

WAR DEPARTMENT FIELD MANUAL
FM 5-15

This manual supersedes FM 5-15, 1 October 1940, including C 1, 2 April 1941, and C 2, 10 December 1941; and so much of Training Circular No. 52, War Department, 1942, as pertains to FM 5-15; Training Circular No. 96, War Department, 1943.

CORPS OF ENGINEERS

FIELD
FORTIFICATIONS



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CHAPTER 1

GENERAL

1. PURPOSE AND SCOPE. Troops in occupied positions increase their combat effectiveness by works of an engineering nature called field fortifications. This manual describes field fortification methods and gives details of construction of entrenchments, emplacements, and shelters. It also outlines the principles of terrain appreciation which apply to field fortifications, and explains how to combine individual field fortifications into a unified system by means of organization of the ground. It does not cover the subject of obstacles, which is treated in FM 5-30.

2. CLASSIFICATION AND USE OF FIELD FORTIFICATIONS. **a. Classification.** There are two general classes of field fortifications.

(1) Hasty fortifications. Those initially constructed when in contact with the enemy or when contact is imminent. They consist generally of light clearing of fields of fire, foxholes for personnel, open weapon emplacements, hasty antitank and antipersonnel mine fields, barbed-wire entanglements, strengthening of natural obstacles, observation posts, and camouflage.

(2) Deliberate fortifications. Those constructed out of contact with the enemy, or developed gradually

from hasty fortifications. They include deliberate entrenchments, antitank and antipersonnel mine fields, antitank obstacles, covered weapon emplacements, barbed-wire entanglements, troop shelters which are proof against artillery fire and weather, extensive signal communication systems, gasproof inclosures of command posts and aid stations, and elaborate camouflage.

b. Use. Field fortifications increase the combat efficiency of troops. They must be used skillfully to further the mission of a unit, and must not be allowed to lead to a passive or static defense. The decisions as to whether or not to occupy a position and the degree of fortification to undertake are primarily tactical and beyond the scope of this manual.

vent direct fire or ground observation into the area; they may be high or low, continuous or discontinuous. When the longer axis of such an area extends in the direction of movement of a force, or leads toward or into a position, the area is called a *corridor*.

