GreenCanvas

Expansive Component for Sustainable Concrete

Shrinkage-Compensating Concrete Enhances L.E.E.D.'s Applications

Concrete is a building material that has numerous positive characteristics that could add up to many points, depending on the project, in the design and construction of a Green project application for L.E.E.D. (Leadership in Energy and Environmental Design) certification. The use of shrinkage-compensating concrete (SCC) builds on this strength and provides for additional points to be earned. Shrinkage-compensating concrete created by using GreenCanvas, a Type G component, offers additional benefits and points in the L.E.E.D. process as compared to a Type K shrinkage- compensating concrete.

The primary purpose of, and benefit derived from, shrinkage-compensating concrete is the ability to eliminate shrinkage cracking. Two primary benefits resulting from this process are the elimination of contraction joints and a measurable improvement in the durability and sustainability of the concrete. While it seems obvious that increased durability and sustainability should be integral part of a green building project, There are no structural longevity credits in a L.E.E.D's application at this time, but it is reported to be in the works and should be applicable in the near future.

Secondary benefits derived from the use of GreenCanvas, a Type G shrinkage- compensating concrete, are numerous and could provide additional credits for a Green project and increase the projects certification level. These points are outlined below in each applicable credit category:

Sustainable Sites

- Site remediation of a brown eld site often requires that an impervious cap be constructed to complete the encapsulation of a contaminated zone. The use of shrinkage-compensating concrete made with GreenCanvas for this cap increases its durability, sustainability, and imperviousness due to the resulting densified concrete that is free of shrinkage cracking, control joints, and micro cracking.

- Cisterns to provide water for irrigation and decorative purposes at a building site is becoming a standard green building feature. A cistern is classified as a containment structure and its function can be maximized by using GreenCanvas shrinkage-

compensating concrete for its construction. A GreenCanvas cistern can be a more impervious leak proof structure without the joints, joint sealants, and cracking associated with normal concrete.

- Water features filling bioretention planters are a natural for GreenCanvas SCC construction since they in essence are a containment structure. These water features can be designed and constructed monolithically without joints and sealants qualified them for VOC reduction credits.

Materials and Resources

- GreenCanvas is manufactured in several locations in allowing shrinkage compensating concrete to maintain the less then 500 mile origin credits normally available to regular concrete. By contrast, Type K components/materials are either imported from Europe or supplied by a company located in Los Angeles, California. GreenCanvas shrinkage-compensating concrete would thereby qualify for the source of origin within 500 miles credit on projects in the megamarkets of the southeast, central, midwestern, and eastern portions of the United States. **Please check with a Rep on location of origin.**

- Shrinkage-compensating concrete is created by adding GreenCanvas, a Type G component, to a standard concrete mix design earning resource credits for water conservation on several counts: (1) the water/cement ratio remains the same as a comparable Portland Cement concrete of the same strength whereas Type K shrinkage-compensating concrete requires an increase in the w/c ratio and water content to achieve a 5-6" slump from water only, (2) still more additional water is required in shrinkage-compensating concrete made with Type K cement since more cement is required to achieve the specified expansion rate resulting in a higher than specified concrete strength, (3) the same curing technique specified for regular concrete can be used for Type G shrinkage-compensating concrete whereas Type K shrinkage-compensating concrete requires a 7 day water cure in order to provide the water necessary to feed the ettringite crystal growth that is its expansion mechanism.

- GreenCanvas is chemically independent of all other components in the concrete mix allowing its use in concrete mixes that substitute y ash, slag, and/or silica fume for a portion of the cement in the concrete mix in order to claim additional materials credits. GreenCanvas differs from Type K Shrinkage-Compensating Concrete in this

regard since Type K is chemically sensitive and interacts with the y ash, slag, silica fume, and even the cement in the concrete mix.

Other Points

- Building interior floor slabs made with Shrinkage-Compensating Concrete can provide a floor surface that does not need to be sealed earning credits by eliminated VOC emitting sealant materials.

- Building interior floor slabs made with Shrinkage-Compensating Concrete eliminates contraction joints that many times in conventional concrete floors are filled and caulked with VOC emitting sealants to provide a smooth surface.

- GreenCanvas dosed at a reduced rate will act as a shrinkage reducing admixture earning credits for not having to use a chemical admixture in the concrete mix.

- Innovative design credits can be earned by using GreenCanvas Shrinkage-Compensating Concrete for building roofs, thereby earning materials and resources credits by eliminating the need for manufactured roof coverings and sealants.

- Innovative design credits can be earned by using GreenCanvas Concrete for building roofs thereby providing a light colored surface that can take advantage of solar reflectance index (SRI) credits. GreenCanvas is compatible with "white" cement concretes further enhancing the SRI credits.

- Green roofs consisting of a planted green area on the roof presents numerous maintenance and upkeep problems that can be eliminated by using a GreenCanvas shrinkage-compensating concrete as the building material of choice for the green roof support structure. The roof structure in this concept consist of a containment structure that provides the water retention necessary for plant growth while maintaining the water tightness necessary to keep the water from entering the building structure. The use of shrinkage-compensating concrete in general, and GreenCanvas SCC in particular, for containment structures is well established concept with many successful applications in the petro-chemical industry. GreenCanvas green roofs are more economical to construct and maintain than other green roof waterproofing methods currently in use.

Energy Credits

- Sustainable design credits can be earned for a high reflectance concrete roof due to decreasing the heat island effect attributable to normal roofing materials.

- Minimum energy performance credits can be earned by a high reflectance concrete roof due to the reduction in interior thermal load as compared to conventional roofing materials.

- Additionally, a concrete roof adds to the "mass" of a green building meaning that it can help provide sufficient heat storage capacity to moderate daily temperature swings that impact HVAC performance.

- Innovative design credits can be applied for based using GreenCanvasGreenCanvas Type G Shrinkage-Compensating Concrete in lieu of standard Portland Cement concrete based on sustainability. Shrinkage-Compensating Concrete structures typically last a minimum of 2 to 3 times longer due to the increased durability and sustainability of Shrinkage-Compensating Concrete, thereby greatly reducing the maintenance, recycling and replacement impact these structures would have on the environment and natural resources.

Based on this last bullet item, a life cycle cost analysis of a green building constructed with shrinkage-compensating concrete invariably results in the lowest per year costs and the greatest ROI to the owner.

In summary, concrete is an excellent material for green building construction and there are additional Green Building credits to be gained by using Shrinkage Compensating Concrete. Also, there are additional Green Building credits to be gained by using a Type G component to create that Shrinkage-Compensating concrete structure.

For more information please contact:

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