

Sustainability Of Construction Materials Woodhead Publishing Series In Civil And Structural Engineering

This book explores the bioclimatic approach to building design. Constant innovations in the field are evident, including the need to face climate changes and increase the local resilience at different scales (regional, urban, architectural). Differently from other contributions, this book provides a definition of the bioclimatic design approach following a technological and performance-driven vision. It includes one of the largest collection of research voices on the topic, becoming also a critical reference work for bioclimatic theory. It is intended for architects, engineers, researchers, and technicians who have professional and research interests in bioclimatic and in sustainable and technological design issues.

This book presents the outcomes of the symposium “NEW METROPOLITAN PERSPECTIVES,” held at Mediterranea University, Reggio Calabria, Italy on May 26–28, 2020. Addressing the challenge of Knowledge Dynamics and Innovation-driven Policies Towards Urban and Regional Transition, the book presents a multi-disciplinary debate on the new frontiers of strategic and spatial planning, economic programs and decision support tools in connection with urban–rural area networks and metropolitan centers. The respective papers focus on six major tracks: Innovation dynamics, smart cities and ICT; Urban regeneration, community-led practices and PPP; Local development, inland and urban areas in territorial cohesion strategies; Mobility, accessibility and infrastructures; Heritage, landscape and identity; and Risk management, environment and energy. The book also includes a Special Section on Rregion United Nations 2020-2030. Given its scope, the book will benefit all researchers, practitioners and policymakers interested in issues concerning metropolitan and marginal areas.

Bricks and brickwork; Blocks and blockwork; Lime, cement and concrete; Timber and timber products; Ferrous and non-ferrous metals; Bitumen and flat roofing materials; Glass; Ceramic materials; Stone and cast stone; Plastics; Glass-fibre reinforced plastics, cement and gypsum; Plaster and board materials; Insulation materials; Sealants, gaskets and adhesives; Paints, wood stains, varnishes and colour; Energy-saving materials and componets; Recycled and ecological materials; Sustainability

Throughout the world, there is an increasing demand on diminishing natural resources in the industrial, transport, commercial, and residential sectors. Of these, the residential sector uses the most energy on such needs as lighting, water heating, air conditioning, space heating, and refrigeration. This sector alone consumes one-third of the total primary energy resources available. By using green building and smart automation techniques, this demand for energy resources can be lowered. Green Building Management and Smart Automation is an essential scholarly publication that provides an in-depth analysis of design technologies for green building and highlights the smart automation technologies that help in energy conservation, along with various performance metrics that are necessary to facilitate a building to be known as a “Green Smart Building.” Featuring a range of topics such as environmental quality, energy management, and big data analytics, this book is ideal for researchers, engineers, policymakers, government officials, architects, and students.

Waste and Supplementary Cementitious Materials in Concrete: Characterisation, Properties and Applications provides a state-of-the-art review of the effective and efficient use of these materials in construction. Chapters focus on a specific type of material, addressing their characterization, strength, durability and structural applications. Sections include discussions of the properties of materials, including their physical, chemical and characterization, their

strength and durability, modern engineering applications, case studies, the state of codes and standards of implementation, cost considerations, and the role of materials in green and sustainable construction. The book concludes with a discussion of research needs. Focuses on material properties and applications (as well as 'sustainability' aspects) of cementitious materials Assembles leading researchers from diverse areas of study Ideas for use as a 'one stop' reference for advanced postgraduate courses focusing on sustainable construction materials

Construction Materials is a comprehensive textbook covering all raw materials and products related to the construction processes, and not only those applied to building structures. The book is organized to help readers achieve competent knowledge about construction materials. At the beginning of the book the author offers the general concepts, definitions, and standards adopted worldwide for these materials to be used along the book. The central part of the text covers the primary construction materials required to manufacture concrete and mortars, the most relevant construction materials in the last century. Expressly, concrete and mortar are treated in detail in dedicated chapters per component. In addition, the author addresses other relevant materials in construction such as ceramic materials, metals and alloys, bituminous materials, and geosynthetic materials. Finally, since the construction industry is one of the largest single waste producing sector in the world, the last chapter outlines the main types and characteristics of construction and demolition waste (e.g. recycled aggregates). The book appeals to students but also professionals interested in construction materials and construction and civil engineering.

