HEADQUARTERS
UNITED STATES MILITARY ASSISTANCE COMMAND, VIETNAM

STRATEGIC/TACTICAL STUDY
PREPARED BY ACofS, J-5
MARCH 1968

UNCLASSIFIED
ORDER SEC ARMY BY TAG P223
23 OCT 1975 7514111
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FOR THE COMMANDER:

s/ WALTER T. KERWIN, JR.
Major General, USA
Chief of Staff

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STUDY OF THE COMPARISONS BETWEEN
THE BATTLE OF DIEN BIEN PHU AND
THE ANALOGOUS KHE SANH SITUATION

1. PROBLEM: To provide an analysis of the Viet Minh/French battle of Dien Bien Phu (1954) as a basis for ascertaining that all actions for countering the NVA have been undertaken by the Allies with regard to the analogous Khe Sanh situation.

2. ASSUMPTIONS:
   a. The thorough study of the basic strategy, tactics and techniques employed by the Viet Minh in the Battle of Dien Bien Phu (1954) will provide indications of the strategy, tactics and techniques which the NVA/VC may use at Khe Sanh.
   b. That nuclear weapons will not be employed in connection with the battle at Khe Sanh.

3. FACTS BEARING ON THE PROBLEM:
   a. Although this report is cast in the Secret classification, as are the inputs thereto, access to other information was afforded. The conclusions depicted herein are not prejudiced by the exclusion of information of a higher classification. Accordingly, the data has been restricted to the Secret level to accommodate appropriate dissemination.
   b. Developments at Khe Sanh, coupled with the "TET Attacks" throughout South Vietnam, demanded an immediate promulgation of conclusions pertinent to the situation. Conditions prevented the accomplishment of a detailed on-the-spot analysis of the Khe Sanh defenses. Notwithstanding this omission, sufficient data was gathered and verified by a committee member visit to III MAF to support the conclusions.

4. DISCUSSION:
   a. POLITICAL/PSYCHOLOGICAL CONSIDERATIONS:
      (1) General Giap continues to emphasize the need to precipitate political/psychological reactions. His strategic philosophy leading to the battle of Dien Bien Phu was as follows:
         (a) The war against the French was to be won in France and in the court of world opinion.
         (b) The purpose in fighting a battle was to gain political and psychological advantage.
b. **DIEN BIEN PHU:** (A detailed history of Dien Bien Phu is at Annex A).

(1) Viet Minh strengths were:

(a) Detailed planning and preparation for the operation.

(b) Meticulous attention to camouflage and concealment.

(c) Concentration of mass and firepower against limited objectives in a progressive, systematic manner.

(d) Consistent use of coordinated secondary attacks.

(2) Viet Minh weaknesses were:

(a) Vulnerability to counter attack.

(b) Demoralizing effect on troop and subordinate leaders of mass losses of personnel.

(3) French failures included:

(a) Inadequate logistic support resulting from an insecure land line of communication and insufficient airlift for an air line of communications.

(b) Failure to control or neutralize key terrain in the battle area.

(c) Failure to provide security to the area of operations through intensive small unit patrolling.

(d) Poor field fortification construction.

(e) Insufficient artillery pieces and tanks.

(f) Ineffective counterbattery fire.

(g) Inadequate and inefficient close air support system.

(h) Inability to counterattack or to take offensive action.
c. KHE SANH AS VIEWED FROM THE DIEN BIEN PHU PERSPECTIVE:

(1) INTELLIGENCE (A Summary of Enemy Situation is at Annex B).

(a) The major goals of North Vietnam remain the unification of all Vietnam under control of Hanoi through any and all of the following means: a general uprising of the people of South Vietnam; the destruction and/or erosion of the RVNAF; the weakening of the will of the Free World Forces to resist NVA political/military offensives; a major defeat inflicted on the Allied forces, especially an American unit.

(b) Tactically, Giap seeks to destroy or neutralize the Allied air capability, to disperse and tie down Allied ground forces into individual defensive zones and, at his choosing, to attack with superior mass to destroy individually these mutually unsupportable forces.

(c) While the increasing tempo of Allied efforts is progressively reducing Giap's overall combat effectiveness in South Vietnam, the main battle force of the North Vietnamese Army is still available to him. Since Giap has no competing need for these forces he is capable of introducing this force to battle in South Vietnam. Giap is credited with the following military capabilities:

1. He can renew attacks within South Vietnam's urban areas.
2. He can conduct coordinated attacks in the DMZ.
3. He can conduct coordinated attacks both in the DMZ and the urban areas of South Vietnam.
4. He can commit his reserves to other selected, less heavily defended areas.

(d) Should Giap apply his Dien Bien Phu approach the scenario would be somewhat as follows:

1. He would see Khe Sanh as an enemy airhead somewhat isolated in the manner of Dien Bien Phu but not out of enemy supporting range. Presently there is no enemy land LOC but one could be provided in time and at substantial cost.
2. He would concentrate considerable effort at the outset, to the task of knocking out the air LOC.
3. He would attack air bases in the enemy rear and would destroy the Khe Sanh airfield.

4. He would employ great numbers of AA fires especially on the approaches to the airfield to gain control of the air over the approaches to the drop zone and the drop zone itself.

5. He would employ direct and indirect fires on the drop zone with the intention of making it difficult for the defenders to retrieve the supplies dropped.

6. He would use the same meticulous camouflage and concealment procedures. The surrounding hill masses and cover provide essentially the same environment used at Dien Bien Phu; he would emplace substantial artillery, rockets and mortars, and ample stocks of ammunition.

7. He would use what concealment benefit is afforded by the elephant grass to tunnel in and to hide his attempts to come in close, hug the camp and construct forward bunkers.

(2) FRIENDLY OPERATIONS: (Summary of Friendly Operations is at Annex C.)

(a) The Allied defensive forces at Khe Sanh are generally located within the vicinity of the airfield fire support base with some forces on the hills to the west and in the valley approach north of the airfield.

(b) The Khe Sanh basin is smaller than that at Dien Bien Phu, the hills are closer in and the basin itself is not flat.

(c) From within the Khe Sanh area, actions would include the:

1. Maintenance of defensive positions, bunkers, protected artillery emplacements, runway, drop zones and supply levels.

2. Conduct of counterbattery fire with in place weapons and direction of supporting fires as appropriate.

3. Conduct of surveillance and reconnaissance to locate enemy positions and to identify movements of enemy forward elements toward the camp.

4. Prevention of enemy attempts to evade air and artillery fires by his moving in and strangling the camp and hugging the positions.
5. Conduct of counterattacks within the battle area and support of counterattack forces employed from outside.

6. Providing of control of the battle area and tactical coordination with supporting forces.

(d) Operations from outside Khe Sanh would include:

1. Conduct extensive air (and other) reconnaissance to locate enemy concentrations, artillery positions, commanding terrain occupation, movement toward the camp and other dispositions, to include stocks, throughout the area.

2. Conduct extensive and continuous air strikes to destroy enemy concentrations, artillery positions and deny enemy exploitation of ammunition and equipment; interdict influx of materiel and personnel into the area; prevent advancement of enemy forces to forward positions; apply all varieties of ordnance as the situation requires exclusive of nuclear weapons.

3. Conduct suppression fires using a variety of ordnance to destroy enemy surface-to-air capability, to include AAA.

4. Impose and operate, as an extension of the battlefield control exercised from within the fire support base, a highly reliable target acquisition system coupled with an instantaneous strike reaction system. Objective is to respond immediately to incoming fires using combined ground and air counterbattery fire.

5. Impose effective command and control of the air/ground environment to insure maximum utilization of resources and implicit integration of weapon systems. In consideration of limiting factors (confined area; competing weapon systems; terrain, weather and time; replenishment of ordnance, speed of application, etc.) apply maximum fire power in all time periods.

6. Prepare offensive plans and forces to encompass entire objective area for counterattack, reinforcement and to take battle to the enemy and destroy his major forces.

7. Insure continued operation of the air LOC and make preparations to open the land LOC should the tactical situation so dictate.

(3) FIREPOWER GROUND: (Summary of Firepower Artillery is at Annex D).

(a) Estimates of enemy OB indicates a three to one ratio in his favor of artillery and mortar pieces when compared to the Khe Sanh fire support base itself. Also, enemy guns are dispersed, hidden and dug in.
(b) Support fires for Khe Sanh can be provided from Camp Carroll and the Rock Pile, which address this imbalance somewhat. Within Khe Sanh is deployed an appropriate balance of artillery to the forces employed in the fire support base.

(c) The success of Allied counterbattery fire (or air attack) will be influenced, as it was with the French, on the ability to acquire targets quickly and the effectiveness of the fire against well protected enemy positions. These same difficulties experienced by the French have not been completely overcome.

(d) The difficulty of protecting artillery in place in Khe Sanh from extensive enemy bombardment is not dissimilar to the French situation. The consistency of the soil in the Khe Sanh base area is more amenable to defensive structures and the acquisition of construction materials competes with other supplies.

(4) FIREPOWER AIR: (Summary of Air Firepower (U) is at Annex E).

(a) The major limitation regarding the amount of air firepower which can be applied in the immediate Khe Sanh area is the airspace available - the number and type of air strikes which can be fitted into this area at any one time. Adverse weather, difficult terrain, the need to mark some targets and FAC - in strikes, the need to control air cargo flights, the need for artillery fire, etc., all compete for air time and space in the area. Effective command and control of the airspace to insure maximum continuous utilization of resources is essential to the prebattle efforts of locating and destroying the enemy as he attempts to entrench, and to the eventual conduct of the battle itself. The Allied system and the supporting communications is by far superior to that of the French.

