

Public Works Department
201 E. Main St.
Waupun, WI 53963
(920) 324-7918

City of Waupun



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1 STORM WATER MANAGEMENT PERMIT INFORMATION

- ✍ Pre-application meeting with Public Works Director and Consulting Engineer to discuss project and unique site conditions. This can also be used to run preliminary storm water management ideas past us.
- ✍ Please direct any questions regarding the ordinance and/or standards to the Public Works Director or Consulting Engineer.
- ✍ Submit Storm Water Management Permit Application and first submittal of plans and/or calculations to City.
- ✍ Respond to comments from engineering department.
- ✍ The City shall have 30 business days to review the first full submittal.
- ✍ The City shall have 15 business days to review any additional submittals.
- ✍ Most projects will require a short-term maintenance and monitoring agreement to be signed and submitted to cover maintenance during the construction phase. This document is drafted by the City, but shall be open to comment and revision from the owner and/or the owner's engineer.
- ✍ After all comments have been addressed and the short-term and long-term agreements are on file with the City, and an infiltration test has been conducted, approval of plans and calculations will be granted. The Public Works Director will sign the permit application and a copy will be mailed to owner. Permit is valid for 180 days from date of issuance unless extended by Public Works Director or property passes final inspection.
- ✍ Ground breaking may commence only once the Storm Water Management Permit is signed. Permit holder shall notify the City at least 5 business days before commencing any work. A copy of the storm water plan shall be available on the job site at all times.
- ✍ Permit holder shall notify the City of any significant modifications it intends to make to an approved storm water plan.
- ✍ Permittee shall inspect all BMP's within 24 hours of any rain event of 0.5 inches or more, and at least once a week. Written records shall be kept of these inspections.
- ✍ Private systems are generally systems that are designed and built to serve only one property. Privately maintained systems will require a long-term storm water management agreement to be signed and filed with the county. Owner must provide proper legal description of property for recording purposes. The City will then draft the document to be signed and notarized by the owner. Once signed and notarized, return to the City to be recorded with the county.
- ✍ Close out of projects:
 - ✍ If the systems will be publicly maintained, systems must pass City inspection and be functioning as designed. Please reference our infiltration acceptance procedures.
 - ✍ If the systems will be privately maintained, a certified as-built and/or certification by an engineer registered in the state of WI must be submitted to the City within 6 months of completion of the project. Certification may be simply a memo indicating that systems were constructed per plans (with date given), no changes were made to the plans, and the system should function as intended, etc.

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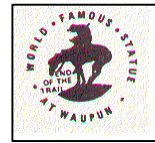


2 SUBMITTAL CHECKLIST

Project Name	Engineering Contact Name

	Submitted
Storm Water Management Permit Application	_____
Full Plan Set:	
Pre-development plan	_____
Post-development plan	_____
Grading and drainage plan	_____
Erosion control plan	_____
Storm sewer system	_____
Full Drainage Report (Please submit Drainage Report in this order):	
Project summary sheet, Submittal checklist, Plan sheet checklist,	
General design requirements checklist	_____
Any pertinent notes or schematics	_____
Pre-developed hydrographs	_____
Post-developed hydrographs	_____
Construction phase hydrographs as applicable	_____
Wet pond summary sheets and reservoir reports	_____
Outlet structure reports (and details if not in plans)	_____
Water quality analysis (P8)	_____
Infiltration summary sheets and infiltration calculations	_____
Any offsite analysis (hydrographs, maps, outlets, etc)	_____
Storm sewer analysis	_____
Soil borings and infiltration test results (with mapped locations)	_____
Soils Map	_____
Plan view of storm sewer (if not in plan set)	_____
Pre and post-developed plan view of drainage areas	_____
Storm sewershed map	_____
Flow path used to calculate time of concentration	_____
Signed short-term maintenance and monitoring agreement*	_____
Signed long-term maintenance and monitoring agreement*	_____

*City will draft the maintenance and monitoring agreement



3 PROJECT SUMMARY SHEET

Project Name	Engineering Contact Name

**If additional space is required for any of these parameters, please attach another page.
 Brief description of project and storm water practices utilized:

Please list all locations water is currently leaving the site:

Location 1: _____
 Location 2: _____
 Location 3: _____
 Location 4: _____

Please provide rate control summaries in the tables provided for each location water is leaving the site.

