
CHAPTER 1

THE ORDINANCE

1.1 ORDINANCE BACKGROUND

The Erosion Control and Stormwater Management Ordinance was designed to help protect Dane County's lakes, streams, wetlands and quality of life by reducing the negative impacts of sediment, rainfall, melting snow and other water runoff.

The ordinance establishes countywide standards for the quantity and quality of water that runs off land under construction in urban and rural areas, including farms. It also provides flexibility in meeting those standards, recognizing the unique characteristics of each project and site. The Erosion Control and Stormwater Management Ordinance builds on the construction site erosion control requirements that have been in effect since 1995.

The Dane County Board of Supervisors adopted the Erosion Control and Stormwater Management Ordinance effective August 22, 2002, acting on the recommendation of the Dane County Lakes and Watershed Commission after 11 public hearings and hundreds of hours of meetings with citizens, technical experts, developers, builders, local municipalities, and other stakeholders. The Board found that construction site erosion and uncontrolled stormwater runoff from land disturbing and land development activities have significant adverse effects upon regional water resources including the health, safety, property and general welfare of the community, diminishing the public enjoyment and use of natural resources. The Board also found that effective erosion control, sediment and stormwater management depends on proper planning, design, timely installation and continued maintenance of erosion control and stormwater management practices. Specifically, they found that soil erosion and stormwater runoff can:

- carry sediment, nutrients, pathogens, organic matter, heavy metals, toxins and other pollutants to regional lakes, streams and wetlands;
- diminish the capacity of water resources to support recreational and water supply uses and a natural diversity of plant and animal life;
- clog existing drainage systems, increasing maintenance problems and costs;
- cause bank and channel erosion;
- increase downstream flooding;
- reduce groundwater recharge, which may diminish stream base flows and lower water levels in regional lakes, ponds and wetlands;
- contaminate drinking water supplies;

- increase risk of property damage and personal injury, and; cause damage to agricultural fields and crops.

Effective January of 2006, revisions to the erosion control and stormwater management ordinance were made to meet state standards for infiltration and to make shoreland erosion control requirements of Chapter 11 consistent with Chapter 14. Dane County chose to adopt the state’s infiltration standards, with few modifications. One significant change was a sunset date for the caps that limited that amount of area required to be dedicated to infiltration (State rules require only one percent of a residential site and two percent of a nonresidential site to be dedicated to infiltration). The other significant change was the elimination of the design storm approach (utilizing TR-55) to meet the infiltration requirements. The Dane County Lakes and Watershed Commission also assembled an infiltration taskforce to explore regulatory alternatives to caps and evaluate stormwater infiltration in Dane County. The taskforce included members from the academic, development, municipal, regulatory communities, and watershed groups. After nearly a year of work, the taskforce returned to the Dane County Lakes and Watershed Commission with a full report including a unanimous recommendation to remove the caps and include an alternative recharge performance standard. The revised infiltration requirements were adopted in August of 2006, and are now effective.

1.2 ORDINANCE APPLICABILITY AND ADMINISTRATION

Construction site erosion control plans and permits are required for any of the following:

- Land disturbance more than 4000 square feet.
- Land disturbance on a slope more than 12%.
- Land disturbance involving excavation and/or filling more than 400 cubic yards of material.
- Land disturbance of more than 100 lineal feet of road ditch, grass waterway, or other area where surface drainage flows in defined, open channels.
- New public or private roads or access drives longer than 125 feet.
- Development that requires a subdivision plat.
- Land disturbance less than 4000 square feet that has a high risk of soil erosion or water pollution, as determined by local ordinance administration.
- Land disturbance of any size in the shoreland zone, which includes any of the following areas:
 - Within 300 feet of the ordinary high-water mark of any navigable water or 1000 feet of a lake or pond.
 - Within the 100 year floodplain.
 - Within 75 feet of the shoreland or inland wetland district.

Stormwater management plans and permits are required for any of the following:

- Development that results in the *cumulative* addition of 20,000 square feet of impervious surface to the site (since August, 2001).
- Construction of agricultural buildings where the *new* total impervious surface area exceeds 20,000 square feet.
- Development requiring a subdivision plat.

