

Sustainable High Rise Building Case Study Three Example

This unique volume offers insights from renowned experts in energy efficient building from the world over, providing a multi-faceted overview of the state-of-the-art in energy efficient architecture. It opens by defining what constitutes a sustainable building, suggesting bases for sorely needed benchmarks, then explains the most important techniques and tools available to engineers and architects exploring green building technologies. It covers such pivotal issues as daylighting, LED lighting, integrating renewables such as solar thermal and cooling, retrofitting, LEED and similar certification efforts, passive houses, net-zero and close-zero structures, water recycling, and much more. Highlighting best practices for commercial buildings and private homes, in widely varied climates and within vastly different socio-economic contexts, this illustrated reference will guide architects and engineers in making sustainable choices in building materials and methods. Explains the best methods and materials to support energy efficient building Features case studies by experts from a dozen countries, demonstrating how sustainable architecture can be achieved in varied climates and economies Covers both new constructions and retrofitting of existing

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structures

This book emphasizes the important message that architects and structural engineers must strive to ensure that the buildings they design and construct should not be major contributors to climate change. Rather, they should be exploring the use of green materials and building methods – such as timber, wood, and associated materials – in order to safeguard the environment. These sustainable materials are not only environmentally friendly, but they have the added benefit of being easy to manufacture, cost effective, often locally available, and easily replenished. Moreover, it has been demonstrated that wood and timber are viable materials in the construction of a wide variety of building types, including medium and high-rise buildings. *The Importance of Wood and Timber in Sustainable Buildings* brings together a distinguished group of contributors from different cultures and building traditions to address why now is the time to rethink our construction methods and explore replacing many of the carbon intensive materials that are currently being used with wood and timber. 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

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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 toolkit 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.

Based on the 2018 International Joint Conference on Industrial Engineering and Operations Management (IJCIEOM) conference that took place in Lisbon, Portugal, this proceedings volume is the first of two focusing on mathematical applications in digital transformation. The different contributions in this volume explore topics such as modelling, simulation, logistics, innovation, sustainability, health care, supply chain, lean manufacturing, operations management, quality and digital. Written by

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renowned scientists from around the world, this multidisciplinary volume serves as a reference on industrial engineering and operations management and as a source on current findings for researchers and students aiming to work on industrial-related problems.

The integration of nature in architecture is a key concern of sustainability. However, all too often sustainable design is reduced to improving the energetic performance of buildings and the ornamental application of natural green. *Dense + Green* explores new architectural typologies that emerge from the integration of green components such as sky terraces, vertical parks and green facades, in high-density buildings. The book describes green strategies in a comparison across different design tasks and climate conditions. In-depth case studies on the most relevant building types, consistently presented with analytical drawings made exclusively for this book, are complemented by expert essays that demonstrate the current paradigm shift in the sustainable urban environment. From the Contents:

- *Dense + Green Building Types*, by Thomas Schröpfer, architect, Singapore University of Technology and Design
- *Dense + Green Building Technology*, by Atelier Ten, environmental design consultants and building services engineers, New York, NY
- *Dense + Green Landscape Design*, by Herbert Dreiseitl, landscape

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architect, Atelier Dreiseitl/Rambøll Liveable Cities Lab, Überlingen/Singapore/Portland, OR •Dense + Green Botanical Design, by Jean Yong, plant ecophysiologicalist, Singapore University of Technology and Design •Dense + Green Urbanism, by Kees Christiaanse, urban planner, ETH Zurich •25 in-depth case studies from Europe, Asia and the USA •Practice Reports by Foster + Partners, WOHA, Ken Yeang, MVRDV and others

Building stakeholders need practical metrics, data, and tools to support decisions related to sustainable building designs, technologies, standards, and codes. The Engineering Laboratory of the National Institute of Standards and Technology (NIST) has addressed this high priority national need by extending its metrics and tools for sustainable building products, known as Building for Environmental and Economic Sustainability (BEES), to whole-buildings. Wholebuilding sustainability metrics have been developed based on innovative extensions to life-cycle assessment (LCA) and life-cycle costing (LCC) approaches involving whole-building energy simulations. The measurement system evaluates the sustainability of both the materials and the energy used by a building over time. It assesses the carbon footprint of buildings as well as 11 other environmental performance metrics and integrates economic performance metrics to yield science-based measures of the business case

