Hydraulic Design Guide

This manual presents the results of research, design studies, and operation experience as guidance for the This manual presents the results of research, design studies, and operation experience as guidance for the hydraulic design of navigation locks.

The Highway Drainage Guidelines provides a consolidated overview of highway hydraulic design and discusses possible hydrology problems in the following areas: Hydraulic Considerations in Highway Planning and Location; Hydrology; Erosion and Sediment Control in Highway Construction; Hydraulic Design of Highway Culverts; The Legal Aspects of Highway Drainage; Hydraulic Analysis and Design of Open Channels; Hydraulic Analysis for the Location and Design of Bridges; Hydraulic Aspects in Restoration and Upgrading of Highways; Storm Drain Systems; Evaluating Highway Effects on Surface Water Environments; Highways Along Coastal Zones and Lakeshores; Stormwater Management; Training and Career Development of Hydraulics Engineers; Culvert Inspection, Material Selection, and Rehabilitation; Guidelines for Selecting and Utilizing Hydraulics Engineering Consultants.

U.S. Army Corps of Engineers Technical Engineering and Design Guide No. 12 presents guidance for the hydraulic design of spillways for flood control or multipurpose dams.

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.
Fluid power systems are manufactured by many organizations for a very wide range of applications, embodying different arrangements of components to fulfill a given task. Hydraulic components are manufactured to provide the control functions required for the operation of a wide range of systems and applications. This second edition is structured to give an understanding of: • Basic types of components, their operational principles and the estimation of their performance in a variety of applications. • A

resume of the flow processes that occur in hydraulic components. • A review of the modeling process for the efficiency of pumps and motors. This new edition also includes a complete analysis for estimating the mechanical loss in a typical hydraulic motor; how circuits can be arranged using available components to provide a range of functional system outputs, including the analysis and design of closed loop control systems and some applications; a description of the use of international standards in the design and management of hydraulic systems; and extensive analysis of hydraulic circuits for different types of hydrostatic power transmission systems and their application.

Hydraulic Design and Management of Wastewater Transport Systems is a manual resulting from the research project CAPWAT (CAPacity loss in wasteWATer pressure pipelines), which researched the mechanisms for the creation, stagnation and discharge of gas bubbles in wastewater pressure pipelines. During this six-year research programme, it was recognised that there is no hydraulic manual/guideline that focuses on the entire wastewater pressure pipeline system, the processes it includes, and the interaction between the pressure pipeline and the pumping station. This manual provides a compilation of all the hydraulic knowledge that is necessary for designing a wastewater transport system and to manage it operationally. The wastewater transport system is the link between the collection and treatment of the wastewater and the collection system includes, among others, the gravity flow sewage system from the house (or consumer) and service connection through street and main sewers up to the suction basins. The transport system, for which this manual was written, includes the

suction basin, the sewage pumping station and the pressure pipelines. Wastewater transport systems are becoming more complex due to building larger sewage water treatment plants, wastewater being transported over greater distances and increasingly more (and smaller) pipelines connecting to the main sewers. The operation of the pumping stations is largely determined by how the entire system behaves. Insight into this operation is, therefore, crucial for proper design and management. The central point of the design is to create an independent and safe system with the necessary transport capacity at minimum societal costs. Predominantly, the management aspect focuses on guidelines to maintain the design principles regarding capacity and required energy.

A labyrinth weir is a series of duckbill spillways for controlling the flow of water over a dam or channel. This slim volume compares the crest shapes used on weirs, identifies considerations for designing downstream chutes and dealing with sedimentation, explores general guidelines for parameter se

* 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

(Hydraulic Design Series) This document provides technical information and guidance on the hydraulic analysis and design of bridges. The goal is to provide information such that bridges can be designed as safely as possible while optimizing costs and limiting impacts to property and the environment. Many significant aspects of bridge hydraulic design are discussed. These include regulatory topics, specific approaches for bridge hydraulic modeling, hydraulic model

selection, bridge design impacts on scour and stream instability, and sediment transport. Basic hydraulic considerations - Channel types and behaviour relation to bridges - Basic hydraulic requirements - Hydraulic design procedures Hydrologic estimates - Statistical frequency analysis - Runoff modeling - Empirical methods - High water levels and stage-discharge relations - Extreme floods and risk Scour protection and channel control - Scour protection around bridge foundations - Erosion protection of banks and slopes - Design of rock riprap - Cannel control works Hydraulic aspects of construction, inspection and maintenance - Construction - Inspection - Maintenance Special problems - Tidal crossings - Inland basic crossings - Waves and waves protection - Physical modeling of bridge problems - Alluvial fans - Debris flow and torrents

At head of title: National Cooperative Highway Research Program.