- Commercial or industrial development that requires a certified survey map.
- Redevelopment exceeding 4000 square feet of land disturbance where the site is predominantly developed to commercial, industrial, institutional or multifamily residential uses.
- Other development or redevelopment that may have significant downstream impacts as determined by the local approval authority (In unincorporated areas, this is the Dane County Land and Water Resources Department (LWRD) Director).

If the site requires erosion control and stormwater management plans and permits, one combined plan and permit is issued. “Site” is defined in the ordinance as any bounded area described in the erosion control plan or stormwater management plan.

- Some land disturbing activities may be exempt from county and state erosion control requirements. Certain state building projects and highway projects are subject to Wisconsin Administration Code Chapter Trans 401. Refer to Dane County Chapters 11.05(2) and 14.47 for a complete exemption list.

Figure 1.2-1 assists in determining which types of permits would be required for projects being considered.

START HERE *Refer to Dane County Ordinances

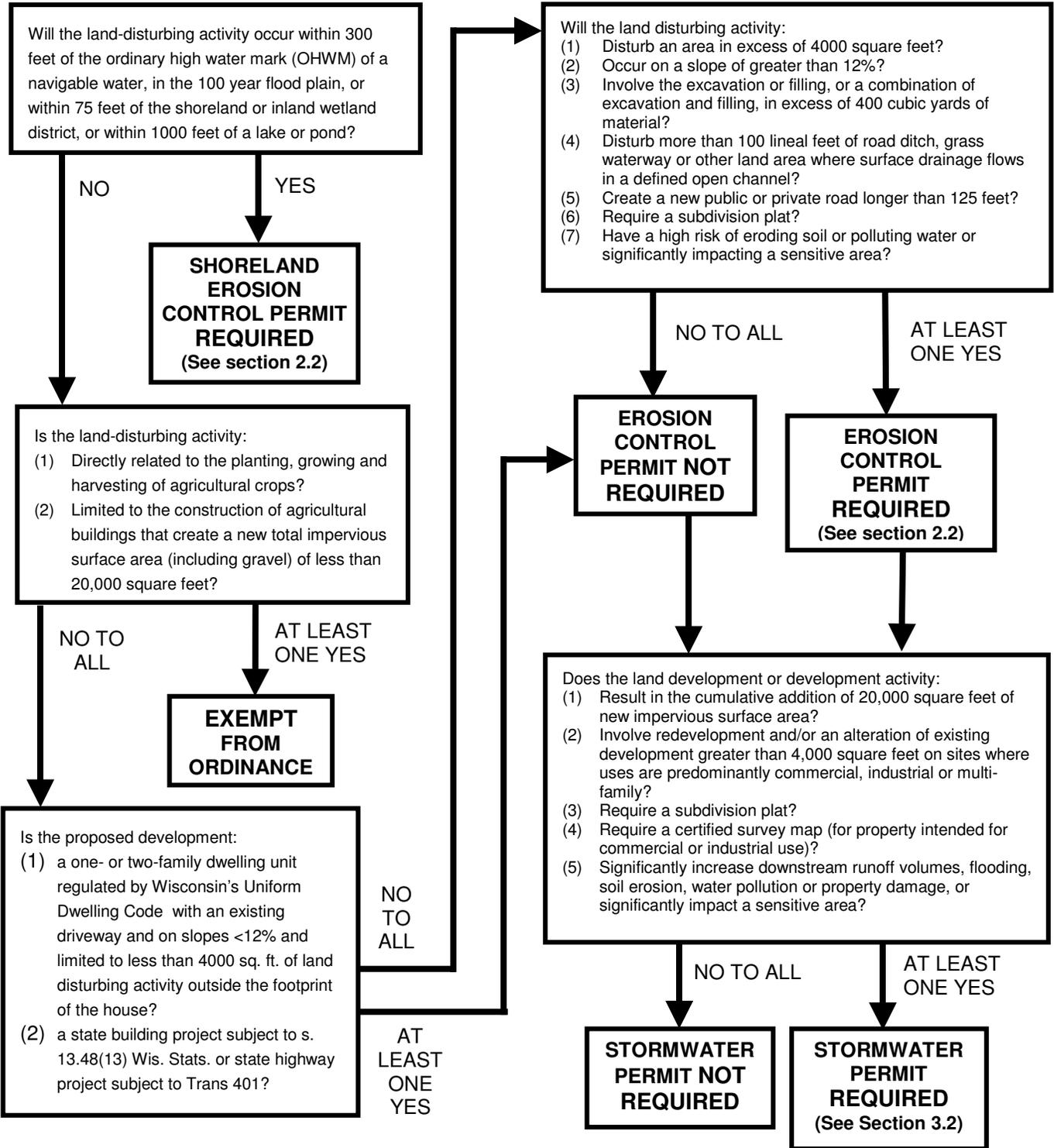


Figure 1.2-1 Permit Selection Chart

Preliminary Review Letter

A preliminary review letter provides a potential permit applicant with an initial evaluation of whether erosion and stormwater control standards can be met for a proposed site, lot layout, or construction design. A preliminary review is required to qualify for certain shoreland erosion control plan requirement exceptions. This general review is intended to assist applicants in preparing general site plans and other submittals necessary to obtain an erosion control and/or stormwater permit. A preliminary review letter does not guarantee that an erosion or stormwater control plan will be approved or that a permit will be issued.

Although cities and villages are not required to include a preliminary review process in their ordinances, Dane County strongly encourages use of this practice. The early consultation before lot line, road and infrastructure decisions have been made is especially helpful for first-time or one-time developers.

Administration

The ordinance sets countywide standards and gives the necessary flexibility to local governments and developers so they can administer and meet those standards effectively and efficiently.

- The ordinance is administered by the Dane County Land and Water Resources Department, Land Conservation Division, in unincorporated areas (towns).
