Water Quality Management regulations. In addition, Stark SWCD:

- Is a member of the City of Canton Site Plan Review Committee;
- Conducts plan reviews with respect to storm water quality management in accordance with Ohio EPA's Construction Storm Water Permit, the Stark County Storm Water Quality Regulations, and Part 4 of this manual. Plan reviews include review of Storm Water Pollution Prevention Plans (SWP3s) and Long-Term Maintenance Plans (for permanent post-construction practices) for activities subject to these regulations;
- Inspects regulated activities for implementation of construction site pollution prevention controls and post-construction storm water treatment practices in accordance with approved SWP3s;
- Conducts annual inspections of permanent storm water treatment practices on applicable post-construction sites;
- Provides correspondence and guidance as necessary to administer respective regulations;
- Has authority to issue Notices Of Violation and/or Stop Work Orders accordingly and advise the City of Canton of any recommended further enforcement actions.

Thus, any applicable activity within the City of Canton subject to Part 4 requires coordination with and approval by Stark SWCD. Unless otherwise stated herein, all correspondence and inquiries regarding Part 4 should be directed to:

Stark Soil & Water Conservation District
2650 Richville Drive SE, Suite 100
Massillon, Ohio 44646
Phone: 330-451 SOIL (7645)
Email: info@starkswcd.org
Website: www.starkswcd.org

C. Applicability of Storm Water Quality Management

Except for storm water discharges associated with exempted activities, these Storm Water Quality regulations apply to construction activities that *disturb one or more total acres of land* (or that will disturb less than one acre of land but are part of a larger common plan of development or sale that will ultimately disturb one or more acres of land) and in which runoff immediately or ultimately discharges to a surface water of the state. In addition, all applicable standards and requirements of Part 2 and Part 3 apply.

As applicable, types of regulated activities include, but are not limited to:

- Commercial, industrial, or institutional construction/development projects
- Subdivision (residential and industrial) construction/development projects

- Recreational projects
- Utility projects
- Public projects (roadway, infrastructure, capital improvements, parks and trails, etc.)
- Redevelopment projects
- Demolition projects
- Parking lot construction or reconstruction
- Grading, filling, borrow, spoil, or soil stock-piling work
- Trench dewatering

D. Exemptions from Storm Water Quality Management

Storm water runoff associated with the following activities is exempt from Part 4 of these regulations:

1. ***Soil-disturbing activities < 1-acre:*** Although not subject to the specific requirements of Part 4 of these regulations, construction activities that disturb <u>less</u> than 1 acre of land are not exempt from other applicable laws, regulations, or environmental stewardship. Appropriate practices should still be implemented (i.e. perimeter silt fence, storm drain inlet protection, etc.) for such activities prior to and during the activity to minimize erosion, sedimentation, and storm water pollution. As applicable, construction plans should include requirements for all such practices. Soil-disturbing activities < 1 acre may still be subject to the requirements of the City of Canton Storm Water *Quantity* Regulations (separately regulated; see Part 3 of this Manual);

2. Any other applicable activities or exemptions as stated within the Construction Storm Water Permit, Stark County Storm Water Quality Regulations, or this Manual.

E. TMDL Requirements for Storm Water Quality Management

See Total Maximum Daily Load Requirements in Part 2. Unless otherwise required by Stark SWCD or the City of Canton, *appropriate* recommended BMPs to address TMDLs should be implemented for regulated activities.

F. NPDES Construction Storm Water Permit Required

All activities covered by Part 4 of these regulations are required by Ohio EPA to obtain a Construction Storm Water Permit. In accordance with the Construction Storm Water Permit, it is the regulated party's responsibility to:

1. ***Submit a Notice Of Intent (NOI)*** to Ohio EPA to obtain permit coverage;

2. ***Comply with all permit requirements and orders of Ohio EPA:*** If a conflict exists between these regulations and the Construction Storm Water Permit, Ohio EPA orders, or other applicable laws or regulations, the most restrictive requirements shall govern; and

3. ***Submit a Notice Of Termination (NOT)*** to Ohio EPA to terminate permit coverage (once eligible).