(b) Air delivered ordnance (fixed wing and helicopter) of various types are available from many locations (also CVAs) outside the Khe Sanh area and applications can be tailored to specific tasks and rapidly modified and applied to the changing tactical situation.

(c) The enemy faces an entirely different weapon system than in his fight with the French. Within this Allied air/ground fire power instrument lies the potential for exploiting the major enemy vulnerability - his entrenchment for a conventional set piece battle and his inability to react effectively in the face of superior firepower and forceful counterattack. A potential exists to reverse the environment and force the enemy into defensive pockets.

(5) LOGISTICS: (Summary of logistics and LOCs is at Annex F.)
(a) The potential land LOC is highway 9 running east from Khe Sanh, presently interdicted. Estimates indicate it would require 14 Engineer Battalion days to open it in a secure environment. Security for this operation would depend on the enemy's determination to keep it closed; it could require a major effort by allied forces.

(b) The air LOC is short and the system is capable of delivering quantities of supplies in amounts and types far greater than anything the French could achieve. To be effective throughout the battle, however, control of the air over the approaches and drop zones is essential should the use of landing aircraft and helicopters become prohibitive.

COMMUNICATIONS: (A Summary of Communications-Electronics is at Annex G.)

(a) Communications into Khe Sanh itself exceed 50 times that available to the French.

(b) Throughout the area, the forces are well equipped with communications and electronic equipment, both quality and quantity, to control the environment, direct counterbattery fire and air strikes, control the airspace, provide air navigational and advisory service and conduct all weather operations.

5. CONCLUSIONS:

a. Notwithstanding certain political and physical similarities with the Dien Bien Phu situation, there are two major dissimilarities which face Giap at Khe Sanh: Firepower and Support.

(1) FIREPOWER:

(a) He faces firepower of many magnitudes greater than the French could muster, the bulk of which would come from outside the Khe Sanh base. The 16 175mm guns from the Rock Pile and Camp Carroll can support the area and provide counterbattery fire. These guns can be augmented.

(b) He faces a very sophisticated air environment with effective communications and a proven all weather delivery capability. Tactical and strategic air ordnance of many types, tailored for each task, can be delivered in magnitudes which far exceed anything available to the French.
(c) Gun ships are available and capable of providing a variety of ordnance in close-in attacks.

(d) Although the airspace available in the specific battle area is limited, effective command and control of the air environment will permit extensive application of strikes on a continuing basis.

(2) SUPPORT:

(a) Allied logistics and reinforcing capability is far greater than the French effort. Aircraft have increased load carrying capacity and an improved low and high altitude drop technique.

(b) The LOC is shorter.

(c) A land LOC can be opened if tactically required.

(d) An air mobile reinforcing capability exists which could assault the enemy outside the Khe Sanh perimeter.

b. Although the air LOC will be forcefully challenged and the enemy gun positions will be difficult to locate and destroy - as it was with the French - the firepower and support capability throughout the general area, of which Khe Sanh is one part, breaks the analogy with Dien Bien Phu. Nevertheless, significant similarities do exist which warrant concerted attention.

s/ WESTMORELAND
General
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OFFICIAL:

s/ DARROW
   J5
ANNEX A to STRATEGIC/TACTICAL STUDY

STUDY OF DIEN BIEN PHU BATTLE

A. INTRODUCTION

In order to understand fully the Battle of Dien Bien Phu, it is best first to go back and examine some events that occurred in 1950.

Up until that time the Vietminh, the communist controlled nationalist movement, had confined its activity to guerrilla warfare. However, with the arrival of the Chinese Communists on the Kuangsi border in 1949, the Vietminh had gained an outside base and source of supplies. This support enabled them to establish the Vietnamese People's Army. The heart of the VPA was the Main Battle Force, which was organized for conventional operations. Initially it consisted of five large divisions. These, however, were weak in firepower and in 1950 they were poorly trained.

At that time the French in North Vietnam were concentrated generally in the Red River Delta around Hanoi, having lost control of much of the surrounding countryside. The Vietminh had established firm control of the area to the north. The French, however, had retained a series of isolated outpost garrisons in an exposed position along Colonial Route 4 which runs parallel to the Chinese border. These were connected to the Red River Delta by a single road running through Lang Son.

B. BACKGROUND

Giap's first major use of his Main Battle Force was to conduct a series of attacks on these positions. In the fall of 1950 he successfully cut them off, overran some, and entrapped relief columns. This resulted in a complete rout of the forces involved and demoralization of the French forces as a whole.

In December 1950 General De Lattre was dispatched from France to regain control of the situation. He rapidly reestablished discipline, reorganized the forces, and developed a new concept of operations.

To secure his base he constructed the De Lattre Line surrounding the Delta. This was a well-organized, fortified position which included some 900 mutually supporting pillboxes backed up by medium and heavy artillery. De Lattre's concept was that this would serve as a secure base from which to launch offensive operations.

Spurred by his success against the Frontier Posts, Giap in January 1951 undertook an attack to seize Hanoi. He attacked the well-prepared French positions in the vicinity of Vinh Yen with two of his fledgling divisions. They were no match for French firepower and, predictably, were sorely taken to task. The French counterattacked but were unable to keep up with the lighter, more mobile Vietminh.
Undaunted, Giap two months later launched another attack, this time with three divisions in the vicinity of Mao Khe with the objective of seizing Hanoi. Once again the Vietminh met with disaster at the hands of French firepower.

Still undeterred, Giap, after a two-month pause, launched a third three divisional attack against the De Lattre Line, this time along the Day River line. Although this attack was accompanied by commitment of two regiments of irregular forces to attack the French rear, the results were the same -- devastation of the attacking force. Giap then withdrew to the north and contemplated the situation.

Both sides derived certain lessons from these battles. Giap recognized that his lightly equipped and semi-trained divisions were no match for French firepower. He would, therefore, revert to guerrilla and peripheral warfare, employing irregular forces against enemy strength and his Main Battle Forces against enemy weakness, and committing his forces only where there was a high assurance of success. For the next year he conducted operations in the Thai Highlands and Laos.

To the French the learning point was that the secret of success lay in causing the Vietminh to attack well-prepared positions where French firepower could be brought to bear, to set up a series of small Verduns and let the enemy bleed himself white. This has come to be known as the "Illusion of Vinh Yen," and this philosophy permeated French thinking for the balance of the year.

While Giap maneuvered in the highlands and Laos, the French tried futilely to develop situations which would induce the Vietminh to attack French strength. Giap did not take the bait.

General Navarre arrived in Indochina in January 1953. His mission was "above all else, to preserve the French Expeditionary Force, and at the same time, if possible, to protect Laos," which has recently become a separate state in the newly created French Union.

Navarre had at his disposal a force of 420,000, which included the 200,000-man embryonic Vietnamese National Army. The balance was composed of French Regular Army, Colonial Troops, and French Foreign Legion.

By this time Giap's forces were some 520,000 strong. They included some 400,000 Popular and Regional Forces troops and the 120,000 man Main Battle Force, which by this time was made up of nine infantry divisions and one heavy artillery engineer division. The forces received support from the bulk of the population.

The campaign which culminated in the battle of Dien Bien Phu had its genesis in the summer of 1953. Each adversary at this time developed his campaign plan.
ANNEX A to STRATEGIC/TACTICAL STUDY

The Navarre plan, really a concept of operations, consisted of undertaking offensive operations aimed at fixing and destroying the Main Battle Force, and concurrently conducting major counterguerrilla operations to clear the Delta.

Giap’s plan, later called the Winter-Spring Offensive, provided for conducting operations to cause Navarre to disperse his forces so that:
(1) the Main Battle Force might isolate and destroy a major French force, and
(2) the Delta might be so weakened that it could be taken either by guerrilla operations from within or by conventional assault. Concurrently, he would increase irregular operations throughout Vietnam to fix and weaken French forces.

During the summer and fall Navarre conducted a series of offensive operations but failed to make contact with the Main Battle Force or to lure it into battle.

C. PRELUDE TO BATTLE OF DIEN BIEN PHU

In the fall Navarre considered two general courses of action: Conduct a major offensive north from the Delta into Giap’s base area or seize a position deep in Vietminh territory that would invite battle. The former lacked decisiveness. Giap might characteristically refuse battle and harass the French rear. Navarre chose the latter course, which resulted in Operation CASTOR, the seizure by airborne assault of Dien Bien Phu, and the establishment of an airhead as a base from which to conduct offensive operations.

Dien Bien Phu, some 190 air miles from Hanoi, was chosen as the objective for the operation because it was the hub of the communication net in the Thai Highlands. It was situated along one of the main Vietminh north-south supply routes from China and on the main east-west invasion route into Laos. It also was the only open area of any size in the Thai Highlands.

On 20 November 1953 the operation was launched and the objective seized. Giap reacted with the immediate dispatch of one division to Dien Bien Phu, to be followed in a few days by three more including his heavy division.

Although Giap’s forces were concentrated at Dien Bien Phu by 25 January 1954, he deferred his attack until mid-March. Rather, he continued with his plan to disperse the French Forces. Between November and January he initiated three major advances: one in southern Laos, one in the Central Highlands, and one into northern Laos. Navarre reacted in each case by throwing a major blocking force in his path (Seno; Luong Pro Bang - Muong Soi; Pleiku). For reasons which remain obscure, Navarre abetted Giap’s efforts to disperse French forces by electing to conduct a sizable amphibious operation in the vicinity of Tuy Hoa at the same time. Giap chose to ignore it. Thus by the beginning of February Navarre’s forces were scattered in six different
locations, each out of supporting distance of the others. Giap chose Dien Bien Phu for destruction.

