

SUPR KIT

ADR SHOP-IN-A-BOX

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The new Sustainment Pavement Repair (SuPR) Kit gives civil engineers a superior capability for contingency repair and sustainment. It is scheduled to be shipped to the field starting in early 2013.

Background

Created as part of the Air Force's Airfield Damage Repair (ADR) Modernization Program, the SuPR Kit is designed to provide everything needed to make fast and durable concrete and asphalt repairs on an airfield in the AOR. It was developed by experts at AFCESA and the Air Force Research Laboratory (AFRL) at Tyndall AFB, Fla., and at the U.S. Army's Engineer Research and Development Center (ERDC) in Vicksburg, Miss., with a great deal of input and help from the Airmen who will actually use the kit in the field.

The SuPR Kit project is the culmination of research that began in 2005. This research effort was initiated by the AFCENT commander to determine why airfield repairs were failing prematurely. AFCESA was also tasked to develop and identify products, equipment, and procedures for field engineers to make fast but durable repairs, working around aircraft missions in high ops tempo environments. What was needed were materials that could gain strength rapidly but were less sensitive to the mixing proportions, as well as equipment that was small, air-transportable, and multipurpose, yet powerful enough to do the job properly and quickly. Also needed were tactics, techniques, and procedures that integrate these materials and equipment to produce long-lasting repairs within operational time frames on airfields.

SuPR Kit Components

The SuPR Kit is a comprehensive package of more than 350 individual items — materials and equipment — that all fit together into four 20-foot Conex containers.

One of the Conex boxes is devoted to consumable materials, including some unique materials acquired and tested by AFRL to improve the speed and durability of repairs. Working with a private vendor, AFRL developed a unique pelletized asphalt material that affords the ability to pack-

age, store, and transport airfield-quality asphalt concrete material for making hot mix asphalt easily. Couple this material with the kit's specialized equipment and in approximately four minutes a team can produce hot-mix asphalt that can be placed and compacted in repairs on the airfield. A rapid-setting flowable fill, developed by ERDC, allows rapid repair of base and sub-grade base materials without the need for compaction of many lifts or in tight locations. A solid, stable base for placing pavements, including asphalt, can be created in a very short period of time. Typically, one can compact hot mix asphalt on the rapid-setting flowable fill within 30 minutes after placement. The kit also includes a rapid-setting concrete material that provides a durable cap or spall repair capable of high early-bond strength to existing pavement and supports aircraft traffic within two hours after placement. Other consumables include dowels, joint sealant, geo-fabric,



Pavements and Equipment CEs perform a variety of spall and full-depth concrete and asphalt repairs, testing equipment, tools, and materials included in the SuPR Kit. (photo by Mr. Eddie Green)

and cold-patch asphalt in enough quantities for a team to get started once they hit the ground.

The other three Conex boxes contain equipment, tools, and maintenance supplies. The “workhorse” of the equipment is an 80-horsepower compact tracked loader with multiple attachments, including a breaker hammer, an angle broom, a cold planer for asphalt and concrete, and a miniature hot-mix asphalt batch heater/mixer. The kit also includes a variety of saws, hand tools, a rotary concrete mixer, an EZ Drill concrete dowel bar drill, and a compact dual steel wheel vibratory roller.

SuPR Kit Concepts

The SuPR Kit is basically an airfield repair “shop in a box” that gives civil engineers the ability to perform high-quality repairs and return an airfield to service within three hours (versus days) while supporting a high aircraft sortie rate. It focuses on sustainment but may be used for spall repair during any phase of airfield operations.

The kit will allow engineers in the field to get away from “repairing the repairs” and to place high-quality durable repairs with minimal impact on flight operations. More efficient repair techniques reduce the required manpower and, because most of the kit’s items are widely used in the field, training will be easier and more efficient. Plans are for the SuPR kits to be treated as war readiness material, or WRM, assets.

Training materials are currently being prepared. A computer-based training course will be supplemented with Silver Flag training and updates to training at Fort Leonard Wood, Mo., at regional equipment operator training sites, and at the Expeditionary Combat Support Training Certification Center, Dobbins ARB, Ga. A mobile training team is expected to provide initial training at forward deployed locations.



A Pavements and Equipment Airman waits to take a temperature reading of pelletized asphalt being heated in the compact tracked loader’s burner attachment. The SuPR Kit gives CEs the capability to produce airfield quality hot-mix asphalt within four minutes. (photo by Mr. Eddie Green)

The Troops Talk

In January 2012, Pavements and Equipment CEs from three installations gathered at the Engineer Research and Development Center in Vicksburg, Miss., to put the SuPR Kit to the test. Here’s what they said:

“I think the kits will be beneficial for those first in. When you hit the ground in an AOR, sometimes you don’t have the tools that you need. When we landed in Bagram in 2002, we were following a RED HORSE team who had minimal pieces of equipment. We had to send a guy to another base with a shopping list of the items we needed.”