Since 1930 more than 100,000 new chemical compounds have been developed and insufficient information exists on the health assessment of 95 percent of these chemicals in which a relevant percentage are used in construction products. For instance Portland cement concrete, the most used material on the Planet (10.000 million tons/year that in the next 40 years will increase around 100 %) currently used in around 15% of total concrete production contains chemicals used to modify their properties, either in the fresh or hardened state. Biopolymers are materials that are developed from natural resources. They reduce dependence on fossil fuels and reduce carbon dioxide emissions. There is a worldwide demand to replace petroleum-based materials with renewable resources. Currently bio-admixtures represent just a small fraction of the chemical admixtures market (around 20%) but with environmental awareness for constituents in construction materials generally growing (the Construction Products Regulation is being enforced in Europe since 2013), the trend towards bio-admixtures is expected to continue. This book provides an updated state-of-the-art review on biopolymers and their influence and use as admixtures in the development of eco-efficient construction materials. Provides essential knowledge for researchers and producers working on the development of biopolymer-modified construction materials Discusses the various types of biopolymers currently available, their different production techniques, their use as bio-admixtures in concretes and mortars and applications in other areas of civil engineering such as soil stability, wood preservation, adhesives and coatings All contributions are made from leading researchers, who have intensive involvement in the design and use of biopolymers in construction materials

Sustainable and Nonconventional Construction Materials Using Inorganic Bonded Fiber Composites presents a concise overview of non-conventional construction materials with a strong focus on alternative inorganic bonded fiber composites and their applications as construction components. It outlines the processing and characterization of non-conventional cementitious composites, which will be of great benefit to both academic and industrial professionals interested in research, development, and innovation on inorganic bonded fiber composites. The book gives a comprehensive review of the innovative research associated with building components based on inorganic bonded composites. Exploring both natural fibers

as reinforcing elements and alternative inorganic binders based on agricultural and industrial wastes, this book also considers the performance and applications of fibrous composites as construction materials and components. Dedicated to analyzing recent developments in inorganic fiber composites research Discusses the broader subjects of processing, characterization, performance, and applications of non-conventional construction materials The construction industry is the largest single waste producing industry in the UK. Ensuring a supply chain of recycled materials affords many potential gains, achieved through: reducing the material volume transported to already over-burdened landfill sites, possible cost reductions to the contractor/client when considering the landfill tax saved and the potential for lower cost material replacements, a reduction in the environmental impact of quarrying and the saving of depleting natural material resources. Reuse of Materials and Byproducts in Construction: Waste Minimization and Recycling addresses use of waste and by products in the construction industry. An over view of new "green" design guides to encourage best practice will be examined and current legislation that channels on site practices, such as site waste management plans. Fundamental individual construction materials are discussed and the process of reforming by products and waste products into new construction materials is investigated, examining the material performance, energy required to convert waste into new products and viability of recycling. The main range of constructional materials will be examined. Aimed at postgraduate students, lecturers and researchers in construction and civil engineering, the book will also be of interest to professional design practices.

Sustainable Construction Materials: Recycled Aggregate focuses on the massive systematic need that is necessary to encourage the uptake of recycled and secondary materials (RSM) in the construction industry. This book is the fifth and the last of the series on sustainable construction materials and like the previous four, it is also different to the norm. Its uniqueness lies in using the newly developed, Analytical Systemisation Method, in building the data-matrix sourced from 1413 publications, contributed by 2213 authors from 965 institutions in 67 countries, from 1977 to 2018, on the subject of recycled aggregate as a construction material, and systematically analysing, evaluating and modelling this information for use of the material as an aggregate concrete and mortar, geotechnics and road pavement applications.

