

USING CHECKLISTS, GUIDANCE DOCUMENTS, & POLICIES

COORDINATING REGULATORY REVIEWS



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Waukesha County
Land Resources Division

BACKGROUND

- *Erosion control ordinance – 1993*
- *Storm Water Ordinance – 1998, updated 2005*
- *Plan requirements listed in ordinances*
- *Submittals ranged widely in content and quality*
- *Very difficult and time-consuming to review*

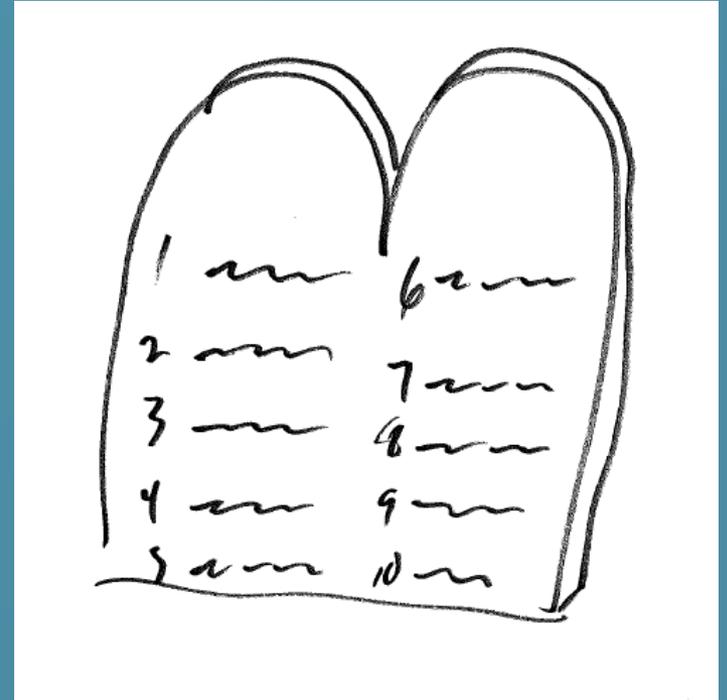


DEVELOPMENT OF REVIEW CHECKLISTS

- *Purposes*
 - *Promote better quality submittals*
 - *Improve efficiency of review process*
- *Basis: ordinance text*
- *Method: submitter may use checklist as punch list*
- *Reviewer may use checklist as stand-alone review document, avoiding need to write letter, especially for incomplete submittals*

CHECKLISTS FOR:

1. *Site plan*
2. *Erosion control plan*
3. *Storm water management plan*
4. *Land divisions*



CHECKLIST 1

SITE PLAN

- *Required for Preliminary Review Letter*
- *Use as the base for other maps in the erosion control and storm water plans*
- *Digital submittal required*
- *Includes:*
 - *Topography*
 - *Water bodies and channels*
 - *Wetlands and protective areas*
 - *Floodplain*
 - *Mapped soils*
 - *Soil test locations (and data)*
 - *Environmental corridors*
 - *Wells and setbacks*
 - *Buildings and septic (ex. and prop.)*



Checklist #1 Site Plan Map Requirements

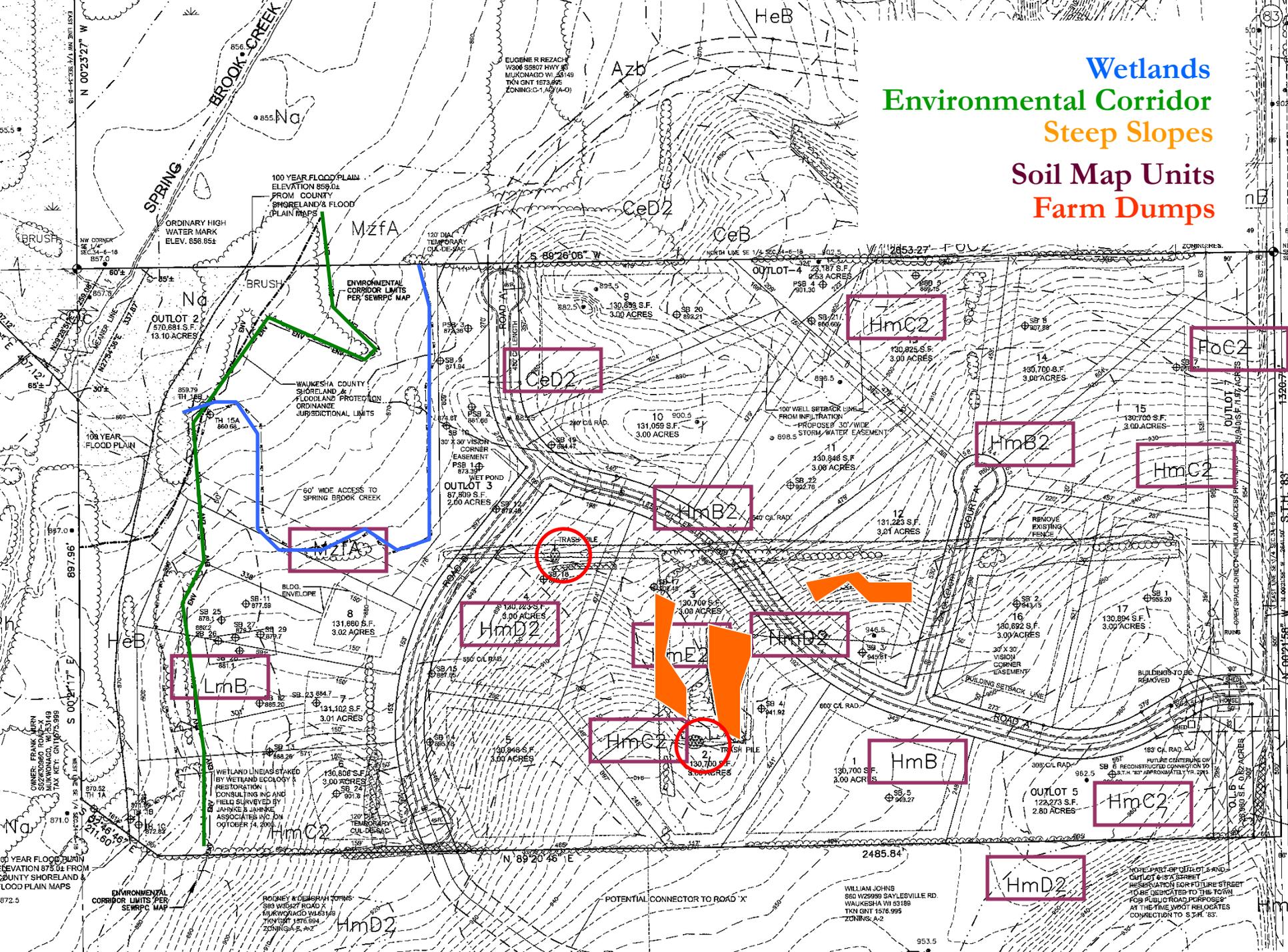
The following existing and proposed site features must be provided for all permit applications. Items listed below must be shown on the site and within 50 feet in each direction of the site boundaries. The county storm water ordinance requires a Preliminary Review Letter from the Land Resources Division (LRD) for projects that: a) Disturb a total land surface area of 1 acre or more; b) Involve the construction of a new public or private road of any length; c) Ultimately result in the addition of 0.5 acres or greater of impervious surfaces or; d) Other projects that may have significant negative impacts on adjacent properties or water resources due to soil erosion or storm water runoff.

