

Stormwater Management Design Guidelines City Of Pickering

During recent years, techniques and legislation for decentralized storm-water management have advanced all over the world. However, decentralized storm-water management systems are still under-utilized and acceptance among citizens and professionals is still lacking. Yet management of this issue will be essential for the sustainable development of cities in the future. Thus acceptance of the systems must be improved. The main question that needs to be answered is how can sustainable storm-water management be integrated with urban design in order to create safe, liveable, sustainable, and attractive cities? This manual, developed by the Hafen City University of Hamburg, provides an overview of a Water Sensitive Urban Design approach and creates principles for a successful strategy focused on the topics: Water Sensitivity, Aesthetics, Functionality, Usability, Public Perception and Acceptance, as well as Integrative Planning. It furthermore presents an international selection of case studies ranging from small scale (site level) up to large scale (city level), demonstrating the WSUD principles in the context of the temperate climates.

The intense concentration of human activity in urban areas leads to changes in both the quantity and quality of runoff that eventually reaches our streams, lakes, wetlands, estuaries and coasts. The increasing use of impervious surfaces designed to provide smooth and direct pathways for stormwater run-off, has led to greater runoff volumes and flow velocities in urban waterways. Unmanaged, these changes in the quantity and quality of stormwater can result in considerable damage to the environment. Improved environmental performance is needed to ensure that the environmental values and beneficial uses of receiving waters are sustained or enhanced. Urban Stormwater - Best-Practice Environmental Management Guidelines resulted from a collaboration between State government agencies, local government and leading research institutions. The guidelines have been designed to meet the needs of people involved in the planning, design or management of urban land uses or stormwater drainage systems. They provide guidance in ten key areas:

*Environmental performance objectives *Stormwater management planning *Land use planning *Water sensitive urban design *Construction site management *Business surveys *Education and awareness *Enforcement *Structural treatment measures *Flow management

Engineers and planners within local government, along with consultants to the development industry, should find the guidelines especially useful. Government agencies should also find them helpful in assessing the performance of stormwater managers. While developed specifically for application in Victoria, Australia, the information will be of value to stormwater managers everywhere.

The manual introduces general audiences to designing landscapes for urban stormwater runoff -- a primary source of watershed pollution. The goal is to motivate awareness and implementation of LID in a wide cross-section of stakeholders, from property owners to municipal governments that regulate infrastructure development. The manual provides a holistic framework in which a novice homeowner and an experienced developer can each find an equally transformative role to enact.

Review of the New York City Watershed Protection Program

Stormwater Best Management Practices

Stormwater

CSCE21 General Track Volume 2

An Overview of Programs and Practices

Urban Stormwater

New York City's municipal water supply system provides about 1 billion gallons of drinking water a day to over 8.5 million people in New York City and about 1 million people living in nearby Westchester, Putnam, Ulster, and Orange counties. The combined water supply system includes 19 reservoirs and three controlled lakes with a total storage capacity of approximately 580 billion gallons. The city's Watershed Protection Program is intended to maintain and enhance the high quality of these surface water sources. Review of the New York City Watershed Protection Program assesses the efficacy and future of New York City's watershed management activities. The report identifies program areas that may require future change or action, including continued efforts to address turbidity and responding to changes in reservoir water quality as a result of climate change.

The Stormwater Management Manual is designed for stormwater managers and those seeking certification as an APWA Certified Stormwater Manager, as well as those wishing to gain an overview of programs and practices. This manual addresses the technical knowledge stormwater managers need to make meaningful water quality improvement. It covers old and new stormwater management techniques, management of new development and redevelopment, funding and financing, and political and social factors of stormwater management programs.

The rapid conversion of land to urban and suburban areas has profoundly altered how water flows during and following storm events, putting higher volumes of water and more pollutants into the nation's rivers, lakes, and estuaries. These changes have degraded water quality and habitat in virtually every urban stream system. The Clean Water Act regulatory framework for addressing sewage and industrial wastes is not well suited to the more difficult problem of stormwater discharges. This book calls for an entirely new permitting structure that would put authority and accountability for stormwater discharges at the municipal level. A number of additional actions, such as conserving natural areas, reducing hard surface cover (e.g., roads and parking lots), and retrofitting urban areas with features that hold and treat stormwater, are recommended.

