

Training and Evaluation Outline Report

Status: Approved

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Task Number: 05-PLT-5141

Task Title: Perform Runway/Taxiway Crater Repair

Distribution Restriction: Approved for public release; distribution is unlimited.

Destruction Notice: None

Foreign Disclosure: FD1 - This training product has been reviewed by the training developers in coordination with the Fort Leonard Wood, MSCoE foreign disclosure officer. This training product can be used to instruct international military students from all approved countries without restrictions.

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	ATP 5-19 (Change 001 09/08/2014 78 Pages)	RISK MANAGEMENT http://armypubs.army.mil/doctrine/DR_pubs/dr_a/pdf/atp5_19.pdf	Yes	No
	FM 5-430-00-1	Planning and Design of Roads, Airfields, and Heliports in the Theater of Operations - Road Design	Yes	No
	TC 5-340	Air Base Damage Repair (Pavement Repair).	Yes	No
	UFC 3-270-07	Unified Facilities Criteria (UFC) O&M: Airfield Damage Repair	Yes	Yes

Conditions: The element is directed to perform runway/taxiway crater repairs. The element is currently conducting operations in support of higher headquarters (HQ). The higher HQ operation order (OPORD), construction directive, plans, specifications, and standard operating procedures (SOP) are available. Higher HQ analysis of the area of operations (AO) is available. All necessary personnel and equipment are available and fully mission capable (FMC). The element must perform the task within the time indicated in the construction directive or OPORD. All unexploded ordnance (UXO) has been cleared. Coalition partners, noncombatants, and media may be present in the operational environment. All environment conditions must be considered while conducting the task. The unit is not likely to be attacked.

Note: The Commander must still determine at what level of training they would want the element to perform. Crawl, walk or run. This can only be determined after consideration as to the units training level.

The Commander prior to evaluating an element in the conduct of the task must determine if it will be conducted in a Live, Virtual, or Constructive environment, additionally it must also be determined which condition as described below that the element will conduct the task. The selection made for this task is at a trained level of proficiency. The commander must determine which of the environments below will best suit the unit and the proficiency level at which the unit is. When conducting crawl or walk level training units should not increase the intensity until the unit has achieved the standards and then unit trainers should include variables that increase proficiency in all conditions.

Note: The condition statement for this task is written assuming the highest training conditions reflected on the Task Proficiency matrix required for the evaluated unit to receive a "fully trained" (T) rating.

Note: Condition terms definitions:

Dynamic Operational Environment: Three or more operational and two or more mission variables change during the execution of the assessed task. Operational variables and threat Tactics, Techniques, and Procedures (TTPs) for assigned counter-tasks change in response to the execution of Blue Forces (BLUFOR) tasks.

Complex Operational Environment: Changes to four or more operational variables impact the chosen friendly COA/mission. Brigade and higher units require all eight operational variables of Political, Military, Economic, Social, Infrastructure, Information, Physical environment, and Time (PMESII-PT) to be replicated in varying degrees based on the task being trained.

Single threat: Regular, irregular, criminal or terrorist forces are present.

Hybrid threat: Diverse and dynamic combination of regular forces, irregular forces, and/or criminal elements all unified to achieve mutually benefiting effects.

This task should not be trained in MOPP 4.

Standards: The element performs runway/taxiway crater repairs in accordance with specifications and requirements found in standard operating procedures and directives provided by higher headquarters or commander.

Note: Leaders are defined as the Commander, Executive Officer, First Sergeant, Operations Sergeant, Platoon Leaders, Platoon Sergeants, Squad Leaders, and Team Leaders.

Live Fire Required: No

Objective Task Evaluation Criteria Matrix:

Plan and Prepare		Execute					Assess	
Operational Environment	Training Environment (LW/C)	Training/Authorized % of Leaders Present at	% of Soldiers Present at	External Eval	% Performance Measures 'GO'	% Critical Performance Measures 'GO'	% Leader Performance Measures 'GO'	Task Assessment
SQD & PLT								
Dynamic (Single Threat)	Night	>=85%	>=80%	Yes	80-90%	All	80-89%	T
		75-84%						T-
Static (Single Threat)	Day	65-74%	75-79%	No	51-64%	<All	<=79%	P
		60-64%	60-74%					P-
		<=59%	<=59%					U

Remarks: None

Notes: This task covers emergency repairs of pavement surfaces. For permanent repairs, refer to doctrinal references covering: pavement design for airfields, standard practices for concrete pavements, and bituminous pavements standard practice for rigid and flexible pavements.

