Green Construction

Green Construction (General)

The Issue

The current focus on "green" is changing the way many people think about future development—spanning the location, design, and construction of buildings and other critical infrastructure in the United States. Policymakers are launching initiatives that aim to conserve natural resources and to reduce the nation's dependency on fossil fuel combustion for energy used in buildings and transportation. One motivator for this interest is that the process of burning fossil fuels for energy emits carbon dioxide (CO2), a greenhouse gas (GHG). In the U.S., the operation of the existing commercial building stock accounted for 17.9 percent of the total energy consumption and 33.1 percent of the total electricity consumption during 2002. Accordingly, the operation of those buildings contributed 17.5 percent of the nation's total manmade CO2 emissions for 2002. Residential and nonresidential buildings also are responsible for 12 percent of all potable water use and 60 percent of the non-food/fuel raw materials use. That same year, transportation (the movement of goods and people from one place to another) accounted for 27 percent of the total U.S. energy consumption and a corresponding 31 percent of total manmade CO2 emissions.

By making improvements to existing and future commercial buildings and transportation-related infrastructure, contractors are an essential partner in the nation's efforts to reduce national CO2 emissions related to those sources. Green buildings often conserve raw materials, use less energy, and use renewable energy sources. The U.S. Green Building Council (USGBC) estimates that 15 million new buildings are projected to be constructed by 2015. New construction and major renovation green building projects offer a great opportunity for construction professionals to improve the efficiency of the nation's buildings, thereby reducing CO2 emissions. In addition, improvement projects to unclog traffic flow at 233 severe bottlenecks on the nation's highways would conserve more than 40 billion gallons of fuel and the CO2 emissions at those locations would drop by 77 percent. The construction of new transportation projects relieves traffic congestion and provides communities with mass transit options.

Recognizing the unique and varying role of the contractor on a green project, AGC has focused its efforts on providing education and resources on green construction, recycling, and emissions control strategies for equipment. Each of these issue areas provide opportunities for contractors to contribute to the overall reduction in U.S. GHG emissions.

AGC Position

AGC stands ready to facilitate and support its members' efforts to meet green construction goals. With respect to the construction of federal facilities, AGC urges the government to set clear and consistent standards. AGC does not, however, endorse any one system. AGC doubts the benefit of a single definition of "green construction" for any and all purposes and would note, for example, that rating systems should allow for variations in regional, local, and site-specific conditions. AGC supports tax-exempt financing for green construction projects. AGC also facilitates its members' efforts to recycle construction and demolition debris but supports the reuse of materials in construction only where those materials have proven their performance.

AGC Action

- AGC often runs educational articles on environmental and green construction issues in its bi-monthly *Constructor* magazine (and several AGC chapter publications). AGC also provides green construction articles, information and resources online.
- AGC routinely offers green construction programs during the association's Annual Convention and other key meetings year round. AGC has partnered with the USGBC and the Green Building Initiative to bring training to members at these national events. The 2010 Annual Convention will have environmental and green construction-related programs and an Environmental Solutions area in the Pavilion.
- An AGC task force assisted the author of a green construction guidebook, published by John Wiley & Sons, Inc. Once completed in 2008, AGC reviewed and approved the book, and it carries the AGC seal. *Contractor's Guide to Green Building Construction* provides information on the relationship between green building practices and construction management. The AGC bookstore now carries several publications on green construction, green building information modeling, and an engineering guide to LEED.
- The AGC Education and Research Foundation sponsored research at the Construction Management Program, Michigan State University to identify how the LEED rating system for new construction (v. 2.2) impacts construction practices. AGC developed a curriculum for a full-day course based on the results of this research. AGC debuted this course, *Building to LEED for New Construction*, in March 2008. AGC is a member of the USGBC and enrolled the course, *Building to LEED for New Construction*, in the council's Education Provider Program, under which the USGBC reviewed and approved the course. AGC is currently updating the course to address LEED v3.
- AGC also offers a half-day program called *LEED Estimating for Green Buildings* as part of its Estimating Academy.
- AGC also works with the Green Building Initiative. In addition to holding educational programs on Green Globes during national events, AGC held a webinar on life cycle assessment for buildings in partnership with GBI in the spring of 2008. AGC worked with GBI to hold a three-part webinar series on the liability of building green in the fall of 2008.
- AGC is a member of the National Institute of Building Sciences High Performance Building Council and Michael Stark (AGC senior director, building division) sits on the executive committee for that council. On a related note, AGC participates in a coalition to support the High Performance Building Congressional Caucus. AGC also has joined the newly-formed High Performance Commercial Green Building Partnership to provide input to the Department of Energy on high-performance building issues.
- AGC is involved in the joint EPA Region 3 and Federal Highway Administration's Green Highways Initiative.
- AGC is a frequent participant at meetings and roundtable discussions organized by the American Institute of Architects and other industry groups on such issues as general sustainability, green buildings, green products, and greenhouse gas emissions.
- AGC Environmental Network members are participating on the AGC Contract Documents Taskforce that is working collaboratively with 22 leading construction organizations to develop and publish the first industry standard contract document comprehensively addressing green construction.
- AGC has a full time LEED AP staff member dedicated to green construction and environmental management issues.

