City of Hamilton
BUTLER COUNTY OHIO

Storm Water Plan Review Checklist

Prepared By:

STRAND ASSOCIATES®

The City of Hamilton's Chapter 929 ordinance "Storm Water Management System" and Chapter 1197.06 ordinance "Storm Drainage System" as well as the City's Storm Water Drainage Policy Manual provide the requirements for storm water management and design within the City.

This document can be used by design engineers as a reference for complying with the City's Storm Water Management requirements. *The City will also utilize this document as a plan review checklist and record of completed reviews.*

Check each of the following items that are included in this submittal or indicate if not applicable.

Included	▪ **Erosion and Sediment Control:** Provide measures to ensure that earth disturbing activities at the site during and after development will be managed in a manner that will not result in increased erosion and sediment from the site resulting in water quality impacts.
Included	▪ **Storm Water Conveyance:** Provide storm water calculations and design of all storm conveyance systems including storm sewers, inlets, and open channels or ditches.
Included	▪ **Post-Construction Storm Water Management Facilities:** Provide detention of surface water runoff from the development site during and after construction that meets the City's detention requirements outlined in the Drainage Policy Manual.
Included	▪ **Water Quality Best Management Practices (BMPs):** Provide water quality controls consistent with the requirements of the latest edition of the Ohio EPA's National Pollutant Discharge Elimination System (NPDES) General Storm Water Permit for Construction Activities.

PROJECT NAME: _____

DEVELOPER (if applicable): _____

DESIGN ENGINEER: _____

DATE SUBMITTED TO CITY: _____

All submittals to the City should include the following items in this order. Each item should be numbered and should meet all requirements listed herein.

Erosion and Sediment Control Submittal Requirements

Include erosion and control measures during the construction phase of the development. The submittal shall include the following:

☐ **1.** An Erosion Prevention and Sediment Control (EPSC) plan sheet detailing the required sediment and erosion control measures to be included on site. Designs shall meet the basic requirements of Ohio EPA's National Pollutant Discharge Elimination System (NPDES) General Storm Water Permit for Construction Activities, and may reference the Rainwater and Land Development manual latest edition, developed by the Ohio Department of Natural Resources.

Note: The contractor is typically responsible for providing the full Storm Water Pollution Prevention Plan (SWP3) prior to the submittal of the Notice of Intent (NOI), prior to start of construction activity - only the EPSC plan is required with this submittal.

Storm Water Conveyance

Documentation of all post-construction storm water conveyance design and sizing information. The submittal shall include the following:

☐ **2.** Map of all proposed storm water conveyance systems including pipe/channel size and material and inlet and manhole locations.

☐ **3.** Sizing calculations for each storm water conveyance system including drainage area, time of concentration, pipe material, manning's roughness coefficient, pipe size, pipe slope, and velocity.

☐ **4.** Profiles of each storm water conveyance system that show hydraulic grade lines for the design storms as specified in the City's Storm Water Drainage Policy Manual.

☐ **5.** Inlet and manhole spacing and design calculations.

☐ **6.** Documentation of other necessary requirements:

a. Drainage easements 10 feet on both sides of the centerline of the conveyance.

b. Stream setbacks as appropriate.

c. Energy dissipation utilized where velocities exceed 5.0 feet per second

d. Floodplain considerations if needed.

Post-Construction Storm Water Management Facility Submittal Requirements

Include an evaluation of pre-development conditions and post-development conditions that quantifies the volume and peak rate of runoff from the site. The submittal shall include the following:

☐ **7.** Pre-development and post-development site maps that highlight the following:

a. The total land disturbance area.

b. Total drainage area used for the purposes of water quantity peak flow rate calculations.

c. The existing and proposed impervious surfaces used in the pre-development and post-development storm water calculations.

d. Time of concentration travel paths used in pre-development and post-development storm water calculations

☐ **8.** Pre-development and post-development time of concentration calculations for sheet flow, shallow concentrated flow and channel flow consistent with methodologies described in the NRCS Technical Release 55 (TR-55).