Sustainable Stormwater Management

The Routledge Handbook of Planning for Health and Well-Being

Construction Site, Soil Erosion and Sediment Control

Rainwater Harvesting—Building a Water Smart City

Clean Water and Sanitation

For the City of Omaha, Nebraska, the County of Douglas County and the Papio Natural Resources District

The Global Street Design Guide is a timely resource that sets a global baseline for designing streets and public spaces and redefines the role of streets in a rapidly urbanizing world. The guide will broaden how to measure the success of urban streets to include: access, safety, mobility for all users, environmental quality, economic benefit, public health, and overall quality of life. The first-ever worldwide standards for designing city streets and prioritizing safety, pedestrians, transit, and sustainable mobility are presented in the guide. Participating experts from global cities have helped to develop the principles that organize the guide. The Global Street Design Guide builds off the successful tools and tactics defined in NACTO's Urban Street Design Guide and Urban Bikeway Design Guide while addressing a variety of street typologies and design elements found in various contexts around the world.

The Urban Street Stormwater Guide begins from the principle that street design can support--or degrade--the urban area's overall environmental health. By incorporating Green Stormwater Infrastructure (GSI) into the right-of-way, cities can manage stormwater and reap the public health, environmental, and aesthetic benefits of street trees, planters, and greenery in the public realm. Building on the successful NACTO urban street guides, the Urban Street Stormwater Guide provides the best practices for the design of GSI along transportation corridors. The state-of-the-art solutions in this guide will assist urban planners and designers, transportation engineers, city officials, ecologists, public works officials, and others interested in the role of the built urban landscape in protecting the climate, water quality, and natural environment.

Approaches to Water Sensitive Urban Design: Potential, Design, Ecological Health, Economics, Policies and Community Perceptions covers all aspects on the implementation of sustainable storm water systems for urban and suburban areas whether they are labeled as WSUD, Low Impact Development (LID), Green Infrastructure (GI), Sustainable Urban Drainage Systems (SUDS) or the Sponge City Concept. These systems and approaches are becoming an integral part of developing water sensitive cities as they are considered very capable solutions in addressing issues relating to urbanization, climate change and heat island impacts in dealing with storm water issues. The book is based on research conducted in Australia and around the world, bringing in perspectives in an ecosystems approach, a water quality approach, and a sewer based approach to stormwater, all of which are uniquely covered in this single resource. Presents a holistic examination of the current knowledge on WSUD and storm water, including water quality, hydrology, social impacts, economic impacts, ecosystem health, and implementation guidelines Includes additional global approaches to WSUD, including SUDS, LID, GI and the Sponge City Concept Covers the different perspectives from Australia (ecosystem based), the USA (water quality based) and Europe (sewer based) Addresses storm water management during the civil construction stage when much of the ecological damage can be done

Proceedings of the Canadian Society of Civil Engineering Annual Conference 2021

Developing Pollution Prevention Plans and the Best Management Practices

Water Sensitive Urban Design

Omaha Metropolitan Area Stormwater Management Design Manual

Guidelines for Human Settlement Planning and Design

Green Stormwater Infrastructure for Sustainable Urban and Rural Development

An essential addition to the landscape design library Nature devises ingenious systems for the management and delivery of water in all its phases. No additional infrastructure is required—the water systems are in place, naturally. But once the natural environment has been disrupted by human development, stormwater becomes an issue that requires intervention and ongoing management. Sustainable Stormwater Management, by leading expert Tom Liptan, provides landscape students and professionals with a green approach to landscape design. The hardworking book includes comprehensive information on how to design, install, and maintain a landscape for sustainable stormwater management. It addresses stormwater in the urban environment, relevant environmental and economic policies, and shares case studies of exemplary projects from around the world.

“Green Stormwater Infrastructure for Sustainable Urban and Rural Development” offers some of the latest international scientific and practitioner findings around the adaptation of urban, rural and transportation infrastructures to climate change by sustainable water management. This book addresses the main gaps in the up-to-date literature and provides the reader with a holistic view, ranging from a strategic and multiscale planning, implementation and decision-making angle down to the engineering details for the design, construction, operation and maintenance of green stormwater techniques such as sustainable drainage systems (SuDS) and stormwater control measures (SCMs). This book is particularly recommended for a wide audience of readers, such as academics/researchers and students in the fields of architecture and landscaping, engineering, environmental and natural sciences, social and physical geography and urban and territorial planning. This book is also a resource for practitioners and professionals developing their work in architecture studios, engineering companies, local and regional authorities, water and environmental industries, infrastructure maintenance, regulators, planners, developers and legislators.