- Cities and villages (incorporated areas) administer the ordinance if they have adopted stormwater and erosion control standards at least as restrictive as the county ordinance.

Models Accepted

The various models currently accepted for use in calculating hydrology, infiltration, soil erosion rates, water quality impacts and temperature impacts include P8, RECARGA, TR-55, SLAMM, USLE (RUSLE2, when available), TURM, and Stokes Law.

Land Conservation Division staff review new analytical tools for use with the Erosion Control and Stormwater Management Ordinance. The user community is encouraged to submit models for consideration. The LWRD Director, per Section 14.53(3) of Dane County Code of Ordinances, may approve new models. Description of the model, relevant mathematical analysis, relevant supporting documentation, simplicity of model, consistency of parameter estimates and sensitivity of results to changes in parameter values will all be considered when evaluating new models.

Fees

The ordinance allows local authorities to establish their own fee schedules for erosion control and stormwater management permits within incorporated areas. In unincorporated areas, fees are set by Dane County.

Enforcement

Dane County will work with municipalities for consistent enforcement of the county minimum standards.

- The ordinance requires builders, developers and other site planners to submit erosion control and stormwater management plans. If a site is not in compliance with its plan as determined by inspection, a stop-work order may be issued and the administrator may levy fines.
- If a city or village does not adopt standards at least as restrictive as the county ordinance or has adopted county standards but the Lakes and Watershed Commission finds that they are not effectively administering and enforcing them, the Dane County Land and Water Resources Department will administer the provisions of the ordinance in that municipality.

1.3 STATE NONPOINT PROGRAM REDESIGN IMPLICATIONS FOR DANE COUNTY

In response to two state legislative acts, the state of Wisconsin has been working for the past several years to redesign its nonpoint source programs. The redesign resulted in eight administrative rules, one of which is NR 151, Runoff Management. NR 151 includes construction site and post-construction runoff pollution performance standards. The complete text of the rule can be found on the Department of Natural Resources web site, at:

<http://www.dnr.wi.gov/org/water/wm/nps/admrules.htm>.

