Kaukauna ON THE FOX

CITY OF KAUKAUNA

STORMWATER REFERENCE GUIDE

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ADAPTED FOR:
CITY OF KAUKAUNA

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EXECUTIVE SUMMARY

The City of Kaukauna Stormwater Reference Guide (Reference Guide) has been created to act as a companion to the City of Kaukauna Model Construction Site Erosion Control Ordinance (Ordinance). The Ordinance cites the Reference Guide as the resource for details that were omitted from the model Ordinance due to the potential for variations in each municipality's permitting process and level of expertise in regard to the Ordinance. Items in the Reference Guide can be changed without the public hearing process, as the changes are typically administrative and/or technical and do not affect the Ordinance's intent and requirements. The Reference Guide is organized similar to the Construction Site Erosion Control Ordinance for ease of relating the comments in the Reference Guide to the appropriate sections in the Ordinance.

Construction Site Erosion Control Ordinance					
Site	Requirements [a]				
	Sediment (TSS)	Prevent Tracking	Perform De-Watering	Protect Storm Drain Inlets	Manage Building Materials
Less than 1 Acre	No Numeric Standard [b]	Yes	Yes	Yes	Yes
1 Acre or More	80%	Yes	Yes	Yes	Yes

[a] Summary of Section S.07 Performance Standards of the Construction Site Erosion Control Zoning Ordinance. See Ordinance and this Reference Guide for specific requirements, exemptions and prohibitions.

[b] Construction sites regulated by the Wisconsin Department of Commerce are required to achieve a 40% sediment reduction for sites with less than 1 acre of land disturbance. See COMM 60.20(3)(c) and COMM 21.125(3)(c) for specific requirements. The local municipality may also be acting as an agent of the Department of Commerce.

S.01 AUTHORITY

S.02 FINDINGS OF FACT

S.03 PURPOSE

S.04 APPLICABILITY AND JURISDICTION

(1) APPLICABILITY

(2) JURISDICTION

(3) EXCLUSIONS

The Wisconsin Department of Transportation (WisDOT) has entered into a memorandum of understanding with the Wisconsin Department of Natural Resources that satisfies s. 281.33 (2), Wis. Stats., such that activities directed and supervised by WisDOT are exempt from this Ordinance.

Activities directed and supervised by the local municipality are covered by this Ordinance.

S.05 DEFINITIONS

S.06 TECHNICAL STANDARDS

(1) DESIGN CRITERIA, STANDARDS AND SPECIFICATIONS

Below is a list of Technical Standards and Guidance Documents that shall be used to satisfy Performance Standards contained in the ordinance. Technical Standards specify the minimum criteria for a best management practice (BMP). Guidance Documents contain recommendations and additional "how to" guidance. Performance Standards take precedence over Technical Standards and Technical Standards take precedence over Guidance Documents.

(a) **Technical Standards**: The following are applicable Wisconsin Department of Natural Resources (DNR) Conservation Practice Standards or Technical Standards:

- 1050 Land Application of Anionic Polyacrylamide
- 1051 Interim Sediment Controls: Water Application of Polymers
- 1052 Non-Channel Erosion Mat
- 1053 Channel Erosion Mat
- 1054 Vegetative Buffer for Construction Sites
- 1055 Sediment Bale Barrier (Non-Channel)
- 1056 Silt Fence
- 1057 Stone Tracking Pad and Tire Washing
- 1058 Mulching for Construction Sites
- 1059 Seeding for Construction Site Erosion Control
- 1060 Storm Drain Inlet Protection for Construction Sites
- 1061 De-watering

- 1062 Ditch Check (Channel)
- 1063 Sediment Trap
- 1064 Sediment Basin
- 1065 Rip-rap / Stabilized Outlet (pending completion)
- 1066 Construction Site Diversion
- 1067 Temporary Grading Practices for Erosion Control
- 1068 Dust Control on Construction Sites
- 1069 Turbidity Barrier
- 1070 Silt Curtain

These standards may be found on the DNR website at http://dnr.wi.gov/org/water/wm/nps/stormwater/techstds.htm

(b) **Local Modifications to Technical Standards:** The following are local requirements which are intended to supplement, clarify, or supersede DNR Technical Standards.

