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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.

This book, Green Roofs And Living Walls For Architects, provides insights on green roof and living wall technologies employed in modern sustainable building projects around the world. It allows readers to gain an understanding of green roof and wall types, landscape design considerations, architectural design considerations, water management and maintenance considerations.

Until now, the green roof movement has been limited to large-scale, professional endeavors and public buildings. But homeown-
ers everywhere are catching onto the benefits of a green roof—water conservation, energy savings, and storm water management. In Small Green Roofs authors Dunnett, Gedge, Little, and Snodgrass profile ordinary homeowners who scaled green roofs down to the domestic level. Small Green Roofs is the first book to focus on small-scale and domestic green roofs. More than forty profiles of small and domestic-scale projects of all shapes and sizes include green roofs on sheds, garden offices, studios, garages, houses, bicycle sheds, and other small structures, as well as several community projects. For each project, details are given for design, construction, and installation, as well as how-to tips on how the roof was planted and cared for. For readers looking for inspiration when hiring a contractor or taking the adventurous step of building their own, Small Green Roofs provides the knowledge and encouragement to make it possible.

Pioneering Women in Plant Pathology is a biographical book on the early women scientists who led the way for others in the field of plant pathology. These untold stories about 27 fascinating women discuss their struggles and triumphs as early women in the science. With contributions from 37 talented writers and more than 130 figures, we are given a true picture of the challenges these women faced on their way to important discoveries. The authors do a wonderful job presenting the scientific achievements of these women in the context of their time. We also get glimpses into the character of these women that show us how their personal attributes and talents helped them achieve great things.

"Green Roofs & Living Walls For Landscape Architects" aims to provide an introduction to green roof and living wall technologies employed in modern sustainable building projects around the world. Several types of green roof and living wall designs have evolved through the years, which this book hopes landscape architects to gain better understanding of for their design projects in terms of landscape design considerations, architectural design considerations, water management and maintenance considerations.

Piet Oudolf’s gardens excite the senses and stir the emotions. Representing a giant step forward from the conventional colour-themed border, this new approach to gardening gives just as much emphasis to form, texture, light and movement as it does to colour. Individual plants are used as harmonious elements in luxuriant and atmospheric plantings. Written in collaboration with Noël Kingsbury, Designing with Plants is an informative and visually breathtaking study of Piet Oudolf’s planting theory and practice, and it provides all the advice necessary to create the same effects in your own garden. Beginning with the building blocks of planting design, a visual sourcebook of Planting Palettes illustrates some of the huge choice available in terms of form, texture and colour. The following chapter explains, with the use of planting plans and diagrams, how to combine these basic elements to create stunning and sculptural planting schemes. Theory is put into practice in Planting Moods in which stunning photography demonstrates how to create a particular feeling or atmosphere, and Year-Round Planting emphasizes the importance of choosing plants to give value throughout the seasons so that they contribute to the garden in death as well as in life. Rounding off with a detailed directory of key plants, Designing with Plants is destined to become an inspiration to all gardeners who wish to
create, in Piet's words, 'an impression and an expression of nature'.

Living Wall: Jungle the Concrete 2 is the second, updated edition of Living Wall: Jungle the Concrete and is a compilation of recent projects as well as revisions to many of the technical drawings and data associated with the projects detailed in the first edition. Chapter-by-chapter, this book teaches readers how to install their own Green Wall step-by-step, including instructional details from the beginning stages of a project (including site assessment) to middle stage details such as plant selection, waterproofing, installing suitable lighting, and irrigation and plant nutrition systems to the final stage when maintenance and other similar activities are discussed. Projects included in this book are accompanied by a detailed plant list. New concepts and new technologies associated with the Green Wall Concept are also introduced.

This book provides an up-to-date coverage of green (vegetated) roof research, design, and management from an ecosystem perspective. It reviews, explains, and poses questions about monitoring, substrate, living components and the abiotic, biotic and cultural aspects connecting green roofs to the fields of community, landscape and urban ecology. The work contains examples of green roof venues that demonstrate the focus, level of detail, and techniques needed to understand the structure, function, and impact of these novel ecosystems. Representing a seminal compilation of research and technical knowledge about green roof ecology and how functional attributes can be enhanced, it delves to explore the next wave of evolution in green technology and defines potential paths for technological advancement and research.

