

CHAPTER 5

Counterobstacle Tasks

USE OF OBSTACLES

THREAT DOCTRINE

While Threat forces have the military expertise and capability to construct develop obstacles other than minefields, their doctrine limits this effort due to the offensive nature of their operations and the expected tempo of the AirLand battle. Simple obstacles include demolished overpasses, road craters, wire obstacles, and urban rubble. Obstacle systems can include such combinations as road craters/mines/rubble, and rubble/fire/timber obstacles. United States forces must also cope with large obstacles created by nuclear weapons. The clearing of blown-down trees

and extensive rubble from nuclear blasts, for example, is a huge mobility task. Also, the task may have to be done in a contaminated environment. Although obstacles themselves may not be destructive, as are mines, many will be booby trapped. The objective of enemy-installed obstacles is to delay moving forces, channelize them, and create time for concentration of destructive fires. Threat obstacles must be rapidly overcome to prevent excessive casualties to friendly forces. Thus, the combined arms team should be prepared to overcome all types of obstacles.

Use of Obstacles	5-1
Bypassing and Breaching	5-7
Command and Control	5-16

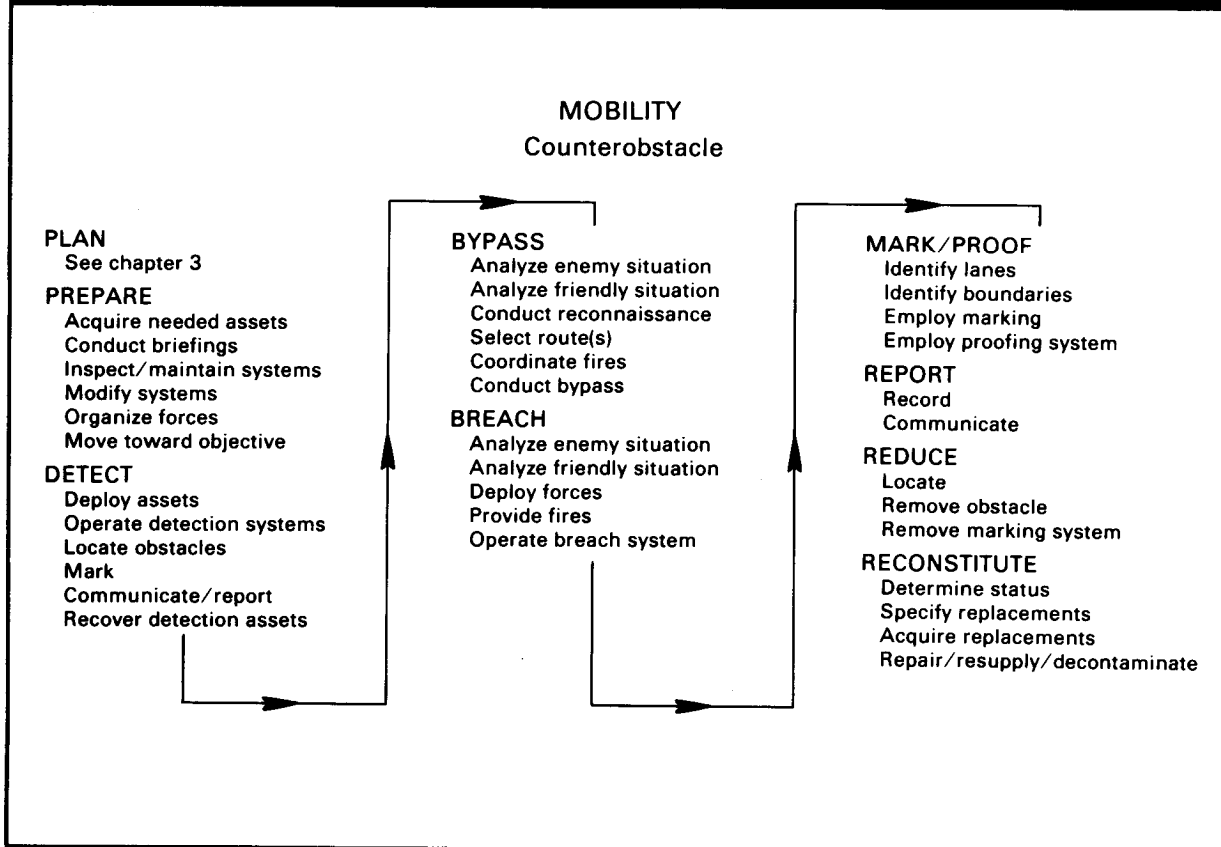
COUNTEROBSTACLE ACTIVITIES

Counterobstacle tasks are divided into nine distinct steps. Each step is separated into several subtasks. The counterobstacle function differs from the countermine function in only two steps. The requirement to proof breached lanes is unnecessary unless the obstacle includes mines (complex). Secondly, the complete removal of mines is termed clearance, whereas the total removal of an obstacle system is termed reduction. Figure 5-1 shows the activities and steps associated with a counterobstacle task. During a single obstacle encounter, however, not all of the subtasks may be required. For example, the removal of a timber obstacle through breaching might eliminate the need for marking or reduction. The remainder of this chapter will discuss the unique considerations of counterobstacle subtasks.

PLANS AND PREPARATIONS

The planning phase for counterobstacle tasks is similar to that of other mobility tasks (chapter 3). Knowledge of existing enemy obstacles or their likely location helps the commander formulate mobility plans. If avoiding the obstacle is not possible, the commander selects and prepares the method of breaching that will allow the force to overcome the obstacle in stride. Because it is not always possible to obtain reconnaissance data fast enough or in detail, the maneuver commander should equip lead elements with the best available means for breaching any type of obstacle. Organic means are supplemented with engineer elements whenever possible. Engineers providing counterobstacle support have special engineer equipment, pioneer tools, and demolitions to breach all types of obstacles.