Location 1	2-year (cfs)	10-year (cfs)	100-year (cfs)
Pre-Developed			
Post-Developed Un-routed			
Post-Developed Routed			

Location 2	2-year (cfs)	10-year (cfs)	100-year (cfs)
Pre-Developed			
Post-Developed Un-routed			
Post-Developed Routed			

Location 3	2-year (cfs)	10-year (cfs)	100-year (cfs)
Pre-Developed			
Post-Developed Un-routed			
Post-Developed Routed			

Location 4	2-year (cfs)	10-year (cfs)	100-year (cfs)
Pre-Developed			
Post-Developed Un-routed			
Post-Developed Routed			

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Schedule and Sequencing: Include a description of the intended sequence of major activities that disturb soils for major portions of the site, such as grubbing, excavating or grading. Also describe any staging of land disturbing construction activities to limit exposed soil areas subject to erosion. Include anticipated starting and completion dates of each sequence of land disturbing activities and the anticipated date of completion of erosion runoff control measures and establishment of final cover for each sequence area.

Descriptions of any interim and permanent stabilization practices. Also include descriptions of any structural practices to divert flow away from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from the construction site:

Any major assumptions used in the design or developing input parameters for the hydrology model:



4 PLAN SHEET CHECKLIST

Project Name	Engineering Contact Name

Pre-Development Plan Sheet(s)

- ✍ 1"=100' or larger scale
- ✍ Existing 2-foot contours
- ✍ Property lines and easements
- ✍ Existing structures, roads, other paving or impervious cover and vegetative cover
- ✍ Existing topography of site and sufficient adjacent lands to indicate site location and existing drainage patterns, water courses, pipes or structures that may affect or be affected by the proposed development
- ✍ Limits of any natural wetland and/or floodplain based on a 100-year flood
- ✍ Existing public and private utilities are shown.

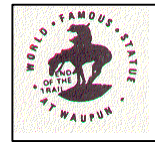
Post-Development Plan Sheet(s)

- ✍ 1"=100' or larger scale
- ✍ Final proposed topography of the site at a contour interval not greater than 2 feet.
- ✍ Any changes to lakes, streams, wetlands, channels, ditches, and other watercourses on and immediately adjacent to the site are shown.
- ✍ Locations of easements.
- ✍ Limits of any natural wetland and/or floodplain based on a 100-year flood.
- ✍ Location, elevations and dimensions of proposed structures and paved areas.
- ✍ Location and types of utilities to be installed.

Erosion Control Plan Sheet(s)

- ✍ 1"=100' or larger scale
- ✍ Existing and proposed contours
- ✍ Location and sediment controls for temporary stockpile areas are shown.
- ✍ Areas to be sodded or seeded and mulched or otherwise stabilized with vegetation or other permeable/protective cover, describing type of final vegetative cover. Type and quantity of mulch or cover material and method of anchoring shall be indicated, as well as seeding mixtures & rates and lime & fertilizer application rates.
- ✍ Shown location of all BMP's
- ✍ Drainage ways are stabilized
- ✍ Stabilized vehicle exits are provided where construction equipment will exit the site.
- ✍ Velocity dissipation devices at discharge locations and the length of any outfall channel.
- ✍ Temporary and permanent erosion control measures are provided and located.
- ✍ Storm inlets protected from receiving sediment.
- ✍ Smallest area disturbed at any given time.
- ✍ Applicable notes on plan sheet regarding erosion control (please request "City of River Falls Standard Notes for Grading and Erosion Control Plans" if needed).
- ✍ Disturbed slopes in excess of 4:1 are seeded and protected erosion blankets or are sodded and staked.
- ✍ Silt fence shall be installed in accordance with standard details.
- ✍ Silt fences are provided to protect adjacent property from receiving untreated runoff.