Simple green roof design and installation for the do-it-yourself builder Essential Green Roof Construction is a comprehensive, in-depth guide to building simple green roofs for houses and small buildings. Packed with detailed photos, illustrations, case studies, and code compliance advice, it offers clear step-by-step instructions necessary to create your own living roof on a new build or as a retrofit. Coverage includes: The benefits of a green roof The basics of planning and design Assessing site conditions such as aspect, slope, and loads Navigating building codes and working with building officials Material options, including professional grade and economical or local alternatives Planting suggestions for different roof climates and conditions, including food production When to call on professionals to ensure safety and integrity Step-by-step guidance for safe roof installation and detailing Annual green roof maintenance. Where common sense meets beauty — a green roof is a system of layers that work together to support plant life, insulate homes, and make the world a greener place. Essential Green Roof Construction will give you the knowledge and confidence to install your own green roof.

This book studies the application of green roofs in ecoregions of the western United States and Canada. While green roofs were intended to sustain local or regional vegetation, this volume describes how green roofs in their modern form are typically planted with a low-diversity mix of sedums from Europe or Asia. The authors demonstrate how in the western USA and Canada many green roofs have been designed with native plants and have been found to thrive. Part I of this book covers theory and an overview of ecoregions and their implications for green roofs. In Part II vegetation from prairies, deserts, montane meadows, coas-
tal meadows, and scrub and sub-alpine habitats are explored on seventy-three ecoregional green roofs. Case studies explore design concepts, materials, watering and maintenance, wildlife, plant species, and lessons learned. Part III covers an overview of ecoregional green roofs and a future outlook. This book is aimed at professionals, designers, researchers, students and educators with an interest in green roofs and the preservation of biodiversity.

A guide for architects, landscape designers, engineers, environmentalists and eco-aware gardeners, this text contains photographs and information for more than 200 species and cultivars of plants, including data on moisture needs, heat tolerance, hardiness, bloom color, foliage characteristics, and height.

The Council on Tall Buildings and Urban Habitat has produced four Technical Guides to date, since the series launched in late 2012. Each of these guides is the product of a CTBUH Working Group—committees formed specifically to address focused topical subjects in the industry. The intention of each guide is the same—to provide working knowledge to the typical building owner or professional who wants a better understanding of available options for improving tall buildings, and what affects their design. The object of the series is to provide a tool-kit for the creation of better-performing tall buildings, and to spread the understanding of the considerations that need to be made in designing tall. This technical guide offers an extensive overview of the use of vertical vegetation in high-rise buildings, an indepth analysis of green walls, definitions and typology, including standards, policies and incentives. It features comprehensive case studies, along with architectural theories of the public and private benefits of green walls. The book delves into architect-design considerations and limitations, the effects of green walls on energy efficiencies and includes recommendations and future research.

The information published in this guide is provided by the Growing Green Guide partners (City of Melbourne, City of Stonnington, City of Yarra, City of Port Phillip, the State of Victoria and The University of Melbourne) to disseminate information in regards to the design, construction and maintenance of green roofs, walls and facades.

A popular design trend, green roofs make private and public buildings inviting and environmentally friendly.

A lavish, richly illustrated study of gardens built on the roofs of buildings traces the history of roof gardens, from the Hanging Gardens of Babylon to the present; explains how to construct safe, durable gardens; and offers tips on selecting plants, garden maintenance, and planting techniques.

This book provides an introduction to green roof and living wall technologies employed in modern sustainable building projects around the world. This book offers a mine of information that leads to understanding green roof and wall types, landscape design considerations, architectural design considerations, water management and maintenance considerations.

Green Roof Systems goes beyond the fashionable green roof movement and provides solid information on building accessible space, often as important public space, over structure. It offers brief coverage of the entire process, including planning and collaboration, and focuses on the technical aspects of these roof systems, their components, and their applications.
This book, Green Roofs And Living Walls For Civil Engineers, provides insights on green roof and living wall technologies employed in modern sustainable building projects around the world. It allows readers to gain an understanding of green roof and wall types, landscape design considerations, architectural design considerations, water management and maintenance considerations.

The Brooklyn Botanic Garden has long been a leading advocate of urban greening and sustainable design—and a green roof is an exciting expression of these ideals. Vegetated roof systems prevent water pollution, cool and purify the surrounding air, extend roof life, and improve energy efficiency. Here are 13 of New York City's most remarkable examples—including the elevated lawn at Lincoln Center—along with a detailed historical overview, essays by industry experts, and practical advice readers can use to turn their own roofs green.