FIGURE 5-1. POSSIBLE SUBTASKS IN THE COUNTEROBSTACLE PROCESS



OBSTACLE DETECTION

The success of counterobstacle activities is in reaching the objective beyond the obstacle. Enemy forces around and beyond the obstacle are the object of attack, not the obstacle itself. Overcoming an obstacle without a significant loss of time, personnel, and equipment is the goal of maneuver forces. To achieve this goal, early detection and warning of obstacles is necessary. The obstacle may either be avoided or overcome, but early warning will allow for swift concentration of effort in order to accomplish the task.

Enemy forces around the obstacle are the object of attack, not the obstacle itself.

MEANS OF DETECTION

Currently, counterobstacle detection is primarily limited to visual inspection and reconnaissance. As maneuver forces prepare to move on the battlefield, means of detecting and identifying obstacles in their path are executed. The mobility planner (the operations officer or staff engineer) forecasts the most likely locations where obstacles could delay, disrupt, or stop tactical movement. Tactics of detection are based upon the methods and equipment available. For example, the leading force in an attack employs its organic reconnaissance elements forward of the main body. The reconnaissance personnel from divisional and corps engineer battalion S-2 sections may be task organized to move with the scouts. In this manner, tactical route reconnaissance and mobility technical data can be collected at the same time. Engineers may require vehicles similar to those used by reconnaissance elements or at least space for the engineers and their equipment if this is possible.

Aerial reconnaissance. Aerial reconnaissance and remote imagery are other methods of early obstacle detection. Unlike mines and minefield, most obstacles are easily detected from the air. Limited only by adverse weather conditions and enemy anti-aircraft systems, aerial reconnaissance can provide the quickest detection of obstacles.

Role of commander. Counterobstacle reconnaissance information must be swiftly dispatched to the maneuver force commander.

Early detection allows the commander time to plan, prepare, and adjust forces for bypassing or breaching the obstacle. Avoiding physical encounter with the obstacle is the ultimate goal because it saves time and resources.

DETECTION REPORTS

Units of all arms and services use simple and concise report formats to quickly report obstacle information. The four different reports explained in this section implement STANAG 2096. They are the terrain, obstacle, bridge, and tunnel reports. Much of the detail required in the bridge and tunnel reports can only be provided by qualified engineer personnel. Personnel of other arms or services provide only the detail they are qualified to collect and report. The discussion of these reports includes expedient techniques for gathering the required technical data. Although these report formats are designed primarily for radio transmission, they can be used for written reports and supplemented by drawings, maps, traces, or overlays. If not transmitted by radio, they should be relayed by the fastest possible means. The originator completes only those parts of the format which apply to the detected obstacle. These reports are forwarded through operational channels and monitored by the staff intelligence, logistics, and engineer sections. Also, at division level, the reports are provided to the terrain analysis detachments in order to update their data base.

Terrain reports. The purpose of this report is to provide general terrain information not available through terrain analysis. It can provide the assessment for cross-country movement, routes of concealment, and area trafficability. A sample terrain report is shown in figure 5-2.

Obstacle reports. The format for reporting enemy or unidentified minefield is provided in chapter 4. This report is used for initial observation of all other obstacles. The inclusion of incomplete data concerning enemy activity or the existence of mines, although

no details are known, is often of great value. An example is that mine-like objects appear near a road crater, but an enemy force of unknown size prevents closer reconnaissance. A sample obstacle report is shown in figure 5-3.

Bridge reports. An army must make maximum use of existing bridges. The existence and condition of bridges is essential information for tactical movement and maneuver. The bridge report confirms or denies the existence of specific bridges and provides information on their condition and capability to sustain crossings. A sample bridge report is illustrated in figure 5-4.

FIGURE 5-2. TERRAIN REPORT

ALFA	Map sheet and grid references (four grid points to outline area reconnoitered).
BRAVO	Shape of the ground, for example, flat, rolling, hilly, swampland, or mountainous.
CHARLIE	Cross-country movement (GO, SLOW-GO, or NO GO).
DELTA	Vegetation (type and restrictions, if any).
ECHO	Concealment available.
FOXTROT	Land use (rice paddies, plowed but unplanted, wheat fields, and so forth).
GOLF	Suitability of soil for digging, for example, good (no rocks), poor (rocky), and difficult (rock) given existing weather conditions.
HOTEL	Weather conditions at time of report (dry, wet, frozen, and so forth).

Bridge military load classification. Before any existing bridge can be used to capacity, it must be classified according to the bridge military load classification system. The military load class of each bridge is posted to prevent damage from overloading which may cause failure.

Classification factor. Bridge classification is basically the reverse of design procedure. Since the individual bridge members are already present, you need only to record their dimensions and strength characteristics to compute the load capacity. To determine the class of a bridge, use the following data:

- The number of members (where applicable). For example, while classifying stringer bridges and concrete T-beam bridges, note the number of stringers in each span.
- Size of members. Take exact and complete dimensions of specific bridge members.
- The span length. Measure span length from center to center of supports. The classification of the bridge is usually based on the weakest span. If the weakest span is

easy to see, you don't need to investigate further. However, if the weakest span is difficult or impossible to locate by sight, you must classify all spans. Even if several spans appear identical, you must take actual measurements to prevent error.

