

JAPANESE DEFENSES AND FORTIFICATIONS TARAWA, IWO JIMA AND OKINAWA 1943 - 1945

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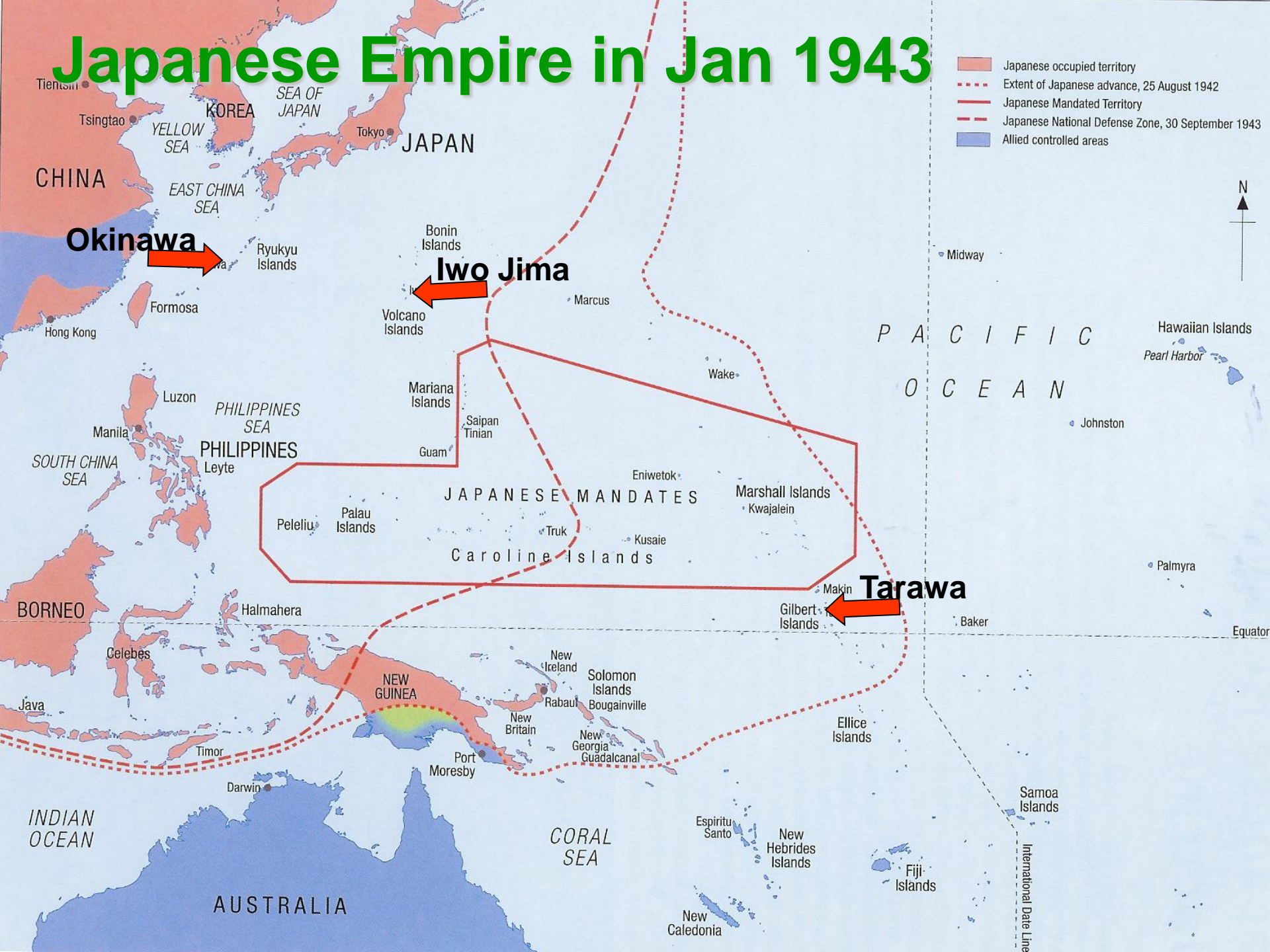
PURPOSE

To provide an understanding of the complex and ever evolving defensive tactics used by the Japanese in the Pacific islands.

