

**DESIGN STANDARDS & GUIDELINES FOR
STORM WATER BEST MANAGEMENT PRACTICES
ST. JOSEPH, MICHIGAN**



**REQUIREMENTS AND GENERAL COMPLIANCE GUIDELINES
FOR STORM WATER DRAINAGE SYSTEM DESIGN
FOR DEVELOPMENTS AND REDEVELOPMENTS
WITHIN THE CITY OF ST. JOSEPH**

Prepared by:
Spicer
group

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I. INTRODUCTION

The purpose of these Guidelines is to establish requirements and general compliance guidelines for storm water management practices in the City of St. Joseph. The Guidelines establish the framework through which storm water will be managed by allowable discharge rates, best management practices for water quality and specified detention and/or retention measures which will be implemented on site development or re-development projects in the City. These administrative guidelines will detail the process which must be followed to gain approval for a new developments or redevelopment's storm water drainage system.

These Guidelines will provide minimum standards for developments however, the City of St. Joseph reserves the right to deviate from the specific design standards set forth in the Guidelines when, on a case-by-case basis, such deviation is appropriate or necessary in order to accommodate the goals and purposes underlying these Guidelines. These guidelines and their implementation are designed to promote green infrastructure and low impact designs such as bioswales, green spaces, infiltration, rain gardens or other site controls of stormwater runoff.

The purpose of these Guidelines is to accomplish the following objectives, which include but are not limited to:

1. To minimize increase in storm water runoff rates and volumes from identified new land development;
2. To minimize the deterioration of existing watercourses, culverts and bridges, and other structures;
3. To encourage water recharge into the ground where geologically favorable conditions exist;
4. To prevent an increase in non-point source pollution;
5. To maintain the integrity of stream channels for their biological functions, as well as for drainage and other purposes;
6. Promote low impact design and green infrastructure in site development or drain projects where it can be applicable and desired.
7. To work with the Berrien County Drain Commissioner to reduce erosion from development or construction projects;
8. To preserve and protect water supply facilities and water resources by means of reducing artificially induced flooding, stream erosion, and runoff pollution;
9. To reduce storm water runoff rates and volumes, soil erosion, and non-point source pollution, to the extent practicable, from lands which were developed without storm water management controls meeting the purposes and standards of these Guidelines; and
10. To reduce the adverse impact of changing land use on waters of the state by establishing minimum standards to protect water bodies from degradation resulting from changing land use.

The Guidelines include:

1. A summary of the procedures including requirements, review procedures, inspection requirements, fee schedule and other agency requirements;
2. A description of design requirements and engineering calculations;
3. A description of minimum design criteria and rules to be followed for design of new drainage systems within the City of St. Joseph; and
4. Set the standards to meet National Pollutant Discharge Elimination System (NPDES) Phase II storm water quality standards as administered by the Michigan Department of Environment, Great Lakes, and Energy (EGLE), formally known as the Michigan Department of Environmental Quality (MDEQ).

These Guidelines are applicable to **all development or re-development projects which disturb at least one or more acres, including projects less than an acre that are a part of a larger common plan of development or sale and discharge into the City's MS4 and are within the current census defined Urbanized Areas within the jurisdictional boundary of the City of St. Joseph.** These proposed site developments are subject to review and approval by the City of St. Joseph's Engineering Department or designee to act as their review agency for water quality Best Management Practices (BMPs) in site development or re-development.

Additionally, if a project takes place in the Urbanized Area of St. Joseph and is discharging to an MS4 which is not under the jurisdiction of the City, but ultimately enters the City MS4 system, the City reserves the right to review any storm water discharges. The City will still maintain zoning and planning administration and overview of the project for all aspects and utilities. The City will provide review services as needed to assure the site development meets these guidelines.

NPDES Phase II Requirements for Storm Water

The City of St. Joseph has a stormwater discharge permit issued by the State of Michigan and must attain compliance with the National Pollutant Discharge Elimination System (NPDES) Phase II requirements as they relate to storm water discharge in the City's jurisdictional area. With the implementation of the Post Construction Controls there will be specific best management practices (BMPs) that developers may be required to implement to assure the storm water discharged from a site is clean to the maximum extent practicable. Please refer to the City of St. Joseph website: <https://www.sjcity.com/>

To accomplish this goal of clean storm water discharges BMPs such as bio-swales, rain gardens, bio-infiltration, sediment forebays, catch basin inserts and other BMPs may be required on specific sites. The design engineers must make every attempt to use appropriate BMPs to clean the storm water runoff as it is collected by the storm sewer system, properly detained, and ultimately discharged into an established City storm drain, county drain, road commission drain, or natural waterway within the jurisdictional area of the City.

Furthermore, it is the responsibility of the owners of private storm sewer systems to maintain these systems properly to assure they are discharging storm water runoff as clean and pollutant free as possible and only storm water or other NPDES authorized discharges are discharged by the private on-site storm sewer system. Storm sewer outfalls into public systems are subject to inspection and if pollutants are being

discharged from a private site into a public system or waters of the state of Michigan it is the responsibility of the owner of the private system to pay for the cleanup of any spill or discharge from their site into a public system.

Development or Re-development requiring Storm Water Design Standards & Guidelines:

The Site Development Storm Water Management Plan (SWMP) establishes the framework through which allowable discharge rates, detention measures and the design of storm water collection systems will be implemented. The Plan details the process that must be followed to gain approval for new developments and redevelopment projects. The SWMP will address storm water quality standards, best management practices (BMPs) and innovative design for the City of St. Joseph to assure that the storm water discharged into a storm water drainage system under jurisdiction of the City is clean to the maximum extent practicable. The plan requires storm water management design practices which will minimize the impacts of proposed development or redevelopment projects on the existing storm drainage system. In addition, these guidelines will help ensure adequate drainage systems are being constructed for future development in the City. The following types of developments and earth changes require a Storm Water Management Plan:

1. The site is one or more acres in area or part of a larger contiguous development with one acre or more of disturbed land.
2. The site is in the Urbanized Area of St. Joseph as defined by the Benton Harbor - St. Joseph Urbanized Area from the Census of 2010 or later.
3. Land development proposals subject to site plan review requirements in the City Zoning Ordinance.
4. Subdivision plat proposals.
5. Site Condominium developments pursuant to the Condominium Act, P.A. 59 of 1978 as amended; MCLA 559.101 et.seq.
6. Any development on property divided by land division in connection with which one or more public or private roads are created or extended, and/or in connection with which more than three parcels of less than one acre are created, with the exception of splits on Ridgeway.
7. Any proposal to mine, excavate, or clear and grade or otherwise develop one acre or more of land for purposes other than routine single-family residential landscaping and gardening, or any proposal within 500 feet of an inland lake, river, or stream.
8. Re-development which increases the impervious surface of a site by either 10% or 5,000 square feet.
9. Re-development of a parcel that does not have an existing storm water management plan. NOTE: single residential lots are exempt from this standard.

II. ADMINISTRATIVE GUIDELINES

A. Definitions

1. Allowable Discharge: The restricted discharge from a site after development or redevelopment as calculated in accordance with these Guidelines.
2. Base Flood: A flood having a one percent (1%) chance of being equaled or exceeded in any given year.
3. Base Flood Elevation: The elevation delineating the flood level having a one-percent probability of being equaled or exceeded in any given year (also known as the 100-year flood elevation), as determined from Flood Insurance Rate Maps (FIRMs) or the best available information.
4. Base Floodplain: The area inundated by the Base Flood.
5. Best Management Practices (BMPs): A practice, or combination of practices and design criteria that comply with the Michigan Department of Environmental Quality's Guidebook of BMPs for Michigan Watersheds (including, but not limited to minimizing storm water runoff and preventing the discharge of pollutants into storm water) as determined by the City Engineer and/or their designee, and where appropriate, the standards of the City of St. Joseph
6. Bioretention (bio-swale) Areas: Areas designed to use soil and plant material to mimic natural processes and store, filter and infiltrate storm water into the ground. These areas may be used anywhere to achieve a degree of storm water treatment.
7. Building Opening: Any opening of a solid wall such as a window or door, through which floodwaters could penetrate.
8. Channel Protection: The Channel Protection (CP) Criteria was developed to prevent or minimize the channel enlargement process in streams and rivers. The CP Volume for a 2-yr storm must be retained on site through infiltration or retention practices. The CP is NOT required for the following waterbody: Direct discharge to Lake Michigan and the St. Joseph River/ Morrison Channel from where the St. Joseph River and the Morrison Channel intersect (near Island Point Marina) downstream to Lake Michigan.
9. Clean Water Act: The Federal Water Pollution Control Act, 33 USC Sec 1251 et seq., as amended, and the applicable regulations promulgated thereunder.
10. Conduit: Any channel, pipe, drainage or culvert used for the conveyance or movement of water, whether open or closed.
11. Construction Site Storm Water Runoff: Storm water runoff from a development site following an earth change.
12. Control Elevation: Contour lines and points of predetermined elevation used to denote a detention storm area on a plat or site drawing.

13. Designee: The engineering firm formally designated by the City of St. Joseph to act as their Engineer.
14. Design Engineer: Registered and licensed professional engineer retained by Owner/Developer responsible for the design of a drainage plan.
15. Detention: A system which is designed to capture storm water and release it over a given period of time through an outlet structure at a controlled rate.
16. Detention Facility: A facility constructed or modified to restrict the flow of storm water to a prescribed maximum rate and to concurrently detain the excess waters that accumulate behind the outlet.
17. Detention Storage: The temporary detaining or storage of storm water in a storage basin, on rooftops, in streets, parking lots, school yards, parks, open space, or other areas under predetermined and controlled conditions, with the rate of drainage regulated by appropriately installed devices.
18. Developed or Development: The installation or construction of impervious surfaces on a development site that require, pursuant to state law or local ordinance, the City Engineer or their designee's approval of a site plan, plat, site condominium, special land use, planned unit development, rezoning of land, land division approval, private road approval or other approvals required for the development of land or the erection of buildings or structures; provided, however, developed or development shall not include the actual construction of, or an addition, extension or modification to, an individual single-family or a two-family detached dwelling.
19. Developer: Any person proposing or implementing the development of land.
20. Developer/Owner Engineer: The engineering company formally designated by the Developer/Owner to act as their Engineer.
21. Development Site: Any land that is being or has been developed, or that a developer proposes for development.
22. Discharge: The release or outflow of water from any source.
23. Discharger: Any person or entity that directly or indirectly discharges storm water from any property. Discharger also means any employee, officer, director, partner, contractor, or other person who participates in, or is legally or factually responsible for, any act or omission that is or results in a violation of the storm water guidelines.
24. Drain: Any drain as defined in and established under the Drain Code of 1956, as amended, being MCL 280.1 *et seq.*
25. Drainage: The collection, conveyance, or discharge of ground water and/or surface water.
26. Drainage Area: The area from which storm water runoff is conveyed to a single outlet (i.e. a watershed or catchment area).