- The width of the traveled way. Measure the distance between the inside faces of the curb (figure 5-5 on page 5-6) to get the traveled way width.
- General condition. You must note the general condition of the bridge, especially damage from natural causes like rot and

FIGURE 5-3. OBSTACLE REPORT

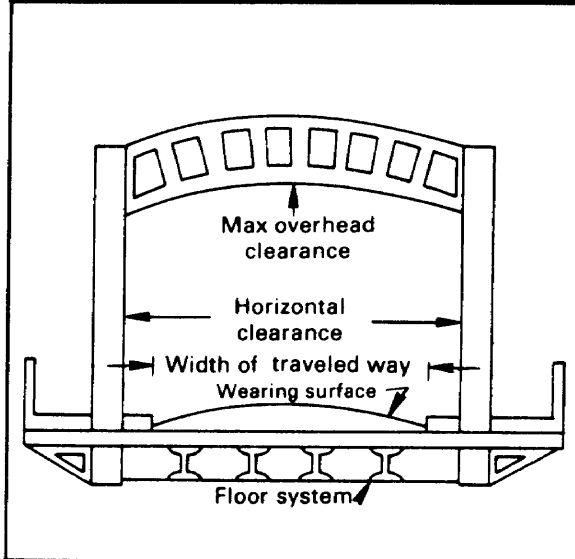
ALFA	Map sheet(s).
BRAVO	Date-time group of observation.
CHARLIE	Location (grid reference).
DELTA	Type of obstacle.
ECHO	Enemy weapons having coverage on the obstacle, if any.
FOXTROT	Any other information which could impact on breaching or bypass, for example, terrain restricts bypass, work required (in personnel-hours) to breach obstacle.

FIGURE 5-4. BRIDGE REPORT

ALFA	Map sheet(s).
BRAVO	Date-time group of observation.
CHARLIE	Location (grid reference).
DELTA	Type of bridge (number of spans, length, and type of material).
ECHO	Military load classification (one-way traffic).
FOXTROT	Military load classification (two-way traffic).
GOLF	Condition of bridge.
HOTEL	Clearance width of vehicle passage.
INDIA	Clearance height for vehicle passage.
JULIETT	Possible bypass route(s) and condition of bypass (difficult/easy).
KILO	Any other information which could impact on trafficability, for example, bridge is wired for demolition.

rust, or combat action. Classification procedures presume that a bridge is in good condition. If the bridge is in poor condition, the class obtained from mathematical computations must be reduced according to the classifier's judgment.

FIGURE 5-5. WIDTH OF ROADWAY AND CLEARANCES



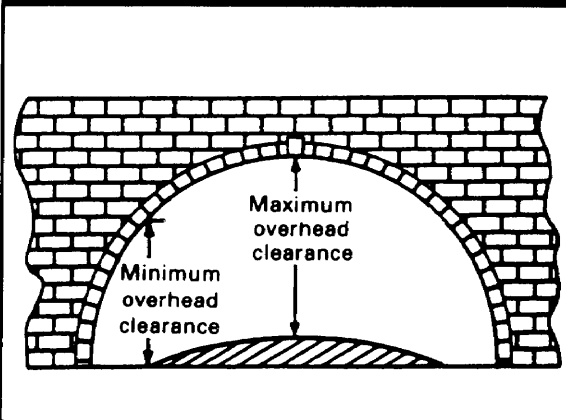
Bridge classification card. This manual lists only one bridge classification method, the Bridge Classification Card (GTA 5-7-7) found in appendix D. This card provides a rapid means of classifying bridges. Using a graphic method with several approximations, the card outlines procedures for determining the class of simple steel and timber stringer, masonry arch, concrete T-beam, and concrete slab bridges. Bridge classification with this card is based on the class of the superstructure only, since this is the controlling feature. A balanced design in the substructure is assumed.

Tunnel reports. A sample tunnel report is shown in figure 5-6 and tunnel clearance measurement in figure 5-7. Tunnel reconnaissance determines essential information about underground roadways or sections of a road which have been artificially covered.

FIGURE 5-6. TUNNEL REPORT

ALFA	Map sheet(s).
BRAVO	Date-time group information was collected.
CHARLIE	Location (grid reference).
DELTA	Length.
ECHO	Width at most constricted diameter (figure 5-7).
FOXTROT	Height at minimum height location (figure 5-7).
GOLF	Gradient.
HOTEL	Type of tunnel (railroad, vehicle, or footpath).
INDIA	Condition.
JULIETT	Bypass routes available.
KILO	Any other information which could affect trafficability including shape of tunnel bore.

FIGURE 5-7. TUNNEL CLEARANCES



Such information includes locating type, length, width, and gradient inside the tunnel. Information on obstructions in the tunnel's

liner or portals which would limit the dimensions of vehicles using the route is especially important.

BYPASSING AND BREACHING

OPTIONS

Once the obstacle is detected and reported, several counterobstacle options are available to the maneuver commander. The method of choice depends on availability of counterobstacle equipment and the tactical situation. The deciding factor is usually the urgency of the mission. The methods for passage of simple and complex obstacles include—

- Bypassing.
- Forcing through.
- Hasty breaching or reduction.
- Deliberate breaching or reduction.

Bypass. To save time and labor, obstacles are bypassed where possible. This should be done with caution, however. A bypass route that appears desirable at first may be a kill zone. Also, time spent looking for a bypass (without benefit of standoff detection means) may cause unnecessary delay. Therefore, the commander should quickly determine if a bypass would produce additional risks. If the bypass route leads forces into an ambush or kill zone situation, the bypass should not be executed.

Forcing through. Where bypass is not possible or breaching means not available, forcing through is used under special tactical situations. All obstacles can eventually be forced through, but some are more difficult than others. The latter include concrete and steel obstacles or complex fortifications. Others, such as wire obstacles, abatis, and log cribs can be overcome by forcing through. However, the possible equipment damage and casualties caused by forcing through

must be weighed against the desired tactical advantage.

Hasty breaching. This method is used when the obstacle is covered by enemy direct or observed fire. Bypass is not possible and speed is the critical factor. The objective is to create a clear path through the obstacle without loss of momentum. In some cases, the obstacle can be breached in a way that completely negates the obstacle's value. This is called obstacle reduction. In all cases, the counterobstacle task is undertaken with assets organic to the maneuver force and engineer equipment traveling with the force. When engineer forces are available, they are organized to assist in the actual breach.

