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Building Drainage **Drainage Design** *Stormwater Collection Systems Design Handbook* **Landscape Drainage Design, 2nd Edition** *Street Drainage Design and Modeling* **Landscape Drainage Design** Stormwater Design for Sustainable Development **Drainage Design Factors Modern Land Drainage 28-774 Sanitary and Drainage Design and Layout** *Drainage Design and Management* Notes for the Short Course Drainage Design in Highway Practice **Autodesk Drainage Design for InfraWorks 360 Essentials** *Urban Drainage Design Manual - Hydraulic Engineering Circular No. 22 - Third Edition Irrigation and Drainage Engineering* **Design and Construction of Urban Stormwater Management Systems** *The Engineered Design of Building Drainage Systems Land Drainage* **Design of Road Drainage System** *Urban Drainage Design Manual* **Autodesk Drainage Design for InfraWorks 360 Essentials Urban Drainage Design Manual for Roads and Bridges A Guide to Golf Course Irrigation System Design and Drainage** Sub-soil as a Factor in Drainage Design on Albert Lea Farms, Minnesota **Principles and Practices of Grading, Drainage, and Road Alignment** Standard Guidelines for the Design, Installation, and Operation, and Maintenance of Urban Subsurface Drainage **Manual on Drainage in Urbanized Areas: Data collection and analysis for drainage design** Highway Subdrainage Design **Sewers and Drains Street Drainage System Design** *Designing for Exceedance in Urban Drainage* **Design Manual for Roads and Bridges** Drainage Design **Flood Control and Drainage Engineering** *Hydraulic Design Tables for Pipelines, Sewers and Drainage Lines* Guidelines and Computer Programs for the Planning and Design of Land Drainage Systems **The Design of Field Drainage Pipe Systems An Introduction to Stormwater Drainage and Site Development** *Design of Plumbing and Drainage Systems*

About the Book: The Book is basically a hydraulic design aid for selection to diameter of pipe and/or deciding gradient of the pipeline to convey water from one place to the other economically. The novel feature of the book is that it highlights the power wasted in overcoming resistance due to friction offered by the surface of pipe in contact with the water. A judicious selection of right size of pipe diameter can save even up to 90% of the power used in transmission of water. The book also helps select appropriate gradient of the pipe line to convey a designed flow through pipe flowing un. In a single volume, Standards ANSI/ASCE/EWRI 12-13, 13-13, and 14-13 establish the guidelines for design, installation, and operation and maintenance of urban subsurface drainage systems. Prepared byØtheØTask Committee of the Urban Water Resources Research Council of ASCE. Copublished by ASCE and the Water Environment Federation. Design and Construction of Urban Stormwater Management Systems presents a comprehensive examination of the issues involved in engineering urban stormwater systems. This Manual?which updates relevant portions of Design and Construction of Sanitary and Storm Sewers, MOP 37?reflects the many changes taking place in the field, such as the use of microcomputers and the need to control the quality of runoff as well as the quantity. Chapters are prepared by authors with experience and expertise in the particular subject area. The Manual aids the practicing engineer by presenting a brief summary of currently accepted procedures relating to the following areas: financial services; regulations;Ø surveys and investigations;Ø design concepts and master planning;Ø hydrology and water quality;Ø storm drainage hydraulics; andØ computer modeling. The main objectives of the manual are to advance the understanding of complex interactions between urban drainage and other facets of urban water resources, to increase the awareness of various planning alternatives , to aid in the selection of appropriate calculation procedures to demonstrate the importance of input and supporting data, to guide the decision-makers and designers in implementation of urban drainage projects, and to increase awareness of pitfalls of drainage planning. Good drainage contributes to the delivery of sustainable, innovative and resilient buildings, and is essential for our health and wellbeing. However, designers and architects can often leave drainage to be implemented by specialists in isolation of other design considerations, resulting in costly changes, rework and repairs, operational discomfort and poor user experiences that could have been avoided. Written for building designers and allied professionals, homeowners and managers as well as the general public, Building Drainage promotes an integrative and collaborative approach. Key principles and components of drainage design are presented in an accessible manner with many UK examples where the underlying information and knowledge can be applied internationally. coverage includes waste and foul water drainage systems and the benefits of integrated water management (IWM) approach, where 'waste' becomes a valuable resource; surface and rainwater drainage; water and energy efficiency through wastewater recycling and reuse, and heat recovery. After reading this book you will understand the mostly invisible, or unperceived, yet vital aspects of functional drainage design and their interaction with the architecture of the building as well as the local and global environments. Dated October 2019 This book is dedicated to the latest developments in: (a) new concepts to analyze the urban catchment hydrology for storm runoff predictions, (b) innovative methods to estimate the street allowable capacities to convey storm runoff, and (c) useful computer models to simulate flow movements in inlets and sewers. This textbook focuses