With the infrastructure to manage storm water threats in cities becoming increasingly expensive to build or repair, the design community needs to look at alternative approaches. Living roofs present an opportunity to compliment ground-level storm water control measures, contributing to a holistic, integrated urban water management system. This book offers tools to plan and design living roofs, in the context of effectively mitigating storm water. Quantitative tools for engineering calculations and qualitative discussion of potential influences and interactions of the design team and assembly elements are addressed.

Discusses the practical techniques required to make planting on roofs and walls a reality, from modifying roofs to bear the weight of vegetation to selecting suitable plant materials.

An accessible overview of the development of green roofs and their contribution to sustainable development. Explains the benefits of their use, and identifies key aspects to consider in designing, building and maintaining them.

Extensively illustrated with photographs and drawings, "Living Architecture" highlights the most exciting green roof and living wall projects in Australia and New Zealand within an international context.

Sustainable architecture is one of the most popular trends today. With dense urban living and less green space available, green walls and roofs are helping to fill that gap. These living structures can be created with vegetation, which helps to absorb rainwater, provide insulation and lower temperatures while creating a habitat for natural flora and fauna. Green Walls Green Roofs features projects from all over the world, showing how these elements work in various climates. Ranging from the tropical houses in Singapore to inner-city buildings in North America, this beautifully illustrated book will show you how living architecture can enrich our world. Gina Tsarounas has coordinated and authored a number of travel guides for Lonely Planet before joining Images Publishing as a senior editor. Her wealth of experience is demonstrated in the beautifully designed books now being produced. Comparable Titles: Vertical Ecoinfrastructure, 9781864703863, Images Publishing Group, August 2010 The Green House, 9781568989501, Princeton Architectural Press, May 2010

Nigel Dunnett's gardens and landscapes have lifted the spirits of city dwellers for decades. They are beautiful, uplifting places that resonate with the energy of the natural world and stop us in our
tracks. But how does he achieve these plantings with their successional waves of colorful perennials, elegant grasses, and pollinators at work with so few demands on irrigation and other natural resources? In this book he shares his inspiration, philosophy and working methods. He puts his own particular style of naturalistic planting in historical context, teaches us how to read wild plant communities and understand how they behave in garden situations. Finally he shares his plant selection, which includes trees and shrubs as well as perennial and annual meadow plants, and implementation techniques in a neat planting design toolkit.

Sustainable design is a collective process whereby the built environment achieves unprecedented levels of ecological balance through new and retrofit construction, with the goal of long-term viability and humanization of architecture. Focusing on the environmental context, sustainable design merges the natural, minimum resource conditioning solutions of the past (daylight, solar heat, and natural ventilation) with the innovative technologies of the present. The desired result is an integrated “intelligent” system that supports individual control with expert negotiation for resource consciousness. International experts in the field address the fundamental questions of sustainable design and landscape management: How should the sustainability of landscapes and buildings be evaluated? Which targets have to be set and which thresholds should not be exceeded? What forms of planning and governance structures exist and to what extent do they further the goals of sustainability? Gathering 30 peer-reviewed entries from the Encyclopedia of Sustainability Science and Technology, Sustainable Built Environments provides comprehensive, multidisciplinary coverage of these issues and other aspects of sustainable building and landscape design.

This book is intended as both an introduction to the discipline for students of landscape architecture, architecture, and planning, and a source of continuing interest for more experienced environmental designers. The book offers various materials for landscape architects and other planning professionals. The book is divided into 4 parts and 17 chapters. Part I "Introduction to the Landscape Architecture Theme" is general reading on landscape architecture. Part II "Art's Replica and Landscape Architecture Model" includes three chapters. This part represents a theoretical and sensitive visual interpretation of landscape architecture. Part III "Sustainable Prototypes of a Contemporary Landscape Architecture" includes four chapters, with sustainability as a concept and guiding thought. Part IV "Landscape Architecture Around the World (Study Cases)" includes 9 chapters with many examples from different geographical practical cases.

