

November 2008

AFI SPOTLIGHT ON SAFETY



EDGE PROTECTION SYSTEM

System Highlights

- ◆ 100% New system designed to eliminate the weakness of competing systems.
- ◆ Allows **5 full levels** of enclosure, more than any other system available.
- ◆ Enhanced protection from wind, rain, snow, and heat loss during winter months.
- ◆ Basic system easily adaptable to even the most challenging structural frames.



Advantages Over Other Systems

- ◆ Provides full enclosure, even during afternoon framing of new deck on 3 day cycle.
- ◆ Polycarbonate light panels allow natural light at each protected level.
- ◆ Enclosure system is made of all steel, no dimension lumber like other systems.
- ◆ Offers one to two full levels of enclosure more than closest competitors.
- ◆ Compact system protrudes out from structure significantly less than others.

Adjustable Forms has teamed up with EFCO to create an entirely new edge protection system. The system is utilized on Bovis Lend Lease's One Museum Park West, Walton on The Park, and 505 N. State. When charged by Bovis to develop a perimeter enclosure system, Adjustable opted to think outside the box. Not satisfied with current systems on the market, Adjustable set out to create a safety system that has the versatility to be utilized on almost any structural frame, while improving upon weaknesses shown in other systems. Some of these weaknesses include:

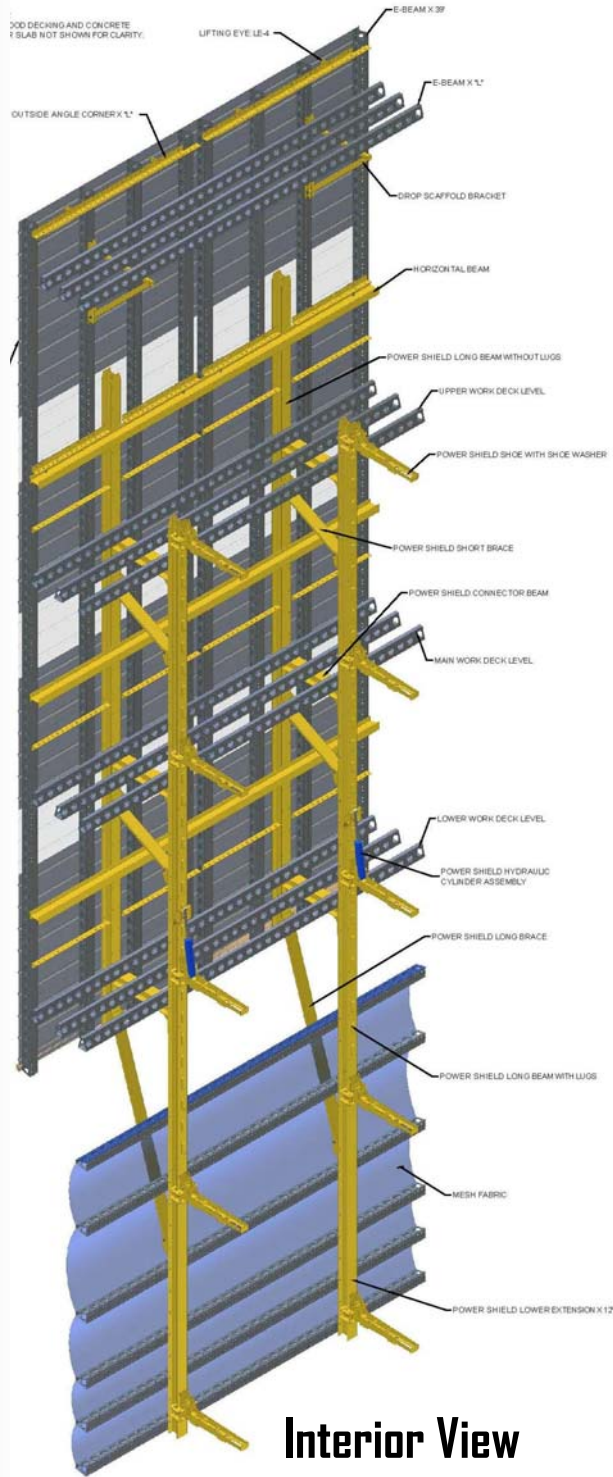
- ◆ Inability to accommodate post tensioned structural frame due to limitations in enclosure systems.
- ◆ No protection for the working deck during 3 day pour cycles.
- ◆ Elimination of all natural light of enclosed levels.
- ◆ Overall lack of quality and engineering in system details.

