



CONTREN® LEARNING SERIES

PREVIEW EDITION

# Your Role in the Green Environment



TRAINEE GUIDE

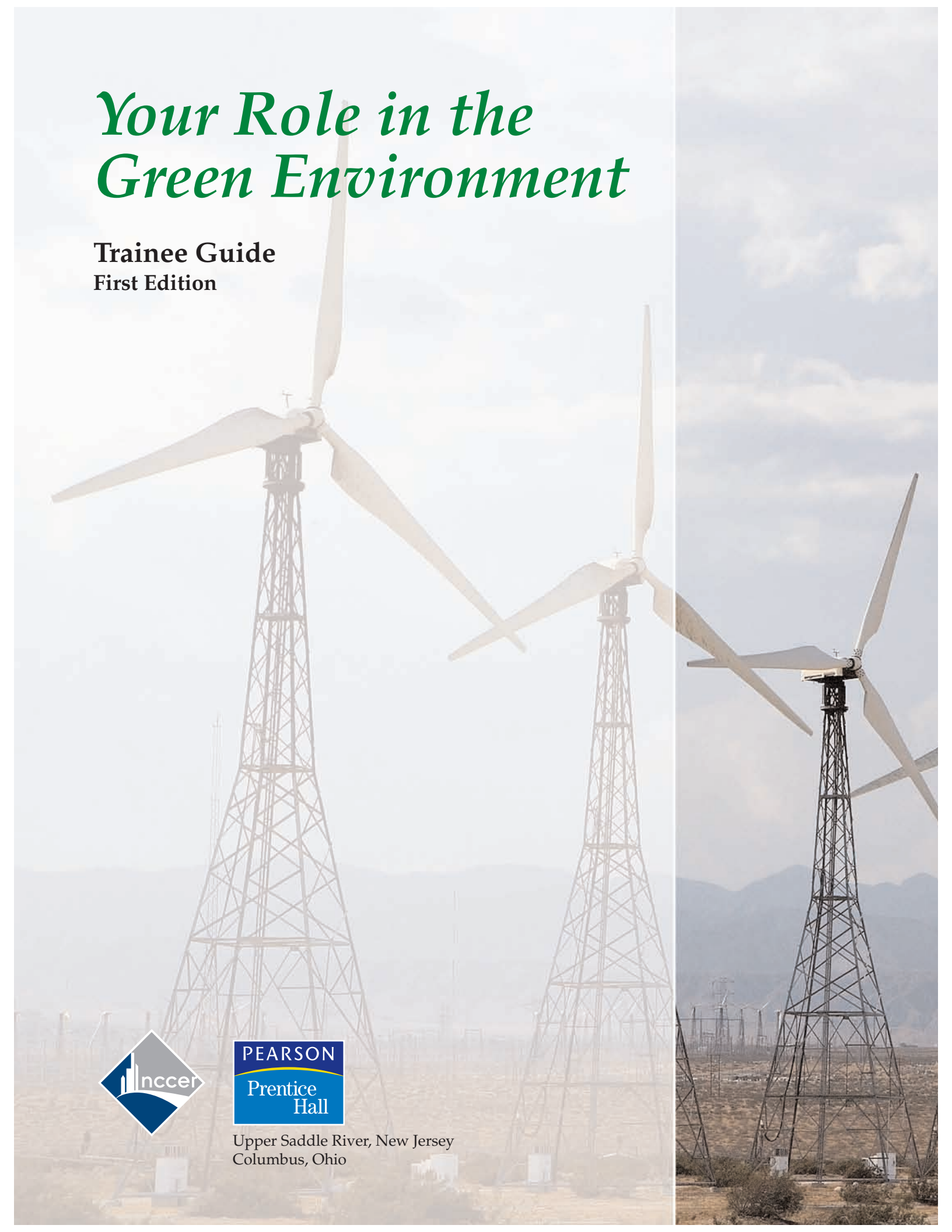
NATIONAL CENTER FOR CONSTRUCTION EDUCATION AND RESEARCH

# *Your Role in the Green Environment*

**Trainee Guide**  
**First Edition**



Upper Saddle River, New Jersey  
Columbus, Ohio



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Contren® Learning Series

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# Preface

## TO THE TRAINEE

If you're just getting started on the path towards a career in construction, you'll soon learn about the tools you'll need to carry you forward—from safety awareness, to construction math, to working with hand and power tools. You'll also discover not just how much these skills can help you on the job, but how well they can transfer into your everyday lives. While tackling that next home project, you'll find your new skills will come in handy—enabling you to manage the project more efficiently and safely than you would have before.