Dane County staff worked closely with DNR staff throughout development of the Dane County Erosion Control and Stormwater Management Ordinance and its amendments. Compliance with Dane County's Erosion Control and Stormwater Management standards have been deemed more restrictive or equivalent to the standards contained in NR 151.

1.4 SITE AND REGIONAL PLANNING

Site Planning Techniques to Minimize Stormwater Runoff

Good stormwater management does not begin with site disturbance and construction. Decisions about lot layout, building density, location of public rights-of-way, protection of sensitive areas, and preservation of open space all have an impact on the quality and quantity of stormwater runoff. To encourage early consideration of these issues, the Dane County Erosion Control and Stormwater Management Ordinance includes a voluntary Preliminary Review consultation that takes place before land is platted and the final design is set (refer to page 5, the "Preliminary Review Letter" section of manual).

When using site-planning techniques to control stormwater, designers should keep local zoning, land division and building codes in mind. Many communities have adopted site design or land division criteria to serve a variety of land use goals that may or may not directly relate to stormwater runoff. Examples include:

- preserving neighborhood or rural character
- protecting specific natural or scenic resources
- promoting smooth traffic flow
- allowing for future land division
- ensuring adequate pedestrian, bicycle or emergency vehicle access

Usually, such goals complement or reinforce good design for stormwater control. However, in some cases, such as choosing between grid-pattern or cul-de-sac street layouts, the designer may need to strike a balance between competing land use goals. For example, in a community seeking to promote

traditional neighborhood design, engineered stormwater basins may be preferable to a curvilinear street layout.

Many techniques can be employed during the site planning and design stage of development to reduce the volume of runoff, thus reducing the need for structural practices to store and treat stormwater. Design and location of stable outlets for site runoff is also important to consider at this time, to avoid causing problems for downstream neighbors. Consider implementing the following techniques to minimize the volume of stormwater runoff.

Identify and Avoid Sensitive Areas

Local variations in topography, soil types, vegetation and hydrology can have a significant influence on the nature and amount of stormwater runoff. The first step in site planning for stormwater management should be identification and mapping of areas that:

- contain features that could be adversely impacted by stormwater runoff (such as wetlands, floodplains, lakes, streams, and shallow fractured bedrock);
- in their natural state, contribute to infiltration, soil and water retention, groundwater recharge or temperature control (such as highly pervious soils, native grasslands, woodlands or hydric soils);
- provide natural drainage ways for surface water runoff (such as intermittent or perennial streams, natural or artificial drainage ways); or
- could be a source of sedimentation, channelized flow or erosion if disturbed (such as steep slopes or easily eroded soils).

Development should be designed and construction operations planned to avoid disturbing these areas wherever possible. Federal, state or local regulations protect some natural features, such as wetlands or navigable waterways. Changes in volume and direction of stormwater flow resulting from development or other stormwater practices should be carefully designed and controlled to avoid secondary impacts to natural areas. For example, increased runoff volume can erode streambeds and banks or damage natural wetlands without careful consideration early in the planning process.

Working around sensitive areas should be incorporated as part of the preliminary design, which not only avoids these areas but also highlights them as natural amenities that add value to the development. These sensitive areas complement the functions and values provided by the countywide network of open space corridors.

Minimize Impervious Surfaces

Imperviousness is the primary source of runoff. Hence, the single most effective means of reducing runoff volume is by minimizing the site's impervious surface area.

Streets and Roads

- *Road length.* Minimize subdivision roadway length by using a roadway layout with the least pavement length suitable for the site's topography and other planning goals.
- *Road width.* Work within local zoning requirements and planned unit development provisions to minimize road width by narrowing road sections and/or reducing on-street parking. On-street parking may be restricted to one side of the street or eliminated altogether. Pavement and right-

of-way width must still meet minimum standards described in local land division and zoning ordinances, and should allow for safe vehicular travel and emergency vehicle access.