Until recently, most green rooftop gardens were little more than variations on sedum mats on four inches of soil. Now, designers are creating cutting-edge green roofs that focus not only on critical environmental issue like heat, storm management, and ecosystem development, but also on the aesthetics, offering beautiful, livable, sustainable landscapes. The Professional Design Guide to Green Roofs is a comprehensive exploration of rooftop garden design and the process behind it. It covers everything landscape architects and garden designers need to know to create a beautiful garden in the sky. With lush photography, international examples, and solid how-to information, this is an essential resource for all design professionals.

Storm Water Management for Construction Activities

Urban Street Stormwater Guide

Urban Storm Water Management

Urban Storm Drainage Criteria Manual

Nature Based Strategies for Urban and Building Sustainability

Stormwater Management Model Ordinance

Urban planning is deeply implicated in both the planetary crisis of climate change and the personal crises of unhealthy lifestyles. Worldwide health issues such as obesity, mental illness, growing health inequalities and climate vulnerability cannot be solved solely by medicines but also by tackling the social, economic and environmental determinants. In a time when unhealthy and unsustainable conditions are being built into the physical fabric of cities, a new awareness and strategy is urgently needed to putting health and well-being at the heart of planning. The Routledge Handbook of Planning for Health and Well-being authoritatively and comprehensively integrates health into planning, strengthening the hands of those who argue and plan for healthy environments. With contributions from international leaders in the field, the Handbook of Planning for Health and Well-being provides context, philosophy, research, processes, and tools of experienced practitioners through case studies from four continents.

DEP's stormwater performance standard is intended to reduce adverse impacts on the city's combined sewer system from runoff during rainstorms that are more severe than sewers and related facilities are designed to handle. When excessive stormwater enters the combined sewer system from impervious surfaces, it can cause combined sewer overflows (CSOs), flooding, and sewer backups. By slowing the flow of stormwater to the sewers, the stormwater performance standard allows the city to manage stormwater runoff from new development and redevelopment more effectively and maximize, to the greatest extent possible, the capacity of the city's combined sewer systems.

The goal of this document is to provide a comprehensive design manual that results in effective, reliable, and economically affordable stormwater management systems for Calgary, Alberta. Chapters of the manual cover the following: general principles of stormwater management & planning; required approvals & processes at the federal, provincial, & municipal levels; design of stormwater system components, including drainage, runoff analysis, pipes, manholes, catch basins, weeping tile, outfalls, surface ponds, and floodplains; commercial, institutional, & multi-family residential drainage & site servicing plans; hydraulic design; stormwater ponds & wetlands; water quality modelling & monitoring; best management practices designed to prevent or reduce the release of pollutants to receiving waters; erosion & sediment control; operating, maintenance, & monitoring requirements; and technical requirements.

A Guide for Floridians

Design and Construction of Urban Stormwater Management Systems

Stormwater Management Manual

Using Graywater and Stormwater to Enhance Local Water Supplies

Stormwater Management & Design Manual

A Design Manual for Urban Areas

Prepared by the Task 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; surveys and investigations; design concepts and master planning; hydrology and water quality; storm drainage hydraulics; and computer modeling. This guidebook has been prepared as a source of general information on urban stormwater management. It is intended for the use of local government officials and others interested in sound planning and design of stormwater management systems.

Covering all elements of the storm water runoff process, Urban Storm Water Management includes numerous examples and case studies to guide practitioners in the design, maintenance, and understanding of runoff systems, erosion control systems, and common design methods and misconceptions. It covers storm water management in practice and in regulation, and reviews shortcomings and suggestions for improvements. It also covers alternative methods such as porous pavements, rain gardens, green roofs and other systems which are becoming increasingly popular and are forming the future of storm water management. Appropriate storm water management and compliance is a necessary, yet costly and involved process. This book provides information, guidelines, and case studies to guide practitioners through all phases of effective structural storm water management. This book covers: All aspects of storm water management—including its impacts on the environment Numerous design procedures and problems with a separate solutions manual Hydrologic and hydraulic calculations involved in the field of storm water management Design and calculation methods required for efficient storm water management Pipe and open channel flow equations, supplemented with charts and tables Various types of nonstructural, source reduction measures Installation methods of drainage and storm water management facilities Urbanization has had a drastic impact on the natural process of storm water runoff; increasing both the peak and the volume of runoff, reducing infiltration, while also degrading water quality. Urban Storm Water Management is a compendium of all matters necessary for the design of efficient drainage and storm water management systems. It includes numerous examples of hydrologic and hydraulic calculations involved in this field. It also contains ample case studies that exemplify the methods and procedures for the design of extended detention basins, infiltration basins, and underground