specifically on the combined topics of irrigation and drainage engineering. It emphasizes both basic concepts and practical applications of the latest technologies available. The design of irrigation, pumping, and drainage systems using Excel and Visual Basic for Applications programs are explained for both graduate and undergraduate students and practicing engineers. The book emphasizes environmental protection, economics, and engineering design processes. It includes detailed chapters on irrigation economics, soils, reference evapotranspiration, crop evapotranspiration, pipe flow, pumps, open-channel flow, groundwater, center pivots, turf and landscape, drip, orchards, wheel lines, hand lines, surfaces, greenhouse hydroponics, soil water movement, drainage systems design, drainage and wetlands contaminant fate and transport. It contains summaries, homework problems, and color photos. The book draws from the fields of fluid mechanics, soil physics, hydrology, soil chemistry, economics, and plant sciences to present a broad interdisciplinary view of the fundamental concepts in irrigation and drainage systems design. Aims to provide advice for the design and management of urban sewerage and drainage systems to reduce the impacts that arise when flows occur that exceed their capacity. This book includes information on the effective design of both underground systems and overland flood conveyance. This book provides a review of the principles and methods of drainage with an emphasis on design. The whole field of drainage is covered, and although the book concentrates mainly on the practice in North America, Europe and Britain, the practice in developing countries is also included. The book is directed primarily at the graduate engineer entering professional practice, but will also provide a useful reference for more senior engineers and for those in adjunct professions. Chapter 1 outlines the necessity for drainage on a large or small scale, for rural and urban areas. As the drainage engineer must decide how much unwanted water there will be and when it will occur, the chapter discusses climatic types, prediction of rainfall, evapotranspiration effects, return periods (of design storms and runoff events), river flow and flood prediction, and various sensing systems for providing short term predictions of rainfall, runoff, streamflow and flood warning. Chapter 2 gives a thorough review of the properties of soil in the context of drainage design. The extensive mathematical theories which relate to the crucial area of soil water movement are outlined and due attention is paid to the growing importance of predicting soil water movement in partially saturated soils. (Hydraulic Engineering Circular 22, Third Edition) This publication provides a comprehensive and practical guide for the design of storm drainage systems associated with transportation facilities. Design guidance is provided for the design of storm drainage systems which collect, convey, and discharge stormwater flowing within and along the highway right-of-way. Methods and procedures are given for the hydraulic design of storm drainage systems. Design methods are presented for evaluating rainfall and runoff magnitude, pavement drainage, gutter flow, inlet design, median and roadside ditch flow, structure design, and storm drain piping. Procedures for the design of detention facilities are also presented, along with an overview of storm water pumping stations and urban water quality practices. This publication provides introductory technical guidance for civil engineers and other professional engineers and construction managers interested stormwater drainage systems and site development. Here is what is discussed: 1. DESIGN CRITERIA, 2. ROOF DRAINAGE, 3. SURFACE STORM DRAINAGE, 4. UNDERGROUND GRAVITY STORM DRAINAGE SYSTEM, 5. STORMWATER MANAGEMENT FACILITIES, 6. STORMWATER PUMP STATIONS, 7. SAFETY AND STORM DRAINAGE SYSTEM COMPONENTS, 8. SECURITY AND STORM DRAINAGE SYSTEM COMPONENTS, 9. AIRFIELD DRAINAGE, 10. SITE DEVELOPMENT. * A comprehensive overview of stormwater and wastewater collection methods from around the world, written by leading experts in the field * Includes detailed analysis of system designs, operation, maintenance and rehabilitation * The most complete reference available on the subject Master the advanced functionality of the drainage-specific InfraWorks add-on Autodesk Drainage Design for InfraWorks 360 Essentials, 2nd Edition provides hands-on guidance to the tools and capabilities of this drainage-specific InfraWorks module. Straightforward explanations coupled with real-world exercises help you get up to speed quickly, and become more productive using the module's core features and functions. The Drainage Design module includes tools and features that go beyond the base software, and this easy-to-follow guide walks you through the entire design process to show you how to take advantage of the advanced stormwater and flood-control analysis functions. Compelling screenshots illustrate step-by-step tutorials, and the companion website provides downloadable starting and ending files so you can jump in at any point and compare your work to the pros. Autodesk is releasing special modules that expand InfraWorks functionality. Drainage Design for InfraWorks is available to all InfraWorks users, and provides an extended toolset and interface specifically designed to streamline your workflow. Master the Drainage tools that go beyond the base software Create new designs and add detail with step-by-step tutorials Utilize the powerful drainage-specific analysis and optimization functions Import and work with real-world data for more comprehensive design If you're ready to work faster and more efficiently, Autodesk Drainage Design for InfraWorks 360 Essentials, 