Survivability
And the Tank Platoon Defense

Editor's Note: With this issue, ENGINEER begins a new feature designed to provide readers with expanded insight into combat branch operations, especially those pertaining to engineer missions. The following article originally appeared in the January/February 1989 issue of ARMOR Professional Bulletin. Original articles by other combat arms personnel are welcome.

by First Lieutenant Kevin Keaveny

Many tank platoons do not know how to prepare a defensive battle position. While the "book" states every tank platoon must correctly construct defensive fortifications, to find out just how to do this becomes a challenge. Worse, platoon leaders have difficulty understanding and integrating engineers into the defense.

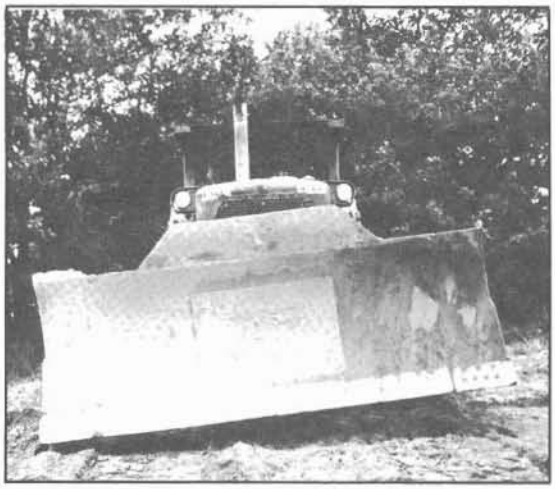
In the year and a half I served as an armor platoon observer controller at the National Training Center, not one platoon in thirty-three ever did all defensive tasks correctly. It always seemed a platoon was good at one point or another, but not at everything. This article discusses ways to overcome these deficiencies by methods employed successfully using tank platoons at the NTC. Points contained here address engineer organization, engineer equipment, fighting positions, listening and observation posts, and prestock ammunition sites.[1]

Engineer Equipment

Platoon leaders seldom grasp where the engineers come from, or what a monumental task it is to dig in a battalion task force.[2] The brigade normally goes to the field with an attached engineer company of the divisional engineer battalion, with subordinate engineer platoons under the operational control of battalion task forces.[3] In all cases, the engineers receive specialized logistic support from their parent unit, while the task force provides common class support. Additional engineers can come from division or corps on a direct or general, support basis. Many of these engineers do not normally dig in tanks, so platoon supervision must be exact.

D7s, D8s, ACEs, and CEVs are the four engineer vehicles associated with building survivability positions.[4] At the time of this article, D7s and D8s are the most numerous and provide most of the earth-moving power of the combat forces. The CEVs, found in the two CEV sections of the engineer company, are excellent for building posi-

Meet the Movers and Scrapers...



One advantage of the D7 and D8 bulldozers is the ability to tilt the blade to focus earth-breaking power, as seen here.

The CEV's blade is wider than its hull, hence it can excavate a full-width tank position, suitable for both M60s and M1 tanks, in a single pass.

The M9 Armored Combat Earthmover (ACE)

The M9's blade, like that on the D7, is narrower than a tank, so leaders have to ensure that the positions it excavates are wide enough for the tanks being emplaced. Each engineer platoon has only two of these.

tions but are used more for mobility and countermobility tasks.

The blades on the tractors are hydraulically operated, and on D8s, and late-model D7s, are adjustable in the horizontal as well as the vertical plane. The ability to tilt the blade horizontally allows the operator to increase the surface pressure on either end, giving the tractor greater earth-breaking power. Supplementing the blade on some tractors are rippers, located at the rear of the vehicles, that act much like a backyard spading fork.

In an environment with extremely hard soil, a typical scene would show the tractor operator preparing the ground by dragging the rippers across first. Then, if required, he would tilt the blade to further break the soil. As a last step, the operator levels the blade and removes the remaining soil from the hole. The D7, though it looks like a D8, is actually smaller, as is its dozer blade.[5] This point is moot until one considers that both the M60 and M1 tank hulls are wider than the D7 blade.[6] This puts added pressure on subordinate leaders to ensure positions are wide enough for tanks to enter and exit without throwing track. The same blade size problem exists with the ACE, which mounts a blade smaller than the D7. There is no problem for the CEV to dig positions, because its blade is wider than its own hull, providing a snug fit for both the M60 and M1.

The platoon leader needs to understand that a battalion task force may only have hours to prepare a defense, and such time will not be sufficient to complete its engineer work.[7] As a case in point, an armor battalion task force, with an engineer platoon OPCON and allotted twenty-four hours to defend, faces many sobering facts:

- The engineer platoon has only two ACEs, for a maximum of 48 construction hours *(See figure on facing page).*
- Forty-six combat vehicles require survivability positions.
- Position construction time will take from 46 hours for all-hull defilade to 119 hours for turret defilade positions.
- Mobility and countermobility tractor tasks, tractor down-time, operator availability, and travel time between positions will all subtract from survivability construction time.
- Each of the 12 platoons can only expect to see the tractors for up to four hours.

