



*Village of Menomonee Falls*  
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*Approved by the Village Board as Official Policy on December 20, 2004*

## **STORMWATER MANAGEMENT DESIGN GUIDELINES**

The following types of developments shall be subject to onsite detention, runoff, and water quality control provisions.

- All Developments with a gross aggregate impervious area of 10,000 square feet (0.23 acres) or more.
- All Developments subject to the Chapter 13 Stormwater Rules of the Milwaukee Metropolitan Sewerage District (MMSD) Rules and Regulations.
- Developments which, in the opinion of the Village Engineering Department, will exceed the safe capacity of the existing downstream drainage facilities, or the receiving water body, or will cause erosion or water pollution, or will otherwise endanger downstream property owners or their property. Safe capacity is defined as the rate of flow that can be conveyed without the potential for flooding damages.

Developments subject to the onsite detention and runoff control provisions shall provide onsite storage or other approved arrangements to safely accommodate runoff from the site. Storm water computations shall be submitted according to the Chapter 13 Stormwater Rules of the Milwaukee Metropolitan Sewerage District Rules and Regulations. The analysis shall be submitted to and approved by the Village of Menomonee Falls Engineering Department prior to any construction activities. In the MMSD sanitary sewer service area only, the stormwater management report shall also be approved by the MMSD in compliance with Chapter 13 of the MMSD Rules and Regulations.

The stormwater management facilities shall contain sufficient storage to contain the runoff from the developed condition as determined by one of the following methodologies:

- Unit Release Rate Method: to meet the requirements for the 100 and 2-year allowable peak release rates of Chapter 13 of the MMSD. The release rates are 0.5 cfs/acre for 100-year events and 0.15 cfs/acre for 2-year events.
- The Volumetric Design Process (VDP) from Chapter 13 of the MMSD especially for 'pass-through' flow situations from offsite tributary areas.

In addition, water quality control shall be provided through either retention basins or other approved devices. The water quality treatment shall remove a minimum of 80% of total suspended solids (TSS) from the development in accordance with the requirements in the Wisconsin Administrative Code Ch. NR 151.

### DESIGN CRITERIA

The stormwater management facilities shall be designed with the following parameters incorporated into the design:

1. The preliminary sizing for the infiltration device(s) shall be in accordance with the maximum area requirements in NR 151 of 1% of the total project site area unless a final Site Evaluation for Stormwater Infiltration, Wisconsin DNR Technical Std. 1002 or final design is submitted. The preliminary plat shall contain sufficient area to provide this sizing. The infiltration facilities shall be located in an outlot and not in proposed lots.
2. The preliminary sizing for the water quantity and quality control shall be in accordance with the MMSD Surface Water and Storm Water Rules Guidance Manual guidelines of 0.3 acre-feet of storage per acre of proposed impervious area unless a final design is submitted. The preliminary plat shall contain sufficient area to provide this sizing. The stormwater management facilities shall be located in an outlot and not in proposed lots.
3. The analysis shall contain inflow and outflow hydrographs, basin routing and stage-storage-discharge graphs for the 2 year, 10 year, 50 year and 100 year events.
4. The rainfall depths to be used for the analysis shall be those from the **Rainfall Frequency Atlas of the Midwest**, Bulletin 71 of the Illinois State Water Survey, 1992, by Floyd A. Huff and James R. Angel. Please see Exhibit A for these design rainfall depths for 24 hours. These rainfall depths shall supercede those presented in Chapter 13 of the MMSD Rules and Regulations, SEWRPC Technical Report No. 40 or the National Weather Service Technical Paper No. 40 (NWS TP-40).
5. The rainfall distribution curves to be used shall be the SCS Type II as presented in TR-55 and TR-20 or the SEWRPC 90<sup>th</sup> Percentile in Technical Report 40.
6. The design shall include a summary table with peak water surface elevations, peak discharge rates, and storage volumes at each of the required events.
7. The design shall include configuration details of the stormwater management facilities. Computations and details of all discharge structures including emergency overflow provisions shall be incorporated.
8. The pond slopes below normal water elevations shall be a maximum of 6: 1 (H:V) for the first two feet of normal depth.
9. The side slopes between the normal water level and the design high water level shall be a maximum of 4:1 (H:V).
10. The top width of the embankment (a berm or structure of earth built or created to retain water in a reservoir) shall be a minimum of ten (10') feet wide.
11. A two-foot freeboard shall be provided around the stormwater management facilities except at the emergency overflow structure.
12. The design shall include an analysis of the path of the stormwater runoff that would be in excess of the 100-year recurrence event in the developed condition or in case of failure of the discharge structures.
13. In conjunction with the requirements for landscaping of the developments, the following restrictions shall be adhered to. When developing the landscape plan, embankments (berms) shall be kept clear of woody vegetation. In addition, woody vegetation shall be kept clear from all areas within 25 feet of the discharge structures including the emergency overflow devices and from areas inside the basin which are below the design high water level.
14. The proposed stormwater management practices shall not be located in a mapped regional floodplain, an area designated as regulated wetlands, or an area that is inundated in the 100 year event as determined by an engineering study. The only exceptions shall be those detention/retention basins designated by a Village approved watershed or sub-watershed stormwater management plan or local stormwater management plan that is regional in nature.

