February 26, 2008
Urban Drainage & Flood Control District's
Annual Seminar

Trends and Developments in Stormwater/Floodplain Management

2007 Updates

to the

Urban Storm Drainage Criteria Manual Spreadsheets & Software

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Master Planning Program
Urban Drainage and Flood Control District

$EURV_{CD} = 1.1 \cdot (1.1381 \cdot I - 0.0339)$

Volume 1 (2007 Updates)

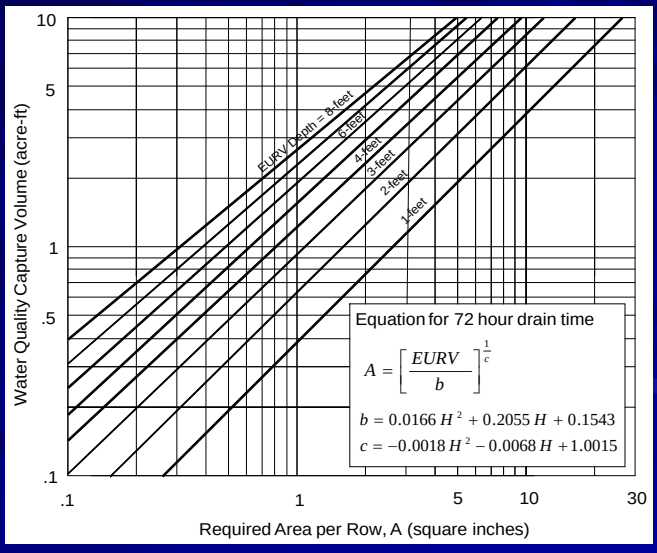
- **STORAGE CHAPTER**

Equation (SO-13) – NRCS Soil Group C/D:

$$EURV_{CD} = 1.1 \cdot (1.1381 \cdot i - 0.0339)$$

in which, *EURV* = Excess Urban Runoff Volume in watershed inches ,
I = Imperviousness ratio (*I*/100)

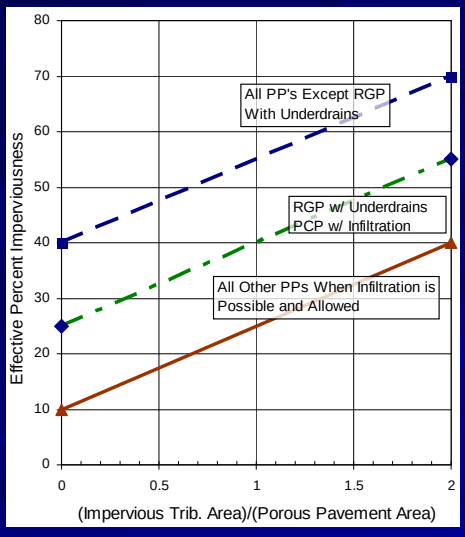
Figure SO-8—Outlet Sizing for EURV Control with 72-hour Drain Time for On-Site Detention



Volume 3 (2007 Updates)

- **STRUCTURAL BMPs CHAPTER**
  - **Figure PP-1 – Interim Guidelines for Effective Imperviousness when using Porous Pavements**

Figure PP-1



1. Chart applies only to PPs in Vol. 3
2. Apply the "Effective % Imp." to the total of porous pavement and impervious area tributary to it .
3. Limit of two units of impervious area tributary to PP (imp. areas exceeding this are treated 100% Imp.
4. Effective Imp. Can be used for all hydrologic calculations to estimate flows and volumes.
5. When Imp. areas cannot be made to run onto the Perv. areas in a sheet-flow fashion, identify individual areas and the run-on ratios for each. Treat them as separate areas for compositing the site's total

Spreadsheet Updated to Support Revised Figure PP-1

Effective Imperviousness of Tributary Catchments With Porous Pavement (*PP*) Using UDFCD Criteria

Catchment Name: Best Shopping Center in the Word

Area Units Used (Acres, sq.ft., other): Acres **Designer:** Joe Closenuff **Date:** 30-Nov-2007

Sub-Area I.D.	(1) Total Area	(2) Pervious Area	(3) Impervious Area	Porous Pavement (PP) Area: (4) Type of *PP*	(5) *PP* Area	(6) Run-on Area	Max. Run-On Area	Run-on Ratio	Allowable PP+Run-On Area	*PP* Effective % Imp.	Total Effective %Imperv.
A-1	2.00	0.50	1.50	A-Undedrain	0.75	0.75	0.75	1.0	1.50	55.0	41.3
A-2	1.50	0.00	1.50	B-Limited Undr	0.50	1.00	1.00	2.0	1.50	55.0	55.0
A-3	2.00	0.00	2.00	C-Infiltration	1.00	1.00	1.00	1.0	2.00	25.0	25.0
A-4	2.00	0.10	1.90	NONE	0.00	0.00	0.00	0.0	0.00	0.0	95.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
			0.00	NONE			0.00	0.0	0.00	0.0	0.0
Totals:	7.50	0.60	6.90		2.25	2.75	2.75		5.00	27.0	43.3

(4) A - All PPs underdrainded except RGP;
B - RGP w/ underdrain & PCP w/ infiltration;
C - All Other PPs w/ infiltration (no underdrains).
Effective imperviousness of PPs recommended here are valid only for PPs recommended in Vol. 3 of the USDCM. Not valid for other types of PPs.