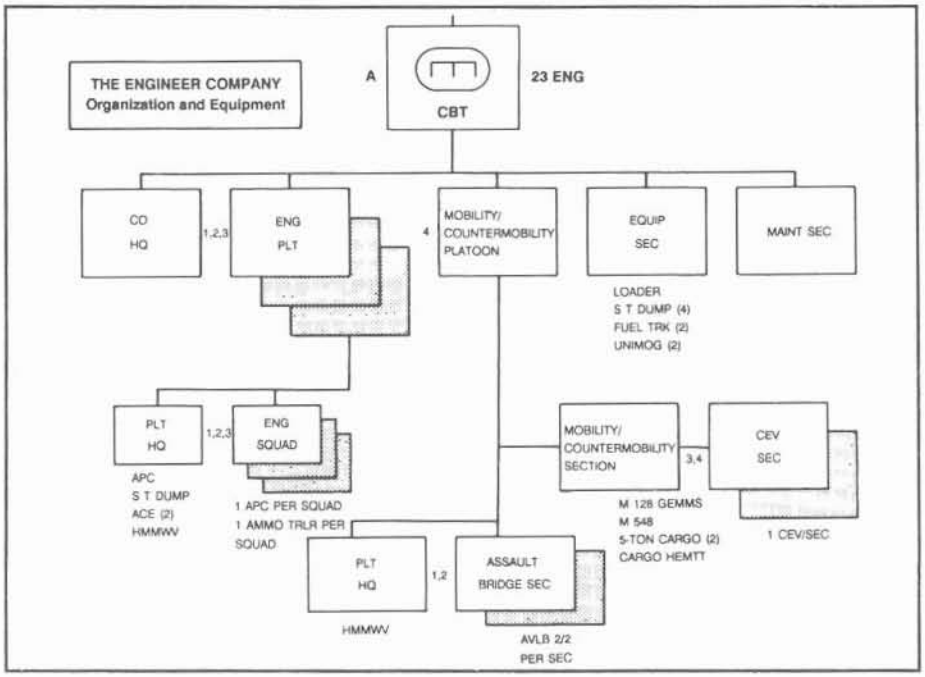
The platoon leader needs to decide beforehand what work the engineers will accomplish onsite. The platoon leader calculates how

much time will be required to dig each fighting position, adds that time up, and compares the total to the time the engineers are under his control.

If the time required to dig in exceeds the engineer time available, one of three courses of action is possible:

- Select new fighting positions requiring less construction time.
- Have more construction time allotted by the company commander or battalion headquarters.
- Request the assignment of additional engineer assets.

If extra time exists, use it to improve positions, dig in prestock ammunition, or loosen soil for listening and observation posts. As a backup to the first plan, leaders should also prepare a contingency plan, so if the engineers are able to return, they can improve the positions. Routinely, platoon leaders *underestimate* what the engineers can do the first time on the battle position.

