

Working Safely on the Edge

Anchored guardrail post provides a tie-off point

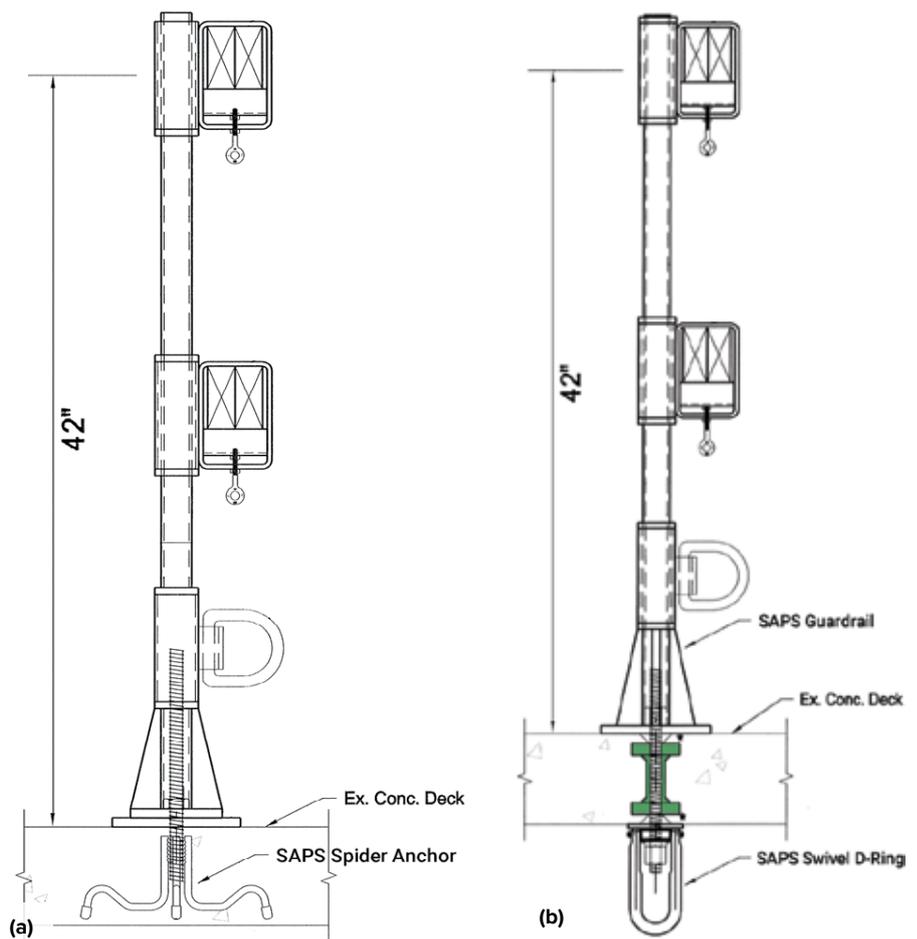
by Manny Carrillo

When I started my construction career, my work was a passion, it was a challenge, but most of all, it was a discipline. I got to know my tools, their capabilities, and their safety features. I worked with many systems, and I continually questioned why the safety of the end user wasn't the priority.

For the last 25 years, I have worked in Northern California. Notable projects have included:

- The largest suspended waffle deck in the world at the San Francisco Moscone Center;
- Tunnels, bridges, and stations for the Bay Area Rapid Transit (BART) system;
- The segments for the San Francisco/Oakland Bay Bridge;
- Tunnels for the Pacifica Devil's Slide Coastal Trail; and
- The Folsom Dam Auxiliary Spillway.

But one project forever changed me from a carpenter to an entrepreneur: Five Hundred Capitol Mall (also known as Bank of the West Tower) in Sacramento, CA. On that project, a guardrail post became dislodged during a tightening adjustment, and the bottom half of the unit fell more than 17 floors. I had witnessed many accidents in the construction industry



Guardrail posts with fixed D-rings for lanyard tie-off can be anchored using: (a) the SAPS Spider Anchor; or (b) the SAPS Dualie Anchor (green), which also provides an overhead tie-off point for the level below (Note: 1 in. = 25 mm)

Products & Practice *Spotlight*



Each guardrail post provides a D-ring tie-off and brackets that clamp dimension lumber railing in place

before, but this time, I refused to accept that such failures were unavoidable. I developed a surface-mounted guardrail system with a positive, threaded anchorage system and a dedicated D-ring for a tie-off point. In 2014, my work was recognized when I was awarded U.S. Patent No. 8,656,652 for the Safety Anchor Post System (SAPS).

How does SAPS work?

Guardrails and the supporting posts must be designed to meet Section 1910.29 of the Occupational Safety and Health Administration (OSHA) standards, and fall arrest systems must be designed to meet Section 1910.15 of the OSHA standards. While guardrail posts are required to resist 200 lb (890 N) loads, anchorages for fall arrest systems (fixed D-rings for lanyard tie-off) are required to resist at least 5000 lb (22.24 kN) per worker attached. Of course, to be effective, any protection system also must be user friendly and ergonomic.

To achieve the tall order of meeting the requirements of both OSHA sections as well as being simple to use, my guardrail post system had to be:

- Anchored within the concrete slab;
- Rapidly installed and removed; and
- Reusable.



Because the SAPS guardrail system can be mounted inboard of the perimeter shoring towers, workers need to set the guardrails only once, prior to releasing and flying the exterior forms and towers to the next level. Workers outboard of the SAPS system have ready access to secure and regularly spaced tie-off points

The solution—use an embedded threaded anchor and an engineered guardrail post with an integral threaded anchor rod. I designed a system with anchors sized to fit slabs ranging from 6 to 24 in. (152 to 610 mm) in thickness. By using an embedded anchor, the SAPS system protects reinforcing bars and post-tensioning tendons from damage that might occur if anchors were installed in drilled holes instead.

To meet the OSHA requirements, SAPS anchors must be installed no closer than 1 ft (0.3 m) from the slab edge and spaced at no more than 8 ft (2.4 m) on center. Once the anchors are secured to the formwork, post-tensioning tendons, reinforcing bars, and concrete can be placed. The SAPS anchors are ready for use after the concrete reaches a compressive strength of 2500 psi (17 MPa). The workers simply remove the antenna plug and thread the SAPS coil rod into the embedded anchor. A SAPS post can be installed in under 30 seconds, without the need for a single tool.

Vision

My vision for the SAPS is to meet and exceed our clients' needs with an engineered system designed with our core

principles of People, Profit, and Planet. We recognize that People are the most valuable assets to a company, that Profit is why the business exists, and that our guardrails help to protect the Planet because they are removable and recyclable. Today, I am privileged to visit many projects and see firsthand how the SAPS is revolutionizing safety for my clients. The end user is my priority, and I am proud to say that my system is making life simpler and safer for the workers that install and rely on it for fall protection.

Latest Developments

At World of Concrete 2018, we introduced the Dualie Anchor, a dual-port anchoring system that provides overhead tie-off points as well as anchorage for guardrail posts. The Dualie Anchor is engineered for horizontal or vertical use. Anchors are available for slab thicknesses ranging from 6.5 to 24 in. (165 to 610 mm).

An installation video is available at the Safety Anchor Post System website.

Selected for reader interest by the editors.

—Safety Anchor Post System
www.safetyanchorpost.com



Jose M. (Manny) Carrillo is the CEO of Safety Anchor Post System. He has over 33 years of experience in the construction industry. His formal construction career began as a carpenter apprentice in Southern California, where he quickly became fascinated with concrete forms and mega structures. He served as member of the Executive Board of the Northern California Carpenters Regional Council for 8 years.

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