The power consumption due to air-conditioning of buildings becomes particularly significant in an urban environment because the temperature of the air of dense urban districts is higher than in the suburbs. This phenomenon, as well as the increase in the standards of living and other factors namely heatwaves, contribute to the growth of the traditionally low demand for artificial air-conditioning in Europe. Case studies make it possible to measure the heat island effect (the accumulation of heat in cities), to characterize the additional electricity consumption of the buildings in an urban environment, and to give an overall picture of the practices, techniques and materials which can help to cool the cities. Priority is given to the practices which avoid the need for artificial air-conditioning by taking into account the environ-
ment, the use of vegetation and "cool" materials for the construction of pavements and buildings. For the remaining needs for air-conditioning, the present systems of air-conditioning can also become more energy efficient. Case studies conducted in Seville made it possible to measure the dispersion of the needs for air-conditioning around their average value for the various zones of the city. One of the case studies evaluates the benefit associated with the systematic plantation of trees and other plants in Athens. Another case study relates to Paris and estimates the importance of centralized solutions for air-conditioning in an urban environment. This book results from a study launched by the European Commission and is written by authors from three European countries very concerned by heatwaves and their effects downtown: Greece (Athens), Spain (Seville) and France (Paris). All of them are professors or researchers in very high level laboratories (Group Building Environmental Studies in Athens University, Energy Laboratory in Ecole des Mines de Paris and in Seville University).

Provides a comprehensive introduction to exterior green wall design. Showcases innovative case studies with spectacular images and technical drawings and diagrams to illustrate the professional expertise, knowledge of planning, design concepts, installation procedures, maintenance, and effective plan selections. Covers a wide range of international projects drawn from many well-known architects and designers. Showcases a collection that is inspirational and a strong practical reference for architects, planners, preservationists, landscape and interior designers, and all who are directly involved in green wall design. In recent years, vertical greening has become more and more popular. No doubt many architects have begun to consider the application of vertical greeneries when designing architecture. We can see that both the vertical garden in Acros Fukuoka and the green facade of One Central Park have attracted world-wide attention. Exterior Green Wall Design has included the latest green wall practices from around the world, and meanwhile provided readers with detailed introductions, summaries and analysis, along with abundant images, drawings and diagrams. Readers can get a good understanding of the development, characteristics, planning, design and plant selection for green walls. This is a definitive practical reference book for landscape designers, architects, students and all those interested in environmental practices."

Extensively illustrated with photographs and drawings, Living Architecture highlights the most exciting green roof and living wall projects in Australia and New Zealand within an international context. Cities around the world are becoming denser, with greater built form resulting in more hard surfaces and less green space, leaving little room for vegetation or habitat. One way of creating more natural environments within cities is to incorporate green roofs and walls in new buildings or to retrofit them in existing structures. This practice has long been established in Europe and elsewhere, and now Australia and New Zealand have begun to embrace it. The installation of green roofs and walls has many benefits, including the management of stormwater and improved water quality by retaining and filtering rainwater through the plants’ soil and root uptake zone; reducing the ‘urban heat island effect’ in cities; increasing real estate values around green roofs and reducing energy consumption within the interior space by
shading, insulation and reducing noise level from outside; and providing biodiversity opportunities via a vertical link between the roof and the ground. This book will appeal to a wide range of readers, from students and practitioners of architecture, landscape architecture, urban planning and ecology, through to members of the community interested in how they can more effectively use the rooftops and walls of their homes or workplaces to increase green open space in the urban environment.

Green roofs—the ultimate in sustainable building practices—continue to generate enormous interest and enthusiasm among architects, landscape designers, and urban planners. Increasingly strict stormwater regulations and the appeal of LEED-related projects have also boosted the popularity and desirability of green roofs. Those who want to build green roofs, however, have few resources to guide them. Until now, no book has taken a comprehensive look at how to effectively adapt green-roof technology to the variable and extreme North American climate, and how to design projects that will function and endure as successfully as those in Germany, Switzerland, and other European countries. This book fills the gap by providing an overview of practices and techniques that have been effective in North America. The authors offer options regarding structure, function, horticulture, and logistics, as well as surveys of actual projects and analyses of why they have or haven’t succeeded. Approachable and reader-friendly, the manual clearly explains how these complex systems function and how to plan and carry out projects successfully from concept through construction and maintenance. Ideally suited to professionals (including architects, landscape architects, engineers, and designers) and their clients, it brings together key lessons from leaders in the field. Numerous photographs highlight the range of design possibilities and show green roofs both during construction and at various stages of maturity. At last, those seeking basic information about how to design and build green roofs have a concise, authoritative guide to this exciting new technology.