All items on this list are required for the Preliminary Review Letter. Additional items must be shown on erosion control plans (see checklist #2) and storm water management plans (see checklist #3). A site plan map and supporting data of site conditions at a scale of 1 inch equals no more than 100 feet (unless otherwise noted) shall delineate or display the following applicable items:

Note: In addition to a paper copy, provide site map items in a digital format georeferenced to the State Plane Coordinate System, Wisconsin South Zone, NAD 27, NGVD-29.

- ___ 1. Development title, graphic scale and north arrow;
- ___ 2. Property location description by public land survey system (1/4 section, section, township, range, county);
- ___ 3. Location map (smaller scale) showing the site location within a public land survey section or subdivision, oriented the same as par. 4 below;
- ___ 4. Ownership boundaries, bearings, lengths and other survey references that will accurately identify the site location, in accordance with s. 236 Wisconsin Statutes and county mapping standards for all land divisions;
- ___ 5. Lot numbers and dimensions, including outlots for all land divisions;
- ___ 6. Name and complete **contact information** for the applicant, landowner, developer and project engineer or planner;
- ___ 7. Surveyor's certificate, signed, dated and sealed for all land divisions;
- ___ 8. Sheet numbers and **revision dates** on every page;
- ___ 9. Existing **site topography** at a contour interval not to exceed 2 feet, including **spot elevations** for physical features such as culvert (invert elevations), retaining walls, road and ditch centerlines and topographic high and low points;
- ___ 10. Location and name, if applicable, of all lakes, streams, channels, ditches, and other **water bodies** or areas of **channeled flow** on or adjacent to the site;
- ___ 11. Location and name, if applicable, of all **wetlands** and identification of source of delineation. For final land divisions, these boundaries shall be field verified;
- ___ 12. Boundaries of **shoreland zones** and the ordinary high water mark (OHWM) for any navigable water body as defined by the Waukesha County Shoreland and Floodland Protection ordinance. For final land divisions, the OHWM boundaries shall be field verified;
- ___ 13. Boundaries and elevation of the **100-year floodplains, flood fringes and floodways**, as defined by the Waukesha County Shoreland and Floodland Protection ordinance. For final land divisions, these boundaries and elevations shall be field verified;
- ___ 14. Boundaries and soil symbol for each **soil mapping unit** and the identification of all **hydric soils** as defined by the USDA-Natural Resources Conservation Service;

Wetlands
 Environmental Corridor
 Steep Slopes
 Soil Map Units
 Farm Dumps



100 YEAR FLOOD PLAIN
 ELEVATION 859.04
 FROM COUNTY
 SHORELAND & FLOOD
 PLAIN MAPS

ORDINARY HIGH
 WATER MARK
 ELEV. 856.854

ENVIRONMENTAL
 CORRIDOR LIMITS
 PER SEWRPC MAP

WAUKESHA COUNTY
 FLOODLAND PROTECTION
 ORDINANCE
 JURISDICTIONAL LIMITS

60' WIDE ACCESS TO
 SPRING BROOK CREEK

WETLANDS STAYED
 BY WETLANDS ECOLOGY &
 RESTORATION CONSULTING INC.
 FIELD SURVEYED BY
 JANIKKE & JANIKKE
 ASSOCIATES INC. ON
 OCTOBER 14, 2007

ENVIRONMENTAL
 CORRIDOR LIMITS PER
 SEWRPC MAP

ROONEY & DESIGN/H/T/MS
 583 W36327 ROAD X
 WAUKESHA WI 53189
 TOWN GNT 1976.594
 ZONING: C-1, MZ (A-O)

POTENTIAL CONNECTOR TO ROAD X

WILLIAM JOHNS
 660 W29990 SAYLESVILLE RD.
 WAUKESHA WI 53189
 TOWN GNT 1976.995
 ZONING: A-2

NOTE: PART OF OUTLOT 5 AND
 OUTLOT 6'S STREET
 RESERVATION FOR FUTURE STREET
 TO BE DEDICATED TO THE TOWN
 FOR PUBLIC ROAD PURPOSES
 AT THE TIME SPOT RELOCATES
 CONNECTION TO S.H. '83'

CHECKLIST 2

EROSION CONTROL PLAN

- *States guiding principals (eg. minimize soil compaction)*
- *Preliminary erosion control plan*
 - *Brief narrative*
 - *General locations of major BMPs*
- *Final Erosion Control Plan includes*
 - *Trees that will be impacted*
 - *Soil stockpile sites*
 - *Soil test and profile info for BMP design*
 - *Location of utilities*
 - *Narrative summary*



Checklist #2 Erosion Control Plan Requirements (>1 Acre)

Under county ordinance, significant grading activity may trigger the need for a storm water permit for construction site erosion control. An erosion control plan is designed to protect downstream water resources and property owners from water pollution and other damage caused by sediment runoff from construction sites. Erosion control plans designed to meet the requirements of the county ordinance shall, to the maximum extent practicable, adhere to the following guiding principles:

- 1) Propose grading that best fits the terrain of the site, avoiding steep slopes, wetlands, floodplains and environmental corridors;
- 2) Minimize, through project phasing and construction sequencing, the time the disturbed soil surface is exposed to erosive forces;
- 3) Minimize soil compaction, the loss of trees and other natural vegetation and the size of the disturbed area at any one time;
- 4) Locate erosion control BMPs upstream from where runoff leaves the site or enters waters of the state and outside of wetlands, floodplains, primary or secondary environmental corridors or isolated natural areas;
- 5) Emphasize the use of BMPs that prevent soil detachment and transport over those aimed to reduce soil deposition (sedimentation) or repair erosion damage.

Preliminary Erosion Control Plans must include (for Preliminary Review Letter):

- ___ 1. ~~A site map in accordance with Checklist #1. Digital submittal required.~~
- ___ 2. A brief narrative describing the proposed land disturbing activity, construction timeline and sequencing, and a general review of the major erosion and sediment control BMPs proposed to be used to minimize off-site impacts during the construction phase and to stabilize the site following construction.
- ___ 3. Delineation of the following on the site map under #1 above: a) the area and size (in acres) of the proposed land disturbance; b) the woodland and wetland areas, and the size (in acres) of each that is proposed to be lost during construction and a general description of the current vegetation types and tree sizes; c) the general location of major BMPs.