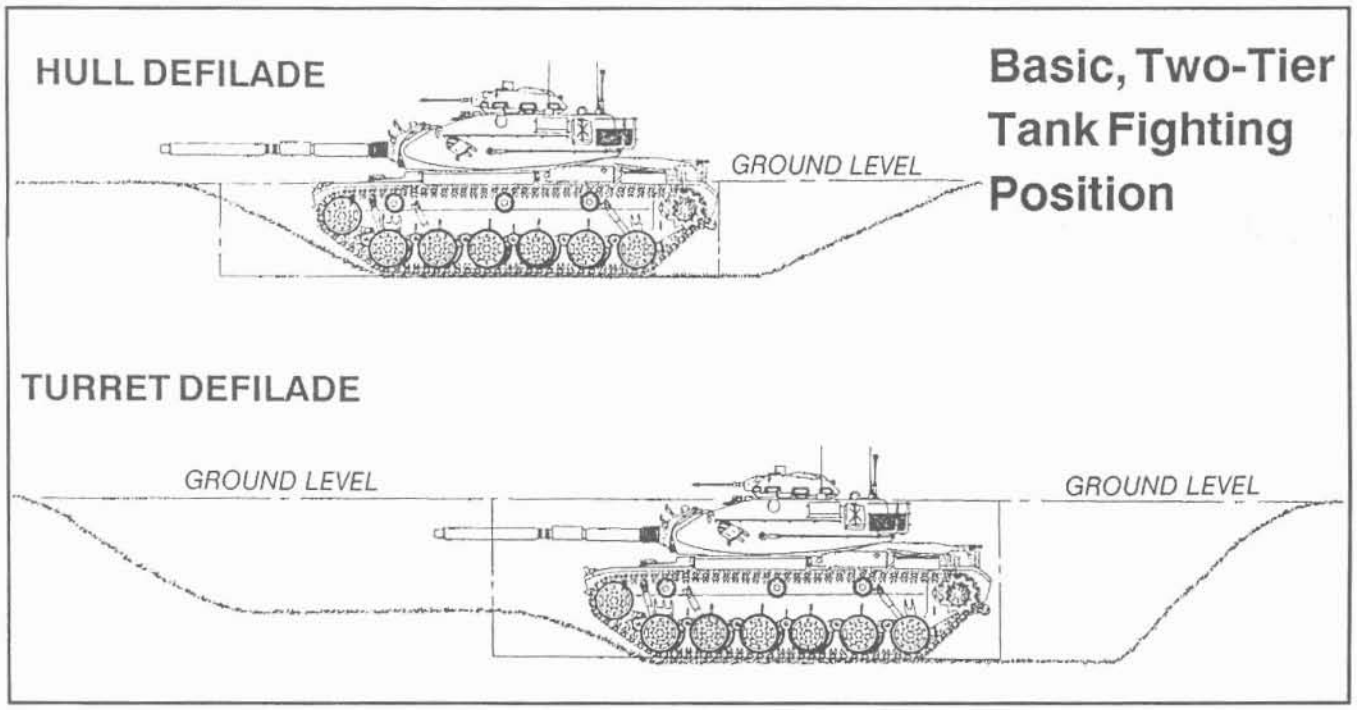


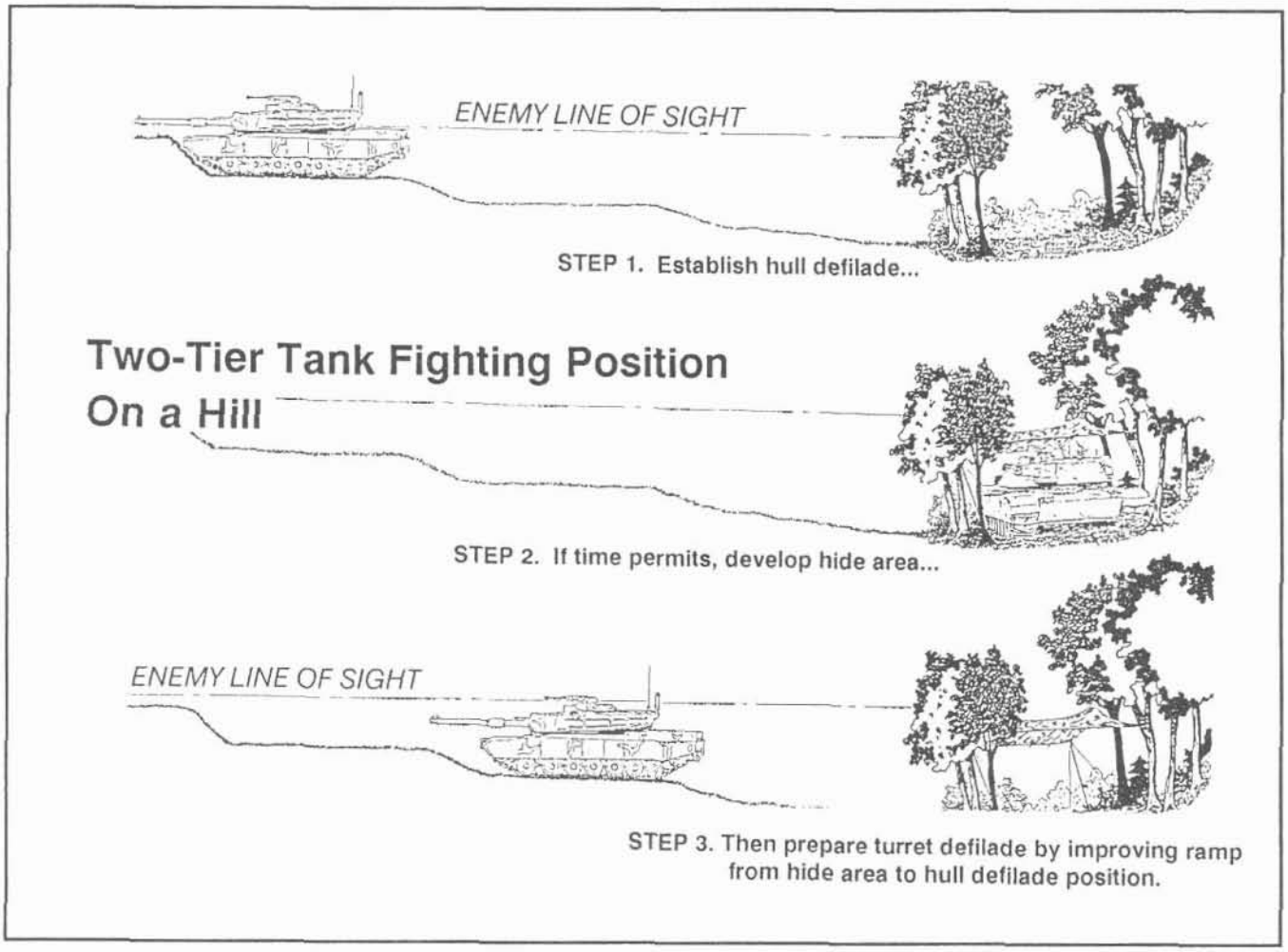
By not preparing for them the second time, platoon leaders cannot achieve the best possible defense.

