Arnold & Mabel Beckman Center for Conservation Research, San Diego, California
Winner of the 2008 NCMA/ICPI Award of Excellence for Sustainability

How Concrete Masonry and Hardscape Products Qualify for LEED Points

LEED FOR NEW CONSTRUCTION 2009

SS—Sustainable Sites		26 Points
Prerequisite 1	Construction Activity Pollution Prevention	
Goal	The goal is to reduce pollution generated by construction activities, such as erosion, waterway sedimentation and dust generation.	
Contributions	Articulating concrete blocks can be used to prevent soil erosion, to provide a drivable surface, which will reduce dust generated by truck traffic, and to construct sediment basins. They also support vegetation growth, which provides increased stormwater quality.	ACB
	Grid pavers can be used as a driving surface to reduce dust generation and dirt tracking which leads to sedimentation.	Paver
Credit 2	Development Density and Community Connectivity	5 points
Goal	The goal is to protect undeveloped land and preserve habitats by channeling development to urban areas with existing infrastructure.	
Contributions	The use of both concrete masonry units and segmental retaining wall units can contribute, as they are modular and relatively small, so are well-suited for use on small and irregularly shaped lots. The reduction of large material and equipment staging areas and the reduced requirements of large pieces of equipments is important when developing infill lots in urban areas.	CMU SRW
Credit 5.1	Site Development: Protect or Restore Habitat	1 point
Goal	The goal is to conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.	
Contributions	Restore erosion prone areas of the site with articulated concrete blocks or grid pavers, which will retain soil while promoting growth of native plantings.	ACB Pavers
	Use segmental retaining walls (SRWs) to maximize site usage and thereby reduce the total percentage of site use for development.	SRW

Concrete masonry and concrete hardscape products are made from abundant local raw materials and are manufactured close to construction sites, minimizing fuel requirements for handling and transportation.

Credit 5.2	Site Development: Maximize Open Space	1 point
Goal	The goal is to conserve existing natural areas on the project site by maximizing the amount of open space relative to the development footprint.	
Contributions	For urban projects that earn Sustainable Sites Credit 2, pedestrian-oriented hardscape areas, such as those constructed with concrete pavers, can contribute towards this credit.	Pavers
	Ponds constructed using articulated concrete block may count as open space as long as they are vegetated and meet the LEED specified maximum side slope gradient average of 1:4 (vertical : horizontal).	ACB
Credit 6.1	Stormwater Design: Quantity Control	1 point
Goal	The goal is to reduce the amount of stormwater runoff.	
Contributions	Limit stormwater runoff by using pervious or grid pavers to minimize impervious surfaces. The stone filled gaps and joints in the pavement provide 100% surface permeability allowing stormwater to be absorbed into the base materials gradually recharging the underlying groundwater.	Pavers
	Protect receiving stream channels from erosion using articulated concrete blocks, which can be planted, contributing to the overall site aesthetics and ecology.	ACB
Credit 6.2	Stormwater Design: Quality Control	1 point
Goal	The goal is to improve the quality of the runoff by providing filtration or other stormwater treatment	
Contributions	Strategy is ACBS can be used for stormwater settling ponds or channels that allow sediment and other solids to settle out of the water, improving the quality of the runoff	ACB
	Permeable/Pervious pavers filter ground water as it passes through the joints and base material.	Paver
Credit 7.1	Heat Island Effect: Nonroof	1 point
Goal	The goal is to reduce heat islands and minimize the resulting impacts on microclimate and human and wildlife habitat.	
Contributions	Pavers with a Solar Reflectance Index (SRI) of at least 29, such as using light-colored pavers vs asphalt (SRI of new gray concrete = 35) to reflect heat instead of absorbing it.	Pavers
	Open grid pavement system with grass in the gaps.	Paver
EA – Energy and Atmosphere		**35 points**
Prerequisite 2	Minimum Energy Performance	
Goal	The goal is to establish a minimum level of energy efficiency for the proposed building and systems to reduce the environmental and economic impacts.	
	Concrete masonry has a unique quality known as thermal mass, or the ability to store heat. The energy efficiency of this quality is recognized by ASHRAE Standard 90.1 and can be used to achieve the energy efficiency thresholds mentioned on the previous slide. The ways this quality affect energy efficiency are the shifting of peak heating and cooling loads to non-peak hours; the reduction of peak heating and cooling loads; the reduction in HVAC systems; and a moderation in interior temperature swings.	CMU
Credit 1	Optimize Energy Performance	1-17 points
Goal	The goal is to achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.	
Contributions	Concrete masonry has a unique property known as thermal mass, or the ability to store heat with very little change in temperature. The energy efficiency of this property is recognized by ASHRAE Standard 90.1 and can be used to achieve the energy efficiency thresholds mentioned on the previous slide. The ways this property affect energy efficiency are the shifting of peak heating and cooling loads to non-peak hours; the reduction of peak heating and cooling loads; the reduction in HVAC systems; and a moderation in interior temperature swings.	CMU

Concrete hardscape products filter stormwater run-off and support grass or other plant growth with open cell product designs.