Final Erosion Control Plans must include (for Permit):

- ___ 1. A site map in accordance with Checklist #1. Digital submittal required. All other map elements listed below shall be delineated and labeled at a scale of 1 inch equals no more than 100 feet, unless otherwise noted.
- ___ 2. North arrow, graphic scale, draft date, name and contact information for project engineer or planner and designation of source documents for all map features;
- ___ 3. Proposed site topography at contour intervals not to exceed two feet, proposed percent slope for all open channels and side slopes and all runoff discharge points from the site;
- ___ 4. Proposed building envelopes and other land area to be disturbed and size in acres;
- ___ 5. All woodland areas, those proposed to be lost or transplanted during construction and acres or numbers of each. For woodlands proposed to be lost, show individual trees larger than eight (8) inches in diameter that are located within twenty (20) feet of proposed grading boundaries;
- ___ 6. Temporary access drive and specified surface material (3 to 6 inch clear or washed stone), minimum depth (minimum 12 inches) and minimum 50 feet long;
- ___ 7. Temporary flow diversion devices for upslope or roof runoff until site is stabilized;
- ___ 8. Temporary sediment trapping devices for site perimeter and inlets to culverts and storm drains;
- ___ 9. Temporary settling basin or other BMP to be used for site dewatering during utility or other subsurface work;
- ___ 10. Temporary soil stockpile sites indicating setbacks (minimum 25 feet) from channelized flow, nearby water resources or environmental corridors and the proposed erosion protection methods;
- ___ 11. Detailed drawings and cross sections for any sediment traps, basins or other major cut or fill areas showing side slopes and elevations;

Erosion Control Plan Narrative

This narrative may be edited by crossing out inapplicable items, subject to LRD review and approval.

I, _____ (signature of permit applicant) _____ (date), have read and understand this narrative. I also understand that failure to follow the approved narrative may be subject to enforcement action.

The timing and sequence of construction is scheduled as follows (see attached map):

1. Before grading begins the project surveyor will stake out all roads, drainageways, and wetlands and other preservation areas in accordance with previous DNR boundary determinations.
2. The landscaper is charged with installing and maintaining all silt fences, seeding, erosion matting and other erosion control practices.
3. A list of all project contacts, phone numbers, e-mail addresses, etc. is on the permit application.
4. Construction is scheduled to begin on _____ (date).
5. Gravel tracking pad will be installed at the entrance first.
6. Silt fence and ditch checks will be installed as shown on the plan map.
7. Topsoil stripping and rough grading will follow.
8. Topsoil piles will be located as shown on the map, and seeded down within one week after layup.
9. Erosion control inspections will be performed weekly and after each rain event of 0.5 inches or larger by _____ (name).
10. Inspection forms will be filled out and kept on site in _____ (location).
11. Building completion is anticipated on _____ (date).
12. Any disturbed site that remains inactive for greater than 7 days shall be stabilized with temporary measures such as soil treatment, temporary seeding or mulching. "Inactive" means that no site grading, landscaping or utility work is occurring on the site and that rain is not limiting these activities. Frozen soils do not exclude the site from this requirement.
13. The topsoil will be reapplied and _____ (name) will complete seeding/fertilizing and install erosion control matting and netting in all road ditched, cut slopes and other disturbed areas as per approved plans and specifications.
14. Restoration will be completed by _____ (date).
15. After grass is well established all silt fences will be removed and permittee will request final inspection by the county.

CHECKLIST 3

STORM WATER MANAGEMENT PLAN

- *Summarizes guiding principals (eg. distribute bioretention)*
- *Preliminary storm water management plan req'ts*
 - *Watersheds, discharge points, data summary*
 - *Soil test locations and evaluations*
 - *Narrative*
 - *BMP location , type, and preliminary design*
- *Final plan requirements include*
 - *BMP design details, including cross-sections*
 - *Sections must include soil profile and SHWT*
 - *Construction notes and inspection plan*
 - *BMP design summaries*

Checklist #3

Storm Water Management Plan Requirements

Under county ordinance, additional impervious surfaces in a proposed development may trigger the need for a storm water management plan and permit. A storm water management plan is designed to protect downstream water resources and property owners from water pollution, flooding and other damage caused by urban runoff after a development is complete. Storm water management plans designed to meet the requirements of the county ordinance shall, to the maximum extent practicable, adhere to the following guiding principles:

- 1) Preserve natural watershed boundaries and drainage patterns;
- 2) Reserve adequately sized areas for storm water infiltration, detention and treatment early in the planning process;
- 3) Locate storm water BMPs upstream from where runoff leaves the site or enters waters of the state and outside of wetlands, floodplains, primary or secondary environmental corridors or isolated natural areas;
- 4) Minimize soil compaction and maintain pre-development groundwater recharge areas;
- 5) Minimize impervious surfaces and have them drain to vegetated areas for pollutant filtering and infiltration;
- 6) Emphasize vegetated swales, warm season and wetland plantings and low flow velocities for storm water conveyance, treatment and infiltration, especially for transportation related projects;
- 7) Allow for different storm water management strategies for cleaner runoff (i.e. roofs) versus more polluted runoff (i.e. streets and parking lots);
- 8) Provide for emergency overflow in all storm water BMP designs (100-year flows);
- 9) Distribute storm water bioretention and infiltration BMPs throughout the site plan for large developments.

Preliminary Storm Water Management Plans must include (for Preliminary Review Letter):

