City of Waukesha
Department of Public Works
130 Delafield Street
Waukesha, WI 53188
Waukesha-wi.gov

Stormwater Management Plan

Attachment D
(Rev 04/18)

Project Name: New Perspective Waukesha

Engineer & Design Firm: The Sigma Group, Inc.

STORM WATER MANAGEMENT PLAN WORKSHEET

The City of Waukesha requires a Stormwater Management Plan to be submitted with the proposed development plans for site plan review. A Stormwater Management Plan is a document describing the storm water management practices constructed and implemented within the proposed development to ensure compliance with the storm water management criteria, as set forth by the City of Waukesha. The purpose of a Stormwater Management Plan is to protect the safety and health of the public, property and aquatic environment from the threats due to storm water from land development activity. The worksheet will provide a basis to the information that shall be provided when preparing a Stormwater Management Plan for a proposed development. This Plan shall include a set of complete plans and calculations, stamped by a registered professional engineer.
Stormwater Management Plans are required as listed in City Code Book Chapter 32.06(b)

Exemptions for Design and Plan Requirements

YES	NO	N/A	
☐	☒	☐	Site is associated with agricultural or sylvicultural activities

Design Requirements: Total Suspended Solids

YES	NO	N/A	
☒	☐	☐	Site is a New Development – 80% Reduction must be met
☐	☒	☐	Site is an Infill Development – 80% Reduction must be met
☐	☒	☐	Site is a Redevelopment – 40% Reduction must be met
☐	☒	☐	Site has areas of New Development and Redevelopment
☒	☐	☐	Calculations for % Reduction are included in the plan (WinSLAMM input and output)
☒	☐	☐	Storm water Management Facilities to address TSS removal are designed according to Chapter 32 of the City Code Book and DNR Technical Standards – Check all that apply: ☐ Wet Detention Basin ☒ Bio Retention Basin ☐ Swales ☐ Proprietary Devices ☒ Other (specify): Infiltration Basin

Design Requirements: Peak Discharge

YES	NO	N/A	
☐	☐	☐	Storm water Management Facilities to address Peak Discharge are designed according to Chapter 32 of City Code Book and DNR Technical Standards – Check all that apply: ☐ Wet Detention Basin ☒ Bio Retention Basin ☐ Swales ☒ Other (specify): Infiltration Basin
☒	☐	☐	Downstream Capacity for 2-year, 10-year and 100-year, 24-hour Design Storms are met
☐	☐	☒	Calculations of available capacity, proportional share, and proposed utilized capacity under all design storms are included in plan
☒	☐	☐	Calculations of Peak Discharge are included in the plan

Design Requirements: Infiltration			
YES	NO	N/A	
☒	☐	☐	Hydraulic Soil Type: ☐ Soil Type A – Proceed ☐ Soil Type B – Proceed ☐ Exemption or Exclusion – Provide documentation
☒	☐	☐	Low Imperviousness. Ex: low density residential parks, cemeteries Post-Development Infiltration Performance Standards: ☐ Up to 40% Connected Impervious Surface ☒ 90% of Pre-Development Infiltration volume met or 25% post-development volume ☐ 1% of site – Maximum Effective Infiltration Area
☐	☒	☐	Medium Imperviousness. Ex: Medium and high density residential, multi-family,industrial, institutional, office park. Post-Development Infiltration Performance Standards: ☐ 40%-80% Connected Impervious Surface ☐ 75% of Pre-Development Infiltration volume met ☐ 2% of site – Maximum Effective Infiltration Area
☐	☒	☐	High Imperviousness. Ex: commercial strip malls, shopping centers, commercial downtowns Post-Development Infiltration Performance Standards: ☐ Greater than 80% Connected Impervious Surface ☐ 60% of Pre-Development Infiltration volume met ☐ 2% of site – Maximum Effective Infiltration Area
☒	☐	☐	Site has parking lots and new road construction: ☒ Pretreatment included ☒ 10% Infiltration of the runoff from the tow-year, 24-hour design storm with Type II Distribution
☒	☐	☐	Calculations of Infiltration Volumes are included in the plan and model input and output (WinSLAMM)
☐	☐	☒	Exclusions for Infiltration: ☐ Tier 1 Industrial Facility ☐ Storage and Loading Areas of Tier 2 Industrial Facility ☐ Fueling and Vehicle Maintenance Facility ☐ Areas within 1,000 feet up gradient of Karst Features ☐ Areas within 100 feet downgradient of Karst Features ☐ Areas with < 3 feet of separation from bottom of Infiltration System to seasonal high groundwater or top of bedrock (does not prohibit roof runoff) ☐ Areas with runoff from industrial, commercial and institutional parking lots and roads with < 5 feet separation from bottom of infiltration system to elevation of seasonal high groundwater or top of bedrock ☐ Areas within 400 feet of community water system well ☐ Areas within 100 feet of private well ☐ Areas where contaminants of concern (defined by NR720.03(2) are present in the soil through which infiltration will occur) ☐ Area where soil does not meet any of the following characteristics between bottom of infiltration system and seasonal high groundwater and top of bedrock: ☐ *At least 3-foot soil layer with 20% fines or greater* ☐ *At least 5-foot soil layer with 10% fines or greater*