Safety Risk: Low

Task Statements

Cue: None

DANGER

Leaders have an inherent responsibility to conduct Risk Management to ensure the safety of all Soldiers and promote mission accomplishment.

WARNING

Risk management is the Army's primary decision-making process to identify hazards, reduce risk, and prevent both accidental and tactical loss. All Soldiers have the responsibility to learn and understand the risks associated with this task.

CAUTION

Identifying hazards and controlling risks across the full spectrum of Army functions, operations and activities is the responsibility of all Soldiers.

Performance Steps and Measures

NOTE: Assess task proficiency using the task evaluation criteria matrix.

NOTE: Asterisks (*) indicate leader steps; plus signs (+) indicate critical steps.

STEP/MEASURE	GO	NO-GO	N/A
+* 1. The element leader conducts troop-leading procedures.			
a. Conducts preliminary construction planning.			
b. Requests augmentation support if required.			
+* 2. The element leader conducts detailed project planning.			
a. Conducts a site visit if conditions allow.			
+ b. Selects equipment best suited for the mission.			
+ 3. The element establishes work site security.			
+ 4. The element conducts spall repairs.			
<p>Note: Numerous commercial-off-the-shelf (COTS) materials are available. Some of these materials have been tested and approved for DOD use while others have not. Before any material can be used on DOD airfields it must be certified for use. Contact the Engineering Research and Development Center, Geotechnical and Structures Laboratory, Airfields and Pavements Branch technical representative for the appropriate material and installation procedures for your particular application.</p>			
+ a. Locates the damage.			
+ b. Prepares the damaged area and mixes the repair material in accordance with the manufacturer's instructions. Adjust the preparation and mixing procedures in accordance with environmental conditions and experience.			
+ c. Places the material and levels as required.			
+ 5. The element conducts expedient/sustainment crater repair.			
+ a. Selects the best repair options considering:			
(1) Aircraft type and load.			
(2) Available material.			
(3) Available equipment.			
(4) Repair quality criteria (RQC).			
(5) Existing pavement structure.			
(6) Time criteria.			
(7) Repair crew capability.			
+ b. Performs crushed stone crater repair.			
<p>Note: There are three types of crushed stone crater repair options: debris backfill, choke ballast over debris, and choke ballast.</p>			
(1) Clears debris from around the crater.			
(2) Performs measurements and inspection to identify and mark upheaval.			
(3) Removes upheaved pavement.			
(4) Fills and compacts the crater with the crushed stone.			
<p>Note: Compaction is determined by the equipment available and type of aircraft using the airfield. Consult doctrinal references and the OPORD for specific guidance.</p>			
(5) Grades the compacted crushed stone.			
(6) Performs final compaction.			
(7) Performs profile measurement.			
+ c. Performs sand-grid crater repair.			
(1) Clears debris from around the crater.			
(2) Performs measurements and inspection to identify and mark upheaval.	N/A	N/A	N/A
(3) Removes upheaved pavement.			
(4) Squares the sides to vertical from the original pavement and removes debris in excess of 12 inches.			
(5) Removes standing water in crater if possible.			
(6) Removes existing reinforcing material.			
(7) Backfills the crater.			
(8) Compacts the fill material.			
(9) Lines the crater with an impervious membrane.			
(10) Places the first layer of sand-grid.			
(11) Backfills the sand-grid using cohesionless material if possible.			
(12) Compacts the first layer of material.			
<p>Note: After compaction, all excess material must be struck off level with the top of the sand-grid. This is critical to ensure a flush repair meeting the RQC.</p>			
(13) Places a membrane over the first layer of sand-grid.			
(14) Lays the second layer of sand-grid.			
(15) Backfills and overfills the sand-grid using a cohesionless material if possible.			
(16) Compacts this layer of backfill.			