With months of planning, continued support from Bovis, and plenty of feedback, we have developed the ideal solution for our perimeter edge protection system. The EFCO Powershield® is a safe, efficient, and reliable system that will provide benefits far beyond keeping workers safe. The implementation and success of the system could not be possible without a substantial investment in project safety from all parties involved. The result is an innovative approach that has created the safest and most efficient working environment possible. Adjustable is excited to be partnered with EFCO in the design and engineering, and Bovis in the implementation of the safety system, and is confident it will meet and exceed highest safety expectations.

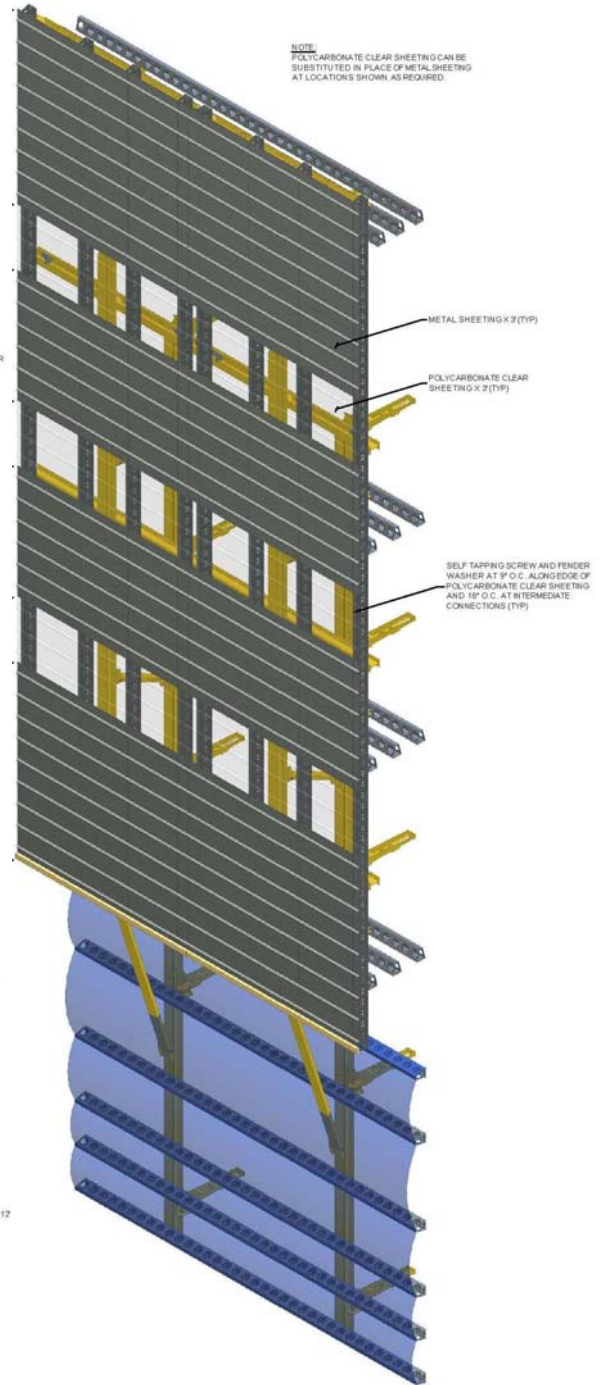
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Exterior View