YES	NO	N/A	
☐	☐	☒	Exemptions for Infiltration: ☐ Areas where infiltration rate < 0.6 inches/hour ☐ Parking Areas and Access Roads less than 5,000 square feet for commercial and industrial ☐ Redevelopment Post-Construction Sites ☐ Infill Development < 5 acres ☐ Infiltration during periods when soil on the site is frozen ☐ Roads in commercial, industrial and institutional land uses ☐ Arterial Roads in Residential land uses
☒	☐	☐	Storm water Management Facilities to address Infiltration are designed according to Chapter 32 of the City Code Book and DNR Technical Standards – Check all that apply: ☒ Bio Retention Basin ☒ Infiltration Basin/Rain Garden ☐ Infiltration Trench ☐ Other (specify): _____
☒	☐	☐	Soil and Site Evaluation Report per DNR Technical Standards.
Design Requirements: Protective Areas			
YES	**NO**	**N/A**	
☐	☐	☒	Impervious areas are outside protective area. If not, provide a written explanation.
☐	☐	☒	Land disturbing activities are within a protective area. If **Yes**, check all that apply: ☐ If no impervious area is within protective area, adequate sod or self-sustaining vegetative cover of 70% or greater shall be established. ☐ Adequate sod or self-sustaining vegetative cover is sufficient for bank stability, maintenance of fish habitat and filtering of pollutants from upslope overland flow areas under sheet flow conditions. ☐ Non-Vegetative materials are employed on the bank as necessary to prevent erosion (steep slopes, high velocity areas).
☐	☐	☒	Best Management Practices are located within the protective area – Check all that apply: ☐ Filter Strips ☐ Swales ☐ Wet Detention Basins ☐ Other (specify): _____
☐	☐	☒	Non-Applicable Areas Apply: ☐ Structures that cross or access surface water (boat landing, bridge, culvert) ☐ Structures constructed in accordance with Section 59.692(1v) Wisconsin Statutes: ☐ Post-Construction Runoff does not enter surface water except to the extent that vegetative groundcover necessary for bank stability
Design Requirements: Fuel and Maintenance Facilities			
YES	**NO**	**N/A**	
☐	☐	☒	Are Fuel and Maintenance Facilities on the Site?
☐	☐	☒	Are Best Management Practices designed to reduce petroleum within runoff (no visible sheen)?

Design Requirements: Swale Treatment for Transportation Facilities			
YES	NO	N/A	
☒	☐	☒	Does the site use swales for runoff conveyance and pollutant removal for transportation facilities? If **Yes**, must have the following: *Groundcover:* ☒ Vegetated ☐ Non-Vegetated where appropriate to prevent erosion or provide runoff treatment (riprap, check dams) *Swale Velocity Control:* ☐ Swale is 200 feet or more in length with a velocity no greater than 1.5 feet per second for the two-year, 24-hour design storm or two-year storm with duration equal to time of concentration ☐ Swale is 200 feet or more in length with velocity > 1.5 feet per second then velocity is reduced to maximum extent practicable. Written explanation stating why requirement of > 1.5 feet per second cannot be met
☐	☐	☒	Exemptions Apply: Average Daily Vehicles > 2,500 and initial surface water of the state that runoff directly enters is any of the following: ☐ An outstanding resource of water (ORW) ☐ An exceptional resource water (ERW) ☐ Water is listed in Section 303(d) of the Federal Clean Water Act and is identified as impaired in whole or in part due to non-point source impacts ☐ Water where targeted performance standards are developed under NR 151.004 of the Wisconsin Administrative Code to meet water quality standards
Plan Requirements			
YES	NO	N/A	
☒	☐	☐	Provide permit application form, including contact information (name, address, telephone number) for the landowner, developer, land operator, certified project engineering, responsible party for installation of storm water management practices, responsible party for long-term maintenance of the storm water management practices.
☒	☐	☐	Legal Description of proposed development. On Maint. Agreement
☒	☐	☐	Narrative describing the proposed development.
☒	☐	☐	Brief summary of Design Criteria and methods used for development of Storm Water Management Practices.
☒	☐	☐	Storm Water Management Maintenance Agreement shall be included with the Storm Water Management Plan (see Storm Water Management Maintenance Agreement template for additional information required). To be placed separately
☒	☐	☐	Certification by a Wisconsin registered professional engineer.
☐	☐	☐	Financial Guarantee.