- *Design road patterns to match landforms.* In rolling terrain, for example, local streets should branch from collector streets and end in short loops or cul-de-sacs, where consistent with other local ordinances and land use goals. Some local ordinances and plans seek to create traditional grid patterns or limit the use of cul-de-sacs to address traffic, neighborhood character or other design objectives.

Lot Layout

- *Rooftops.* Reduce the impervious rooftop area by minimizing the building footprint of houses or utilizing green roof technology. Use vertical space rather than horizontal house layouts.
- *Driveways.* Where permitted under local driveway, zoning or land division ordinances, reduce impervious driveway area by using shared driveways, limiting driveway width, using pervious pavement, and using reduced building setbacks.
- *Parking lots.* For commercial sites, reduce overall impervious area by providing compact car spaces, eliminating excessive or unnecessary spaces, utilizing shared parking, minimizing stall dimensions, incorporating efficient parking lands, and using pervious materials in spillover parking areas.

Site and Lot Vegetation

- *Predevelopment vegetation.* Maintain as much predevelopment vegetation as possible. Vegetation prevents erosion and absorbs water and, therefore, reduces runoff volume.
- *Swales.* Use shallow grassed roadside swales, boulevards and sunken parking lot islands with check dams instead of curb and gutter storm drain systems to handle runoff, wherever possible.
- *Natural buffers and drainage ways.* Maintain natural buffers between development sites and water bodies. Buffers slow runoff, remove sediment and enhance infiltration. Natural depressions and channels should be maintained to slow, store, and infiltrate water.

Preserve and Reproduce Pre-Development Hydrologic Conditions

- *Utilize natural drainage flow paths.* Dane County strongly recommends the use of grass waterways, vegetated drainage channels and/or water quality swales along street right-of-ways or back lots to channel runoff without abrupt changes in the direction of flow.
- *Restore soil permeability.* Use practices such as deep tilling, chisel plowing and incorporating organic matter into the upper soil layer to restore soil infiltration capacity on heavily disturbed sites. When soil is compacted its capacity to infiltrate water is greatly diminished. On heavily disturbed sites where practices are used to restore soil permeability, the county may waive the requirement to lower the soil permeability class rating in hydrologic calculations. Compaction mitigation is required when disturbed green space is included in recharge calculations (refer to Chapter 3).
- *Minimize directly connected impervious area.* Downspouts and driveways should be directed to pervious areas, where feasible. This reduces the directly connected impervious area, promotes infiltration and reduces the velocity of runoff water. Other strategies for minimizing connected impervious area include directing sheet flow through vegetated areas and locating impervious areas so they drain to vegetated buffers or other pervious areas.
- *Use bioretention and other practices to increase infiltration.* Bioretention basins are engineered practices that use natural processes, including microbial soil processes, infiltration, and evapotranspiration

to improve stormwater quality. Rain gardens, often very attractive, are one type of practice commonly designed for residential lots to soak up rainwater from roofs, driveways, and lawns. A detailed design manual addressing sizing, costs, species, etc. is available from the Wisconsin Department of Natural Resources and UW Extension Rock trenches or rock beds can also be used as a conduit to more permeable layers with higher percolation rates. The Appendices list design and maintenance recommendations for these and other practices.

Case Example: St. Francis Addition to the Village of Cross Plains

The St. Francis Addition is a 72-acre, 80-lot subdivision in the Village of Cross Plains that demonstrates good site planning. Brewery Creek, a cold-water community and a tributary to the cold-water community of Black Earth Creek, runs through the site. During the site planning process, hydric soils to be avoided were mapped, as well as permeable soils where infiltration practices could be located. Figure 1-4.1 shows the soil permeability analysis prepared for the preliminary plat, identifying the ideal locations for infiltration practices. A comprehensive study was designed to evaluate both the physical and biological in-stream response resulting from this development. The results of this study concluded that the erosion control and stormwater management plans that were designed and implemented by the developer of the subdivision were effective in mitigating the harmful effects of runoff to Brewery Creek. The complete USGS publication can be viewed in PDF at http://pubs.usgs.gov/sir/2004/5156/pdf/SIR_2004_5156.pdf.