Environmental issues, case studies and standards are also discussed. The work establishes what is already known and can be used to further progress the use of sustainable construction materials. It can also help to avoid repetitive research and save valuable resources. The book is structured in an incisive and easy to digest manner and is particularly suited for researchers, academics, design engineers, specifiers, contractors, and government bodies dealing with construction works. Provides an exhaustive and comprehensively organized list of globally-based published literature spanning 5000 references Offers an analysis, evaluation, repackaging and modeling of existing knowledge that encourages more responsible use of waste materials Provides a wealth of knowledge for use in many sectors relating to the construction profession, including academia, research, practice and adoption of RSM

The multi-disciplinary perspective provided here offers a strategic view on built environment issues and improve understanding of how built environment activities potentially induce global warming and climate change. It also highlights solutions to these challenges. Solutions to Climate change Challenges in the Built Environment helps develop an appreciation of the diverse themes of the climate change debate across the built environment continuum. A wide perspective is provided through contributions from physical, environmental, social, economic and political scientists. This strategic view on built environment issues will be useful to researchers as well as policy experts and construction practitioners wanting a holistic view. This book clarifies complex issues around climate change and follows five main themes: climate change experiences; urban landscape development; urban management issues; measurement of impact; and the future. Chapters are written by eminent specialists from both

academic and professional backgrounds. The main context for chapters is the developed world but the discussion is widened to incorporate regional issues. The book will be valuable to researchers and students in all the built environment disciplines, as well as to practitioners involved with the design, construction and maintenance of buildings, and government organisations developing and implementing climate change policy.

As one of the largest consumers of energy, the housing sector and its unconscious occupants' activities negatively affect the environment. Architects and engineers have a major role in resolving the associated problems while maintaining comfort for occupants. Also very important are environmental education and awareness of appropriate environmental development in designing activity and selecting building materials and products. There are different architectural strategies that are aimed to achieve a low-energy built environment. Determining the needed strategy according to function, economy, and occupant comfort and affordability is the crucial step. This book helps the reader to achieve a sustainable development without destruction of the resources while maintaining a growing universal awareness of protecting the living and non-living environment.

Containing the proceedings of the second International Conference on Defence Sites, Heritage and Future this book promotes the knowledge of the scale, design and functions of defence sites. It brings a better understanding of the issues raised by their redundancy and the implications of different disposal processes for the land. Redundant defence sites offer a range of opportunities to planners, architects and local communities to redevelop large areas, bringing new life to often neglected parts of towns. These opportunities are common to many countries and the papers in this book stress this common feature and help to share experiences of the transformation of defence sites to civilian uses around the world. The re-use of defence sites also raises questions regarding the need to recover brownfields and contaminated land which can have far-reaching legal responsibilities and environmental consequences. Achieving the sustainable development of these sites involves issues related to maintenance and conservation, as well as built and natural environmental controls, while also responding to the needs and aspirations of the community. Topics covered include: Military heritage history; Castles and fortresses; Fortified cities; Case studies; Transition from military to civilian life; Community involvement; Economic analysis; Risk assessment; Simulation and modelling; Funding and legal requirements.

This book presents an introduction, a discussion of the concept of the design and the concrete development, and the properties and testing of the concrete in fresh and hardened stages. After an introduction to the principles of cement and concrete composites, the reader will find information on the principles of quantum-scaled cement, low-carbon cement, fiber-reinforced concrete, reactive powder concrete, and tailor-made recycled aggregate concrete.