Fighting Positions

Doctrinally, deliberate fighting positions consist of four elements constructed in this order: hull defilade, concealed access route, hide location, and turret defilade.[8] In the field, many platoons instead opt to build the positions in this order: hull, turret, access ramp (route), and hide. Experience shows that engineers seldom have enough time to improve hide positions.

Also, contrary to doctrine, many units dig positions from *back to front*, leaving spoil piled into berms.





In this case, the access ramp was too steep, and the tank commander failed to raise gun tube high enough when moving into hull defilade. As a result, dirt entered gun tube, and the tube failed when it was fired.

The unfortunate side effect of this method is that the disturbed earth usually reveals the position and enables the enemy to target friendly tanks with artillery and maneuver forces. While some can argue that hasty positions are better than nothing, such arguments weaken when *the unit understands how little* protection it is really getting.[9]

Whenever possible, units need to camouflage or haul away spoil. In cases where spoil remains, the leader needs to go forward of the battle position and look back to

evaluate what the spoilage reveals, and then adjust his defensive plan accordingly.

Desert operations present unique problems for position construction. The earth is usually either too soft or too hard to permit conventional positions, so the platoon leader must seek a balance between the use of natural terrain and engineer-prepared positions.[10] Ravines, wadis, and dunes can all provide a certain amount of ballistic protection if located effectively within the battle position. When using natural fighting positions, the related protection is greatest at or near the main gun's effective range, but diminishes as the enemy closes and is able to maneuver against specific targets.