Upon approval of permit coverage, Ohio EPA will notify the regulated party. The notification will provide:

- Acknowledgement of receipt of an NOI;
- Facility name (project/regulated activity description);
- Facility location information;
- Ohio EPA Facility Permit Number (a specific permit number assigned only to the referenced facility);
- Approval for coverage under the Construction Storm Water Permit;
- Other information.

A copy of the notification from Ohio EPA granting the regulated activity coverage under a Construction Storm Water Permit is required by Stark SWCD as one of the conditions to be met to commence regulated activities per these regulations.

G. Post-Construction Storm Water Management

Post-construction storm water management is the management of the quantity *and* quality of post-construction storm water runoff.

- **Post-construction storm water *quality* management** is the management and treatment of the quality (i.e. pollutant reduction) of post-construction storm water runoff and shall be addressed by satisfying applicable requirements of:
    - The current Ohio EPA NPDES Construction Storm Water Permit;
    - The current Stark County Storm Water Regulations (contact Stark SWCD);
    - Part 4 of this manual.

  All aspects of post-construction storm water *quality* management are reviewed by Stark SWCD.
- **Post-construction storm water *quantity* management** is the management of the quantity (i.e. flow and volume) of post-construction storm water runoff for conveyance and flood control and shall be addressed by satisfying applicable requirements of Part 3 of this manual. All aspects of post-construction storm water *quantity* management are reviewed by the City of Canton Engineering Department.

So that receiving streams' physical, chemical and biological characteristics are protected and stream functions are maintained, post-construction storm water practices shall be designed, installed, and maintained for regulated activities to provide perpetual management of post-construction runoff quality *and* quantity on regulated sites.

Post-Construction Storm Water Management General Standards: Unless otherwise approved, all post-construction storm water management controls or BMPs designed and implemented for regulated sites shall comply with the following standards, as applicable:

- Ohio's Rainwater and Land Development Manual;
- Ohio Department of Transportation's "Location and Design Manual - Volume Two - Drainage Design" may be utilized for roadway projects;
- Part 3 of this manual (for storm water quantity management).

H. Storm Water Pollution Prevention Plan Required

A Storm Water Pollution Prevention Plan (SWP3) shall be developed and implemented for each activity covered by Part 4 of these regulations and shall satisfy, at a minimum, respective requirements of Ohio EPA's current Construction Storm Water Permit and Stark SWCD's Storm Water Quality Regulations.

1. ***Timing of SWP3 Actions:***

a. *SWP3 preparation and submission for review:* An SWP3 shall be prepared and submitted by the regulated party in accordance with the terms and conditions of these regulations and the applicable Ohio EPA NPDES Construction Storm Water Permit.

(1) *For projects requiring submission of a site plan to Zoning:* An SWP3 shall be prepared and included as part of the site plan. All other provisions for site plans per the Planning and Zoning Code shall apply.

(2) *For transportation projects:*

(A) *Transportation projects following ODOT standards for a Project Site Plan:* A Project Site Plan shall be prepared by the project designer in accordance with ODOT requirements and submitted to the City Engineering Department. Subsequently, an SWP3 shall be prepared by the contractor in accordance with ODOT requirements and submitted to the City Engineering Department and Stark SWCD.

(B) *Transportation projects not following ODOT standards for a Project Site Plan:* An SWP3 shall be prepared by the project designer as directed by the City of Canton and submitted to the City Engineering Department and Stark SWCD.

(3) *For other projects:* An SWP3 shall be prepared and submitted as directed by the City of Canton and/or

Stark SWCD.

(4) The SWP3 shall be submitted for review by Stark SWCD no less than thirty (30) days before regulated activities are planned to commence.