This book provides a compendium of material properties, demonstrates several successful examples of bio-based materials' application in building facades, and offers ideas for new designs and novel solutions. It features a state-of-the-art review, addresses the latest trends in material selection, assembling systems, and innovative functions of facades in detail. Selected case studies on buildings from diverse locations are subsequently presented to demonstrate the successful implementation of various biomaterial solutions, which defines unique architectural styles and building functions. The structures, morphologies and aesthetic impressions related to bio-based building facades are discussed from the perspective of art and innovation; essential factors influencing the performance of materials with respect to functionality and safety are also presented. Special emphasis is placed on assessing the performance of a given facade throughout the service life of a building, and after its end. The book not only provides an excellent source of technical and scientific information, but also contributes to public awareness by demonstrating the benefits to be gained from the proper use of bio-based materials in facades. As such, it will appeal to a broad audience including

architects, engineers, designers and building contractors.

New Trends in Eco-Efficient and Recycled Concrete describes different recycled materials that have been used in eco-efficient concrete, reviewing previous publications to identify the most effective recycled materials to be applied in concrete manufacture. New trends on eco-efficient concrete are presented, filling a gap in the market. Sections cover various recycled materials applied in concrete production, present the latest on the lifecycle analysis of recycled aggregate concrete, detail new trends in recycled aggregate concrete research, and finally, present updates on upscaling the use of recycled aggregate concrete and structural reliability. Focuses on new trends in recycled aggregate concrete and its applications (rather than the more subjective 'sustainability' aspects) Contains very important contributions from researchers in eco-efficient concrete, including Chi Sun Poon, Jorge de Brito, Valeria Corinaldesi, Francisco Agrela, etc. Presents a 'one stop' reference for a graduate course on sustainable construction

This volume contains papers presented at the Twelfth International Conference on Structural Studies, Repairs and Maintenance of Heritage Architecture. The conference provides an ideal forum for professionals in the area to discuss problems and solutions, and exchange opinions and experiences.

So far in the twenty-first century, there have been many developments in our understanding of materials' behaviour and in their technology and use. This new edition has been expanded to cover recent developments such as the use of glass as a structural material. It also now examines the contribution that material selection makes to sustainable construction practice, considering the availability of raw materials, production, recycling and reuse, which all contribute to the life cycle assessment of structures. As well as being brought up-to-date with current usage and performance standards, each section now also contains an extra chapter on recycling. Covers the following materials: metals concrete ceramics (including bricks and masonry) polymers fibre composites bituminous materials timber glass. This new edition maintains our familiar and accessible format, starting with fundamental principles and continuing with a section on each of the major groups of materials. It gives you a clear and comprehensive perspective on the whole range of materials used in modern construction. A must have for Civil and Structural engineering students, and for students of architecture, surveying or construction on courses which require an understanding of materials.

This book presents the proceedings of the INternational CongRESS on Engineering and Sustainability in the XXI cEntury – INCREaSE 2017, which was held in Faro, Portugal, from October 11 to 13, 2017. The book promotes a multidisciplinary approach to sustainable development, exploring a number of transversal challenges. It discusses natural and anthropogenic risks; tourism and sustainability; healthy food; water and society; sustainable mobility; renewable energy; and energy efficiency, offering perspectives from civil, electronics, mechanical and food engineering.

This book investigates the enhancement of properties of acacia wood and its surface treatment for high strength bio-composites. It describes the tensile, flexural and impact strength, surface behaviour, morphological analysis, infrared spectral functional analysis, thermal properties analysis and dielectrical properties of acacia wood bio-composites. It reports efforts on the optimization of fabrication techniques to prepare acacia wood reinforced bio-composites based on PLA, PHA, Etc. The book also reports on environmental impact analysis of acacia wood bio-composites. A special chapter is

dedicated to the nano-enhancement of acacia wood bio-composites and their possible use in applications in terms of sustainability and economics.