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for investment choices in high-performance, green buildings. Building Industry Reporting and Design for Sustainability (BIRDS) applies the sustainability measurement system to an extensive whole-building performance database NIST has compiled for this purpose. In addition to the database developed for previous versions of BIRDS, the updated BIRDS Commercial database now includes energy, environmental, and cost measurements for 17 100 new commercial and non-low rise residential buildings. These buildings cover the 15 building prototypes based on the PNNL Commercial Prototype Building Models in 228 cities across all U.S. states for study period lengths ranging from 1 year to 40 years. The sustainability performance of buildings designed to meet current state energy codes can be compared to their performance when meeting four alternative building energy standard editions to determine the impact of energy efficiency on sustainability performance. The impact of the building location and the investor s time horizon on sustainability performance can also be measured. In *Building Reuse: Sustainability, Preservation, and the Value of Design*, Kathryn Rogers Merlino makes an impassioned case that truly sustainable design requires reusing and reimagining existing buildings. The construction and operation of buildings is responsible for 41 percent of all primary energy use and 48 percent of all carbon emissions. The impact

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of the demolition and removal of an older building can greatly diminish the advantages of adding green technologies to new construction. Reusing existing buildings can be challenging to accomplish, but changing the way we think about environmentally conscious architecture has the potential to significantly reduce carbon emissions. Additionally, Merlino calls for a more expansive view of historic preservation that goes beyond keeping only the most distinctive structures and requiring that they remain fundamentally unchanged to embracing the creative reuse of even unremarkable buildings. In support of these points, *Building Reuse* includes a compelling range of case studies from an eighteen-story office building to a private home all located in the Pacific Northwest, a region with a long history of sustainable design and urban growth policies that have made reuse projects feasible.

An important consideration for energy-efficient buildings is their primary energy requirements over the entire life cycle. How to determine this? What integrative factors influence the performance of a healthy and sustainable building? This, while it may be important for clients and architects to know, is frequently not very transparent. This book has been written to assist with clarifying target criteria and expanding horizons when it comes to ecological buildings. It is meant as a handbook and source of reference for clients, architects, planners and

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building operators, to provide them with pertinent information about their design, construction and operation: how to do this in the most energy-efficient and economical manner? Also, there is feedback and documentation about prominent buildings like the Hamburg Dockland or the Landesbank Baden-Wuerttemberg in Stuttgart. They provide excellent architectural examples for detailed construction and design solutions. Further, there are insightful interviews with architects and clients about many important buildings, which help turn this book into an integrated source of reference for sustainable architecture. - A Guideline for Planning, Construction and Operation of sustainable Buildings - A source of reference for clients, architects, planners and building operators - Innovative architectural examples with sustainable concepts and design Building stakeholders need practical metrics, data, and tools to support decisions related to sustainable building designs, technologies, standards, and codes. The Engineering Laboratory of the National Institute of Standards and Technology (NIST) has addressed this high priority national need by extending its metrics and tool for sustainable building products, known as Building for Environmental and Economic Sustainability (BEES), to whole buildings. Whole building sustainability metrics have been developed based on innovative extensions to life-cycle assessment (LCA) and life-cycle costing

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(LCC) approaches involving building energy simulations. The measurement system evaluates the sustainability of both the materials and the energy used by a building over time. It assesses the, carbon footprint of buildings as well as 11 other environmental performance metrics, and integrates economic performance metrics to yield science-based measures of the business case for investment choices in high-performance green buildings. Building Industry Reporting and Design for Sustainability (BIRDS) applies the new sustainability measurement system to an extensive whole building performance database NIST has compiled for this purpose. The BIRDS database includes energy, environmental, and cost measurements for 12 540 new commercial and non low-rise residential buildings, covering 11 building prototypes in 228 cities across all U.S. states for 9 study period lengths. The sustainability performance of buildings designed to meet current state energy codes can be compared to their performance when meeting four alternative building energy standard editions to determine the impact of energy efficiency on sustainability performance. The impact of the building location and the investor s time horizon on sustainability performance can also be measured. Built environment professionals considering whether to embark on the design and construction or retrofit of a fully 'sustainable' or 'green' build need to

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know the financial implications of their decisions. What are their financial options? What are the risks? This book offers practical guidance on how sustainable building projects are financed, designed and built. All too often sustainable building is undertaken without proper consideration of the true lifecycle cost, risk and financial impact. This book will take the reader on a journey from initial sustainable design through to final completion highlighting the finance options available to them. *New Financial Strategies for Sustainable Buildings* provides key guidance to a variety of professionals, including architects, designers, contractors, construction managers, investors and other interested parties, whilst providing a useful reference to students on architecture, construction management and real estate/surveying courses who need to know about finance, construction economics, and sustainable development projects.