☐ **9.** A summary of the pre-development post-development runoff curve numbers based on land use from tables available in the NRCS Technical Release 55 (TR-55).

☐ **10.** Storm water calculations using hydrologic methods in the NRCS Technical Release 55 (TR-55) indicating the total volume of runoff from a one (1) year frequency, 24-hour storm occurring on the development area for both pre-development and post-development conditions. Based on the volume increase, utilize the below table to select the critical storm.

If the percent of increase in runoff volume is		The critical storm for peak rate control will be
equal to or greater than	and less than	
-	10%	1 Year
10%	20%	2 Year
20%	50%	5 Year
50%	100%	10 Year
100%	250%	25 Year
250%	500%	50 Year
500%	-	100 Year

☐ **11.** Storm water calculations for the design of storm water management facilities that demonstrate the following for the proposed development site.

a. The post-development peak rate of runoff from the critical storm and all more frequent storms occurring on the site does not exceed the peak rate of runoff from a one (1) year frequency, twenty-four (24) hour storm occurring on the same site under pre-development conditions.

b. Storms of less-frequent occurrence (longer return periods) than the critical storm up to the 100-year storm shall have peak runoff rates no greater than the peak runoff rates from equivalent size storms under pre-development conditions.

☐ **12.** A summary table of the stage-storage relationship provided by the storm water control that is intended for water quantity requirements.

☐ **13.** Design details for the proposed storm water management facility, including plan view with proposed grading and footprint, cross sections, and details of outlet control structure configuration consistent with storm water calculations.

Water Quality Best Management Practices Submittal Requirements

Include storm water BMPs to ensure that water quality controls will be in place in post-development or post-construction conditions. The submittal shall include the following:

☐ **14.** Calculations for the drainage areas and percent imperviousness tributary to the proposed post-construction storm water BMPs.

☐ **15.** Calculations for the water quality runoff coefficient consistent with the equation included in the Ohio EPA's National Pollutant Discharge Elimination System (NPDES) General Storm Water Permit for Construction Activities., latest edition, in the Post-Construction Storm Water Management Requirements section.

☐ **16.** Calculations for the water quality volume in both acre-feet and cubic feet consistent with the equation included in the Ohio EPA's National Pollutant Discharge Elimination System (NPDES) General Storm Water Permit for Construction Activities., latest edition, in the Post-Construction Storm Water Management Requirements section.

☐ **17.** A brief narrative of the post-construction storm water quality BMP selected, consistent with Table 2 of the Ohio EPA's National Pollutant Discharge Elimination System (NPDES) General Storm Water Permit for Construction Activities., latest edition, for meeting the water quality volume requirements.

☐ **18.** Calculations for the drain time or drawdown time for the selected BMP consistent with the requirements described in Table 2 of the Ohio EPA's National Pollutant Discharge Elimination System (NPDES) General Storm Water Permit for Construction Activities., latest edition.

☐ **19.** Design details for the proposed post-construction storm water quality BMP, including plan view with proposed grading and footprint, cross sections, and details of outlet control structure configuration consistent with storm water calculations.

☐ **20.** Detailed long-term maintenance plan for the post-construction storm water quality BMP.

Submission, Review and Action

Submit two (2) copies of the above required information to the City to initiate the review process. The applicant is encouraged to have a pre-submission meeting with the City.

Upon submission, the City shall complete a review of the submittal within 30 days, provided that the applicant has submitted all information required.

The City shall either approve the design as submitted by the applicant or disapprove and note the deficiencies. If a submittal is not approved, an updated design submittal may be prepared and submitted by the applicant to the City for review.

Area below line is for City use only.

The City of Hamilton has reviewed the drainage design submittal and has determined that this submittal is:

☐ **APPROVED** ☐ **NOT APPROVED**

Review Comments If Applicable:

REVIEWER SIGNATURE: _____ **Date:** 9/12/19