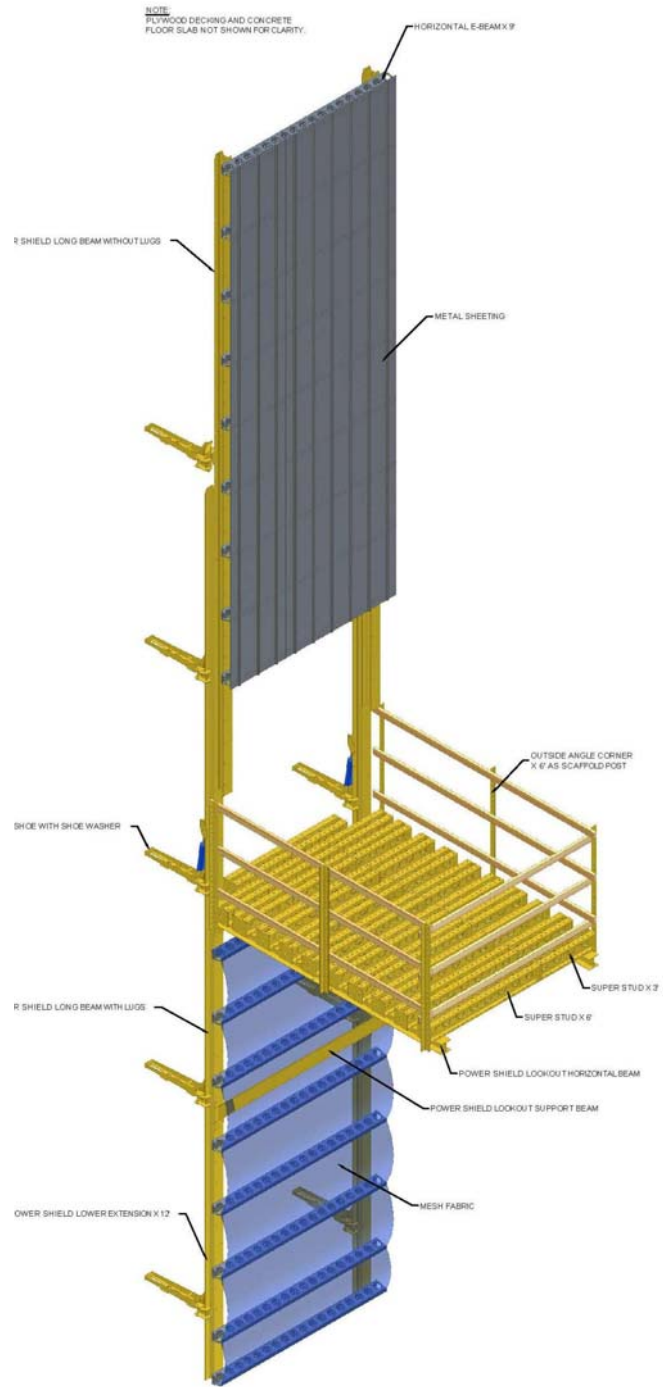


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EPS Look-out Platform Exterior View



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SYSTEM BENEFITS



Post-tensioned frames can easily be accommodated with the offset work platforms and vertical cantilever (plywood decking not shown on work platform).



Polycarbonate light panels offer a 36" ribbon of natural light around the structure.



Heavy-duty all steel construction ensures performance and reliability in the field. All panels assembled off-site to minimize impact on schedule and other trades.

Post Tensioned Frames

One of the main disadvantages of the current systems available is the lack the ability to handle a post-tensioned frame. Adjustable has helped design the EFCO system to ensure the working platforms at each level provide sufficient space for stressing operations to occur, without obstruction. The EFCO Powershield Edge Protection System features a cantilevered upper sheeting assembly that allows 100% perimeter enclosure during all phases of the structural frame cycle.

100% Perimeter Protection At All Times

Adjustable Forms was not content with allowing workers on working deck to be exposed to perimeter falls during any phase of the pour cycle. This innovative system provides 5 full levels of protection, including a 60" perimeter above deck framing even on 3 day cycles. At no point in the cycle are workers, materials, or equipment susceptible to perimeter fall hazards.

Natural Light

Another benefit to Adjustable / EFCO's Powershield system is the ability to provide 5 full levels of protection, while maintaining abundant natural light. At the top of each of the top three levels of protection, high strength polycarbonate panels are installed. Without these panels, lower levels become so dark that both safety and productivity is compromised. Construction productivity, particularly during winter months with fewer hours of daylight, will benefit substantially with this system.

Quality and Engineering

With so many pieces and parts involved with edge protection system, it is easy to overlook small but nevertheless important details. Adjustable and EFCO spent months planning and designing the system to improve current system strengths, and eliminate their weaknesses.

The individual parts that make up the EFCO Powershield are much more substantial than other systems. EFCO uses a more significantly rigid combination of structural steel beams and its aluminum E-Beam for sheeting support. The result is a product that not only offers better performance, but is more aesthetically pleasing. The system can be customized to fit almost any floor plate with only slight modifications.

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SYSTEM BENEFITS



Edge of slab to lifting beam distance substantially reduced (Note: Shoe and lifting beam assembly shown during installation without exterior panel.)

Minimized Slab Edge to EPS Gap

Adjustable spent time ensuring the gap between the work platforms and slab edge is kept to an absolute minimum. The gap on Adjustable's system is substantially reduced to minimize kick hazards, susceptibility of falls, and overall protrusion of the system outside the building. Vertical lifting beams closely hug the slab edge, and cantilevered work platforms easily accommodate post-tensioning tendons protruding from the slab edges.

Utilizing its own shoring and decking rather than a proprietary "panel" decking system allows Adjustable to bring the supported deck much closer to the exterior enclosure system. By using a proprietary panelized decking system, the gap between working platforms and the primary deck is often large enough to pose a significant hazard to workers. Our system of formwork and work platforms are never limited to specific dimensions, offering unparalleled flexibility and improved safety over more limited safety systems.

