

## List of Revisions to USDCM Volume 3

The following lists revisions made following the November 2010 update:

1. Chapter 4, Fact Sheet T-5, page EDB-5 (Dec. 15, 2010):

Replaced Equation EDB-3 to be consistent with the Technical Memorandum dated July 13, 2010. The equation is correct in UD-BMP v. 3.0. The correct equation is:

$$A_o = \frac{88V^{(0.95/H^{0.085})}}{T_D S^{0.09} H^{(2.6S^{0.3})}} \quad \text{Equation EDB-3}$$

2. Preface, (August 2011):

Changed “UD-BMPCost” to “BMP-REALCOST”.

3. Chapter 1, (August 2011):

Added units to Table 1-2.

4. Chapter 2, (August 2011):

Corrected equation 2-2. (Replaced  $nP_R$  with  $nR_R$ .) The correct equation is:

$$C_R = \frac{NPV}{nR_R} \quad \text{Equation 2-2}$$

5. Chapter 3, (August 2011):

Corrected units in Equation 3-1. Imperviousness should be a ratio here, not a percentage.

6. Chapter 4, Fact Sheet T-10, page PPS-6 (August 2011):

Clarified leaders in Figure PPS-1.

7. Chapter 7 Fact Sheet SM-8, Temporary Diversion Channel (August 2011):

Clarified Figure names. Changed all references from “DC” to “TDC” for consistency.

8. Chapter 4 Fact Sheet T-11, Underground BMPs (June 2012):

Modified discussion regarding use of underground BMPs for “Pretreatment”.

9. Chapter 7 Fact Sheet EC-02, Temporary and Permanent Seeding (June 2012):

Removed reference to using hay.

10. Chapter 7 Fact Sheet EC-04, Mulching (June 2012):

Modified discussion on using hay for mulch.

11. Chapter 7 Fact Sheet SM-8, Temporary Diversion Methods (June 2012):

Methodology was modified to consider time and length of construction. These changes were made based on detailed analysis of Crest Stage Indicator (CSI) data. Other methods of diversions were also added and the Fact Sheet (formerly titled “Temporary Diversion Channels”) was renamed “Temporary Diversion Methods”.

12. Chapter 7 Fact Sheet SM-10, Temporary Stream Crossing (June 2012):

Sizing methodology was modified to match (refer to) Fact Sheet SM-10.

13. Chapter 4, Fact Sheet T-10.3, Pervious Concrete (January 2013):

This Fact Sheet was removed. See the memorandum available at [www.udfcd.org](http://www.udfcd.org) (Ken MacKenzie, January 2013)

14. Chapter 4, Fact Sheet T-10, Permeable Pavements (August 2013)

References to growing media in the *Site Selection* section were corrected.

15. Chapter 4, Fact Sheet T-12, Outlet Structures (August 2013):

Trash rack tables and details modified to recommend a bar grate trash rack (instead of a well screen) with circular orifices greater than 1-1/4 inches

16. Chapter 7, Fact Sheet SC-6, Inlet Protection (August 2013):

The Culvert Inlet protection detail, CIP-1, was added.

17. Chapter 7, Fact Sheet SC-7, Sediment Basin (August 2013):

Use of a riser pipe and the simplified detail provided in SB-1 was clarified.

18. Chapter 1, Stormwater Management and Planning (November 2015):

Updated table 1-2 (EMCs for Denver area runoff values)

19. Chapter 4, Fact Sheet T-3, Bioretention (November 2015)

Guidance for geotechnical investigation was added. Equation B-2, for the minimum filter area, was modified to equal 2% of the impervious tributary. Growing medium was modified to include silt and clay and eliminate compost. Recommendation of a forebay was added for concentrated inflow. A specification summary was added. CDOT Class B filter material was added.

20. Chapter 4, Fact Sheet T-05, Extended Detention Basin (November 2015):

Gravel was removed from the list of potential surfacing materials where a stabilized maintenance path is required.

The recommendation for adding 20% WQCV to the design volume was removed. This recommendation was made during a time when communities were not required to ensure upkeep.

The design example was removed — users are directed to the UD-Detention example in the storage chapter of Volume 2.

Criteria for EDBs serving less than one impervious acres was removed as this BMP is not recommended for this condition

21. Chapter 4, Fact Sheet T-6, Sand Filter (November 2015)

Discussion of vegetation was removed. Equation SF-2, for the minimum filter area, was modified to equal 1.25% of the impervious tributary. This is a return to previous criteria but presented based on surface area rather than maximum depth. CDOT Class B filter material was added.

22. Chapter 4, Fact Sheet T-12, Outlet Structures (November 2015)

Outlet details were revised to include only three orifices as the typical configuration. Other updates were made per edits listed above for other November 2015 documents. Tables were removed and this information was added to typical details. The difference between trash racks and safety grates was clarified and made consistent with changes to the *Culverts and Bridges* chapter volume 2.

23. Chapter 7, Fact Sheet SC-02, Sediment Control Log (November 2015):

Use of compost sediment control logs was added.

24. Chapter 4, Fact Sheet T-10, Permeable Pavements (March 2018):

Added CDOT Class B Filter Material as an option for the drainage layer. Specified all aggregate, outside of the filter layer, be dry screened and the mass percent passing the No. 200 sieve be no more than one percent.

25. Chapter 4, Fact Sheet T-0, Quantifying Runoff Reduction (April 2018):

Added this new Fact Sheet.

26. Chapter 4, Fact Sheet T-1, grass buffers (April 2018):

Edited equations to determine when a level spreaders recommended.

27. Chapter 3, (October 2019):

Updates make this chapter consistent with Fact Sheet T-0: Quantifying Runoff Reduction and provide additional guidance for quantifying volume reduction of the WQCV at various scales. Also revised:

- Replaced the effective impervious method with the simplified method presented in Fact Sheet T-0.
- Revised recommendations for estimating the depth of the WQCV event outside of the UDFCD

boundary.

- Removed outdated watershed impervious figures.
- Added guidance and revised old guidance for calculating volume reduction (of the WQCV only) using CUHP and SWMM.