Deliberate breaching. This method is preferable to hasty methods whenever time and the tactical situation allow detailed reconnaissance and additional support deployed at the obstacle. A deliberate breach is also undertaken when hasty methods have failed. The disadvantages of this method, however, are movement delay and possible enemy response.

MEANS OF BREACHING

Breaching is accomplished by using manual, mechanical, or explosive force against the obstacle. These three means of breaching or reduction can be used together or separately. There are advantages and disadvantages of each means.

Manual reduction or breaching. This is the removal or breaching by troops and is the slowest and most dangerous method. It is rarely desired because the working party is exposed to enemy direct or observed indirect fire. Assaulting foot troops use mats, planks, assault ladders, or other available equipment

to surmount wire obstacles and barriers. This is a rapid means for light forces to secure the far side of an obstacle. Antipersonnel mines will significantly reduce the speed and effectiveness of this tactic.

Mechanical reduction or breaching. Most obstacles, except extensive concrete or steel barriers, can be breached by mechanical means. Tanks or engineer equipment can destroy obstacles by force. Heavy equipment can be used to develop vehicular passage lanes. Equipment suitable for reducing timber obstacles, steel rail obstacles, and small concrete or rock obstacles is organic to combat engineer units. The M9 armored combat earthmover (ACE) and combat engineer vehicle (CEV) can destroy by impact or push aside such obstacles. Obstacles which are too heavy to be pushed aside can be breached by building earthen ramps over them or shattering them with explosives. Obstacles must be checked for mines and booby traps as these are often used by the enemy to reinforce obstacles. Radiation presents the following special situations:

- Some obstacles may consist only of radioactive contaminated areas. In some cases, foot troops or vehicles can be quickly passed through without resorting to other measures. Where contamination is too great to allow safe passage of foot troops, paths are cleared quickly by bulldozing with a combat engineer vehicle or tank bulldozer. Radioactive fallout contamination from even the largest atomic weapons is not more than a quarter of an inch deep. The contaminated earth should be removed to this depth and covered or pushed well clear of the lane or area. Scraping away fallout does not entirely eliminate radiation within the lane, but reduces it to a degree which allows swift passage of forces.
- This method should not be used in areas affected by induced radiation as this type of contamination penetrates deeper into the ground than fallout. The amount and intensity of induced radiation depends on

the location of ground zero, the yield of the nuclear weapon, height of burst, whether the device was an enhanced nuclear weapon, and time elapsed since detonation. Chemical reconnaissance personnel should advise commanders as to the locations of these areas. Terrain contaminated by induced radiation should be bypassed.

Explosive reduction or breaching. This is the quickest and most efficient means of obstacle removal or reduction and is the most common method used during hasty or deliberate breaches. It not only includes hand-placed demolition charges, but direct and indirect weapons fire, linear explosive devices, fuel-air explosive charges, and nuclear detonations as well. The successful use of demolitions depends on two factors, the type of obstacle being breached and the physical characteristics of the obstacle. Certain types of charges are more effective against certain types of obstacles. The type, width, depth, and composition of an individual obstacle system will dictate the amount and placement of the explosives. Extreme caution should be used to avoid casualties to friendly personnel from falling debris. Troops in the vicinity must be forewarned through visual signals, radio, or by firing at a prearranged time. Destruction of obstacles by direct fire or artillery fire generally requires a high expenditure of ammunition. Tanks firing high-explosive plastic ammunition or the CEV 165-millimeter demolition gun are more effective than artillery fire.

SITUATIONAL TECHNIQUES

A discussion of the methods and situational techniques in breaching nonexplosive obstacles follows. Nonexplosive obstacles that Threat forces can include in their defensive or flank protective measures include—

- Timber obstacles.
- Wire obstacles.
- Nuclear weapons effects.

- Antiairborne obstacles.
- Water and beach obstacles.
- Strongpoints and urban rubble.
- Snow obstacles.
- Icing obstacles.

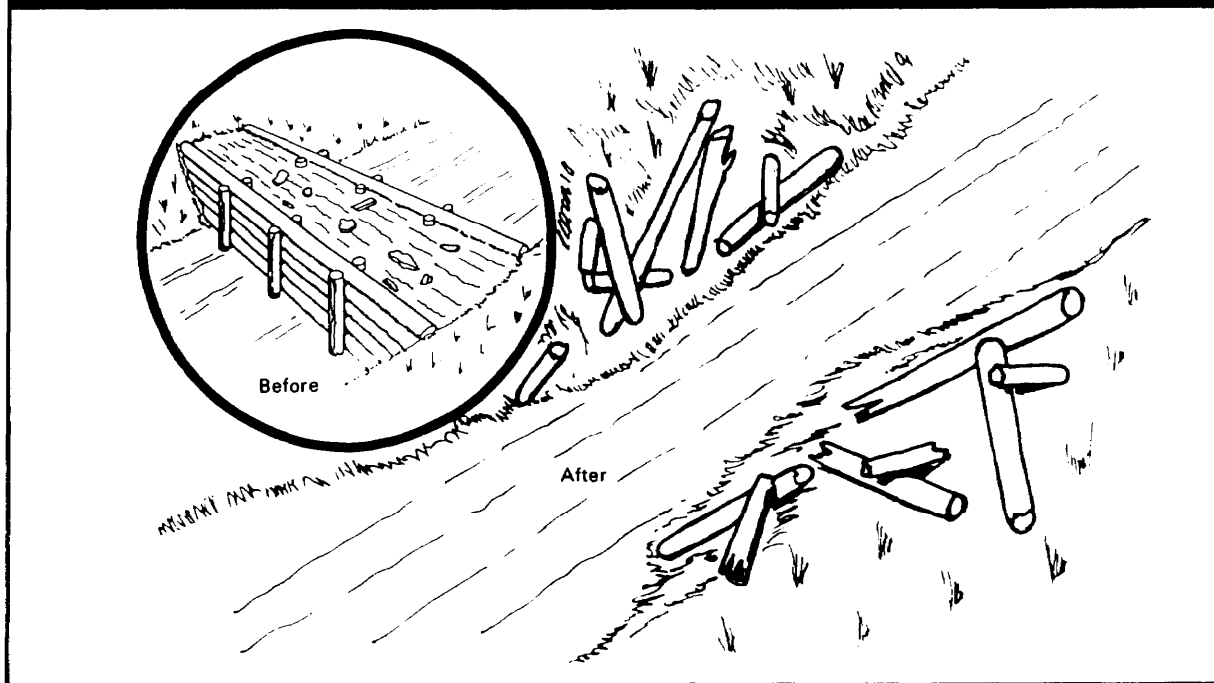
Timber obstacles. Heavily wooded areas provide an effective obstacle to vehicular movement. Log obstacles, such as abatis across roads and trails and earth-filled cribs can further decrease trafficability. These obstacles can be mined and should be covered by fire. Engineers should be positioned well forward in maneuver columns to breach or reduce such obstacles. Preferred breaching techniques are mechanical removal, destruction with demolitions, or a combination of both.