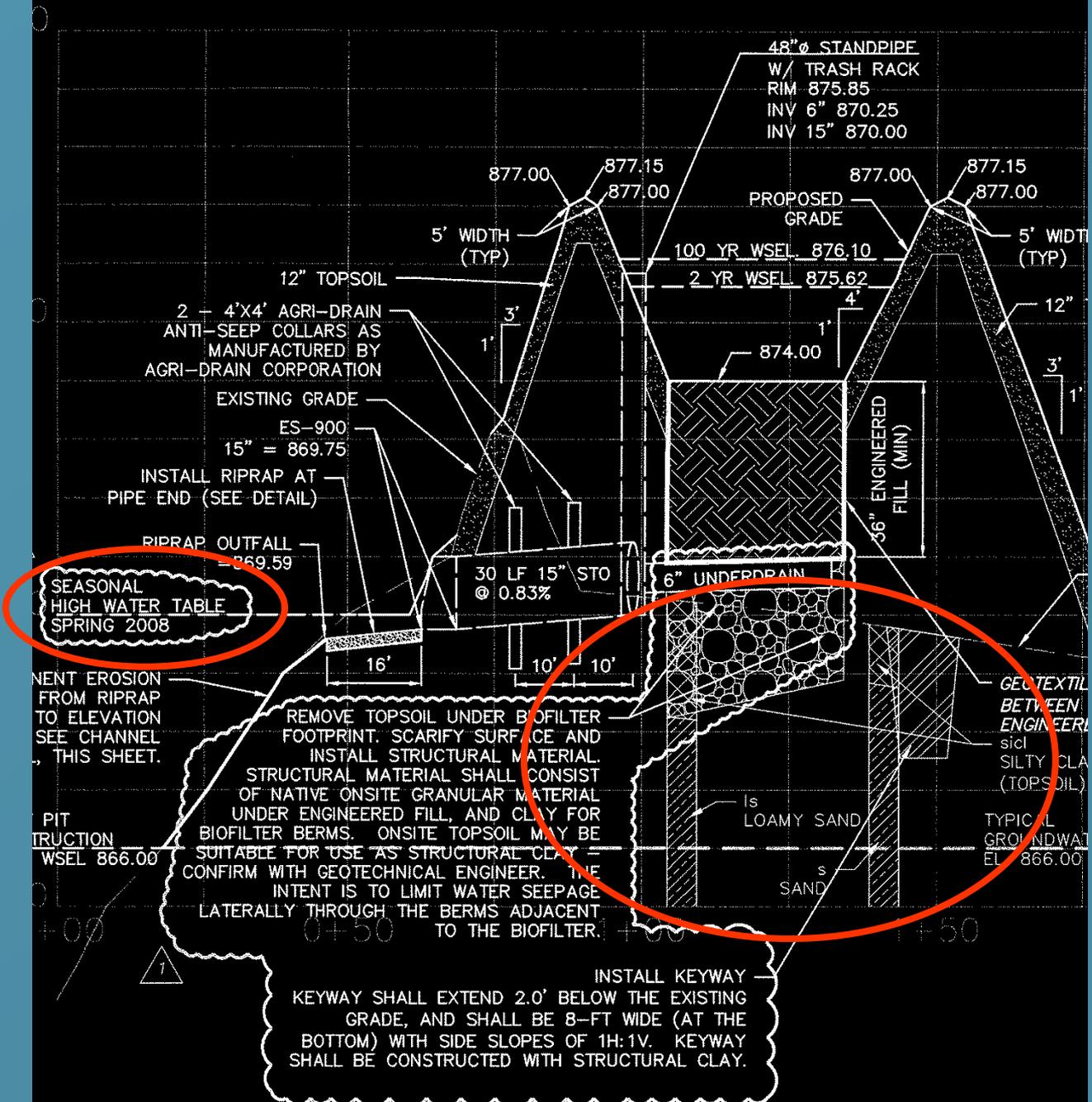
- ___ 1. A site map in accordance with Checklist #1. Digital submittal required.
- ___ 2. Drafting date and contact information for the project engineer with all other mapping elements and scale consistent with the site plan map.
- ___ 3. Delineation of existing and proposed watersheds, subwatersheds and major flow paths within the site and draining into the site from adjacent properties.
- ___ 4. Location, type and preliminary design of proposed storm water BMPs needed to comply with the ordinance.
- ___ 5. Location and type of major storm water conveyance systems proposed for the site.
- ___ 6. Existing and proposed storm water discharge points.
- ___ 7. Locations and preliminary dimensions of proposed drainage easements.
- ___ 8. Location of soil borings and soil profile evaluations with surface elevations and unique references to supplemental data sheets, as needed to determine feasibility of any proposed storm water BMP and to comply with applicable BMP technical standards.
- ___ 9. Preliminary location of access lanes for maintenance of storm water BMPs.
- ___ 10. Support documentation including:
 - ___ a. Preliminary plan narrative describing site drainage, ultimate receiving water body for off-site discharges, major site restrictions, and how the preliminary storm water management plan will meet the requirements of the ordinance and other project objectives;
 - ___ b. Summary of watershed, subwatershed and land use data in acres and the preliminary results of any hydrology calculations, following approved I.R.D. format;
 - ___ c. Soil profile evaluation data submitted on COMM form SBD-10793 in accordance with BMP technical standards and county basement/groundwater separation requirements.
 - ___ d. Proposed ownership and maintenance responsibilities for all proposed storm water BMPs

Final Storm Water Management Plans must include (for Permit):

1. A site map in accordance with Checklist #1. Digital submittal required.

Example Combined Construction Sequence and Construction Inspection Schedule

Date	Duration	Milestone or Task	Date of Inspection	Inspector Initials	Provide Photo	Inspector Role
		Prior to grading activities				
		Surveyor stakes road, drainageways, storm water BMPs. Mark wetlands.				
		Plan implementation meeting				
		Hold pre-construction meeting with Town, County, DNR, contractors, utilities				
		Install tracking pad				EC insp.
		Install silt fence or other perimeter BMPs, clearing and grubbing as minimally needed				EC insp.
		Contact County LRD and other authorities at least 2 days prior to beginning construction				
		Construct Basins				
		Strip topsoil in basin and subsoil stockpile areas				
		Excavate temporary or permanent basins to be used for sediment control				
		The following steps apply to construction of infiltration basins				
		Before engineered soil is installed in the infiltration area, verify that:				
		Basin was over-excavated to expose permeable soil				Soil Scientist
		Compost used to amend soil meets WDNR specification S100. Submit sample to LRD				Engineer
		Correct mixture of engineered soil is used (70-85% sand, 15-30% compost)				Engineer
		Before berm material is placed, verify that				
		Topsoil, stumps, and vegetation are stripped in basin berm footprint				Engineer
		A 2'x8' keyway is excavated under berm (if permanent pool will pond > 3 ft against embankment)				Engineer
		The basin berm is constructed with the specified material				Engineer
		Basin interior slopes do not exceed maximum pitches (3:1 above water, 10:1 safety shelf, 2:1 below)				Engineer
		Basin bottom and shelf elevations are correct				Engineer
		The safety shelf is at least 8 ft wide				Engineer
		Before the berm is re-compacted around outlet pipes following installation, verify that:				
		The correct pipe diameter, drain hole diameter, and materials are used				Engineer
		The outlet pipe and riser elevations are correct				Engineer
		Anti-seep devices are installed on specified outlet pipes				Engineer
		Before topsoil is re-applied, verify that:				
		The 90% standard Proctor compaction req't is met by sampling at five locations along embankment				Engineer
		The berm elevation is 5% above design height (above existing grade) to allow for settling				Engineer
		Verify that compaction mitigation procedures were followed (deep tilling)				Engineer
		Perform infiltration test with double-ring infiltrometer. Provide data. Include results in Exhibit D.				Engineer
		Verify that topsoil is re-applied to all non-infiltrating surfaces				Engineer
		As-built elevations are correct (see as-built survey punch list)				Engineer
		Begin Grading				
		Strip topsoil. Stockpile locations are shown on plan. Piles 1 and 2 for re-use on site. Pile 3 to be seeded and sold later.				
		Install silt fence around stockpiles within 7 days of lay-up				EC insp.
		Seed stockpiles within 30 days of lay-up				EC insp.
		Rough grading				
		Apply road base material.				
		Stabilize disturbed areas that are inactive for 7 days or more with temporary seed mix				
		Install gas				
		Install electric and communications lines				
		Pave roads				
		Finish shoulders				
		Remove ditch checks				EC insp.
		Re-apply topsoil				EC insp.
		Seed, establishing and mulch seedlings within 7 days of end of grading				EC insp.