It is widely assumed that the 'dense vertical city' is more sustainable than the 'dispersed horizontal city.' This concept has certainly been a large factor in the unprecedented increase in the construction of tall buildings globally over the last few decades, especially in the developing world. The concentration of people in denser cities 'sharing space, infrastructure, and facilities' is typically thought to offer much greater energy efficiency than the expanded horizontal city, which requires more land

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use, as well as a higher energy expenditure in infrastructure and mobility. Though this belief in the sustainability benefits of `dense` versus `dispersed` living is driving the development of cities worldwide, the principle has rarely been examined at a detailed, quantitative level. Studies to date have been mostly based on large data sets of generalized data regarding urban-scale energy consumption, or large-scale transport patterns. Crucially, there are very few studies that also consider a `quality of life` aspect to urban vs. suburban living, in addition to differences in energy use patterns. Chicago, subject city of the research, is uniquely positioned for a study exploring density vs. sprawl from a sustainability point of view. The birthplace of, and center for innovation in tall buildings, Chicago also has an ever-growing suburban area that is typical of most US cities. And yet, again in line with many other cities around the world over the past decade or two, it has seen suburban growth alongside densification of its downtown area and a resurgence of people seeking high-rise urban living. This research report offers a quantitative evaluation of long-held assumptions, and with sometimes surprising results. The groundbreaking study quantitatively investigates and compares the sustainability of people's lifestyles in both urban and suburban areas from environmental and social perspectives, using detailed information directly collected from households and best available

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data from public resources. It fills significant research gaps in our knowledge of the sustainability of urban density compared to suburban sprawl. This is an indispensable resource for policy makers, developers, urban planners, architects, utilities, and anyone else with a stake in shaping the future of the built environment.

Volume Four focuses on research drawn from work grounded in “Sustainability.” Scholars known in this discipline contribute to a 360-degree evaluation of the theory, including cross-discipline research, empirical explorations, cross-cultural studies, literature critiques, and meta-analysis projects. Through a series of detailed case studies from East Asia, Arup, one of the global leaders in tall building design, presents the latest developments in the field to inspire more innovative and sustainable ideas in tall building design and engineering. This book exhibits the key design aspects of tall buildings in 20 case studies, from China, Singapore, Hong Kong, Vietnam and Japan. Chapters cover design and construction, safety concerns, sustainability strategies, BIM and optimisation solutions, and include contributions from the actual project engineers. The projects chosen are not the tallest buildings, but all of them have been selected for their significant engineering insights and values. Arup’s engineers explain the design principles, and how they overcame various design constraints and

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challenges, while exceeding their clients' expectations. Unique examples include: the design and application of a hybrid outrigger system in the Raffles City Chongqing project the challenges encountered in the construction of the CCTV Headquarters, Beijing as well as Tianjin's Goldin Finance 117 Tower, Ho Chi Minh City's Vincom Landmark 81, the China Resources Headquarters, Ping An IFC, Tokyo's Nicolas G Hayek Center and the Shanghai World Financial Centre. These varied and complex cases studies draw on multi-disciplinary design and engineering challenges which make this book essential reading for architects, structural engineers, project managers and researchers of high-rise buildings. The book also provides a usual reference and link between practitioners in the industry, academia and engineering students.

This unique reference gathers numerous new studies examining specific, prominent high-rise buildings around the world. Each nuanced study included undertakes the following pivotal considerations: environmental impacts; safety & social acceptability; energy consumption and comfort; planning contexts within the urban zone; physical footprint and size; services and risks; and a careful assessment of advantages and challenges. Architects and engineers exploring and optimizing sustainable building practices, energy managers,

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municipal and private project planners, as well as students will find edification and inspiration in the analysis provided by esteemed practitioners and professors within this fascinating volume.