This book is part of a five-volume set that explores sustainability in textile industry practices globally. Case studies are provided that cover the theoretical and practical implications of sustainable textile issues, including environmental footprints of textile manufacturing, consumer behavior, eco-design in clothing and apparels, supply chain sustainability, the chemistry of textile manufacturing, waste management and textile economics. The set will be of interest to researchers, engineers, industrialists, R&D managers and students working in textile chemistry, economics, materials science, and sustainable consumption and production. This volume comprehensively covers the various sustainable natural materials used in textiles that originate from raw materials sourcing. The book discusses agricultural production systems and standards for the development of sustainable textile fibers, the effects of chemical surface modification methods on the properties of textile fibers, and how antibacterial and antifungal textiles can be manufactured using natural resources.

This book discusses applying vernacular strategies to modern architectural design to adhere to basic green principles of energy efficiency and materials utilization. Written from an international perspective, chapters present the perspectives and experiences of architects and engineers from across the globe. Historically successful approaches are integrated with modern design concepts to create novel, sustainable, and resource conscious solutions. The scope of topics covered include natural ventilation, cooling and heating, daylight and shading devices, and green micro-climate and functional facades, making this a useful reference for a wide range of researchers and workers in the built environment. Covers the most up-to-date research developments, best practices, and innovations from countries all over the globe; Presents the latest research in vernacular architecture and sustainable building; Contains case studies and examples to enhance practical application of the technologies presented.

The 3rd International Symposium on Nanotechnology in Construction (NICOM 3) follows the highly successful NICOM 1 (Paisley, UK 2003) and NICOM 2 (Bilbao, Spain 2005) Symposia. The NICOM3 symposium was held in Prague, Czech Republic from May 31 to June 2, 2009 under the auspices of the Czech Technical University in Prague. It was a cross-disciplinary event, bringing together R&D experts and users from different fields all with interest in nanotechnology and construction. The conference was aimed at: Understanding of internal structures of existing construction materials at nano-scale Modification at nano-scale of existing construction materials. Production and properties of nanoparticulate materials, nanotubes and novel polymers. Modeling and simulation of nanostructures. Instrumentation, techniques and metrology at nano-scale. Health and safety issues and environmental impacts related to nanotechnology during research, manufacture and product use. Review of current legislation. Societal and commercial impacts of nanotechnology in construction, their predictions and analysis.

Geomaterials derived from the Earth's crust and used in construction after appropriate processing are among the earliest raw materials exploited, processed and used by humans. Their numerous functional properties include accessibility, workability and serviceability, and these are explored within this volume. In modern society, sustainable use of raw materials, specifically those exploited in large volumes such as geomaterials

for construction, raises questions of reducing extraction of primary resources and thus minimizing impacts on natural systems, and also employment of materials and technologies to lower emissions of deleterious substances into the atmosphere. This will be possible only if we fully understand the properties, processing and mode of use of traditional geomaterials. Although most of the papers within this volume were written by geologists, the contributions will also be of interest to those working in cultural heritage, monument conservation, civil engineering and architecture.

Digital fabrication has been termed the “third industrial revolution”, and is promising to revolutionize many disciplines, including most recently the construction sector. Both academia and industry see immense promise in cementitious materials, which lend themselves well to additive manufacturing techniques for digital fabrication in construction. With this recent trend and high interest in this new research field, the 1st RILEM International Conference on Concrete and Digital Fabrication (Digital Concrete 2018) was organized. Since 2014, ETH Zurich has been host for the Swiss National Centre for Competence in Research (NCCR) for Digital Fabrication in Architecture, which is highly interdisciplinary and unique worldwide. In 2018, this NCCR opened the “DFAB House”, which incorporates many digital fabrication principles for architecture. It is also responsible for the 600 m² Robotic Fabrication Lab and the first robotically built roof in the world. Held in tandem with Rob|Arch 2018, the leading conference for robotics in architecture, RILEM deemed it the right time to combine forces at this new conference, which will be the first large conference to feature the work of the recently created RILEM Technical Committee on Digital Fabrication with Cement-based Materials, among other leaders in this new field worldwide. This conference proceedings brings together papers that take into account the findings in this new area. Papers reflect the varying themes of the conference, including Materials, Processing, Structure, and Applications.