retention/infiltration basins such as chambers and dry wells. Furthermore, the book demonstrates how storm water runoff can be an effective and cost-efficient conservable and reusable resource.

City of flagstaff stormwater management design manual

Understanding Your Utility Bill

technical design guidelines for stormwater management

Design and Construction of Sanitary and Storm Sewers

Low Impact Development

Soil Survey of Clark County, Washington

This guide shows you how to develop and implement a Storm Water Pollution Prevention Plan specifically designed for your construction site. It should answer any questions you have regarding the NPDES General Permit for Storm Water Discharges from Construction Activities that are classified as "Associated with Industrial Activity" (referred to as EPA's Baseline Construction General Permit).

Step-by-step guidelines and checklists walk you through the process of setting up your plan, which makes the book invaluable for consultants, regulators, and construction managers and engineers.

Nature Based Strategies for Urban and Building Sustainability reviews the current state-of-the-art on the topic. In the introduction, the editors review the fundamental concepts of nature elements in the built environment, along with the strategies that are necessary for their inclusion in buildings and cities. Part One describes strategies for the urban environment, discussing urban ecosystems and ecosystem services, while Part Two covers strategies and technologies, including vertical greening systems, green roofs and green streets. Part Three covers the quantitative benefits, results, and issues and challenges, including energy performances and outdoor comfort, air quality improvement, acoustic performance, water management and biodiversity. Provides an overview of the different strategies available to integrate nature in the built environment Presents the current state of technology concerning systems and methodologies on how to incorporate nature in buildings and cities

Features the latest research results on operation and ecosystem services Covers both established and new designs, including those still in the experimental stage

Chronic and episodic water shortages are becoming common in many regions of the United States, and population growth in water-scarce regions further compounds the challenges. Increasingly, alternative water sources such as graywater-untreated wastewater that does not include water from the toilet but generally includes water from bathroom sinks, showers, bathtubs, clothes washers, and laundry sinks- and stormwater-water from rainfall or snow that can be measured downstream in a pipe, culvert, or stream shortly after the precipitation event-are being viewed as resources to supplement scarce water supplies rather than as waste to be discharged as rapidly as possible. Graywater and stormwater can serve a range of non-potable uses, including irrigation, toilet flushing, washing, and cooling, although treatment may be needed. Stormwater may also be used to recharge groundwater, which may ultimately be tapped for potable use. In addition to providing additional sources of local water supply, harvesting stormwater has many potential benefits, including energy savings, pollution prevention, and reducing the impacts of urban development on urban streams. Similarly, the reuse of graywater can enhance water supply reliability and extend the capacity of existing wastewater systems in growing cities. Despite the benefits of using local alternative water sources to address water demands, many questions remain that have limited the broader application of graywater and stormwater capture and use. In particular, limited information is available on the costs, benefits, and risks of these projects, and beyond the simplest applications many state and local public health agencies have not developed regulatory frameworks for full use of these local water resources. To address these issues, Using Graywater and Stormwater to Enhance Local Water Supplies analyzes the risks, costs, and benefits on various uses of graywater and stormwater. This report examines technical, economic, regulatory, and social issues associated with graywater and stormwater capture for a range of uses, including non-potable urban uses, irrigation, and groundwater recharge. Using Graywater and Stormwater to Enhance Local Water Supplies considers the quality and suitability of water for reuse, treatment and storage technologies, and human health and environmental risks of water reuse. The findings and recommendations of this report will be valuable for water managers, citizens of states under a current drought, and local and state health and environmental agencies.