27. Drainageway: The area within which surface water or ground water is carried from one part of a lot or parcel to another part of the lot or parcel or to adjacent land.
28. Drain Commissioner: The Berrien County Drain Commissioner or their designee.
29. Drainage District/Watershed: All drainage areas contributing surface water runoff upstream of a discharge location of the proposed development.
30. Drains (Privately-Owned): Those drains under private ownership and not under the control of the Drain Commissioner's office or any other public entity.
31. Earth Change: Any human activity, which removes ground cover, changes the slope or contours of the land, or exposes the soil surface to the actions of wind and rain. Earth change includes, but is not limited to, any excavating, surface grading, filling, landscaping, or removal of vegetative roots.
32. EGLE: The Michigan Department of Environment, Great Lakes, and Energy (formerly known as the Michigan Department of Environmental Quality (MDEQ)).
33. EPA: The United States Environmental Protection Agency.
34. Erosion: The process by which the ground surface is worn away by action of wind, water, gravity or a combination thereof.
35. Excess Storm Water Runoff: The volume and rate of flow of storm water discharged from a drainage area which is in excess of the Allowable Discharge.
36. Exempted Discharges: Discharges other than storm water.
37. Federal Emergency Management Agency (FEMA): The agency of the federal government charged with emergency management.
38. First Flush: Is defined as the runoff generated from the contributing area to the outlet from a site development. Research indicates the majority of pollutants washed off in the "first flush" of runoff from impervious surfaces are contained in the first inch of runoff. Typically calculated as $3630 \times A_C = FF$
39. Flood or Flooding: A general and temporary condition of partial or complete inundation of normally dry land areas resulting from the overflow of water bodies or the unusual and rapid accumulation of surface water runoff from any source.
40. Flood Proofing: Any structural and/or non-structural additions, changes, or adjustments to structures or property that reduce or eliminate flood damage to land, or improvements utilities and structures.
41. Flood Protection Elevation (FPE): The Base Flood Elevation plus one (1) foot at any given location.
42. Floodplain: The special flood hazard lands adjoining a watercourse, the surface elevation of which is lower than the Base Flood Elevation and is subject to periodic inundation.

43. Floodway: The channel of any watercourse and the adjacent land areas that must be reserved to carry and discharge a base flood without cumulatively increasing the water surface elevation more than one-tenth (1/10) of a foot due to the loss of flood conveyance or storage.
44. Forebay: These are man-made surface waters used as pretreatment systems. They are designed to temporarily store the first flush of runoff from a storm event and provide for pollutant removal through settling. A forebay or other pretreatment system is recommended at each inlet to a detention system or retention basin and should detain the runoff for 24 hrs.
45. Forebay Outlets: Outlets that convey flow from a forebay into detention systems and retention basins. They must include a flow restrictor for restricted flow and a weir for unrestricted flow.
46. Freeboard: A volume of additional storage designed within a detention basin. A “Safety Factor” within a storm water detention system that is based on 1.0-foot detention volume above the proposed high-water elevation of a detention pond. This volume provides additional storm water detention in the event that a storm exceeds the design capacity.
47. Grading: Any stripping, excavating, filling, and stockpiling of soil or any combination thereof and the land in its excavated or filled condition.
48. Green Roofs: These roofs are constructed of a lightweight soil medium, layered over a drainage layer and a waterproofing membrane. The soil is planted with a specialized mix of plants that can thrive in a roof environment. These types of roofs are also known as vegetated roof covers, eco-roofs, or nature roofs.
49. Illicit Connection: Any method or means for conveying an illicit discharge into water bodies or the City’s storm water system.
50. Illicit Discharge: Any discharge to water bodies that does not consist entirely of storm water, discharges pursuant to the terms of an NPDES permit, or exempted discharges as defined in the Storm Water Guidelines.
51. Impervious Surface: Surface that does not allow storm water runoff to slowly percolate into the ground.
52. Infiltration: A process whereby precipitation or runoff seeps into the ground.
53. Infiltration Trench: This type of trench is not considered a preferred means of discharging storm water.
54. Leaching Basin: This type of basin is not considered an effective means of controlling and treating storm water runoff.
55. Low-Impact Design (LID): A storm water management strategy that aims to control water, both rainfall and storm water runoff, at the source.
56. Lowest Floor: The lowest floor or the lowest enclosed area (including a basement), but not including an unfinished or flood-resistant enclosure that is usable solely for parking of vehicles or building access.

57. NPDES: National Pollutant Discharge Elimination System.
58. NREPA: Natural Resources and Environmental Protection Act, Act 451 of 1994.
59. O&M Plan: Operations and Maintenance Plan describes resource organization, responsibilities, policies, and general procedures.
60. Overland Flow-way: Surface area that conveys a concentrated flow of storm water runoff.
61. Owner: Any person or entity having legal or equitable title to property or any person or entity having or exercising care, custody, or control over any property.
62. Peak Discharge: The maximum rate of flow of storm water runoff at a given location.
63. Person: An individual, firm, partnership, association, public or private corporation, public agency, instrumentality, or any other legal entity.
64. Pervious Pavement: A unique environmentally friendly porous pavement that allows rainwater to pass directly through into the soil naturally.
65. Plan: Written narratives, specifications, drawings, sketches, written standards, operating procedures, or any combination thereof containing information pursuant to these Guidelines.
66. Pollutant: A substance discharged which includes, but is not limited to the following: any dredged spoil, solid waste, vehicle fluids, yard wastes, animal wastes, agricultural waste products, sediment, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological wastes, radioactive materials, heat, wrecked or discharged equipment, rock, sand, cellar dirt, and industrial, municipal, commercial and agricultural waste, or any other contaminant or other substance defined as a pollutant under the Clean Water Act.
67. Property Owner: Any person having legal or equitable title to property or any person having or exercising care, custody, or control over any property.
68. Rain Garden: A landscaping feature planted with perennial native plants. It is a bowl-shaped or saucer-shaped garden, designed to absorb storm water runoff from impervious surfaces such as roofs and parking lots.
69. Redevelopment: Altering, improving, or otherwise changing the use of an existing developed property. A site will be considered a redevelopment under these Guidelines when the impervious area is increased by an area greater than or equal to ten percent (10%) of the existing developed site or an area greater than 5,000 square feet.
70. Restrictor: A structure, which regulates storm water discharge within a system.
71. Retention: A system which is designed to capture storm water and contain it until it infiltrates the soil or evaporates.
72. Soil Erosion: The stripping of soil and weathered rock from land creating sediment for transportation by water, wind or ice, and enabling formation of new sedimentary deposits.

73. State of Michigan Water Quality Standards: All applicable State rules, regulations, and laws pertaining to water quality, including the provisions of Section 3106 of Part 31 of 1994 PA 451, as amended.
74. Storm Drain: A system of open or enclosed conduits and appurtenant structures intended to convey or manage storm water runoff, ground water and drainage.
75. Storm Water Runoff: The water from a rainstorm, snow melt or other natural event or process, which flows over the surface of the ground or is collected in a drainage system.
76. Storm Water Runoff Facility: The method, structure, area, system, or other equipment of measures which are designed to receive, control, store, or convey storm water.
77. Stream: A river, stream or creek which may or may not be serving as a drain, or any other water body that has definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water.
78. Time of Concentration: The elapsed time for storm water runoff to flow from the most distant point in a drainage area to the outlet or other predetermined point.
79. Ten Year (10-yr) Design Storm: A precipitation event with a duration equal to the time of concentration, having a ten percent (10%) chance of occurring in any one year. This amounts to approximately 3.46 inches of rain in 24 hours. (Source: NOAA Atlas 14)
80. Underground Detention Systems: An underground system consisting of one or more underground pipes or structures that are designed to provide the required volumes for storage for a development project, including bankfull flood and flood control volumes.
81. Upland Area: Land located in the upper portion of a watershed whose surface drainage flows toward the area being considered for development.
82. Urbanization: The development, change, or improvement of any parcel of land consisting of one or more lots for residential, commercial, industrial, institutional, recreational, or public utility purposes.
83. USACE: United States Army Corps of Engineers is responsible for investigating, developing and maintaining the nation's water and related resources.
84. Vegetated Swales: Channels that are broad and shallow lined with vegetation that slow and filter storm water runoff and promote infiltration.
85. Water Body: A river, lake, stream, creek or other watercourse or wetlands.
86. Watercourse: Any natural or artificial stream, river, creek, channel, ditch, canal, conduit, culvert, drain, waterway, gully, ravine, street, roadway, swale, or wash in which water flows in a definite direction, either continuously or intermittently.
87. Watershed: A region draining into a water body.

88. Wetlands: Land characterized by the presence of water at a frequency and duration sufficient to support wetland vegetation or aquatic life.
89. Weir: A weir is a notch of regular form through which water flows. The term is also applied to the structure containing such a notch. A weir may be a depression in the side of a tank, reservoir, or channel, or it may be an overflow dam or other similar structure.

B. Application, Review, and Approval Procedure

1. Conceptual Review and Application

- a. Contact the City Engineer's Office and/or the City of St. Joseph's Web site to obtain the latest version of the Storm Water Design Standards & Guidelines.
- b. The Owner/Developer shall submit to the City Engineer or their designee the conceptual design and layout of the proposed development. The Developer/Owner shall also submit copies of the conceptual design and layout of the development for preliminary review and comment. This conceptual design and layout, at a minimum, shall include:
 - i. Small location map showing the section and part of the section in which the site is situated;
 - ii. Location and description of all activities that may impact or be impacted by the proposed development or redevelopment both on and off the site;
 - iii. Acreage of the total site and acreage of the area being affected by the development; and
 - iv. If known, a conceptual layout of the proposed drainage system for the development or redevelopment.

