

Contractor's Guide to Green Building Construction

Contractor's Guide to Green Building Construction

Management, Project Delivery,
Documentation, and Risk Reduction

Thomas E. Glavinich, D.E., P.E.

The University of Kansas



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Published by John Wiley & Sons, Inc., Hoboken, New Jersey

Published simultaneously in Canada

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Library of Congress Cataloging-in-Publication Data:

Glavinich, Thomas E.

The AGC contractor's guide to green building construction : management, project delivery, documentation, and risk reduction / Thomas E. Glavinich.

p. cm.

Includes bibliographical references and index.

ISBN 978-0-470-05621-9 (cloth)

1. Sustainable buildings—Design and construction. 2. Sustainable architecture. 3. Construction industry—Management. I. Title.

TH880.G53 2008

690—dc22

2007039330

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

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Foreword

I remember when I was four or maybe five years old, seeing my grandfather pull up in my driveway in a great big dump truck. His father's name, his company's name, was painted in big red letters on the side of that bright white Mac truck. My grandfather owned a construction company, and on this sunny Saturday morning, he was delivering a load of sand for the sandbox in the backyard. This was my first realization that my grandfather and his father before him owned a construction firm. Seeing him standing out on the running board of that truck triggered a feeling inside of me—a feeling that he loved what he did and was proud to be a part of a great industry. As I grew older, that image never faded; it only grew stronger. By the time I was 10 years old, I knew that I wanted to work for my grandfather. I wanted to be a truck driver. As the years went by, I realized it was not a truck driver I wanted to be, it was being a part of the industry in which he was so successful.

Just like my direction in professions changed, so did the focus of this company. When my great-grandfather started his company, the primary focus was concrete flatwork. As the company grew, they moved into larger projects, and by the time I had that first glimpse into my legacy, the company had a primary focus in roads and bridges. By the time I was old enough to hold a real job, the company performed virtually no roadwork and had diversified into steel fabrication, commercial buildings, heavy industrial, healthcare, and the installation of process automation equipment. I progressed from a copy boy through the ranks of project management to the level of vice president before launching a subsidiary sustainability consulting firm. What does this evolution of one firm have to do with green building and this book?

In today's changing world, it is hard to read through a trade publication or a mainstream magazine without seeing a story about green buildings. Even magazines like *Vanity Fair* and *Sports Illustrated* have had issues that deal with this topic. When you read these articles, you see words used to describe the movement like *green*, *integrated design*, *sustainability*, *high-performance buildings*, *living buildings*, *integrated delivery*, *next-generation buildings*, and organizations like the Green Building Initiative (GBI), U.S. Green Building Council (USGBC), National Institute of Building Sciences (NIBS), General Services Administration (GSA), Environmental Protection Agency (EPA), and Architecture 2030 just to list a few. What does all of this mean? Who are all of these people, and why are they putting such a tremendous amount of effort into this movement when many of us may dismiss it as a passing fad?

When you look at the profile of most successful companies, you find that one key to success is the ability to change and adapt to the marketplace. The executives who run those successful companies scan the business horizon for indicators that show them which way to steer their firms. Those of us who are lucky enough to work in the construction industry are experiencing a change that has not been seen before. The external effects of global climate changes, diminishing amounts of raw and manufactured goods, a shrinking labor pool, an increased amount of governmental regulation, and rising energy costs combined with the internal forces of shorter time schedules, lower margins, a mix of delivery methods, and changes in the insurance market have forced all of us to reevaluate the way we deliver our services to the marketplace. We are seeing an evolutionary progression in the way buildings are designed and constructed. We are seeing the green movement take our industry by storm. All of us in the construction industry need to understand what this means and how it may affect our businesses.

In the recent past, many of us who work in the construction industry have been labeled as a "necessary evil," a part of the delivery supply chain that is bought and sold as a commodity, forced to compete using the lowest common denominator—price. Long past are the days when we were respected for the quality of services we delivered, when we were respected as "master builders." I feel that the green movement can be looked at in two ways. It can be viewed as just another trend that we as professionals need to understand in order to continue to compete using the lowest common denominator, but it could also be looked at as a way for the construction industry to regain a higher level of respect. Our ability to solve complex problems and demonstrate quality can help all of us regain the position of the master builder.

The Associated General Contractors of America (AGC) commissioned this book to aid construction professionals from any tier to understand what it takes to compete and to be more successful in the marketplace. The author and those who contributed to this book have drawn on extensive research and real-life experience to define the terms used in this segment of the industry, the risks associated with these types of construction projects, and how best to manage a “green” project. Our intent was to provide guidance to contractors. The structure of the book follows the progression of a project, from acquisition through project closeout. It delineates the typical project activities and explains how normal deliverables need to be modified when working on a green project. It is our hope that this book will help contractors navigate the challenges of green projects and emerge better able to take advantage of the multitude of benefits these projects offer.

THOMAS A. TAYLOR

General Manager

Vertegy, an Alberici Enterprise

Thomas Taylor is a member of the AGC Environmental Network Steering Committee and has served as Chair on the association’s Green Construction Task Force. Thomas Taylor also participates on the ANSI Technical Committee charged with developing the first ever consensus based national standard on green building, Green Globes. The Alberici headquarters has received the highest level of certification provided both the U.S. Green Building Council and the Green Building Initiative programs, as well as other awards and recognition. Chapter 4 of this publication includes a case study on the Alberici headquarters.

