

Viet Cong Tunnels

Author(s): Glenn H. Lehrer

Source: *The Military Engineer*, Vol. [108], No. [703], VIETNAM Commemorative Issue (2016), pp. 60-63

Published by: Society of American Military Engineers

Stable URL: <https://www.jstor.org/stable/10.2307/26357656>

---

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <https://about.jstor.org/terms>



Society of American Military Engineers is collaborating with JSTOR to digitize, preserve and extend access to *The Military Engineer*

JSTOR





# Viet Cong Tunnels

By Maj. Glenn H. Lehrer, Corps of Engineers, United States Army

*While it is generally known that the term "tunnel rat" refers to soldiers in Vietnam who search and destroy the Viet Cong tunnels, few people know much about the typical Viet Cong tunnel. During Operation CEDAR FALLS in January 1967, Army Engineers<sup>1</sup> explored, plotted, and destroyed over 10,900 yards of Viet Cong tunnels and tunnel complexes in the "Iron Triangle" of South Vietnam. The engineers found the construction of these tunnels ingenious and their uses imaginative. It was necessary to devise special techniques for their detection, exploration, and destruction.*

## CONSTRUCTION AND FEATURES

The Viet Cong require very few tools and little training for the construction of their tunnel complexes. Labor is normally provided by workers who actively support the Viet Cong movement, and by civilians who have been charged taxes by the Viet Cong in excess of their financial means and are forced to work out the assessment. Sandbags or baskets are used to carry the dirt from the dug face to the nearest exit. "Bucket-brigade" techniques speed the operation. Disposal exits are dug every 100 to 200 feet to limit the extent of the bucket brigade and the number of laborers to man it. These disposal exits are closed and sealed off after the tunnel face has gone far enough beyond them. Reed mats covered with mud are used to conceal the disposal exit on the inside of the passageway. Most of the structures are not reinforced because the cohesive soil of the areas and the root network of the dense vegetation provide the

strength required. There are few tunnels in areas of little vegetation and noncohesive soil, but where they do exist they are reinforced with timbers, logs, and bamboo. To avoid detection, the spoil is rarely piled near a disposal exit. Instead, it is either dumped in a nearby stream or spread in thin layers under trees at a distance from the exit. In a short time vegetation covers the newly spread earth.

Since rain and flood conditions could make death traps of the tunnels during the monsoon season, the Viet Cong have all but eliminated this threat by placing entrances and air holes on high ground. Wherever possible, they locate the entire complex above the local ground-water table. Where this is not possible, passageways of upper levels are sloped to entrances of lower levels so that any water seeping through the walls of tunnels or into air passages will fill the lower levels first.

Entrances and air holes are cleverly concealed at the bases of trees, in thick underbrush, under logs, or even in the sides of wells. In some instances openings have been found underwater in the bank of a river or stream.

When an entrance to a tunnel is found, it is often difficult to enter because it is usually built for Vietnamese users and is no more than 18 inches in diameter. This is why the smallest soldiers are selected as tunnel rats. Beyond the entrance the passageway (which expands to about 2 feet wide and 3 feet high) consists of a series of straight sections 20 to 50 feet long, joined at various angles to one another, forming a zigzag trace. This pattern is advantageous in hiding the Viet Cong from observation while escaping, and protecting him from shock waves caused by explosives dropped into the tunnel, from shrapnel of detonating grenades, and from projectiles of direct-fire weapons. It also makes it easier for him to ambush tunnel rats during their search.

The tunnels found during Operation CEDAR FALLS were at an average of 20 feet below ground surface, and had more than one level or depth. The upper level is used as the main travel route whereas lower levels serve as hospitals, as living, hiding, and

(Left) Military land clearing in the thick vegetation of Vietnam is a major operation in uncovering hiding places and tunnels of the Viet Cong. Ambush sites and tunnel complexes thus are denied to the enemy. (Below) Team Member at Exposed Tunnel Entrance Receiving Information Telephoned by Tunnel Rats Inside



training areas, and for numerous more permanent purposes.

