

# New Hampshire Stormwater Manual - Errata Sheet

The following is a list of errors found in the New Hampshire Stormwater Manual. Format errors will not be listed on the errata sheet, but will be revised to the best of NHDES's knowledge in the upcoming revision. It is anticipated that the first revision to the December 2008 manual will be made by the end of 2009. Until that time, please refer to the below corrections. Please email Amy Clark at [amy.clark@des.nh.gov](mailto:amy.clark@des.nh.gov) if you find any other errors. Please note the page number and a description of the error.

## Volume 1: Stormwater and Antidegradation

DATE POSTED	PAGE	DESCRIPTION OF ERROR
4/2009	Page 105 – Appendix E	<p>Information on the literature references was inadvertently omitted. They are as follows:</p> <p><b>Sources A-F are as reported in the EPA Region 5 Model:</b></p> <ul style="list-style-type: none"> <li><b>A.</b> Appendix D Model Best Management Practice Selection Methodology &amp; Lake County Decision-Making Framework, NIPC. July 1994.</li> <li><b>B.</b> <a href="http://www.epa.gov/owow/wtrl/NPS/MMGI/Capter4/table407.gif">www.epa.gov/owow/wtrl/NPS/MMGI/Capter4/table407.gif</a>.</li> <li><b>C.</b> <a href="http://ohioline.ag.ohio-state.edu/aex-fact/0467.html">http://ohioline.ag.ohio-state.edu/aex-fact/0467.html</a>.</li> <li><b>D.</b> Athayde 1983</li> <li><b>E.</b> Schueler. 1987.</li> <li><b>F.</b> Model Stormwater Regulations. Duxbury, Marshfield, and Plymouth, MA. Horsley Witten Group. December 31. 2004. (Suggested Average assumes no practice is greater than 90% efficient. Median values are shown in parentheses.)</li> <li><b>G.</b> 2005 Data Report. University of New Hampshire Stormwater Center. University of New Hampshire. <a href="http://www.unh.edu/erg/cstev">www.unh.edu/erg/cstev</a> and personal communication with Dr. Robert Roseen.</li> <li><b>H.</b> Unpublished 2007 Draft Report. Seasonal Variations for Stormwater Management Systems in Cold Climate Condition. Robert M. Roseen, Thomas P. Ballestero, James Houle, Pedro Avelleneda, Joshua Briggs, George Fowler, Robert Wildey. University of New Hampshire.</li> <li><b>I.</b> <a href="http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm">http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm</a></li> </ul> <p><b>Sources J - M are as reported in the Stormwater Center website <a href="http://www.stormwatercenter.net/Pollution_Prevention/Factsheets/Catchbasins.htm">www.stormwatercenter.net/Pollution_Prevention/Factsheets/Catchbasins.htm</a>:</b></p> <ul style="list-style-type: none"> <li><b>J.</b> Pitt, R., M. Libum, S. Nix, S. Durrans, and S. Burian. 1997. Guidance Manual for Integrated Wet Weather Flow Collection and Treatment Systems for New Urbanized Areas. USEPA. Office of Research and Development. Cincinnati, OH.</li> <li><b>K.</b> Aronson, G., D. Watson, and W. Pisaro. 1983. Evaluation of Catch Basin Performance for Urban Stormwater Control. EPA-600/2-83-043.</li> <li><b>L.</b> Pitt and Shawley, 1982 (no other information given in Stormwater Center website)</li> <li><b>M.</b> Mineart, P. and S. Singh. 1994. Storm Inlet Pilot Study. Woodward-Clyde Consultants. Alameda County Urban Runoff Clean Water Program. Oakland, CA.</li> </ul>