Figure EDB-3—Water Quality Outlet Sizing: EDB w/ 40-hour Drain Time

(Equations valid only for WQCV Depth H < 6 feet)

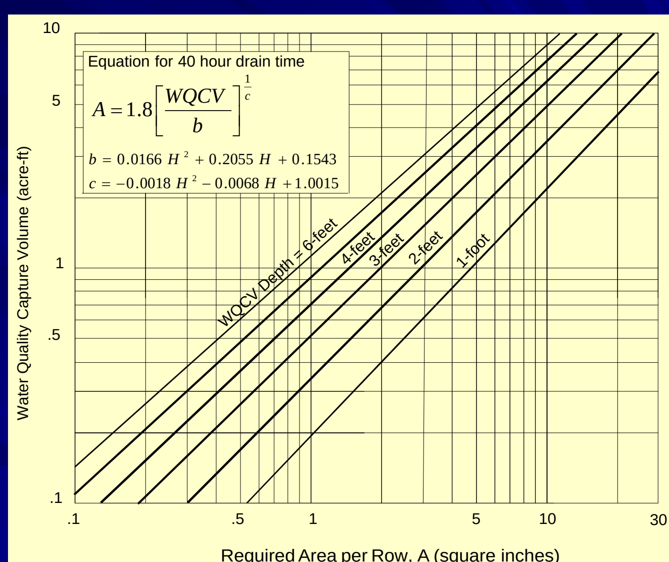


Figure CWB-3—Water Quality Outlet Sizing: CWB w/ 24-hour Drain Time

(Equation valid only for WQCV Depth H < 6 feet)

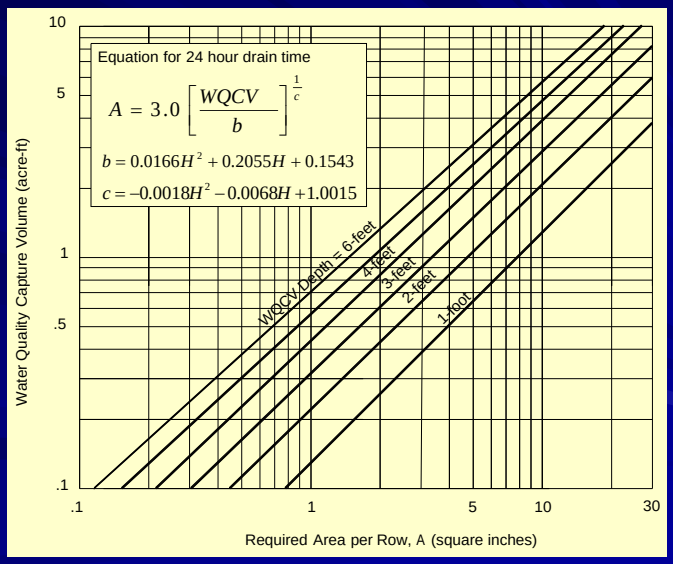
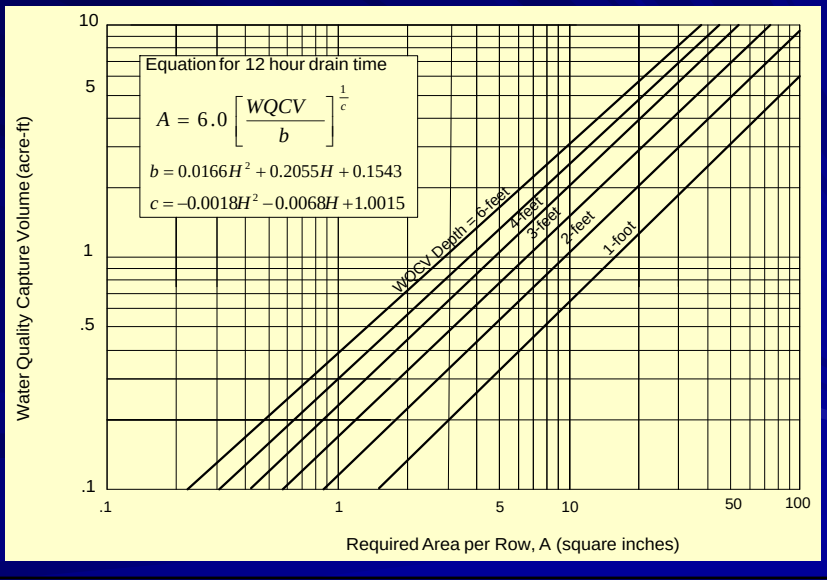


Figure RP-3—Water Quality Outlet Sizing: RP w/ 12-hour Drain Time.