SEASONAL HIGH WATER TABLE SPRING 2008

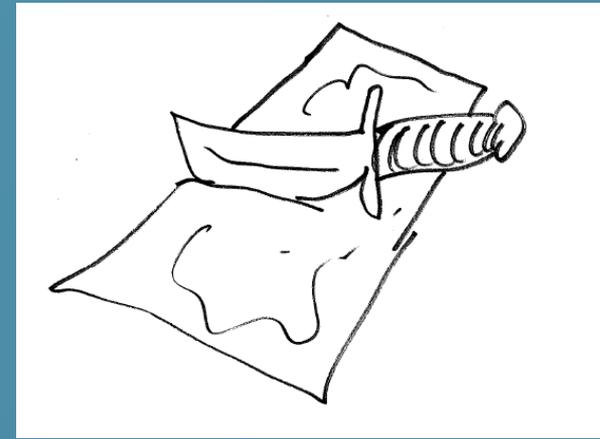
REMOVE TOPSOIL UNDER BIOFILTER FOOTPRINT. SCARIFY SURFACE AND INSTALL STRUCTURAL MATERIAL. STRUCTURAL MATERIAL SHALL CONSIST OF NATIVE ONSITE GRANULAR MATERIAL UNDER ENGINEERED FILL, AND CLAY FOR BIOFILTER BERMS. ONSITE TOPSOIL MAY BE SUITABLE FOR USE AS STRUCTURAL CLAY - CONFIRM WITH GEOTECHNICAL ENGINEER. THE INTENT IS TO LIMIT WATER SEEPAGE LATERALLY THROUGH THE BERMS ADJACENT TO THE BIOFILTER.

INSTALL KEYWAY - KEYWAY SHALL EXTEND 2.0' BELOW THE EXISTING GRADE, AND SHALL BE 8-FT WIDE (AT THE BOTTOM) WITH SIDE SLOPES OF 1H:1V. KEYWAY SHALL BE CONSTRUCTED WITH STRUCTURAL CLAY.

SECTION B-B

CHECKLIST 4

LAND DIVISIONS



- *The Land Resources Division must certify compliance with county storm water ordinance requirements before any new plat or CSM can be approved by the county Planning and Zoning Division.*
- *Items reviewed include*
 - *Well setbacks from infiltration*
 - *Building restrictions (setbacks from BMPs)*
 - *Minimum basement elevations to prevent flooding*
 - *Site drainage standards*
 - *BMP maintenance provisions*

Checklist #4

Requirements for New Land Divisions with a Storm Water Mgt. Plan (“Certification of Compliance”)

The Land Resources Division must certify compliance with county storm water ordinance requirements before any new plat or CSM can be approved by the county Planning and Zoning Division. This “certification of compliance” helps ensure that all storm water outlots, easements, setbacks, maintenance agreements and associated covenants and restrictions are properly documented prior to recording the land division through the Waukesha County Register of Deeds.

To obtain Certification of Compliance, provide the following applicable information on the plat or CSM:

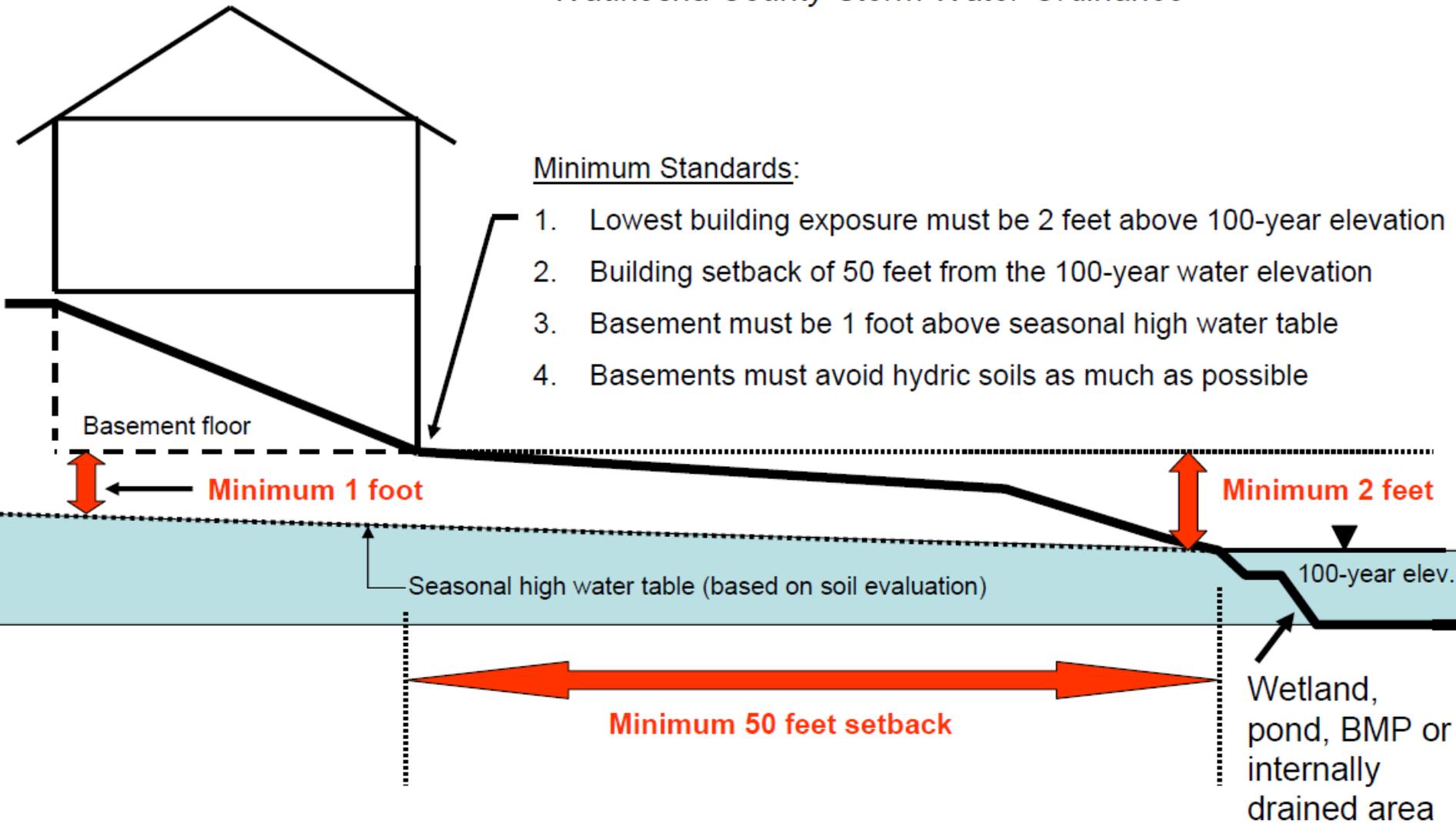
- ___ 1. Delineation and dimensions of **well setbacks** in accordance with ch. NR 811 and 812 Wis. Admin. Code. and applicable DNR technical standards.
- ___ 2. Delineation and dimensions of **outlots** set aside for storm water management (when a BMP treats storm water from more than one lot).
- ___ 3. Delineation and dimensions of existing and proposed **drainage easements**.
- ___ 4. Delineation and dimensions of existing and proposed **access lanes** for future maintenance and inspection of storm water BMPs (minimum width is 15 feet).
- ___ 5. Delineation and dimensions of **utility easements**.
- ___ 6. Delineation, dimensions and descriptive notes for **protective areas**.
- ___ 7. **Building restrictions:** For buildings designed for human occupation, the plat or CSM may need to demonstrate compliance with the following building restrictions. Published county procedures must be followed to demonstrate compliance. The first two apply to any area that temporarily or permanently stores storm water at a depth greater than one foot.
 - a. Minimum 2-foot vertical separation between the lowest elevation of the structure that is exposed to the ground surface and the maximum water surface elevation produced by the 100-year, 24-hour design storm (can be shown as an elevation on the lot).
 - b. Minimum 50-foot horizontal setback between the building and the closest edge of the water at the elevation produced by the 100-year, 24-hour design storm.