(5) Two (2) copies (one copy for Stark SWCD and once copy for the City of Canton Engineering Department) of all associated calculations and supporting information shall be submitted along with the SWP3.

b. *SWP3 review:* Stark SWCD will review all SWP3s for construction site storm water runoff control and post-construction storm water *quality* management. As applicable, the City of Canton Engineering Department will review any post-construction storm water *quantity* management (flood control). Reviews are done in accordance with "Plan Review Process" provisions of these regulations. Stark SWCD shall review the SWP3 and approve or respond with comments for revision within thirty (30) working days of receipt.

c. *SWP3 revisions prior to approval:* Unless otherwise directed, revised SWP3s shall be submitted to Stark SWCD and the City of Canton Engineering Department. Upon receipt of a revised SWP3, another 30-day review period shall commence.

d. *SWP3 approval:* Stark SWCD will issue a letter to the responsible party upon SWP3 approval. The City of Canton will be copied on the letter. Approved SWP3s shall remain valid for two (2) years from the date of approval. A variance for an extension may be requested in writing before the 2-year termination or a revised/updated SWP3 may be submitted accordingly.

e. *SWP3 implementation:* The approved SWP3 must be implemented accordingly upon initiation of construction activities.

f. *Changes to an approved SWP3:* The approved SWP3 shall be amended or revised under either of the following conditions:

(1) There is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to surface waters of the state that was not anticipated in the approved SWP3; or

(2) The SWP3 proves to be ineffective in achieving the general objectives of controlling pollutants in accordance with these regulations.

Changes to the approved SWP3 may be initiated by the regulated party or required by notification from a regulatory agency (Ohio EPA, City of Canton, or Stark SWCD). Changes required by a regulatory agency shall be made within 10 days or as otherwise provided in the notification. A revised SWP3 shall be submitted as directed.

2. ***SWP3 Components:*** SWP3s shall include all items as required by the current Construction Storm Water Permit and Stark SWCD. In addition:

a. *Post-construction BMPs used to address TMDLs:* The SWP3 shall contain a description of post-construction BMPs used to address Nimishillen Creek TMDLs.

b. *Maintenance requirements:* The SWP3 shall communicate that post-construction BMPs shall be maintained in accordance with conditions of a Long-Term Maintenance Plan approved by Stark SWCD.

3. ***SWP3 Availability:*** SWP3s shall be made available as required by the current Construction Storm Water Permit. In addition, SWP3s shall also be made available to representatives from Stark SWCD and the City of Canton.

I. Long-Term Maintenance Plan Required

A Long-Term Maintenance Plan (LTMP) shall be provided for all post-construction storm water BMPs implemented pursuant to these regulations. LTMPs shall comply with the following requirements:

1. LTMPs shall be provided by the regulated party to the Stark SWCD as part of the SWP3 review.

2. LTMPs shall be provided to the party responsible for post-construction operation of the site (including homeowner associations) upon completion of construction activities or as otherwise directed by Stark SWCD.

3. Separate LTMPs shall be submitted for BMPs located on separate properties.

4. ***LTMP contents:*** To ensure that storm water management systems function as they were designed and constructed, the LTMP shall be a stand-alone document, which contains, at a minimum:

a. *Cover sheet* showing site name, date, and description of site's *immediate* receiving drainage system (e.g. Water of the State, private system, City of Canton MS4, Stark County MS4, Township MS4, etc.).

b. *Responsible party:* A designated person, party, or entity responsible for inspection and maintenance of the BMP(s), including contact information (i.e. address, telephone number, email, etc.).

c. *Assurance of operation and maintenance:* A description of how BMP(s) will be operated and maintained in the absence or dissolution of the designated responsible party, including how such responsibilities will be transferred upon the sale of the subject property.

d. *BMP information:* Descriptions of all post-construction storm water BMPs and all supporting design and installation data.

e. *Maintenance responsibilities:* The routine and non-routine maintenance tasks to be undertaken.

f. *A schedule for inspection and maintenance*.

g. *Easements and agreements:* Any necessary legally binding maintenance easements and agreements.

h. *Map:* A map showing all BMP locations and any access and maintenance easements.

i. *Statement prohibiting BMP alterations:* A statement prohibiting the alteration of BMPs unless otherwise approved by the City of Canton and/or Stark SWCD.

j. *Pollutant disposal statement:* A statement that any pollutants collected within post-construction BMPs shall be disposed of in accordance with local, state, and federal regulations.

k. *Statement of City of Canton authority:* A statement acknowledging the City of Canton's inspection and enforcement rights for violations of Chapter 961 Storm Water Management of the City of Canton codified ordinances.

l. *Statement of acceptance of responsibility:* A statement acknowledging that the contents are requirements of the LTMP are understood an accepted by the responsible party.

m. *A printed name, signature, and date of signature of the responsible party*.

n. Any other information as required by Stark SWCD.