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- ✍ Water bodies and watercourses are protected from receiving untreated runoff.
- ✍ Silt fences follow contour lines with ends flared uphill to provide storage capacity.
- ✍ Silt fences are used in sheet flow areas only, not for concentrated flows.
- ✍ Flow length up slope from silt fence shall be limited as follows:
 - ? 600' max for slopes less than 3%.
 - ? 300' max. for slopes 3% to 6%.
 - ? 150' max. for slopes greater than 6%

Grading/Drainage Plan Sheet(s)

- ✍ 1"=50' or larger scale
- ✍ 2-foot contours (1-foot contours in the pond areas)
- ✍ Contours for existing topography are dashed and proposed are solid. Contours are labeled.
- ✍ North arrow shown (up or to left)
- ✍ Property limits shown
- ✍ Park and wetland areas are shown
- ✍ Existing wells and drain fields are shown
- ✍ Emergency overflows labeled
- ✍ Groundwater elevations shown (or accounted for in notes section)
- ✍ Bottom, normal water level and high water level elevations are shown.
- ✍ Flow path and direction for all storm water conveyance sections
- ✍ Location, dimensions and description of all channels, pipes, structures, basins, reservoirs or other conveyances proposed to carry runoff to the nearest adequate outlet.
- ✍ The minimum building opening elevation is shown and complies with the following:
 - ? 2 feet above the 100-year design storm elevation.
 - ? At least one foot above the emergency overflow
 - ? At least 4 feet above the groundwater table
- ✍ Each lot shall have:
 - ? Proposed elevation of garage floor
 - ? Lowest opening elevation
 - ? Ground elevation at front of building.
 - ? Ground elevation at rear of building.
 - ? Proposed structure type (STD or S, SWO or LO, WO).
 - ? Proposed lot corner elevations.
- ✍ High points and low points labeled as needed
- ✍ Drainage directional arrows are shown
- ✍ Percent of grade is shown for all drainage swales
- ✍ Drainage flows over only one adjacent lot before proper discharge
- ✍ All rear and side yard swales shall be centered on property lines
- ✍ Drainage flows away from structures
- ✍ Minimum lot grades are 1% wherever drainage from only one lot exists
- ✍ Any retaining walls are shown
- ✍ Plan accommodates offsite drainage
- ✍ Plan matches existing grades at the development property lines with a slope not to exceed 3:1 within 10 feet of the property line.
- ✍ 15' wide access and turn-around area for maintenance vehicles is shown on a slope no greater than 15%. Access shall encircle the pond above the 100-year high water elevation for the pond.



5 GENERAL DESIGN REQUIREMENTS CHECKLIST

<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Project Name</td> <td style="width: 50%;">Engineering Contact Name</td> </tr> </table>	Project Name	Engineering Contact Name
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Drainage Easements

- ☞ Provided for all private storm water rate control facilities
- ☞ Provided where concentrated flow from more than 1 adjacent lot is received
- ☞ Provided where emergency overland overflow location associated with:
 - ? Catch basins in sag vertical curves
 - ? Detention and retention ponds
 - ? Anywhere the storm sewer system cannot handle a 100-year event
- ☞ ? Minimum drainage easement widths shall be as follows:
 - ? 15' wide for flows from 1 acre or less, or 4 lots or less
 - ? 20' wide for flows from more than 1 acre or more than 4 lots
 - ? Three times the combination of pipe diameter plus bury depth or 20', whichever is greater, for all other buried pipes.
- ☞ All easements shall be seeded and protected
- ☞ All easements are shown on grading plan

Swales

- ☞ Channelized storm runoff in excess of 0.5cfs discharges into a catch basin or inlet before crossing a sidewalk or curb.
- ☞ Swales are seeded and protected with wood fiber blankets or are sodded and staked where concentrated flow from more than 1 acre or 4 lots is directed.
- ☞ Velocity computations are provided for drainage swales where concentrated flow from more than 2 acres or 8 lots.
- ☞ Permanent turf reinforcement mats are installed in drainage swales where design velocities exceed 7fps.
- ☞ Minimum swale cross section for flows from 1 acre or less or 4 lots or less are a V-shaped ditch, 1.9' deep with 4:1 side slopes up to a 15' easement line
- ☞ Minimum swale cross section for flow from more than 1 acre or more than 4 lots shall be a ditch, 2' deep with a 4' bottom and 4:1 side slopes up to a 20' easement line.
- ☞ All public drainage rear yard swales and roadside ditches shall have a min. 1% grade.
- ☞ Rear and side yard swales centered on property lines.