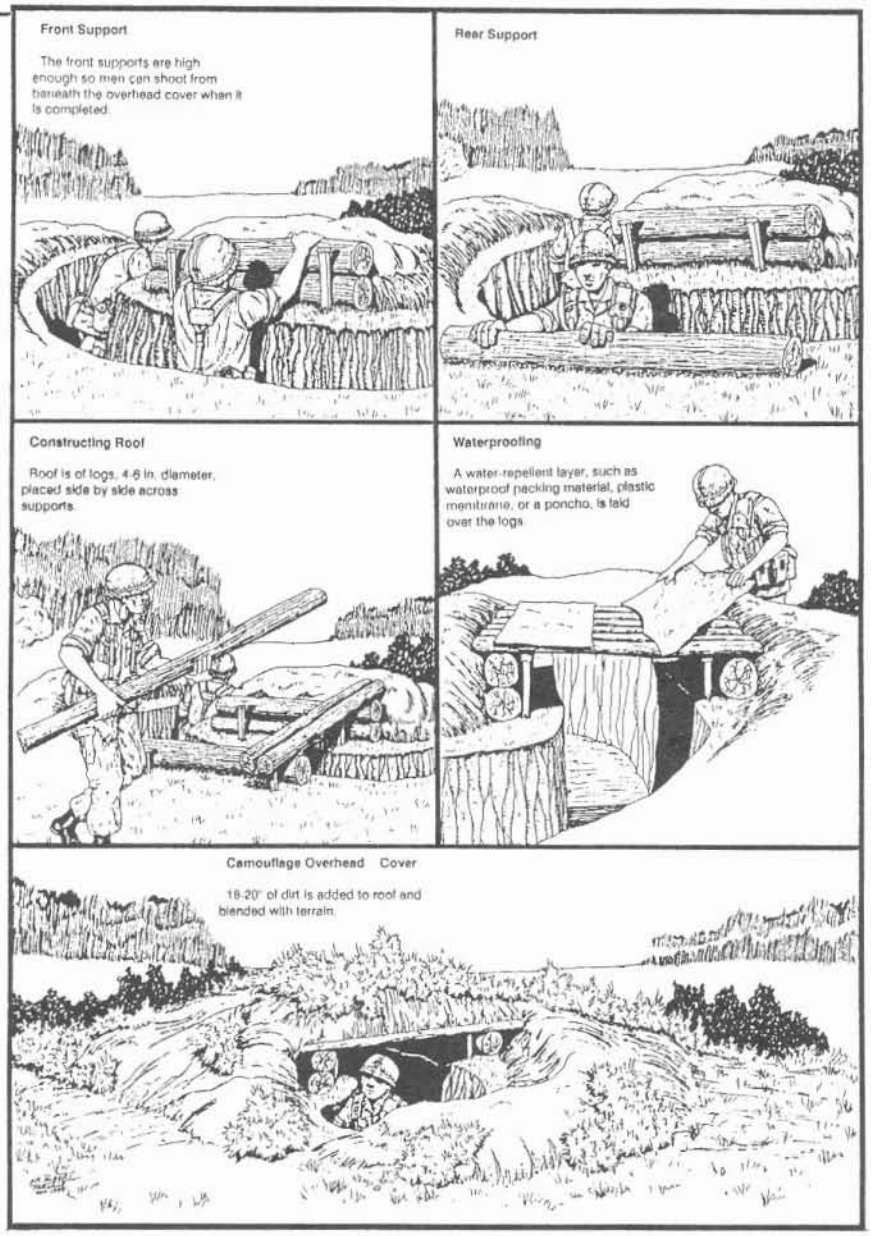
Individual Fighting Positions

Listening and observation posts need to withstand indirect fire. Tank platoons tend to violate this principle and send out soldiers to man posts that have no protection at all. As doctrine now stands, the only fighting position applicable is the one-soldier deliberate, with eighteen inches of overhead cover – not a good choice because most tankers dislike digging.

An alternative is to modify another position, the one-man hasty prone, into a deliberate with the same eighteen inches of overhead cover. Such a position lends itself to prefabrication.

To store the structure, a bracket mounted on the tank's bustle rack holds the folded roof.[11] Displaced tactical signs, formerly on the bustle rack, can either attach to the outside of the roof or appear directly on it. The design concept of the "deliberate" prone position has four key features:

- It is foldable for storage.
- A pop-up sand box on top holds the eighteen inches of overhead fill.

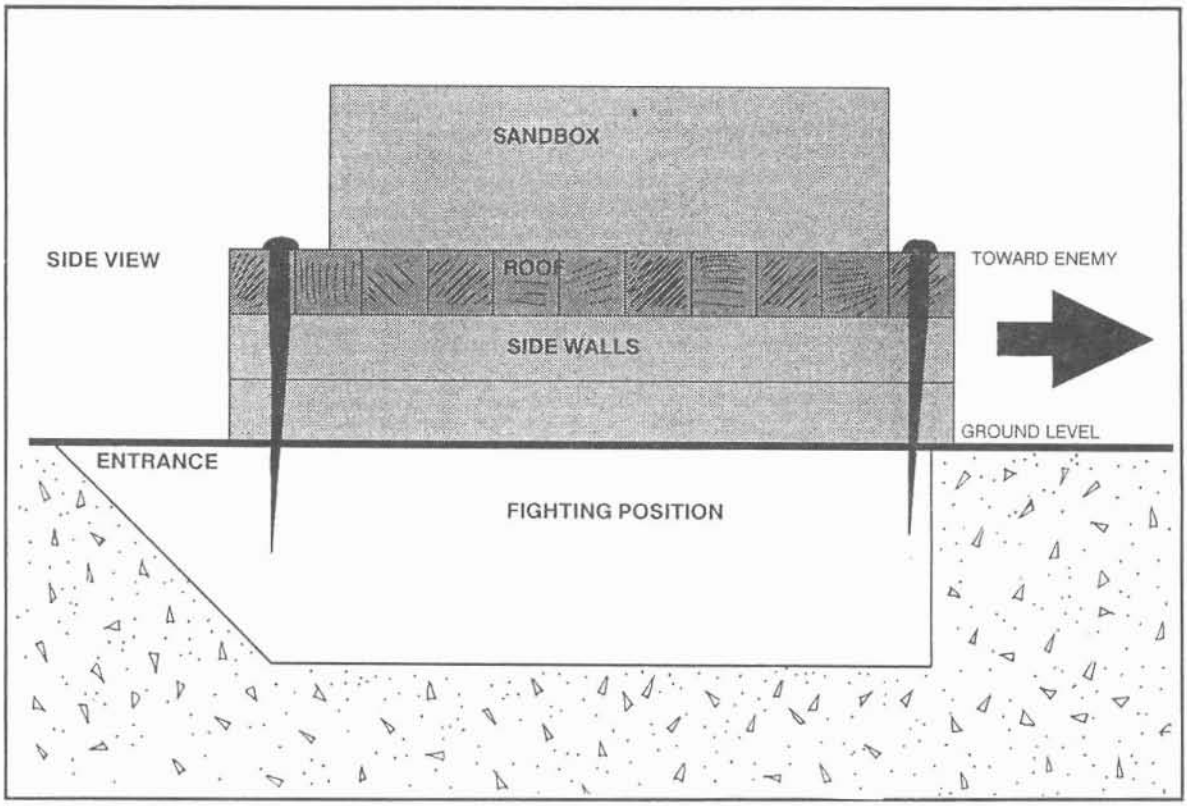


One- or Two-Soldier Position with Overhead Cover
While providing ideal protection for soldiers in listening posts and OPs, there is seldom enough time to prepare such a complex position. Prefabricated version on the following page protects as well with less digging.