J. Calculations and Supporting Information for Storm Water Quality Management

All calculations and supporting information (i.e. drainage maps, software printouts, etc.) for design of storm water BMPs required to satisfy Part 4 of these regulations shall be submitted with the SWP3. Any additional information shall be

submitted as directed.

K. Required Meetings with Stark SWCD

1. ***Pre-Construction Meeting with Stark SWCD:*** After all required approvals of regulated activities are granted by Stark SWCD and the City of Canton, a Pre-Construction Meeting is required prior to the commencement of regulated activities. Unless otherwise directed or approved by Stark SWCD, the following conditions shall be met:

    a. The responsible party of a regulated activity shall meet with Stark SWCD for a Pre-Construction Meeting no less than seven (7) days prior to soil-disturbing activities.

    b. The responsible party shall contact Stark SWCD to schedule a Pre-Construction Meeting.

    c. Representation of the responsible party at the Pre-Construction Meeting shall consist of the contractor, at a minimum. It is recommended that the owner/developer attend as well.

    d. The Pre-Construction Meeting shall take place on site of the regulated activity.

2. ***Pre-Winter Stabilization Meeting with Stark SWCD:*** If a regulated activity is active or is planned to remain active through the winter months, Stark SWCD may require a pre-winter stabilization meeting to be held with the regulated party prior to October 1st.

L. Conditions to be Met to Commence Activities Requiring Storm Water Quality Management

All of the following conditions shall be met before the commencement of activities covered by Part 4 of these regulations:

1. ***Proof of coverage under a Construction Storm Water Permit*** must be submitted to Stark SWCD.

2. ***Storm Water Pollution Prevention Plan (SWP3)*** must be approved by Stark SWCD.

3. ***Long-Term Maintenance Plan (LTMP)*** for post-construction BMPs must be approved by Stark SWCD.

4. ***Proof of other applicable permits or approvals*** associated with the regulated activity must be provided as directed by City of Canton and/or Stark SWCD;

5. ***Payment of applicable fees*** as required by City of Canton and/or Stark SWCD.

6. ***Submission and approval of other information*** as may be required by City of Canton and/or Stark SWCD;

7. ***Site plan/construction plans*** must be approved by City of Canton.

8. ***Pre-Construction Meeting with Stark SWCD*** is required.

9. ***Notification by City of Canton of approval to proceed*** with regulated activity, as applicable. Additional conditions may apply such as a pre-construction meeting or other coordination with respective City departments, etc.

M. As-Built Survey for Post-Construction BMPs

An as-built survey *may* be required to be performed and submitted to the Stark SWCD to substantiate that the construction and/or function of structural post-construction storm water BMPs is in satisfactory conformance with the approved design. The as-built survey must show the locations, elevations, and other relevant information as directed by Stark SWCD. If the as-built survey demonstrates that the respective BMP is not in satisfactory conformance with the approved design, then redesign, revised calculations, and/or reconstruction of the BMP may be required to the satisfaction of Stark SWCD.

N. Inspection for Compliance with Storm Water Quality Management Requirements

1. ***General Authority:*** The regulated party shall allow an authorized representative of Ohio EPA, the City of Canton, and/or Stark SWCD, upon the presentation of credentials and other documents as may be required by law, to:

   a. Enter upon the regulated party's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of these regulations;

   b. Have access to and copy at reasonable times, any records that must be kept under the conditions of these regulations;

   c. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment); and

   d. Sample or monitor at reasonable times, for the purposes of assuring compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

2. ***Inspections During Construction Activities:***

   a. *Inspections by regulated party:* Inspections shall comply with requirements of the Construction Storm Water Permit or as otherwise directed by Stark SWCD.

   b. *Inspections by Stark SWCD:* Inspections shall be conducted per the Stark County Storm Water Quality Regulations.