Tight Seals and Protection

Protection from the elements, particularly wind, will be greatly enhanced with the EPS system. Adjustable went to great lengths to ensure that not only is each panel completely weatherproof, but also the seals between adjacent panels. Heavy duty rubber gaskets allow a tight seal and minimize gaps.

Eliminate Storm Damage and Falling Debris

Weather days due to high winds have become especially prominent in the Museum Park and Central Station developments in Chicago. The system will reduce, and even eliminate the risks of construction materials coming off the building due to storms and high winds.

Increased Productivity and Access

Worker productivity benefits greatly from the inherent feeling safety that comes with full enclosure, even at the uppermost levels. Access between the working deck and lower levels is greatly improved with versatile stair tower lookouts, capable of supporting 5 full levels of enclosed stairs. Easier vertical access between levels substantially reduce down time waiting for the hoist, particularly in structures without stairs caught up to the working deck.

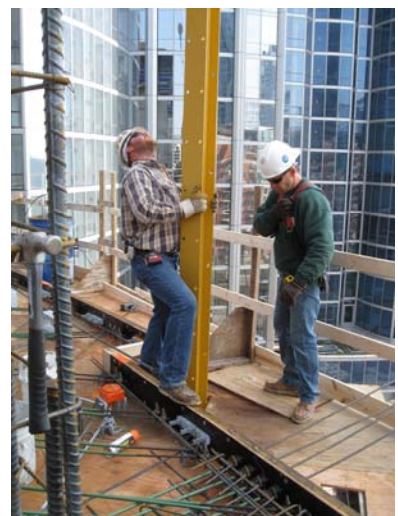


Above: Steel framing provides a solid and secure work platform.

Below: Vertical lifting beams and support structure is kept close to slab edge, minimizing gaps and fall hazards between the enclosure system.



Heavy duty 1/4" double rubber gaskets seal adjacent panels while reducing panel to panel binding common when raising other systems.



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1.) EPS being assembled off-site in Adjustable Forms' yard. The same basic system can be adapted for use on multiple projects and applications.



2.) When assembly is complete, modularized pieces are shipped to jobsite for installation.



3.) EPS components hoisted onto jobsite and prepared for installation. Left: Exterior panel sections flown up to working deck. Right: Working platforms being prepared for installation.



4.) Shoes are installed and bolted to anchor or sleeve cast into slab edge. Right: Custom shoe extensions allow system to adapt to irregular floor plates that change in profile.



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5.) Left: Lifting beams and work platforms are hoisted and set into shoes. Right: Lower trailing platform screens secured to lifting beams.



6.) Left: Exterior panels attached to lifting beams, completing the assembly and enclosing 5 full levels. Right: interior view of full assembly (without plywood decking installed). Note abundance of space for PT tails protruding from slab edge.



7.) System can be easily phased into any cycle, including 3-day, with no lost time or schedule impact.



8.) Once panels are secured, system rises using hydraulic rams, requiring no crane time for cycling during construction and no impact on other activities requiring crane time.



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System shown on the north side of One Museum Park West project in Chicago, IL. Note the 5 full levels of protection. At no point in the cycle are workers exposed to the perimeter, including shoring and decking the afternoon of the deck pour. EPS system phased into project while maintaining a 3 day cycle. No additional time added to schedule to install EPS.



View from inside the working deck. The EPS system was custom designed to fit irregular slab edge. Picture shows day 2 of 3 day cycle. When slab is cast on the morning of day 3, that same afternoon workers will begin framing on cast slab for the next level. The cantilevered vertical protection supports allow 100% enclosure for workers during framing operations, secure tie off points, minimal wind exposure, and increased productivity from feeling of safety.



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The view from the working deck shows complete perimeter protection. Note the working platforms at the above level, engineered to be flush with the next slab level. This allows safe construction of the next level during rapid cycles, without having to wait for safety to play catch-up. The EPS offers a safe tie-off point during decking operations. Polycarbonate light panels offer additional light, especially beneficial at lower levels during stripping and reshoring operations.



Material lookouts shown with adjacent panels completely installed at 505 N. State St. project in Chicago, IL. Note the full protection above and below the lookout platform.



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Even irregular floor plates that change shape from one level to the next can be accommodated with EPS. Note the eyebrow slab extension on the level below the lower EPS level. This situation was easily handled with custom shoes that can handle the slab profile as it changes throughout the structure.



When EPS system is in place, workers benefit from increased feeling of safety. Full enclosure reduces sensation of height and allows for increased productivity.