Description and Site Characteristics for Pre/Post Development conditions shall be delineated by one (1) or more site maps at a scale of not less than one (1") inch equals two hundred (200') feet. The map(s) shall include, at minimum, the following information:			
YES	**NO**	**N/A**	
☒	☐	☐	Site Location and Legal Description.
☒	☐	☐	Pre-developed and revised topography by contours related to USGS survey datum or other datum approved by City. The topographic contours of the site shall not exceed 2 feet. The topography shall extend at minimum 100 feet outside the site boundaries to show runoff patterns onto, through and from the site.
☐	☐	☒	One hundred (100) year Floodplain boundary, shore land, environmental corridors, and wetland boundaries shall be delineated if applicable
☐	☐	☒	All lakes, streams, and other water bodies illustrated on map shall be named as defined on a USGS 7.5 minute topographic map.
☒	☐	☐	Predominant Soil Types and Hydraulic Soil Group Classifications.
☐	☒	☐	State Plane coordinates of all manhole and inlets with reference to two nearest reference point monuments which shall be Section or ¼ Section corners.
☒	☐	☐	Location, capacity, and dimensions/details of on-site Pre-developed and Post-developed storm water management facilities such as, but not limited to, the following: manholes, pipes, curbs, gutters, curb inlets, filter strips, swales, detention basins, curb cuts, and drainage gates.
☒	☐	☐	Location, extent, detailed drawings, typical cross sections and slope ratios of all pre-developed and post-developed storm water retention and detention areas and drainage ways – list inlet/outlet elevations, permanent water surface elevation, high water surface elevation, and emergency spillway elevation, if applicable.
☒	☐	☐	Location and Elevations at top and bottom of pre-developed and post-developed buildings and structures.
☒	☐	☐	Locations and names of pre-developed and post-developed streets and intersections and the location of parking lots, sidewalks, bike paths and impervious surfaces (excluding single family residences). Map(s) shall clearly differentiate pre-developed and post-developed surfaces.
☒	☐	☐	Delineation and dimensions of all pre-developed and post-developed property boundaries, easements, right-of-way, building setbacks, maintenance easements, and other restrictions.
☒	☐	☐	Pre-developed and post-developed land use boundaries, including cover type and condition.
☒	☐	☐	Post-developed land use cover totals for Impervious and Pervious areas as well as permanent water surface area of all storm water management facilities.
☒	☐	☐	Delineation of pre-developed and post-developed watershed and sub-watershed boundaries used in determination of Peak flow discharges and discharge volumes from the site. (If the watershed extends beyond the site boundaries, a separate watershed map can be supplied).
☒	☐	☐	Location of the pre-developed and post-developed discharge points.
☒	☐	☐	Pre/Post developed directional Flow Paths used to calculate existing/proposed time of concentrations.
☒	☐	☐	Location of the Emergency Overland Flow.
☐	☐	☒	Location of any Regional Treatment Options (if applicable).
☒	☐	☐	Identify all pre-developed land cover features, such as, natural swales, natural depressions, native soil infiltrating capacity and natural groundwater recharge areas.
☐	☐	☒	Location of any protective areas within the site.
☐	☐	☒	Location of wells located within 1,200 feet of pre-developed and post-developed Storm Water Detention Basins, Infiltration Basins, or Infiltration Trenches.
☐	☐	☒	Delineation of Wellhead protection areas defined under NR 811.16

Supportive Information and Calculation summaries shall be supplied for all storm water management requirements as dictated in the checklist under Design Requirements:			
YES	**NO**	**N/A**	
☒	☐	☐	Pre-developed and post-developed watershed, sub-watersheds, and land use areas (acres, watershed shall be delineated by property lines).
☒	☐	☐	Pre-developed and post-developed impervious areas (acres).
☒	☐	☐	Pre-developed and post-developed Runoff Curve Numbers.
☒	☐	☐	Pre-developed and post-developed Time of Concentration.
☒	☐	☐	Pre-developed and post-developed peak flows for the 2-year, 10-year and 100-year, 24-hour storm events for each discharge point.
☒	☐	☐	Total suspended solids removal computations to show compliance.
☒	☐	☐	Design computations for the runoff volume of the pre-developed and post-developed conditions to show compliance with the infiltration requirements.
☒	☐	☐	Design computations for all storm water drainage facilities such as, but not limited to, inflow/outflow rates, hydrographs, water surface elevations, outlet design computations, runoff discharge volume, velocities, and stage/storage data.
☒	☐	☐	Design computations for the 10-year Rational Method flows for all proposed storm conveyance systems.
☐	☒	☐	Computation of the available downstream capacity flowing full, overflow level of ditches and the top of the upstream end of the pipe for any culverts.
☐	☒	☐	Computation of the downstream capacity using the 5-year rational storm.
☐	☒	☐	Tail water analysis included in storm water design for 2-year, 10-year and 100-year storm events.
☒	☐	☐	Design computations to illustrate compliance with pollutant loading criteria (Storm Water Quality Management practices) with pre- and post-storm water management facilities.
☒	☐	☐	Narrative describing all assumptions that were deemed appropriate for design.
☐	☐	☒	Explanation of provisions to preserve and use natural topography and land cover features.
☐	☐	☒	Explanation of restrictions on Storm Water Management practices by wellhead protection plans (if applicable).
☒	☐	☐	Results of investigations of soil and groundwater required for installation of Storm Water Management practices.
☐	☐	☒	Impact assessment results on Wetland Functional Values (if applicable).
☒	☐	☐	Storm Water Management practices installation schedule.
☐	☒	☐	Cost estimate for the construction, operation and maintenance of each Storm Water Management practice.
☒	☐	☐	Any additional information that the City, or designee, may need to evaluate the impacts of the storm water discharge quality and quantity on the existing area and existing utilities.