The Owner/Developer or the Design Engineer shall submit information including a description of the drainage district/watershed, allowable discharge, etc. with the conceptual design and layout of the proposed development.

- c. The City Engineer or their designee will review the conceptual design information to determine if it is consistent with these Storm Water Design Standards & Guidelines.
- d. The Owner/Developer and the Design Engineer must coordinate with the City Engineer or their designee, the Berrien County Road Commission, or MDOT where the project is proposed. The intention of these meetings is to obtain uniform direction and communication to minimize misdirection of early construction and minimize financial losses to proprietors, developers, and consultants.
- e. If the conceptual layout of the storm drainage system is approved, the Owner/Developer shall begin completing final design plans and calculations for application submittal under these Guidelines.

2. Application Submittal

Applications shall be submitted to the City Engineer by the Owner/Developer or the Design Engineer on behalf of the Owner/Developer. Application for a review shall be made prior to the start of any work on the proposed development requiring a review under these Guidelines. Soil

test borings, vegetative cutting solely for land surveys, percolation tests, and normal maintenance shall not be considered a start of work under these Guidelines.

3. Sequential Applications

For projects on a site which are so large or complex that a plan encompassing all phases of the project cannot reasonably be prepared prior to initial work, applications on successive major construction activities may be allowed. Requests for sequential applications shall be approved by the City Engineer or their designee prior to submittal of the initial application.

4. Application Submittal Requirements

- a. The Owner/Developer or Design Engineer shall submit two sets of plans, two sets of calculations, and any other supporting information for the site to the City Engineer or their designee with the application. Alternatively, applicant may submit information via email to the City Engineer at tzebell@sjcity.com. The plans and calculations shall comply with the requirements of these Guidelines. The checklist, design requirements, and design guidelines that will be used during the review process of the drainage construction plans are established by these Guidelines. The application submittal shall include:
 - i. The location of the development site and water bodies that will receive storm water runoff;
 - ii. The existing and proposed topography, if required, of the development site, including the alignment and boundary of the natural drainage courses, with contours having a maximum interval of one (1) foot (using NAD 27 or NAD 83). The information shall be superimposed on the pertinent Berrien County soil map;
 - iii. The development tributary area to each point of discharge from the development;
 - iv. Calculations for the final peak discharge rates;
 - v. Calculations for any facility or structures size and configuration;
 - vi. A drawing showing all proposed storm water runoff facilities with existing and final grades;
 - vii. The sizes and locations of immediately upstream and immediately downstream culverts serving the major drainage routes flowing into and out of the development site. Any significant off-site and on-site drainage outlet restrictions other than culverts should be noted on the drainage map;
 - viii. An implementation plan for construction and inspection of all storm water runoff facilities necessary to the overall drainage plan, including a schedule of the estimated dates of completing construction of the storm water runoff facilities shown on the plan and an identification of the proposed inspection procedures to ensure that the storm water runoff facilities are constructed in accordance with the approved drainage plan (when known);
 - ix. A plan to ensure the effective control of construction site storm water runoff and sediment track-out onto roadways;
 - x. Drawings, profiles, and specifications for the construction of the storm water runoff facilities reasonably necessary to ensure that storm water runoff will be drained, stored, or otherwise controlled in accordance with these Guidelines.
 - xi. The name of the engineering firm and the Design Engineer that will inspect final construction of the storm water runoff facilities;
 - xii. Deposit/fee for plan review and inspection in accordance with the fee schedule provided herein.

xiii. **No meeting will be considered until a deposit for review has been received by the City Engineer office.**

- b. An Operation & Maintenance Plan, in form and substance acceptable to the City Engineer, shall be required for ensuring maintenance of any privately-owned storm water runoff facilities (i.e. those facilities that will not be turned over as an established County Drainage System). The maintenance agreement shall include the owner/developer's written commitment to provide routine, emergency, and long-term maintenance of the facilities and, in the event that the facilities are not maintained in accordance with the approved drainage plan, the agreement shall authorize the City of St. Joseph to maintain any on-site storm water runoff facility as reasonably necessary, at the developer's/owner's expense. The completed, signed, agreement shall be submitted to the City Engineer's office along with the applicable fees to complete the review and approval process.

5. Storm Water Site Plan Review

The City Engineer or their designee will review all plans, calculations, and other information for compliance with these Guidelines. All materials will be reviewed for completeness before beginning the review process. If not a complete submittal, it will be returned to the developer.

Calculations will be checked. The minimum design requirements, standards, and guidelines as outlined in these Guidelines will be used as a reference. The drainage plan checklist will be reviewed. The City Engineer shall approve, approve with conditions, or disapprove an application within 30 days. The review period begins upon the receipt of a completed application, plan and fees. Copies of the approval, approval with conditions, or disapproval will be provided to the design engineer or developer upon completion of a review.

- a. Approval or Approval with Conditions. Upon a determination by the City Engineer or their designee that the application has met all the requirements of these Guidelines, the City Engineer or their designee will issue a letter specifying the design or development is approved. The City Engineer or their representative shall notify the Owner/Developer or authorized representative of the approval or approval with conditions via email. If original copies are required, please respond to the email approval and request original hard copies to be mailed by USPS first class mail or another reliable carrier service.
- b. Disapproval. If the proposed drainage system is disapproved, two sets of plans and calculations may be resubmitted with the appropriate revisions.
- c. Multiple-Phase Projects. When additional phases are planned, an approval with conditions will be given addressing the overall storm water requirements of the site. The City Engineering department encourages submittal of all phases of a multi-phased project at the onset of a proposed project.

6. Changes to Plan after Approval

- a. Any proposed changes made to the approved plan shall be submitted to the City Engineer and/or their designee for review and approval. Changes made without approval may result in revocation of approval.

- b. Upon receipt of this information, the City Engineer or their designee will determine whether additional information, such as calculations, will be required, or whether modifications to the submittal and further approval will be necessary.

7. Approval Expiration

Approval shall expire automatically upon the project completion date or one year from issuance date of the approval. Approval shall also terminate automatically if construction has not commenced within one year of the date of issuance. The City Engineer may extend an approval for a period not to exceed one year upon the request of the Owner/Developer if there are valid reasons to support such an extension.

8. Approval Revocation

Any approval issued by the City Engineer under these Guidelines may be revoked or suspended if there is a violation of the conditions of the approval or if there is a misrepresentation or failure to disclose relevant facts in the application submittal. The City Engineer will provide the Owner/Developer notice of any revocation of the approval via email followed by an original copy by USPS first class mail or other designated carrier.

9. Permits and Approvals by Other Governmental Agencies

Approvals under these Guidelines shall not relieve Owner/Developer of the need to obtain other applicable permits or approvals as required by federal, state, county and local agencies. Examples of other permits or approvals, which may be required, include:

- Soil Erosion and Sedimentation Control Permit – Part 91 of NREPA. The Berrien County Drain Commissioner’s Office is the County Enforcing Agent for Berrien County, (269) 983-7111 ext. 8261 and 8633, and a permit must be obtained when applicable for Soil Erosion and Sedimentation Control (SESC) and provided to the City of St. Joseph before a project can start.
- Site Plan Approvals. All site plans must meet local zoning ordinances in the City of St. Joseph.
- Berrien County Road Commission which has or shares jurisdiction over drainage along county roads and county rights-of-way within Berrien County. Sites located along county road rights-of-way and discharging to Road Commission drainage systems must obtain a permit from the Road Commission. When a crossing is installed over a county roadside drain, a permit must be obtained from the Road Commission. An application can be obtained at the following web address:
- Michigan Department of Transportation (MDOT) which has or shares jurisdiction over drainage along state highways and state rights-of-way within St. Joseph, for example M-63. Sites located along MDOT rights-of-way and discharging to MDOT drainage systems must obtain a permit from MDOT.
- Michigan Department of Environment, Great Lakes, and Energy (EGLE) (Joint permit with the US Army Corps of Engineers) which has jurisdiction over proposed work within the 100-year floodplain, inland lake and stream areas, navigable waterways, critical dunes, bottom lands of surface water, and wetland areas. A permit must be obtained for work proposed in these areas.

In addition, the EGLE is responsible for implementing the National Pollution Discharge Elimination System (NPDES) Storm Water Permitting Program.

C. Inspection Requirements

Inspection of storm drainage systems and/or detention facilities is required on all development and redevelopment projects. As-built drawings will be required on all projects prior to final inspection. Descriptions of the inspection requirements are outlined below. The fees associated with this inspection are outlined in Section II.D. It is not the intent of these Guidelines to review single-family residential development.

1. *Developments* - Site inspections of the storm drainage, outlet, and detention storage areas will be required. These inspections will occur during construction as determined necessary by the City Engineer or their designee. The Owner/Developer and/or the Design Engineer will be informed at what stage of construction these inspections will be required. The City Engineer or their designee shall be informed 24 hours in advance for these site inspections. Daily inspection reports will be completed by the Design Engineer as needed. At a minimum, the inspection reports will include the information shown on the sample daily inspection report included in the Appendix.

A final inspection by the City Engineer or their designee will take place at the completion of the project after as-built drawings have been received by the City Engineer. A final inspection report (See Appendix) will be completed by the City Engineer or their designee. Subsequent inspections may be required if deficiencies exist.

2. *Residential and Condominium Projects* - Inspection of storm drainage and drainage system construction will be required. This inspection shall be performed by the Design Engineer or the City Engineer or their designee as determined by the City Engineer. Daily Inspection reports shall be completed for all days on which construction of the storm drainage system occurs. Copies of these reports shall be submitted to the City Engineer at the beginning of each week. At a minimum, the daily inspection reports shall include the information shown on the sample daily inspection report included in the Appendix. Subsequent inspections may be required if deficiencies exist.

A final inspection by the City Engineer or their designee will take place at the completion of the project after as-built drawings have been received by the City Engineer. A final inspection report (See Appendix) will be completed by the City Engineer or their designee. Subsequent inspections may be required if deficiencies exist.