Note: For internally drained sites, the maximum water surface elevation for the 100-year, 24-hour storm for a. and b. above must be determined assuming frozen conditions.
 - c. Minimum 1-foot vertical separation between basement floors and seasonal high water table elevation.

Note: Basement construction must avoid hydric soils (very poorly drained) as much as possible.
- ___ 8. Language describing **outlot** ownership, BMP maintenance responsibilities, easements, setbacks and other applicable covenants or restrictions relating to the above noted items.
 - a. Sample BMP maintenance agreements are available; language is provided below.

Minimum Site Drainage Standards

Waukesha County Storm Water Ordinance



Certification of Compliance

Waukesha County Storm Water Management and Erosion Control Ordinance

(Chapter 14, Article VIII – Waukesha County Code of Ordinances)

Purpose: This form is used for new land developments to certify compliance with the above noted ordinance before a plat or CSM is recorded at the County Register of Deeds. It is designed to prevent site plan conflicts relating to storm water.

Directions: Before signing the plat/CSM, the Town or county planner completes items in shaded box below and submits to Alan Barrows in Land Resources (address in footer) along with the new plat/CSM. Land Resources will complete the form within 10 working days and return it to the sender, indicating compliance status.

(Check One): Final Plat Certified Survey Map Condo Plat
Project Name:
Project Location: ¼, Section , Township of
Applicant Name:
Latest Plat/CSM Revision Date: Drafter:
Name of person submitting form:
Date submitted:

Date received by Land Resources:

The following items have been reviewed by Land Resources to determine compliance with the county Storm Water Management and Erosion Control Ordinance. (0 = Not Applicable, Y = Complies, N = Does not comply)

1. Location and size of drainage easements, outlots and other areas set aside for storm water management, and the associated language describing use restrictions (i.e. structures out of 100-year flows, outlots for BMPs serving multiple lots, equal undividable interest, grading/filling restrictions, etc.);

Comments:

2. Setback requirements from public and private wells (i.e. 100-400 feet/infiltration basins, 25 feet wet detention, etc.), structures (50 feet), steep slopes (200 feet - infiltration basins), road right-of-ways and other items related to the location of storm water management facilities;

Comments:

GUIDANCE DOCUMENTS, TEMPLATES, AND SAMPLE MATERIALS ON THE WAUKESHA COUNTY WEBSITE

- *Storm Water Mgt.*
 - *Storm water plan narrative*
 - *Watershed summary table*
 - *BMP design summary tables*
 - *Construction inspection schedules*
 - *Construction verification letter*
 - *Planting verification process & letter*
- *Erosion Control*
 - *Sample erosion control narratives*
 - *Channel stabilization charts*
 - *Slope stabilization charts*
 - *Erosion matting installation drawing*
 - *Utility placement cross-section*

LWC Programs

- [Storm Water & Urban Runoff](#)
- [Water Conservation & Education](#)
- [Agricultural Conservation](#)
- [Nonmetallic Mining](#)

Stormwater Info

- [Index of Storm Water Documents](#)
- [Checklists](#)
- [County MS4 Permit Information](#)
- [Erosion Control Tools](#)
- [Financial Guarantee](#)
- [Maintenance Agreement](#)
- [Permit Application](#)
- [Rain Gardens & Barrels](#)
- [Staff Contacts](#)
- [Storm Water Tools](#)
- [Storm Water Workshops](#)
- [Technical Standards](#)
- [Water Resources Map](#)

Index of Storm Water Documents

LAND CONSERVATION DIVISION (STORM WATER)

Index of Forms and Related Links:

If you have never been to this site before, we recommend you start by clicking [here](#). This will walk you through the storm water program. If you know what you're looking for, the links below should make finding it simple.

Attention: All documents are in PDF format; if you wish to obtain a document in Word format, please call 262-896-8300.

Application Forms:

- Storm Water Permit Application ([fillable PDF](#))
- Small Site/Utility Installation Form* ([fillable PDF](#)) (* sites < one acre of total land disturbance and no storm water plan)
- General Requirements Agreement ([Form](#))
- Permit Extension/Amendment Request Form ([fillable PDF](#))
- Plan Implementation Sign-off ([Form](#))

Checklists:

- #1 Site Plan [Map Requirements](#)
- #2 Erosion Control [Plan Requirements](#)
- #3 Storm Water Mgmt [Plan Requirements](#)
- #4 Certification of [Compliance](#)

Design Guidance/Summaries:

- Principles & Practices - [Erosion Control](#)
- Erosion Control Plan [Sample Narrative](#)
- Erosion Control Plan - small sites ([fillable PDF](#))
- Principles & Practices - [Storm Water Management](#)
- Storm Water Plan [Sample Narrative](#)
- Summary of [Watershed Data](#)
- Wet Detention [Example](#)
- Infiltration Basin [Example](#)
- Infiltration Practice Vegetation [Establishment](#)

Development Review Team:

- [Development Review Team Information](#)

Drawing Samples:

- Basin Cross [Section](#)
- Erosion [Netting & Matting](#)
- Inlet [Protection](#)
- In-line [Water Level Control](#)
- Rock-lined [Channel](#)
- [Utility Installation](#)

Financial Assurance:

Ordinance:

- [Ordinance](#)- Waukesha County Storm Water Management & Erosion Control
- Summary of Ordinance & Permit [Flowchart](#)
- Storm Water BMP [Maintenance Ordinance](#)
- County Ordinance Jurisdiction [Map](#)
- Intergovernmental Agreement [Sample](#)

Ordinance Admin. Standards:

- [Basement Wetness & Flooding Prevention Standards](#)
- [Form A - Seasonal High Groundwater Determination Report](#)
- [Internally Drained Procedures](#)
- [First Half-Inch Infiltration Standard](#)
- [Late Season Stabilization Standard](#)

Soils:

- [Soil Evaluation Report Form](#)

