

HIGH PERFORMANCE STRUCTURES AND HIGH PERFORMANCE PRECAST CONCRETE

WHAT IS A HIGH PERFORMANCE STRUCTURE?

The United States Government defines a high performance structure as one that “...integrates and optimizes on a lifecycle basis all major high performance attributes including energy and water conservation, environment, safety, security, durability, accessibility, cost-benefit, productivity, sustainability, functionality, and operational considerations.”

– *Energy Independence and Security Act of 2007 -401 PL 110-140*

At the heart of this definition is a fundamental shift in perspective from sustainable design and construction to sustainability and performance on a life cycle basis. The concept of ‘high-performance’ encompasses the concepts and practices of sustainability. However it goes beyond a ‘this-or-that’ approach by requiring optimization of all relevant attributes for a project. Hence, characteristics such as energy and water conservation, safety, security, and durability, are no longer just options, but requirements that must be integrated into a structure’s overall design, construction, and performance.

High performance structures require high performance materials and systems. These consist of integrated systems that allow for design versatility and are efficient, resilient and can be optimized to meet the multi-hazard requirements and long-term demands of high performance structures. Precast concrete is used more and more to help projects meet and exceed their high performance goals during design, construction, and operation.

HIGH PERFORMANCE PRECAST CONCRETE

Precast concrete is a high performance material that integrates easily with other systems and inherently provides the versatility, efficiency, and resiliency needed to meet the multi-hazard requirements and long-term demands of high performance structures. Precast concrete is a versatile, efficient, and resilient high performance system that allows designers and owners to integrate and optimize important attributes for their projects.

VERSATILE	EFFICIENT	RESILIENT
AESTHETIC VERSATILITY	SITE EFFICIENCY	STRUCTURE DURABILITY
Virtually any color, form, and texture	Minimal site disturbance	Long service life
Facade integration	Negligible waste	Barrier wall system
Historic compatibility	Accelerated construction	Functional resilience
STRUCTURAL VERSATILITY	ENERGY AND OPERATIONAL EFFICIENCY	MULTI-HAZARD PROTECTION
Scalable performance	Scalable performance	Storm resistance
Economical sections	Thermally efficient	Earthquake resistance
Long open spans	Low life-cycle costs	Blast resistance
USE VERSATILITY	RISK REDUCTION	LIFE SAFETY AND HEALTH
Recyclable	Design assist	Indoor environmental quality
Deconstructive reuse	Reduced and trades	Passive fire resistance
Adaptive reuse	Enhanced profitability	Meets FEMA 361