3. *Redevelopment Projects* - Site inspections of the storm drainage, outlet, and detention storage areas will be required. These inspections will occur during construction as determined necessary by the City Engineer or their designee. The Owner/Developer and/or the Design Engineer will be informed at what stage of construction these inspections will be required. The City Engineer or their designee shall be informed 24 hours in advance for these site inspections. Daily inspection reports will be completed as needed. At a minimum, the inspection reports will include the information shown on the sample daily inspection report included in the Appendix.

A final inspection by the City Engineer or their designee will take place at the completion of the project after as-built drawings have been received by the City Engineer. A final inspection

report (See Appendix) will be completed by the City Engineer or their designee. Subsequent inspections may be required if deficiencies exist.

4. Any infrastructure that would come under the jurisdiction of the City of St. Joseph must be inspected at the time of installation.
If a take-over of an existing storm water system is requested, as-built drawings must be accompanied by recent video documentation and reviewed, accepted and submitted by a licensed Professional Engineer (P.E.), registered in the State of Michigan.

D. Codes / Laws for Enforcement of Storm Water Management Requirements for Pollution of Surface Waters or MS4

The City of St. Joseph has adopted the following as commercial / residential building enforcement procedures:

- Michigan Plumbing Code,
- Michigan Residential Code, or
- The International Property Maintenance Code of years 2012, 2015, 2016.

These administrative procedures when adopted by a community provide the “**right of entry**” for the municipality’s inspector, code enforcement staff, or their designee to enter private property if a violation of the code is witnessed, visible, or quantifiable evidence is present to suggest that a violation exists on the property. If access is denied, and evidence of violation is present, then staff will obtain a warrant for entry if necessary.

Enforcement Venues for Townships, Cities and Villages:

PA245-1999 which amended PA230-1972 (the Stille-Derossett-Hale Single State Construction Code Act) established the “Single State Construction Code” whereby the entire state of Michigan is subject to a single “family” of construction codes **without** exception. This means that every portion of the State is subject to the Michigan Plumbing Code (2012, 2015, or 2017 years) and the Michigan Residential Code (2009, 2015, 2019 years) enforced either locally (as an authorized enforcing agency) or by the State Bureau of Construction Codes (BCC).

Since Code Enforcement and Property Maintenance is not a function enabled by PA230-72 and not otherwise mandated by state law, a local governmental unit would have to locally adopt the International Property Maintenance Code (IPMC) to lawfully enforce its provisions.

Through the Code Enforcement Program, municipalities utilize a Code Enforcement Log; this is a tracking mechanism used by communities to track violations and their outcome.

Enforcement Venues for County Agencies/Departments:

The Berrien County Road Department (BCRD) and the Berrien County Drain Commissioner (BCDC) do not have ordinance authority. However, the BCDC has some authority to control water pollution in county drains provided by the State of Michigan Drain Code of 1956. The following are pertinent excerpts:

The Michigan Drain Code Public Act 40 of 1956 states:

Sec. 280.423. (1) A person shall not continue to discharge or permit to be discharged into any county drain or inter-county drain of the state any sewage or waste matter capable of producing in the drain detrimental deposits, objectionable odor nuisance, injury to drainage conduits or structures, or capable of producing such pollution of the waters of the state receiving the flow from the drains as to injure livestock, destroy fish life, or be injurious to public health. This section does not prohibit the conveyance of sewage or other waste through drains or sewers that will not produce these injuries and that comply with section 3112 of Part 31 Water Resources Protection of the Natural Resources and Environmental Protection Acts, Act No. 451, of 1994, being section 324.3112 of Michigan Compiled Laws.

(2) See section 2 of this set for further information

(10) Failure to comply with any of the provisions of this section subjects the offender to the penalties described in section 602.

Sec. 602. If any person shall willfully or maliciously remove any section or grade stake set along the line of any drain, or obstruct or injure any drain, he shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding \$100.00 and the costs of prosecution, or in default of the payment thereof, by imprisonment in the county jail not exceeding 90 days.

The Berrien County Road Department (BCRD) has limited authority under state law to control water pollution in statutory road right-of-way. When evidence of an illicit discharge to a Road Commission ditch or drain is found, and voluntary correction is not forthcoming, the BCRD will contact the City of St. Joseph, depending on the nature of the illicit discharge, and work with the City and the County Health Department, and/or the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to require elimination. The EGLE has broad authority to control pollution, either directly or indirectly, to waters of the state provided by Part 31 of Act 451 of 1994.

E. Fee Schedule

Prior to submitting a submittal package for review, the Owner shall submit an application with payment to both the City of St. Joseph and the appropriate Township to set up escrow account to be used to cover the costs for plan reviews, a copy of the application can be found in the appendix. This escrow account will be used for all review fees for the site (ex. sanitary sewer, water, and stormwater). The fee schedule for reviewing storm drainage submittals and performing inspection of drainage system construction is outlined below:

REVIEW FEES:

<i>Application Review and Inspection:</i>	<u>Fee</u>
Developments and Redevelopments	Hourly, based upon the time required

Re-Review Fees: The review fee is for the first storm water review and inspection of the site plan submittal. An additional hourly fee will be required for subsequent reviews and/or inspections.

Escrow Account: An escrow account must be set up with the City prior to the review of the storm drainage plans. Final review and inspection fees will be taken from this account prior to the issuance of a building permit.

Re-Inspection/Additional Inspection Fees: Hourly, based upon the time required.

Residential Subdivisions and Condominiums: Full-time inspection of the installation of the storm water drainage and construction of the storm water detention facilities. Developer's licensed engineer shall complete this work on behalf of the City of St. Joseph providing daily inspection reports and preparation of as-built drawings. The City reserves the right to provide inspection services at an hourly rate if a licensed engineer is not available for such inspection.

III. STORM DRAINAGE SYSTEMS WITHIN THE CITY OF ST. JOSEPH

The City of St. Joseph encourages the use of green infrastructure and Low Impact Design (LID) approaches to manage storm water. Such approaches may include pervious pavement, rain gardens, green roofs, bio swales, etc. Some of the following requirements can and will be waived if a LID approach is taken. For example, the requirement for a 1.0 foot of freeboard may be reduced to 0.5 feet if a proposed detention basin is designed and constructed as a wetland complex, rain garden or other LID approach. The proposed type of site development should be reviewed at the design concept review meeting with the City Engineer and/or their designee to evaluate the design options.

The City encourages the implementation of regional storm water detention basins and/or the sharing of detention basins between two or more developments when feasible or possible.

Additional information on Low Impact Design can be found in the Low Impact Development Manual for Michigan; A Design Guide for Implementers and Reviewers (2008). Which can be found at:

<https://semcog.org/reports/lid/index.html>

A. Allowable Discharge (Q_a)/ Detention Requirements

The peak storm water discharge from any proposed development or redevelopment as required in these Guidelines shall be restricted to an allowable discharge (Q_a). The allowable discharge from the proposed area of development or redevelopment cannot exceed the calculated discharge from the proposed site based on one of the following methods. The method resulting in the lowest allowable discharge from the site shall be used in determining the required detention.

- a. The existing discharge from the site calculated under the existing design storm for the required design storm interval as calculated with the Rational Method. $Q_a = CIA$
- b. The percentage of capacity available in the downstream receiving storm drainage and/or water course, i.e. capacity of outlet storm drainage is 10 cfs, there is a total of 100 acres within the contributing district, the proposed site has 20 acres (20 acres of site/100 acres of contributing watershed * 10 cfs, capacity = Q_a of 2 cfs).

NOTE:

For calculating the time of concentration (T_c) for the rainfall intensity (I), the lag time typically used in the City of St. Joseph is 10 minutes.

Excess storm water runoff must be detained on site. Equations for determining the required volume of detention storage are outlined in Section IV. Detention storage calculations must be included with review submittals.

B. Stormwater Management Criteria

Table 1. Stormwater Management Criteria

Stormwater Management Criteria	Description
1. Water Quality (WQ)	All site development projects are required to detain or treat the first flush volume. The WQ Volume is determined by the St. Joseph Storm Water Design Standards & Guidelines and site applicability. Design for a minimum removal of 80% of TSS as compared to uncontrolled runoff or a discharge concentration not to exceed 80 mg/L Total Suspended Solids (TSS). Any water that remains on site (infiltration or retention) can be credited against the water quality volume.
2. Channel Protection (CP)	The Channel Protection (CP) Criteria was developed to prevent or minimize the channel enlargement process in streams and rivers. Maintain the post development CP Volume and peak flow rate at or below the predevelopment levels for all storms up to the 2-yr 24-hr event. The CP is NOT required for the following waterbody: Direct discharge to Lake Michigan and the St. Joseph River/ Morrison Channel from where the St. Joseph River and the Morrison Channel intersect (near Island Point Marina) downstream to Lake Michigan, in cases where infiltration has been proven to be infeasible on site. NOTE: Predevelopment level means the runoff volume and rate from the last land use prior to the new development or redevelopment.

First Flush Requirements

All site development projects are required to detain or treat the first flush volume, which is defined as 1-inch of runoff over the area contributing storm runoff (A) for new development or re-development. C_w is the weighted runoff coefficient for the site. This volume will be calculated as:

$$3630 \times A \times C_w = \text{FF volume}$$

This volume must be held for more than 18 hours but not more than 24 hours. The average allowable release rate for runoff resulting from 1.0 inch of rain in 24 hours is calculated as follows:

$$Q_{\text{ff}} = \frac{\text{Volume}}{(24\text{hr}) * \left(\frac{3600\text{sec}}{1\text{hour}}\right)} = \frac{V}{86,400\text{sec}}$$

Channel Protection Criteria

The purpose of bankfull, or channel protection, criteria is to prevent habitat degradation and erosion in streams caused by an increased frequency of bankfull and sub-bankfull storm water flows. Channel protection seeks to minimize downstream channel enlargement and incision that is a common consequence of urbanization. Stream protection for redevelopments shall be provided through retention of the difference in the 2-year 24-hr stormwater runoff volume between pre-development and post-development/redevelopment conditions. Pre-development means the last land use prior to the planned new development or redevelopment. If the post-development volume or rate exceeds the existing volume or rate, then appropriate controls or design changes shall be implemented to make the post-development runoff volume and rate equal to or less than the existing levels for all storms up to the 2-year, 24-hour event.