This book provides a comprehensive, hands-on approach to bioclimatic building design in Africa. Bioclimatic design is at the core of urban sustainability, and is a critical issue in Africa, where “imported” building typologies are being used at an increasing pace, disregarding the local context and consequently causing damage to the environment, to the economy, and to the culture itself. This book provides a concise set of sustainable design guidelines to be applied in both new buildings and the refurbishment of old buildings, and integrates bioclimatic design strategies with other sustainability issues such as: cultural aspects, affordability, and urban planning. Chapters are fully illustrated with photographs and drawings and include best-practice examples and strategies making it accessible to engineers, architects, students and a broad range of professionals in the building industry. Encompasses all climatic regions in Africa; Integrates bioclimatic design strategies with other sustainability issues; Discusses new design to refurbishment, from urban to rural, including office buildings, residential, tourism, social housing and self building.

This book is a printed edition of the Special Issue "Life Cycle Assessment on

Green Building Implementation" that was published in Sustainability of Construction Materials, Second Edition, explores an increasingly important aspect of construction. In recent years, serious consideration has been given to environmental and societal issues in the manufacturing, use, disposal, and recycling of construction materials. This book provides comprehensive and detailed analysis of the sustainability issues associated with these materials, mainly in relation to the constituent materials, processing, recycling, and lifecycle environmental impacts. The contents of each chapter reflect the individual aspects of the material that affect sustainability, such as the preservation and repair of timber, the use of cement replacements in concrete, the prevention and control of metal corrosion and the crucial role of adhesives in wood products. Provides helpful guidance on lifecycle assessment, durability, recycling, and the engineering properties of construction materials Fully updated to take on new developments, with an additional nineteen chapters added to include natural stone, polymers and plastics, and plaster products Provides essential reading for individuals at all levels who are involved in the construction and selection, assessment and use, and maintenance of materials

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Sustainable Construction Materials: Municipal Incinerated Bottom Ash discusses the global use of virgin aggregates and CO₂ polluter Portland cement. Given the global sustainability agenda, much of the demand for these two sets of materials can be substantially reduced through the appropriate use of waste materials, thereby conserving natural resources, energy and CO₂ emissions. Realistically, this change can only be realized and sustained through engineering ingenuity and new concepts in design. Although a great deal of research has been published over the last 50 years, it remains fragmented and ineffective. This book develops a single global knowledge-base, encouraging greater use of selected waste streams. The focus of massive systematic reviews is to encourage the uptake of recycled secondary materials (RSM) by the construction industry and guide researchers to recognize what is already known regarding waste. Provides an extensive source of valuable database information, supported by an exhaustive list of globally-based published literature over the last 40-50 years Offer an analysis, evaluation, repackaging and modeling of existing knowledge on sustainable construction practices Provides a wealth of knowledge for use in many sectors relating to the construction profession

This book, as part of a series of five, aims to promote the use of sustainable construction materials. It is different to the norm and its uniqueness lies in developing a data matrix sourced from 525 publications, contributed by 1107 authors from 442 institutions in 48 countries from 1970 to 2016, on the subject of sewage sludge ash as a construction material, and systematically analysing, evaluating and modelling this information for use in cement, concrete, ceramics, geotechnics and road pavement applications. Related environmental issues, case studies and standards are also discussed. The work establishes what is

already known and can be used. It would also help to avoid repetitive research and save valuable resources, which can instead be directed towards new research to progress the use of sustainable construction materials. The book is structured in an incisive and easy to digest manner. As an excellent reference source, the book is particularly suited for researchers, academics, design engineers, specifiers, contractors, developers, and certifying and regulatory authorities, seeking to promote sustainability within the construction sector. Provides an extensive source of valuable database information, supported by an exhaustive and comprehensively organised list of globally-based published literature spanning over 40-50 years, up to 2016, with >5000 references Offers an analysis, evaluation, repackaging and modelling of existing knowledge, which should help to encourage better and more responsible use of waste materials in construction Provides a wealth of knowledge for use in many sectors relating to the construction profession

