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Standard Guidelines for the Design, Installation, and Operation and Maintenance of Urban Stormwater Systems

THREE COMPLETE STANDARDS

Standard Guidelines for the Design of Urban Stormwater Systems

ANSI/ASCE/EWRI 45-16

Standard Guidelines for the Installation of Urban Stormwater Systems

ANSI/ASCE/EWRI 46-16

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CONTENTS

STANDARD GUIDELINES FOR THE DESIGN OF URBAN STORMWATER SYSTEMS, ANSI/ASCE/EWRI 45-16	1
STANDARD GUIDELINES FOR THE INSTALLATION OF URBAN STORMWATER SYSTEMS, ANSI/ASCE/EWRI 46-16	61
STANDARD GUIDELINES FOR THE OPERATION AND MAINTENANCE OF URBAN STORMWATER SYSTEMS, ANSI/ASCE/EWRI 47-16	85
INDEX	99

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45-16

**Standard Guidelines for the
Design of Urban Stormwater
Systems**

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CONTENTS

PREFACE		vii
ACKNOWLEDGMENTS		ix
1 SCOPE		1
1.1	Applicable Standards	1
2 DEFINITIONS		3
2.1	General	3
2.2	Terms	3
3 SITE ANALYSIS		5
3.1	Basic Requirements	5
3.1.1	Topography	5
3.1.2	Geography	5
3.1.3	Water Table	5
3.1.4	Geology	5
3.1.5	Water Source	5
3.1.6	Soil Information	5
3.1.6.1	Soil Classification	5
3.1.6.2	Hydraulic Conductivity and Permeability	5
3.1.6.3	Strata and Layers	6
3.1.6.4	Soil/Water Chemistry	6
3.1.6.5	Temperature	6
3.1.6.6	Soil Testing	6
3.1.7	Environmental Factors	6
3.1.7.1	Water Quality	6
3.1.7.2	Flooding	6
3.1.7.3	Wetlands	6
3.1.7.4	Principal or Primary Aquifers	6
3.1.7.5	Hydrology	6
3.1.8	Physical Constraints	6
3.1.9	Land Use	6
3.1.10	Zoning Regulations	6
3.1.11	Other Governmental Regulations	6
4 HYDROLOGY		7
4.1	Quantity	7
4.1.1	Design Points and Return Periods	7
4.1.2	Runoff Determination Methods	7
4.1.2.1	Statistical Methods	7
4.1.2.2	Regional Methods	7
4.1.2.3	Transfer Methods	7
4.1.2.4	Rainfall Runoff Methods	8
4.1.3	Design Rainfall	8
4.1.4	Rainfall Abstraction	8
4.1.5	Runoff Hydrographs	8
4.1.6	Rational Method	8
4.1.6.1	Assumptions	8
4.1.6.2	Runoff Coefficient	8
4.1.7	Time of Concentration	9
4.1.7.1	Sheet Flow	9
4.1.7.2	Shallow Concentrated Flow	10
4.1.7.3	Open Channel Flow	10

4.1.8	Hydrograph	10
4.1.9	Calibration	10
4.1.10	Historical Information	11
4.2	Water Quality	11
4.2.1	Pollutant Sources	11
4.2.2	Water Quality Impacts	11
4.3	Rainfall Runoff Computer Models	11
5	NONSTRUCTURAL CONSIDERATIONS	13
5.1	Floodplains	13
5.2	Wetlands	13
5.3	Forests and Riparian Buffers	13
5.4	Stream Bank Assessment	13
5.5	Site Planning	13
6	SYSTEM CONFIGURATION	15
6.1	Collection System Types	15
6.1.1	Pipes or Conduits	15
6.1.2	Inlet Structures	15
6.1.3	Drainage Ways	15
6.1.4	Streets	15
6.1.5	Flow Controls	15
6.1.6	Retention/Detention Facilities	15
6.1.6.1	Wetlands	15
6.1.6.2	Impoundments	15
6.2	Special Structures	16
6.2.1	Pumping Stations	16
6.2.2	Vaults	16
6.2.3	Manholes	16
6.2.4	Cleanouts	16
6.2.5	Equipment Access Shafts	16
6.3	Applications	16
6.3.1	Location Requirements	16
6.3.2	Site Restrictions	16
7	HYDRAULIC DESIGN	17
7.1	Hydraulic Principles	17
7.1.1	Flow Classification	17
7.1.2	Energy Principle	18
7.1.3	Momentum Principle	18
7.1.4	Conservation of Mass	19
7.2	Elements of Hydraulic Analysis	19
7.2.1	Normal Depth	19
7.2.2	Water Surface Profile Classification	19
7.2.3	Hydraulic Jump	19
7.2.4	Hydraulic Head Losses Because of Friction	20
7.2.5	Form Losses	20
7.2.5.1	Transition Losses	21
7.2.5.2	Pipe Junction Losses	21
7.2.5.3	Bend Losses	21
7.3	Hydraulic Structures	21
7.3.1	Stormwater Inlets	22
7.3.2	Culverts	26
7.3.2.1	Opening Size Determination	26
7.3.2.1.1	Flood Flow Determination	26
7.3.2.1.2	Downstream Hydraulic Conditions	26
7.3.2.1.3	Culvert Hydraulic Design	26
7.3.2.2	Special Considerations	27
7.3.2.2.1	Flow Continuity	27
7.3.2.2.2	Stone Riprap Outlet Design	27
7.3.2.2.3	Joint Design	27
7.3.2.2.4	Utility Interference	27