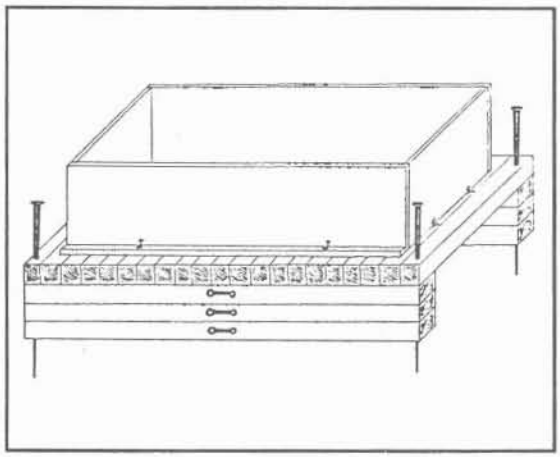
- Four-by-four construction lends sturdiness.
- Spikes firmly anchor the roof into the ground.

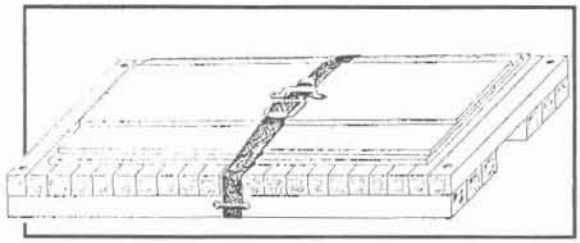
Of the two positions, the "deliberate" prone has three principal advantages:

- The position requires the removal of 12 cubic feet less of dirt.
- The majority of the dirt is composed of loosely compacted top soil.
- A tractor can take a swipe of soil to eliminate much of the necessary digging.[12]

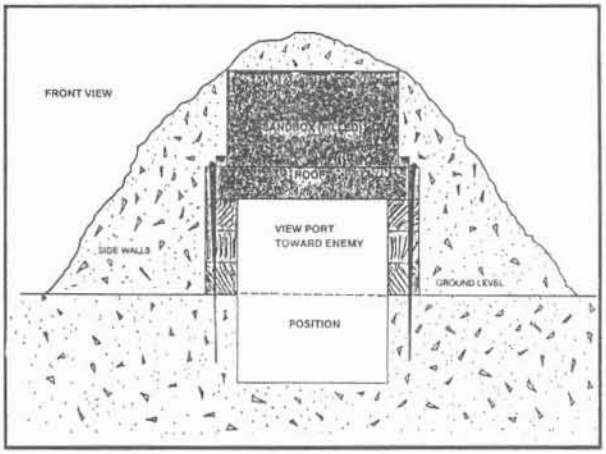


A Semi-portable, Modified Hasty One-Man Fighting Position With Overhead Cover





"Sandbox," roof beams, and side beams fold up and store on tank turret. When assembled and filled with earth, box adds 18 inches of overhead cover to roof.



At top and above, drawings illustrate how semi-portable overhead cover is assembled and buttressed with earth, both for camouflage and additional ballistic protection. "Sandbox" folds and stores on turret bustle brackets; spikes are stored in sponsons.

Excavators can loosen soil, even if there's not enough time to finish the job by machine.

Another survivability project is the task of fortifying prestock ammunition against indirect fire. More than any other task, some tankers view the job of hardening prestock sites as a distraction from other responsibilities. Two methods are available to cut down the time dedicated to hardening the sites. The first is to carry on the tanks — or in the trains — enough Class IV to support the required eighteen inches of overhead cover.

The second method, shown by field experience to be the best, is to use the wooden ammunition packaging crates filled with sand and soil. The crates are easy to stack, provide a handy method for building, and come with handles for easy access to the rounds beneath. Again, the engineers can assist by digging a slit trench, which places the rounds below ground level and provides loose soil for filling the crates.

Usable fighting positions, listening and observation posts, and prestock ammunition sites are critical to an armor platoon's defense. Platoon leaders must use engineers to help make the best possible defensive battle position. To do that, the platoon leader must define what tasks the platoon can do itself and what tasks the engineers can help with. As a minimum, the platoon leader is responsible for all site selection and post-construction evaluation. Subordinate leaders are accountable for supervision and doctrinal soundness of construction. With the right supervision from the tankers, and productive work from the engineers, the platoon will gain steady firing platforms, and a chance to dominate the battle.

Notes

1. FM 71-1, Final Draft, Section Four, June 1983.

2. Divisional Engineer Company TOE 5-145J, Divisional Engineer Battalion TOE 5-145J, Command Relationships FM 5-103, 2-29.

3. Vehicular composition of a TOE 5-145J Divisional Engineer Company is six tractors, two combat engineer vehicles, and two small emplacement excavators.

4. D8s are not common to divisional engineer battalions, but are used by other engineer elements which may appear in the forward battle areas.