D. THE BATTLE OF DIEN BIEN PHU

Dien Bien Phu is located in an open valley 16 km long by 6 km wide. It lies deep in heavy jungle country and is surrounded on all sides by rugged mountains 1,000 to 1,400 meters in altitude. It was serviced by one primitive road running to the east and by jungle trails running to the north, south, and west. There was an old dirt airstrip in the upper part of the valley and an auxiliary airstrip in the southern portion.

As for weather, the monsoon season normally arrived beginning in April and lasted through the summer. The two months preceding were generally attended by low clouds, poor visibility, and fog which developed during the night and remained until late morning.

The French airhead initially had a strength of 11,000 and included thirteen infantry battalions. During the siege over 4,000 reinforcements were parachuted into the airhead, but the strength at any one time never rose much over 13,000. French volunteers continued to be parachuted into the airhead until a few days before the end.

Although the stated concept specified that this would be a base for the conduct of offensive operations, the impact concept which permeated all thinking was to establish a firm base of French firepower on which the Main Battle Force would impale itself. The "Illusion of Vinh Yen" persisted.

The French position was organized in the center of the valley and consisted of a number of mutually supporting strong points organized for defense against ground attack. The primary position was centered on the main airstrip. One strong point was situated 6 km to the south adjacent to the auxiliary airstrip. And to the north were three outlying positions organized on the low ground along the valley approaches.

The surrounding high ground which rose from the valley floor 3-4,000 meters from the airstrip (1,500-2,000 meters from the edge of the French positions) was not occupied.

Each of the strong points consisted of a number of mutually supporting fortifications. In general the position was poorly constructed. The field fortifications were shallow, unrevetted earthworks with dirt parapets. Communication trenches were inadequate. Although the commander directed that the position be prepared to withstand light artillery bombardment, for a variety of reasons little overhead cover was constructed. The artillery was virtually on top of the ground.
Barbed wire entanglements were strung and minefields were laid. The latter seemed to have been uncoordinated as several French counterattacks stumbled onto their own mines.

In the way of firepower, the French mainstay, Dien Bien Phu contained 24-150mm howitzers and 4-155mm howitzers, about one-third the amount normally associated with this size force. Although ample artillery was available in the Delta, the artillery commander, Colonel Piroth, felt the amount on hand was adequate. Fire direction and fire coordination procedures left much to be desired as attested to by the number of times French shells fell on friendly troops.

For counterbattery fire reliance was placed on the four 155mm howitzers. Target acquisition procedures were primitive and counterbattery planning was poor. When questioned about the adequacy of his counterbattery capability, Colonel Piroth stated that he could destroy any Vietminh gun by the time it fired a third round. During the siege the French counterbattery fire was almost completely ineffective, whereas the Vietminh eventually eliminated almost all of the French artillery. A factor favoring the Vietminh was, of course, they were firing into a concentrated exposed target whereas the French were attacking dispersed, illusive well-protected targets.

For the close air support some 130 combat aircraft were available. These included some 47 B-26s and eight Privateer antisubmarine bombers. The balance were World War II naval fighters. Because of the distance from Hanoi, the on station time over the airhead for most fighters was about fifteen minutes. Close air support procedures had not been perfected, and pilot training was below standard. The air support seemed to have hit French positions as often as it missed the enemy. Language problems in air ground communications further compounded the situation.

Although a factor in the French selection of Dien Bien Phu had been to provide adequate maneuver room around the position, few if any counterattack plans were developed much less rehearsed. In most cases no reconnaissance was made.

Ten light tanks were flown into the airhead. These again appear to have been inadequate for the size force supported. Even so, no combined tank-infantry coordination or training took place. Except for a few escort missions between strong points, the tanks for the most part were relegated to the role of stationary pillboxes.

French leadership within the airhead left something to be desired. Prior to the attack General de Castre seldom inspected his position, and no action was taken to correct the obvious shortcomings he did observe. During the siege he rarely left his bunker, and in many respects he virtually abdicated command.
Logistically Dien Bien Phu was tied to Hanoi by an air LOC. To support this there were approximately 100 transport aircraft on hand, some C-119s but mostly C-47s. Logistic staff work was shoddy to say the least. Apparently no daily tonnage supply requirements factor to support the operation was ever developed. No required stockage levels within the airhead were prescribed. And there was an imbalance of supplies delivered to the airhead. Food stocks ran out at the end of the third week of the siege.

Using current planning factors the French would have required about 550 tons of resupply per day. Analysis of the supply situation experienced at the time indicates that the airhead required well over 200 tons per day to maintain its combat effectiveness. During the siege an average of 120 tons per day were delivered to the airhead by parachute. Of this, not more than 100 tons per day were recovered by the defenders. Drops were first made from 2,500 feet. However, antiaircraft fire soon drove the transports up to 6,000 and then 8,500 feet with the attendant increase in dispersion. This was coincident with the steady shrinkage in the size of the airhead. Explosive delayed opening devices were tried but with little success. The Vietminh recovered much of the supplies including thousands of rounds of 105mm ammunition which they employed against the airhead.

In contrast to many other aspects, French intelligence seems to have been reasonably good, at least at Hanoi level. For example the initial movement of the artillery of the heavy division toward Dien Bien Phu from the base area was detected almost as soon as it began. The problem lay in reaction to the intelligence. Decisions were based more on conviction than fact. During the siege, serial reconnaissance located numerous enemy antiaircraft positions, but French air seemed unable to hit them.

The French relied to a large degree on serial reconnaissance to locate the enemy and detect movements. This turned out to be less than effective because of the excellent camouflage employed by the Vietminh. To discourage French reconnaissance Giap lined his LOC with a large number of antiaircraft weapons. This was highly effective in negating French observation, and the route soon took on the common aphorism of "Flak Alley."

To provide for ground security, the French in keeping with their offensive concept, initially dispatched battalion size long-range combat patrols. This, however, proved to be a futile effort. The patrols were too large and heavy to negotiate the dense mountainous jungle. Their rate of march was frequently not more than 200 meters an hour, and they suffered from logistic problems. About the only contact they had with the enemy was when they had become ensnared in one of his numerous ambushes. These operations ceased after the first five weeks.

During the period of the long-range patrols, the French neglected the jungle covered mountains which surrounded them. When this was
attempted at the end of December, they were stopped virtually at the jungles edge in all directions. The enemy was in firm control of the hills. Dien Bien Phu was surrounded. Even then few patrols were conducted around their positions in the valley.

Now let us take a look at Giap's conduct of the siege.

During the period 20 November to 25 January, Giap concentrated his forces. He then spent two months building up his supplies, making plans, and moving his forces into assault positions. The attack began on 13 March and was conducted in three phases. It terminated on 7 May when, with the exhausted defenders out of ammunition, the last positions were overrun.

Giap's concentration and preparation can be characterized as being detailed, methodical, and thorough. He concentrated at Dien Bien Phu a force of four infantry divisions, his heavy division, and an independent regiment with a combat strength of 50,000. These were supported by another 50,000 support troops in the area and on his LOC. And the operation overall was supported by over 100,000 coolies.

He had available some 200 guns of calibre 57mm or larger including 24-105mm howitzers, between 15 and 24 pack 75mm howitzers and 20-120mm mortars. During the latter part of the siege he also employed heavy rockets. In antiaircraft weapons he had at least 24 Russian 37mm guns, 50 -.50 calibre machine guns, and a number of 20mm guns. By the beginning of the siege French intelligence had located 170 antiaircraft positions, and 740 by the time Dien Bien Phu fell.

Massive stocks of supplies and equipment had been amassed by the time the siege began. These were brought forward by a variety of means, trucks, bicycles, coolies, and even boats. Roads were used where they were available; supplies were shuttled where necessary and a capillary system of trails under the jungle canopy was used.

All of Giap's operations during the preparatory stage were meticulously camouflaged. Individuals wore natural camouflage, and an entire battalion could vanish into the roadside ditches at the sound of an approaching plane. Jungle parking and maintenance areas were provided for trucks all along the usable roads. Elaborate trellis works were erected. Tree tops were tied together to form jungle tunnels.

Tactically Giap's plan involved three basic tasks: (1) Cut the French off from their base; (2) neutralize French firepower; and (3) isolate strong points and reduce them one at a time.
ANNEX A to STRATEGIC/TACTICAL STUDY

During the preparatory phase Giap moved his forces forward onto the forward slope of the hills dominating Dien Bien Phu. Artillery which would be used to neutralize the airstrips and pulverize the French positions was brought forward in pieces at night and assembled in well-concealed cave-like bunkers with firing ports just large enough to accommodate the muzzle of the piece. Antiaircraft guns were emplaced in a similar manner in positions where they could bring fire to bear on the aircraft on the landing strip as well as on approach and take off.

The hills were honeycombed with troop and automatic weapons positions. The bunkers were dug into the hills and camouflaged with natural material. The firing slots were often no larger then a letter drop. French patrols stumbled to within a few feet of them without detecting them.

Giap began to neutralize the airstrips and aircraft as artillery and antiaircraft weapons became available. The first howitzer shell fell on the runway on 4 February. By the beginning of the attack its use had been greatly restricted.