This book brings together a group of international specialists to explore the current state of the art and future potential for encouraging, developing and implementing smart and sustainable built environment strategies. It covers a broad spectrum of issues, ranging from technological advancement, through the assessment of past experiences, to communication and education requirements and future strategies. provides a snapshot of current methods and technologies for developing smart and sustainable built environment strategies over 30 fully refereed chapters from international experts addresses the particular requirements and problems of difference areas and climatic regions

This book describes a new structural system in wood that represents the first significant challenge to concrete and steel structures since their inception in tall building design more than a century ago. The introduction of these ideas is driven by the need to find safe, carbon-neutral and sustainable alternatives to the incumbent structural materials of the urban world. The potential market for these ideas is quite simply enormous. The proposed solutions have the potential to revolutionize the building industry, address the major challenges of climate change,

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urbanization, and sustainable development and to significantly contribute to world housing needs.

The Sustainable Tall Building: A Design Primer is an accessible and highly illustrated guide, which primes those involved in the design and research of tall buildings to dramatically improve their performance. Using a mixture of original research and analysis, best-practice design thinking and a detailed look at exemplar case studies, author Philip Oldfield takes the reader through the architectural ideas, engineering strategies and cutting-edge technologies that are available to the tall building design team. The book takes a global perspective, examining high-rise design in different climates, cultures and contexts. It considers common functions such as high-rise housing and offices, to more radical designs such as vertical farming and vertical cemeteries. Innovation is provided by examining not only the environmental performance of tall buildings but also their social sustainability, guiding the reader through strategies to create successful communities at height. The book starts by critically appraising the sustainability of tall building architecture past and present, before demonstrating innovative ways for future tall buildings to be designed. These include themes such as climatically responsive architecture, siting a tall building in the city, zero-carbon towers, skygardens and community spaces at height, sustainable structural systems and novel façades. In doing so, the book provides essential reading for architects, engineers, consultants, developers, researchers and students engaged with sustainable design and high-rise architecture.

When searching for genuinely sustainable building design and technology - designs that go beyond conventional sustainability to be truly restorative - we often find that nature got there first. Over 3.5 billion years of natural history have

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evolved innumerable examples of forms, systems, and processes that can be applied to modern green design. For architects, urban designers and product designers, this new edition of *Biomimicry in Architecture* looks to the natural world to achieve radical increases in resource efficiency. Packed with case studies predicting future trends, this edition also contains updated and expanded chapters on structures, materials, waste, water, thermal control and energy, as well as an all-new chapter on light. An amazing sourcebook of extraordinary design solutions, *Biomimicry in Architecture* is a must-read for anyone preparing for the challenges of building a sustainable and restorative future.

Tall buildings are not the only solution for achieving sustainability through increased density in cities but, given the scale of current population shifts, the vertical city is increasingly being seen as the most viable solution for many urban centers. However, the full implications of concentrating more people on smaller plots of land by building vertically - whether for work, residential or leisure functions - needs to be better researched and understood. It is generally accepted that we need to reduce the energy equation – in both operating and embodied terms – of every component and system in the building as an essential element in making it more sustainable. Mechanical HVAC systems (Heating, Ventilation and Air-Conditioning) in tall office buildings typically account for 30-40 percent of overall building energy consumption. The increased efficiency (or possibly even elimination) of these mechanical systems – through the provision of natural ventilation – could thus be argued to be the most important single step we could make in making tall buildings more sustainable. This guide sets out recommendations for every phase of the planning, construction and operation of natural ventilation systems in these buildings, including local climatic factors that need to be

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taken into account, how to plan for seasonal variations in weather, and the risks in adopting different implementation strategies. All of the recommendations are based on analysis of the research findings from richly-illustrated international case studies. Tried and tested solutions to real-life problems make this an essential guide for anyone working on the design and operation of tall buildings anywhere in the world. This is the first technical guide from the Council on Tall Buildings and Urban Habitat's Tall Buildings & Sustainability Working Group looking in depth at a key element in the creation of tall buildings with a much-reduced environmental impact, while taking the industry closer to an appreciation of what constitutes a sustainable tall building, and what factors affect the sustainability threshold for tall.

This volume contains the proceedings of the 11th KES International Conference on Sustainability and Energy in Buildings 2019 (SEB19) held in Budapest, 4th -5th July 2019 organised by KES International in partnership with Cardiff Metropolitan University, Wales, UK. SEB-19 invited contributions on a range of topics related to sustainable buildings and explored innovative themes regarding sustainable energy systems. The aim of the conference was to bring together researchers, and government and industry professionals to discuss the future of energy in buildings, neighbourhoods and cities from a theoretical, practical, implementation and simulation perspective. The conference formed an exciting chance to present, interact, and learn about the latest research and practical developments on the subject. The conference attracted submissions from around the world. Submissions for the Full-Paper Track were subjected to a blind peer-review process. Only the best of these were selected for presentation at the conference and publication in these proceedings. It is intended that this volume provides a useful and informative snapshot of recent

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research developments in the important and vibrant area of Sustainability in Energy and Buildings.