5. The D7 blade is 11 feet wide; the D8 is 13 feet, 1.5 inches; and the width of the M9 ACE blade is 10 feet, 6 inches.

6. The M60 is 11.91 feet wide, the M1 11.98 feet wide.

7. FM 71-1, Final Draft, Section Four, June 1983, and FM 5-100, May 1984.

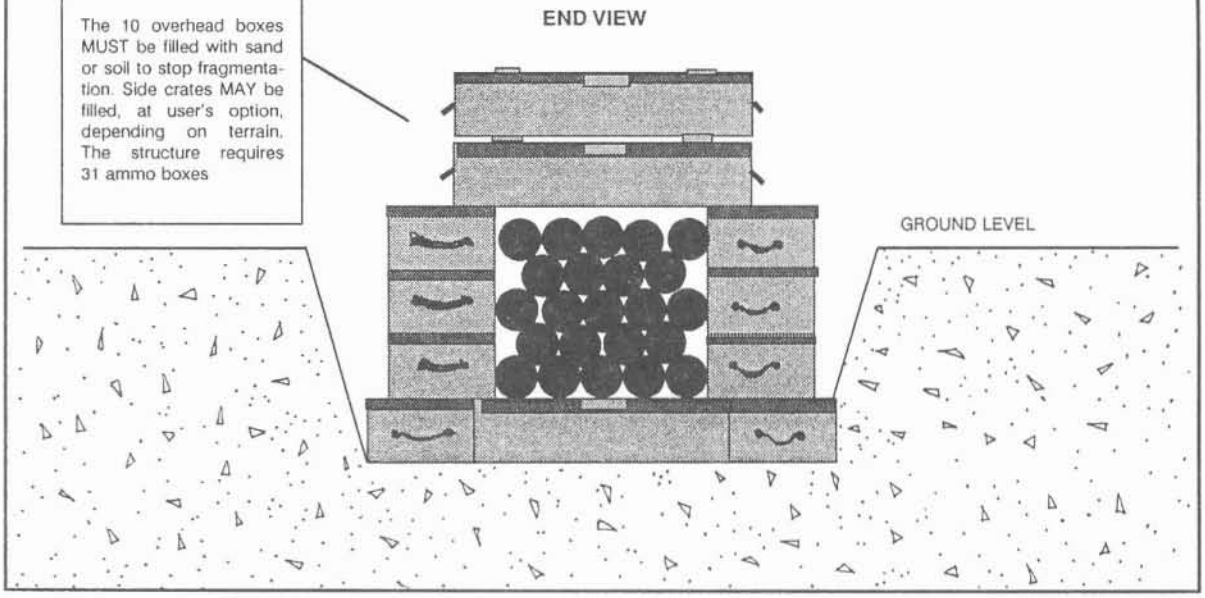
8. No matter what any manual states as construction times, such numbers are only estimates. In many cases, there are differences between manuals.

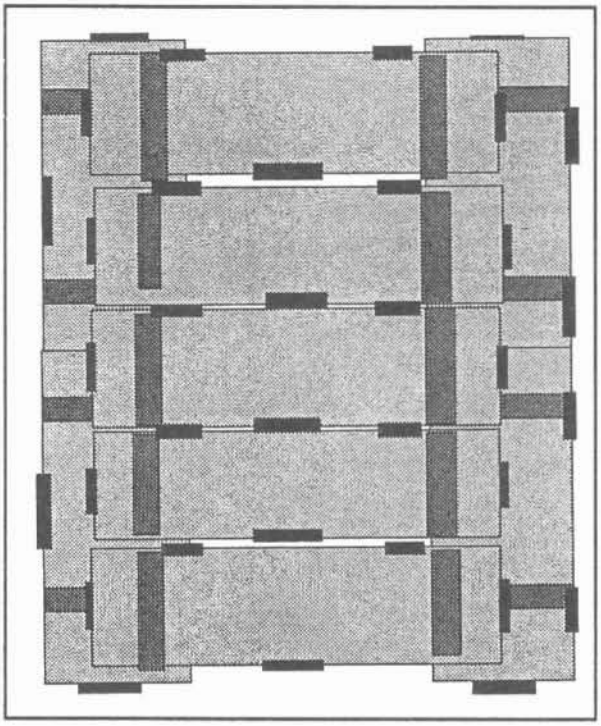
9. Hasty positions are often referred to as MILES berms, parapets, or berms. FM 5-103, 4-13, states such positions are

Hardened Prestock Ammunition Site

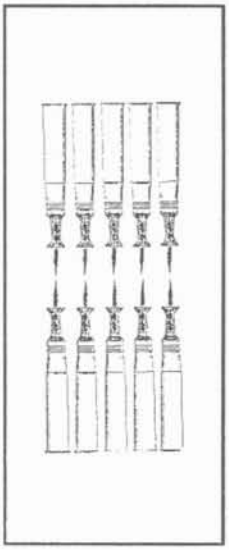
Constructed of ammo crates filled with sand, this ammunition shelter holds 54 tank rounds. A few dozer swipes prepare the hole. Spoil is used to fill crates.