2nd Edition is the hands-on guide to this exciting new module. This circular provides a comprehensive and practical guide for the design of storm drainage systems associated with transportation facilities. Design guidance is provided for the design of storm drainage systems which collect, convey, and discharge stormwater flowing within and along the highway right-of-way. Methods and procedures are given for the hydraulic design of storm drainage systems. Design methods are presented for evaluating rainfall and runoff magnitude, pavement drainage, gutter flow, inlet design, median and roadside ditch flow, structure design, and storm drain piping. Procedures for the design of detention facilities are also presented, along with an overview of storm water pumping stations and urban water quality practices. This edition presents a major change in the methodology discussed in Chapter 5 for designing channels and in Chapter 7 for

calculating energy losses in storm drain access holes. Urban Drainage has been thoroughly revised and updated to reflect changes in the practice and priorities of urban drainage. New and expanded coverage includes: Sewer flooding The impact of climate change Flooding models The move towards sustainability Providing a descriptive overview of the issues involved as well as the engineering principles and analysis, it draws on real-world examples as well as models to support and demonstrate the key issues facing engineers dealing with drainage issues. It also deals with both the design of new drainage systems and the analysis and upgrading of existing infrastructure. This is a unique and essential textbook for students of water, environmental, and public health engineering as well as a valuable resource for practising engineers. Proper drainage system is one of the basic requirements of a road project. Poor drainage results into losses in the form of damaged roads and reduced serviceability. In spite of this, adequate priority for drainage system is rarely accorded. Funds required for a drainage system are small as compared to the enormous funds needed for development of road infrastructure and to meet the recurring losses due to poor drainage. It is necessary that due priority is given to the drainage of roads to ensure sustainability of road infrastructure. The road drainage issues which most of the cities in countries like India face today have been identified with the help of a study undertaken in Panipat city, an industrial city of Haryana, India. It also exhibits the urgent need for a rational and simple design of road drainage system. As the existing guidelines for the design of road drainage system have some shortcomings in respect of clarity on some of the design parameters and their complexity to use, the book brings forth the simplified design guidelines for the design of road side drainage system. Improve surface and subsurface drainage design and installation with this reference manual. Topics include soil and water relationships, topography and grades, and drainage materials and applications. Dated May 2016 A Guide to Golf Course Irrigation System Design and Drainage details every phase of an irrigation program - from the system design to construction, from scheduling to operation, and much more. It also covers the fundamentals of drainage design and installation. Turfgrass managers and golf course superintendents will refer to this handy book often to plan and implement effective irrigation systems, ensure appropriate capacity, easy installation, and practical operation and maintenance. Get up to speed on drainage design with Autodesk InfraWorks 360 Autodesk Drainage Design for InfraWorks 360 Essentials offers an indispensible resource to InfraWorks' Drainage Design module. The module's interface includes tools that enable engineers to import and combine other data that goes beyond the base InfraWorks software. This book provides step-by-step instruction for creating new drainage designs, or adding detail to existing designs using InfraWorks 360. Filled with illustrative examples and robust design instructions, this book reveals how to best use the powerful tools and functions of the Drainage Design module, and includes information on analyzing profiles and setting up scenarios for various materials. This Autodesk Official Press book covers the basics for creating proposals and design intent within the context of real site conditions, and shows how the software's cloud-based capabilities enable teams from around the globe to store, manage, and access models from desktop or mobile devices. Includes an approachable introduction to InfraWorks for Drainage Design module Filled with practical, real-world exercises and additional task-based tutorials that show how to become quickly productive with the software Shows how to access the cloud-based 3D visualizations that allow designers and engineers to communicate and get better informed input Offers a key resource to the technology that provides government and civil engineers the ability to fast-track infrastructure projects Autodesk Drainage Design for InfraWorks 360 Essentials is the introduction needed for accessing the specialized tools for analysis, design, and documentation of drainage design and storm water projects. The aim of this paper is to facilitate the planning and design of land drainage systems for sound land and water management for engineers and other professionals. It considers the integration of technical, socio-economic and environmental factors and the need for system users' participation in the planning, design, operation and maintenance processes. The text provides guidelines for the appropriate identification of drainage problems, for the planning and design of field drainage systems (surface and subsurface) and