

**SUMMARY OF CHANGES TO VOLUME 1
of the
URBAN STORM DRAINAGE CRITERIA MANUAL
and
DISCLAIMER**

2001 Edition vs. 1969 Edition

GENERAL

- All chapters edited; some totally rewritten.
- Many design aids added, including figures, nomographs, spreadsheets, etc.
- New chapters on Revegetation and Design Examples added.
- Emphasis on maintenance, public safety, aesthetics and multidisciplinary design approaches.
- Design checklists added to many chapters.
- Stronger emphasis on “designing with nature” principles such as “bioengineering.”

POLICY CHAPTER

- Provides increased emphasis on staying out of the 100-year floodplain.
- Recommends reducing runoff rates, volumes and pollutants to the maximum extent practicable.
- Recommends reserving sufficient rights-of-way for lateral movement of incised floodplains.
- Clarifies the role of irrigation ditches in urban drainage.
- Revises street inundation criteria for the 100-year flood.

DRAINAGE LAW CHAPTER

- Contents totally updated.

PLANNING CHAPTER

- Also addresses the areas now being emphasized in the Policy chapter.

RAINFALL CHAPTER

- Adds a 25-year design storm and its distribution.
- Provides spreadsheets for calculations of design storms and IDF curves.
- Expands rainfall maps to include new areas of District added since 1969.

RUNOFF CHAPTER

- Clarifies the use of flows published in District’s master plans and other reports.
- Also clarifies the use and applicability of statistical analysis.
- Provides spreadsheets for the Rational Method and CUHP calculations.
- Describes the use of CUHP and UDSWM software.
- Includes new procedure for calculating the runoff coefficient “C” in the Rational Formula.
- Clarifies which hydrologic methods to use as a function of watershed size.

STREETS/INLETS/STORM SEWERS CHAPTER

- Combines three separate chapters on design of streets, inlets and storm sewers.
- Uses protocols from the Federal Highway Administration Engineering Circular Nos. 12 and 22.
- Includes reduction factors for allowable gutter/street flow.
- Provides an inlet capacity reduction protocol that accounts for inlet clogging.
- Also provides spreadsheets for calculations and design examples.

MAJOR DRAINAGE CHAPTER

- Includes expanded and updated design guidance and criteria for each channel type.
- Provides guidance for protection of natural channels from effects of urbanization.
- Adds new section on bioengineered channel design.
- Includes new guidance on use and design of composite channels.
- Adds text on the fundamentals of open channel hydraulics and stream stability.
- Updates text on 404 permitting.

- Revises guidance for sizing trickle channels and low-flow channels.
- Includes new criteria for design of boulders and grouted boulders.
- Provides spreadsheets as design aids.

2002 through 2005 Revisions to 2001 Edition

ENTIRE VOLUME 1

2005-03: Reformat entire Volume 1 to facilitate future updates. (Significant Revision)

RUNOFF CHAPTER

2004-01: Correct typos on Page RO-35.

MAJOR DRAINAGE CHAPTER

2002-06: Correct Table MD-2.

2004-01: Revise text on Page MD-62 and MD-105 and add Figure MD-25. (Significant Revision)

STREETS/INLETS/STORM SEWERS CHAPTER

2002-06: Correct units in Eq. ST-8 and correct Eq. ST-25. (Significant Revision)

2002-06: Replace Sections 4.4.2 and 4.4.13 and UDSEWER example. (Major Revision)

2003-03: Corrects Eq. ST-17. (Significant Revision)

August 2006 Update to 2001 Edition

RUNOFF CHAPTER

- Updated description of CUHP to use of CUHP 2005 software and EPA SWMM 5.0 for routing
- Deleted use of UDSWM and described EPA SWMM 5.0 for routing CUHP 2005 hydrographs.

MAJOR DRAINAGE CHAPTER

- Cleaned up a number of figures using AutoCAD™
- Expanded on the description on use of trickle and low flow channels in grass-lined channels.
- Modified submittal checklist to include some design elements not previously listed in them.
- Clarified Froude Number and Velocity limitations for concrete and riprap lined channels.
- Clarified that concrete-lined channels are not maintenance eligible.
- Expanded the use of soil riprap to now include VL, L and M riprap sizes.
- Clarified the minimum embedment of riprap bank and channel toe lining for sandy soils.
- Clarified the need to check rock sizes for increased velocities at channel bends and transitions.
- Clarifies the use of soil-riprap lining side-slopes above the low-flow section of a channel.
- Added a figure relating grass cover type, velocity, depth and Manning's n in grass-lined channels.
- Added details for soil-riprap installation.
- Expanded on the need for air-venting when rectangular storm sewers are used.
- Clarified importance of pipe entrance(s) in design.
- Modified examples to reflect latest spreadsheet workbooks.

April 2008 Update to 2001 Edition

MAJOR DRAINAGE CHAPTER

- Revised Section 4.4.1.2 (page MD-62) to recommend grouted boulders on banks be covered with topsoil and vegetated.

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