		<p><b>Source N is as reported in the Low Impact Development Center website <a href="http://www.lid-stormwater.net/bioretention/bio_benefits.htm">www.lid-stormwater.net/bioretention/bio_benefits.htm</a>:</b></p> <p><b>N.</b> Yu, S.L., X. Zhang, A. Earles and M. Sievers, 1999: Field testing of ultra-urban BMPs. Proceedings of the 26th Annual Water Resources Planning and Management Conference ASCE, 609 June, Tempe, Arizona.</p> <p><b>Source O is as reported in the EPA's National Management Measures to Control Nonpoint Source Pollution from Urban Areas (Nov 2005) pg 3-17.</b></p> <p><b>O.</b> Herson-Jones, L.M., M. Hearty, and B. Jordan. 1995. Riparian Buffer Strategies for Urban Watersheds. Metropolitan Washington Council of Governments, Washington, DC.</p> <p><b>Source P is as reported in the Stormwater Center Library website at: <a href="http://www.stormwatercenter.net/Library/STP-Pollutant-Removal-Database.pdf">http://www.stormwatercenter.net/Library/STP-Pollutant-Removal-Database.pdf</a></b></p> <p><b>P.</b> Winer, Rebecca. 2000. National Pollutant Removal Performance Database for Stormwater Treatment Practices. 2nd Edition. Center for Watershed Protection. Elliot City, MD</p>
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## **Volume 2: Post-Construction Best Management Practices Selection & Design**

<b>DATE POSTED</b>	<b>PAGE</b>	<b>DESCRIPTION OF ERROR</b>
4/2009	Page 16-17	Format error – the example on page 16 continues below the first full paragraph on page 17. Items numbered 1 and 2 should be included in the shaded example box on page 16.
4/2009	Page 19	Item 7. on the bottom of the page should read as follows: “7. Within areas where the <del>design</del> infiltration rate is less than 0.5 inches per hour...”
4/2009	Page 124	In the design criteria, Bottom Width should read as follows: <del>4 to 8 feet</del> <b>0 to 8 feet</b> (widths up to 16 feet are allowable with dividing berm/structure such that neither channel width exceeds 8 feet).
4/2009	Page 125	The Example Design section should be labeled as follows: <b>“FREEBOARD (0.3M (1 FOOT) MINIMUM RECOMMENDED)”</b> .  <del>“0.3M (1 FOOT) MAX. 4”</del> <b>MAXIMUM WATER QUALITY TREATMENT DEPTH”</b>
4/2009	Page 127	The vegetated buffer types that are bulleted out should include “Ditch turn-out buffers”, which was inadvertently listed below in the general requirements section.
4/2009	Page 137	The allowable contributing area in the design criteria should read as follows:

- No area other than road surface, shoulder, and road ditch
- ~~≤500 feet of 1 travel lane + ditch~~
- ~~≤250 feet of 2 travel lanes + ditch~~
- ≤ 6,000 sq. ft. of pavement, ~~it > 2 lanes and ditch are directed to the buffer~~

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Replace table 4-10 and 4-11 with the following tables:

Table 4-10 Required Buffer Flow Path Length per Area Directed to the Buffer with 0% to 8% Buffer Slope

Hydrologic Soil Group of Soil in Buffer	Maximum Area Directed to the Buffer (square feet)	Length of Flow Path for Forested Buffer (feet)	Length of Flow Path for Meadow Buffer (feet)
A or B	3,000	50	70
	4,500	50	85
	6,000	60	100
C	3,000	60	100
	4,500	75	120
	6,000	100	150
D	3,000	100	150
	4,500	150	180
	6,000	200	230

Table 4-11: Required Buffer Flow Path Length per Area Directed to the Buffer with >8% to 15% Buffer Slope

Hydrologic Soil Group of Soil in Buffer	Maximum Area Directed to the Buffer (square feet)	Length of Flow Path for a Forested Buffer (feet)	Length of Flow Path for Meadow Buffer (feet)
A or B	3,000	60	85
	4,500	60	100
	6,000	70	120
C	3,000	70	120
	4,500	90	145
	6,000	120	180
D	3,000	120	180
	4,500	170	220
	6,000	230	270

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The Example Design section should be labeled as follows:  
 “FREEBOARD (0.3M (1 FOOT) ~~MINIMUM~~”