	7.3.2.2.5	Standard Details	27
	7.3.2.2.6	Safety Considerations	27
	7.3.2.2.7	Freeboard	27
	7.3.2.2.8	Flow over Top of Road	27
	7.3.2.2.9	Special Hydraulic Losses	27
7.3.3		Bridges	28
7.3.4		Spillways and Drop Structures	29
7.3.5		Energy Dissipation and Outlet Structures	29
	7.3.5.1	Straight Drop Spillways	29
	7.3.5.2	Flip or Roller Bucket Spillways	30
	7.3.5.3	Impact Stilling Basin	30
	7.3.5.4	Hydraulic Jump Stilling Basins	30
	7.3.5.5	Baffled Chute Spillway	30
	7.3.5.6	Energy Dissipating Headwalls	30
7.3.6		Open-Channel Linings	30
	7.3.6.1	Vegetated Channels	30
	7.3.6.2	Lined Channels	31
	7.3.6.3	Mortared Masonry, Poured Concrete and Metal or Plastic Prefabricated Channels	31
7.3.7		Pumps	32
	7.3.7.1	Vertical Pumps	32
	7.3.7.2	Submersible Pumps	32
	7.3.7.3	Centrifugal Pumps	32
	7.3.7.4	Screw Pumps	32
	7.3.7.5	Volute or Angle Flow Pumps	32
	7.3.7.6	Discharge Conduits	32
	7.3.7.7	Stormwater Pumping Station Design	32
		7.3.7.7.1 Introduction	32
		7.3.7.7.2 Generalized Solution	32
		7.3.7.7.3 Comparison to Other Methods	33
		7.3.7.7.4 Pump Operation	34
		7.3.7.7.5 Example	34
		7.3.7.7.6 Extension of the Method	36
		7.3.7.7.7 More Generally	36
7.4		Hydraulic Analysis Procedures	36
7.5		Flow Routing	37
	7.5.1	Muskingum Method or the Kinematic Wave Technique	37
	7.5.2	Modified Kinematic Wave Routing Method	37
	7.5.3	Modified Puls Method	37
7.6		Computer Models	38
8		STRUCTURAL DESIGN OF STORMWATER SYSTEMS	39
8.1		Loading	39
	8.1.1	Dead Loads	39
		8.1.1.1 Soil Loads	39
		8.1.1.2 Pipe Weight	39
		8.1.1.3 Internal Fluid Weight	39
		8.1.1.4 Foundation Loads	39
		8.1.1.5 Surge Loads	39
	8.1.2	Live Loads	39
		8.1.2.1 Highway Loadings	39
		8.1.2.2 Train Loads	39
		8.1.2.3 Aircraft Loads	39
		8.1.2.4 Internal Hydraulic Transient Loads	39
	8.1.3	Construction Loads	39
	8.1.4	Jacking Loads	40
	8.1.5	Other Loads	40
8.2		Embedment	40
8.3		Pipe and Culvert Structural Requirements	40
	8.3.1	Concrete Pipe	40
		8.3.1.1 Concrete Pipe Design	40
		8.3.1.2 Standard Installations	40
		8.3.1.3 Indirect Design Method	40
		8.3.1.4 Direct Design Method	44
		8.3.1.4.1 Pressure Distributions	44

