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## What It Means To Be Green

### Materials Re-use & Resource Conservation

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Posted in: **Region**  
By Andrew P. Borgese

To quote from William McDonough's book Remaking the Way We Make Things – Cradle to Cradle, "the best way to reduce any environmental impact is not to recycle more, but to produce and dispose of less". The design and construction industry provides, perhaps the greatest opportunity to affect the environment by following this sound advice. Architects, engineers, builders, developers, facility managers and property owners have a choice when it comes to how a building project is to be designed, constructed, and operated and whether each of these processes will utilize materials and resources wisely, or not.

There are billions of dollars spent each year on building construction projects that require enormous amounts of materials and resources to be extracted, processed, transported and finally installed in buildings where they will remain – for 10 years, or 30 years, or maybe 50 years -until it is decided that the building is no longer of value and should be demolished and disposed of and a new one erected in its place. This is the traditional life cycle of buildings in our society. They are disposable. The proliferation of poorly built, cheaply constructed developments, often by developers who never intend to occupy the structures themselves, further promotes the concept of disposable buildings along with a perceived inexhaustibility of resources. The availability of salvaged materials is rapidly increasing and their costs becoming more competitive. The tipping fees at the landfills are steadily rising and these dumping sites are quickly reaching their capacity and closing. These are some of the obvious indicators that our current methods (which

are generations old) are not economical, not efficient and constitute an extremely wasteful process that results in extraordinary amounts of construction and demolition debris.

Construction and demolition (C&D) waste includes building materials such as asphalt shingles, insulation, concrete, wood, gypsum wall board, PVC, steel, bricks, etc. While there may also be some hazardous materials such as asbestos, lead, mercury, and arsenic treated lumber contained in building related debris, they are not generally considered with the C&D waste and must be disposed of according to regulations and practices beyond those required for C&D waste.

The United States Environmental Protection Agency concluded that approximately 136 million tons of construction and demolition waste was generated in 1996, 43% of which was from residential projects. New construction accounted for about 11 million tons (8%), renovation was 60 million tons (44%) and demolition another 65 million tons (48%).

The National Association of Home Builders Research Center estimates that during the construction of a typical 2,000 square foot home about 8,000 lbs. of construction waste is diverted to landfills.

There are several strategies that can be employed to insure less C&D waste, and consequently less demand for new material production and less disposal of materials in landfills. To start with, the design of a building should consider the possible re-use of any existing structure or structures on the site. The benefits can often be substantial if there is a structure already in place that can

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be altered or added onto in order to satisfy a different program of requirements for a new owner or a different use. (*A more in-depth description of the environmental, financial and community benefits of a development of this type are addressed in the March 14<sup>th</sup> article: Sustainable Sites.*) An evaluation of the building by a knowledgeable professional can determine whether maintaining a large portion of the existing building structure including the building frame, structural floors and roof deck is feasible given the specific requirements of a new use. Often the building envelope (exterior skin such as veneer brick or wood siding) can also be retained with minimal repair or replacement to maintain the integrity of the assembly of materials. The goal of this building re-use strategy is to extend the life cycle of the existing structure beyond the single purpose for which it was initially intended. By doing so, this new construction project will require substantially fewer resources while retaining the cultural resources of the older existing building stock within the community. Additionally, the massive reduction in demolition waste will limit the amount of debris that is diverted to landfills. Consider also the associated impacts of the need for fewer materials as they relate to the harvesting or extracting of resources to create various building products; the energy needed to process and manufacture those finished materials; and the fuel required to transport those materials to the job site. The re-use of existing buildings, whenever practical, can produce a measurable reduction in environmental impacts compared to new buildings and result in a smaller carbon footprint. (*For more on carbon footprints see the May 16<sup>th</sup> article:*

*Greenhouse Gases, Architecture & Climate Change.*)

Another strategy that can be implemented on any job site is the re-use of building materials and products from either an existing structure on site or from other local or regional sources. These may include such items as brick, wood flooring, millwork, beams, posts, doors and frames, furniture and cabinetry. When materials such as these can be refurbished and reused for installation in a new construction project, it not only extends the life cycle of these products by diverting them away from landfills, but it also reduces the need to extract and process virgin resources for the purpose of creating new materials and further impacting the environment.

Certainly, the introductory quote from Cradle to Cradle is not meant to discount the importance of recycling materials during building construction projects. As more owners and municipalities are beginning to require it, we're beginning to see construction waste management plans as standard protocol on job sites. These plans typically provide for the sorting and collecting of materials to be reused, repurposed or recycled instead of being hauled to landfills or incinerators. The intent of that quote, as I understand it, has more to do with the process of designing and building in ways, and with materials that will retain their intrinsic value either as part of the assembly that they are attached to or as part of something else that has yet to be determined. These materials would have no adverse effects on the environment in their present form or in any stage of decomposition and could be used as a raw material over and over again. While this

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concept is not yet mainstream, it is, in fact, real and products are being developed now with this cradle to cradle life cycle certification. (*For more information, go to [www.c2ccertified.com](http://www.c2ccertified.com).)* As *Time Magazine* phrased it, this new design paradigm is “a unified philosophy that – in demonstrable and practical ways – is changing the design of the world.”

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