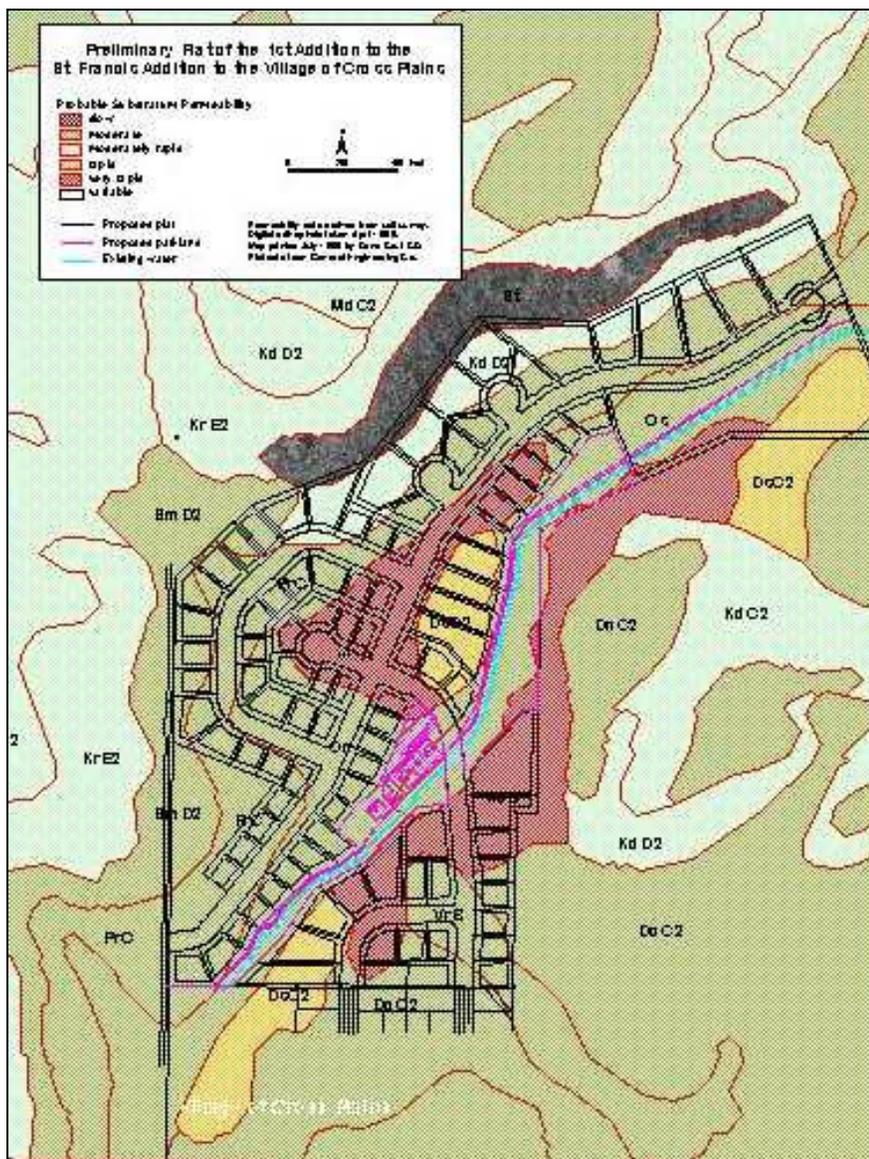


Figure 1.4-1 St. Francis Addition Permeability Analysis

Following the site analysis, a site plan was prepared which incorporated the following practices:

- naturally vegetated buffer to Brewery Creek
- protected existing wooded areas
- deep tilling to increase infiltration and reduce other effects of soil compaction
- stormwater storage and infiltration swales behind all house sites
- stormwater storage and infiltration swales within cul-de-sacs and boulevards
- narrower street widths (16' boulevard lanes; 28' street widths wherever possible)

Figure 1.4-2 is a detail from the site plan, indicating infiltration and other practices.