3. ***Long-Term Inspections of Post-Construction BMPs:***

   a. *Inspections by Responsible Party:* Responsible parties, as described in a Long-Term Maintenance Plan for post-construction BMPs, shall inspect post-construction BMPs in accordance with terms described in the Long-Term Maintenance Plan.

   b. *Annual Inspections by Stark SWCD:* Stark SWCD performs annual inspections of post-construction BMPs with the exception of alternative BMPs. Alternative BMPs shall be inspected by the responsible party and certified of their proper operation and maintenance accordingly. Stark SWCD will issue an inspection report to the responsible party for each post-construction BMP inspected, detailing any maintenance needs and an associated timeline for completion. A copy of the inspection report will be sent to the City of Canton. Inspections by the Stark SWCD do not relieve the responsible party from their obligation to inspect and maintain respective post-construction storm water BMPs.

O. Operation and Maintenance of Storm Water Quality BMPs

The regulated party shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the regulated party to achieve compliance with the conditions of Part 4 of these regulations and with the requirements of SWP3s.

1. ***O&M of Construction Site BMPs.*** Construction site BMPs and all related appurtenances installed or used to achieve compliance with the conditions of these regulations must at all times be properly operated and maintained by the regulated party (i.e. contractor).

   All temporary BMPs implemented to control construction site runoff shall be maintained and repaired as needed to ensure continued performance of their intended function. All sediment control practices must be maintained in a functional condition until all up-slope areas they control are permanently stabilized.

2. ***O&M of Post-Construction BMPs.*** Post-construction BMPs and all related appurtenances installed to achieve compliance with the conditions of these regulations must at all times be properly operated and maintained by the responsible party in accordance with conditions of a Long-Term Maintenance Plan. Appropriate legal mechanisms

such as easements or deed restrictions may be required.

All permanent BMPs implemented to manage post-construction runoff shall be maintained and repaired as needed to ensure continued performance of their intended function. A Long-Term Maintenance Plan shall be designed to specify maintenance requirements and responsibilities.

Stark SWCD may periodically offer workshops for operation and maintenance of BMPs.

P. Requirements when Portions of a Site are Sold

Lots or parcels that may be sold off within a regulated site (e.g. subdivision) covered by Part 4 of these regulations shall continue to be subject to Part 4 of these regulations. However, certain responsibilities apply depending on whether or not the development uses centralized construction site runoff controls (i.e., controls that address storm water runoff from one or more lots).

1. ***Sale of lots within developments that use centralized construction site runoff controls:*** The current regulated party (i.e. seller) shall continue to be responsible for the implementation of all such controls to the satisfaction of Stark SWCD.

2. ***Sale of lots within developments that do not use centralized construction site runoff controls:*** The current regulated party (i.e. seller) shall:

    a. Be responsible to temporarily stabilize all lots sold to individual lot owners.

    b. Inform the individual lot buyer of "Individual lot owner responsibilities" (see below).

3. ***Individual lot owner responsibilities:*** An individual lot owner (i.e. buyer) shall:

    a. Be responsible for the implementation of individual lot construction site controls in accordance with respective requirements of the development's approved Storm Water Pollution Prevention Plan once construction activities commence for the lot.

    b. Submit a residential site plan to the City of Canton Zoning Inspector and abide by any respective requirements.

    c. Contact Stark SWCD and abide by any other respective requirements.

PART 5. DEFINITIONS

Key terms used in this manual and not otherwise defined in *Chapter 961: Storm Water Management* of the City of Canton Codified Ordinances, Ohio EPA's Construction Storm Water Permit, or the Stark County Storm Water Quality Regulations shall have the following meanings. Any words in this manual not otherwise defined shall have meaning as determined by the City Engineer.

"100-year storm" means a storm event that, statistically, produces an amount of rainfall that can be expected to occur on average of once every one-hundred (100) years. This same concept applies respectively to the 1-, 2-, 5-, 10-, and 50-year storm events that are commonly used in engineering design. The 100-year storm may also be expressed as having a one percent (1%) probability of occurrence in any given year.

"Above-ground detention facility" means a storm water detention facility, such as a detention, retention, or infiltration basin, in which storm water runoff rate and volume is managed above-ground.

