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## Pepper Construction Unveils Net Zero Construction Jobsite Trailer

**Chicago, IL – November 6, 2018** Pepper Construction today announced they will unveil a Net Zero Jobsite Trailer at Greenbuild on November 14<sup>th</sup> in Chicago. The move is part of a larger initiative to positively affect the communities the company serves. Pepper believes that high-performing buildings are the future of the construction industry. By integrating their high-performance expertise into the company's operational process and raising awareness about the significant benefits high performance construction brings, Pepper is transforming the future.

The Net Zero trailer is efficient from every perspective, leveraging technology to manage a project paperlessly while providing a healthy and high performing environment for occupants. The idea originated with Susan Heinking, Pepper's Vice President of High Performance and Sustainable Construction and a LEED Fellow.

"Most people spend about 90% of their time indoors, and that environment has a significant impact on our health," says Heinking. "That philosophy also applies to the men and women working on our jobsites. We want our trailer to match our values. From air quality to basic human comforts and energy consumption, we found that existing jobsite trailers didn't match our commitment to the environment or our staff. We redesigned it to focus on the human experience, productivity and quality from every aspect."

Inside the trailer is a gathering room that hosts up to 14 people and hoteling space for visitors. Furnished with Red List Free furniture and materials, the modern design is flexible and collaborative. Daylight streams into the space, eliminating the need for candescent lighting. Reclaimed wood cabinets illustrate the team's solid understanding of where materials are sourced from while bamboo flooring is a durable alternative to the typical vinyl flooring options. Thoughtful details such as locker storage and flexible work space complete with folding meeting space furniture transform previously utilitarian conditions into a modern, functional and healthy work space.

Essentially a tiny building, Pepper's Net Zero Trailer works holistically as one system to reduce the demand for energy. The average jobsite construction trailer emits 53,712 pounds of CO2 emissions into the air each year through its energy use. That means that each year, a jobsite's carbon footprint equates to the energy of four residential homes. Pepper's Net Zero trailer uses 100% less energy than a traditional trailer through thoughtful design.

The trailer is clad in cement fiber panels which reduce heat absorption. To further increase energy efficiency and eliminate temperature swings, the envelope features a thermal barrier from 6" of rigid insulation, doubling the R-values for the walls, floor and roof, which now range from R-30 to R-40. Atop the structure, 27 photovoltaic panels convert just 4 hours of sunlight into the needed electricity to power the trailer for a full work day.

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Additional features include:

- On the roof are 27 commercial solar panels. Each panel produces 327 Watts. The panel configuration is 3 strings of 9 panels each. The panels produce 37 kWh of energy with access to only four hours of daylight. This equates to exceeding the daily demand of the trailer which is 36.kWh, making the trailer net positive. The system also weighs about 3 pounds per square foot totaling around 2,000 pounds.
- Functional workspaces that respond to new technology as well as the daily needs of the project team. Stand-up desks improve health and fold-up furniture allows the team to reconfigure the space for various meetings. When the trailer goes to a new jobsite, furniture can easily accommodate new preferences with writable surfaces.
- Cladding attached with thermally isolated fasteners which diminishes the thermal performance of the exterior insulation by less than 5%. This dramatically reduces the losses or gains of heat inside the trailer compared to traditional Z-furring increasing thermal comfort dramatically
- Highly permeable wind and rain barrier that prevents the reduction of the R-value of the underlying insulation.
- Acoustical panels and sheetrock that are low VOC-emitting and GREENGUARD Gold Certified.
- An air conditioning system that runs on a working fluid called R-410A which does not emit any ozone depleting chemicals. It also operates at a higher pressure, creating cooler temperatures more effectively while operating more quietly.
- Low consumption lighting throughout offers a sensible approach. Inside, the trailer is illuminated by a wireless system with integrated occupancy and daylight sensors. The lights can be controlled via a mobile app to limit unnecessary consumption. It also allows us to reconfigure the space without rewiring in the future.
- Full-amenity kitchens enable our employees the opportunity to pursue healthier eating habits. The cabinets and credenza are made from reclaimed wood, so they are inherently Red List Free.
- Recycled, bio-formed felt above the conference room area provides sound absorption and incorporates biophilic design through its organic pattern.
- Double pane, low-Argon glass windows that are operable windows provide fresh air and are covered with transparent window shades for glare control.
- Energy Star appliances and water efficient fixtures.
- Walk off mats keep dust and debris outside, while green cleaning supplies limit harmful chemicals inside.