(17) Grades off excess material.			
(18) Installs and anchors the fiberglass reinforced plastic (FRP).			
Note: The sand-grid repair must have a foreign object debris (FOD) cover installed to be operational.			
(a) Assembles the FRP mat.			
(b) Installs and tightens panel-connecting bolts.			
(c) Positions the assembled mat over the crater.			
(d) Secures the mat in accordance with material being anchored to.			
(19) Verifies that the repair does not exceed surface roughness criteria.			
+ d. Performs stone and grout repair (above freezing temperatures).			
Note: This type of repair is considered a sustainment airfield repair. It may be used as a replacement for both the crushed stone and sand-grid repairs when additional resources are available.			
(1) Clears debris from around the crater.			
(2) Performs measurements and inspection to identify and mark upheaval.			
(3) Removes upheaved pavement.			
(4) Squares the sides to vertical from the original pavement and removes debris in excess of 12 inches.			
(5) Removes standing water in crater if possible.			
(6) Removes existing reinforcing material.			
(7) Backfills the crater within specifications.			
(8) Fills and compacts the crater with the crushed stone.			
Note: Compaction is determined by the equipment available and type of aircraft using the airfield. Consult doctrinal references and the OPORD for specific guidance.			
(9) Places a layer of sand inside of crater's lip to prevent seepage of the grout.			
(10) Positions a layer of impervious membrane material over the entire crushed stone material.			
(11) Places an eight inch layer of grout material mixed in accordance with specifications.			
(12) Adds calcium chloride accelerator to the grout mix.			
(13) Places stone into the grout mix.			
(14) Uses a vibratory roller to percolate the grout up through the stone to the surface.			
(15) Continues adding mix of stone and grout until level with pavement surface.			
+ e. Performs stone and grout repair (below freezing temperatures).			
Note: Special consideration must be made when placing the stone and grout mixture in freezing temperatures. There are several methods that can be employed to help ensure successful mission accomplishment.			
Follow steps 1-11 for performing grout repair (above freezing temperatures).			
(1) Adds additional calcium chloride accelerator (up to as much as 3 percent by weight from the normal amount of 1 percent) to the solution of stone and grout to decrease set time.			
(2) Heats the aggregate; this can be done in a tent surrounding aggregate stockpiles.			
(3) Heats the water.			
Note: Do not uncover the subgrade until immediately before placement to allow heat to be retained.			
(4) Places an insulated blanket over the finished surface.			
+ f. Performs concrete repair.			
Note: This type of repair may be used as a replacement for both the crushed stone and sand-grid repairs when additional resources are available.			
(1) Clears debris from around the crater.			
(2) Performs measurements and inspection to identify and mark upheaval.			
(3) Removes upheaved pavement.			
(4) Squares the sides to vertical from the original pavement and removes debris in excess of 12 inches.			
(5) Removes standing water in crater if possible.			
(6) Removes existing reinforcing material.			
(7) Backfills the crater within specifications.			
Note: If settling problems are anticipated, a geomembrane fabric is recommended for use between dissimilar backfill and the next layer of material.			
(8) Places a layer of crushed stone over the backfill material.			
Note: Compaction is determined by the equipment available and type of aircraft using the airfield. Consult doctrinal references and the OPORD for specific guidance.			
(9) Fills the final 12 inches with concrete and levels to existing pavement surface.			
Note: For craters smaller than 30 feet in diameter, screeding can generally be performed by hand. When single craters or overlapping craters form a damaged area greater than 30 feet in diameter, a screed method using a concrete pedestal is recommended.			
+* 6. The element leader submits status reports to higher headquarters according to the unit standing operating procedure (SOP).			

