Common Ground, Consensus Building and Continual Improvement: International Standards and Sustainable Building





STP1503



STP 1503

Common Ground, Consensus Building and Continual Improvement: Standards and Sustainable Building First International Symposium

Alison Kinn Bennett and Dru Meadows, editors

ASTM Stock Number: STP1503



ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA 19428-2959

Printed in the U.S.A.

Library of Congress Cataloging-in-Publication Data ISBN: 978-0-8031-4507-8

Copyright © 2009 ASTM INTERNATIONAL, West Conshohocken, PA. All rights reserved. This material may not be reproduced or copied, in whole or in part, in any printed, mechanical, electronic, film, or other distribution and storage media, without the written consent of the publisher.

Text printed on 30% post-consumer recycled paper.

Photocopy Rights

Authorization to photocopy items for internal, personal, or educational classroom use, or the internal, personal, or educational classroom use of specific clients, is granted by ASTM International provided that the appropriate fee is paid to ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9634; online: http://www.astm.org/ copyright/

The Society is not responsible, as a body, for the statements and opinions expressed in this publication. ASTM International does not endorse any products represented in this publication.

Peer Review Policy

Each paper published in this volume was evaluated by two peer reviewers and at least one editor. The authors addressed all of the reviewers' comments to the satisfaction of both the technical editor(s) and the ASTM International Committee on Publications.

The quality of the papers in this publication reflects not only the obvious efforts of the authors and the technical editor(s), but also the work of the peer reviewers. In keeping with long-standing publication practices, ASTM International maintains the anonymity of the peer reviewers. The ASTM International Committee on Publications acknowledges with appreciation their dedication and contribution of time and effort on behalf of ASTM International.

Citation of Papers

When citing papers from this publication, the appropriate citation includes the paper author(s), "paper title", J. ASTM Intl., volume and number, ASTM International, West Conshohocken, PA, Paper, year (listed in the footnote to the paper), Paper ID JAI100887 (located at the top of each first page). This book is a repackaging of those papers.

Printed in Mayfield, PA February, 2009

Foreword

This publication, *Common Ground, Consensus Building, and Continual Improvement: Standards and Sustainable Building,* contains papers presented at the first international symposium of the same name held in Washington, DC, on 19-20 April, 2007. The symposium was sponsored by the ASTM International Committee E06 on Performance of Buildings, Subcommittee E06.71 on Sustainability. The symposium co-chairs were Alison Kinn Bennett, EPA and Dru Meadows, theGreenTeam, Inc.

The symposium, a first of its kind, brought together governments, professional organizations, trade organizations, industry, standard developing organizations, and environmental organizations in a discussion about current and developing sustainable building and product standards. Furthermore, the symposium highlighted opportunities and needs for coordination and consensus in the marketplace. Twenty-three papers were presented at the symposium. This book contains a selection of 13 symposium papers published by the Journal of ASTM International (JAI). JAI is an online, peer-reviewed journal for the international scientific and engineering community. Publication in JAI allows rapid dissemination of the papers as soon as they become available, while publication in this Special Technical Publication (STP) is intended to provide easy access to the condensed information in a single volume for future reference.

Contents

Overview	vii
Rethinking Green Building Standards for Comprehensive Continuous Improvement —Tom Lent and Bill Walsh	1
Development of American National Standards for Sustainable Building Products —JANE M. WILSON AND JACLYN M. BOWEN	11
FloorScore-Flooring Products Certification Program for Indoor Air Quality —WILLIAM H. FREEMAN	20
Evaluating Sustainability Using Standard Approaches: The BEES Tool —BARBARA C. LIPPIATT	25
Sustainability in Building Construction—International Standards in Progress —WOLFRAM TRINIUS AND CHRISTER SJÖSTRÖM	36
Introducing Standards and Sustainable Design—WILLIAM E. KELLY	45
Standards Versus Recommended Practice: Separating Process and Prescriptive Measures from Building Performance—WAYNE TRUSTY	56
Designing a System to Apply an Assessment Method of of Buildings for All Lifecycle Stages Based on the Concept of Eco-efficiency—JUNKO ENDO, SHUZO MURAKAMI, AND TOSHIHARU IKAGA	63
BRE Environmental Profiles: Past, Present, and Future—K. STEELE AND J. ANDERSON	74
Development of a Canadian National Standard on Design for Disassembly and Adaptability for Buildings—M. CLAPHAM, S. FOO, AND J. QUADIR	80
The Review on Sustainability of National Building Standard Design in China—LIU GANG	85
Continuous Improvement of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED [®]) Rating System [™] —JOEL ANN TODD AND JOHN BOECKER	95
Practice, Education and Research for Sustainable Infrastructure (PERSI) —RICHARD N. WRIGHT	103
Next Steps	ix
Appendix	xiii