OUTLINE

- ▮ **Area of Operations**
- ▮ **Defensive tactics**
- ▮ **Layout of typical positions**
- ▮ **Tarawa 1943**
- ▮ **Iwo Jima 1945**
- ▮ **Okinawa 1945**
- ▮ **Summary**

Japanese Empire in Jan 1943



JAPANESE DEFENSIVE DOCTRINE

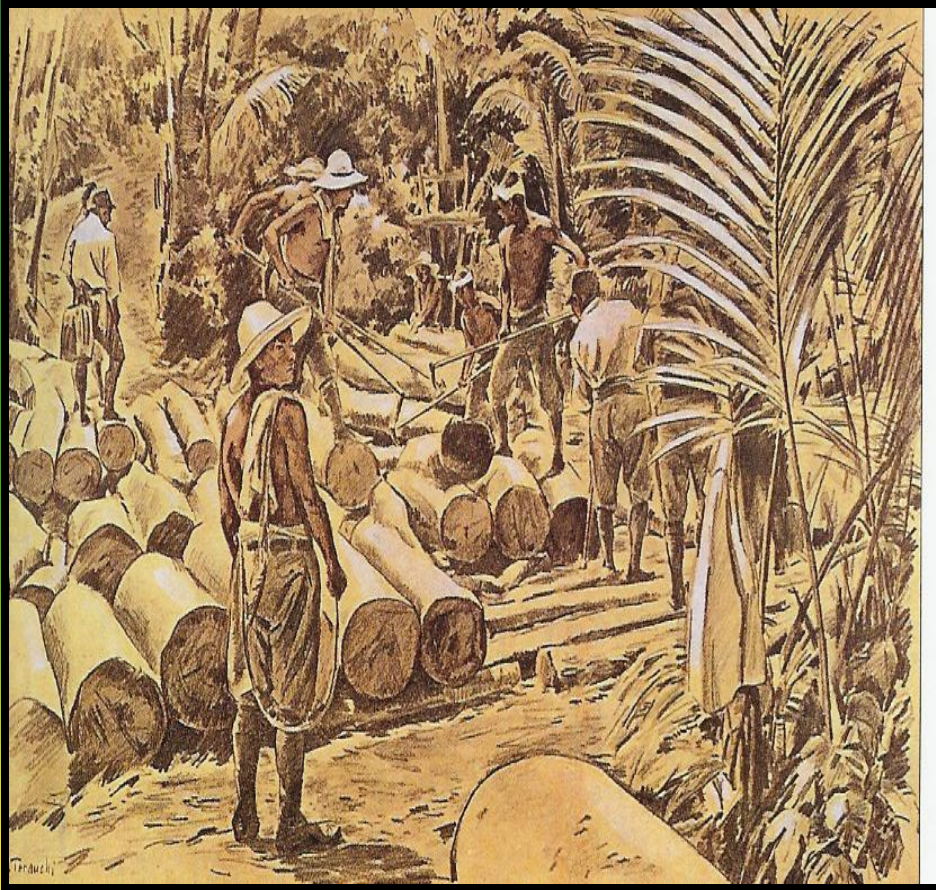
- **The U.S. Army's Handbook on Japanese Military Forces describes the Japanese attitude toward defense at the beginning of World War II:**
 - **“the defensive form of combat generally has been distasteful to the Japanese, and they have been reluctant to admit that the Imperial Army would ever be forced to engage in this type of combat”**
- **Every Japanese manual from 1909 onward focused on the importance of offensive action to achieve victory.**
 - **“What the Japanese lacked in firepower and material was to be made up for by spiritual power, superior martial values, and total dedication to fulfilling one's duty, even if it meant attacking a superior force with bayonets or defending a position to death.”**
- **The Japanese officer corps basically loathed defensive and fixed fortifications, feeling that these were in contrast to the true Bushido Spirit of the ancient Samauri.**
- **1938 Japanese Combat Regulations (in effect during WW2)**
 - **Called for “passive defense” only in the face of overwhelming superiority**
 - **Prior to this the Japanese had stuck to the “active Defense” concept**
 - **“Active defense” used only until offense could be re-established**