the main drainage and disposal systems. The annexes provide more detailed information with technical background, appropriate equations, some cross-references for finding appropriate methodologies, and computer programs for calculation of extreme values, of permeability and some land drainage system parameters. --Publisher's description. This book presents the latest developments in street drainage design and inlet sizing. Street drainage is vital to the preservation of urban environment. All streets are designed to pass the excess storm water. Street drainage design is always subject to the public safety that sets forth the allowable water spread on street and flow depth in gutter.Chapter 1 covers street classifications and their functions for both traffic movement and storm water drainage. The design rainfall statistics in Chapter 2 and the rational method in Chapter 3 are introduced to determine the stormwater design flow on the street. Street hydraulic capacity is defined for two aspects: conveyance capacity for a sloping street in Chapter 4 and storage capacity at a street sump in Chapter 5. Wherever the design flow exceeds the street allowable capacity, a street inlet should be placed. From the hydraulic point of view, street inlets are classified into sump and on-grade interceptions. Chapter 6 in this book summarizes the design procedures to size grate, curb opening, slotted, and combination inlets. Street inlets are connected to the street manhole and sewer systems. Chapter 7 presents the basic procedure to size the sewer segments in a storm sewer system. All sewer segments are subject to the backwater effect. Chapter 8 outlines the detailed procedure to calculate the hydraulic and energy grade lines. Depending on the upstream and downstream conditions, a sewer flow is analyzed as open-channel flow, surcharged flow, or pressurized flow. The design methodology summarized in this book has been adopted by the metropolitan cities and counties in Denver, Colorado. The computing procedures for street hydraulic analysis and inlet sizing have been computerized for convenience. UDINLET is a Micro Soft Excel model for street drainage design that includes (1) analysis of street allowable capacity, (2) determination of minor and major flood flow conditions, and (3) sizing of street inlets on a continuous grade or in a sump. Neo-UDSEWER is the computer model developed to analyze the flow through a sewer system using circular, rectangular, and elliptical pipes. Neo-UDSEWER is capable of analyzing the mixed flow among open channel flow, surcharged flow, and pressurized flow when the sewer exit is subject to a high tailwater. Neo-UDSEWER calculates hydraulic and energy grade lines with consideration of friction, bend, and juncture losses. Neo-UDSEWER also calculates the excavated earth volume along the sewer system for cost estimation. Stormwater Design for Sustainable Development presents an integrated approach to controlling stormwater runoff quantity and quality. With a focus on low-impact development, the book describes how to incorporate existing topography and drainage channels, curvilinear street layout, building locations, utilities, and proven best management practices, blending them all into a pleasing whole. Modern Land Drainage 2nd edition is a fully revised and updated edition of the 2004 edition. Modern Land Drainage describes traditional drainage formulas (Hooghoudt, Kirkham, Donnan, Ernst, Glover-Dumm) for rainfed agriculture in the humid temperature zone. Significant parts are devoted to drainage for salinity control of irrigated land in (semi-) arid zones, and to drainage of rice land in the humid tropics. Institutional, management and maintenance aspects are extensively covered, as well as the mitigation of adverse impacts of drainage interventions on the environment. The latest computer applications for drainage design in the context of integrated water management are described (DRAINMOD, HEC, SWAP, etc.). Field surveys are executed by governments, with the aid of consultants, but rarely are the end stakeholders (i.e., farmers and general public) involved from inception to planning to execution of a drainage system. Yet, during the Operation, Management and Maintenance (OMM) phase of a water management system, they are expected to takeover, run, bear and be responsible for the costs of OMM. The book describes successful methodologies and processes to be followed for engagement of stakeholders at all levels, from government to farm, from minister to farmer, and, from beginning to end. The book covers all aspects needed for sustainable drainage. The latest survey methodologies with satellites and drones are suggested to assess cause and effect. Waterlogging and salinity are the effect of something caused most likely upstream of the drainage problem location. Hence treating the cause may be more cost-effective. Triple Bottom Line (social, environmental and financial considerations) and the water-food-energy nexus are an integral part of the drainage design process. Controlled drainage, i.e. the balance of removal and conservation of drainage water and minimising solute transport as low as reasonably achievable (ALARA principle) is extensively described. This work is intended for use both as a university level textbook and as a professional handbook; it is of particular value to professionals engaged in drainage development in the context of integrated water resources and river basin management, civil and agricultural engineers, government officials, university students and libraries.

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- Urban Drainage Design Manual Hydraulic Engineering Circular No 22 Third Edition

- Irrigation And Drainage Engineering
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