	8.3.1.4.2	Design Method	44
8.3.2		Flexible Pipe	44
	8.3.2.1	Metal Pipe	44
		8.3.2.1.1 Ring Compression Design.	45
		8.3.2.1.2 Allowable Stresses.	45
		8.3.2.1.3 Limitations of Steel Pipe with Longitudinal Seams	45
		8.3.2.1.4 Standard Product Selection	46
	8.3.2.2	Plastic Pipe Design	46
		8.3.2.2.1 Deflection	47
		8.3.2.2.2 Buckling	48
		8.3.2.2.3 Bending	48
8.3.3		Box Culverts	49
	8.3.3.1	Structural Plate Box Culverts	49
	8.3.3.2	Reinforced Concrete Box Culvert, Precast	49
	8.3.3.3	Reinforced Concrete Box Culvert, Cast-in-Place	49
8.3.4		Pipe Joints	49
8.3.5		Trenchless Technology	49
	8.3.5.1	Tunneling	49
	8.3.5.2	Lining	49
8.3.6		Geosynthetics	50
8.4		Pipe Appurtenances and Other Structures.	50
	8.4.1	Pipe Appurtenances	50
	8.4.2	Other Structures	50
9		MATERIALS.	51
	9.1	Environmental Considerations.	51
	9.2	Economic Considerations	51
	9.3	Pipe and Culvert Materials	51
	9.3.1	Rigid Pipe	51
		9.3.1.1 Concrete Pipe	51
	9.3.2	Metal Pipe	51
	9.3.3	Thermoplastic Pipe	52
		9.3.3.1 Acrylonitrile-Butadiene-Styrene (ABS) Pipe	52
		9.3.3.2 Polyethylene (PE) Pipe	52
		9.3.3.3 Polyvinyl Chloride (PVC) Pipe	52
	9.3.4	Box Culverts	52
		9.3.4.1 Reinforced Concrete Box Culverts, Precast.	52
		9.3.4.2 Structural Plate Box Culverts	53
	9.3.5	Pipe Joints	53
9.4		Other Materials and Products	53
10		REGULATIONS AND PERMITS.	55
	10.1	Regulations.	55
		10.1.1 Urban Stormwater Systems	55
		10.1.2 Urban Surface Drainage Systems	55
	10.2	Permits	55
		10.2.1 Contract Documents	55
		10.2.2 Terms and Provisions	55
11		REFERENCES	57
	11.1	Cited References.	57
	11.2	General References	59

PREFACE

The *Standard Guidelines for the Design of Urban Stormwater Systems* is a companion to the *Standard Guidelines for the Installation of Urban Stormwater Systems* and *Standard Guidelines for the Operation and Maintenance of Urban Stormwater Systems*. These standard guidelines were developed by the Urban Drainage Standards Committee, which is responsible to the Environmental and Water Resources Institute of the American Society of Civil Engineers.

The provisions of this document are written in permissive language and, as such, offer to the user a series of options or

instructions but do not prescribe a specific course of action. Significant judgment is left to the user of this document.

These standard guidelines may involve hazardous materials, operations, and equipment. These standard guidelines do not purport to address the safety problems associated with its application. It is the responsibility of whoever uses these standard guidelines to establish appropriate safety and health practices and to determine the applicability of regulatory and nonregulatory limitations.

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This group comprises individuals from many backgrounds, including consulting engineering, research, construction industry, education, and government. The individuals who serve on the Urban Drainage Standards Committee are

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CHAPTER 1

SCOPE

The intent of these standard guidelines is to present design guidance for urban stormwater systems. It updates ASCE/EWRI 45-05 *Standard Guidelines for the Design of Urban Stormwater Systems* with material developed within the past eight years. The collection, management, and conveyance of urban surface waters are within the purview of these standard guidelines for applications such as airports, roads, and other transportation systems; and industrial, commercial, residential, and recreation areas. This document is intended for guidance during the design phase.

These standard guidelines do not address applications, such as agricultural drainage, landfills, and injection systems. Combined Sewer Overflows (CSOs) also are not addressed, because they are environmentally unacceptable as a new standard of practice in the United States.

Both SI units and customary units are used throughout the guidelines for the narrative, figures, and tables. The formulas are written in dual units or written separately to show the use of either SI units or customary units.

1.1 APPLICABLE STANDARDS

The standards listed as follows are available from the offices of the cited organization: American Association of State Highway Officials (AASHTO) in Washington DC; American Society of Civil Engineers (ASCE) in Reston, VA; American National Standards Institute/American Water Works Association documents from AWWA in Denver; and ASTM International (ASTM) in West Conshohocken, PA. The standards are mentioned in these guidelines at the sections in which they are applicable.

The ASTM standard and comparable AASHTO standard for a product are commonly identical; however, there may be some differences, especially when AASHTO standards lag behind ASTM standard revisions. If there is a separate metric edition of a standard, its designation includes the letter M (e.g., C507M).

American Association of State Highway and Transportation Officials (AASHTO), *Standard Specifications for Highway Bridges*, AASHTO HB-17, 17th Ed., 2002.

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ASTM, *Standard Specification for Joints for Concrete Box, Using Rubber Gaskets*, C1677-11A.