Preparatory to launching the assault, Giap intensified guerrilla operations throughout Vietnam, and on 2-8 March guerrillas attacked airfields throughout the Delta including Gia Lam, using satchel charges to destroy or damage some 74 of the sorely needed aircraft.

On 13 March Giap launched his offensive with a heavy bombardment and attacks on the satellite positions to the north.

The French found that the Vietminh had by that time painstakingly burrowed to within two hundred yards of the positions and at night had patrols cutting the barbed wire and preparing the intervening ground for the assault. The enemy had made detailed models of the positions and had rehearsed the attack. Two of the positions were overrun within a few hours. The commander withdrew the third one.

Giap then set about closing on the main position. He employed the medieval siege tactics of digging parallels and saps. The digging was carried out at night using coolie labor, while the position was pounded by artillery during the day, crumbling the French field works and gradually reducing the French artillery, piece by piece.

Three significant events occurred during the first phase: the first monsoon rain arrived on 17 March; the last aircraft to use the Dien Bien Phu airstrip departed; and Colonel Piroth, the artillery commander, committed suicide on the second day of the assault.
During the second phase which began the end of March and ran through the middle of April, Giap commenced reducing the main French position, concentrating on one or two strong points at a time. He would encircle the chosen French strong points with his nocturnal digging only, a few yards from the position. Having isolated them, he would then mount mass human wave attacks to overrun them without regard to losses. Concurrently, secondary attacks were conducted on all positions within supporting distance.

Throughout, he practiced hugging tactics to avoid French artillery and mortar fire. As the siege wore on, the heavy losses associated with the mass wave attack caused a substantial morale problem among the Vietminh troops and subordinate leaders.

During this phase the French mounted two major and several smaller counterattacks. Most caught the Vietminh completely off balance and were eminently successful. Although after Phase II a number of situations ripe for counterattack presented themselves, the French could either not mount them or could not carry them through because of lack of firepower.

During April the heavy rains did major damage to the poorly constructed French positions. Fortifications crumbled and trenches turned into racing torrents.

During the final phase, which began on 1 May, Giap resorted to sheer weight of human mass to overwhelm the weakened garrison and its few remaining guns. Fighting was the bitterest of the campaign, and Giap sustained staggering losses. The last three days it rained incessantly further eroding the battered earth works. On the 7th of May it was over. Giap had accomplished his purpose of defeating a major French force. On the 8th of May the Geneva Conference took up the Indochina question.

The French losses were 15,000 including 6,500 prisoners. This represented less than 4 percent of Navarre's overall forces.

Giap suffered losses in the vicinity of 23,000. This represented more than two of his divisions, more than half of his combat troops engaged at Dien Bien Phu, or almost a quarter of his Main Battle Force. But he won.

F. SUMMARY

1. French Failures included:

   a. Inadequate logistic support caused by an insecure LOC and insufficient airlift.
ANNEX A to STRATEGIC/TACTICAL STUDY

b. Failure to control or neutralize key terrain.

c. Failure to provide security through intensive patrolling.

d. Poor field fortifications.

e. Inadequate artillery and armor.

f. Ineffective counterbattery fire.

g. Inadequate and inefficient close air support.

h. Inability to counterattack or take offensive action.

2. Giap's Strength Lay in:

a. Detailed planning and preparation.

b. Meticulous camouflage and concealment.

c. Concentration of mass and firepower against limited objectives in a progressive, systematic manner.

d. Consistent use of coordinated secondary attacks.

3. Giap's Chief Weaknesses were:

a. Vulnerability to counterattacks.

b. Demoralizing effect of mass losses on his troops and subordinate leaders.

C. CONCLUSION

The French in spite of their quest for the "Illusion of Vinh Yen," were defeated because they ran out of firepower.

s/ WESTMORELAND
General

OFFICIAL:

s/ ARGO
Military History

A-10
### CHRONOLOGY

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<td>JAN</td>
<td>VPA Activated 5th Inf and 1st Arty Div</td>
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<td>OCT</td>
<td>Frontier Battles</td>
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<td>1952</td>
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<td>20 NOV</td>
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<td>1 JAN</td>
<td>DBP Completely Surrounded</td>
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<td>JAN-JUN</td>
<td>VM Western Highlands Campaign</td>
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<td>25 JAN</td>
<td>Giap Forces Concentrated at DBP</td>
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<td>27 JAN</td>
<td>316th VPA Div moves into Laos</td>
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<td>4 FEB</td>
<td>1st Artillery Round Falls on DBP Airstrip</td>
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<td>18 FEB</td>
<td>Agreement on Geneva Conference</td>
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APPENDIX TO ANNEX A Study of Dien Bien Phu Battle

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<td>1 MAR</td>
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<td>7 - 8 MAR</td>
<td>Guerrilla Attack on Gia Lam Airfield</td>
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<td>13 - 17 MAR</td>
<td>Phase I -- VM Assault on DBP Begins</td>
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<td>21 JUL</td>
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s/ WESTMORELAND
General

OFFICIAL

s/ ARGO
Military History
ANNEX B to STRATEGIC/TACTICAL STUDY

SUMMARY OF ENEMY SITUATION

A. GENERAL

1. The enemy's major goal is the unification of all Vietnam under Hanoi's control. His present objectives are as follows:

   a. Political/Psychological

      (1) To create a general uprising of the people.

      (2) To destroy the stability of the GVN and discredit its ability to protect its adherents.

      (3) To cause the defection of RVNAF troops and units.

      (4) To weaken the will of the Allies of GVN.

   b. Military

      (1) To cripple the air capability of friendly forces.

      (2) To disperse friendly troops, driving them into a defensive posture.

      (3) To disrupt control of the GVN/Allied effort.

2. The increasing efforts of the US and FWMAF are progressively reducing the military effectiveness of the VC and NVA units in RVN.

3. Captured documents covering the plans, policies, and political indoctrination related to enemy's Winter-Spring Campaign 1967 - 1968 make frequent reference to a "general offensive", "general uprising", "negotiations", and "coalition government". There was continuing reference to "conditions favoring" all of the above and "conditions favorable for achieving the final victory". The enemy's present offensive is consistent with his objectives and thinking expressed in his documents.

B. CHARACTERISTICS OF THE AREA. Appendix 1 to Annex B, Summary of Enemy Situation.

C. ENEMY MILITARY FORCES.

1. Ground Forces.

   a. The 304th and elements of the 325C Divisions are deployed in the Khe Sanh area. The 304th Division has an artillery regiment attached. While the total TOE strength is 25,000 including combat support troops it is estimated...
that each division probably initially infiltrated about 11,000. During
February 1968, the 29th Regiment, 325C Division, was deployed from Khe
Sanh to the Hue area. There is no firm evidence that the 78th Artillery
Regiment has infiltrated to South Vietnam. If the 78th Artillery Regiment
did infiltrate, it would make the total enemy strength in the Khe Sanh area
about 17,000 to 19,000.

b. The 304th NVA Division deployed in late 1967 from its home
base in North Vietnam. Though it is one of the oldest NVA divisions, it
has not had much experience in conventional warfare.

c. Elements of the NVA 325C Division have operated in South
Vietnam since 1965 and were in the Khe Sanh area in April 1967.

(1) Order of Battle and Organization. (Appendix 2)
(2) Disposition. (Appendix 3)
(3) Enemy Fire Power. (Appendix 4)
(4) Enemy Logistics and Lines of Communication. (Appendix 5)
(5) Reinforcement Capability. (Appendix 6)

2. Air Defense (Appendix 7)

3. Armor Capability (Appendix 8)

4. Weather (Appendix 9)

5. The North Vietnamese Air Force (Appendix 10)

D. ENEMY CAPABILITIES. The Tet onslaught failed to gain the
hold in the dynamic uprising he sought but he is still left with several
capabilities for future action which are:

1. He can renew attacks against South Vietnam urban areas at
any time.

2. He can conduct coordinated attacks in the DMZ at any time.

3. He can conduct coordinated attacks in the DMZ and against
the urban areas at any time.

4. He can commit his reserves to other less defensible objectives
at any time.

5. He can avoid offensive action and withdraw his forces to
boundaries and continue small scale guerrilla harassing attacks.
E. CONCLUSION. This estimate will direct itself to the enemy's capability to conduct an attack against Khe Sanh. We estimate that coordinated attacks will possibly be conducted throughout the DMZ and I CTZ and perhaps throughout all of South Vietnam in conjunction with a major attack against Khe Sanh. These coordinated attacks would reduce FWMAF capacity to reinforce and support friendly forces at Khe Sanh.

s/ WESTMORELAND
General

OFFICIAL:

s/
DAVIDSON
J2

APPENDICES

1 Characteristics of the Area
2 Order of Battle and Organization
3 Disposition
4 Enemy Fire Power
5 Enemy Logistics and Lines of Communication
6 Reinforcement Capability
7 Air Defense
8 Armor Capability
9 Weather
10 The North Vietnamese Air Force
APPENDIX 1 to ANNEX B, (SUMMARY OF ENEMY SITUATION)

CHARACTERISTICS OF THE AREA - PHYSIOGRAPHY AND MILITARY ASPECTS DIEN BIEN PHU AND KHE SANH

1. GENERAL: This study is a comparison of the physiography and its military aspects, of Dien Bien Phu and Khe Sanh. Physiography is considered with respect to landforms, vegetation, drainage, water resources, soils and geology, and suitability for underground construction. Military aspects are considered with respect to cross-country movement, cover and concealment, observation and fields of fire, avenues of movement, key terrain and effects of weather and terrain. Also included are four overlays illustrating ridgelines, cross-country movement, potential avenues of movement and geology and soils.