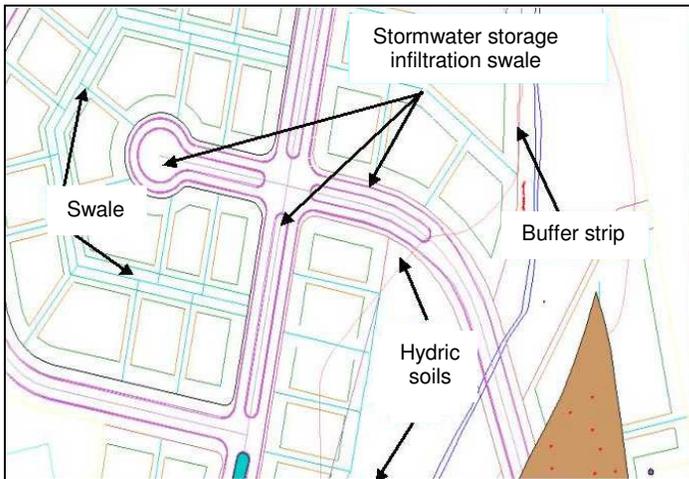


Figure 1.4-2 Detail from St. Francis Addition Plan

How to Credit Conservation and Low-Impact Design

Many of the practices and techniques discussed above are commonly referred to as “conservation design” or “low-impact design.” Figure 1.4-3 compares a conventional subdivision layout with a subdivision incorporating conservation design practices. During plan review, conservation design and other practices will be evaluated to ensure that the plan meets or exceeds ordinance requirements. Less imperviousness results in less runoff to treat or store, resulting in smaller structural practices needed to comply with requirements, resulting in lower development costs (related to structure size). Reducing peak rate and runoff volume also means less land will need to be set aside for peak rate and volume control which may result in less engineering design, and may contribute to lower development costs.

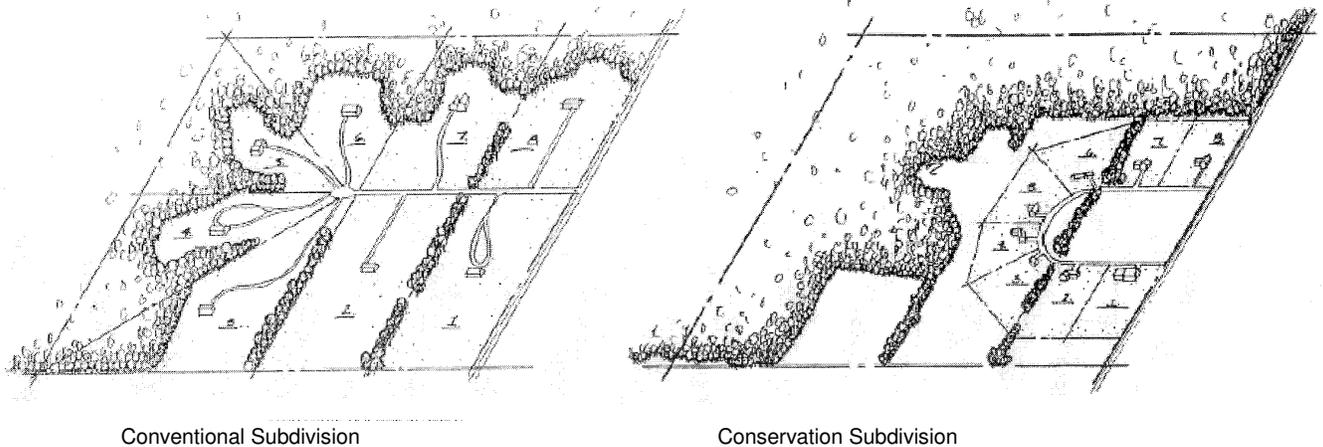


Figure 1.4-3 Comparing conventional and conservation subdivisions. Source: Ordinance for a Conservation Subdivision, UWEX, Brian Ohm.

Dane County encourages conservation design by providing incentives in the ordinance for features commonly associated with conservation or low impact practices. When developers incorporate such practices, they reduce the runoff that needs to be treated by other engineered

practices. Limiting the disturbed area may reduce construction costs and minimize the need for erosion control practices.