Use of demolition gun. The CEV is equipped with a 165-millimeter demolition

gun. The maximum effective range of this weapons system is 950 meters. When brought forward for breaching log cribs or abatis, the CEV crew fires its gun low at the center of mass on the target (figure 5-8). The CEV or heavy equipment with a dozer blade then mechanically pushes the remaining debris from the breach lane.

Clearance of abatis. The removal and clearance of log abatis depends on the characteristics of the fallen trees and the total depth of the timber obstacle. An abatis consisting of only several trees or trees of small diameter can generally be forced through with mechanical pushing effort. Where this is not possible, a combination of manual or explosive breaching and mechanical force is recommended. First, the fallen trunk of the tree should be separated from its base with saws or explosive charges. The remaining timber is then pushed or winched from the roadway. Figure 5-9 on page 5-10 shows the placement of concentrated external cutting charges on tree or timber obstacles.

FIGURE 5-8. DEMOLITION GUN DESTRUCTION OF LOG CRIB



Cutting timber with explosives. The following formula is used for cutting trees, piles, posts, beams or other timber with explosives as an untamped external charge:

$$P = \frac{D^2}{40} \text{ or } P = .025 D^2 \text{ where,}$$

P = pounds of TNT required.

D = diameter of round timber, or least dimension of dressed timber, in inches, and

$$\frac{1}{40} = .025 = \text{constant.}$$

The amount of explosive required to cut a round timber 30 inches in diameter using an untamped external charge is determined as follows:

$$P = \frac{D^2}{40}$$

$$P = \frac{(30)^2}{40} = \frac{900}{40} = 22.50 \text{ pounds of TNT.}$$

Concentrated charges should be rectangular, 1 to 2 inches thick and approximately twice as wide as they are high. Charges are placed as close as possible to the surface of the timber. Notching the tree to hold the explosive in place is often helpful. If the tree or timber is not round and the direction of fall is of no concern, the explosive is placed on the widest face so that the cut will be through the least thickness.

Wire obstacles. Wire obstacles are used mainly to hinder movement of dismounted troops and usually supplement other obstacles. The preferred breaching technique is through use of the CEV demolition gun (figure 5-10) or the bangalore torpedo (figure 5-11). By themselves they are generally not effective against motorized forces, although wire can stop wheeled or tracked vehicles if entangled in running gear or sprockets. Although the use of manual techniques, such as personnel ramps of wood or fencing, can be used, the

FIGURE 5-9. ABATIS CLEARANCE

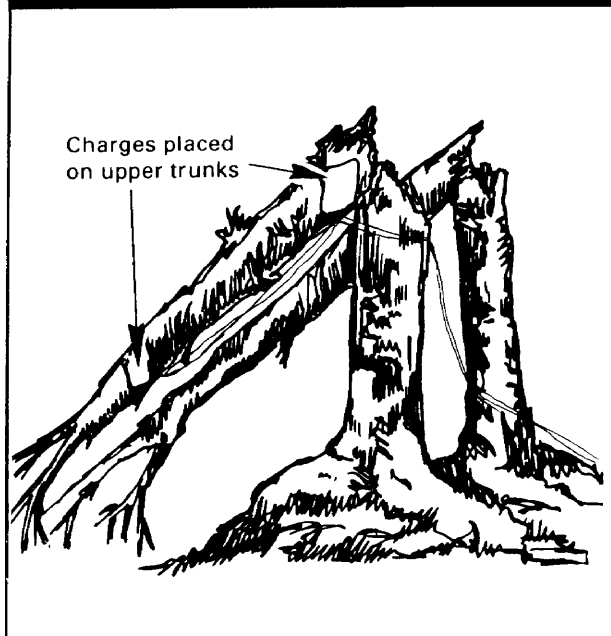
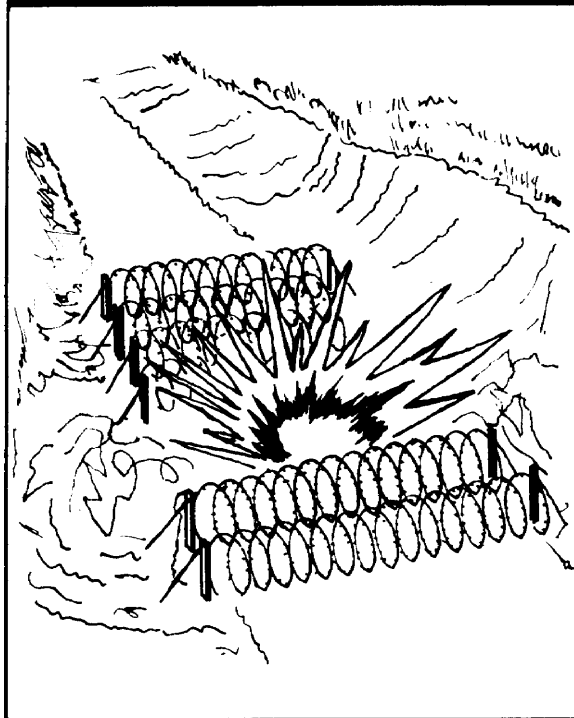


FIGURE 5-10. WIRE OBSTACLE BREACHED WITH CEV



possibility of hidden antipersonnel mines or booby traps in the wire obstacle adds additional risk. Also, mechanical breaching using the track-width mine plow is capable of swiftly breaching concertina while clearing mines in the breach lane.