(Equation valid only for WQCV Depth H < 6 feet)



2007 Update of the Construction BMPs Chapter of USDCM Volume 3

2004 Construction Chapter

- 75 Pages
- Scanned figures (27)
- No Photographs
- Content was developed before MS4 permits were issued
- Table of Content
  - 1.0 INTRODUCTION
  - 2.0 EROSION CONTROL PLANNING
  - 3.0 EROSION CONTROL
  - 4.0 SEDIMENT CONTROL
  - 5.0 DRAINAGEWAY PROTECTION
  - 6.0 MATERIAL STORAGE
  - 7.0 UNDERGROUND UTILITY CONSTRUCTION
  - 8.0 DISPOSITION OF TEMPORARY MEASURES
  - 9.0 MAINTENANCE

2007 Construction Chapter

Posted on UDFCD Website

- 97 Pages
- Most figures no in AutoCAD available for downloading (41)
- 7 Photographs
- Content was updated since MS4 Phase 1 & 2 permits issued
- Table of Content
  - 1.0 INTRODUCTION
  - 2.0 FUNDAMENTALS FOR THE MANAGEMENT OF CONSTRUCTION SITES
  - 3.0 CONSTRUCTION ACTIVITIES MANAGEMENT
  - 4.0 EROSION CONTROL MEASURES
  - 5.0 SEDIMENT CONTROL MEASURES
  - 6.0 WATERWAY PROTECTION
  - 7.0 UNDERGROUND UTILITY CONSTRUCTION
  - 8.0 DISPOSITION OF TEMPORARY MEASURES
  - 9.0 MAINTENANCE

Key Issues Addressed (1)

- Owner/contractor has to develop a Storm Water Management Plan (SWMP)
- Most local jurisdictions require SWMP be prepared **and signed by a PE**
- SWMP is used as the basis for obtaining the construction permit and compliance
- Manual provides guidance for development of SWMPs and their narrative report

Key Issues Addressed (2)

- Under the State Law, primary responsibility for INSPECTIONS are with the permit holder
- The local jurisdiction must also conduct inspections
- State and EPA may also conduct inspections at any time they choose to do so.

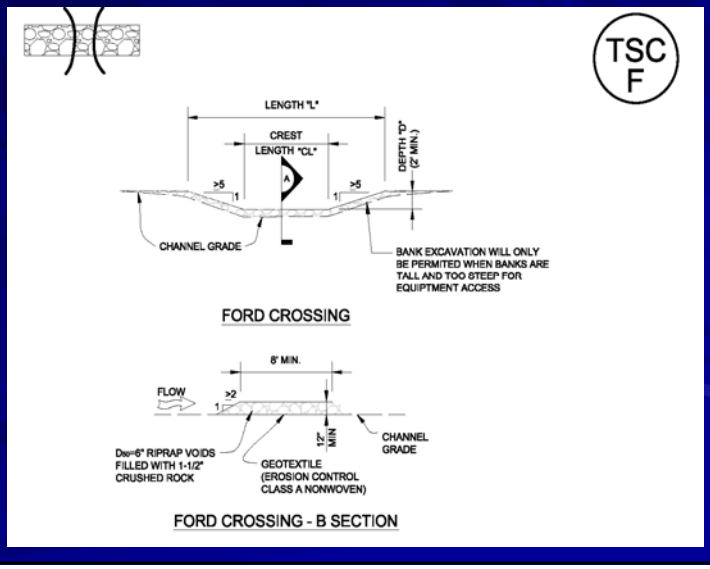
Principles of Erosion and Sediment Control

- Erosion controls limit amount and rate of erosion occurrence.
- Sediment controls attempt to capture eroded soils before they leaves the construction site.
- Construction activities management have to address:
  - Erosion control to limit erosion of soil from disturbed areas
  - Sediment control to limit transport of sediment off-site
  - Waterway protection
  - Construction practices management to limit pollutant movement off site from:
    - construction equipment maintenance and storage
    - from materials storage and handling.