The Concrete Solutions series of International Conferences on Concrete Repair began in 2003 with a conference held in St. Malo, France in association with INSA Rennes. Subsequent conferences have seen us partnering with the University of Padua in 2009 and with TU Dresden in 2011. This conference is being held for the first time in the UK, in association with Queen's University Belfast and brings together delegates from 36 countries to discuss the latest advances and technologies in concrete repair. Earlier conferences were dominated by electrochemical repair, but there has been an interesting shift to more unusual methods, such as bacterial repair of concrete plus an increased focus on service life design aspects and modelling, with debate and discussion on the best techniques and the validity of existing methods. Repair of heritage structures is also growing in importance and a number of the papers have focused on the importance of getting this right, so that we may preserve our rich cultural heritage of historic structures. This book is an essential reference work for those working in the concrete repair field, from Engineers to Architects and from Students to Clients.

Until recently, much of the development of building materials has predominantly focused on producing cheaper, stronger and more durable construction materials. More recently attention has been given to the environmental issues in manufacturing, using, disposing and recycling of construction materials. Sustainability of construction materials brings together a wealth of recent research on the subject. The first part of the book gives a comprehensive and detailed analysis of the sustainability of the following building materials: aggregates; timber, wood and bamboo; vegetable fibres; masonry; cement, concrete and cement replacement materials; metals and alloys; glass; and engineered wood products. A final group of chapters cover the use of waste tyre rubber in civil engineering works, the durability of sustainable construction materials and nanotechnologies for sustainable construction. With its distinguished editor and international team of contributors, Sustainability of construction materials is a standard reference for anyone involved in the construction and civil engineering industries with an interest in the highly important topic of sustainability. Provides a comprehensive and

detailed analysis of the sustainability of a variety of construction materials ranging from wood and bamboo to cement and concrete Assesses the durability of sustainable construction materials including the utilisation of waste tyre rubber and vegetable fibres Collates a wealth of recent research including relevant case studies as well as an investigation into future trends

When it comes to architecture, there has been a focus on sustainable buildings and human well-being in the built environment. Buildings should not only be environmentally friendly and sustainable, but dually focused on human health, wellness, and experience. This includes considerations into the quality of buildings, ranging from ventilation to thermal comfort, along with environment considerations such as energy usage and material selection. Specific architectural choices and design for buildings can either contribute to or negatively impact both society and the environment, leading research in the field of architecture to be focused on environmental and societal well-being in accordance with the built environment. The Research Anthology on Environmental and Societal Well-Being Considerations in Buildings and Architecture focuses on how the built environment is being constructed to purposefully enhance societal well-being while also maintaining green standards for environmental sustainability. On one side, this book focuses on the specific building choices that can be made for the purpose of human well-being and the occupants who will utilize the building. On the other side, this book also focuses on environmental sustainability from the standpoint of green buildings and environmental concerns. Together, these topics allow this book to have a holistic view of modern architectural choices and design. This book is essential for architects, IT professionals, engineers, contractors, environmentalists, interior designers, civil planners, regional government officials, construction companies, policymakers, practitioners, researchers, academicians, and students interested in architecture and how it can promote environmental and societal well-being.

Designing buildings and physical environments depends on social structure, social needs, economic data, environment, and technological development. Planning these environments is heavily influenced by cultural and regional need, the existing environment, and the materials available. Reusable and Sustainable Building Materials in Modern Architecture is an essential reference source that discusses the shaping of building design through culture and materials as well as the influence of environment on building design. Featuring research on topics such as passive design, ecological design, and urban design, this book is ideal for academicians, specialists, and researchers seeking coverage on culture, environment, and building design.

