

Researchers transform machine to make runways safer

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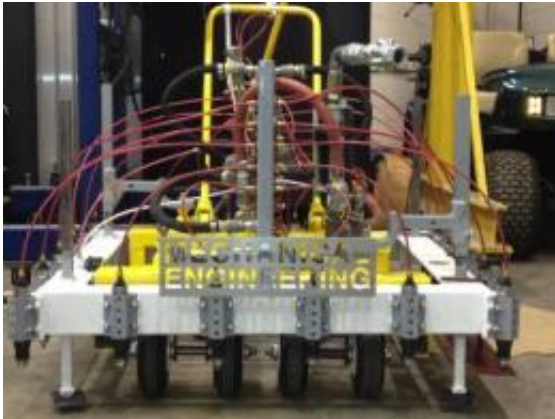
Clemson student researchers reassemble the mobile drill press. Credit: Gregory Mocko

Clemson researchers redesigned and modified a mobile drill press to retrofit a section of a runway that halts overrun aircraft, ultimately minimizing aircraft damage and passenger injury.

The process of retrofitting the end of a runway at Greenville Downtown Airport required more than 80,000 holes to be drilled in the concrete. Pace Pavement Technologies Inc. recognized that manually drilling the holes was not an option and there needed to be a more efficient and accurate way to drill.

"We visited several machine shops and pneumatic suppliers and received

minimal assistance in the design and build of a mobile drill press," said Carl Pace, president of Pace Pavement Technologies Inc. "Clemson University stepped up to the challenge and enjoyed taking on this project."



Clemson student researchers redesigned and fabricated this mobile drill press. Credit: Gregory Mocko

Seven Clemson University student researchers and their faculty adviser met with representatives from Pace Pavement Technologies Inc. to discuss the design problems and challenges related to their mobile drill press.

"We needed to reduce the weight of the machine by half so as to not cause any damage to the [pavement](#) underneath," Pace said.

The students began by redesigning the undercarriage and modifying the [wheels](#) to evenly spread the weight of the machine and reduce ground pressure.



This is the engineered materials arrestor system at the end of the runway at Greenville Downtown Airport. Credit: Gregory Mocko

"Clemson University student researchers truly went above and beyond their call of duty by not only reducing the ground pressure of the mobile drill press, but also improving the machine's overall performance and [maneuverability](#)," said Gregory Mocko, an assistant professor in Clemson's mechanical engineering department.

The students improved the overall performance of the machine by altering the [plumbing](#), developing a gauge to adjust each drill simultaneously and adding a device that allows the operator to better control drill depth. They also published an operations and parts manual.

"I was overjoyed to have young minds really focused on this project," said Pace. "They gave this project the attention that it deserved and I truly hope we have the opportunity to work with Clemson again."

Provided by Clemson University

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