Providing current; best practice methods; tips; guidelines; and examples to help you handle any hydraulic design challenge; this all-inclusive; authoritative text will save you hours of searching through journals and fine-print government publications. --

This manual provides the procedures and data necessary to calculate discharges over and through hydraulic structures. Contents: Introduction; Discharge measurement structures; Discharge relationships and component head losses for hydraulic structures; Headlosses in closed conduit systems flowing full; Analysis of flow conditions and hydraulic design for river diversion in closed conduits; Flow

through and over rockfill structures

Information and technical data concerning scouring/erosion caused by water fl in rivers and streams. More specifically, how certain structures exaggerate this natural process by restricting water flow, causing constriction and loc scour. Material presented is from both field studies and laboratories

This new edition again includes the extended range of pipe size that covers European standards as well as those for the newer materials now widely adopted in the UK. The book's main objective is to aid Colebrook-White assessments of resistance in such pipes and in a great variety of free-surface circumstances including large rivers.

Prepared by the Task Committee on Recommendations for Standards in Hydraulics of the Hydraulics Division of ASCE. This report investigates whether standards or guides are useful to hydraulic engineers and whether additional standards or guides should be prepared. The results of a questionnaire indicate that most hydraulic engineers are not familiar with the procedures used to develop standards or with existing national or international standards. However, responses to the questionnaire show that hydraulic engineers welcome guides or standards as long as some flexibility to use engineering judgment for site specific conditions is allowed. The report recommends that guidelines or consensus

standards be developed in the following areas: application of one-dimensional surface water computer programs of the HEC-2 type; prediction of scour at bridge piers; design of pump intakes and sumps; and calculations of friction and form losses in closed conduits. Annotated lists of standards and guidelines produced in the United States and abroad are included.

Graduate-level text synthesizes research and experience from disparate fields to form guidelines for dealing with vibration phenomena, particularly in terms of assessing sources of excitation in a flow system. 1994 edition.

Full color, richly illustrated book. The purpose of HDS 7, Hydraulic Design of Safe Bridges, is to provide technical information and guidance on the hydraulic design of bridges. HDS 7 replaces the HDS 1 manual "Hydraulics of Bridge Waterways" (FHWA 1978) for guidance of bridge hydraulic analyses. Bridges should be designed as safely as possible while optimizing costs and limiting impacts to property and the environment. Many significant aspects of bridge hydraulic design are discussed. These include regulatory topics, specific approaches for bridge hydraulic modeling, hydraulic model selection, bridge design impacts on scour and stream instability, and sediment transport.

Hydraulic Design Series Number 5 (HDS 5) originally merged culvert design information contained in Hydraulic Engineering Circulars (HEC) 5, 10, and 13

with other related hydrologic, storage routing and special culvert design information. This third edition is the first major rewrite of HDS 5 since 1985, updating all previous information and adding new information on software solutions, aquatic organism passage, culvert assessment, and culvert repair and rehabilitation. The result is a comprehensive culvert design publication. The appendices of the publication contain the equations and methodology used in developing the design charts (nomographs) and software programs, information on hydraulic resistance of culverts, the commonly used design charts, and Design Guidelines (DG) illustrating various culvert design calculation procedures. The number of design charts provided has been reduced recognizing the increased use of software solutions...

This book provides a discussion of the latest research pertaining to the hydraulic design of spilways and to hydraulic engineering in general. It comprises the papers of a workshop organized to bring together engineers and scientists from around the world for the exchange of ideas on water flow over stepped spillways. This workshop covered a range of subjects from two-phase flow characteristics to refurbishment and implementation of spillways in existing dam structures, and the book also includes a number of illustrative case studies. Overall, this book is one of the first in the rapidly growing field of modern hydraulic engineering

techniques. It will interest designers, scientists, and graduate students and researchers in the fields of hydraulic, civil and environmental engineering.

This monograph is aimed at the practising hydraulic engineer. Work on it commenced at Professor Naudascher's instigation in 1982. Over the next six years all or some of the authors discussed progress at IAHR sponsored conferences at Esslingen, Melbourne, Lausanne and Beijing. With the authors scattered throughout the world, and all with other responsibilities, progress was bound to be slow. Completion was further delayed by the great increase in published technical literature in this area over the period 1982-1988. This literature continues to expand and with it our understanding of the air water flow phenomena. The monograph must therefore be seen as the authors' views on the state of the art around 1988. More recent references have been included for completeness.This monograph has been a joint effort with most authors making suggestions and contributions to more than one chapter. Nevertheless, the chapter authors are primarily responsible for the material in their chapters.Throughout the monograph symbols are defined when they are fist introduced and a list of symbols is included at the end of each chapter.Many other people have contributed to this monograph, but the authors would particularly like to acknowledge the assistance given by Professor John McNown who has read, commented on and improved the style of the complete monograph.

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.