The entrances to the lower levels are usually cleverly concealed trap doors in the floor of the upper level. They are difficult to find even using probing techniques. These doors are commonly made of wooden or metal wash pans or wood framework. Each hole made in the floor is shaped like an inverted cone frustum, with the sides of the hole conforming to the shape of the pan or frame with the small bottom end closed. The sloped walls of the hole receive the pressure of the pan or frame sides when someone steps on top of it and thus prevent it from collapsing. To conceal the trap door, the users fill the pan or frame slightly more than level with dirt prior to being emplaced. Once through the hole, the user replaces the "door" and taps the bottom several times to shake the extra dirt into the lips of the hole and thus conceal it.

In some instances tunnels seem to come to a dead end. This is a dangerous situation, for usually a trap door will be near the end of such a tunnel and will lead to the area below the passageway and up on the other side of the tunnel face. There is probably a hole in the tunnel face through which the enemy may observe the searcher coming down the dead-end tunnel. The Viet Cong will wait on the other side of the tunnel face and shoot those who are following him.

Entrances are usually some 150 to 900 feet apart (straight line distance) which means that the irregular trace of the tunnel is much longer. Air holes are placed every 100 to 200 feet.<sup>2</sup>

Rooms are sometimes found in tunnel complexes, especially in the lower levels and in tunnels which are for more permanent use. Rooms discovered in the Iron Triangle usually measured 5-by-5-by-5 feet. The dimensions are limited by the type of soil in which they are dug and by their depth.

## USES

Among the many uses served by these underground mazes, probably the most common is to provide cover and concealment for Viet Cong soldiers, political cadres, and leaders. Headquarters can function, training may continue, and hospitals can care for the sick and wounded 24 hours a day. It takes almost a direct hit with a 750-pound bomb to collapse a tunnel 20 feet below the ground surface. In the Iron Triangle, 750-pound bombs from B-52 bombers hit within 50 yards of one tunnel passageway and did not noticeably affect it. Tunnels are used to store rice, weapons, and ammunition. Rice is sometimes buried in the floor of the tunnel in covered baskets with a thin layer of dirt over the top. Water is stored in motor vehicle inner tubes. Almost every tunnel entered during CEDAR FALLS yielded some of these stores in quantity plus many documents.

Small fires are used for cooking near air holes in some rooms. Candles or diesel lamps provide light. Some of the enemy chased out of tunnels in the Iron Triangle had not seen the light of day for two weeks or more.

In addition to providing cover, concealment, and secure areas for the support of guerrilla operations, some tunnels are used as concealed escape routes after ambushes or attacks on allied forces. Two tunnel complexes were discovered that were built for this purpose. Each complex was along a main avenue of approach and the actual firing positions were entrances to a branch of the main

tunnel, which provided an excellent escape route for the ambush units. These two tunnel complexes differed from the others, having more than their share of entrances, fewer rooms, and fewer levels.

Tunnel complexes built primarily for escape and shelter are found in Viet Cong controlled hamlets. They consist of many separate one-level tunnels with one room usually for each hut in the hamlet. An entrance to the tunnel is commonly concealed somewhere in the house and an exit is generally some 50 to 150 feet away on the edge of the village. The exits are well concealed because they may be the only means of escape when a hamlet is surrounded by allied troops. One favorite place for an exit seemed to be the side of a well. The room in the tunnel provides protection and shelter for the family of the house if the Viet Cong decide to try to hold the village and it is subjected to artillery and small-arms fire.

The most extensive and the rarest type of tunnel complex could be termed a communication facility. It is used for Viet Cong headquarters, hospitals, political cadres, troop training, infiltration routes, and, in some cases, supply routes. It consists of many levels and rooms. Some of these complexes are miles in length. One found during CEDAR FALLS was 6 miles long.

## DETECTION

The first step in operations against tunnels is to find them. If one entrance is found and the tunnel complex is continuous, the rest of the entrances can usually be discovered. But the first entrance is the difficult one to find. Captured Viet Cong and local civilians are good sources of information on this subject. Another source is the American soldier who uncovers a hole in the ground while on a search-and-destroy mission. When an entrance or air hole is found, smoke generators are used to blow smoke through it into the tunnel. Observers are posted in the area to watch for smoke coming out of other holes. When new holes are spotted, they are marked and sealed so that the smoke cannot escape. This quick method of finding holes and entrances shortens exploration time, allowing teams of tunnel rats to enter the complex from several points simultaneously. This is also a good method of smoking out the Viet Cong from their hiding places. However, the usefulness of this method is somewhat limited. The small generator is effective in tunnels up to only 50 yards long and the large generator in tunnels up to only 500 yards, and the smoke must be cleared out before troops may enter even wearing protective masks. Also, the enemy may plug the tunnel, and the generator is then useless. Smoke grenades, unless used with an air blower, are ineffective in all but very short tunnels and shelters.

