

Green building codes
Report to the Town of Dryden Town Board
Town of Dryden Planning Board

Overview

The basic role of a house has not changed since humans lived in caves. It shelters us from the elements and provides a place to live, work, and play. With the exception of changes in designs and styles, that role remained unquestioned in the United States until the mid 1970s, when the Arab oil embargo highlighted energy inefficiencies in the residential sector. Initial responses from architects and engineers to that early crisis were to explore such alternative energy sources as active and passive solar heating systems. Years of experimentation followed until the premise of that direction was questioned. Instead of replacing the energy source, why not reduce the need for it? That question led to the development of what were called superinsulated homes, some of which required as little as 5% of the energy used by conventional homes at the time. But initial applications of this technology suffered serious problems with moisture generated from normal household activities and resulted in a focus on indoor air quality. That focus evolved beyond moisture and resulting biological contaminants to gradually include radon and other soil gases, volatile organic compounds (VOCs), combustion pollutants, and other toxicants. The significance of this shift in focus is highlighted by findings that approximately 70% of people's lives are typically spent inside the house.

In recent years, house design and construction issues have broadened beyond energy efficiency and indoor environmental quality to include embodied energy content and durability of construction materials. Now called sustainable, regenerative, or green design, this view takes a systems approach to the design and construction of a house and the selection of its building materials. A green house is a high-performance home with respect to its energy use and a healthy home regarding its indoor environmental quality. Its small carbon footprint also makes it an earth-friendly home. The challenge facing designers and builders is to incorporate each of these concerns into the housing process without compromising affordability, aesthetics, or function. In other words, green design represents construction techniques that minimize impacts on the natural environment and create healthy indoor spaces for building occupants. These methods address the following points:

- Waste management at the construction site;
- Airtight, highly insulated building envelope;
- Nontoxic, recycled or reused building materials;
- Energy- efficient, water- conserving fixtures and appliances;
- Natural daylighting; and
- Renewable energy sources for space conditioning and electricity.

This list is still evolving to include issues related to subdivision development, proximity to public transportation, and consideration for cultural and historical factors of

the building site. The environmental benefits of green design include a reduction in carbon dioxide emissions. The residential sector of the United States alone generated more than 1,200 million metric tons of CO₂ in 2006 (EIA 2007). When CO₂ emissions from all

sources are considered, buildings represent the best prospects for reduction of this pollutant at costs that society will accept (Malin,2008). Reductions come principally from less energy used for space conditioning but also from lower manufacturing and transportation costs associated with building materials. Other significant benefits of green buildings might result from improved well-being of the occupants. Nearly all materials used in buildings shed particles or give off gases, particularly when new. Outside pollutants also find their way into buildings through air intakes and inadequate filtering systems. Such indoor environments can affect the physical and psychological well-being of building occupants (Syal 2008).

Building Codes

In 1994 the three regional code associations [Building Officials and Code Administrators International, Inc. (BOCA), the Southern Building Code Congress International (SBCCI), and the International Conference of Building Officials (ICBO)], formed the International Code Council (ICC). This body was charged with developing a single set of national codes for building and fire safety, which came to be known as the I-codes.

“Alongside other codes developed by national code-setting organizations such as the International Association of Plumbing and Mechanical Officials (IAPMO) and the National Fire Protection Association (NFPA), ICC’s I-Codes provide a widely accepted set of comprehensive, coordinated minimum safeguards for people at home, at school and in the workplace, often relying on nationally recognized consensus standards in the process.” (USGBC, 2011, p.3).

The U.S. Green Building Council (USGBC) was founded in 1993 to address human and environmental health issues not addressed in building codes. USGBC oversees a program known as Leadership in Energy and Environmental Design (LEED), which assigns various rating levels (Certified, Silver, Gold, Platinum) for buildings that are efficient in their use of energy, water, and building materials, and have healthy indoor environments. Other green building programs exist, such as the ICC 700 National Green Building Standard.

As green building techniques have emerged as acceptable industry practice, state and local government officials across the U.S. have recognized the need for building codes that address the enforceable implementation of green building. In 2009 the ICC introduced the International Green Construction Code (IGCC). In 2010 the ICC worked with the American Institute of Architects (AIA), the American Society for Testing and Materials (ASTM), the American Society of Heating, Refrigerating, and Air-Conditioning Engineers

(ASHRAE), the Illuminating Engineering Society (IES), and USGBC to release the IGCC with ASHRAE Standard 189.1 as an alternative path for compliance. ASHRAE 189.1 is the Standard for the Design of High Performance Green Buildings Except Low-Rise Residential Buildings.

In 2011 the California Green Buildings Standard Code, known as CALGreen went into effect as the country's first green building code. That code has mandatory measures for both residential and non-residential buildings. Since then, green building codes have been adopted by several municipalities in Arizona, North Carolina, Washington State, New Hampshire, Colorado, and Maryland. New York City is working to implement 111 proposals developed by its Green Codes Task Force. On August 26, 2009, Article 4-C of the New York State Public Buildings Law was passed and mandates that the construction and substantial renovation of state buildings comply with green building standards.

New York State is moving forward in the area of green building codes to a greater extent than neighboring states are. Numerous resources exist for the development and implementation of green building codes at the town level. The Town of Dryden could take advantage of these resources to develop a code that addresses the energy efficiency, resource efficiency, and indoor environmental quality of its stock of residential and non-residential buildings. The Planning Board recommends that this code be voluntary. This would allow for people to either build to the current energy code, which will be updated in June 2016, or build under a more restrictive green building code. Another approach the Town could take is to require a percentage of units in a proposed subdivision to be encouraged or required to be built under a green building code.

References

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