Pepper built the Net Zero trailer in the company's Barrington warehouse with locally-sourced materials. Like most buildings, the team began the process digitally, using 3D BIM models to develop the most efficient placement for MEP and data systems in the trailer and ensure quality enclosures. The team pushed the use of the Microsoft HoloLens to build the trailer without paper drawings. The design was also vetted through an energy model to ensure the trailer performs at peak levels.

Now in their fourth generation of family leadership, Pepper Construction Group serves clients across the country with comprehensive teams in Illinois, Indiana, Ohio and Wisconsin. Ranked by ENR magazine as one of the top builders of sustainable projects in the nation, Pepper serves clients in a variety of markets such as healthcare, education, manufacturing and light industrial, data centers, entertainment, hospitality and interiors, among others. Pepper's High Performance and Sustainable Construction group is part of their Integrated Construction Services (ICS) team, which represents some of the most advanced thought leadership in our industry — investigating new technologies, evaluating new methodologies and integrating innovative solutions in the field. Some of the firm's current high performance work includes the transformation of the Cincinnati Zoo & Botanical Garden into the world's first Net Zero zoo; the LEED Gold Certified Chicago Children's Theatre; the LEED Platinum Certified Sunset Ridge High School in Northfield, IL; and the LEED Gold Certified MILA apartment tower in downtown Chicago, IL. For more information, please visit [www.pepperconstruction.com](http://www.pepperconstruction.com).



## Pepper Construction Net Zero Construction Trailer

### Product Information Sheet

Pepper's Net Zero Jobsite Trailer is efficient from every perspective, leveraging technology to manage a project paperlessly while providing a healthy and high performing environment for occupants. We designed it to focus on the human experience, productivity and quality from every aspect.

From procurement to products to installation, we worked with some of the nation's leading thought leaders to develop and build this transformative space:

Pepper's Self Perform Group built the Net Zero trailers in the company's Barrington warehouse with locally-sourced materials. Like most buildings, the team began the process digitally, using 3D BIM models to develop the most efficient placement for MEP and data systems in the trailer and ensure quality enclosures. The team also used the Microsoft HoloLens to build the structure without paper plans.

Pepper's longtime partner Mobile Office Systems has long provided mobile offices for the company. Moving forward, Pepper will work with Mobile Office Systems and other manufacturers to make the Net Zero trailer a reality on our jobsites.

Pepper worked with Kelso Burnett and Ballard Engineering to design and install the 27 photovoltaic panels that convert sunlight into the needed electricity to power all the energy the trailer demands. The 27 SunPower® E-Series Commercial Solar Panels sit atop the roof. Each panel produces 327 Watts. The panel configuration is 3 strings of 9 panels each. The panels produce 37 kWh of energy with access to only four hours of daylight. This equates to exceeding the daily demand of the trailer which is 36.kWh, making the trailer net positive. The system also weighs about 3 pounds per square foot totaling around 2,000 pounds.

To support that weight, Pepper worked with Olsson Roofing and Metal Edge to select the right roof system. The solution is a Firestone PS TPO with is VOC-free and also addresses the trailer's need to travel across roadways to the jobsite. Perimeter sheet metal connects the roof to the siding, while OMG attachments provide a watertight detail so the solar panels could be installed without damaging the roof system.

To ensure thermal comfort of the occupants, we partnered with EcoSpec to select the most effective exterior façade system components. The exterior walls are clad with a fiber cement panel façade, which reduce heat absorption. To attach the fiber cement panel façade over 2 inches of continuous exterior rigid foam insulation, we chose Knight Wall's HCI™ System which came with several benefits. By using only thermally isolated fasteners to penetrate the insulation we diminish the thermal performance of the exterior insulation by less than 5%. This dramatically reduces the losses or gains of heat inside the trailer compared to traditional Z-furring, increasing thermal comfort dramatically.