This book presents state-of-the-art research and case studies on new approaches to the design, construction and planning of our cities. Emphasis is placed on the role of alternative and renewable energy in the development of urban infrastructures that enable sustainable futures. Reflecting the multi-faceted efforts required to successfully meet sustainability challenges, this book is a collaboration between practitioners and academics across a broad spectrum of specializations. Compelling research findings are explained in the context of practical implementation, enhanced by case studies from industry leaders in order to create a pragmatic reference across policy areas where environmentally aware decision making is required.

Filling a gap in existing literature on sustainable design, this new guide introduces and illustrates sustainable design principles through detailed case studies of sustainable buildings in Europe, North America and Australia. The guide will provide the reader with a deeper understanding of the design issues involved in delivering sustainable buildings, and giving detailed description of the process of integrating principles into practice. Approximately one hundred case studies of sixty buildings, ranging from small dwellings to large commercial buildings, and drawn from a range of countries, demonstrate best current practice. The sections of the book are divided into design issues relating to sustainable development, including site and ecology, community and culture, health, materials, energy and water. With over 400 illustrations, this highly visual guide will be an invaluable reference to all those concerned with architecture and sustainability issues.

Handbook of Green Building Design and Construction: LEED, BREEAM, and Green Globes, Second Edition directly

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addresses the needs of building professionals interested in the evolving principles, strategies, and concepts of green/sustainable design. Written in an easy to understand style, the book is updated to reflect new standards to LEED. In addition, readers will find sections that cover the new standards to BREEAM that involve new construction Infrastructure, data centers, warehouses, and existing buildings. Provides vital information and penetrating insights into three of the top Green Building Codes and Standards applied Internationally Includes the latest updates for complying with LEED v4 Practices and BREEAM Presents case studies that draws on over 35 years of personal experience from across the world

The tropical belt – where large areas of South East Asia, India, Africa and parts of both North and South America are located – forms the biggest landmass in the world and has one of the highest numbers of rapidly developing cities. Coincidentally, architecture in these regions shares common problems, the most easily identifiable being the tropical conditions of climate and natural environment. The context for architecture here is fraught with conflicts between tradition and modernization, massive influx of rural poor into urban areas, poorly managed rapid urban development as well as the cultural and social strain of globalization. Many local and overseas architects, planners and city fathers are interested in the social and environmental dimensions of these areas that contribute towards short terms solutions and long term sustainable developments. This book, developed from the first conference of the International Network for Tropical Architecture, supplies a wealth of information from experts worldwide covering the cultural, environmental and technical aspects of thinking, researching and designing for the tropics. Never were energy use and security of energy supply as

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high on the international political agendas as they are now. There seems to be a consensus that energy savings and sustainable energy production must have a high priority. Because the energy use in the residential and non-residential sectors account for a large part of the total energy use, new programs are being developed in order to limit the consumption of energy in these sectors and a lot of attention is put into increasing the energy efficiency of the existing building stock. Towards a Sustainable Northern European Housing Stock is based on a search and inventory of data on the existing Northern-European building stock and related policy developments. In this book, the authors try to give a realistic image of what is really known about the current quality of the building stock, the type of renovation activities that are undertaken and the policies being currently implemented. Recommendations are also made on how to improve the present situation. Despite recent improvements in energy efficiency being made in new build, it is important that the existing commercial building sector also take action to meet emission reduction targets. The objectives and challenges of such action will reduce the risk of the sector becoming obsolete due to high energy use and poor environmental performance. This book presents a theory-based, practice-support methodology to deal with sustainable retrofitting opportunities for existing commercial buildings in warm climates using bioclimatic design as the basis. The book has four main parts, focusing on eco-design and renovation, bioclimatic retrofitting, technological and behavioural change and

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case studies of retrofitting exemplars. In the first part, the context of climate change effects on design and renovation at the city scale is discussed. The second part looks at bioclimatic retrofitting as a 'design guide' for existing buildings, highlighting the significance of architectural design and engineering systems for energy performance. The technological and behavioural contexts of the existing building sector – policies, modelling, monitoring and trend analysis in respect to energy and environmental performance – are covered in part three. The final part gives some case studies showing the effectiveness of strategies suggested for effective environmental performance. This book is a must-have guide for all involved in the design and engineering of retrofitting projects in warm climates.

