

homebuilder associations (HBA) interested in further developing a local program.

With respect to the use of wood products in the NAHB *Guidelines*, aside from the use of certified wood and renewable resources, there are some unique credit areas. For example, because jobsite waste of scrap lumber and wood structural panels is undesirable, establishing building dimensions that correspond to product sizes is recognized. Notably, building widths that are divisible by 4 feet, and building lengths that are divisible by 2 feet, are ideal for panel products.

Another example of optimizing the use and minimizing the waste of lumber is to pay careful attention to wall opening locations. According to the NAHB *Guidelines*, windows and doors sized or positioned to take advantage of 24 inches on-center framing are ideal.

In addition to a comprehensive checklist, the *Model Green Home Building Guidelines* promises to be an outstanding resource for architects, engineers, and homebuilders interested in "greening" their designs.

Conclusions

Green building rating systems are evolving. Not all green building rating systems recognize the significant environmental attributes of wood as a primary building material. However, science-based life cycle assessment readily demonstrates for typical single-family construction that wood products have less of an environmental footprint than competing materials. The North American forest products industry strongly supports the integration of science-based green building criteria into mainstream practice.

Kenneth E. Bland, P.E., Senior Director of Codes and Standards, American Forest & Paper Association/American Wood Council, Washington, D.C. This article was reprinted with permission from STRUCTURE magazine, August 2005, Volume 12, Number 8.

Understanding Green Building Rating Systems

Jim DeStefano

There are two nationally available green building rating systems in common use for commercial construction. They have been developed by two independent non-profit organizations:

- U.S. Green Building Council – www.usgbc.org and
- The Green Building Initiative™ – www.thegbi.org.

The most widely accepted green building rating system is the *Leadership in Energy and Environmental Design – New Construction (LEED-NC)*® developed by the U.S. Green Building Council (USGBC). This rating system is intended for new construction and substantial renovations of commercial and institutional buildings. USGBC has other programs that deal with existing buildings, commercial interiors, as well as core and shell projects. The first version of LEED-NC (version 2.0) was released in 2000 and it was revised (version 2.1) in 2004.

The *Green Globes*® rating system was developed by the Green Building Initiative. It is a user-friendly web-based design tool intended to provide guidance to design professionals on green building design. The Green Globes rating system is a flexible program that can be applied to all types of projects, including residences.

The rating systems involve scoring points for including specific green building features into a project. The rating

systems each include six categories as shown in **Table 1**. In general, the only category that structural engineers become involved with is materials and resources. There are four levels of certification for each system, as shown in **Table 2**. In addition to scoring points, there are also seven prerequisites that must be met for a project to become LEED certified:

- Sediment and Erosion Control,
- Minimum Energy Performance,
- Fundamental Commissioning,
- CFC Reduction in HVAC Equipment,
- Storage of Recyclables,
- Minimum Indoor Air Quality Performance, and
- Environmental Tobacco Smoke Control.

In addition to certifying building projects, both systems accredit professionals to participate in the certification process. An individual can become an Accredited Professional by successfully completing an examination.

The LEED certification process begins with registering a project with the USGBC at the inception of the design. Throughout the design and construction of the project, green building efforts must be documented. The LEED-NC scorecard along with documentation is submitted to USGBC for review and if it is deemed to meet their standards, certification is awarded.

Table 1.—Green building rating system categories.

% of total	Points	LEED	Green Globes	Points	% of total
20	14	Sustainable sites	Site	220	22
7	5	Water efficiency	Water	85	9
25	17	Energy and atmosphere	Energy	325	33
19	13	Materials and resources	Resources	100	10
22	15	Indoor environmental quality	Indoor environment	220	22
7	5	Innovation and design process	Project management	50	5
100	69	Total	Total	1000	100

Table 2.—Green building rating system certification levels.

Green Globes designation	Required number of points	LEED™ designation	Required points
Total possible points	1000 points	Total possible credits	64 + 5 innovation points
Five Green Globes	86+%	Certified Platinum level	81+%
Four Green Globes	71 to 85%	Certified Gold level	71 to 80%
Three Green Globes	56 to 70%	Certified Silver level	61 to 70%
Two Green Globes	36 to 55%	Certified	50 to 60%
One Green Globe	15 to 35%		N/A

Table 3.—Comparison of "Materials and resources" points for LEED versus Green Globes.

LEED	Green Globes
Materials and resources	Resources
	100
	E.1 Low impact systems and materials (selection of building materials based on low environmental impact)
	40
MR Prerequisite 1 - Storage & Collection of Recyclables	E.6 Recycling and composting facilities
MR Credit 1 - Building Reuse	E.3 Reuse of existing buildings
	15
	E.4 Building durability, adaptability and disassembly
MR Credit 2 - Construction Waste Management	E.5 Reduction, reuse and recycling of demolition waste
MR Credit 3 - Resource Reuse	E.2 Minimal consumption of resources (reused, recycled, local, lowmaintenance materials, certified wood)
MR Credit 4 - Recycled Content	15
MR Credit 5 - Local/ Regional Materials	
MR Credit 7 - Certified Wood	
MR Credit 6 - Rapidly Renewable Materials	1 N/A
	N/A

For Green Globes, projects are evaluated at eight stages of design, with a preliminary score at the schematic design phase and a final score at the completion of contract documents. The system can be self-administered. However, if an official certification is desired, a third party is engaged to verify the design.

The points available under the category "Materials and resources" are shown in **Table 3**.

The concept of green building design can include a wide variety of strategies and initiatives that reduce adverse impacts on the environment and conserve energy and material resources. The green building rating systems cover only a few of the initiatives that result in green buildings. It is tempting for design professionals to get caught up in scoring points rather than pursuing meaningful green building initiatives that may not contribute to the scorecard. It is important to remain focused on the objectives of green building design.

It is clear that other design professionals such as mechanical engineers, site engineers, and landscape architects play a much more significant role than structural engineers in the certification of a project. They also generate considerable fees for their participation in the process. It is not surprising that very few structural engineers participate in the committees that have developed the certification programs. Green building design is not a passing fad and the rating systems are here to stay. Isn't it time for structural engineers to get involved and play more of a leadership role?

Jim DeStefano, Structural Engineer, DeStefano Associates, Fairfield, CT. This article was reprinted with permission from STRUCTURE magazine, August 2005, Volume 12, Number 8.