## EXPLORATION

The work of the tunnel rats, with or without smoke, is to search, clear, and plot the tunnel complex. This is done by reporting by telephone to engineers on the surface the distance and direction of each leg of the tunnel and anything significant that is found. The tunnel rat must be observant and alert to avoid booby traps and ambush, and to be sure not to miss a trap door to a lower level or pass up a concealed supply cache.

The 173d Engineers employed two-man tunnel-rat teams. The first man carried a hand telephone and a compass. The second man





Blowing Up Entire Tunnel Complex with 1,500 pounds of TNT. The Complex was Next to a Main Road in the Iron Triangle

carried a roll of communication wire. Both men carried bayonets for probing, flashlights, smoke grenades, pistols, and protective masks. Each team should have at least two men at their entrance to the tunnel — one to keep contact with the team via telephone and the other to record the team findings, distances, and directions. The difficulty of crawling long distances in narrow tunnels with all this equipment makes it necessary to relieve the teams every hour or so. When a team emerges from a new exit, smoke grenades are used to reveal it to observers. A guard should then be set up near it. Viet Cong have been known to use searched sections of tunnels even while the exploration continued.

## DESTRUCTION

There are several methods of destruction and denial of tunnel complexes. For tunnels within 10 feet of the ground surface, acetylene generators, air blowers (smoke generating devices), and a small explosive charge are used. The acetylene from the generators is forced into the tunnel by the air blower, with all tunnel openings sealed, and a small explosive charge is set off inside, which detonates the acetylene-oxygen mixture causing collapse of the tunnel. For tunnels deeper than 10 feet, explosive charges are placed in series at 100-foot intervals on the floor. Between these charges one or more 1-pound charges are placed, with sacks of a powdered riot-control agent on top of them. When the chain of explosives is set off, the tunnel collapses at 100-foot intervals and riot-control chemicals are blown into the walls between the collapsed sections. The chemical remains effective for from two weeks up to six months, depending upon how well the tunnel is sealed by the main charges. The 173d Engineers found that 2 pounds of TNT per foot of overburden concentrated at one point would collapse a tunnel in all soils encountered. These methods may be used in combination as necessary to destroy or deny use of the structures.

## FUTURE NEEDS

Many new techniques are being explored for making the job of tunnel detection, exploration, and destruction easier. Possibly old tunnel complexes could be detected by airphoto interpreters finding changes in vegetation or soil coloration and shading patterns. Seismic detection devices similar to those used in geological exploration and instruments such as mine detectors modified to sense changes in density below the ground surface at depths of 50 feet are being studied. Exploration of tunnels would be easier and safer if tunnel rats could be equipped with infrared devices instead of flashlights which give away their position to the enemy. A radio transmitter-receiver for communication would eliminate the need for heavy and cumbersome telephone equipment inside a tunnel. This device could also be developed to provide a vertical fix on the tunnel rats so that their exact position could be known at all times.

The construction, concealment, and use of tunnels is one of the best indications of the ingenuity of the Viet Cong. As trenches in World War I and land and sea mobility in World War II were major elements of those wars, so the Viet Cong tunnel complexes are an important part of the Vietnam conflict. These complexes have afforded the Viet Cong secure and protected areas from which to operate. But the American Engineers, using imagination, ingenuity, and improvisation, have found effective methods to detect and deny to the enemy the use of his unique underground facilities.

TME

<sup>1</sup> 173d Engineer Company (Separate) of the 173d Airborne Brigade (Separate).

<sup>2</sup> It has been reported that the Viet Cong use small burrowing animals to dig their air holes. The animal is held in a cage which is opened on top and placed against the roof of a passageway. Supposedly the animal will dig his way to freedom on the ground surface and thus provide a very natural-looking air vent for the Viet Cong. The 173d Engineers found no evidence to support this theory.

First published in *The Military Engineer*, July-August 1968.