Construction and Demolition Debris Recycling

The Issue

When individuals discuss recycling and reuse of materials, they often focus on the environmental benefits such as conservation of natural resources, lessening the need to convert natural habitats to landfill space, and the potential reductions in air emissions as seen in the overall lifecycle of a new material from its harvesting, processing, transporting, and disposal compared to that of a recycled or reused material.

When construction companies discuss recycling, they also must consider the market and economic drivers as well as the barriers to recycling, and the potential impacts that recycling may have on their standard operating procedures. In some instances, contractors can save money simply by having less waste and paying lower tipping fees. Growing trends in green buildings and green highways promote recycling and foster local markets for recycled materials. Recycling and reuse directly contribute to several sustainability points in achieving green-building certification. In addition, some debris can be reused in construction or other applications in the agricultural and manufacturing industries, which increases the value of recycling for a company.

The construction industry recycles more than any other industry, though some areas do recycle more than others, and much depends on local markets for recycled materials. In practice, only asphalt, steel, metals, and concrete have been recycled or reused in significant volumes in the U.S., because there are established secondary markets for these used materials. According to EPA estimates, wastes from new construction, renovation, and demolition projects generate about 25% of the total U.S. solid waste volume. EPA estimates that 170 million tons of building-related construction and demolition (C&D) materials were generated in the U.S. in 2003. Of that quantity, as much as 48 percent was diverted from landfills. EPA has not published estimates of waste generation and recycling on highway projects; however, informal estimates have indicated that highway contractors recycle and reuse large amounts of asphalt and concrete associated with their projects. On highway and road projects, these materials often are processed and reused on the very same job site.

The recycling of construction and demolition debris is an area where contractors can see success in reducing GHG emissions through a lifecycle approach. A significant amount of energy is expended (and associated GHGs are released) during the harvesting, manufacturing and transportation of materials used in construction. Emissions are expended during the process of recycling and reusing materials; however when these materials are reused or recycled, the GHG emissions that would have occurred during virgin material harvesting, processing, and manufacturing are avoided. EPA estimates that for every ton of asphalt recycled from construction an associated 0.03 metric ton of CO2 emissions are avoided. Since approximately 139 million ton/year of asphalt are recycled in the U.S., the result is 4.2 million ton of CO2 emissions avoided. Likewise for concrete, 0.01 metric tons of CO2 are avoided for every ton recycled. About 140 million tons per year of concrete are recycled, which equals 1.4 million ton of CO2 emissions avoided. For steel the amounts are even greater as 1.79 metric ton CO2 avoided for each ton recycled. The U.S. recycles about 40 million tons of steel each year, which amounts to 71.6 million tons of CO2 emissions avoided.

AGC Position

AGC facilitates members' efforts related to recycling and the environmentally safe reuse of non-hazardous industrial materials in construction, where feasible and practicable. Industrial materials are the non-hazardous byproducts of industrial processes, such as construction, power generation, metal casting, steelmaking, and pulp and paper production. AGC recognizes that industrial materials may only be viable in certain applications and encourages project owners and contractors to evaluate the feasibility and performance of these materials for each use.

AGC Action

- AGC has developed the *Recycle This!* brochure, fact sheets, articles, and case studies regarding the contractor's role in recycling and reuse of materials.
- AGC works with EPA in the Sector Strategies Program and the Resource Conservation Challenge to ensure that contractors have the resources they need to recycle construction and demolition debris, where feasible and practicable.
- Together, AGC and EPA are attempting to identify ways contractors can reuse construction debris and other industrial materials and the barriers to recycling and reuse.
- AGC and EPA will soon release a joint white paper on recycling, and have discussed the possibility of establishing a joint recognition program.
- AGC worked with EPA on an online "recycling toolkit" to provide resources and case studies for those interested in recycling and reuse. We launched the toolkit in 2009.
    - Among other things, the toolkit addresses efforts to recycle and reuse industrial materials in various construction applications, such as structural and masonry material, fill, roofing material, insulation, reused internal elements, flooring and ceiling material, and fuel.
- AGC and its members offered input on the EPA report, *Estimating 2003 Building-Related Construction and Demolition Materials Amounts*, released in 2009.