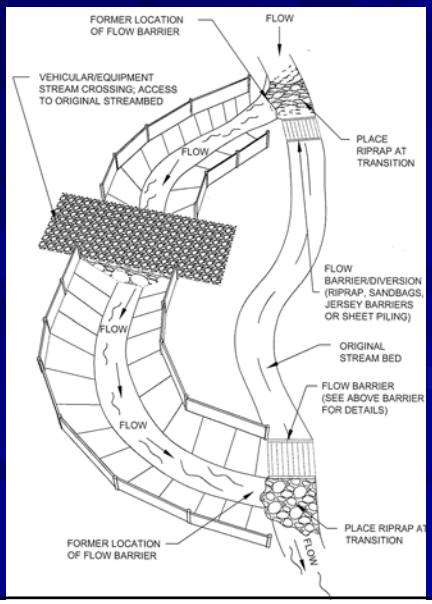
Example
How not to install a silt fence

Photo courtesy Douglas County

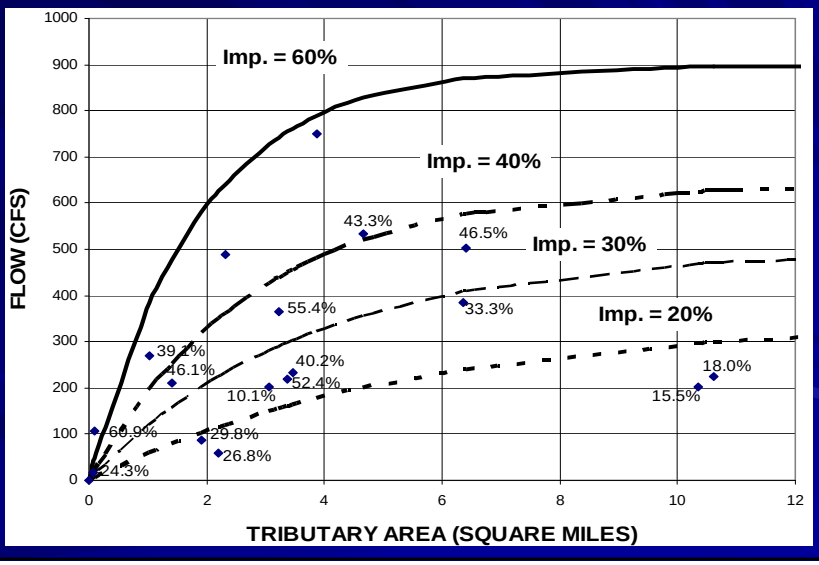
Examples of New Details:
Ford-Type Construction Crossing



Example of New Figures: Temporary Diversion Channel



Revised Sizing of Temporary Diversions – Based on Local Data



Working Within or Crossing a Waterways

- Urban Drainage and Flood Control District contracted with ***Scott Olson*** to develop an 1-day training class on **construction management when working in waterways**.
  - Class is offered through District
  - Look for postings on www.udfcd.org web site.
  - Fee: $125 including lunch & coffee breaks
  - Scott Olson will talk about this class later today

***Ken MacKenzie* will now describe**

2007-2008 Updates to UD-Workbooks

Posted on UDFCD Website

2007-2008 UD-Workbook Updates
Posted on UDFCD Website

- UD-Detention
- UD-Channels
- UD-BMP
- UD-Effective_Imperviouness

2007-2008 UD-Workbook Updates
Posted on UDFCD Website

- UD-Detention
  - Longer hydrograph table allows up to a six hour inflow hydrograph using a one minute time step.
  - Simplification of the Modified FAA procedure.
  - A new separate “Restrictor Plate” sheet to size a circular vertical outlet with a plate over the upper portion to choke flow to a prescribed value based on head.
  - Simplification of the “Outlet” sheet, five routing scenarios and four outlet openings plus a water quality orifice plate.
  - Fixes for a few Excel 2007 compatibility issues.

2007-2008 UD-Workbook Updates
Posted on UDFCD Website

- UD-Channels
  - More accurate results using the NRCS Vegetal Retardance Method
  - Increased functionality using the “Riprap” worksheet
  - Fixes for a few Excel 2007 compatibility issues.

2007-2008 UD-Workbook Updates
Posted on UDFCD Website

- UD-BMP
  - More accurate sizing of WQCV outlets based on extensive Puls routing analysis
  - Increased functionality through user-prompts

2007-2008 UD-Workbook Updates

Posted on UDFCD Website

- UD-Effective_Imperviouness
  - Major rework makes it easier to calculate “real” imperviousness
  - Choose from one of three categories:
    - A - All underdrained PPs except RGP
    - B - RGP w/ underdrain & PCP w/ infiltration
    - C - All Other PPs w/ infiltration (no underdrains)