"As-built survey" means a survey conducted and shown on a drawing prepared and sealed by a Registered Surveyor and/or Engineer indicating information such as, but not limited to: actual dimensions, elevations, and locations of any structures and their components, underground utilities, roads, swales, ditches, detention/retention facilities, sewers, BMPs, or other infrastructure and facilities after construction has been completed.

"BMPs" means Best Management Practices in accordance with Ohio EPA typical use and application associated with storm water management and pollution prevention.

"Construction activity" means any clearing, grading, excavating, grubbing, filling, or other activities that result in the exposure of bare soil. The term "construction activity" is also synonymous with "earth-disturbing activity", "soil-disturbing activity", and "land-disturbing activity".

"Construction General Permit" or "CGP", is synonymous with "Construction Storm Water Permit".

"Construction Storm Water Permit" means the current Ohio EPA permit titled "General Permit Authorization for Storm Water Discharges Associated with Construction Activity Under the National Pollutant Discharge Elimination System". Construction Storm Water Permit may also be referred to as "Construction General Permit" or "CGP".

"Control(s)" is synonymous with "practices" or "BMPs".

"CPESC" means "Certified Professional in Erosion and Sediment Control" per the EnviroCert International, Inc. Program.

"CPSWQ" means "Certified Professional in Storm Water Quality" per the EnviroCert International, Inc. Program.

"Detention" means the management of storm water runoff volume and rate by temporary storage and controlled release. Unless specifically indicated otherwise, "detention" may also refer to "retention".

"Detention facility" means a facility such as a detention basin, retention basin, underground storage tanks or pipes, etc. used for the purpose of controlling the rate and volume of storm water from the site.

"Detention volume" means the maximum volume required for storage in a storm water detention facility.

"Drainage area" means an area, measured in a horizontal plane, enclosed by a topographic divide from which storm water runoff normally drains to a particular point of interest such as a stream, catch basin, detention basin, property line, BMP, etc. This term is synonymous with "watershed".

"Drainage easement" means a legally recorded plat and/or document executed by a property owner that conveys to another person, entity, etc. the right to access designated areas of a property that contain permanent storm water management systems, facilities, and/or BMPs for the purpose of repairing, maintaining, or providing some other specified responsibility.

"Drawdown time (Drain time)" means the minimum time required to drain an applicable post-construction BMP in order to provide adequate treatment of pollutants per Ohio EPA's Permit for Storm Water Discharges Associated with Construction Activity Under the National Pollutant Discharge Elimination System.

"Earth-disturbing activity" is synonymous with "construction activity", "soil-disturbing activity", and "land-disturbing activity". See "construction activity" for definition.

"Infiltration basin" means a storm water detention facility purposely designed and constructed to allow storm water runoff to infiltrate into the ground, thereby reducing the rate and volume of water flowing from a site.

"Land-disturbing activity" is synonymous with "construction activity", "earth-disturbing activity", and "soil-disturbing activity". See "construction activity" for definition.

"Long-Term Maintenance Plan (LTMP)" means a written operations and maintenance plan describing permanent post-construction storm water best management practices (BMPs), their respective operations, inspection, and maintenance requirements, the party responsible for the operations, inspections, and long-term maintenance of the BMPs, and any other requirements deemed necessary by the City of Canton and/or Stark SWCD to be included in the LTMP.

"MS4 Operator" means a political entity such as the federal government, state, municipality, township, or county that owns or operates a municipal separate storm sewer system (MS4).

"Non-Structural BMP" means preservation, planning, or procedural practices that direct development away from water resources or limit the use of impervious surfaces. Examples include conservation easements, riparian and wetland setbacks, breaking up the connectivity between impervious surfaces, and conservation subdivision design.

"Off-line detention" means storm water detention with contributing drainage areas from on-site areas only; storm water detention facilities are "off-line" or, in other words, not "in-line" with existing watercourses that originate off-site. Off-line storm water detention facilities may also be designed to serve the purpose of storm water quality management, if applicable.