The goal of *Your Role in the Green Environment* is to impart the very same work and life-changing skills. You'll not only learn how much of an impact construction has on the environment and ways in which you can lessen the impact, but you'll also learn about the enormous influence you can have on the environment in your day-to-day lives. While these skills may not directly affect how well you accomplish that next home project, you'll likely approach it with a deeper understanding that you didn't have before.

## SPECIAL FEATURES OF THIS MODULE

In an effort to provide a comprehensive user-friendly training resource, NCCER has incorporated many different features for your use. These features include:

- *Notes, Cautions, and Warnings* – Safety features are set off from the main text in highlighted boxes and are organized into three categories based on the potential danger of the issue being addressed. Notes simply provide additional information on the topic area. Cautions alert you of a danger that does not present potential injury but may cause damage to equipment. Warnings stress a potentially dangerous situation that may cause injury to you or a co-worker.
- *What's wrong with this picture?* – What's wrong with this picture? features include photos of actual code violations for identification and encourage you to approach each installation with a critical eye.
- *Think About It* – Think About It features use "What if?" questions to help you apply theory to real-world experiences and put your ideas into action.
- *Going Green* – Going Green looks at ways to preserve the environment, save energy, and make good choices regarding the health of the planet. Through the introduction of new construction practices and products, you will see how the "greening of America" has already taken root.
- *Trade Terms* – Each module presents Trade Terms that are discussed within the text and defined in the Glossary at the end of the module. These terms are denoted in the text with blue bold type upon their first occurrence.
- *Review Questions* – Review Questions are provided to reinforce the knowledge you have gained. This makes them a useful tool for measuring what you have learned.

We also invite you to visit the NCCER website at [www.nccer.org](http://www.nccer.org) for the latest releases, training information, newsletter, Contren® product catalog, and much more. Your feedback is welcome. You may email your comments to [curriculum@nccer.org](mailto:curriculum@nccer.org) or send general comments and inquiries to [info@nccer.org](mailto:info@nccer.org).



## CONTREN® LEARNING SERIES

The National Center for Construction Education and Research (NCCER) is a not-for-profit 501(c)(3) education foundation established in 1995 by the world's largest and most progressive construction companies and national construction associations. It was founded to address the severe workforce shortage facing the industry and to develop a standardized training process and curricula. Today, NCCER is supported by hundreds of leading construction and maintenance companies, manufacturers, and national associations. The Contren® Learning Series was developed by NCCER in partnership with Pearson Education, Inc., the world's largest educational publisher.

Some features of NCCER's Contren® Learning Series are as follows:

- An industry-proven record of success
- Curricula developed by the industry for the industry
- National standardization providing portability of learned job skills and educational credits
- Compliance with Office of Apprenticeship requirements for related classroom training (CFR 29:29)
- Well-illustrated, up-to-date, and practical information

NCCER also maintains a National Registry that provides transcripts, certificates, and wallet cards to individuals who have successfully completed modules of NCCER's Contren® Learning Series. *Training programs must be delivered by an NCCER Accredited Training Sponsor in order to receive these credentials.*

# Foreword

An enormous shift is underway in the U.S. due to two major challenges facing Americans and our economy: rapidly rising energy prices and climate change. As I write this the average price of gasoline is the highest it has been in U.S. history, and it is likely to climb even higher in just a few years. The financial pain for most of us is great and is forcing us to rethink how we live, how we get around, where we live, and how we can operate our businesses to cope with this rapidly changing situation. Even more challenging is climate change which threatens higher global temperatures, possibly resulting in crop loss, rising sea levels, more violent storms, and many other negative consequences. Clearly, change is afoot and responding to these twin threats is a national imperative.

Within the construction sector of the U.S. economy there is a significant effort underway to address these challenges. Known simply as *green building*, this movement seeks to design, build, and operate facilities and homes that use far less energy than their conventional counterparts and that reduce the climate change impacts typically associated with buildings. Green buildings also address water consumption and wastewater generation; construction and demolition waste; recycling and reuse of land, buildings, materials, and water; impacts of construction on the building site; and the health of the building.

Systems to support green building, such as the U.S. Green Building Council's LEED® (Leadership in Energy and Environmental Design) green building rating system are emerging and helping accelerate the shift to buildings that minimize energy consumption and that have greatly reduced contributions to climate change. A significant segment of the design community (architects, engineers, interior designers, and landscape architects) has undergone additional training to become LEED Accredited Professionals (LEED-AP) to provide them with a detailed understanding of what constitutes a green building and how to design and deliver them to the marketplace.

The result is that over 8,000 commercial and institutional buildings have been registered with the U.S. Green Building Council for green building certification. A similar phenomenon is happening in residential construction with thousands of homes being certified to local and national green home standards around the country.