MR—Materials and Resources		**14 Points**
Credit 1.1	Building Reuse: Maintain Existing Walls, Floors and Roof	1-3 points
Goal	The goal is to achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.	
Contributions	Concrete masonry buildings, because of their exceptional durability, lend themselves very well to renovation rather than teardown. This strategy helps conserve natural resources, retain cultural resources, reduce waste, and reduce the environmental impacts of materials manufacturing and transport.	CMU
Credit 1.2	Building Reuse: Maintain Interior Nonstructural Elements	1 point
Goal	The goal is to extend the lifecycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials, manufacturing and transport.	
Contributions	Concrete masonry buildings, because of their exceptional durability, lend themselves very well to renovation rather than teardown. This strategy helps conserve natural resources, retain cultural resources, reduce waste, and reduce the environmental impacts of materials manufacturing and transport.	CMU
Credit 2	Materials and Resources: Construction Waste Management	1-2 points
Goal	The goal is to divert construction and demolition debris from disposal in landfills and incineration facilities, to redirect recyclable recovered resources back to the manufacturing process, and reusable materials to appropriate sites.	
Contributions	Strategies include redirecting broken or damaged concrete products back to the manufacturing process (possible for use in CMU, but more commonly in other products/materials). Concrete masonry and hardscape products that are not used and are reusable can be donated or redirected to another project.	CMU Pavers SRW ACB
Credit 3	Materials and Resources: Material Reuse	1-2 points
Goal	The goal is to reuse materials and products to reduce demand for virgin materials and reduce waste, thereby lessening impacts associated with the extraction and processing of virgin resources.	
Contributions	Some concrete masonry products such as SRW units, pavers and ACBs can often be removed from one location and reused in another.	SRW Pavers ACB
Credit 4	Materials and Resources: Recycled Content	1-2 Points
Goal	The goal is increase the demand for materials with recycled content and to lower the demand for virgin materials.	
Contributions	The inert nature of masonry lends itself well to incorporating recycled materials. Concrete masonry units are routinely manufactured with by-products from other industries as well as some post-consumer materials.	CMU Pavers SRW ACB
Credit 5	Materials and Resources: Regional Materials	1-2 Points
Goal	The goal is to increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.	
Contributions	Concrete masonry units are typically manufactured very close to the point-of-use. Also the raw materials that are used in the manufacturing of concrete masonry units are typically extracted close the production facility including the recycled materials that are often incorporated into the product.	CMU Pavers SRW ACB

Concrete hardscape products reduce storm-water runoff with permeable concrete pavers and ACB units.

ID—Innovation in Design		**6 Points**
Credit 1	Innovation in Design	1-5 Points
Goal	The goal is to provide design teams and projects the opportunity to achieve exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.	
Exemplary Performance Contribution	**Site Development**—an additional point can be achieved by having a larger percentage of the site undisturbed or restored than the original credit. SRW, ACB and paver units can assist in minimizing site disturbance and restoring erosion prone areas. **Stormwater Design**—using paver and ACB units can assist in reducing and improving stormwater to increase the requirements in the original credits. **Heat Island Effect**—using high-albedo or open grid paver units on all non-roof impervious surfaces will yield an additional point. **Optimizing Energy Performance**—using concrete masonry walls strategically can assist in achieving the 50% efficiency level needed to get this additional point. **Construction Waste**—crushing and reusing concrete masonry materials can assist in accomplishing the 95% diversion from landfill threshold established for this credit. **Material Reuse**—salvaging paver, ACB and SRW units can make the 15% material reuse level attainable. **Recycled Material**—a 30% recycled content level will yield a point.	CMU Pavers SRW ACB
Innovation Contribution	To earn these credits, the design team must develop their own criteria and document the performance. Concrete masonry can contribute in a variety of ways. **Durability** One of the most obvious characteristics of concrete masonry is its durability and long life expectancy, with minimal care, upkeep and maintenance. Each of these factors contributes to a building's lasting beauty, comfort, convenience, economy, and returns benefits to the environment when concrete masonry is used. **Low/No VOCs** Unpainted concrete masonry is not currently recognized under the LEED low-VOC credit (Environmental Quality credit 4.2). However, the use of unpainted masonry may be able to qualify under a LEED interpretation ruling for that credit. **Acoustics** Currently there isn't a sound level requirement for LEED for New Construction. By using IEQ credit 9 in LEED for Schools as a guide an ID credit could be developed taking advantage of concrete masonry's acoustical properties. **Mold Inhibitor** Using the Mold Prevention credit in LEED for Schools, a project team could develop an ID credit capitalizing on concrete masonry's natural ability to resist mold growth due to it not being a food source for mold.	CMU Pavers SRW ACB
RP—Regional Priority Credits		**4 Points**
Goal	The goal of this category is to encourage design teams to focus on regional priorities.	
Contributions	The content of these credits varies by zip code across the country. The requirements operate similar to the Innovation in Design Exemplary credits in that they typically require a higher requirement threshold for existing credits and are not new credits. Concrete masonry units will assist in achieving these credits in the same manner as previously described under each credit.	CMU Pavers SRW ACB