"On-line detention" means storm water detention with contributing drainage areas from both on- and off-site areas; storm water detention facilities that are "on-line" or, in other words, "in-line" with existing watercourses that originate off-site. On-line storm water detention facilities may also be designed to serve the purpose of storm water quality management, if applicable, and must be designed to accommodate the volume of the *entire* contributing drainage area with the assumption that it is *fully* developed, in accordance with the current zoning map.

"Open water carrier" means a natural or artificial drainage conveyance such as a ditch, stream, concrete channel, etc. that has an obvious cross section used for water conveyance and is open to atmospheric conditions.

"Outfall" means the downstream termini area of a storm water management system where water flows out of or from, such as the outlet of a storm sewer into a creek or where a ditch connects into a stream; also known as "outlet".

"Owner or operator". See "regulated party".

"Post-developed" means the conditions such as topography, land use, imperviousness, ground cover, and the rate, volume, quality, and flow patterns of storm water runoff that exist following completion of a construction project.

"Practice(s)" is synonymous with "control(s)" or "BMP(s)".

"Pre-construction meeting" means a meeting held between local government entities, owners/developers, contractors, utility companies, and/or other interested parties prior to the start of regulated activities to discuss various aspects of project coordination, inspection, construction phasing, regulatory issues, etc.

"Pre-developed" means the conditions such as topography, land use, imperviousness, ground cover, and the rate, volume, quality, and flow patterns of storm water runoff that exist prior to the start of construction of a project.

"Pre-winter stabilization meeting" means a meeting held between owners/developers, contractors, Stark SWCD, and/or other interested parties prior to October 1st of a given year, to discuss how construction site storm water quality management BMPs and site stabilization will be implemented on the respective site during the upcoming winter months.

"Private drainage easement" means a right, represented on a legally recorded plat and/or easement document, granted to one private property owner, party, or entity, to make use of designated land of another for storm water drainage purposes for the benefit of the grantee, and in which ownership, rights, responsibilities, and restrictions are expressly assigned with respect to the designated land and storm water management systems represented by the easement.

"Private drainage system" means a storm water drainage system located on private or public property or in a private drainage easement which has the purpose of conveying or managing storm water runoff mainly for the benefit of a private party. Private drainage systems are owned, operated, and maintained by a private party, unless otherwise expressly stated.

"Professional Engineer (PE)" means an engineer registered by The Ohio State Board of Registration for Professional Engineers and Surveyors.

"Professional Land Surveyor (PS)" means a surveyor currently registered to practice land surveying in the State of Ohio.

"Public drainage easement" means a right, represented on a legally recorded plat and/or easement document, granted to a public entity, to make use of designated private land for storm water drainage purposes for the benefit of the public, and in which ownership, rights, responsibilities, and restrictions are expressly assigned with respect to the designated land and storm water management systems represented by the easement.

"Public drainage system" means a storm water drainage system located under a public street, in a public drainage easement, or within other public property that is for the purpose of conveying or managing storm water runoff for the benefit of the general public. Public drainage systems are owned, operated, and maintained by a public entity such as the City of Canton, unless otherwise expressly stated.

"Receiving storm water management system" means the respective storm water management system that directly receives or is proposed to directly receive discharges from storm water best management practices.

"Redevelopment project" means construction activities involving the disturbance of one or more acres of land in which impervious surfaces have previously been developed and where the new land use will not increase the runoff coefficient.

"Regulated activities" means any activities which are subject to any provisions of these regulations.

"Regulated party" means the owner of a regulated site or the representatives (e.g. architect, contractor, designer, engineer, operator, etc.) of the party responsible for a regulated activity.

"Regulated site" means any site within the City of Canton's corporate limits on which regulated activities occur and is therefore subject to these regulations.

"Residential site plan" means a plan for the proposed development of a single residential lot showing proposed grading, downspout and sump pump discharge and/or connection points, existing storm sewers, swales, and open channels, and any other features relevant to the overall drainage of the site. As required by the City Zoning Inspector, Residential Site Plans may be subject to the review of the City Engineer and/or Stark SWCD.

"Small MS4 Permit" means the current Ohio EPA Permit titled "Authorization for Small Municipal Separate Storm Sewer Systems to Discharge Storm Water Under the National Pollutant Discharge Elimination System".