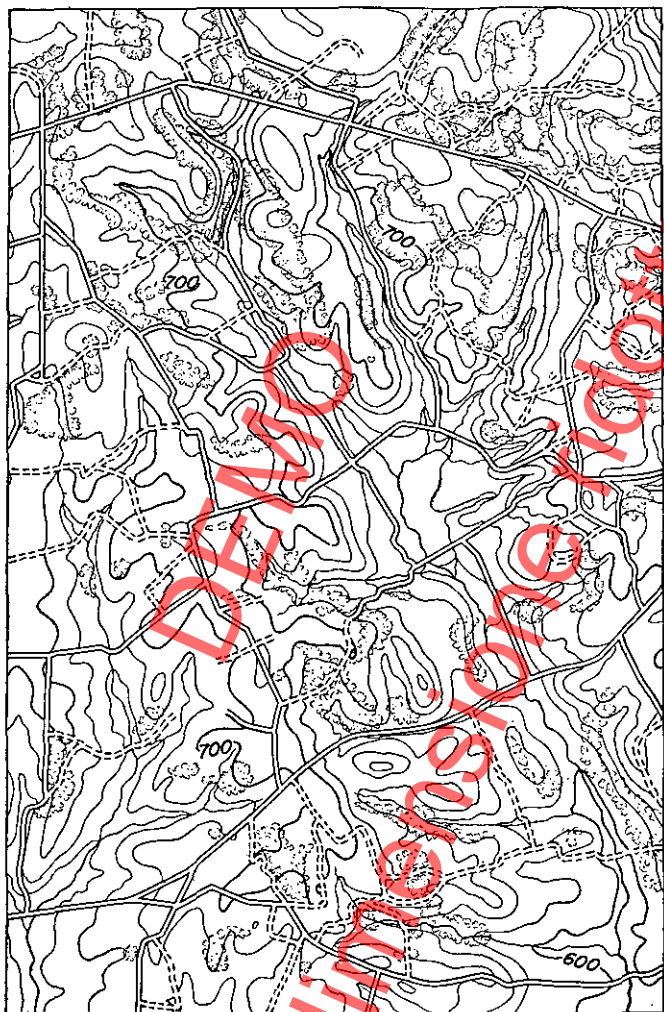
SECTION II

AIDS TO THE STUDY OF TERRAIN

10. GENERAL. Maps and aerial photographs, supplemented by ground and air reconnaissance, form the basis for studying terrain. In many cases maps marked in special ways simplify its study. Often a series of special maps, on each of which is emphasized a separate item of military importance such as roads, streams, or ridges, is necessary. The purpose of this section is to indicate methods used in preparing such maps.

11. FEATURES OF MILITARY IMPORTANCE. a. Ground forms. Drainage lines and ridge lines are the natural basis for studying terrain with respect to the shape of the ground. Drainage lines always form a connected system or systems of branching lines. Ridge lines form similar systems of branching lines. Together, ridge and drainage lines form two interlocking branching systems which, singly or together, clearly indicate the general shape of the ground.

(1) Figures 1 ① shows a section of a contoured map. Figure 1 ② is the same map with the drainage lines emphasized. This is generally done in blue. Figure 1 ③



① Section of contoured map before emphasis.

Figure 1.

CHAPTER 3

GENERAL FORTIFICATION TECHNIQUE

SECTION I

TOOLS AND MATERIALS

18. TOOLS. Tools normally used for hasty fortification work are carried by the infantry. These may be supplemented by additional tools obtained from en-

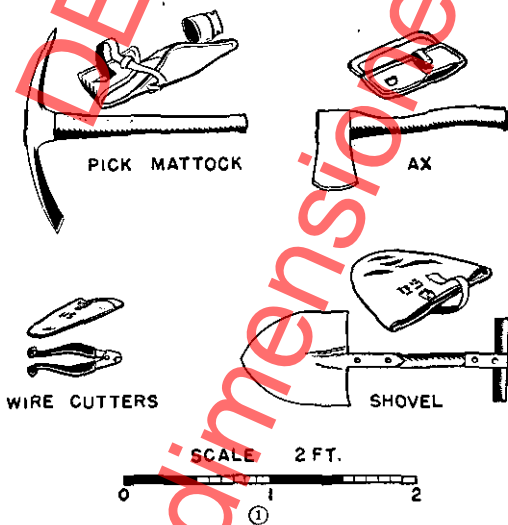
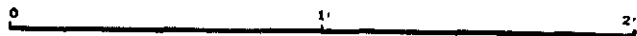
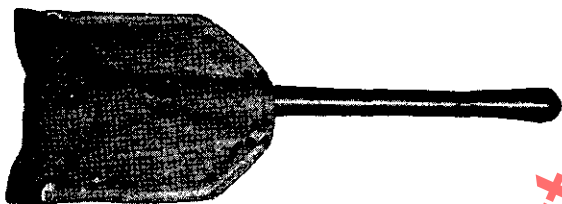


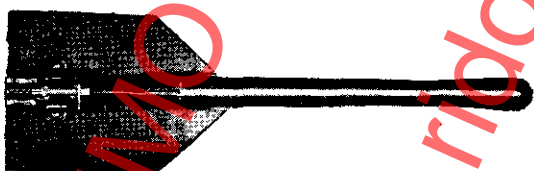
Figure 4. Entrenching tools carried by infantry soldiers.



