

**CITY OF MADISON  
INTER-DEPARTMENTAL  
CORRESPONDENCE**

**DATE:** February 18, 2009  
**TO:** Bradley Murphy, Planning and Development  
**FROM:** Larry D. Nelson, City Engineer  
**SUBJECT:** Stormwater Management & Sustainability Goals in the Northeast Neighborhood Plan

You requested that Engineering staff review the most recent proposed modifications to the resolution regarding the above development area as they regard stormwater infiltration.

On October 1, 2004 the WDNR implemented Administrative Code NR-151. This code created, for the first time, statewide stormwater quality discharge requirements for new development, redevelopment, and infill development. These standards included controls on Total Suspended Solids (TSS), Oil & Grease, Detention and Infiltration. At the time the new code was issued, the City of Madison had existing standards that were more restrictive than the new statewide standards but for the infiltration requirement.

Subsequent to the adoption of the requirements of NR-151 the WDNR used the Standards Oversight Council (SOC) process to create technical guidance to meet these standards. The technical standards are designed to create infiltration devices that are designed and constructed in an extremely conservative manner. This conservative design guidance was agreed upon in an effort to reduce the significant number of failures these systems have experienced in a short time. The Center for Watershed Protection, in Maryland, studied several types of these devices and found that in a sample of 60 practices that had been in service for times ranging from 6-months to 6-years that 37 of the 60 practices had failed. This is a greater than 50% failure rate in 6-years or less. I think we can all agree that from the perspective of a public works facility a 6-year life cycle is not sustainable.

Since the creation of NR-151, which had some land dedication limits or "caps" included, Dane County has strengthened the State code by removal of this "cap" and replaced it with a secondary standard for "recharge". This action has resulted in all new residential development in Dane County now provides 90% of the predevelopment stay-on (stay-on = recharge + evaporation + transpiration) and that all commercial development meets 60% of the predevelopment stay-on.

City Engineering was requested to propose a change to the stormwater regulations that would improve stormwater quality in newly developing areas. During our discussions on this, it was determined that increasing infiltration requirements was not an effective goal because of the limitations specified in the Code for stormwater infiltration. While we could set a more restrictive goal, more developments would request a variance based on the "maximum extent practicable" language in the Code.

Rather, it was decided that it would be better to improve the design of many of the infiltration features being constructed in new plats. Compliance with NR-151 is typically gained through the design and construction of two (2) ponds (one pretreatment retention pond and one infiltration basin) at the bottom of the hill. This standard design replaced the single pond at that bottom of the hill that has been the standard since the mid-1990's. While the single pond system worked well for ponds designed to detain water and capture sediment the design is less robust for systems designed to infiltrate water.

This flaw has been well understood for some time as concentration of water you are trying to infiltrate makes it much more likely that the device you are using to infiltrate that water will become clogged with sediment carried by that water. The solution is to infiltrate water closer to where it is generated and before it has the opportunity to mix with water from many other sources. With this in mind the language for the original proposed resolution proposed to keep the standards the same but require 25% of the infiltration take place where the water is generated.

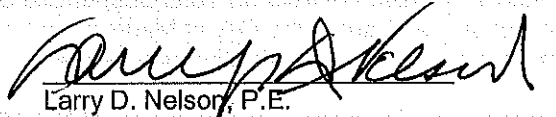
MEMORANDUM FOR THE CITY ENGINEER  
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Actually achieving this goal is difficult, given the small lots in this neighborhood plan. (It would not be problem with the lots were an acre or size or larger.) This design will require more land, more construction resources and increased maintenance costs. But, we understand that the engineers representing have concluded that that 25% goal is achievable but with considerable effort.

In the opinion of Engineering Staff the changes proposed by the Sustainable Design and Energy Committee requiring the infiltration of 100% of stormwater volume on or adjacent to points of generation is not technically feasible and is likely not legal or desirable in all circumstances with the size of lots being created in the North-East Neighborhood Plan.



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