Best-Practice Environmental Management Guidelines

Potential, Design, Ecological Health, Urban Greening, Economics, Policies, and Community Perceptions

An Assessment of Risks, Costs, and Benefits

A Landscape-Driven Approach to Planning and Design

Global Street Design Guide

Debris-control Structures

This volume discusses the climate responsiveness of sustainable architecture design and technology in China, Japan, Singapore, and South Korea in recent years, addressing concepts and applications in urban planning, building design, and structural performance evaluation. The four sections of the text cover the theory and implementation of sustainable architecture within various geographic boundaries and contexts, offering an interdisciplinary assessment of the challenges faced in urban areas at different climate zones. The main topics covered are: 1) urban ecological restoration under the influence of climate environment; 2) health and human considerations of building and environment; 3) prototype optimization of sustainable building, and 4) feedback of building performance and design evaluation. The book is intended to be a contribution to the growing body of knowledge on sustainable architecture for applicable use by practitioners, city planners, field researchers, and building operators in building design, construction, usage, operation, and maintenance.

The problems related to the process of industrialisation such as biodiversity depletion, climate change and a worsening of health and living conditions, especially but not only in developing countries, intensify. Therefore, there is an increasing need to

search for integrated solutions to make development more sustainable. The United Nations has acknowledged the problem and approved the "2030 Agenda for Sustainable Development". On 1st January 2016, the 17 Sustainable Development Goals (SDGs) of the Agenda officially came into force. These goals cover the three dimensions of sustainable development: economic growth, social inclusion and environmental protection. The Encyclopedia of the UN Sustainable Development Goals comprehensively addresses the SDGs in an integrated way. It encompasses 17 volumes, each devoted to one of the 17 SDGs. This volume is dedicated to SDG 6 "Ensure availability and sustainable management of water and sanitation for all". Water and sanitation are fundamental to human well-being. Integrated water resources management is essential to ensure availability and sustainable management of water and sanitation for all and to the realization of Sustainable Development. Concretely, the defined targets are: Achieve universal and equitable access to safe and affordable drinking water for all Achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally Substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity Implement integrated water resources management at all levels, including through transboundary cooperation as appropriate Protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes Expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies Support and strengthen the participation of local communities in improving Uwater and sanitation management Editorial Board Ulisses M. Azeiteiro, Anabela Marisa Azul, Luciana Brandli, Dominique Darmendrail, Despo Fatta-Kassinou, Walter Leal Filho, Susan Hegarty, Amanda Lange Salvia, Albert Llausàs, Paula Duarte Lopes, Javier Marugán, Fernando Morgado, Wilkister Nyaora Moturi, Karel F. Mulder, Alesia Dedaa Ofori, Sandra Ricart Designed to give practical engineering solutions to all those who need to implement WSUD guidelines. Provides design and maintenance procedures, typical drawings, design checklists, landscape requirements, worked examples and case studies.

Stormwater Management Guidelines for the Province of Alberta

Design and Technological Applications in Sustainable Architecture

Guidelines for the Design and Construction of Stormwater Management Systems - Color Edition

Principles and Inspiration for Sustainable Stormwater Management in the City of the Future

Reducing Stormwater Costs Through Low Impact Development (LID) Strategies and Practices

Shaping a sustainable and healthy future

Design and Construction of Urban Stormwater Management Systems ASCE Publications

In response to the increasing urbanization, advances in the science of urban hydrology have improved urban water system management, creating more livable cities in which public safety and health, as well as the environment, are protected. The ultimate goal of urban water management is to mimic the hydrological cycle prior to urbanization. On top of urbanization, climate change, which has been demonstrated to alter the hydrological cycle in all respects, has introduced additional challenges to managing urban water systems. To mitigate and adapt to urbanization under a changing climate, understanding key hydrologic components should expand to include complex issues brought forth by climate change. Thus, effective and efficient measures can be formulated. This Special Issue of Water presents a variety of research papers that span a range of spatial and temporal scales of relevance in different societies' efforts in adapting to the eminent changes in climate and the continuous changes in the landscape. From mitigating water quality in permeable pavements and bioretention swales to understanding changes in groundwater recharge in large regions, this Special Issue examines the state-of-the-art in sustainable urban design for adaptation and resiliency.

The Professional Design Guide to Green Roofs

Approaches to Water Sensitive Urban Design

Urbanization under a Changing Climate

WSUD Engineering Procedures

Urban Stormwater Management in the United States