		<p><b>RECOMMENDED)</b>".</p> <p><b>“0.3M (1 FOOT) MAX. 4” MAXIMUM WATER QUALITY TREATMENT DEPTH”</b></p>
4/2009	Page 158	In the design criteria, the Design Discharge should read as follows: 50-year, 24-hour storm without overtopping embankment crest, 1’ freeboard <del>required</del> <b>recommended</b> .
4/2009	Page 174	<p>In the design criteria, the <math>D_o</math> in the apron length equation should be raised to the power of 1.5 not multiplied by 1.5. The equation should be corrected to read as follows:</p> $La = 1.8Q/(D_o)^{1.5} + 7D_o \text{ (when } TW < D_o/2)$ $La = 3.0Q/(D_o)^{1.5} + 7D_o \text{ (when } TW \geq D_o/2)$
4/2009	Page 174	<p>All descriptions of the variable “TW” should read as follows:</p> <p>TW = tailwater <del>elevation</del> <b>depth</b> (feet)</p>
4/2009	Page 197 – Appendix B	<p>Information on the literature references was inadvertently omitted. They are as follows:</p> <p><b>Sources A-F are as reported in the EPA Region 5 Model:</b></p> <ul style="list-style-type: none"> <li>A. Appendix D Model Best Management Practice Selection Methodology &amp; Lake County Decision-Making Framework, NIPC. July 1994.</li> <li>B. <a href="http://www.epa.gov/owow/wtrl/NPS/MMGI/Capter4/table407.gif">www.epa.gov/owow/wtrl/NPS/MMGI/Capter4/table407.gif</a>.</li> <li>C. <a href="http://htl://.ohioline.ag.ohio-state.edu/aex-fact/0467.html">htl://.ohioline.ag.ohio-state.edu/aex-fact/0467.html</a>.</li> <li>D. Athayde 1983</li> <li>E. Schueler. 1987.</li> <li>F. Model Stormwater Regulations. Duxbury, Marshfield, and Plymouth, MA. Horsley Witten Group. December 31. 2004. (Suggested Average assumes no practice is greater than 90% efficient. Median values are shown in parentheses.)</li> <li>G. 2005 Data Report. University of New Hampshire Stormwater Center. University of New Hampshire. <a href="http://www.unh.edu/erg/cstev">www.unh.edu/erg/cstev</a> and personal communication with Dr. Robert Roseen.</li> <li>H. Unpublished 2007 Draft Report. Seasonal Variations for Stormwater Management Systems in Cold Climate Condition. Robert M. Roseen, Thomas P. Ballester, James Houle, Pedro Avelleneda, Joshua Briggs, George Fowler, Robert Wildey. University of New Hampshire.</li> <li>I. <a href="http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm">http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm</a></li> </ul> <p><b>Sources J - M are as reported in the Stormwater Center website <a href="http://www.stormwatercenter.net/Pollution_Prevention/Factsheets/Catchbasins.htm">www.stormwatercenter.net/Pollution_Prevention/Factsheets/Catchbasins.htm</a>:</b></p> <ul style="list-style-type: none"> <li>J. Pitt, R., M. Libum, S.Nix, S. Durrans, and S. Burian. 1997. Guidance Manual for Integrated Wet Weather Flow Collection and Treatment Systems for New Urbanized Areas. USEPA. Office of Research and Development. Cincinnati, OH.</li> <li>K. Aronson, G., D. Watson, and W. Pisaro. 1983. Evaluation of Catch Basin Performance for Urban Stormwater Control. EPA-600/2-83-043.</li> </ul>

- L. Pitt and Shawley, 1982 (no other information given in Stormwater Center website)
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- N. Yu, S.L., X. Zhang, A. Earles and M. Sievers, 1999: Field testing of ultra-urban BMPs. Proceedings of the 26th Annual Water Resources Planning and Management Conference ASCE, 609 June, Tempe, Arizona.

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- P. Winer, Rebecca. 2000. National Pollutant Removal Performance Database for Stormwater Treatment Practices. 2nd Edition. Center for Watershed Protection. Elliot City, MD