2. SUMMARY OF CONCLUSIONS: From a terrain aspect Dien Bien Phu and Khe Sanh have many similarities. Both are located on flat terrain with overlooking hills and mountains that afford unobstructed observation. Dien Bien Phu is situated in a valley with hills and mountains to the east, north and west. Although Khe Sanh is situated on a plateau, hills and mountains to the north and west afford observation of the airfield. Slopes in the surrounding terrain are similar in both areas thus indicating the capability of the enemy to introduce heavy artillery to the rugged terrain surrounding Khe Sanh. Vegetation surrounding the fortifications at both bases was cleared for observation and clear fields of fire. Both bases contain no natural concealment thus allowing the enemy a view of all movement from the surrounding hills and mountains. The only cover available is from bunkers. Key terrain consists of the commanding heights which offer observation and sites for artillery and anti-aircraft weapons. Weather conditions are similar with respect to the rainy season, occurring during the southwest monsoon and fog conditions during the dry season. Flying conditions are limited during the foggy periods and for periods of time during the rainy season. These poor weather conditions favor the enemy since the use of airpower was a key tactic at Dien Bien Phu and in all probability will be a significant factor at Khe Sanh. All supplies and personnel require air support because of no adequate land routes at either Dien Bien Phu or Khe Sanh.

3. DIEN BIEN PHU:

a. Physiography.

(1) General. Dien Bien Phu is located in northwestern North Vietnam along the 21°22' parallel. It is situated 10 kilometers east of the Laotian border and approximately 300 kilometers west of Hanoi. The town of Dien Bien Phu is situated in the northern end of a valley that measures approximately 16 kilometers long with north-south orientation and 5 kilometers wide. This valley consists primarily of ricefields and is relatively flat with an average elevation of 480 meters. The surrounding terrain consists of steeply sloped rugged mountains covered by multi-
canopied dense undergrowth forests. These mountains have slopes over 80 percent and a maximum elevation of 1445 meters (UJO20606). Through the center of the valley the Nam Youn (Stream Youn) flows in a southerly direction. Just to the east of the Nam Youn, Highway 19 traverses the valley in a north-south direction.

(2) Landforms. Dien Bien Phu is situated at the northern end of a relatively level valley consisting primarily of ricefields. This valley is approximately 16 kilometers long with north-south orientation and 5 kilometers wide. The average elevation is 480 meters with a maximum of 500 meters in the northern sections. Completely surrounding this valley are steeply sloped, rugged mountains. Slopes vary from 10 percent to a maximum of over 80 percent. Elevations vary from 600 meters to a maximum of 1445 meters (UJO20606). An almost continuous ridgeline is formed by these mountains around the valley of Dien Bien Phu with an average elevation of 1100 meters. This ridgeline is approximately 6 kilometers from the Dien Bien Phu Airfield. A smaller secondary ridgeline also surrounds the valley with an average elevation of approximately 550 meters and is located about 4 kilometers from the Dien Bien Phu Airfield. When comparing the ridgeline overlay to a topographic map, the ridgelines surrounding Dien Bien Phu are apparent. The elevations noted illustrate the heights of these hills and mountains. Within the valley itself several low lying hills surround the airfield and Dien Bien Phu. These hills have an average height of 60 meters above the valley floor.

(3) Vegetation.

(a) General. Vegetation within the vicinity of Dien Bien Phu consists of ricefields and open areas in the valley and multi-canopied dense undergrowth forests in the mountains. Along the Nam Youn (Stream Youn) are small areas of multi-canopied dense undergrowth forests.

(b) Specific.

1. Multi-canopied Dense Undergrowth Forest (Map Unit 1). This forest is characterized by a thick semi-closed canopy of mixed species with a generally dense undergrowth. The crowns of the varied components of this type will generally close in and provide little light to the forest undergrowth. While the component species of the dense undergrowth are tolerant of the heavy shade, they exhibit generally high requirements for soil nutrients and moisture. The multi-canopied characteristic is essentially continuous from a vertical view, but exhibits some discontinuity from an oblique view. This discontinuity is greater in the steeper more rugged terrain than in the areas of flatter or rolling relief. Characteristically, the average height of the stand will be from 25 to 30 meters. Occasionally, individual tree heights may reach 50 meters. Spacing between trees is generally 2 to 3 meters. Trunk diameter may vary within the limits of 0.5 to 1.5 meters. The undergrowth is dense and consists of bushes, vines and lianas. The
vines and lianas will grow through and over the bushes and small trees up into the tree canopy. The bushes and small trees will form a discontinuous ground cover from 1 to 3 meters in height. The vines and lianas found in the undergrowth are smooth-skinned, approximately 2.5 to 5 centimeters (1 to 2 inches) in diameter and covered with sharp, half-inch barbs. Elephant grass dominates the area adjacent to stream beds.

Single-Crop Rice (Map Unit 13). Ricelands are open areas of cultivation which are perennially or seasonally inundated either by irrigation or natural flooding. The rice fields are surrounded by low dikes 0.5 to 1.0 meter high and 0.3 to 0.6 meter wide.

(4) Drainage.

(a) The mountainous areas are well drained because of the numerous streams and steep slopes. In the valley, drainage is poor with many areas flooded during the rainy season (March to August). The Nam Youn flowing in a southerly direction through the center of the valley is the primary drainage media for this region. Periods of flooding in the valley will occur during the rainy season (March to August).

(b) The French experienced problems with drainage along the Nam Youn. Many areas along the Nam Youn and adjacent to Dien Bien Phu would become flooded during the rainy season. In fact, the southern defenses of Dien Bien Phu were flooded during the rainy season. Seven kilometers to the south of Dien Bien Phu, the French held a defensive position named Isabelle. It became apparent to the French that Isabelle would become completely flooded during the rainy season and that the position should be abandoned. However, the position was maintained despite the threat of flooding. Because of the threat of flooding, much effort was required to construct fortifications above ground. Bridges had to be built, and existing bridges raised and extended to accommodate the flooding during the rainy season.

(5) Water Resources.

(a) Water within the vicinity of Dien Bien Phu is readily available because of the numerous streams in the mountains and the Nam Youn in the valley. During the rainy season (March to August) an average of 1500 millimeters (60 inches) of rain falls in the vicinity of Dien Bien Phu thus providing more than adequate water resources. During the dry season (November to February), water resources are also adequate.

(b) The French utilized the Nam Youn for their source of drinking water. Like most rivers in a tropical zone, the Nam Youn is heavily contaminated and required treatment. Four water purifiers were utilized by the French to provide drinking water for over 10,000 troops. Problems were encountered in delivering water supplies to the various outposts because of heavy loses by enemy fire on water carrying crews. In many instances rain water was utilized.
(6) Soils and Geology.

(a) Geological formations in the area consist of ancient alluvial deposits in the valley, a small area of metamorphosed granite bed rock in the northeast section of the area and sedimentary bedrock in the remaining mountainous areas.

(b) Soils in this area consist of ancient alluvial deposits in the valley and shallow mountainous soils in the hills and mountains.

1 Ancient Alluvial Deposits. Soils found in ancient alluvial deposits consist of a slightly organic gray to gray-brown silty surface soil over a grayish, highly leached silty sand to a great depth. Another soil type found is a gray brown surface soil underlain by a yellowish loamy layer and a distinct red to yellow clay accumulation. Laterite is a possibility under this clay layer.

2 Shallow Mountainous Soils. The soils covering the hills and mountains are categorized as sandy, stony soils that are shallow, particularly on the steeper slopes. These soils are best described as gravelly sand-silt-clay complexes. The amount of clay present, increases with decreasing slope, with a maximum occurrence in the stream valleys. The depth of the soil profile varies from 2 to 20 meters, but locally it may be more shallow and exhibit rock outcrops.

(c) The French encountered difficulties with their fortifications. Because of a lack of construction materials, the fortifications were mainly constructed with the use of local material and soils. Many of the fortifications fell apart because of the constant artillery barrage which "loosened" the soil structure and poor drainage that allowed the area to stay saturated.

(7) Suitability for Underground Construction.

(a) Valley. Underground construction is feasible because of the clayey content in the soils. Laterite may be encountered and thus create problems in excavation. During the rainy season, the water table will become critical, especially in areas of flooding and along the river.

(b) Hills and Mountains. Soils and geology in the hills and mountains restrict emplacements to shallow surface installations on the steeper terrain. The granular soils are shallow and do not possess enough stability for emplacements other than trenches, foxholes and surface bunkers unless extensive site preparation is undertaken to expand these emplacements. The dense vegetation will provide additional materials such as timber, bamboo and vines for use as reinforcements.

(c) The French were quite limited in their underground construction because of a lack of construction materials for reinforcement and flooding during the rainy season. Soils in the valley have a
cohesive property but under an artillery barrage the soil will not withstand the vibration and will not absorb the blast of a direct hit. Because of the lack of construction materials, the French concentrated on fortifying the X-Ray room and the command post. The Viet Minh built many trenches around Dien Bien Phu. One tactic consisted of digging a trench and immediately filling up sandbags with the excavated material. Then timbers were carried forward and placed over the open trench with sandbags placed on top. Thus a semi-fortified tunnel was created. The Viet Minh also succeeded in digging tunnels through a few of the low hills located in the valley. In one instance the Viet Minh constructed a tunnel through the hill large enough for an artillery piece. At the enemy side of the hill a hole was made large enough to fire through. No exact details were noted as to the stability of the soil on the hills.

b. Military Aspects of Terrain.