15. Water quality computations shall be provided for the effectiveness of the treatment of the developed runoff. If the retention basin is designed and built to the Wisconsin Dept. of Natural Resources Technical Standard: Wet Detention Basin No. 1001, the area tributary to the basin will be considered as meeting the minimum 80% TSS removal without need of further computations. Alternatively, computational methods may be submitted. The acceptable methods shall include SLAMM or other models as approved by the Engineering Dept.
16. A final analysis and report encompassing all the guidelines listed above shall be submitted for approval. The report shall follow the format described in the Chapter 13 rules. The report shall include design assumptions, computations, conclusions and solutions. Also, flow rates for each stormwater discharge point off the site shall be summarized in a table. The submittal shall coincide with the submittal of the proposed grading plan.
17. If the grading plan is subsequently revised, the stormwater management report shall be similarly revised to account for the revisions.

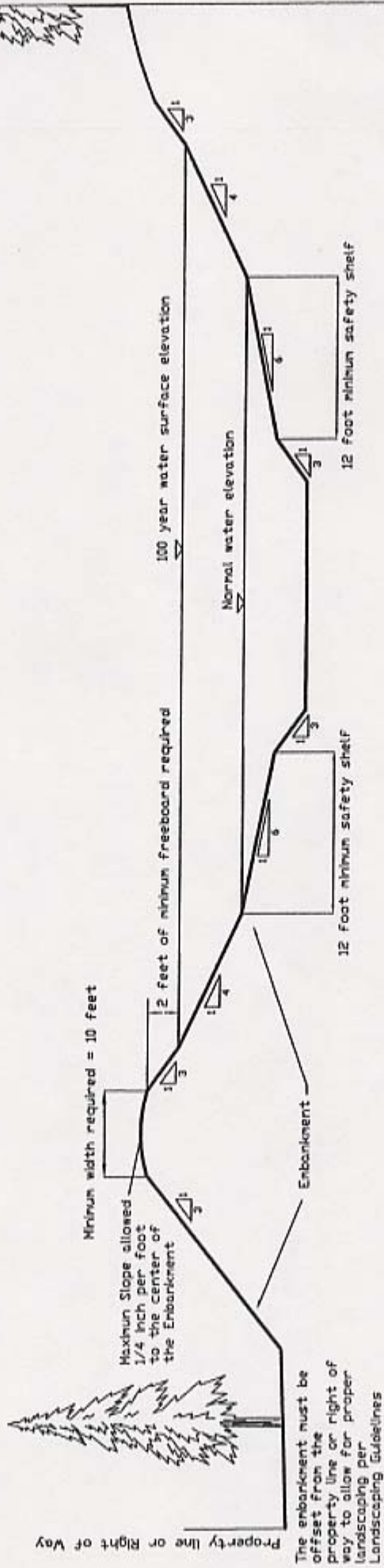
**Exhibit A - Design Rainfall Depths**

Recurrence Interval (years ) 24- Hour Duration	Design Rainfall Depths* (inches)
100	7.1
50	5.8
25	5.0
10	4.0
5	3.3
2	2.6

\*Note: From the isohyetal maps in the Rainfall Frequency Atlas of the Midwest, Bulletin 71 of the Illinois State Water Survey, 1992, by Floyd A. Huff and James R. Angel.

**Exhibit B – Typical Stormwater Basin Cross-Section follows on next page.**

# VILLAGE OF MEMOMONEE FALLS Typical Pond Cross Section



MEMOMONEE FALLS ENGINEERING DEPT.	
DRAWN BY: <u>Jon Brett</u>	SCALE: <u>NTS</u>
CHECKED BY: <u>Jeff Nettlesheim, P.E.</u>	
DATE: <u>9/20/04</u>	FILE NUMBER: <u>MEM04-141-Drawings\pondcrosssection.dwg</u>