(c) **Guidance Documents**: The following are the applicable Guidance Documents:

- Guidance for the Establishment of Protective Areas for Wetlands
- "Construction Site" Definition – "Common Plan of Development"
- Applicability of NR216 Subchapter III to Mill and Crush Operations
- Meeting New State Standards: Construction Erosion Control Workshops http://dnr.wi.gov/org/water/wm/nps/stormwater/constr_workshops
- Estimating Residue Using the Line Transect Method (UW-Extension A3533).
- Wisconsin Department of Transportation - Erosion Control Product Acceptability Lists (PAL) for Multi-Modal Applications
- Wisconsin Department of Transportation - Facilities Development Manual
- Wisconsin DOT Standard Specifications for Highway and Structure Construction
- Other National Publications

(2) OTHER STANDARDS

S.07 PERFORMANCE STANDARDS

(1) RESPONSIBLE PARTY

(2) PLAN

(3) REQUIREMENTS

(a) TOTAL SUSPENDED SOLIDS

Construction sites with 1 acre or more of land disturbance are required to meet the ordinance's numeric performance standards.

Construction sites with less than 1 acre of land disturbance are required to achieve a 40% sediment reduction if the construction site is regulated by the Wisconsin Department of Commerce. See COMM 60.20(3)(c) and COMM 21.125(3)(c) for specific requirements. All other construction sites with less than 1 acre of land disturbance are not required to meet the ordinance's numeric performance standards. BMP design guidance is provided below in Section (b) for sites with less than 1 acre of land disturbance.

Computer Models:

The Wisconsin Department of Natural Resources (DNR) is working with the EPA, NRCS, and several other states to develop a Windows version of RUSLE2 for construction site erosion control. Until this software is available for statewide use, BMPs shall be designed using the Technical Standards listed in S.06. The Wisconsin Department of Commerce (COMM) is using the RUSLE2 spreadsheet developed by Dane County until the new RUSLE2 software is available. Use of the spreadsheet is not required by COMM, but is encouraged (http://commerce.wi.gov/sb/SB-SoilErosionControlProgram.html).

Design Clarifications:

Erosion Control Practices- Erosion control practices are used to prevent sediment particles from becoming dislodged and suspended in runoff. Erosion control practices include land application of polyacrylamide, mulching, seeding, and erosion mats. Grading practices can be used to supplement these practices.

Sediment Control Practices- Sediment control practices are used to remove sediment particles that are suspended in runoff and being transported. Sediment control practices used for sheet flow conditions include vegetative buffers, sediment bale barriers (non-channel), and silt fence. Sediment control practices used for concentrated flow conditions include storm drain inlet protection (< 1 acre), ditch checks (< 1 acre), sediment traps (< 5 acres), sediment basins (< 100 acres), and polymers. Sediment control practices used for lakes, rivers, and streams include turbidity barriers and silt curtains.

Construction Site Diversions- Construction site diversions are used to divert clear-water runoff away from disturbed areas. Construction site diversions are also designed to convey sediment-laden runoff from disturbed areas to sediment control practices such as ditch checks, sediment traps, and sediment basins.

Dust Control Practices- Dust control practices are used to prevent wind erosion.

Dewatering- Dewatering practices are used to remove sediment from ponding surface water or groundwater. A DNR permit is required for pumping 70 gpm or more (http://dnr.wi.gov/org/water/dwg/hicap.html). The discharge must be sampled in accordance with DNR requirements.

Non-Erosive Flows- Velocity dissipation devices shall be placed at outfall locations and along the length of any channel, as necessary, to provide a non-erosive flow so that the natural, physical, and biological characteristics and functions are maintained and protected. Velocity dissipation devices could include erosion mat (channel), rip-rap, drop structures, stilling basins, and other energy dissipation devices.

