

Modern *Earth Building* Handbook

Dr. Tanjina Nur, Ph.D.



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Earth is an ancient building material that has been used in many different ways around the world for thousands of years. Building with earth materials can be a way of helping with sustainable management of the Earth's resources. This book covers a wide description of Modern earth buildings and provides an essential exploration of the materials and techniques key to the design, development and construction of such buildings. The first part of the book describes sustainable technology research and demonstration and a sustainable habitat for earth structures. Then review of the architecture of mud and thermal comfort characteristics of some selected building materials in the regional setting of Ile-Ife, Nigeria are presented. Then we try to find out flooding effect on earth walls and strength behaviour of mud brick in building construction. The second part of the book describes sustainable use of tepetate composite in earthen structure and enhancing sustainability of rural adobe houses of hills by addition of vernacular fiber reinforcement. We also focus on red mud sintering using fly Ash via Taguchi's methodology and effect of the insulation by the mud on the convection in building in the Sahara of Algeria. Then we present the effect of banana fibers on the compressive and flexural strength of compressed earth blocks. The last part of the book presents Lime as an anti-plasticizer for self-compacting clay concrete and thermal performance of hollow clay brick with low emissivity treatment in surface enclosures. Then residual mechanical properties of concrete made with crushed clay bricks and roof tiles aggregate after exposure to high temperatures and use of natural-fiber bio-composites in Construction are described. At the end, an experimental study of strengthening of masonry columns with BFRCM or with Steel Wires is also presented



Dr. Tanjina Nur, Tanjina finished her PhD in Civil and Environmental Engineering in 2014 from University of Technology Sydney (UTS) and also her undergraduate in Civil Engineering. Now she is working as Post-Doctoral Researcher in Civil and Environmental Engineering of UTS and published about eight International journal papers with 85 citations. She has about 6 years of research experiences.

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Editor:

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Tanjina finished her PhD in Civil and Environmental Engineering in 2014 from University of Technology Sydney (UTS). Now she is working as Post-Doctoral Researcher in the Centre for Technology in Water and Wastewater (CTWW) and published about eight International journal papers with 80 citations. Her research interest is wastewater treatment technology using adsorption process.

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Preface

Earth is an ancient building material that has been used in many different ways around the world for thousands of years. Building with earth materials can be a way of helping with sustainable management of the Earth's resources. This book covers a wide description of Modern earth buildings and provides an essential exploration of the materials and techniques key to the design, development and construction of such buildings. The first part of the book describes sustainable technology research and demonstration and a sustainable habitat for earth structures. Then review of the architecture of mud and thermal comfort characteristics of some selected building materials in the regional setting of Ile-Ife, Nigeria are presented. Then we try to find out flooding effect on earth walls and strength behaviour of mud brick in building construction.

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