Behind the open joint cladding, you'll find a highly permeable, UV stable, water-resistive barrier by Dörken Systems called DELTA®-FASSADE S. EcoSpec recommended this barrier for several reasons. First, it protects the substructure from wind and rain while the matte black finish complements the 3-dimensional aesthetic of the façade. At the same time, it prevents wind washing from reducing the R-value of the underlying insulation. It's UV stable and very moisture vapor permeable, assuring the long-term sustainability and beauty of the wall system.

Pepper turned to 365 Equipment and Supply to provide wood framing lumber, bits, blades, fasteners and safety supplies for the trailer at the lowest possible price. They also provided the labor and transport from local vendors and distributors, providing just in time deliveries.

The main ceilings are paneled with USG ASTRO Acoustical panels. In addition to being GREENGUARD Gold for low-emitting performance and 50% recycled content – these panels contain a broad-spectrum antimicrobial additive that resists mold and mildew, while not sagging over time.

For the walls, the team chose USG Sheetrock's Ultralight Panels which are low VOC-emitting and GREENGUARD Gold Certified. The noncombustible core is also encased in 100% recycled papers.

Behind the restroom walls you'll find USG's Mold Tough Ultralight Panels – the first lightweight moisture and mold-resistant panels available. The core is encased in 100% recycled paper and are an ideal fit for the jobsite.

To keep the air inside the trailer at comfortable levels, we worked with The Hill Group to install a Daikin Applied 3 ton unit. The multi-zone system has occupancy sensors to deliver comfortable, clean air to the trailer on demand. The 4-part air conditioning system runs on a working fluid called R-410A which benefits both the environment and the trailer occupants. The fluid for the three evaporative units and one condensing unit does not emit any ozone depleting chemicals, it is non-flammable and it is non-corrosive. Because the condensating unit is gravity-fed, the need for pumps is eliminated. It also operates at a higher pressure, creating cooler temperatures more effectively and operating more quietly.

Force Partners, a Lighting + Controls Agency, assisted the Pepper team in developing the lighting and controls strategy for the Green Trailer. We were looking for a lighting solution that would meet our energy efficiency, controls, and aesthetic requirements.

The outside of the trailer features LED lighting fixtures by Modern Forms. These efficient, long-lasting Ledge sconces provide a modern and sleek aesthetic to the façade while consuming just 19.5 watts. At 3000 Kelvin and 670 delivered lumens, the Ledge sconce provides warm light with enough output for team members to safely enter and exit the trailer.

Inside, the trailer is illuminated by Eaton Lighting & Controls WaveLinx system, which uses wireless integrated occupancy and daylight sensors to gather real-time building data, helping Pepper make informed decisions and save energy. The wireless system eliminates up to 60% of the required wire runs and 45 minutes of installation time per control zone. Light fixtures are dimmable and have built-in occupancy/vacancy control, providing significant cost-savings. This lighting solution also comes with a mobile app for ease of control and efficiency providing the ability to configure individual settings from a single platform.

For fire protection, we chose Oval Fire Products which are ADA and NFPA-101 Compliant Fire Extinguishers. This innovative extinguisher enables fully recessed fire extinguisher cabinets that sit flush into standard walls. When surface mounted, they protrude less than 4 inches for true ADA compliance. If the mounted extinguisher is bumped, a swivel mounting hook lets it easily move out of the way without being damaged or dislodged from the wall.

Full-amenity kitchens enable our employees the opportunity to pursue healthier eating habits. The cabinets and credenza are made from reclaimed wood, so they are inherently Red List Free. Not only do they provide healthier air quality for the team – they are prefabricated based on precise measurements taken days before installation, eliminating waste and rework.

Overhead, recycled, bio-formed TURF felt is shaped over the conference room area, providing superior sound absorption and incorporating biophilic design through its organic pattern.

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