Permanent Ponds

- ☞ Public pond areas are platted as outlots, Private pond areas are platted as drainage easements.
- ☞ 80% sediment removal for new development and 40% sediment removal for redevelopment.
- ☞ Not located within wellhead protection area.
- ☞ Emergency overflow spillway is provided to accommodate events greater than the 100-year event. High point elevation and direction of overflow are marked on plans.
- ☞ One foot of freeboard shall be provided above the emergency overflow.
- ☞ Access bench shall be no further than 20 feet horizontally from the normal water level.
- ☞ Inlet(s) and outlet have energy dissipation devices.

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- ✍ 4:1 side slopes maximum above the normal water level.
- ✍ Storage below outlet for sediment accumulation.
- ✍ Inlet(s) and outlet are located at opposite ends to prevent short-circuiting of pond.
- ✍ Mean pond depth (volume/surface area) is 4 feet or greater, excluding safety bench.
- ✍ Maximum pond depth based on normal water level is 10 feet or less.
- ✍ Ponds greater than 20,000sf, 50% of surface area shall be a minimum of 5 feet deep.
- ✍ 10:1 slope starting at the pond's normal water level and extending 15 feet from shore, 3:1 max slope there after.
- ✍ Length to width ratio of pond is 3 or greater.
- ✍ Control outlet is provided with skimmer to prevent plugging from floating debris
- ✍ Trash racks installed as needed
- ✍ No utility lines located within basin area
- ✍ No utility boxes located in access road to pond.

Infiltration Ponds

- ✍ Pretreatment is provided for parking lot and new road construction runoff
- ✍ 3 feet separation distance from groundwater
- ✍ Half of measured infiltration rate is used as design infiltration rate
- ✍ Design infiltration 0.5-5.0 in/hr, verified with 3 double ring infiltrometer tests
- ✍ Pond has maintenance draw down device
- ✍ 100 foot private well setback; 1,200 ft public well setback
- ✍ 200 foot setback from 20% slopes (2 feet elevation change in 10 feet)
- ✍ Erosion protection provided at inlet
- ✍ Drainage area is less than 50 acres for each pond
- ✍ Maximum depth is 4 feet
- ✍ Flat bottom with 4:1 side slopes, longitudinal slope 1% max, lateral slopes 0%
- ✍ Pond designed to infiltrate in less than 48 hours, based on the design infiltration rate
- ✍ Not located in floodplain
- ✍ 1 foot of freeboard is provided above the emergency overflow

Infiltration Trenches

- ✍ Depth is not greater than width
- ✍ Filter fabric shall surround trench
- ✍ 3 feet separation distance from groundwater (5 feet in industrial and commercial areas)
- ✍ At least 10 feet down slope and 100 feet up-slope of building foundations.
- ✍ Infiltration rate 0.5-5.0 in/hr
- ✍ Location, surface area, depth, soil types and infiltration rate and volume comps are included.
- ✍ Pretreatment is provided for parking lot and new road construction runoff prior to infiltration.
- ✍ Half of measured infiltration rate is used as design infiltration rate
- ✍ Observation wells provided
- ✍ Emergency overflow provided



Minor Systems (Storm Sewer, Ditches, Culverts)

- ✍ Local systems provide for containment of flows from 10-year event within parking lanes of roadway without overtopping the curb
- ✍ Drainage report indicates inlet capacity of each CB and how much flow by passes the CB. When a system has reached its capacity and a 24-hour, 100-year storm event occurs, the maximum allowable ponding shall be:
 - ? 18" in a rear yard
 - ? 9" in a parking lot
 - ? 12" in a street or gutter
- ✍ Path for overflows from 100-year event is evaluated to ensure no structural damage will occur as a result of street low-point flooding
- ✍ Open channels shall carry 10-year event within channel and 100-year event in right-of-way.
- ✍ Emergency overflows provided. Overflow should be at least one foot below the lowest opening elevation.
- ✍ Emergency overflows are analyzed for the 100-year storm as part of the design of the structure.
- ✍ Anti-seepage collars used where necessary.