The Sustainable Tall Building A Design Primer Routledge
Addresses the multi-disciplinary aspects of urban planning, a result of the increasing size of cities, the amount of resources and services required and the complexity of modern society. Innovative tools are required for identifying the high complexity of contemporary cities. It is necessary to provide a more scientific approach to urban studies, inspired by Prigogine's theories of dissipative structures, and to highlight relations between different systems and between systems and the environment. The challenge of placing sustainable contemporary cities lies in considering the dynamics of urban systems, exchange of energy and matter and the function and maintenance of ordered structures directly or indirectly supplied and maintained by natural systems. The task of researchers,

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aware of the complexity of the contemporary city, is to increase the capacity to manage human activities pursuing welfare and prosperity in sustainable cities. The green building movement has produced hundreds of “how-to” books and websites that are filled with tips about green building and what homeowners should do to go green. While helpful and informative, when it comes to making actual purchasing and installation decisions, these books do not make it any easier for a homeowner to prioritize against a budget. Here, Schifman shares her knowledge and experience for others to use in their journey toward a greener way of living. Whether the reader is building a new home or doing a minor remodel, a homeowner needs a framework by which to guide their decisions. These decisions are based on values, and the author posits that there are really only three reasons to go green: For Our Health: By building more sustainably, we reduce our exposure to harmful chemicals and toxins. For Our Wealth: By building a more durable home and being more efficient with resources like water and electricity, we reduce our monthly utility bills and ongoing maintenance expenses. For Our Soul: Collectively doing the right thing for our planet does make a difference—and that is soul-nourishing. Learn the logistics of choosing windows, insulation, appliances, and lighting. Find out about FSC certified wood and about using reclaimed materials. Here is everything you need to make your home sustainable.

Construction is one of the biggest industries in the world, providing necessary facilities for human prosperity ranging from the homes in which we live to the highways

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we drive, the power plants that provide energy for our daily activities, and the very infrastructure on which human society is built. The construction sector, including the building sector, has among the largest potential of any industry to contribute to the reduction of greenhouse gas emissions. This ambitious and comprehensive textbook covers the concept of embedding sustainability across all construction activities. It is aimed at students taking courses in construction management and the built environment. Written in a lively and engaging style the book sets out the practical requirements of making the transition to a sustainable construction industry by 2020. Case studies are included throughout making the book both a core reference and a practical guide.

This book presents articles from the International Conference on Sustainable Design, Engineering, Management, and Sciences (ICSDEMS 2020), held in Bali, Indonesia. It highlights recent advances in civil engineering and sustainability, bringing together researchers and professionals to address the latest, most relevant issues in these areas.

A preview of the twenty-first-century city dweller's world is seen in the work of an architect whose visionary approach to skyscraper design sets new standards for high-rise construction.

Through a series of detailed case studies from East Asia, Arup, one of the global leaders in tall building design, presents the latest developments in the field to inspire more innovative and sustainable ideas in tall building design and engineering. This book

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exhibits the key design aspects of tall buildings in 20 case studies, from China, Singapore, Hong Kong, Vietnam and Japan. Chapters cover design and construction, safety concerns, sustainability strategies, BIM and optimisation solutions, and include contributions from the actual project engineers. The projects chosen are not the tallest buildings, but all of them have been selected for their significant engineering insights and values. Arup's engineers explain the design principles, and how they overcame various design constraints and challenges, while exceeding their clients' expectations. Unique examples include: the design and application of a hybrid outrigger system in the Raffles City Chongqing project the challenges encountered in the construction of the CCTV Headquarters, Beijing as well as Tianjin's Goldin Finance 117 Tower, Ho Chi Minh City's Vincom Landmark 81, the China Resources Headquarters, Ping An IFC, Tokyo's Nicolas G Hayek Center and the Shanghai World Financial Centre. These varied and complex cases studies draw on multi-disciplinary design and engineering challenges which make this book essential reading for architects, structural engineers, project managers and researchers of high-rise buildings. The book also provides a usual reference and link between practitioners in the industry, academia and engineering students.