Overview

Environmental protection has evolved. There is a new "movement" afoot. Building on the foundation of governmental programs, both regulatory and voluntary, a new form of governance is defining the "rules of sustainability." Standards developing organizations offer a unique forum that allows different perspectives to come together and build consensus around the issues of sustainability—defining what it means to be "green" and "sustainable" for manufacturers, designers, retailers, the general public, and the government itself.¹

The April 2007 ASTM International Symposium *Common Ground, Consensus Building, and Continual Improvement: Standards and Sustainable Building* was a first of its kind—setting out to examine the field of standards in the marketplace and discuss their origins and evolution. By engaging governments, professional organizations, trade organizations, industry, standard developing organizations, and environmental organizations, the Symposium highlighted opportunities and needs for coordination and consensus in the marketplace.

The Symposium had superb timing—serving as a prelude to the April 24, 2007 inaugural meeting of the High Performance Building Council. The Council was formed in response to Section 914 of the Energy Policy Act of 2005. Section 914 directed the U.S. Department of Energy to work with the National Institute of Building Sciences (NIBS) to assess current voluntary consensus standards and rating systems for high performance buildings and to recommend steps to fill gaps. The key objectives identified for a high performance building include: accessibility, aesthetics, cost effectiveness, functional/operational, historic preservation, productive, secure/ safe, and sustainability.

The ASTM Symposium demonstrated that sustainable building standards are at the forefront of high performance building objectives in many ways: taking a holistic, systems approach to defining environmental preferability; pushing the science of life cycle assessment; asking the tough questions about chemicals of concern; balancing environmental, economic, and social considerations; and responding to consumer demand by communicating the keys to responsible purchasing. Furthermore, the leaders in sustainable building standards development are engaging stakeholders in an open, transparent process—demonstrating that consensus can bring real industry transformation.

This is evident in the success ASTM's Subcommittee E06.71 on Sustainability has had over the past 10 years in forging standards development in the areas of general principles and terminology of sustainability relative to buildings; data collection for sustainability assessment; environmentally preferable products; green power; vegetative roofing systems; and earthen materials.

As E06.71 publishes this volume, we look forward to a future Symposium on Standards and Sustainable Building to reengage in this all-important and ever-evolving discussion. We encourage all readers to participate in ASTM's work on sustainability. Your participation and feedback help to advance the industry. Together we will build a strong foundation for a sustainable future.

^{*}In the US, the federal government is largely behind this shift in governance toward voluntary consensus standards and ecolabelling programs. The National Technology Transfer and Advancement Act (NTTAA) (P.L. 104-113: 1996) and the Office of Management and Budget (OMB) Circular A-119 direct federal agencies to make use of voluntary consensus standards rather than government-unique standards in procurement and regulations.

Finally, we would like to gratefully acknowledge the outstanding quality of the contributions made by the authors as well as the dedicated efforts of the peer reviewers and the staff of ASTM and AIP, who all helped to make the 2007 symposium and the publication of the associated papers possible.

Alison Kinn Bennett Co-Chair EPA Green Building Workgroup US Environmental Protection Agency Office of Pollution Prevention and Toxics Environmentally Preferable Purchasing Program

> Dru Meadows, AIA, CSI Principal, theGreenTeam, Inc. Chair ASTM E06.71

www.astm.org ISBN: 978-0-8031-4507-8 Stock #: STP1503