Storm Sewer

- ✍ Storm sewers are reinforced concrete pipe or dual wall HDPE
- ✍ Minimum cover for storm sewer:
 - ? 2' in non-pavement areas
 - ? 1' in paved areas and for laterals
- ✍ Catch basins within the curb areas of City streets have 2'x3' grates and curb inlets (Neenah R-3067)
- ✍ Drainage does not cross intersections in 10-yr event (no valley gutters).
- ✍ Mid-block CB's on property lines.
- ✍ CB's are not in the curb return at intersections.
- ✍ CB's spaced 600' max. on collectors & arterials.
- ✍ CB's spaced 800' max. on residential streets.
- ✍ Minimum catch basin depth shall be 3' (measured from pavement to invert)
- ✍ All Manholes are precast reinforced concrete with offset cone tops.
- ✍ 400' max. MH spacing for lines 15" diameter or less.
- ✍ 500' max. MH spacing for lines 18" to 30" diameter
- ✍ MH's provided at change in direction or grade.
- ✍ Storm sewer pipe materials only change at MH or CB
- ✍ Buried "T" connections allowed where:
 - ? The main is at least 2x the diameter of the lateral
 - ? Length of lateral measured from the "T" to the next structure is not greater than 100'
- ✍ Any outfall storm sewer draining into an existing open ditch or watercourse has a reinforced concrete head wall or end section.
- ✍ Pipes larger than 15" diameter, discharge flow direction shall be at 45 degrees or less to the flow direction of the receiving ditch or stream.
- ✍ Discharge shall be taken to rear property lines at a minimum.

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6 WET POND SUMMARY SHEET

Project Name	Engineering Contact Name

Pond ID: _____

Design Information

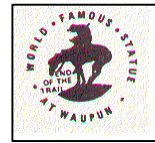
Normal Water Elevation _____ ft
High Water Elevation for 100-yr Event _____ ft
Bottom Elevation _____ ft
Surface Area for:
 100-year, 24-hour event _____ sf
 Normal water elevation _____ sf
Volume of Pond for:
 100-year, 24-hour event _____ ac-ft
 Normal water elevation _____ ac-ft
Overflow Elevation _____ ft
Minimum Building Elevation _____ ft
Total Suspended Solids Removal _____ %
 If TSS removal is less than 80% for this device, please explain: _____

Downstream

Downstream Major Water Body _____

Description of where water travels from the pond to the downstream major water body: _____

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7 INFILTRATION SUMMARY SHEET

Project Name	Engineering Contact Name

Facility ID: _____

Soil and Site Investigation

Soil type(s) and location on site:

Design infiltration rate (between 0.5-2.5 in/hr) _____ in/hr

Note: Shall be 1/2 of measured dual ring infiltrometer tests (minimum of three tests per infiltration area)

Distance from bottom to bedrock (3ft min) _____ ft

Distance from bottom to seasonal high groundwater (3ft min) _____ ft

Floodplain area Y / N

Wellhead Protection Involved Y / N

Design Information

Volume required (using TR-55, post minus pre) _____ ac-ft

Note: Connected impervious shall be modeled in a separate subcatchment from the remaining area

Volume provided below outlet or overflow _____ ac-ft

Time required to completely infiltrate stored water (48 hrs max) _____ hrs

Bottom area _____ sf

Bottom elevation _____ ft

Emergency overflow elevation _____ ft

Top of berm elevation _____ ft

Device(s) providing tretreatment: _____

**Please provide calculations and/or supporting information for all information provided on this page. e.g. soilborings, soils map, dual ring infiltrometer test results and locations, volume computations, etc.