Nuclear weapons effects. Large amounts of rubble in built-up areas will produce an effective obstacle that is difficult to breach. Other obstacles, such as tree blowdown will be created by nuclear weapons. Rubble and debris can be breached by mechanical or explosive means. Some rubble may require removal with a winch or tow chain. Only the minimum amount of rubble that will allow vehicles to pass should be removed. Trees blown down by nuclear weapons are often parallel-laying. The difficulty of reducing or breaching will depend on the extent of blowdown and the breast-high diameter (BHD) of the toppled trees. Coniferous trees will form a barrier of long, straight trunks with little foliage. Deciduous trees, on the other hand, will be more difficult to clear because of dense

foliage and many branches low on the trunks. Breaching over existing trafficways is emphasized to avoid clearing tree bases and stumps. Work crews and equipment operators must be suited in protective clothing when breaching contaminated rubble and debris.

Antiairborne obstacles. Antiairborne obstacles are used to deny forces the use of landing strips or zones for airborne or air assault. These could consist of obstacles previously discussed. Such combinations include abatis, wire entanglements, steel or wood posts, concrete or steel obstacles and mines. Advance reconnaissance must provide information on these obstacles. Within the context of an operation, demolition parties should be brought in as early as tactically possible to begin reduction of such obstacles. Although speed is urgent in removal operations, these mobile teams provide the only means of breaching the obstacles until mechanical and heavier demolition equipment can be landed and used.

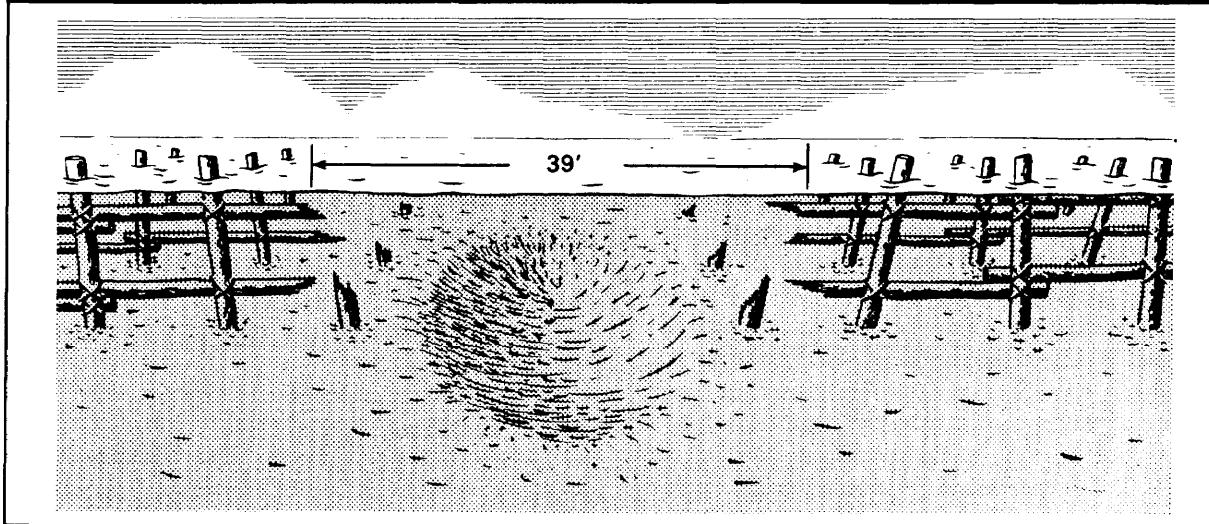
FIGURE 5-11. WIRE OBSTACLE BREACHED BY BANGALORE TORPEDO



Water and beach obstacles. Water and beach obstacles generally consist of wire entanglements, constructed beach obstacles,

mines, floating obstacles, or natural sandbars. Figures 5-12 and 5-13 show how linear breaching charges are used to destroy sub-

FIGURE 5-12. LOG SCAFFOLDING BLOWN BY BANGALORE TORPEDO



merged obstacles and sandbars. Underwater wire entanglements and natural obstacles can be breached with mechanical or explosive means. The placement of explosive charges on constructed beach obstacles is shown in figure 5-14. Floating obstacles should be reduced by destroying the anchorage only, allowing the obstacle to float or be hauled downstream. When possible, the obstacle may be removed by sinking it in place. Breaching water and beach obstacles often requires special personnel with special skills such as divers.

Strongpoints and urban rubble. A strongpoint is a well-fortified position designed to defend against an attack. Strongpoints may be encountered in all terrain environments, particularly urban, because buildings can be easily converted to hardened positions. When a strongpoint is assaulted, the area selected for penetration must be isolated from the remainder of the mutually supporting defensive system. The assault elements are organized in a manner similar to a force breaching an obstacle or minefield.