(1) General. From a military standpoint, Dien Bien Phu was planned by the French as a defense of northern Laos and as a set battle to defeat a large segment of the Viet Minh forces. In order to lure the Viet Minh, a "target" was created at Dien Bien Phu. The French created a fortress around the airfield at Dien Bien Phu. This area of open flat land offered poor cover and concealment while observation and fields of fire were excellent. Movement through the valley in a north-south direction is generally good but limited during the rainy season and when crossing the Nam Youn. In the mountains surrounding Dien Bien Phu, cover and concealment are excellent because of the multi-canopied dense undergrowth forest. Observation and fields of fire are poor to non-existent. Movement through the rugged mountains is slow and tedious.

(2) Cross-Country Movement.

(a) General.

A discussion of cross-country movement involves comments on the suitability of the area for the movement of military vehicles and foot troops. Vegetation, local and regional relief, soils, the state of the ground, and surface water are important factors which should be considered in determining the suitability. Various areas are rated good to unsuited depending on the difficulties encountered in moving across the terrain. Good suitability means that terrain conditions do not significantly hinder progress or restrict the choices of direction of movement. Fair suitability means that conditions moderately hamper progress or moderately restrict choices of direction of movement. Poor suitability means that conditions severely hinder progress or severely restrict choices of direction of movement. Unsuited conditions preclude all but local movement.
2. The cross-country movement plate presented has a dual purpose. The primary purpose of this plate is to indicate the suitability of an area for the cross-country movement of foot troops, tracked and wheeled vehicles. Secondly, this plate indicates the aerial distribution of observation, fields of fire, and cover and concealment. Each different vegetation environment contained in the study area is considered in terms of 3 slope ranges, namely: 0 to 15 percent, 15 to 30 percent and over 30 percent. Local stream density is also considered in three categories; less than 500 meters, 500 to 1500 meters and over 1500 meters apart. Each distinct terrain environment has a letter-letter-letter-number-designation. The first letter indicates suitability of the terrain for movement by foot troops. The second letter indicates suitability for tracked vehicles and the third for wheeled vehicles. The number specifies the vegetation type. For example UUU1 means that the terrain is unsuited for the movement of foot troops, unsuited for the movement of tracked vehicles, unsuited for the movement of wheeled vehicles and the vegetation is multi-canopied dense undergrowth forest.

(b) **Specific.**

1. **Valley.** Cross-country movement through the rice-fields in the valley is fair for foot troops. In areas of dry ground, movement is good. During the rainy season, movement is limited in areas of flooding. Movement by tracked vehicles was quite limited during the wet season. In the dry season movement by tracked vehicles is improved.

2. **Hills and Mountains.** Cross-country movement in the mountains is unsuited for both foot troops and tracked vehicles. Because of the multi-canopied dense undergrowth forest and steep slopes, movement is limited to stream beds, trails and ridgelines.

(3) **Cover and Concealment.**

(a) **Valley.** Cover and concealment in the rice-fields is non-existent. Whatever vegetation that existed around Dien Bien Phu was cut down by the French for construction material and firewood. Furthermore, all the travel around the fortress by vehicles and foot troops destroyed any vegetation that existed. Therefore, the French had no concealment from vegetation and the only cover was provided by fortifications.

(b) **Hills and Mountains.** Cover and concealment in the hills and mountains is excellent because of the multi-canopied forest. This multi-canopy was especially useful in concealing the Viet Minh artillery. The multi-canopied forest also helped to diffuse the smoke after firing an artillery piece. Some cover was also provided by the multi-canopy, however the Viet Minh further reinforced their artillery positions.
(4) Observation and Fields of Fire.

(a) Valley. Observation and fields of fire are excellent in the valley because of the lack of vegetation and flat terrain. The French cleared any remaining vegetation in many areas to provide clear fields of fire as a measure against human wave attacks by the Viet Minh. A disadvantage of the excellent observation was that the Viet Minh had a view of all movements by the French.

(b) Hills and Mountains. Observation and fields of fire in the hills and mountains are poor to non-existent. Fields of fire must be prepared in the dense undergrowth.

(5) Avenues of Movement and Lines of Communication.

(a) General. Potential avenues of movement are selected on two criteria, ease of movement and concealment. The ideal movement route would be along a long ridge or valley or across a flat plain covered with clear forest. Broad, unconfined avenues are represented on the avenue of movement plates with wide doubleline arrows. A single-line arrow on the plate signifies a narrow, restricted; probably a trail along a ridge or valley or possibly an intermittent stream.

(b) Specific. Avenues of movement in the mountains around Dien Bien Phu are restricted because of the rugged terrain and dense vegetation. Movement through the area is limited to the stream beds, trails and ridgelines. During the rainy season, movement along streams and across streams is limited because of flash flooding and swift stream currents. Movement into the Dien Bien Phu area was along Route 19. The Viet Minh used Route 19 as their supply route from the east despite constant bombing by the French Air Force.

(6) Key Terrain. All of the hills and mountains surrounding the Dien Bien Phu can be considered as key terrain. The commanding heights offered an unobstructed view of the airfield and all of the French fortifications at Dien Bien Phu. From these heights the Viet Minh were able to strike Dien Bien Phu with accurate artillery fire. Of particular interest is the high ground surrounding the airfield at Dien Bien Phu. Just 3 Kilometers to the north of the airfield, a hill 60 meters above the valley was utilized by the Viet Minh as an anti-aircraft site. From this position they were able to fire straight down the runway at aircraft taking off or landing.

(7) Effects of Weather and Terrain.

(a) Tactical Air Support. Tactical air support in the hills and mountains is limited by the elevations, deep valleys and multi-
canopied forests. The French were unable to use tactical air to any
great extent because of a limited number of aircraft; limited number of
pilots; difficulty in locating and marking targets in the multi-canopied
forest; terrain that was difficult to fly; enemy anti-aircraft artillery;
and poor flying weather during the rainy season. Ground fog was pre-
valent in the valley thus limiting use of aircraft, however, the con-
cealment offered by the ground fog was utilized to repair the runway and
fortifications.

(b) Para-Drop. The French relied quite extensively on
the ability to para-drop men and supplies into the valley. Extreme dif-
ficulty was encountered by the fact that aircraft had to make numerous
passes to unload equipment. (C-47 required 8 passes to drop equipment
within drop zone). Aircraft that were able to drop equipment in one pass
(C119) created a problem on the ground in that the pallet could not be
moved because of its weight. Further problems encountered included sup-
plies dropping into enemy positions and parachute malfunctions. In one
instance, 12,000 rounds of 105mm artillery shells fell into enemy hands
which in turn was used against the French.

(c) Helicopter Operations. The French used a limited
number of helicopters from their bases in Laos to Dien Bien Phu. All
operations were limited to medical evacuation and some aerial surveill-
ance. Fog conditions during the morning hours greatly limited their use.

(d) Armor Operations. Light tanks were airlifted into
Dien Bien Phu in pieces. Assembled in the field, the French utilized the
tanks for their firepower and ability to maneuver. During the rainy sea-
son the use of tanks was limited by flooding and slippery ground conditions.

4. KHE SANH.

a. Physiography.

(l) General. The Khe Sanh airfield is located in northwestern
South Vietnam along the 160 39' parallel approximately 30 kilometers south
of the Demilitarized Zone (DMZ) and 16 kilometers east of the Laotian bor-
der. Khe Sanh airfield itself is situated on a relatively flat plateau
surrounded by highly dissected and steeply sloped hills and mountains to
the west and north. Mountains to the north of Khe Sanh airfield (elevation
460 meters) reach a maximum of 1739 meters (XD830545). Just 3 kilometers
north of the airfield the elevation is 1015 meters (XD854454). Vegetation
consists of brushwoods and multi-canopied dense undergrowth forests with
and without bamboo. Major drainage media in the area are the Xe Pon in
the southwest and the Riviere de Rao Quan northeast of the airfield. Route
QL-9 provides for movement in an east-west direction through the center of
the area.
(2) **Landforms.** The Khe Sanh airfield is situated on a relatively flat plateau with an average elevation of 460 meters. To the north of the airfield, steeply sloped and highly dissected mountains are located. Maximum elevation in the area is 1739 meters (XD 830545). Slopes vary from 20 to over 100 percent with an average of 40 percent. West of the airfield, landforms consist of highly dissected and steeply sloped hills. Slopes range from 10 to over 70 percent with an average of about 35 percent. To the southwest of the airfield and adjacent to Route QL-9, the terrain consists of a relatively flat area extending to the Xe Pon Valley. South and east of the airfield the terrain consists of highly dissected and steeply sloped hills. Slopes range from 10 to over 80 percent with an average of 40 percent. Elevations vary from 4 meters (XD925418) in the Riviere de Quang Tri to a maximum of 843 percent. No extensive ridgeline pattern exists at Khe Sanh as evidenced by the ridgeline overlay. The only significant ridgeline is about 3 kilometers to the north of Khe Sanh. From this ridge there is excellent observation over the airfield.

(3) **Vegetation.**

(a) **General.** Immediately surrounding the Khe Sanh airfield, vegetation consists of brushwoods. To the north, areas of brushwoods and multi-canopied dense undergrowth forests are found. The multi-canopied forests are mostly found on the mountains. West of the airfield, a large area of multi-canopied dense undergrowth forest with bamboo is located. South and east of the airfield, areas of brushwood and multi-canopied dense undergrowth forests are located.