“If kits like these had been there already, we would not have had to waste time and money and man-hours. The kits will be a life-saver. When you go in, you can get right to work and focus on the mission.”

MSgt Tellas Johnson
633 CES, JB Langley-Eustis, Va.

“When we opened the first Conex box, it was a Dirt Boyz’ dream — all new equipment including a skid-steer loader with brand new attachments.”

“The team that put this kit together was thorough in their design and planning. They’ve even thought of the little things you need for maintenance, like air filters and oil filters. They’ve put in all the extension cords and all the different generator sizes that you’ll need to switch through. We have everything we need to take off and go.”

TSgt Jason Collins
4 CES, Seymour Johnson AFB, N.C.

Final Testing and Delivery

During final field testing at Vicksburg, Miss., in January 2012, minor adjustments were made to the final kit configuration. ERDC is working with the Defense Logistics Agency to procure the kits while AFCESA is finalizing the UTCs and the training packages. Throughout the development process, experts with recent field experience from different military units from around the Air Force helped to refine the kit. The Pavements and Equipment Airmen who have tested the kit are impressed by the design planning and detail involved. The feedback is that it is a comprehensive tool kit that every Air Force civil engineer tasked with performing pavement maintenance would love to have, with items they deem valuable and necessary, especially during deployments.

Shipping of the SuPR Kit is scheduled to start in early 2013, with all kits delivered by the end of FY14. AFCESA, in conjunction with AFRL and ERDC, continues to refine the capabilities of this system with a focus on improving the ability to use locally procured materials and reducing the need for the transport of large quantities of specialized materials.

Dr. Rutland is the Pavements Subject Matter Expert, AFCESA, Tyndall AFB, Fla.

Watch the video about SuPR Kit at <http://youtu.be/Zuv3Gd0TutY>

*Read about the history of ADR in this issue's **Proud Heritage** article, page 28.*



TSgt Jason Collins, 4 CES, Seymour Johnson AFB, N.C., uses the SuPR Kit's vibratory asphalt roller to compact a repaired section of asphalt. (photo by Mr. Eddie Green)

Pavements and Equipment CEs extract needed equipment from one of the SuPR Kit's four 20-foot Conex containers. Over the course of one week, CEs performed a series of concrete and asphalt repairs, evaluating the kit's design, configuration, and equipment selection to provide valuable feedback to the development team. (photo by Mr. Eddie Green)





“Dirt Boyz” remove containers of consumables from the SuPR Kit’s fourth Conex container. The Kit includes a supply of materials like rapid-setting concrete and dowels, as well as cold-patch asphalt components like pelletized asphalt and a rapid-setting flowable fill. (photo by Mr. Eddie Green)

ADR modernization will improve our ability to function during all phases of airfield operations, including Open, Establish, Expand, Maintain, Sustain, and Recover. AFCESA is developing and testing new materials, equipment, and procedures to accomplish required tasks in logistically constrained environments, and then making them operational by publishing criteria, specifications, and guidance; creating and updating training materials and courses; and developing new equipment and materials in specialized packages, kits or UTCs. These include:

- ! **Rubber Removal and Paint Striping Kit** – C-130 transportable capability for rubber removal using either detergents or ultra-high pressure water and paint striping in remote locations
- ! **Aircraft Tie Down Augmentation Kit** – Equipment and materials to test existing tie-downs or mooring points as well as install new tie downs with little impact to the airfield or operations
- ! **Aircraft Expedient Trim Pad Anchor Kit** – Equipment and materials to install an engine run-up anchor in remote locations (currently available)
- ! **Semi-Prepared Runway Operations Sustainment Kit** – Equipment and materials to perform maintenance and minor repair of semi-prepared (dirt) airfields to sustain air operations
- ! **Asphalt Sustainment Augmentation Kit** – C-130 transportable infrared heating and mixing equipment and materials to allow the reuse of cracked and oxidized asphalt in repair, thus reducing the need for new materials
- ! **Precast Slab Repair Augmentation Kit** – C-130 transportable equipment that, with the SuPR Kit, allows engineers to perform major repairs, including complete and multiple slab replacements on airfields in a few hours
- ! **Airfield Recovery** – Scalable equipment and material set that enables a squadron to repair and return an airfield with hundreds of craters back to operations within a few hours
- ! **MARES Kit** – Update of equipment, materials, and procedures in the MARES kits to improve the ability to open the base