The design engineer must consider incorporation of green infrastructure elements and keep in mind that if extended detention is to be used, then additional BMPs likely will be needed to maintain pre-development volume and peak flow rate levels for all storms up to the 2-year 24 hour event. Please see Section IV. Minimum Design Requirements and Guideline section on requirements for BMPs (starting on pg. 23). The pre-development discharge rate for a site must be maintained for sites discharging to a system with a mechanical separator in place. Contact the City Engineer upon determination of channel protection requirements at the site development level to confirm implementation meets EGLE requirements. Waterbodies excluded to this channel protection performance standard are the following: Direct discharge to Lake Michigan and the St. Joseph River/ Morrison Channel from where the St. Joseph River and the Morrison Channel intersect (near Island Point Marina) downstream to Lake Michigan, in cases where infiltration has been proven to be infeasible on site (see infiltration section, Section IV.A.4 & 5 starting on pg. 25 for site requirements).

BMPs To Minimize Post Construction Impacts on Water Quality

1. The City of St. Joseph recommends that BMPs be utilized on all new or re-development sites to improve storm water runoff quality in the post construction phase.
2. The City of St. Joseph recommends BMPs to be designed on a site-specific basis to reduce a site development's post-development total suspended solids (TSS) loadings by 80 percent or achieve a discharge concentration of TSS not to exceed 80 milligrams per liter.
3. The BMPs used on a site must be reviewed and approved by the City Engineer, or other appointed designee, during the site plan review and approval process.
4. The site Designer, Engineer, or Architect must supply a list of BMPs being used on a site which will improve water quality of the runoff being discharged from a site for the review process. Example BMPs for use, or consideration, are located at the following site:

https://www.michigan.gov/egle/0,9429,7-135-3313_71618_3682_3714-118554--,00.html

C. Storm Water Detention / Treatment Requirements

The storm water detention storage/CDS treatment (or equivalent) required for a site is to be calculated using the City of St. Joseph Storm Water Management Guidelines Spreadsheet. The required detention volume will be the runoff from up to a 10-yr 24-hr storm event as defined in

NOAA Atlas 14, volume 8, version 2 and is dependent upon current drainage conditions. Information on the design storms can be found at:

https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ne

And locating the City of St. Joseph, Michigan on the map provided.

In order to meet the storm water quality discharge requirements in the storm water management criteria stated in the table above for Phase II of Section 10 of the Clean Water Act and to meet the Environmental Protection Agency's storm water guidelines, designs must provide for storm water treatment. This can be accomplished by implementation of one of the following measures or a combination thereof:

1. On systems that utilize a storm water detention basin a sediment forebay retention area can be utilized within the detention facility this retention area is required in addition to the storm water detention requirements equal to 1.0 inch of runoff from the contributing site area (See the calculation spreadsheet in the Appendix). The forebay must be designed to remove a minimum 80% of total suspended solids (TSS) or meet a TSS standard of 80 mg/L or less in the water discharged from the site.
2. Rain gardens, filtration, or an equivalent low impact design approach can be utilized which provides a soil or media filter for the water prior to entering the storm drainage system or storm detention system. The utilization of this type of treatment measure does not require the additional capture of 1.0 inch of runoff above the detention requirement for the site. (See the Sample Details in the Appendix of acceptable rain garden treatment systems).
3. Mechanical treatment devices designed to remove suspended solids and other debris. Mechanical treatment devices include specially designed treatment units which will remove 80% of the total suspended solids or meet TSS standard of 80 mg/L.

D. Discharge Restrictor Requirements

Restrictors are required to regulate the discharge of storm water to the allowable discharge rate established for a site. The circular in-line restrictor is sized based on the orifice formula.

$$a = Qa / [0.62 (64.4 (h))^{1/2}]$$

a = area of orifice (sq. ft.)

Δh = head differential from center of orifice to Hydraulic Grade Line of detention facility at maximum capacity (ft).

E. Storm Water Retention Requirements

If a storm water retention basins/system is selected to be used in a special situation. For example; a site which has no storm water outlet access or similar situation. The retention basin must be designed to store runoff of the 100-year 24-hour storm event. The rainfall amount for the 100-year storm is 6.1 inches. Retention calculations must be completed using the City of St. Joseph's Spreadsheet.

One soil boring must be provided for each 5,000 square foot of retention basin proposed, unless otherwise determined by the City Engineer based upon known/presented conditions. A practicing, licensed soils engineer must evaluate the borings to assure that there is adequate hydraulic capacity

of the soils to receive the proposed storm water. The capacity of the site soils must be a minimum of 0.15 cfs X the contribution acreage (i.e. contributing area 10 acres X 0.15 cfs = 1.5 cfs). Reduction in the retention volume for systems with higher infiltration capacities will not be allowed. The existing seasonally high-water table must be below the bottom of the proposed basin/system to assure that there is an adequate hydraulic outlet.

IV. MINIMUM DESIGN REQUIREMENTS AND GUIDELINES FOR STORM DRAINAGE SYSTEMS

The following is an outline of requirements for the design of storm water management systems. Engineering judgment must be utilized to accomplish the overall goals of these Guidelines.

A. Requirements

1. General Requirements

- a. Storm water detention requirements for any new construction development, redevelopment, or land use change occurring within the City of St. Joseph will be determined according to the procedure outlined in these Guidelines.
- b. A review will be required for all site development and redevelopment, **except residential sites for single-family or two-family dwellings**. The City Engineer or their designee may require side lot or rear lot drainage to be installed if the City Engineer or their designee determines it necessary.
- c. The peak runoff rate from the required storm event for the site development from a developed or improved site shall not exceed the allowable discharge rate (Qa).
- d. There shall be no detrimental effect on the floodway or the floodplain elevation during the required storm event upstream or downstream of the proposed development area as a result of the proposed development.
- e. The drainage area used for computation will be the total area tributary to the site outlet, including off-site properties that drain onto the site.
- f. Engineering calculations must be submitted with the application. The calculations shall follow the procedures outlined in these Guidelines.
- g. Roof drains may be connected to a drainage system if the flow through the outlet to the drainage system is properly treated and restricted. Unrestricted runoff from roof drains will not be accepted. Roof drain runoff will not be allowed to drain directly to sidewalks or parking areas.
- h. The City Engineer shall make a determination as to whether any or all the facilities proposed are to remain private or should be established as a city owned storm sewer, unless otherwise provided in these Guidelines.
- i. The City Engineer or their designee shall in the case of a proposed subdivision, make a determination as to those control elevations which shall be entered on the final plat or make a determination as to the necessity for deed restrictions on any particular lot in the

subdivision requiring the preservation of mandatory drainage facilities. Where a non-subdivided parcel of land is proposed for development, the City Engineer or their designee shall make a determination as to the need for covenants to maintain responsibility for mandatory drainage facilities. All the facilities in the subdivision shall be located in easements dedicated to the public and shall be subject to continual inspection during the construction period.

- j. Proposed storm drainage enclosures must be designed so they will not adversely impact any adjacent properties, upstream or downstream, and must be designed to the impervious factors of the lands based upon future land use, not necessarily existing conditions.

2. Storm Drainage Piping Requirements

- a. Proposed storm drainage shall be designed to have minimum capacity to pass 10-year design storm runoff rate (Qd).
- b. All storm drainage materials must comply with the authority having jurisdiction over the storm drainage system.
- c. Provide two (2) feet minimum cover or comply with the authority having jurisdiction over the storm drainage system.
- d. Provide eighteen (18) inch vertical separation between all other public utilities including sanitary drainages and water mains.
- e. Provide ten (10) feet horizontal separation from other public utilities.
- f. Manholes/catch basins shall be placed at a maximum distance of four hundred (400) feet from any other manholes/catch basins for access/maintenance purposes.
- g. Provide a sump discharge outlet for each individual lot or all developments. This outlet shall be a catch basin (minimum four (4) feet diameter) and/or provide a storm water lead to each lot. Manufactured tees or cored and booted leads, six (6) inch minimum to each lot are acceptable.
- h. Minimum pipe grades must be such to produce minimum scouring velocity of 2.5 ft/sec when pipe is flowing full without surcharging.
- i. For storm drainage systems, pipe selection and material are based upon the current MDOT standard specifications for construction.
- j. Minimum pipe diameter for catch basin leads is twelve (12) inches.
- k. Minimum pipe size for storm drainage is twelve (12) inches.
- l. Pipe should be sized for a 10-year design storm without surcharging when possible.
- m. When two pipes or more of different sizes come into a structure, the 8/10th flow lines shall match when possible.

- n. Catch basins should have a minimum sump depth of twenty-four (24) inches.
- o. Minimum diameter of catch basins shall be two (2) feet (for single inlet structures). The diameter must be larger diameter for multiple inlets and follow MDOT guidelines.

3. Detention Requirements

- a. Proposed storm drainage detention facilities shall be designed to have capacity to detain up to the 10-year recurrence interval design storm runoff volume in excess of the allowable discharge from the site. The detention requirements must be reviewed with the City Engineer or their designee. The outlet conditions may dictate a larger detention facility than required.
- b. The maximum design storage elevation in a detention area must be a minimum of **one (1) foot below the lowest ground elevation adjacent to the detention area.**
- c. The design maximum storage elevation in a detention area must not exceed a depth of nine (9) inches above any paved surfaced. **No water storage will be accepted in parking lots and/or any areas with pedestrian traffic.**
- d. The design maximum storage elevation in a detention area must not be closer than twelve (12) inches below the minimum finish floor elevation of the proposed structure(s) or existing facilities.
- e. Designs of detention facilities will incorporate features which facilitate their inspection and maintenance. The Owner/Developer shall submit a signed Operation and Maintenance (O&M) Plan for all storm water structures and BMPs on a site development, as necessary, with prior approval required by the City Engineer. A contact person must be provided for the site who will be responsible for maintenance of the storm water system and structures.
- f. Designs of detention facilities shall incorporate safety features, particularly at inlets, outlets, on steep slopes, and at any attractive nuisances. These features may include, but not be limited to, fencing, handrails, lighting, steps, grills, signs, and other protective or warning devices so as to restrict access.
- g. Side slopes and the bottom of detention basins shall be top soiled, to a minimum of three (3) inches, and seeded. Soil erosion control blankets must be installed to protect slopes if adequate vegetation does not exist between September 1st to May 1st.
- h. The side slopes and bottom of detention basins shall be shaped with maximum slopes of one (1) vertical to four (4) horizontal to allow mowing of these surfaces.
- i. Detention basins and restrictors shall be maintained as necessary. If a detention basin is found not to be maintained or a flow restrictor is removed or not maintained, Owner/Developer will have 30 days to complete the necessary maintenance. If this maintenance is not completed, the City of St. Joseph may take all actions necessary to perform necessary maintenance at the Owner's/Developer's expense unless other arrangements have been agreed to in writing in an executed Maintenance Agreement.