Maximum Permissible Velocities for Channels			
Channel Cover	Slope Range %	Erosion-resistant soils	Easily eroded soils
Bare Soil	0-5	3-6 fps*	1.5-2 fps*
	Do not use on slopes steeper than 5%, except for side slopes in a combination channel.		
Bermuda Grass	0-5	8 fps	6 fps
	5-10	7 fps	5 fps
	>10	6 fps	4 fps
Buffalo grass, Kentucky bluegrass, Smooth brome, blue grama	0-5	7 fps	5 fps
	5-10	6 fps	4 fps
	>10	5 fps	3 fps
Grass mixture	0-5	5 fps	4 fps
	5-10	4 fps	3 fps
	Do not use on slopes steeper than 10%, except for side slopes in a combination channel.		
Lespedeza sericea, weeping love grass Ischaemum (yellow bluestem), kudzu, alfalfa, crabgrass	0-5	3.5 fps	2.5 fps
	Do not use on slopes steeper than 5%, except for side slopes in a combination channel.		
Annuals – used on mild slopes or as temporary protection until permanent covers are established, common lespedeza, Sudan grass	0-5	3.5 fps	2.5 fps
	Use on slopes steeper than 5% is not recommended		

* Maximum permissible velocities depend on specific soil properties and shear stress. Typically, the maximum velocity for sand = 1.5 fps, silt and loam = 1.7 to 2.5 fps, fine gravel = 2.5 fps, clay = 3.7 fps, coarse gravel = 4.0 fps, cobbles = 3.7 to 5.0 fps, and shale / hard pan = 6.0 fps.
Source – Chow Open Channel Hydraulics & Civil Engineering Reference Manual for the PE Exam, Ninth Edition

Materials- No sediment or solid materials, including building materials, may be discharged in violation of the following federal, state, and local regulations:

- Navigation, Dams, & Bridges (Chapter 30 and 31, Stats.)
- Wetland Water Quality Standards (NR 103)
- Wetlands (US Army Corps of Engineers Section 404 regulations)
- Shoreland Management (NR 115, NR 117, & local regulations)
- Floodplain Management (NR 116 & local regulations).

Wetland Delineations- Wetland delineations shall be performed by a professional soil scientist, professional hydrologist, or other qualified individual approved by the administering authority. The individual performing the delineation shall classify the wetland as a less susceptible wetland, highly susceptible wetland, exceptional resource water, or outstanding resource water.

Protective Areas- Protective areas may be disturbed as part of a construction project, if necessary. Disturbed areas must be stabilized from erosion and restored with a self-sustaining vegetation. Best Management Practices (ponds, swales, etc.) may be located in protective areas.

Type of Vegetation- It is recommended that seeding of non-invasive vegetative cover be used in the protective areas. Vegetation that is flood and drought

tolerant and can provide long-term bank stability because of an extensive root system is preferable. Vegetative cover can be measured using the line transect method described in the University of Wisconsin Extension publication number A3533, titled "Estimating Residue Using the Line Transect Method".

Adjacent Property Owners- If a stream or channel is permanently placed or relocated along a property line, an easement or letter of permission is required from any property owners impacted by the protective area's new location. Also, if a stormwater facility or structure is proposed within an onsite stream or channel, 100-year flood elevations shall be evaluated to determine if offsite property owners are impacted by backwater or a flood elevation increase. An easement or letter of permission is required from any property owners impacted by backwater. Changes to a stream, wetland, or channel should be discussed during the pre-design meeting. Changes to a navigable stream, wetland or other waters of the state will require permits from the DNR, Army Corps of Engineers, and local municipality.

Agricultural Activity Areas- Agricultural Activity Areas (i.e. farm fields and other cropland areas) are exempt from the ordinance.

Agricultural Production Areas- Agricultural Production Areas (i.e. farm buildings, structures, and other impervious surfaces) are exempt if the disturbed area is less than 1 acre. Sites where the land disturbance is one acre or more shall meet the requirements of this ordinance. Sites where the disturbance is less than one acre shall have a drainage plan prepared that is appropriate for the site. The County Land Conservation Department (LCD) may be available to prepare Erosion & Sediment Control Plans for farm structures and disturbances in the non-cropland areas. Construction of farm structures and disturbances in non-cropland areas one acre or greater must also be covered by an NR 216 permit.

(b) SITES WITH LESS THAN 1 ACRE OF LAND DISTURBANCE

Pursuant to S.07(5) of the ordinance, the municipality may establish erosion control requirements more stringent than those set forth in this section if the municipality determines than an added level of protection is needed.