Dane County's ordinance fee structure also provides an incentive for reducing imperviousness and minimizing land disturbance. Permit fees are calculated based on amount of disturbed area and amount of impervious area.

Regional Stormwater Treatment

Dane County's Erosion Control and Stormwater Management Ordinance does not prohibit regional treatment for stormwater management. A regional stormwater treatment facility can increase efficiency of treatment and ease maintenance. These facilities improve sediment trapping with a larger pool of water in the detention pond, and avoid problems that can arise from many smaller on-site treatment facilities all releasing water at the same time. Regional facilities, however, are not adequate for meeting the soil loss standard during land disturbance and may not be the best strategy for stormwater infiltration.

Cities and villages in Dane County that have adopted regional stormwater plans may want to establish a "fee-in-lieu" program and identify its requirements in their ordinances. Fee-in-lieu programs allow developers to pay a fee rather than install on-site control measures where these may not be desirable. The fee is put into a dedicated fund to recoup the costs for construction, operation, and maintenance of regional or multipurpose detention facilities. **Fee-in-lieu may not be used as an alternative to meeting the county's minimum standards.**

Dane County's ordinance allows municipalities that establish a fee-in-lieu program to allow owners of sites served by an off-site stormwater management facility to pay a fee-in-lieu of on-site control. However, the ordinance requires that these municipalities only allow this if the regional facility is in place at the time of land disturbance, is designed and adequately sized to provide a level of stormwater control capable of meeting county standards, and has a legally-obligated entity responsible for its long-term operation and maintenance. Regional facilities must be in place at the time of land disturbance to prevent situations where a landowner pays a fee-in-lieu of on-site control, yet the regional facility is never built, or built after a delay of years, resulting in uncontrolled and untreated stormwater runoff.

Watershed-Wide Planning for Stormwater Management

The Dane County ordinance, while focusing on plans and practices to meet the erosion control and stormwater needs of particular sites, complements watershed-wide planning. Ideally, stormwater management should be conducted as part of a watershed plan.

In watershed-wide planning, communities can work together across municipal boundaries to identify potential locations for regional stormwater treatment facilities, and coordinate on-site basins and outlets to reduce the effect of combined peak discharges after storm events. They can also collectively identify areas where stormwater detention facilities should not be located, e.g. in hydric or alluvial soils, and target areas where they are preferred, e.g. deep sandy soil. Such a collaborative approach may result in significant cost savings from economies of scale and shared responsibility.

Sources

“An Introduction to Better Site Design” in *The Practice of Watershed Protection*. Edited by Thomas R. Schueler and Heather K. Holland. The Center for Watershed Protection, Ellicott City, MD 21043. 2000. pp. 253-262.

“Bioretention as a Stormwater Treatment Practice” in *The Practice of Watershed Protection*. Edited by Thomas R. Schueler and Heather K. Holland. The Center for Watershed Protection, Ellicott City, MD 21043. 2000. pp 548-550.

“A Model Ordinance for a Traditional Neighborhood Development” by Brian W. Ohm, James A LaGro Jr., and Chuck Strawser, 2001, University of Wisconsin-Extension (available at: <http://www.uwex.edu/ces/cty/green/cnred/documents/TraditionalNeighborhoodDesignOrdinance.pdf>).

“Rain Gardens: A household way to improve water quality in your community” brochure published by the Wisconsin Department of Natural Resources and University of Wisconsin-Extension in February, 2002. (<http://clean-water.uwex.edu/pubs/home.htm> - rain) UW-Extension Publication GWQ 034.

Low-Impact Development: An Integrated Design Approach, June 1999, Prince George's County, Maryland, Department of Environmental Resources.

Dane County Land Use and Transportation Plan. June 1997. Dane County Regional Planning Commission.

“How to Build A Rain Garden.” brochure published by Dane County Lakes and Watershed Commission, 2006 (available at: <http://www.danewaters.com/pdf/HowToBuildaGarden.pdf>).