SCALE



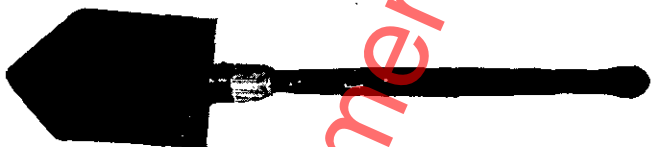
PACKED IN CARRYING CASE



FOLDED FOR CARRYING



FOR USE AS A PICK



FOR USE AS A SHOVEL

(2)

Figure 4—Continued.

gineer supplies. Each infantry soldier carries a small entrenching tool (fig. 4) on his pack. Standard-sized tools are supplied in infantry entrenching tool sets (figs. 5).

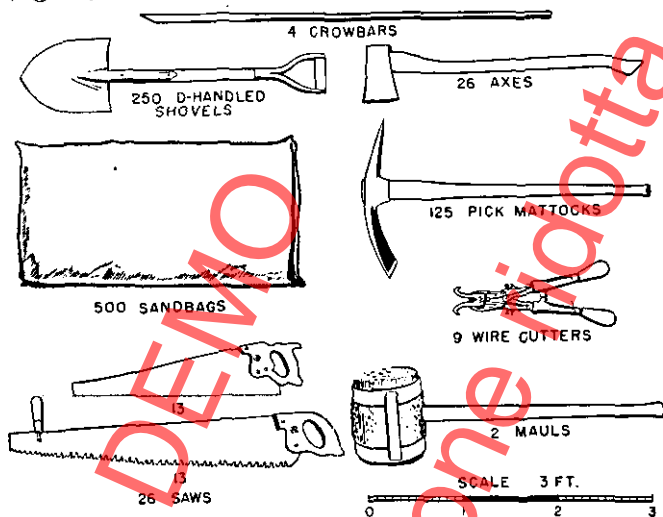


Figure 5. Principal tools carried in infantry entrenching tool set.

19. MATERIALS. Materials for fortification are supplied through engineer dumps, and include antipersonnel mines and firing devices, lumber, barbed wire and pickets, and materials for reveting, camouflage, shelter construction, and concrete construction. Antitank mines are supplied like ammunition.

SECTION II

GENERAL TECHNIQUE

20. CLEARING FIELDS OF FIRE. Suitable fields of fire are required in front of each entrenchment or

emplacement. In clearing them the following principles must be observed :

a. Do not disclose position by excessive or careless clearing (fig. 6).

b. In areas organized for close defense, start clearing near main line of resistance and work forward at least 100 yards.

c. In all cases leave a thin natural screen to hide defense positions (fig. 7).

d. In sparsely wooded areas, remove the lower branches of scattered, large trees. Occasionally it is desirable to remove entire trees which might be used as reference points for enemy fire.

e. In heavy woods, complete clearing of the field of fire is neither possible nor desirable. Restrict work to thinning undergrowth and removing lower branches of large trees. In addition, clear narrow lanes for fire of automatic weapons (fig. 8).

f. Remove or thin thick brush. It is never a suitable obstacle and obstructs the field of fire.

g. Demolish other obstructions to fire, such as buildings and walls, only when resulting debris provides less enemy protection.

h. Mow grain crops and hay fields or, if ripe and dry, burn them if it will not disclose the position. Usually this is practicable only for a deliberate position organized prior to contact with the enemy.

i. Drag away cut brush to points where it will not furnish concealment to the enemy nor disclose the position.

j. Before clearing the fields of fire make a careful estimate as to how much clearing can be done in the time available. This estimate often determines the nature and extent of the clearing to be undertaken, since