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This book contains the proceedings of the 12th KES International Conference on Sustainability and Energy in Buildings 2020 (SEB20) held in Split, Croatia, during 24–26 June 2020 organized by KES International. SEB20 invited contributions on a range of topics related to sustainable buildings and explored innovative themes regarding sustainable energy systems. The aim of the conference is to bring together researchers, and government and industry professionals to discuss the future of energy in buildings, neighbourhoods and cities from a theoretical, practical, implementation and simulation perspective. The conference formed an exciting chance to present, interact and learn about the latest research and practical developments on the subject. The conference attracted submissions from around the world. Submissions for the Full-Paper Track were subjected to a blind peer-review process. Only the best of these were selected for presentation at the conference and publication in these proceedings. It is intended that this book provides a useful and informative snapshot of recent research developments in the important and vibrant area of sustainability in energy and buildings. This book is intended to fill a knowledge gap in the study of contemporary high-rise living. While there has been much documentation on the engineering and technological aspects of tall buildings, relatively little has been written about the social and livability

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of high-rise. Much less is written about Asian cities even though Asia is the current hotbed of high-rise development. Even though traditional discourse of high-rise housing is not always positive, new forces are redefining its place in 21st century urbanity. Many cities around the world are reembracing high-rise in urban agenda under current narrative of sustainable development. High-rise is fast becoming a priority area in international research agenda. The quest is for livable and sustainable high-rise development. Against the background of current trends--globalization, urbanization, mixed-use development, and new-built taller buildings in inner city areas in both developed and developing countries, this book examines the software: design, economics, estate management, legal and property rights, physical environment, planning, community development, and social dimensions of high-rise living. Analysis is with the widely acclaimed successful high-rise public housing in Hong Kong and Singapore to understand the advantages and worries of high-rise living, and to distill the key points and lessons in the making of a 'good' highrise living environment. Hong Kong and Singapore have been constructing high-rise for more than four decades each. The majority of their population has moved to live in high-rise, selecting to live high-rise, and registering consistently high residential satisfaction. The height of apartment buildings in both cities

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continues to rise. The tallest is anticipated to be 70-storey. It is the contention of this book that contrary to earlier common negative discourses on public high-rise living, the high-rise environment may yet offer urban residents a satisfying dwelling experience. Leading housing academics, researchers and practitioners in the two cities have contributed to this book. This book presents a timely contribution to our understanding of a widening urban phenomenon that will affect a growing number of the world's population.

This book features case studies and recommendations for new approaches to environmentally responsive sustainable building, illuminating many principles of sustainability and energy efficiency applicable to buildings worldwide, and in developing countries in particular. These projects identify practical technologies, new and existing, that will yield energy-efficient, healthy, and comfortable designs. Individual chapters address ventilation, controls, materials, and daylighting. Design guidelines and organizational methods suited to urban projects are also discussed.

Much of the anticipated future growth in the United States will take place in suburbia. The critical challenge is how to accommodate this growth in a sustainable and resilient manner. This book explores the role of suburban tall as a viable, sustainable alternative to continued suburban sprawl. It identifies

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10 spatial patterns in which tall buildings have been integrated into the American suburbs. The study concludes that the Tall Building and Transit-Oriented-Development (TB-TOD) model is the most appropriate to promote sustainable suburbanism. The findings are based on analyzing over 300 projects in 24 suburban communities within three major metropolitan areas including: Washington, DC, Miami, Florida, and Chicago, Illinois. The book furnishes planning strategies that address the social, economic, and environmental aspects of sustainable tall building development. It also discusses sustainable architectural design and site planning strategies and provides case studies of sustainable tall buildings that were successfully integrated into suburban settings.

As the ever-changing skylines of cities all over the world show, tall buildings are an increasingly important solution to accommodating growth more sustainably in today's urban areas. Whether it is residential, a workplace or mixed use, the tower is both a statement of intent and the defining image for the new global city. The Tall Buildings Reference Book addresses all the issues of building tall, from the procurement stage through the design and construction process to new technologies and the building's contribution to the urban habitat. A case study section highlights the latest, the most innovative, the greenest and the most inspirational

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tall buildings being constructed today. A team of over fifty experts in all aspects of building tall have contributed to the making of the Tall Buildings Reference Book, creating an unparalleled source of information and inspiration for architects, engineers and developers.

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