Design Clarifications:

For a construction site with less than 1 acre of land disturbance, the applicant shall install best management practices to prevent or reduce all of the following:

1. Tracking of sediment onto streets by vehicles.
2. Discharge of sediment into stormwater inlets.
3. Discharge of sediment into abutting waters of the state.
4. Discharge of sediment from drainage ways that flow off the site.
5. Discharge of sediment by de-watering activities.
6. Discharge of sediment from soil stockpiles existing for more than 7 days.
7. Properly use, store and dispose of building materials, chemicals, cement, concrete truck washout, litter, sanitary waste, and other compounds and materials used on the construction site.
8. Construction sites also regulated by the Wisconsin Department of Commerce are required to achieve a 40% sediment reduction for sites with less than 1

acre of land disturbance. See COMM 60.20(3)(c) and COMM 21.125(3)(c) for specific requirements.

(4) LOCATION

A regional wet detention pond (post-construction site) may be used as a sediment basin (construction site) until final stabilization of the wet detention pond and expiration of the erosion control permit associated with construction of the regional wet detention pond. While regional stormwater management facilities are appropriate for control of post-construction pollutants, they should not be used for construction site sediment removal at other construction sites located within the wet detention pond's watershed.

(5) ALTERNATE REQUIREMENTS

S.08 PERMITTING REQUIREMENTS, PROCEDURES AND FEES

(1) PERMIT REQUIRED

(2) PERMIT APPLICATION AND FEES

(3) REVIEW AND APPROVAL OF PERMIT APPLICATION

Meetings between the permit applicant, designer, and plan reviewer are encouraged during the pre-design, design, and plan review process. The meetings are used to educate each other about regulatory requirements, environmentally sensitive areas, and design challenges. The number of meetings held is typically commensurate with the size and complexity of the project. Meetings can be face-to-face or via telephone.

A pre-construction conference is encouraged before the start of all construction projects. For sites with 1 acre or more of land disturbance, a pre-construction conference is required. The permit applicant, designer, plan reviewer, contractor, and inspector are encouraged to attend. The purpose of the meeting is to exchange contact information, review the Erosion & Sediment Control Plan, and identify individuals responsible for permit compliance, plan amendments, and weekly inspection reports.

(4) SURETY BOND

Construction sites with 1 acre or more of land disturbance are required to have a financial guarantee. The financial guarantee includes the cost associated with erosion and sediment control BMPs, site inspections, project administration, and contingencies.

Construction sites with less than 1 acre of land disturbance are not typically required to have a financial guarantee.

Portions of the financial guarantee may be released as the construction project progresses. The last portion of the financial guarantee is not released until the municipal inspector performs a final inspection and the permit applicant pays final inspection fees.

(5) PERMIT REQUIREMENTS

The permit applicant is required to post the "Certificate of Permit Coverage" in a conspicuous place at the construction site.

(6) PERMIT CONDITIONS

(7) PERMIT DURATION

(8) MAINTENANCE

(9) ALTERNATE REQUIREMENTS

S.09 EROSION AND SEDIMENT CONTROL PLAN, STATEMENT AND AMENDMENTS

(1) PLAN REQUIREMENTS

The erosion and sediment control plan for construction sites with 1 acre or more of land disturbance shall contain, at a minimum, the following information:

(a) The name, contact person, title, mailing address, e-mail address, telephone number, and fax number of the following individuals or organizations: permit applicant, landowner, consultant or plan preparer, and contractor (if known).
(b) Anticipated project start date and projected project end date.
(c) Description of the construction site and the nature of the land disturbing construction activity, including representation of the limits of land disturbance on a USGS 7.5-minute series topographical map.
(d) Description of the intended sequence of major land disturbing construction activities for major portions of the construction site, including clearing; stripping topsoil; rough grading; installation of erosion and sediment controls; construction of utilities, streets, and buildings; finish grading; and permanent stabilization.
(e) Estimates of the total area of the construction site and the total area of the construction site that is expected to be disturbed by land disturbing activities.
(f) Available data describing the surface soil as well as sub-soils, including representation of the limits of land disturbance on a NRCS soils map.
(g) Wherever permanent infiltration devices will be employed or were evaluated, the depth to the nearest seasonal high groundwater elevation or top of bedrock shall be identified.
(h) Name of the immediate named receiving water from the United States Geological Service 7.5 minute series topographic maps.
(i) Calculations to show the expected percent reduction in the average annual sediment load carried in runoff as compared to no sediment or erosion controls (calculations may not be feasible until RUSLE2 is completed).