- j. Detention basins shall be constructed with the top of banks a minimum of five (5) feet from any pedestrian walkway (i.e. public and private sidewalks/bike paths).
4. Infiltration

An infiltration structure is a facility constructed within highly permeable soils that provides temporary storage of stormwater runoff. An infiltration structure does not normally have a structural outlet to discharge runoff from the stormwater quality design storm. Instead, outflow from an infiltration structure is through the surrounding soil. An infiltration structure may also be combined with an extended detention structure to provide additional runoff storage for both stormwater quality and quantity management. The adopted TSS removal rate for infiltration structures is 80 percent.

Infiltration structures are used to remove pollutants and to infiltrate stormwater back into the ground. Such infiltration also helps to reduce increases in both the peak rate and total volume of runoff caused by land development. Pollutant removal is achieved through filtration of the runoff through the soil as well as biological and chemical activity within the soil.

Pre-Design Site Evaluation

Infiltration structures can present some practical design problems. When planning for an infiltration structure which provides stormwater quality treatment, consideration should be given to soil characteristics, depth to the groundwater table, sensitivity of the region, and runoff water quality. Specifically, infiltration structures **must not be used in the following locations**:

- Industrial and commercial areas where solvents and/or petroleum products are loaded, unloaded, stored, or applied or pesticides are loaded, unloaded, or stored.
- Areas where hazardous materials are expected to be present in greater than “reportable quantities” as defined by the U.S. Environmental Protection Agency in the Code of Federal Regulations at 40 CFR 302.4.
- Areas where infiltration structure use would be inconsistent with an approved remedial action work plan or landfill closure plan.
- Areas with high risks for spills of toxic materials such as gas stations and vehicle maintenance facilities.
- Areas where industrial stormwater runoff is exposed to “source material.” “Source material” means any material(s) or machinery, located at an industrial facility, that is directly or indirectly related to process, manufacturing, or other industrial activities, that could be a source of pollutants in any industrial stormwater discharge to groundwater. Source materials include, but are not limited to raw materials, intermediate products, final products, waste materials, by-products, industrial machinery and fuels, and lubricants, solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.
- Areas where their installation would create a significant risk for basement seepage or flooding, cause surficial flooding of groundwater, or interfere with the operation of subsurface sewage disposal systems and other subsurface structures. Such adverse impacts must be assessed and avoided by the design engineer.

If any of the above-mentioned conditions are present, the City Engineer will coordinate with the EGLE as appropriate in the matters regarding the site to implement infiltration BMPs to manage stormwater on a site with contaminated soils or similar issues.

Infiltration structures must be configured and located where their construction will not compact the soils below the structure. In addition, an infiltration structure must not be placed into operation until the contributing drainage area is completely stabilized.

5. Infiltration Requirements

Soil borings and/or soil test pits may be required to determine the feasibility of infiltration. Also, the design engineer must research the soils in the area of development/re-development and determine the hydrologic soil groups (HSG - A, B, C, or D) and soil characteristics. If the site has had previous soils borings and BMPs in place which have functioned well in the past and can currently meet the 0.25 inches per hour infiltration rate, or if the soils map and soil profile show an area which is conducive to infiltration, then new soil borings may not be required. The need for soil borings will be determined by the City Engineer or designee.

Another aspect to be cognizant of when implementing infiltration practices is the buildings on the perimeter of a site development. The design engineer must consider basements nearby or other buildings which may be adversely impacted by an infiltration practice being implemented in an area with a clay layer just a few feet under the soils which prevents effective infiltration.

The bio-retention filtration collection system with its sand filtration system will slow the discharge rates considerably and will lower the peak discharge rates. The peak discharge rate from these systems cannot exceed the 2-yr 24-hr discharge from the site development, so as to meet channel protection standards, if in an area which requires channel protection standards.

For infiltration trench and structure practices, the following infiltration (K_{SAT}) values shall be used:

- $K_{sat} \geq 0.50$ inches/hour
Infiltration BMPs shall be constructed to provide the infiltration volume as calculated using the above requirements.
- 0.24 inches/hour $< K_{sat} < 0.50$ inches/hour
Install supplemental measures, which may include subsoil amendment, or an underdrain placed at the top of the storage bed layer to ensure dewatering in the event underlying soils fail to provide adequate drawdown/dewatering time. If underdrains are selected, they shall be designed to allow stormwater to percolate through the soils first, with the underdrain serving as a secondary outlet, by placing the underdrain in the upper level of the BMP, with pipe perforations located along the underdrain invert.
- $K_{sat} < 0.24$ inches/hour
Soils are not suitable for infiltration. Alternative methods to reduce stormwater volume shall be used.

Feasibility testing is to be conducted to screen unsuitable sites and reduce testing costs. A soil boring is not required at this stage. However, a designer or landowner may opt to engage concept design borings at his/her discretion, without feasibility testing.

Initial testing involves either one field test per facility, regardless of type or size, or previous testing data, such as the following:

- * on-site septic percolation testing, within 200 feet of the proposed BMP location, and on the same contour which can establish initial rate, water table and/or depth to bedrock,
- * geotechnical report on the site prepared by a qualified licensed geotechnical consultant, or
- * Natural Resources Conservation Service (NRCS) County Soil Mapping showing an unsuitable soil group such as a hydrologic group “D” soil in a low-lying area.

Soil information can be found at this website:

<https://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>

If the results of initial feasibility testing as determined by a qualified professional show that an infiltration rate of greater than 0.24 inches per hour is probable, then the City Engineer or designee shall make the final decision on implementation.

Once all testing is completed the design engineer must contact the City Engineer or designee to review the results for the site and determine if the proposed BMP is a feasible practice for the development/re-development.

6. Rear Lot Drainage Requirements

- a. Rear lot tile drains with contributing drainage areas up to 1/2 acre shall have a minimum diameter of six (6) inches and a minimum pipe slope of 0.5%.
- b. Rear lot tile drains with contributing drainage areas greater than 1/2 acre and less than 1 acre shall have a minimum diameter of eight (8) inches and a minimum pipe slope of 0.3%.
- c. Rear lot tile drains with a contributing area greater than one (1) acre shall be considered main line storm drainage and shall be designed according to corresponding requirements. Calculations shall be submitted to the City Engineer or their designee to verify the rear lot drains have the capacity to pass the 10-year design storm event.
- d. All lots must be provided with rear lot drainage.
- e. Rear lot drainage tiles shall have a minimum cover of two (2) feet.
- f. Rear lot drainage tile and catch basin material shall be approved by the City Engineer or their designee. The minimum diameter of a rear lot catch basin shall be two (2) feet.
- g. A 20-foot easement will be required for all rear lot drainage systems. This easement should be centered along lot lines to allow for a 10-foot easement along adjacent lots and to

provide access to the rear lot drainage system from either adjacent property owners. Said easements shall be written as to permit neighboring property and/or condominium owners to maintain the rear lot drainage system as it may affect their property.

NOTE: Rear lot drainage systems are not a part of the MS4 system and are the responsibility of the Home Owners or Condo Association for the housing development. IF these systems become plugged or inoperable it is the associations responsibility. The City of St. Joseph is not responsible to repair or maintain these rear lot systems.

B. General Compliance Guidelines

The following guidelines are recommended but are not a requirement of this plan. These guidelines are provided for reference.

1. The minimum surface slopes for overland drainage are as follows:
 - For bituminous paved surfaces, 1%.
 - For concrete paved surfaces, 0.5%.
 - For concrete curb and gutter, 0.5%.
 - For drainage swales and valley shaped ditches, 0.5%.
 - For rear lot drainage swales and valley shaped ditches, 0.5%.
 - Landscape grading, 2%.

2. The maximum surface slopes for overland drainage are as follows:
 - For bituminous, concrete paved surfaces, 6%.
 - For concrete curb and gutter, 6%.
 - For drainage swales and valley shaped ditches, 6%.
 - For rear lot drainage swales and valley shaped ditches, 5%.
 - Drainage swales and valley shaped ditches shall have maximum side slopes of 3 horizontal to 1 vertical.
 - Landscape grading, 4 horizontal to 1 vertical.

C. Variations from Requirements

The City may waive allowable discharge requirements and or detention requirements. All variances will be reviewed under the appeal procedures established in the current storm water management ordinance. Variances from these requirements shall require the approval of the City of St. Joseph whose actions shall be conditioned upon the following:

1. A petition shall be submitted describing in detail the rationale for the proposed design changes including hydraulic and or hydrologic computations.
2. Special circumstances or conditions exist which will affect the property under consideration such that strict compliance with the provisions of the storm water discharge permit would deprive the applicant of the reasonable use of their land.
3. A variance is necessary for the preservation and enjoyment of a substantial property right of the proprietor.

4. Granting of the variance will not be detrimental to the public health, safety or welfare, or injurious to other property in the territory in which said property is located.
5. An affirmative recommendation must be received from the City Engineer supporting such variance. In the event that the City Engineer does not submit an affirmative recommendation, a recommendation shall be received from the City of St. Joseph's City Commission.

