



Summit Reliance Group, Inc.
Pioneering a Sustainable Future

The Summit
!! AND !!
Advantage

**ENERGY & ENVIRONMENTAL
STEWARDSHIP**
with
STRUCTCRETE™ SOLUTIONS

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Summit Reliance Group, Inc., is a disruptive platform construction technologies and systems company with unique **StructCrete™ Solutions** that provide practical, fast and affordable solutions to large scale new infrastructure development and construction, and disaster reconstruction.

StructCrete™ precast concrete Panels: (1) employ rebar-reinforced structural/load-bearing ribs, (2) are produced in precision-engineered, re-configurable all-steel Moulds with an expected commercial life-cycle in excess of 3,000 castings, (3) are cast horizontally in the Mold at an open space at or near the Project site, and (3) employ local/regional construction materials, equipment (primarily truck-mounted telescoping cranes or other available suitable panel lifting devices), and labor. **StructCrete™ Solutions eliminate the increased time, cost, and energy and environmental impacts associated with other construction systems.** For example:

StructCrete™ structural precast concrete Panels use approximately only 50% of the concrete (cement) and 40% of the rebar required for other structural, load-bearing concrete construction methods (e.g., *full-thickness* tilt-up and factory-manufactured panels and modular units, and pour/form-in-place walls and floors). These savings in construction materials are achieved by the: (1) structural rib network design of the StructCrete™ Panel and (2) ability uniquely to (a) mass-customize that design to minimize the number of structural ribs that are required without compromising the structural performance of the Panel, and (b) easily configure/re-configure the structural rib network in the Moulds.

Cement manufacturing is a major generator of CO₂. According to a survey of Portland Cement Association (PCA) members, an average of 927 kg (2,044 lb) of CO₂ are emitted for every 1,000 kg (2,205 lb) of Portland cement produced in the U.S. and a significant portion of the CO₂ produced during manufacturing of cement is reabsorbed into concrete during the product life cycle through a process called carbonation. Cement is manufactured from a combination of naturally occurring minerals – calcium (60% by weight) mainly from limestone or calcium carbonate, silicon (20%), aluminum (10%), iron (10%) and small amounts of other ingredients that are heated in a large kiln to over 1,500°C (2,700°F) to convert the raw materials into clinker. CO₂ is generated mainly from two different sources during the cement manufacturing process: (i) use of fossil fuels in the burning process; and (ii) calcination, when calcium carbonate is heated and broken down to calcium oxide with the release of CO₂. The most commonly used type of cement is called Portland cement. It contains about 92% to 95% clinker by weight. Some companies produce blended cements that incorporate other industrial byproducts that have cementitious properties, thus reducing the amount of clinker in the cement.

Significantly, each standard StructCrete™ concrete panel produces 1,235 lbs less CO₂ emissions compared to conventional concrete construction methods. Increased applications of the StructCrete™ technology will contribute to reducing the “loss and damage” contribution of \$100 billion per year that a cement-producing country will otherwise be required to share under the United Nations Framework Convention on Climate Change, as established at the Framework technical endorsement conference held November 2013 in Warsaw, Poland. Custom StructCrete™ concrete mix designs provide multiple additional significant environmental savings.



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StructCrete™ buildings typically do not require a structural steel framework or columns or beams up to 4 stories (or up to 6 stories depending upon the number and placement of StructCrete™ internal structural load-bearing walls). Taller buildings up to 13 stories constructed with StructCrete™ typically also do not require a structural steel framework, but employ unique StructCrete™ precast columns and beams. Thus, the energy and associated environmental impacts for producing, delivering and erecting such structural steel frameworks is eliminated for these types of buildings.

StructCrete™ on-site casting in precision-engineered Moulds eliminates the energy and associated environmental impacts for constructing and operating a precast concrete products factory with a fixed production capacity and then having to transport the factory-made panels and modular units to the Project site with the risk of damaging those panels/units, most often requiring their disposal in land-fills.

StructCrete™ on-site casting in horizontal Moulds eliminates the energy and associated environmental impacts resulting from the use of plywood shuttering panels that are commonly employed in pour-in-place concrete forming systems used for constructing housing and other buildings, and the disposal of the plywood after only limited use (e.g., typically 3 to 15 pours) by burning or at land-fills. Further, horizontal casting essentially eliminates spillage and concrete waste that commonly occurs with all types of forming systems and that can contaminate the Project site. The use of form release oils is reduced significantly in StructCrete™ Moulds compared to the heavy dosages required for wood or metal shuttering panels used in vertical forming and floor shoring systems.

The StructCrete™ Panels and required internal openings (e.g., for doors, windows) and Columns/Beams, being cast in precision-engineered Moulds, are true in shape, size, squareness of the angles and flatness of the surfaces with very tight tolerances in all dimensions. Thus historically, the structural skeletons of buildings constructed with StructCrete™ Panels or Hybrid Panels & Columns/Beams are monolithic structures that do not leak air or water and otherwise are maintenance-free and rated for up to 200 mph wind loads and Zone 4 seismic events, with an expected life cycle in excess of 100 years. Accordingly, StructCrete™ structural skeletons eliminate the adverse energy and environmental impacts and costs typically associated with buildings that do not provide these features.

Summit provides on-the-job vocational education and training of the local workforce employed by the Project construction contractor. This training includes skills required for StructCrete™ casting and building erection, as well as general construction operations and best energy and environmental stewardship practices.