"Soil-disturbing activity" is synonymous with "construction activity", "earth-disturbing activity", and "land-disturbing activity". See "construction activity" for definition.

"Special Flood Hazard Area" means the land in a floodplain subject to a one percent (1%) or greater chance of flooding (also known as 100-year flood zone) in any given year as identified or otherwise determined per *Chapter 1166 Flood Hazard Zoning District* of the City of Canton codified ordinances.

"Stabilization" means the implementation of vegetative and/or structural measures to establish a cover over soil in order to prevent or reduce erosion.

"Storm Water Management Report" means a report that contains all documentation and supporting calculations for the storm water management on a site.

"Storm Water Pollution Prevention Plan" means a plan, including supporting calculations and any other relevant information, showing the practices to be used for quality treatment of construction site storm water runoff and for post-construction storm water runoff, in accordance with applicable permits and storm water quality regulations.

"Storm water practices" means storm water quantity BMPs and/or storm water quality BMPs.

"Storm water quality BMP" means a BMP used to directly or indirectly improve the quality of storm water runoff by providing treatment of pollutants in storm water runoff. "Storm water quality BMP" is a general term that may refer to structural or non-structural BMPs or to BMPs that may or may not be designed to treat Water Quality Volume.

"Storm water quantity BMP" means a BMP used to manage the quantity (rate and/or volume) of storm water runoff. "Storm water quantity BMP" is a general term that typically refers to detention/retention facilities used to manage the rate and volume of storm water runoff.

"Storm water treatment practice (STP)" is synonymous with "storm water quality BMP" or "storm water quantity BMP".

"Structural BMP" means a practice that must be built to provide treatment of storm water either through storage, filtration, or infiltration. Examples include extended detention basins, bioretention cells, sand filters, vegetated filter strips, water quality swales, infiltration trenches, "Table 2 BMPs", and manufactured systems.

"Subject property" means the property in which storm water management systems are located or are proposed to be located.

"Transportation project" means the construction of new roads and roadway improvement projects by public entities (i.e., the state, counties, townships, cities, or villages) involving the disturbance of one or more acres of land.

"Variance" means a modification to a specific requirement of these regulations, but not an exemption from the requirement.

"Waiver" means an exemption granted from having to meet a specific requirement of these regulations.

"Watercourse" means a permanent or intermittent stream, creek, or other body of water, either natural or man-made, which collects and carries storm water runoff.

"Wetland" means a land area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support (and under normal circumstances do support) a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, and similar areas (40 CFR 232, as amended). There are three components that must be present in a wetland: hydrology source, hydrophytic vegetation, and hydric soils. Wetland delineations may be required (where these three components are indicative of possible wetlands) and submitted to Ohio EPA and/or US Army Corps of Engineers for concurrence and further regulation, as applicable.

PART 6. REVISIONS

Date of Manual to be Revised	Section Revised	Description of Revisions	Resulting Revised Manual Date
9/19/2019	PART 1.D. “Revisions to Regulations”	Revised content	3/6/2020
9/19/2019	PART 1.E. “Additional Guidance and Resources	Updated certain referenced website links	3/6/2020
9/19/2019	PART 2.Q.3.a. “Public Drainage Easements”	Removed (1)(A) regarding contributing drainage area	3/6/2020
9/19/2019	PART 2.S. “Plan Review Process”	Revised content	3/6/2020
9/19/2019	PART 2.W. “Operation and Maintenance”	Revised content	3/6/2020
9/19/2019	PART 3.D. “Runoff Analysis”	Revised content	3/6/2020
9/19/2019	PART 3.F. “Storm Water Detention”	Revised “City of Canton Storm Water Detention Applicability” flowchart	3/6/2020
9/19/2019	PART 3.F.1. “Detention Criteria”	Revised content	3/6/2020
9/19/2019	(Throughout)	Updated specific website links	3/6/2020
9/19/2019	(not applicable)	Added PART 6. REVISIONS	3/6/2020
9/19/2019	Table of Contents	Updated to reflect all revisions made	3/6/2020

(End of document)