APPENDIX

STORM WATER REVIEW APPLICATIONPA-1
(Word Fill-in Document)

DRAINAGE PLAN CHECKLISTDP 1-2
(Word Fill-in Document)

PLAN REVIEW ESCROW ACCOUNT APPLICATIONPR 1-2
(Word Fill-in Document)

SOIL EROSION SEDIMENT CONTROL PROCEDURE.....SESC-1

STORM WATER DETENTION REQUIREMENTS DR 1-2
(Excel Spreadsheet)

CHART FOR C FACTORS.....CF-1
(Example: Used by City of St. Joseph)

MAINTENANCE AGREEMENT..... MA 1-2
(Example: Used by City of St. Joseph)

INSPECTION DAILY REPORTIDR-1
(Example: Used by City of St. Joseph)

DETENTION AND RESTRICTION, FINAL INSPECTION REPORT FIR-1
(Example: Used by City of St. Joseph)

ENGINEER'S CERTIFICATE OF OUTLET..... ECO 1-2
(Example: Used by City of St. Joseph)

ENGINEER'S CERTIFICATE OF CONSTRUCTION..... ECC 1-2
(Example: Used by City of St. Joseph)

SAMPLE DETAILSSD 1-9A

CITY OF St. JOSEPH

STORM WATER DISCHARGE PERMIT APPLICATION

PROJECT NAME:	
Property Tax Identification #:	
Site Plan Review Date:	
Date Applied:	
Deposit Amount Submitted:	
NAME OF DEVELOPER/OWNER:	ENGINEER/ARCHITECT:
Contact Person:	Contact Person:
Street Address:	Street Address:
City, State, Zip:	City, State, Zip:
Telephone:	Telephone:
Email:	Email:
PROJECT LOCATION:	
Street Address:	
Name of Subdivision/Plat:	
Other	
STORM WATER DESIGN INFORMATION (*Calculation must be submitted for verification. Calculations must have clearly labeled headings, clearly labeled formulas, and clearly labeled units.)	
Type of Development (Circle): <i>COMMERCIAL SITE, INDUSTRIAL SITE, RESIDENTIAL PLATTED, RESIDENTIAL CONDOMINIUM, OTHER</i>	
*AREA OF DEVELOPMENT (acres):	
*AREA OF CONTRIBUTING DRAINAGE DISTRICT (acres):	
*AREA OF EXISTING IMPERVIOUS SURFACE (acres):	
*AREA OF PROPOSED IMPERVIOUS SURFACE (acres):	
*ALLOWABLE DISCHARGE RATE (Q _a) (cfs):	
*TOTAL VOLUME OF STORAGE REQUIRED (cu. ft.)	
*TOTAL VOLUME OF STORAGE DESIGNED (cu. Ft.)	
DESIGN STORM WATER DETENTION STORAGE ELEVATION:	
EMERGENCY OVERFLOW/MAXIMUM STORAGE ELEVATION:	
LOWEST FINISHED FLOOR ELEVATION:	
OUTLET DRAIN SIZE AND DESIGN FLOW CAPACITY:	
OUTLET DRAIN INVERT ELEVATION:	
DESIGN IMPERVIOUS FACTOR (IMP):	
*DESIGN DISCHARGE (cfs):	
*HEAD DIFFERENTIAL THROUGH RESTRICTOR (ft.):	
*DIAMETER OF PROPOSED RESTRICTOR (in.):	
*ACTUAL RESTRICTED DISCHARGE (cfs):	
AUTHORIZED SIGNATURE	PLEASE REFER TO BACK FOR ADDITIONAL PERMIT APPLICATION INFORMATION
DATE	

The Owner/Developer must provide a Complete Storm Water Permit Submittal to City of St. Joseph for review by the City Engineer or designated Reviewer. This includes a completed permit application with calculations, two complete sets of the site drainage and grading plan, two copies of the calculations for allowable discharge and on-site storage requirements, as prepared by a Registered Professional Engineer or Architect, any other supporting information, and completion of the drainage checklist outlined below.

Complete the drainage checklist by checking each of the following items after you have verified they are clearly indicated on the plan:

- Total acres of site.
- Total acres of watershed draining through the site outlet.
- Drainage District and impervious factor. Drainage district lines, including sub district lines, contributing to individual storm sewers and rear lot drainage systems, showing all land to be drained through proposed drainage system, including rear lot drainage systems.
- Location of site, including dimension to nearest intersection, road, or section line.
- Existing and proposed ground elevations at maximum 50-foot centers, including shots on perimeter of site and 50 feet beyond or contour lines at one (1) foot intervals extending 50-ft beyond the site limits.
- Existing and proposed elevations at edge of pavement or buildings within 50-ft of site.
- Existing and proposed elevations of top of curb, gutter, ditch line, and centerline of road at maximum 50-ft intervals within 50-ft of site.
- Rim and invert elevations of existing catch basins, manholes, sewers, and culverts.
- Location of all existing and proposed utilities, water main, storm drains, sanitary sewer, and corresponding rights-of-way.
- Horizontal control of all storm water drainage facilities and building locations.
- Location of proposed lawn/landscape areas, paved areas, and building locations.
- Location, size, length, slope, and type of proposed storm sewer and rear lot drains.
- Rim and invert elevations(s) of proposed manholes and catch basins, including rear lot drainage.
- Location of on-site storage showing contour line for top of storage elevation.
- Provide sufficient dimensions, cross-sections, profiles, tie downs, and horizontal controls to determine the location and size of proposed storm sewers and detention/retention areas. This information will be used for verifying proposed detention/retention volume calculations in grassed and paved areas.
- Location and elevation of emergency overflow.
- Proposed grades for bituminous and concrete paving comply with storm water management plan.
- Storm sewer material, sizes, and minimum grades comply with storm water management plan.
- Rear lot drainages comply with storm water management plan.
- Location, size, and detail of proposed restrictor.
- Trench detail, manhole detail, catch basin detail, restrictor detail, curb detail, pavement detail, storm water detention basin detail, and topsoil and seeding detail.
- Detailed hydrology and hydraulic calculations used for sizing storm sewer (can be submitted on separate form). Calculations must show there will be no adverse impacts upstream or downstream of proposed development.
- Calculations of maximum allowable discharge on-site storage, storage volume, and size of restrictor.

Beyond City of St. Joseph requirements, the Developer must submit applications for permits with all agencies which may regulate storm water within the area of development. These may include Michigan Department of Transportation, Michigan Department of Environment, Great Lakes & Energy, Berrien County Drain Commissioner, Berrien County Road Commission, and others.

City of St. Joseph
Application for Post-Construction Storm Water Runoff Review & Approval Application

To be completed and submitted to the City of St. Joseph Finance Department with the deposit before submitting plans to the Engineering Department for review/processing. Authorized copies to be included with plan submittals.

Project Name: _____

Project Location:

City / Township: _____

Nearest existing street intersection: _____

Proposed street names: _____

Attach Project Location Map

Engineer: _____

Contact Name: _____

Phone: _____

Address: _____

Email Address: _____

Owner: _____

Contact Name: _____

Phone: _____

Address: _____

Email Address: _____

We are requesting that an escrow account be set up to cover the cost of the post-construction storm water runoff reviews for the above-named project. We have attached an initial deposit of \$1,000 for a preliminary review or \$3,000 for a full review. In the case of a full review, we agree to replenish the account if notified that the balance has fallen below \$1,000, up to \$3,000. We further understand that the balance in the account will not be refunded until all required paperwork and submittals to meet City of St. Joseph Design Standards & Guidelines for Storm Water Best Management Practices have been reviewed and approved.

Please note that no building permits for the project will be issued until the Final Acceptance Submittal Package has been approved.

_____/_____/_____
Owner Signature *Date*

By signing the application, the owner acknowledges the above-named engineer as their Agent for this project

AUTHORIZATION For City Use Only

I acknowledge that the escrow account for the above project has been established and preliminary review or full review may proceed.

_____/_____/_____
Signature and Title *Date*

SOIL EROSION AND SEDIMENT CONTROL FOR CONSTRUCTION SITES PROCEDURE

A general procedure for Soil Erosion and Sediment Control (SESC) and NPDES permits to discharge storm water from construction sites:

There have been changes in the permitting for construction sites for contractors, developers, municipalities, and other public agencies. These rules took effect at the date listed below; everyone must adhere to these changes and be aware of them.

EFFECTIVE DATE – MARCH 10, 2003

General procedure to follow:

Site has a soil disturbance of 1 to <5 acres:

Apply for Soil Erosion Sediment Control permit from either the county enforcement agency (CEA) or municipal enforcement agency (MEA).

The NPDES discharge permit for this site is covered by the “permit by rule”; no permit or application needs to be filled out for the state.

Note: If client is an APA (authorized public agency for soil erosion and sediment control) they still must follow the permit by rule, they do not need a SESC Permit as they have procedures approved by EGLE. The rules are at the following site:

https://www.michigan.gov/documents/deq/wb-stormwater-ConstructionQA_248586_7.pdf

Site has a soil disturbance of 5 or more acres:

Apply for Soil Erosion Sediment Control permit from either the county enforcement agency (CEA) or municipal agency (MEA) first. Then fill out the NPDES Notice of Coverage form for discharges from the construction site on the MiWaters website.

To apply, renew, or terminate permit coverage, go the MiWaters website at <https://miwaters.deq.state.mi.us/miwaters/external/home> and log into your account. If you don't already have an account, [view the tutorial on how to establish your account](#). Once you have an account established, you may:

- apply for permit coverage by searching for Notice of Coverage Application,
- renew by searching for Notice of Coverage Renewal, or
- terminate your permit by searching for Notice of Termination.

Once the state receives the form, the site is covered.

Note: If client is an APA (authorized public agency for soil erosion and sediment control) they still must obtain and fill out the NPDES Notice of Coverage to discharge storm water from a construction site; they do not need SESC Permit as they have procedures approved by EGLE.

https://www.michigan.gov/documents/deq/wb-stormwater-ConstructionQA_248586_7.pdf

Once the project site is stabilized and has good vegetative cover, remember to fill out a project termination form on the MiWaters website.

Determine inspection responsibilities:

Make sure that SESC issues are an agenda item at the pre-bid meeting and at the pre-construction meeting. Do not just put a note on the plans that SESC is the contractor’s responsibility; make sure they are fully aware of their site responsibilities. Remember that the owner of the project is ultimately the responsible party, the EGLE or enforcing agency will be fining them.

TABLE of RUNOFF COEFFICIENTS FOR RATIONAL FORMULA

<i>Type of Drainage Area</i>	<i>Runoff Coefficient, C*</i>
<i>Concrete or Asphalt Pavement</i>	0.8 – 0.9
<i>Commercial and Industrial</i>	0.8 – 0.9
<i>Gravel Roadways and Shoulders</i>	0.8 – 0.9
<i>Residential – Urban</i>	0.5 – 0.7
<i>Residential – Suburban</i>	0.3 – 0.5
<i>Undeveloped</i>	0.15 – 0.3
<i>Berms</i>	0.15 – 0.3
<i>Agricultural – Cultivated Fields</i>	0.15 – 0.4
<i>Agricultural – Pastures</i>	0.15 – 0.4
<i>Agricultural – Forested Areas</i>	0.15 – 0.4

For flat slopes or permeable soil, lower values shall be used. For steep slopes or impermeable soil, higher values shall be used. Steep slopes are 2:1 or steeper.