Eco-efficient Construction and Building Materials provides essential reading about materials for the construction industry in the twenty-first century. It covers the latest findings in the field, especially the toxicity aspects, embodied energy, construction and demolition wastes, the use of wastes in concrete, masonry units, materials reinforced with vegetable fibres, earth construction, the durability aspects, and also the importance of nanotechnology to the development of more environmentally-friendly materials. Based on more than nine hundred references, Eco-efficient Construction and Building Materials is of fundamental importance to academics, engineers and architects who are dedicated to the creation of a greener and more holistic construction industry. This book presents select proceedings of National Conference on Advances in

Sustainable Construction Materials (ASCM 2020) and examines a range of durable, energy-efficient, and next-generation construction materials produced from industrial wastes and by-products. The topics covered include sustainable materials and construction, innovations in recycling concrete, green buildings and innovative structures, utilization of waste materials in construction, geopolymer concrete, self-compacting concrete by using industrial waste materials, nanotechnology and sustainability of concrete, environmental sustainability and development, recycling solid wastes as road construction materials, emerging sustainable practices in highway pavements construction, plastic roads, pavement analysis and design, application of geosynthetics for ground improvement, sustainability in offshore geotechnics, green tunnel construction technology and application, ground improvement techniques and municipal solid waste landfill. Given the scope of contents, the book will be useful for researchers and professionals working in the field of civil engineering and especially sustainable structures and green buildings.

This book focuses on ecological wisdom inspired restoration engineering through theories, hypotheses, policies, practical understanding, and case studies.

Understanding nature's processes is a prerequisite for the healthy and sustainable functioning of a habitable Earth. As such, the book provides a guide for readers seeking to understand and build sustainable, urban socio-ecological systems using restoration technologies based on wisdom. Motivated by recent rapid advances in restoration engineering, such as the role of green building materials in urban infrastructures, and developing sustainable landscapes to benefit the environment, economy and communities, it is an essential reference on the most promising innovative technologies. It discusses engineering methods and practices in the restoration of soil, water, heritage sites, and other ecosystems, as well as the development and applications of green building materials. It presents a holistic and systematic approach that utilizes natural resources and the concept of ecological wisdom to reap sustainable environmental, economic and social benefits to fulfill the concept of living in harmony with nature. This book is a valuable resource for civil- and environmental engineering researchers as well as organizations engaged in eco-restoration practices.

Nonconventional and Vernacular Construction Materials: Characterisation, Properties and Applications, Second Edition covers the topic by taking into account sustainability, the conservation movement, and current interests in cultural identity and its preservation. This updated edition presents case studies, information on relevant codes and regulations, and how they apply (or do not apply) to nonconventional materials. Leading international experts contribute chapters on current applications and the engineering of these construction materials. Sections review vernacular construction, provide future directions for nonconventional and vernacular materials research, focus on natural fibers, and cover the use of industrial byproducts and natural ashes in cement mortar and concrete.

This book is the fourth, in the series of five, on sustainable construction materials and like the previous three, it is also different to the norm. Its uniqueness lies in using the newly developed, Analytical Systemisation Method, in building the data-matrix sourced from 751 publications, contributed by 1402 authors from 513 institutions in 51 countries, from 1970 to 2017, on the subject of processed waste glass (glass cullet) as a construction material, and systematically analysing, evaluating and modelling this

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information for use of glass cullet as cement, aggregate or filler in concrete, ceramics, geotechnics and road pavement applications. Environmental issues, case studies and standards are also discussed. The work establishes what is already known and can be used to further progress the use of sustainable construction materials. It can also help to avoid repetitive research and save valuable resources. The book is structured in an incisive and easy to digest manner and is particularly suited for researchers, academics, design engineers, specifiers, contractors, and government bodies dealing with construction works. Provides an extensive source of valuable database information, supported by an exhaustive list of globally-based published literature over the last 40-50 years Offer an analysis, evaluation, repackaging and modeling of existing knowledge on sustainable construction practices Provides a wealth of knowledge for use in many sectors relating to the construction profession

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