(b) **Description of Vegetation.**

1 **Multi-Canopied Dense Undergrowth Forests (Map Unit 1).** The forest is characterized by a thick semi-closed canopy of mixed species with a generally dense undergrowth. The canopy is predominately double layered with areas of single and triple canopy. Although the canopy is essentially continuous from a vertical view, it does exhibit some discontinuity from an oblique. However, the discontinuity is greater on the steeper slopes than along level ground. Tree heights are commonly from 25 to 30 meters with some trees as high as 50 meters. Spacing between trees is generally 2 to 3 meters. Trunk diameters may vary within the limits of 0.5 to 1.5 meters. The undergrowth is dense and consists of bushes, vines (non-woody, annuals), and lianas (woody, perennial). The vines and lianas will grow through and over the bushes and small trees up into the tree canopy. The bushes and small trees will form a discontinuous ground cover from 1 to 3 meters in height. The vines and lianas found in the undergrowth are smooth-skinned, about 2.5 to 5
centimeters (1 to 2 inches) in diameter and have sharp half inch barbs. Elephant grass grows to a height of 7 meters and is commonly found along the streams.

2 Multi-Canopied Dense Undergrowth Forests with Bamboo (Map Unit 2). Combined with multi-canopied dense undergrowth forests as described above, bamboo will grow in dense stands from 4 to 10 meters in height. Very little grows beneath these stands. Stems and crowns diverge from the base and the crowns of adjacent clumps interlock about 1 meter above the ground. Clump diameter is 0.6 to 1.0 meter. Spacing between clumps varies between less than 3 meters to over 10 meters.

3 Brushwoods (Map Unit 7). This vegetative type occurs on abandoned 'Rai' (slash and burn) cultivation sites and may form a transition zone between the clear undergrowth forest and grassy open areas. Further, it is a stage in the successional development of grass and open area sites to a single canopy, light undergrowth forest. Thus, density of the type will be variable as a function of the length of time this development has been taking place, i.e., light growth may be expected on areas recently abandoned, and a dense growth on areas that have had more time to develop. Vegetation will include grasses, bushes, and scrub deciduous trees. The composite of the vegetation in this type will vary in height from 1 to 3 meters. A predominance of any one of these type components will generally result in a decrease in a predominance of the others. Large trees to 15 meters in height may occur here.

4 Drainage. Drainage within the area is good because of the steep slopes in the hills and mountains. In the vicinity of the Khe Sanh airfield, drainage is also good because of a gentle slope of the terrain towards the Riviere de Rao Quan. The Riviere de Rao Quan flows eastward on a steep gradient through a deep valley to the Riviere de Quang Tri. In the southwest section of the area, the Xe Pon provides for excellent drainage. The rainy season for this area extends from May to November with September the wettest month. There is no threat of flooding due to the local relief and the drainage basis provided by the Riviere de Rao Quan.

5 Water Resources. Water within the vicinity of Khe Sanh is readily available because of the numerous streams in the mountains and hills. The Xi Pon and the Riviere de Rao Quan provide abundant sources for water. In the area of the Khe Sanh airfield, water is available from the Riviere de Rao Quan to the northeast. The availability of ground water in the area of the airfield is poor because of the clayey basaltic soil. During the rainy season (May to November) the average rainfall is 2,000 mm (80 inches).
6 Soils and Geology.

a Geological formations in the area consist of basalt at the Khe Sanh airfield plateau, a narrow band of sandstone to the east and west of the basalt area, a large area of granite to the northeast of Khe Sanh, ancient alluvial deposits in the Xe Pon Valley, sandstone to the southwest of the Xe Pon Valley and the remaining area is composed of a combination of granite, gneiss and micaschist.

b Soils in the area consist of ancient alluvial deposits, basaltic soils and shallow mountain soils.

(1) Ancient Alluvial Deposits. Soils found in ancient alluvial deposits consist of a slightly organic gray to gray-brown silty surface soil over a grayish, highly leached silty sand. Another soil type found is a gray brown surface soil underlain by yellowish loamy layer and a distinct red to yellow clay accumulation. Laterite is a possibility under this clay layer.

(2) Basaltic Soils. The plateau on which the Khe Sanh airfield is located consists of a deeply weathered red-brown clayey soil weathered by basalt. When wet this soil is slippery. The construction of underground fortifications and tunnels in this soil is excellent because of its cohesive properties.

(3) Shallow Mountain Soils. The soils covering the hills and mountains are categorized as sandy, stony soils that are shallow, particularly on the steeper slopes. These soils are best described as gravelly sand-silt-clay complexes. The amount of clay present increases with decreasing slope, with a maximum occurrence in the stream valleys. The depth of the soil profile varies from 2 to 20 meters, but locally it may be more shallow and exhibit rock outcrops.

c The most significant fact about the soils in the Khe Sanh area concerns the underground construction capability in the basalt soils. Because of the cohesive properties of the basalt soil and their great depths, the construction of tunnels is possible. This soil is also excellent for the construction of fortifications. On the Khe Sanh plateau, drainage is good, therefore adding no further problems to tunnel construction.

7 Suitability for Underground Construction.

a Underground construction is excellent around the Khe Sanh airfield. A large area around the airfield is located on a deeply weathered basalt soil. This soil has cohesive property which allows for excavation with a minimum of shoring and supports. Because
of its stability, this soil is excellent for construction of trenches, fortifications and tunnels. In the hills and mountains, underground construction is limited by shallow soil depths and poor soil conditions.

b. American troops at Khe Sanh have constructed defensive trenches and storage trenches. From aerial photography, it does not appear that these trenches require shoring. The command post, hospital and airfield control tower have been extensively fortified against direct hits from artillery.

c. In areas of multi-canopied forests, the enemy is capable of digging in artillery with maximum concealment.

b. Military Aspects.

(1) General. Terrain in the Khe Sanh area is both favorable and unfavorable to conventional military forces. The hilly area covered with multi-canopied dense undergrowth north of the Xe Pon near Lang Vei and the mountainous area in the northeast favor a guerrilla force more than conventional forces. In these areas, cover and concealment are excellent. The use of airpower is somewhat restricted because of poor observation and cover provided by the multi-canopied forests. In areas covered with brushwoods, a conventional military force with airpower has an advantage because of increased observation, and limited cover and concealment for the enemy. Around Khe Sanh, these brushwood areas are located to the northwest and the south. At the Khe Sanh airfield cover and concealment are limited to fortifications. Most of the vegetation surrounding the airfield has been destroyed. Observation and fields of fire are excellent around the airfield. The mountains just 3 kilometers to the north of the airfield (1015 meters; 950 meters) provide excellent observation of the airfield.

(2) Cross-Country Movement.

(a) General.

A discussion of cross-country movement involved comments on the suitability of the area for the movement of military vehicles and foot troops. Vegetation, local and regional relief, soils, the state of the ground and surface water are important factors which should be considered in determining the suitability. Various areas are rated good to unsuited depending on the difficulties encountered in moving across the terrain. Good suitability means that terrain conditions do not significantly hinder progress or severely restrict choices of direction of movement. Unsuit conditions preclude all but local movement.
The cross-country movement plate presented has a dual purpose. The primary purpose of this plate is to indicate the suitability of an area for the cross-country movement of foot troops, tracked and wheeled vehicles. Secondly, this plate indicates the area distribution of observation, fields of fire and cover and concealment. Each different vegetation environment contained in the study area is considered in terms of 3 slope ranges, namely; 0 to 15 percent, 15 to 30 percent and over 30 percent. Local stream density is also considered in three categories; less than 500 meters, 500 to 1500 meters and over 1500 meters apart. Each distinct terrain environment has a letter-letter-letter-number designation. The first letter indicates suitability of the terrain for movement by foot troops. The second letter indicates suitability for tracked vehicles and the third for wheeled vehicles. The number specifies the vegetation type. For example UUU1 means that the terrain is unsuited for the movement of foot troops, unsuited for the movement of tracked vehicles, unsuited for the movement of wheeled vehicles and the vegetation is multi-canopied dense undergrowth forest.

(b) Specific. Cross-country movement through the area is limited in areas of dense undergrowth and slopes over 30 percent. In areas of brushwoods, movement is fair to poor and may become unsuited in areas of excessive slopes. Foot troops will experience difficult movement in the dense undergrowth and may be restricted to existing trails, stream beds and ridgelines. The use of tracked vehicles for cross-country movement in the dense undergrowth is unsuited. Brushwood areas provide for fair to unsuited movement by foot troops and tracked vehicles, depending upon local terrain. Some areas of excessive slopes will limit the use of tracked vehicles. In the area surrounding the Khe Sanh airfield, movement is excellent because of the flat ground and lack of vegetation.

(3) Cover and Concealment. Cover and concealment in the dense undergrowth is excellent. In areas of brushwood vegetation, cover and concealment varies from good to poor. The brushwoods in many areas forms a single canopy which provides some concealment from aerial observation. Surrounding the Khe Sanh airfield, cover and concealment is non-existent except for fortifications constructed around the airfield.

(4) Observation and Fields of Fire. Observation and fields of fire in the dense undergrowth is poor to non-existent. The multi-canopy extremely limits observation from the air. In areas of brushwood vegetation observation and fields of fire are poor to good. The brushwood forms an almost continuous canopy which limits observation from the air. Fields of fire must be prepared in the brushwoods. In the area around the Khe Sanh airfield, observation and fields of fire are excellent because of the flat ground and lack of vegetation.
(5) Avenues of Movement and Lines of Communication.