TASK PERFORMANCE / EVALUATION SUMMARY BLOCK							
ITERATION	1	2	3	4	5	M	TOTAL
TOTAL PERFORMANCE MEASURES EVALUATED							
TOTAL PERFORMANCE MEASURES GO							
TRAINING STATUS GO/NO-GO							

ITERATION: 1 2 3 4 5 M

COMMANDER/LEADER ASSESSMENT: T P U

Mission(s) supported: None

MOPP 4: Never

MOPP 4 Statement: None

NVG: Never

NVG Statement: None

Prerequisite Collective Task(s): None

Supporting Collective Task(s):

Step Number	Task Number	Title	Proponent	Status
1.	71-CO-5100	Conduct Troop Leading Procedures for Companies	71 - Combined Arms (Collective)	Approved
3.	05-PLT-3006	Establish Work Site Security for a General Engineering Mission	05 - Engineers (Collective)	Approved
6.	05-CO-0018	Conduct Report Procedures	05 - Engineers (Collective)	Approved

OPFOR Task(s):

Task Number	Title	Status
71-2-9002	OPFOR Ambush(Company and below)	Approved
71-CO-9004	OPFOR Reconnaissance Attack (Company and below)	Approved

Supporting Individual Task(s):

Step Number	Task Number	Title	Proponent	Status
	052-12N-4001	Manage a Horizontal Construction Project	052 - Engineer (Individual)	Approved
	052-12T-1500	Determine the Moisture Content of a Soil Using the Oven-Dry Method	052 - Engineer (Individual)	Approved
	052-12V-1036	Produce Concrete With an M5 Concrete Mobile Mixer	052 - Engineer (Individual)	Approved
	052-210-1230	Determine the Design of California Bearing Ratio (CBR)	052 - Engineer (Individual)	Approved
	052-210-1249	Manage an Airfield Obstruction Survey	052 - Engineer (Individual)	Approved
	052-236-1168	Place Concrete	052 - Engineer (Individual)	Approved
	052-243-1305	Determine Grain Size Distribution and Gradation by Mechanical Analysis	052 - Engineer (Individual)	Approved
	052-243-1503	Determine the Specific Gravity of a Soil	052 - Engineer (Individual)	Approved
	052-243-1506	Classify a Soil Using the Unified Soil Classification System	052 - Engineer (Individual)	Approved
	052-243-3029	Design Concrete Mix	052 - Engineer (Individual)	Approved
	052-252-3055	Direct Employment of an M5 Concrete Mobile Mixer	052 - Engineer (Individual)	Approved
	052-254-1057	Backfill With a Scoop Loader	052 - Engineer (Individual)	Approved
	052-254-1058	Construct a Stockpile With a Scoop Loader	052 - Engineer (Individual)	Approved
	052-254-1060	Load a Haul Unit With a Scoop Loader	052 - Engineer (Individual)	Approved
	052-254-1061	Move a Load With a Scoop Loader Clamshell	052 - Engineer (Individual)	Approved
	052-254-1075	Construct a Stockpile With a Deployable Universal Combat Earthmover (DEUCE)	052 - Engineer (Individual)	Approved
	052-256-3041	Direct Soils Stabilization Operations	052 - Engineer (Individual)	Approved
	052-256-3046	Direct Compaction Operations	052 - Engineer (Individual)	Approved
	052-256-3047	Direct Scoop Loader Operations	052 - Engineer (Individual)	Approved
	052-256-3048	Direct Utility Tractor Operations	052 - Engineer (Individual)	Approved

Supporting Drill(s): None

Supported AUTL/UJTL Task(s):

Task ID	Title
ART 4.1.7.2.5	Construct Airfield Facilities

TADSS

TADSS ID	Title	Product Type	Quantity
No TADSS specified			

Equipment (LIN)

LIN	Nomenclature	Qty
T34505	Tractor Wheeled: Industrial	1
L77215	Loader Skid Steer: Type III	1
T76541	Tractor Full Tracked High Speed: Deployable Light Engineer (DEUCE)	1

Material Items (NSN)

NSN	LIN	Title	Qty
No materiel items specified			

Environment: Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to the current Environmental Considerations manual and the current GTA Environmental-related Risk Assessment card. .

Safety: In a training environment, leaders must perform a risk assessment in accordance with ATP 5-19, Risk Management. Leaders will complete the current Deliberate Risk Assessment Worksheet in accordance with the TRADOC Safety Officer during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note:

During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection, FM 3-11.5, Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination. .