

Company offers game-changing, dropped-object protection

Safway® Group

In response to a complex set of challenges at a giant industrial project, Safway® Group developed a new way to handle dropped-object protection (DOP). “This is why people hire Safway,” said Eric Durham, Safway’s designer who led the team that developed the DOP solution.

Safway was hired to provide access at a busy but remote site where a massive industrial structure was being built, which included a 40,000-square-foot platform several hundred feet tall. Durham was brought on-site as a safety and technical expert.

Historically, DOP on similar projects is provided by erecting a platform consisting of quarter-inch steel plate sandwiched between two layers of 2-by-10 plank. But given the complexity of this work environment, a lot of people started thinking there had to be a better way. Installing the steel

sheets, each weighing about 500 pounds, by hand was not a good option. Hoisting the sections in by crane would create even more risks than hand carrying them being the project already included multiple tower cranes conducting simultaneous lifting activities at several levels.

In addition, the project managers were concerned about the end game. Regardless of the DOP system used, it needed to stay in place until the structure was completed. Then the protection system would have to be removed very quickly. As the project managers tried to picture the removal of 5-foot by 10-foot sheets of steel plate from a maze of pipes and equipment on a cramped, elevated structure, everyone agreed there had to be a better way.

One alternative to the plank and steel combo is the use of netting. However, netting needs room to sag when something hits it in order to absorb the force. With the tight working environment, there was no room to sag.

The proposed solution: Replace the steel plate with two layers of Kevlar fabric — the stuff bulletproof vests are made of — and replace the 2-by-10 planks with a plywood sandwich. The sandwich layers would be supported by aluminum joists 12 inches apart.

Durham knew the idea was a bit out there when he first proposed it. “I remember saying, ‘You’re going to think I’m crazy, but this is going to work,’” Durham said.

The team’s research revealed they could get significant quantities of the Kevlar material for testing. Ten-pound hammers and lengths of rebar were dropped on test sections of a plywood and Kevlar sandwich from a height of 117 feet. The platform stopped everything the engineers threw at it — even a 6-foot length of rebar that came down vertically at about 60 mph. It smashed both layers of plywood, but the Kevlar fabric held, displacing only about an inch.

In addition to passing the test, the Kevlar and plywood solution reduced weight by 78 percent, which would allow for a reduction in supporting material and was a third of the cost of steel.

The project owner congratulated Safway on the innovation. A representative of its safety committee commented, “Through collaboration and ingenuity, the integrated management team identified an issue and successfully afforded a DOP alternative that not only affords the (required) level of protection, it simultaneously removes identified (high potential risk) activities and significantly reduces associated costs.”

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