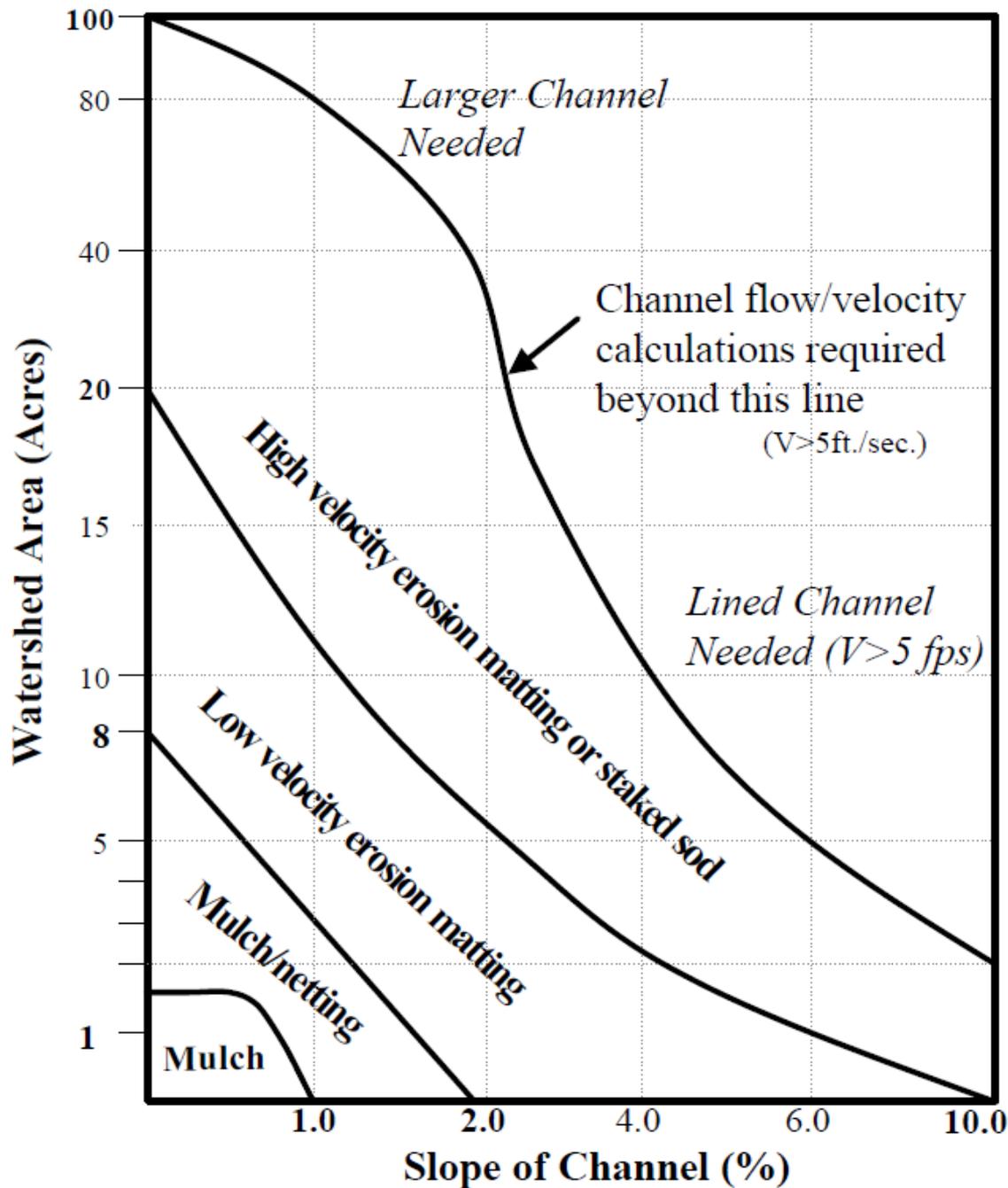
Stabilization Charts:

- [Watershed slopes >8%](#)
- [Watershed slopes <8%](#)
- [Sample Completed Chart](#)
- [Slope Stabilization Chart](#)

Storm Water Related Links:

- Storm Water Web Pages (DNR)
- Storm Water BMPs (EPA)
- Erosion & Sediment Control Technical Standards (DNR)
- Storm Water Management Technical Standards (DNR)
- Runoff Information Web Pages (UWEX)
- Center for Watershed Protection
- Standards Oversight Council
- WISDOT - PAL
- NRCS Technical Standards
- TR-55 ([NRCS](#))
- Minnesota Storm Water Manual
- Open Space Manual

Verification Forms, Construction Inspection, As-Built Standards:



Minimum Stabilization Requirements for Roadside Swales

Watershed Slopes <8%

Notes:

- Assumes consistent channel dimensions of 2 foot bottom, 4:1 side slopes & 2 foot depth. Channels of different sizes must follow velocity
- Assumes runoff curve numbers for entire watershed to be in the range of 65-75.
- Based on flow velocities produced by a 10-year, 24 hour storm in SE Wisconsin.

Example Data Summary Sheet for Stormwater Management Plan

Project Name: Rolling Acres **Project Size:** 120 Acres **Project type:** Residential Subdivision **No. of Lots:** 180
Number of Runoff Discharge Points: 3 **Watershed (ultimate discharge):** Pewaukee Lake (via unnamed tributary)
Watershed Area (including off-site runoff traveling through project area): 140 acres (20 acres off-site)
Public Land Survey Location: SE1/4, Section 32, T8N R19E (Pewaukee Township)

Summary Data Elements	Subwatershed A		Subwatershed B		Subwatershed C	
	Pre-develop	Post-develop	Pre-develop	Post-develop	Pre-develop	Post-develop
Watershed Areas (see attached map)	100 acres	120 acres	20	10	20	10
Average Watershed Slopes	2-8%	2-8%	3-6%	3-6%	6-8%	6-8%
Land Uses (% of each, see attached map)	75 ac. cropland 15 ac. brush 10 ac. woodland	110 ac. ½ ac. lots 5ac. brush 5 ac. woodlands	100% cropland	100% ½ ac. lots	100% Woodland	100% ½ acre lots
Runoff Curve Numbers	68 x 75 ac.= 5100 30 x 25 ac.= 750 Net 5850/100 ac. RCN = 59	70 x 110 ac.= 7700 10 x 10 ac.= 100 Net 7800/120ac RCN = 65	RCN = 68 (state standard)	RCN = 70	RCN = 55	RCN = 70
Conveyance Systems Types	Grass waterway	50% grass swale 50% storm sewer	100% bare channel	100% grass swale	100% natural channel	100% storm sewer
Summary of Average Conveyance System Data	8' bottom/4:1 ss 2' depth/3% grade	2' depth swale/3% 30" r/c sewer/2% (see calcs.)	15' (w) top 1' (d) parabolic 2% grade	2' deep standard road ditch 2% grade	15' top (w) 1' (d) parabolic 4% grade	2' deep standard road ditch 4% grade
Time of Concentration (T _c) (see attached map & worksheets)	1.1 hrs.	0.97 hrs.	0.74 hrs.	0.65 hrs.	0.45 hrs.	0.35 hrs.
Runoff volume: 25% of 2-yr 24-hr storm, post-developed	N/A	0.94 ac. ft.	N/A	0.18 ac. ft.	N/A	0.19 ac. ft.
Runoff volume: first half-inch	N/A	5.0 ac. ft.	N/A	0.41 ac. ft.	N/A	0.41 ac. ft.
Peak Flow: 1-year/24 hour (see attached hydrographs)	2.0 cfs	7.6 cfs	0.7 cfs	0.6 cfs	0.6 cfs	0.6 cfs
Peak Flow: 2-yr./24 hour	5.4 cfs	15.9 cfs	1.1 cfs	0.8 cfs	1.2 cfs	1.1 cfs
Peak Flow: 10-yr./24 hour	31.1 cfs	59.3 cfs	3.4 cfs	3.3 cfs	4.6 cfs	4.2 cfs
Peak Flow: 100-yr./24 hour	84.5 cfs	132 cfs	13 cfs	11 cfs	15 cfs	14 cfs