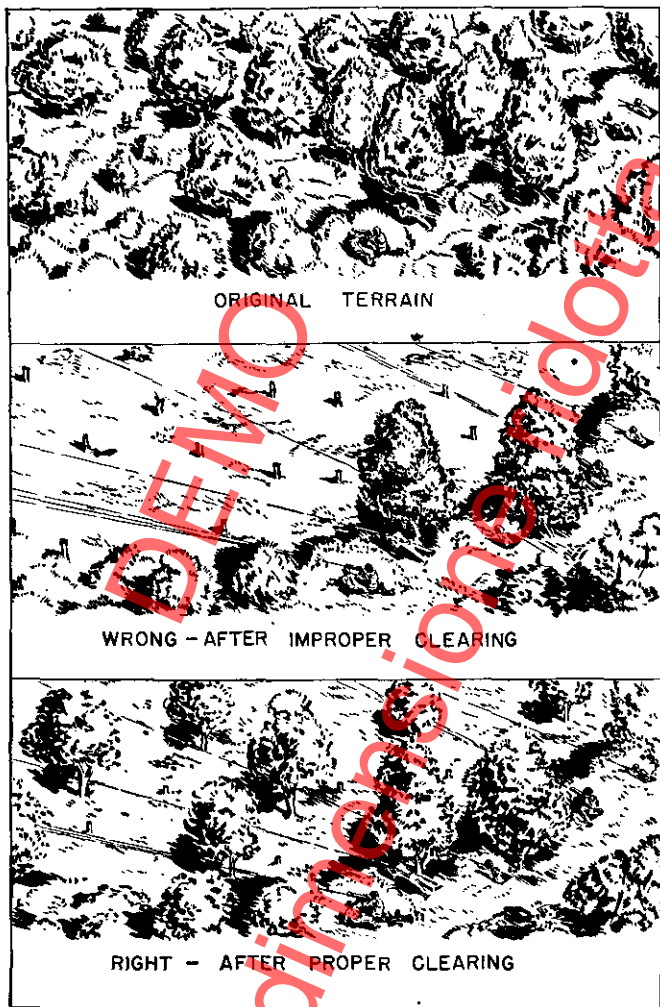


Figure 6. Clearing fields of fire.



WRONG
(IN FRONT OF NATURAL SCREEN)



RIGHT
(JUST BEHIND THIN NATURAL SCREEN)

Figure 7. Thin natural screen.



WRONG—TOO MUCH CLEARING, DEBRIS
NOT REMOVED, ENEMY WILL AVOID.

①

Figure 8. Clearing lanes of fire for automatic weapons.



RIGHT — ONLY UNDERBRUSH AND TREES DIRECTLY
IN LINE OF FIRE REMOVED, ENEMY SURPRISED.

②

Figure 8—Continued

a field of fire only partially cleared may afford the enemy better concealment and cover than the area in its natural state. Estimates may be based on table I, which makes no allowance for the removal of debris. Additional allowance must be made for this, depending upon the amount of debris, length of haul, and equipment available.

TABLE I. *Man-hours required to clear 100 square yards*

Description of clearing	Tools used	Man-hours required
Medium clearing—clearing undergrowth and some trees not exceeding 12 inches in diameter.	Saws, axes	3½
Light clearing—clearing small brush only.	Axes	1½

21. CAMOUFLAGE. Concealment is of prime importance in locating defensive works. Before any excavation is started, all turf, sod, leaves, or forest humus is removed carefully from both the area to be excavated and that on which spoil is to be piled. This material is set aside and replaced over the spoil when the work is completed. To prevent discovery of the work during excavation, camouflage nets are suspended from stakes or trees before excavation is started. The workers confine their activities to the area beneath the camouflage net. The net is suspended high enough above the ground to permit excavation without snagging equipment or entrenching tools on it. After the excavation has been completed and the spoil covered with sod or other natural camouflage material, the net is lowered close to the ground so that it is inconspicuous from ground observation. Nets are kept in position when the weapon is not being fired. Arrangements are made

23. DISPOSAL OF SPOIL. Excavated soil is much lighter in color and tone than surface soil and must be hidden carefully lest its presence disclose the fortifica-



SPOIL BEING REMOVED CORRECTLY



SPOIL BEING CONCEALED CORRECTLY

Figure 9. Disposal of spoil.

tion (fig. 9). There are several ways to dispose of spoil.

a. It may be used to form a parapet if the topsoil is carefully saved and used to cover the parapet. Turf,

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