Green Roofs, Facades, and Vegetative Systems: Safety Aspects in the Standards analyzes codes, standards and official documents from countries around the world, including: the United States and Canada in North America, Germany, France and Italy in Europe, and Australia, Singapore, Japan and Thailand in Asia. This essential resource for building design professionals covers a full range of living technologies, such as vegetative systems, green architecture/urban design, construction efficiency, facades, fire protection, sustainability aspects in buildings, landscape design, tall buildings and wind design. The book provides an invaluable tool on international codes and standards and how to incorporate them into projects. Provides expert advice for complying with the international codes and standards governing the use of green living technology Covers codes and standards for façades, fire protection, landscape design and wind design Includes case studies and excerpts from major international codes and standards Peer reviewed by some of the top experts and construction firms currently applying this technology around the world

Examine possibilities for city-wide green roof development using 335 color photographs, 40 in-depth building case studies, and 7 municipal case studies of Berlin, Tokyo, London, Portland, Chicago, Toronto, and New York. This book includes an opening essay
by William McDonough, an architect and leader of the sustainable development movement, and details the ecological benefits, technical requirements, architectural history, and design possibilities of vegetated rooftops.

Green roofs are the great green hope of many environmentalists, politicians, and architects interested in more efficient and environmentally aware buildings. From a design standpoint, however, there is less consensus. While some see the roof garden as a visual statement using plants, geometric lines, and sculptural elements, others believe concerns for sustainability should outweigh visual appeal. A green roof that combines aesthetics and mechanics has become the goal of many a landscape architect. In Green Roof Gardens, author Christian Werthmann explains the history, methodology, and design process of green roof garden construction, providing a rich source of inspiration and technical knowledge in the process for anybody interested in this simple solution to many of the environmental challenges we face today.

Nature and architecture have never been more intertwined. As more of the earth’s surface is swallowed up by the built environment, architects are increasingly up to the task of integrating flora and greenery into their creations. There are many ways to express this: green roofs, living walls, indoor courtyards and entire facades filled with plants. But where these are posed as solutions there are yet more questions. How does a skyscraper uphold the weight of hundreds of trees? How do residents keep moss-covered walls alive? Jungle Architecture explores this, and much more.

A Complete Guide to Building and Maintaining Green Roofs Written by an industry expert in green roof design and installation, this GreenSource book presents all of the information you need to skillfully design, construct, and maintain green roofs. You will find a wealth of practical details gathered through real-world implementations and independent research. Green Roof Construction and Maintenance explains how to design a green roof, plan for irrigation and drainage, select and place soil and plants, and maintain the entire setup. The book also discusses return on investment, LEED design specifications, and the myriad short- and long-term environmental benefits of green roofs. Filled with step-by-step illustrations and full-color photographs, this is a valuable, hands-on guide to a rapidly emerging trend in the sustainability movement. Green Roof Construction and Maintenance includes:

- Key questions to ask at each stage of the green building process
- Tested tips and techniques for successful structural design
- Construction methods for new and existing buildings
- Information on insulation, drainage, detailing, irrigation, and plant selection
- Details on optimal soil formulation
- Illustrations featuring various stages of construction
- Best practices for green roof maintenance
- A survey of environmental benefits, including evapo-transpiration, storm-water management, habitat restoration, and improvement of air quality
- Tips on the LEED design and certification process
- Considerations for assessing return on investment
- Color photographs of successfully installed green roofs
- Useful checklists, tables, and charts

This open access book brings together research findings and experiences from science, policy and practice to highlight and debate the importance of nature-based solutions to climate change adaptation in urban areas. Emphasis is given to the potential of
nature-based approaches to create multiple-benefits for society. The expert contributions present recommendations for creating synergies between ongoing policy processes, scientific programmes and practical implementation of climate change and nature conservation measures in global urban areas. Except where otherwise noted, this book is licensed under a Creative Commons Attribution 4.0 International License. To view a copy of this license, visit http://creativecommons.org/licenses/by/4.0/

This book guides architects, landscape designers, urban planners, agronomists and society on the implementation of sustainable rooftop farming projects. The interdisciplinary team of authors involved stresses the different approaches and the multi-faceted forms that rooftop farming may assume in any context. While rooftop farming experiences are sprouting all over the world the need for scientific evidence on the most suitable growing solutions, policies and potential benefits emerges. This volume brings together existing experiences as well as suggestions for planning future sustainable cities.

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.