The 10 overhead boxes MUST be filled with sand or soil to stop fragmentation. Side crates MAY be filled, at user's option, depending on terrain. The structure requires 31 ammo boxes





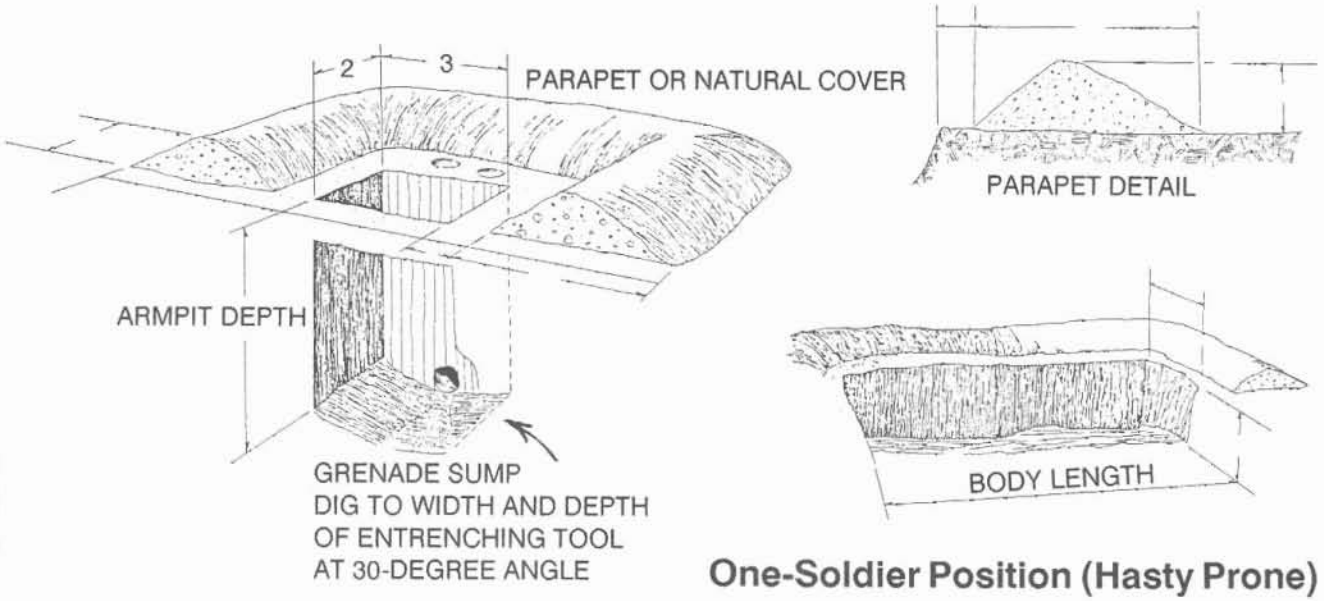
Increased Survivability For Prestocked Ammo



This field-expedient method protects main gun ammunition from indirect fire. The basic building block is the empty ammo crate, filled with soil taken from the slit trench excavation that allows the rounds to be stored below ground level.

At left, schematic shows how rounds should be stacked in the enclosure.

One-Soldier Position (Deliberate)



One-Soldier Position (Hasty Prone)

"usually for APCs and CEVs and are not recommended for tanks because of their false sense of security."

10. FM 90-3, 4-6, elaborates on desert fighting positions, which consist of irregularly-shaped scoops approximately two meters deep in the center and three times the vehicle width.

11. The mount would be similar, but not as complicated as the mounting developed in the late 1970s for the tank-mounted reconnaissance motorcycle.

12. The one-soldier deliberate fighting position requires removal of 30 cubic feet of soil (3 ft. x 2 ft. x 5 ft.), compared with 18 cubic feet for the hasty prone position (6 ft. x 2 ft. x 1.5 ft.)

Battalion Task Force Emplacement Time

Chart illustrates how to calculate the time needed to emplace a heavy division battalion task force with a mix of M1 and M2 vehicles. (In an M60/M113-equipped force, there would be more dozer time available per tank because many units do not dig in hasty fighhting positions for the APCs in the hide. But in either case, estimates do not include scout or mortar vehicles.)

TF ELEMENT	HULL POSITION		TURRET POSITION		TOTAL TIME
	Per	Total	Per	Total	
Co. A (M1)	.9	12.6	1.5	21.0	33.6
Co. B (M1)	.9	12.6	1.5	21.0	33.6
Co. C (M2)	.8	10.4	1.2	15.6	26.0
Co. D (M2)	.8	10.4	1.2	15.6	26.0
TOTALS		46.0		73.2	119.2

Note: Total time would be greater if the TF had more infantry and Co. E (i.e., more vehicles). Chart assumes emplacement of 12 platoons and availability of two ACEs for 48 hours.

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