From Michigan State Administrative Rules R 280.9.

Operation & Maintenance Plan for Storm Water Drainage Systems, Structural & Vegetative Best Management Practices (BMPs)

< Please insert name of site >

<Address or Location >

This Operation & Maintenance Plan is to be completed for development or re-development of all commercial, industrial, subdivision and condo developments that disturb at least one or more acres, including projects less than an acre that are part of a larger common plan of development or sale and require the operation and maintenance of storm water drainage systems and/or structural and vegetative best management practices.

I. Responsibility for Maintenance:

A. During Construction: <name of site> (contractor) has the responsibility to perform the maintenance.

B. Following Construction: <name of site> is responsible to perform the maintenance.

1. Routine maintenance of the storm water facilities must be completed on a scheduled basis by the owner or lessee. All catch basins/manholes/rear yard basins, detention basins, flow restrictors, or other stormwater structures must be maintained and inspection on a scheduled basis.
2. Any structural and/or best management practices (BMPs) must be installed and implemented properly to meet the performance standards.
3. If the site is notified by the local DPW, zoning administrator or municipal engineer, either verbally or in writing, within 10 calendar days of this notification action is required, unless other acceptable arrangements are made with the <municipality name>. Emergency maintenance (when there is endangerment to public health, safety or welfare) shall be performed immediately upon receipt of verbal or written notification. If the <name of site> fails to act within these timeframes, the <municipality name> or successors may perform the needed maintenance and assess the cost against the <name of site>, plus an administrative fee.

II. Funding:

The <name of site> is required to pay for all continued maintenance activities.

III. Maintenance Tasks and Schedule:

A. During Construction:

1. Properly plug and abandon existing storm sewer to prevent any sediment from entering the existing system.
2. Establish and maintain 'BMP's to prevent sediment from leaving the site.

B. Post-Construction:

1. Perform scheduled semi-annual inspections and inspections following major storm events to check for floatables and debris within the system. Remove floatables and debris as required.
2. Annually inspect for sediment within the catch basin sumps. Removal of sediment is required if within 12 inches of an inlet or outlet pipe in the structure.
3. Every two (2) years inspect the structural elements of the storm system (restrictor, catch basins, etc.) noting any failures. Correct as needed.
4. If catch basin inserts are in place, inspect every 6 months and replace screens, filters or cloth as necessary for the particular type of insert.
5. Mow detention basins on a regular basis; no cattails, Phragmites, or other plants can grow unrestricted in these basins.

6. Ensure long-term operation and maintenance of all structural and vegetative best management practices installed and implemented.

IV. Records:

- A. The <name of site> shall keep a written log of both preventive and corrective maintenance activities. At minimum, the log shall contain the date of the inspection, the reason for the inspection, the conditions encountered and the resulting activities. The log shall be available for review at the request of the <name of municipality>.
- B. If a site is sold to another, this Operation and Maintenance agreement must be transferred to the new owner and the <name of municipality> must be informed of the change in ownership within 14 days of the sale.
- C. Annually, a compliance statement must be sent to <insert tracking site>. The owner or operator of the site will at minimum provide the date of inspection(s) and any maintenance performed, if applicable. This can be accomplished by email to the email address listed below of the responsible party.
- D. If the owner or operator of the site does not respond to the compliance statement with verification of site inspection and maintenance of storm water structural controls and best management practices within 14 days from the day of receiving the email, the municipality, or representative for the municipality, will perform an inspection and an administrative fee will be charged to the owner or operator.

V. Site Access:

- A. If there is a drainage issue/problem on a site that has to do with the storm drainage system, best management practices, or is discharging too much storm water or water that does not appear to meet water quality standards, the owner must let the municipality or designee onto the property for the following:
 - 1. Inspect the structural or vegetative best management practice(s), drainage issue/problem, or discharge problem.
 - 2. Perform the necessary maintenance or corrective actions neglected by the BMP owner or operator.
- B. Any and all necessary maintenance or correction actions that the <name of municipality> must perform will be charged to the owner or operator of <name of site>.

VI. Operation and Maintenance Verification:

I have read this document and agree to implement the operation and maintenance procedures listed for this site to protect storm water quality leaving this site and to ensure best management practices are installed and being implemented.

Printed Name(s) _____

Authorized Signature **Date**

Email address of responsible party: _____

NOTE: if the above person responsible for Maintenance and Operation is no longer responsible for this site a new contact and email must be provided to the (city, township, DPW/S) within 5 business days.

DAILY INSPECTION REPORT FORM

FOR SUBDIVISIONS and CONDO DEVELOPMENTS ONLY

PROJECT NAME:		WORK ORDER NO.:		
CONTRACTOR:		REPORT NO.:		
SUPERINTENDENT:		DATE:		
WEATHER (CLEAR, CLOUDY, RAIN, SNOW):		TEMPERATURE:	INSPECTOR:	
WORK FORCE ON SITE:	NUMBER:	TRADE:	NUMBER:	TRADE:
EQUIPMENT IN USE (Number and Type):				
WORK DONE (Location, Amount, and Type): (Be Specific)				
TYPE OF UTILITY INSTALLED (Water, Sewer, Pavement, size, Class, Description, Source):				
GROUND CONDITIONS ENCOUNTERED (Clay, Sand, Wet, Dry, Good Poor, or Other & Detail Further):				
BACKFILL INSTALLED:				
EXISTING UTILITIES ENCOUNTERED:				
RELOCATION OF PROPOSED UTILITIES AND REASON NECESSARY:				
MATERIAL DELIVERED TO SITE (Size, Class, Description, Source):				
VISITORS TO WORK SITE (Name, Affiliation):				
REMARKS:				

NOTE: Complete in ink each day. Use reverse side if necessary.

By: _____ Date: _____

**CITY OF ST. JOSEPH
DETENTION AND RESTRICTION
FINAL INSPECTION REPORT FORM**

Name of Site Development:	
Engineering Department Approval Date	
Location or Address:	
Type of Development: *	
Size of Restrictor:	
Type of Restrictor: ** or BMP for Water Quality	
Location of Restrictor or BMP for Water Quality	
Required Detention (ft ³):	
Type of Detention: ***	
Location of Detention:	
Do As-builts Conform To Present Site Conditions?	
Inspection Comments:	
Date of Inspection:	
Inspector's Name and Affiliation:	

* - Residential, Commercial, Subdivision, Etc.

** - Orifice in Outlet Pipe, Metering Outlet Pipe, Square Orifice, Etc.

*** - Underground storage WQ BMPs, Detention Basin, Etc.

CITY OF St. JOSEPH
STORM WATER MANAGEMENT

**Engineer's Certification of Storm Sewer Construction for Platted
Developments and Condominium Projects, or Large
Developments/Redevelopments (5 acres or greater)**

PROJECT NO.: _____

PROJECT NAME: _____

SITE ADDRESS: _____

CONTRACTOR NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

MICHIGAN LICENSE NO.: _____

I hereby certify that the storm sewer system installed has been inspected during construction and is in general conformance to the approved plans and specifications. In my professional opinion, this site's storm sewer system is in compliance with City of St. Joseph Storm Water Management Plan design guidelines.

Printed Name and Title

Date

Signature

Date

WITNESSES:

Date

STATE OF MICHIGAN)
) ss.
COUNTY OF _____)

Subscribed and sworn to before me on the _____ day of _____, 201__, by

Notary Public
_____ County, Michigan
My Commission Expires: _____

<p>CITY OF St. JOSEPH <i>STORM WATER MANAGEMENT</i></p>
--

Contractor's Certification of Storm Sewer Construction

PROJECT NO: _____

PROJECT NAME: _____

SITE ADDRESS: _____

CONTRACTOR NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

MICHIGAN LICENSE NO: _____

I hereby certify that I am a licensed contractor in the State of Michigan. To the best of my knowledge, information, and belief, the storm sewer system has been constructed in general conformance to the approved plans and specifications delivered to me by the Design Engineer. In my professional opinion, this site's storm sewer system is in compliance with the City of St. Joseph Storm Water Management Plan design guidelines.

Printed Name and Title	Date
------------------------	------

Signature	Date
-----------	------

WITNESSES:

	Date
--	------

STATE OF MICHIGAN)
) ss.
 COUNTY OF _____)

Subscribed and sworn to before me on the _____ day of _____, 201__, by

 Notary Public
 _____ County, Michigan
 My Commission Expires: _____

ENGINEER'S CERTIFICATE OF CONSTRUCTION

I. ENGINEER'S CERTIFICATE OF CONSTRUCTION

- A. The registered professional engineer responsible for the supervision of construction inspection shall provide an Engineer's Certificate of Construction.
- B. For any site discharging to a County or Intercounty Drain, or any body of water regulated under Phase II of the Clean Water Act amendments, the engineer shall certify, in a form as provided on Page 2 of this Appendix, that:
 - 1. Construction of storm water management facilities is complete.
 - 2. He/she has supervised inspection of the construction.
 - 3. All facilities were installed in accordance with the final construction plan approved by the City Engineer.
 - 3. Inspection and construction material tests have been filed with the St. Joseph City Engineer.
- C. The Engineer's Certificate of Construction must be signed by and stamped with the registered professional engineer's seal. The Certificate submitted to the St. Joseph City Engineer.

ENGINEER'S CERTIFICATE OF CONSTRUCTION

ENGINEERING COMPANY LETTERHEAD

Engineer's Certificate of Construction

Date: [INSERT DATE]

Development: [NAME OF DEVELOPMENT]
county drain]

Drain: [NAME OF DRAIN-if a

City Address of Site: [address or location] Section: [SECTION NUMBER]

Parcel Number: []

I HEREBY CERTIFY that construction of all storm water management facilities for the above-referenced development is complete and that:

1. I have supervised inspection of the construction.
2. All facilities have been installed in accordance with final construction plans approved by the Berrien County Drain Commissioner.
3. Inspection reports and construction material testing reports have been filed with the St. Joseph City Engineer

Signed: _____
L. P. Engineer [ENGINEER'S SEAL]