Example Data Summary Sheet for Wet Detention Basin Design

(Note: Example only -- see minimum design criteria in DNR technical standard 1001)

Design Element	Design Data
Site assessment data: (see attached maps)	
Contributing drainage area to basin (subwatershed A)	120 acres
Distance to nearest private well (including off-site wells)	> 100 feet
Distance to municipal well (including off-site wells)	> 1200 feet
Wellhead protection area involved?	No
Ground slope at site of proposed basin	average 3%
Any buried or overhead utilities in the area?	No
Proposed outfall conveyance system/discharge (w/ distances)	35 ft. to CTH "U" Road ditch 1000 ft. to wetland
Any downstream roads or other structures? (describe)	Yes - 36" cnp road culvert
Floodplain, shoreland or wetlands?	No
Soil investigation data (see attached map & soil logs):	
Number of soil investigations completed	3 (in basin area)
Do elevations of test holes extend 3 ft. below proposed bottom?	Yes (see map)
Average soil texture at pond bottom elevation (USDA)	Clay loam
Distance from pond bottom to bedrock	> 5 feet
Distance from pond bottom to seasonal water table	Pond bottom 2 below mottling No water observed in test holes
General basin design data (see attached detailed drawings):	
Permanent pool surface area	1.5 acres
Design permanent pool water surface elevation	elev. 900.0
Top of berm elevation (after settling) and width	elev. 905.0 / 10 feet wide
Length/width (dimensions/ratio)	445 ft. (L) x 145 ft. (W) = 3:1
Safety shelf design (length, grade, max. depth)	10 ft. @ 10% slope / 1.5' deepest
Ave. water depth (minus safety shelf/sediment)	5 ft. (in center)
Sediment forebay size & depth	.16 acres (13% pool size) / 5 feet
Sediment storage depth & design maintenance	2 ft. depth for forebay & pool 15 year maintenance schedule

Design Basin Inflow, Outflow & Storage Data				
(see attached hydrographs and detail drawings)				
Inflow Peak/Volume	Maximum Outflow Rate	Max. Water Elevation	Storage Volume at Max. Elev. (above perm. pool)	Outflow Control Structures*
1-yr./24 hr. (volume)	.7 cfs (34 hr. drawdown)	901.3 ft.	2 acre feet	#1
24.3 cfs (Post 2-yr./24 hr. peak)	11 cfs	902.0 ft.	3.1 acre feet	#1 and #2
72 cfs (Post 10-yr./24 hr. peak)	35 cfs	903.0 ft.	4.5 acre feet	#3
171 cfs (Post 100-yr./24 hr. peak)	143 cfs	904.0 ft.	6.0 acre feet	#3 and #4

* The controlling elements are summarized below (See attached detail drawing of outlet structure):

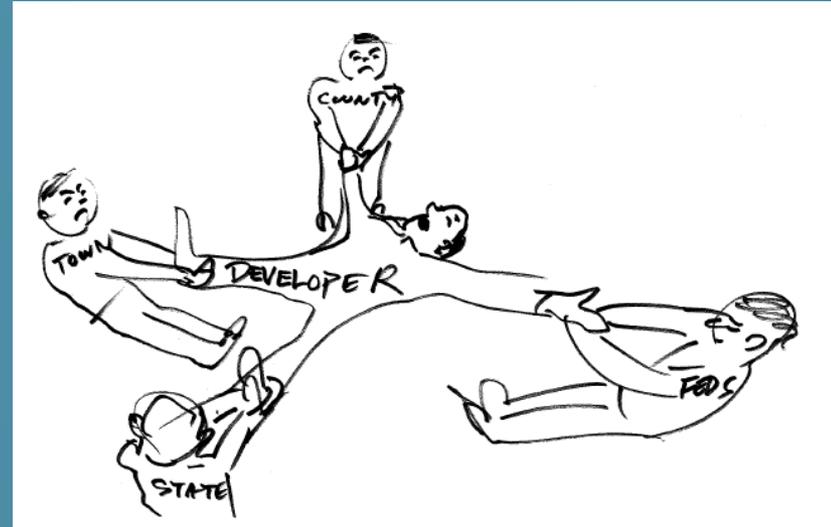
- #1 = 6 inch orifice in water level control weir plate - flow line elev. @ 900.0 (1.3 ft. max. head)
- #2 = 2 foot wide rectangular weir - flow line elev. @ 901.3 (1.7 ft. hydraulic head)
- #3 = 30 inch diameter smooth wall pvc pipe - flow line elev. @ 900.0 (3.0 ft. max. hydraulic head)
- #4 = 30 foot wide earthen/grass emergency spillway - flow line elev. @ 903.0 (1.0 ft. max. depth)

STANDARDS AND POLICIES

- *First Half-Inch of Runoff*
 - *Retention complies with WQ and infiltration req'ts*
- *Basement Wetness & Flooding Prevention Standards*
 - *Basements must be one foot above SHWT*
 - *Exposures must be two feet above flood level around kettles*
- *Seasonal High Groundwater Determination Report*
 - *Based on SPS 385*
- *Internally-Drained Procedures*
 - *100-year storm on frozen ground*
- *Late Season Stabilization*

COORDINATION OF REVIEWS WITH OTHER AGENCIES

- Purpose
 - Avoid conflicts in review process
 - Avoid “piling on,” redundant comments, fees
- Methods
 - Offer joint preliminary site inspection with Town Engineer
 - Development Review Team meetings at concept level, with County DPW, EH, Planning, and LRD staff
 - Invite Town officials to DRT meeting
 - Copy Town, DNR, ACOE on review, construction inspection, enforcement correspondence, as applicable



COORDINATION OF REVIEWS WITH OTHER AGENCIES

- *Applicability Exemption*
 - *Exemption – another regulatory agency is enforcing the county ordinance req'ts*
 - *Provide plans, contact info for owner, engineer, and regulator*
- *Authorized Local Program*
 - *DNR approves County as ALP for regulating construction sites in accordance with NR 216*
 - *County permit serves as NOI application.*
 - *County collects fee, pays State*
 - *County provides permit info to State for DNR database*

Thank you. Questions?