The erosion and sediment control plan for construction sites with 1 acre or more of land disturbance shall include a site map. The site map shall include the following items and shall be at a scale not greater than 100 feet per inch and at a contour interval not to exceed two feet:

(a) Existing topography, vegetative cover, impervious surfaces, natural and engineered drainage systems, roads, surface waters, and 100-year floodplains.
(b) Boundaries of the construction site.
(c) Drainage patterns and approximate slopes anticipated after grading activities.
(d) Areas of soil disturbance, including soil stockpile locations.
(e) Location of major structural and non-structural controls identified in the erosion and sediment control plan, including standard detail drawings and specifications where appropriate.
(f) Location of areas where stabilization practices will be employed.
(g) Areas that will be vegetated following land disturbing construction activities.

(h) Area and location of wetland acreage on the construction site and locations where stormwater is discharged to a surface water or wetland within one-quarter mile downstream of the construction site.
(i) Areas used for infiltration of post-construction stormwater runoff.
(j) An alphanumeric or equivalent grid overlying the entire construction site.

The erosion and sediment control plan for construction sites with 1 acre or more of land disturbance shall include a description of appropriate erosion and sediment control best management practices that will be installed and maintained at the construction site to prevent pollutants from reaching waters of the state. The erosion and sediment control plan shall clearly describe the appropriate erosion and sediment control best management practices for each major land disturbing construction activity and the timing during the period of land disturbing construction activity that the erosion and sediment control best management practices will be implemented. The description of erosion controls shall include, when appropriate, the following minimum requirements:

(a) Description of any interim and permanent stabilization practices, including a schedule for implementing the practices. The erosion and sediment control plan shall ensure that existing vegetation is preserved where attainable and that disturbed portions of the construction site are stabilized.
(b) Description 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. Unless otherwise specifically approved in writing by the local municipality, structural measures shall be installed on upland soils.
(c) Management of overland flow at all areas of the construction site, unless otherwise controlled by outfall controls.
(d) Trapping of sediment in channelized flow.
(e) Staging land disturbing activities to limit exposed soil areas subject to erosion. Soil stockpiles exposed for more than 7 days shall be stabilized.
(f) Protection of downslope drainage inlets where they occur.
(g) Minimization of tracking at all vehicle and equipment entry and exit locations of the construction site.
(h) Clean up of off-site sediment deposits by the end of each work day.
(i) Proper disposal of building and waste material.
(j) Stabilization of drainage ways.
(k) Installation of permanent stabilization as soon as possible after final grading.
(l) Minimization of dust to the maximum extent practicable.

(2) EROSION AND SEDIMENT CONTROL PLAN STATEMENT

For construction sites with 1 acre or more of land disturbance, prepare a narrative describing the following: site location, total site area and disturbed area, purpose of project, drainage system and outfalls, drainage area for each outfall, stream and wetland locations, topsoil and subsoils, depth to groundwater and bedrock, erosion and sediment controls, sequence of construction, BMP inspection and maintenance responsibilities, weekly inspection reports, and plan amendments.

The erosion and sediment control plan statement shall require the following: (a) erosion and sediment control practices be repaired or replaced within 24 hours of an inspection; and (b) when the failure of erosion or sediment control practices results in an immediate threat of sediment entering waters of the state or an offsite drainage system, procedures shall be implemented immediately to repair or replace the practices.

(3) AMENDMENTS

(4) ALTERNATE REQUIREMENTS

S.10 FEE SCHEDULE

S.11 INSPECTION

S.12 ENFORCEMENT

S.13 APPEALS

(1) BOARD OF APPEALS OR ADJUSTMENT

(2) WHO MAY APPEAL

S.14 SEVERABILITY

S.15 EFFECTIVE DATE