Preface

Today, the state of the environment and our impact on it is a topic of discussion and debate at all levels of government, as well as in the corporate board room and across the table at the local diner. In the past, the focus was on the industrial and transportation sectors of our economy, and commercial and institutional buildings escaped a lot of public scrutiny because they appeared to be benign environmentally. Commercial and institutional buildings do not openly belch smoke, deplete natural resources, use foreign oil, or pollute the land or water supply. However, over the past decades we have become increasingly aware of the amount of energy being consumed by commercial and institutional buildings and the impact that their construction and operation has on our environment. Even though they do not openly appear to contribute to the environmental problems that we face today, their construction and operation results in all of the aforementioned environmental impacts as we clear land for their construction, use precious natural resources to manufacture the materials used to construct them, dispose of all sorts of waste throughout their life, and use fossil fuels directly in the form of natural gas or indirectly in the generation of electricity to operate them. The importance of the commercial sector and commercial and institutional buildings to our economy will grow in the future as the United States continues its shift from a manufacturing and industrial-based economy to a service economy, which will compound the problem if we do not take action today.

Economic growth is the key to improving our quality of life in the United States, and we will need to continue to build and operate commercial and institutional buildings in the future. We need these buildings to support our growing population and to provide healthy and productive environments for

people to live, work, and play. Reconciling the seemingly opposing goals of improving the environment and providing the needed infrastructure to support economic growth is the genesis of the green building movement. The green building movement is simply about being mindful of the potential impact that the construction and operation of commercial and institutional buildings will have on the environment and devising innovative strategies to mitigate or eliminate these impacts. This means changing the way we think about buildings and their construction and operation as well as the integration of new state-of-the-art technologies into buildings. In short, we are finding that we can have our cake and eat it too. Today, building owners, designers, manufacturers, and contractors are focused on achieving increasingly environmentally friendly and energy-efficient buildings, with the ultimate goal of producing environmentally and energy-neutral buildings in the not-too-distant future. The green building movement will provide new opportunities and challenges for contractors as high-performance buildings move into the mainstream and become the norm in the United States.

Helping contractors recognize and address the challenges of green building construction is what this book is all about. Green buildings are as much about construction as they are about design. Green designs must be implemented and documented by the contractor for the building to become a reality and achieve its potential. Sustainable building design and construction can impact the contractor's material and equipment procurement, sequencing and scheduling of work, jobsite productivity, and commissioning and closeout activities. Green requirements may impact not only impact the direct costs of construction, but also project and home office overhead resulting from increased administrative, documentation, and commissioning requirements. All of these potential impacts must be recognized and accounted for when bidding, contracting for, constructing, and closing out a green building project.

The purpose of this book is to provide the contractor with a guide to effectively bidding, contracting for, constructing, and closing out a green building project. This book is focused on the green building process from the contractor's viewpoint and its potential impact on project management, delivery, documentation, and risk. This book is not about green design or the ins or outs of any particular green building rating system that have already been addressed in many other publications. Instead, this book is focused on the contractor's business and construction processes and how they may be affected by green construction. This book addresses the overall construction process, including understanding green project requirements for bidding, contracting for green construction, managing green design

when the contractor is operating as a design-builder, subcontracting on green projects, green procurement, managing green construction, and green project commissioning and closeout. It is our hope that the information contained in this book will help contractors who are new to the green building market enter it more confidently and provide contractors who are already working in this market with new insights that will help them reduce their risk and be more competitive.

The green building market is an emerging market, and this book represents a snapshot of this new market today and contractors' experiences to date. The green building market will continue to evolve as more public and private building owners demand high-performance buildings and that their commitment to the environment be recognized through green building certification. Existing green building rating systems will continue to change, and new rating systems will emerge as sustainable buildings become increasingly mainstream, our understanding of what makes a green building continues to evolve, and new design and construction techniques, materials, equipment, and systems become available. Also, government agencies at all levels are beginning to require that public and private buildings under their jurisdiction be certified or certifiable using a specified third-party green building rating systems. This is an exciting time in the building industry, with many changes and opportunities for contractors. However, to be successful, contractors must keep up with the rapid pace of change in order to compete in this emerging market.

Thomas E. Glavinich, D.E., P.E.
The University of Kansas
Lawrence, Kansas

Acknowledgments

The author would like to thank The Associated General Contractors of America (AGC), the AGC staff, and the AGC membership for their help and support throughout this project. This includes the AGC Green Building Task Force members who freely gave of their time, knowledge, and experience. Without the AGC and the input from its members, this book would not have been possible.

I would also like to take this opportunity to recognize and thank several individuals who worked closely with me throughout this project, providing detailed reviews of chapter drafts and invaluable input and suggestions. These include Melinda Tomaino, Associate Director of Environmental Services at AGC; Thomas Taylor, Vertegy: An Alberici Enterprise; Joshua Bomstein, Creative Contractors, Inc.; and Daniel Osterman, McGough Construction Company, Inc.

AGC GREEN BUILDING TASK FORCE

Joshua Bomstein	Creative Contractors, Inc.	Clearwater, Florida
Dirk Elsperman	Tarlton Corporation	St. Louis, Missouri
Chris Miller	Brasfield & Gorrie, LLC	Birmingham, Alabama
Daniel Osterman	McGough Construction Company, Inc.	St. Paul, Minnesota
Kimberly Pexton	HITT Contracting, Inc.	Fairfax, Virginia
Beth Studley	Holder Construction Company	Atlanta, Georgia
Thomas Taylor	Vertegy: An Alberici Enterprise	St. Louis, Missouri
Melinda Tomaino	The Associated General Contractors	Arlington, Virginia
Mark Winslow	Gilbane, Inc.	Providence, Rhode Island