Indeed there is a national program designed specifically for the purpose of educating and certifying contractors, subcontractors and progressive members of the construction community in green building. Known as Green Advantage®, it provides a systematic approach for training about green buildings in the form of a 15-hour course followed by a commercial/residential certification examination. The resulting Green Advantage certification is an indication that the participant has demonstrated his or her knowledge about green building, the vocabulary of green building, and a variety of the unique approaches to construction that are associated with green building.

This volume represents the efforts of the National Center for Construction Education and Research (NCCER) to support Green Advantage training through the NCCER training program sponsor network. This represents a remarkable breakthrough in green building because it means that a potentially enormous audience will now be informed about high-performance building. More importantly it will help embed green building practices in the U.S. construction community thus addressing the issues of climate change and high energy costs.

The efforts of Dr. Annie Pearce at Virginia Tech to bring together a wide and varied array of information into this volume are commendable. This training program marks a major milestone on the road to more responsible construction practices and indicates that the tipping point in green building has probably been reached.

Finally, NCCER's foresight in supporting the development of this volume should be gratefully acknowledged by the larger U.S. green building movement because of the enormous positive impact it will bring in educating contractors, subcontractors, supervisors, and craftspeople alike, in the building of environmentally responsible facilities and homes.

Dr. Charles J. Kibert  
Powell Center for Construction and Environment  
University of Florida  
Gainesville, Florida

June 29, 2008

# Contren<sup>®</sup> Curricula

NCCER's training programs comprise over 50 construction, maintenance, and pipeline areas and include skills assessments, safety training, and management education.

Boilermaking  
Cabinetmaking  
Carpentry  
Concrete Finishing  
Construction Craft Laborer  
Construction Technology  
Core Curriculum:  
    Introductory Craft Skills  
Drywall  
Electrical  
Electronic Systems Technician  
Heating, Ventilating, and  
    Air Conditioning  
Heavy Equipment Operations  
Highway/Heavy Construction  
Hydroblasting  
Industrial Maintenance  
    Electrical and Instrumentation  
    Technician  
Industrial Maintenance Mechanic  
Instrumentation  
Insulating  
Ironworking  
Masonry  
Millwright  
Mobile Crane Operations  
Painting  
Painting, Industrial  
Pipefitting  
Pipelayer  
Plumbing  
Reinforcing Ironwork  
Rigging  
Scaffolding  
Sheet Metal  
Site Layout  
Sprinkler Fitting  
Welding

## **Pipeline**

Control Center Operations,  
    Liquid  
Corrosion Control  
Electrical and  
    Instrumentation  
Field Operations, Liquid  
Field Operations, Gas  
Maintenance  
Mechanical

## **Safety**

Field Safety  
Safety Orientation  
Safety Technology

## **Management**

Introductory Skills for the  
    Crew Leader  
Project Management  
Project Supervision

## **Spanish Translations**

Andamios  
Currículo Básico  
    Habilidades  
    Introductorias  
    del Oficio  
Instalación de Rociadores  
    Nivel Uno  
Introducción a la Carpintería  
Orientación de Seguridad  
Seguridad de Campo

## **Supplemental Titles**

Applied Construction Math  
Careers in Construction



# Acknowledgments

## SUSTAINABLE FACILITIES AND INFRASTRUCTURE RESEARCH TEAM

This module was developed by the Sustainable Facilities & Infrastructure Research Team of the Myers-Lawson School of Construction at Virginia Tech. Contributors included Dr. Annie Pearce, Dr. Christine Fiori, and Mr. Sushil Shenoy. To ask questions or learn more about the ideas presented in this module, contact [sustainablefacilities@vt.edu](mailto:sustainablefacilities@vt.edu).

## UNITED STATES GREEN BUILDING COUNCIL®

NCCER is a USGBC Education Provider. NCCER is committed to enhancing the ongoing professional development of building industry professionals and LEED Accredited Professionals (LEED AP) through appropriate Education Courses. As a USGBC Education Provider, NCCER has agreed to abide by USGBC-established operational and educational criteria and is subject to annual reviews and audits for quality assurance purposes. To learn more about the United States Green Building Council, the LEED rating system, or LEED-AP, visit <http://www.usgbc.org/>.

## GREEN ADVANTAGE®

Green Advantage® has approved this module as a good primer for green building concepts and techniques. When taught by qualified instructors, it should assist students and practitioners in their preparations for the Green Advantage® Commercial/Residential certification exam. For more information, contact the NCCER customer service; to learn more about Green Advantage® and to better understand the benefits of Green Advantage® certification – visit <http://www.greenadvantage.org/>.

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