FIGURE 5-13. BLASTING SANDBAR

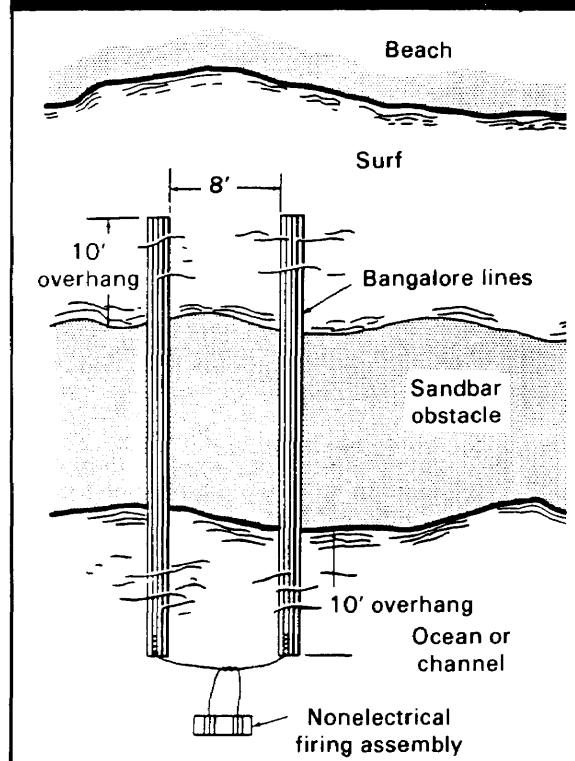
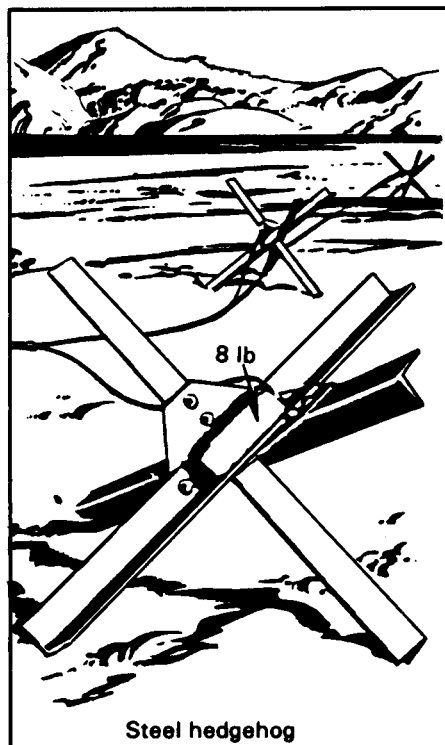
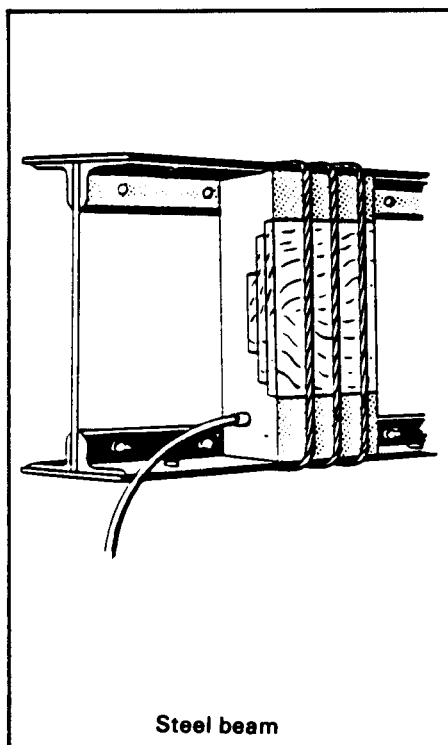
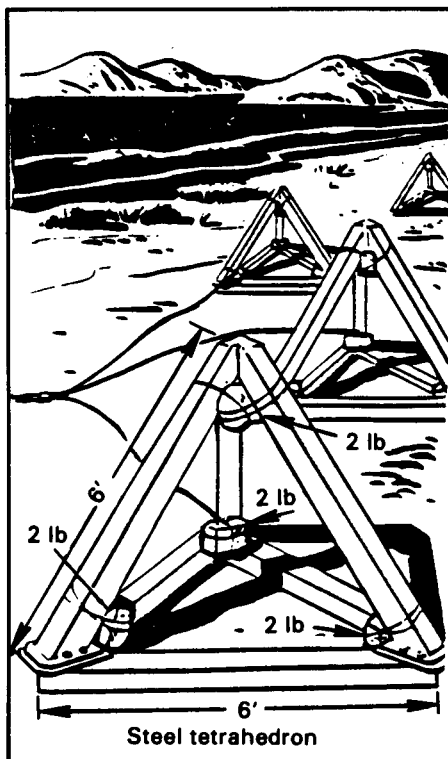


FIGURE 5-14. CHARGES PLACED ON BEACH OBSTACLES

The CEV is ideal for fighting through fortifications.

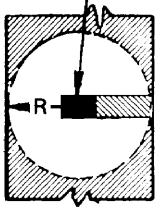
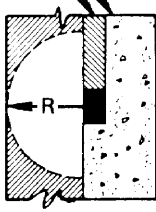
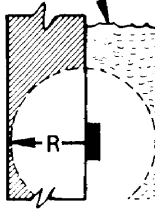
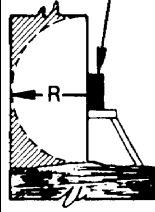
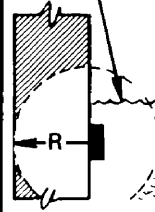
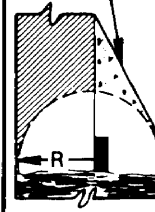
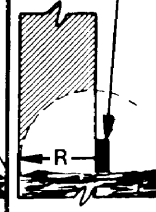
Breaching techniques. Engineers use the same techniques to breach strongpoints as they use to breach any other large obstacle system. Before the assault, forces conduct ground reconnaissance to determine breaching resources needed. Normally, those personnel conducting the breach will make the reconnaissance. After the fortified line has been breached, the route to and through the gaps must be maintained. Secondly, the captured fortifications should be destroyed by demolition or with heavy equipment. The CEV, with its 165-millimeter demolition gun, boom, winch, and blade, make it well suited for fighting through fortifications.

