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SOLID VERSATILITY MOVABLE STUCCAST WALLS ARE GOOD DESIGN-BUILD CONCRETE OPTION

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A durable and secure freestanding concrete wall is often necessary, but the time and expense of building one can be prohibitive. This is especially true if the need is temporary, as additional costs to demolish and dispose of the wall can add up.

Add tight schedules on which a design-build project will operate and the importance of project completion on time and under budget, and the pressure is even greater. With a few adjustments and alternatives, however, design-builders have some options when faced with a project that demands a freestanding concrete wall.

When addressing the needs of such walls, a new system of lightweight, relocatable and reusable concrete wall panels can meet the need, eliminate downside risk and reduce waste. This cost-effective option meets needs such as jobsite fencing, traffic control, security barriers, storage and a host of other applications that, in the end, can save design-builders time and money.

The Idaho National Guard, for example, recently purchased such a system of lightweight, movable wall panels made of studcast concrete. Developed by Ecolite Concrete USA Inc., the wall panels were supplied by DBIA member RQ Construction, an Ecolite licensee in Carlsbad, Calif., and fabricated at their manufacturing facilities in Moreno Valley, Calif. The 3,000 linear feet of panels are a reconfigurable system being used for a variety of troop training exercises.

"The Guard needed a system that was easily relocatable and extremely stable without permanent foundations," says George Rogers, RQ Construction CEO. The freestanding units are each six feet wide, 10 feet long and 7.5 inches thick. They stand on steel feet that can be rotated entirely underneath the panel, allowing the units to be shipped and stored flat, then moved into position quickly. Made of a special lightweight concrete, each unit weighs only 2,100 pounds, just 35 pounds per square foot or 210 pounds per linear foot of wall.

"The Guard considered a tall, modified Jersey barrier, similar to ones being used in Iraq," Rogers says, "but that option was far too heavy." Even a conventional Jersey barrier — only 2.5 feet tall and two feet wide at the base, tapering to six inches wide at the top — weighs about 600 pounds per linear foot. A 6' x 10' x 7.5" slab of conventional concrete would weigh approximately 5,400 pounds and would require an additional heavy support system.

SIMPLE VERSATILITY

The range of uses the Guard has found for these walls illustrates the possibility for increased design-build use in a variety of applications such as site fences, security, screen walls, fire safety, traffic control, crowd control and more.

Originally, the units for the Idaho project were specified purely as perimeter wall. As the project developed, however, performance specifications expanded to require panels that would be stable as troops climbed them. On the training range, they have been configured as a maze-like controlled entry point, to train troops in vehicle-search procedures.

The studcast wall panels can deploy with little or no site preparation. And with the land borrowed from the Bureau of Land Management, the Guard must return it to the owner in its original condition with no permanent foundations installed.

"The beauty of it," says 1st Lt. Eric J. Simmons, "is that the wall units can be reused in different ways for training." In one place, for example, they added a tarp across the top to form a shelter.

The units have cast-in lift points on the top edge and can be moved and repositioned with a forklift. The current units are all positioned independently — in some cases on uneven terrain — but the panels also can be designed with connections for linking them edge-to-edge. In addition, their flat profile enables them to be placed at right angles with virtually no gap between them, unlike Jersey barrier-type units whose tapered design cannot abut seamlessly at any angle, except end-to-end.

Their rotatable feet extend 2.5 ft. from the wall edge when deployed, providing stability to resist wind-loads of up to 120 mph. For shipping and storage, the feet fit completely underneath the wall profile, so the units can be horizontally stacked flat or close-stacked vertically. The walls were fabricated at Ecolite's Moreno Valley facility and shipped to the Idaho site 850 miles away, stacked seven panels high on flatbed trucks, 21 units per truck.

A WALL FOR ALL SEASONS

In a construction context, the movable wall design has many possibilities. With a variety of available dimensions in addition to those used in Idaho, they can be engineered to be lifted from top or bottom and are adaptable to semi-permanent or permanent support systems.

For example, when used as a perimeter fence, they go up quickly and can adapt to new configurations as a project changes. Their screening ability makes them much more difficult to climb or penetrate than a chain-link fence, and they serve as a sound barrier to help minimize job-site noise.

The high-impact resistant walls can control both vehicular and pedestrian traffic and serve as hazard protection. In fact, a similar type of wall, with only half the concrete thickness, passed the Miami/Dade County (Fla.) Wind-blown Missile Impact Test, the most stringent hurricane-safety test in the country.

The material's high fire resistance is useful when enclosing fueling areas or tank farms as well as welding areas, and it serves as both spark protection and a visual screen. Wall units also can serve as emergency fire breaks to control the spread of a conflagration. The design can be modified to include blast- and ballistic-resistant materials for high-security applications.

By placing the units in an enclosed configuration with linked corners, they become a bin for loose bulk material or they can be covered and temporarily joint-sealed to protect contents from wind and weather.

Because the walls are reusable, they represent a versatile investment.

Beyond temporary applications on the construction site, the walls offer architectural opportunities. The material can be finished with integral color, cast-in textures and architectural details such as reveals. They can form a reconfigurable partition system for a multi-purpose event space and can act as screens for crowd management and pedestrian traffic channeling.

DESIGN-BUILD ADVANTAGE

The various high-performance properties of the walls derive from the hybrid system used to make them. They are studcast panels, a composite of specially formulated lightweight Ecolite concrete mated to cold-formed steel stud framing. A robust, pre-engineered wall technology, studcast was invented as a sustainable, rapid-erection construction system (*See September 2008 DATELINE*).

Wall units can be generic or custom made for virtually the same cost. Studcast allows an almost seamless flow from design to construction, since the factory fabrication system is directly driven by the design documents, and even a boilerplate design, such as a 6'x10' freestanding wall unit, is, in essence, custom fabricated.

Time and cost are highly predictable and controllable: casting is done indoors, unaffected by bad weather minimizing jobsite labor and time.

A design-build firm also can license the wall system technologies from Ecolite and become its own studcast producer, the logical extension of the design-build one-stop shop concept. In addition to supplying its own needs, an Ecolite licensee has an exclusive territory to fabricate and sell studcast walls to other builders, thereby getting a piece of the competition's projects. Regardless of the method, the overall rapidity of erection shortens schedules, leading to faster delivery and better cash flow.

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