(a) General. Potential avenues of movement are selected on two criteria, ease of movement and concealment. The ideal movement route would be along a long ridge or valley or across a flat plain covered with clear forest. Broad, unconfined avenues are represented on the avenue of movement plates with wide double-line arrows. A single-line arrow on the plate signifies a narrow, restricted route; probably a trail along a ridge or valley or possibly an intermittent stream.

(b) Specific. Numerous avenues of movement exist throughout the area. Many avenues follow existing trails and along ridgelines. Movement along stream beds is unsuited during the rainy season because of swift stream currents and difficulty in crossing. Broad avenues of movement exist along the Xe Pon Valley in the southwest, along Route QL-9 from the west to Khe Sanh and along the Riviere de Rao Quan to the northwest of the Khe Sanh airfield. Route QL-9 in Laos provides the enemy an avenue of movement from the north for troops and supplies.

(6) Key Terrain.

(a) Key terrain at Khe Sanh consists of the commanding heights which afford observation and control over the airfield and avenues of approach to the airfield. These locations include hills 881 North (XD774457), 881 South (XD777438), 861 (XD803443), 950 (XD 843456), 1015 (XD854454) and the high terrain along Route QL-9 from Khe Sanh Hamlet (XD850385) to Ca Lu (XD000455).

(b) Hills 881 North, 881 South and 861 provide observation and control over avenues of movement into the airfield. Hill 861 also affords excellent observation over the airfield. Hills 950 and 1015, 3 kilometers north of Khe Sanh, afford unrestricted observation of the airfield. The high terrain along Route QL-9 from Khe Sanh Hamlet to Ca Lu controls all movement on QL-9.

(7) Effects of Weather and Terrain.

(a) Tactical Air Support. The effectiveness of tactical air support depends on the ability to fly at low levels and to identify the location of targets. Elevations in the area do not restrict operation of aircraft except for the mountainous section to the north of Khe Sanh and possibly along the escarpment southwest of the Xe Pon. Dense vegetation will cause difficulty in identifying and marking targets and will cause
some ordnance to explode prematurely in the multi-canopy. Weather conditions will also limit operations during the morning hours. During the rainy season from May to November, tactical air operations will be limited during periods of heavy rains. The fog conditions will restrict observation by the enemy and allow for repair of runway damage. Anti-aircraft artillery can be placed in brushwood areas from 2 to 8 kilometers northwest and southeast of the airfield. This allows the enemy to shoot at aircraft on approach and take off altitudes.

(b) **Heliborne Operations.** Heliborne operations will be limited in areas by the multi-canopied dense undergrowth forests. In areas of brushwoods, limitations will be caused by steep slopes and areas of tall scrub and elephant grass. Helicopter landing zones can be cleared easily in the brushwood areas and along Route QL-9. Low ceilings and fog will restrict operations from November to April. Periods of heavy rain from May to November will also limit operations.

(c) **Para-Drop Operations.** Para-drop operations will be limited by the size of the drop zone and weather conditions. Drop aircraft cannot operate during periods of low ceilings and fog from November to April. Periods of heavy rain from May to November will also restrict para-drop operations.

(d) **Armor Operations.** The use of tanks in the Khe Sanh area is suitable because of the relatively flat open area surrounding the base. However, introduction of armor from the east is only practicable along Route QL-9. Tanks are suitable along Route QL-9 into Laos. During the rainy season, some difficulty will be encountered due to slippery ground conditions.
<table>
<thead>
<tr>
<th><strong>SUMMARY OF TERRAIN CHARACTERISTICS OF</strong></th>
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<tbody>
<tr>
<td><strong>DIEN BIEN PHU &amp; KHE SANH</strong></td>
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### DIEN BIEN PHU

<table>
<thead>
<tr>
<th><strong>A. GENERAL</strong></th>
<th></th>
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<tbody>
<tr>
<td>1. Located 10 km east of Laotian Border.</td>
<td>1. Located 16 km east of Laotian Border.</td>
</tr>
<tr>
<td>2. Elevation 480 meters.</td>
<td>2. Elevation 460 meters.</td>
</tr>
<tr>
<td>3. Road from Red River Delta into Dien Bien Phu, used by Viet Minh as logistical route.</td>
<td>3. Road from Laos to Khe Sanh used by North Vietnamese as logistical route.</td>
</tr>
<tr>
<td>4. River flowing through area.</td>
<td>4. River flowing through area.</td>
</tr>
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### KHE SANH

<table>
<thead>
<tr>
<th><strong>SIMILARITIES</strong></th>
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</thead>
<tbody>
<tr>
<td>1. Similar distance from Laotian Border.</td>
<td>1. None.</td>
</tr>
<tr>
<td>2. Elevation almost same.</td>
<td>2. None.</td>
</tr>
<tr>
<td>3. Road to area used by enemy as logistical route.</td>
<td>3. None.</td>
</tr>
<tr>
<td>4. River in area.</td>
<td>4. None.</td>
</tr>
</tbody>
</table>

### DISSIMILARITIES

|  |
| --- | --- |
| 1. None. | 2. None. |
| 3. None. | 4. None. |
B. PHYSIOGRAPHY.

1. Landforms.
   a. In valley 16 x 5 km.
   b. Surrounded by mountains.
   c. Continuous ridge-line 600 meters above valley.

2. Vegetation.
   a. Ricefields in valley.
   b. Multi-canopied dense undergrowth forests in mountains.

   a. On plateau 3 x 4 km.
   b. Mountains north of airfield.
   c. Hills to west.
   d. Rolling dissected terrain to south and east.
   e. Deep ravine 1 km north-east of airfield.

   a. Mountains and hills located near airfield.
   b. Both areas on flat terrain.
   c. Slopes similar in mountainous areas.

   a. Khe Sanh is not completely surrounded by hills and mountain.
   b. Large areas of brushwoods at Khe Sanh.
3. Drainage.
   a. Drainage in valley very poor.
   b. Flooding during rainy season (March-August).
   c. Drainage excellent in mountains.

4. Water resources.
   Contaminated water available from Nam Youn.
   Contaminated water available from Rivers de Rao Quan.
   Adequate water resources available.
   None.

5. Soils/Geology.
   a. Ancient alluvial soils in valley: good for construction of fortifications but high water table and flooding limits construction.
   b. Shallow mountain soils in mountains: poor for underground construction.
   a. Basaltic soil around airfield: Clayey soil is excellent for underground construction; slippery when wet.
   b. Shallow mountain soils in hills and mountains: poor for underground construction.

Excellent drainage at Khe Sanh, no problem of flooding.

a. Underground construction in valley suitable in soils but limited because of high water table and flooding during rainy season.

b. Underground construction in mountains is limited by shallow soil depths.

c. Only bunker fortified to any extent were the command bunker and the X-Ray room and sections of the hospital.

MILITARY ASPECTS.


a. Movement in valley is unrestricted.

b. Movement in mountains restricted to trails, ridgelines and along streams.

c. Movement through brushwoods limited only by excessive slopes.

Underground construction around airfield is suitable because of cohesive property or soil and sufficient depth.

b. Command Post and Hospital were the only extensively fortified underground installations are the command post, hospital and airfield control tower.

Underground construction limited in hills and mountains because of shallow soil depths.

b. Movement near airfield is unrestricted.

b. In areas of rugged terrain and dense vegetation movement restricted to trails, ridgelines and along streams.

b. Good movement in vicinity of airfield.

Brushwood areas around Khe Sanh allow for fair cross-country movement.
2. Cover and Concealment.

a. No cover and concealment in valley except cover provided by fortifications.

b. Excellent cover and concealment in multi-canopied dense undergrowth forests and dissected terrain.

c. Excellent cover and concealment in multi-canopied dense undergrowth forests and dissected terrain.

3. Observation and Fields of Fire.

a. Observation and fields of fire are excellent in valley.

b. Observation and fields of fire are poor to non-existent in multi-canopied dense undergrowth forests.

c. Observation and fields of fire are poor to non-existent in multi-canopied dense undergrowth forests.

Fair concealment offered by brushwood vegetation around Khe Sanh.
4. **Avenues of Movement and Lines of Communication.**

a. Avenues of movement in mountains are restricted to trails, ridgelines and along streams.

b. Route 19 provided supply route for Viet Minh from Red River Delta into Dien Bien Phu.

c. No land supply route for French forces.

5. **Key Terrain.**

High terrain surrounding valley provided constant observation of valley.

Hills and mountains to west and north of airfield offer constant observation of airfield.

Mountains provide observation of airfield.

Hills and mountains to north and west of Khe Sanh are the only observation positions overlooking the airfield.

a. Tactical Air Support.

(1) Limited during periods of heavy rain (March to August).

(2) Fog during morning hours limits operations from December to March.

(1) Fog and low ceilings limit operations during morning from November to April.

(2) Periods of heavy rain limit operations from May to November.

(1) Fog limits tactical air support.

None.

b. Para-Drop.

(1) Size of drop zone limited.

(2) Weather conditions limited operation of aircraft.

(3) Size and weight of load limited to ability to carry off drop zone by personnel.

(1) Size of drop zone limited.

(2) Poor weather condition limit operation of aircraft. Low ceilings and fog from November and April.

(1) Drop Zones are limited in size.

None.

(2) Low ceilings and fog limit operations.