Use of mechanized equipment. Mechanized engineer equipment is essential for obstacle breaching missions in urban areas. The armored combat earthmover (ACE) and CEV are well suited to breaching force tasks in these environments. The ACE can remove rubble and destroyed equipment, rapidly fill craters, and clear the traveled way of roads.

The CEV can remove obstacles and rubble with its blade, winch, and boom. Its 165-millimeter demolition gun is effective against hardened obstacles. Both of these engineer systems afford limited protection against small arms fire, chemical contamination, and nuclear radiation.

Use of demolitions. Concrete obstacles, such as building rubble or bunker fortifications, can be breached using demolitions. Figure 5-15 shows the methods of placement for concrete demolition and an expedient calculation chart for determining the amount of explosives required. The disadvantage of this method is that personnel installing demolition charges are exposed to enemy covering fire. The combined arms team organizes for

FIGURE 5-15. CALCULATION OF TNT CHARGES FOR CONCRETE

Placed in center of mass 	Tamped or stemmed Fill 	Deep water 	Elevated untamped 	Shallow water 	Earth tamping 	Untamped 
C = 1.0	C = 1.0	C = 1.0	C = 1.8	C = 2.0	C = 2.0	C = 3.6

THICK- NESS OF CON- CRETE (FEET)	METHODS OF PLACEMENT						DISTANCE BETWEEN CHARGES (FEET)	
								
	POUNDS OF TNT						INTER- NAL	EXTER- NAL
2	2	8	14	16	28		2	4
2½	2	15	27	30	54		2½	5
3	4	22	39	44	78		3	6
3½	6	35	62	69	124		3½	7
4	8	52	93	103	185		4	8
4½	11	73	132	146	263		4½	9
5	15	79	142	158	284		5	10
5½	20	105	189	210	378		5½	11
6	22	136	245	273	490		6	12
6½	28	173	312	346	623		6½	13
7	35	186	334	371	667		7	14
7½	43	228	410	456	821		7½	15
8	52	277	488	553	996		8	16

C = Calculation factor

R = Radius of concrete

breaching in the same manner as for countermine or other counterobstacle activities. If possible, the assault force secures the far side of the obstacle before the breaching force employs explosive charges.

Snow and icing obstacles. Obstacles

created by mounds of snow in traveled ways delay or trap vehicles attempting to negotiate

them. These obstacles may be deep snow or compacted ice over snow. Obstacles created

by icing roads, slopes, and so forth create a temporary NO GO situation.

COMMAND AND CONTROL

PLANNING

The commander must maintain positive control regardless of the method used to overcome obstacles. Coordination and timing of the separate counterobstacle activities can only occur with good communications and a well-thought-out plan. To sustain movement momentum, counterobstacle activities must be executed violently and rapidly.

RESPONSIBILITIES

Counterobstacle activities and responsibilities are a necessary part of combined arms team operational plans. Responsibilities are divided as follows:

- Engineers (or specially-trained personnel if sufficient engineers are not available) should be organized with one squad per lead maneuver platoon. Breaching equipment should accompany these forward platoons. When necessary, additional engineers should accompany the main body to breach additional foot or vehicle lanes.
- Although infantry provides part of the assault force, they must also be trained in breaching foot lanes.
- Armor provides part of the assault force. They must also be prepared to use their tank dozers or rollers and to tow or push explosive charges.
- Supporting artillery provides counterbattery fire required to eliminate Threat artillery fires directed on breaching forces. Artillery or mortar-delivered smoke is essential to obscure the breaching effort.

- Combat service support is coordinated to allow rapid resupply and distribution during consolidation on objectives.

GROUPING OF FORCES

These forces are organized into the following three groupings:

- Support force provides the direct and indirect fire power assets required to assist the assault force.
- Assault force, consisting of infantry, armor, and engineers, is capable of accomplishing hasty attacks on the defending enemy.
- Breaching force, organized as required, provides vehicle lanes during hasty or deliberate breaches.

LANE CHARACTERISTICS AND MARKING

Breaching by mechanical methods is preferred over hand breaching. If possible, one breach per assaulting platoon should be made. The minimum number of lanes required is one per maneuver company. Surprise and limited observation by the enemy are necessary in the latter case. Breach lanes for obstacles will have the same characteristics as minefield breach lanes. These characteristics are explained in chapter 4. The unit that breaches an obstacle is responsible for marking the resulting defile or constricted route. Defiles may exist through an obstacle area, or a gap may be cleared through them. All routes or defiles are marked with standard

marking systems or with expedient material by the breaching element.

Such routes may be suitable for both tracked and wheeled vehicles. Marking should allow for separation of these vehicles onto different lanes, if necessary. When it is necessary to give advance warning of a defile or obstacle breach lane, approach and exit markings are also required. Figure 4-4 on page 4-10 shows how these areas are marked. Some obstacles require the establishment of safety area markings, such as contaminated areas. As soon as possible, fences or markers are deployed to mark the perimeter of the hazard.

OBSTACLE HAND-OFF

The flow of traffic through a breached lane is an important consideration in maintaining or regaining the momentum of movement. While developing counterobstacle plans and orders, a technique for handing-off control of

the breached lane is required. This step allows follow-on forces to quickly find the defile or lane and negotiate it. The tactical commander of the leading force can designate a guard team to remain behind in order to assure safe transfer of the site. If obstacles are detected early, guide detachments are provided by the follow-on force to remain at the breached lane or bypass and guide traffic safely to and through the obstacle.

OBSTACLE REDUCTION

Obstacle reduction is the complete destruction or removal of an obstacle and generally requires engineer support. It is undertaken to regain full use of routes and maneuverable terrain, or eliminate danger to personnel. Obstacle reduction is not generally conducted in conjunction with breaching as thoroughness and safety are the major considerations. Obstacle reduction is done with mechanical means or demolitions.