JAPANESE DEFENSIVE DOCTRINE

(continued)

- **Japanese officers were trained to conduct essentially active defenses**
 - **Goal was to halt enemy at the water's edge, and if unable to decisively defeat him there, they sought to reduce his strength, and conduct immediate counterattacks to keep him disorganized until mobile reserves could be brought forward to annihilate their foes**
- **Key problems the Japanese faced:**
 - **Vast distances between their fortified islands**
 - **Limited logistical support because of American interdiction of shipping by submarines and aircraft; material shortages were routine and often extreme**
 - **Vast climate differences between different theaters of combat**
- **As the war continued Japanese tactics evolved rapidly:**
 - **Skillful use of camouflage, esp. in jungle environments**
 - **Utilized natural materials found on the islands in their fortifications**
 - **Effective use of terrain masking**
 - **Developed mutually supporting fire support positions**
 - **Extensive use of decoys**
 - **Fortifications constructed to withstand massive firepower**

CONSTRUCTING DEFENSES



Natives cutting coconut logs for use in fortifications

- **Local laborers used extensively for constructing support facilities, cutting wood, and material transport**
- **Japanese troops constructed fighting positions themselves**
- **Little or no equipment or power tools to assist in construction.**

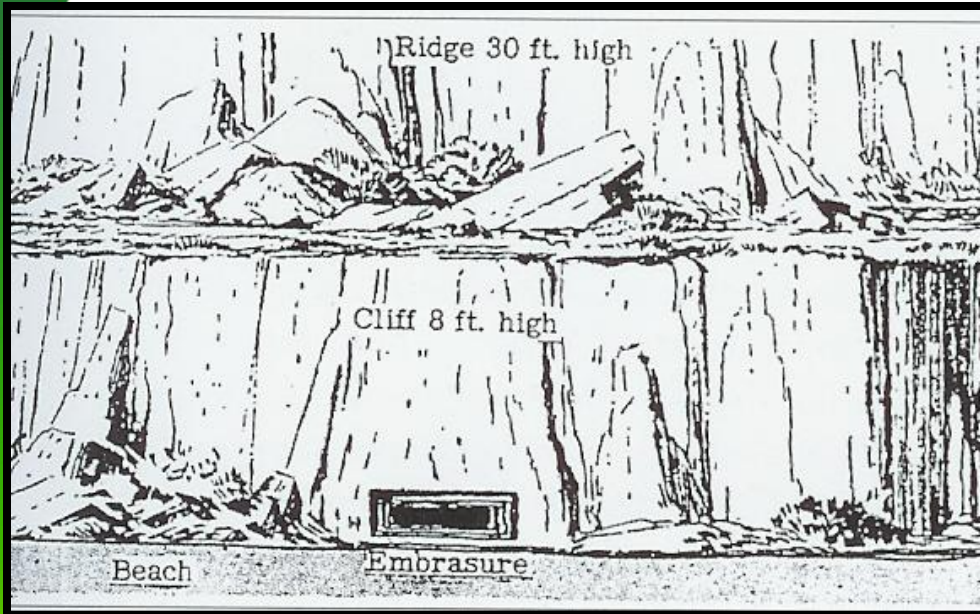
BUILDING MATERIALS

- **Japanese forces made extensive use of local materials for fortifications and obstacles; it was usually all they had to work with**
- **Materials supplied from the Japanese mainland were of insufficient quantities and were earmarked for priority structures such as command posts, communication centers, and coastal defense guns.**
- **Material shortage of concrete and steel was due to diversion to fortifications of the Home Islands and Mandated Territory such as Iwo Jima.**
- **A large percentage of construction materials was sunk en route to the islands by Allied aircraft and submarines**

BUILDING MATERIALS (continued)

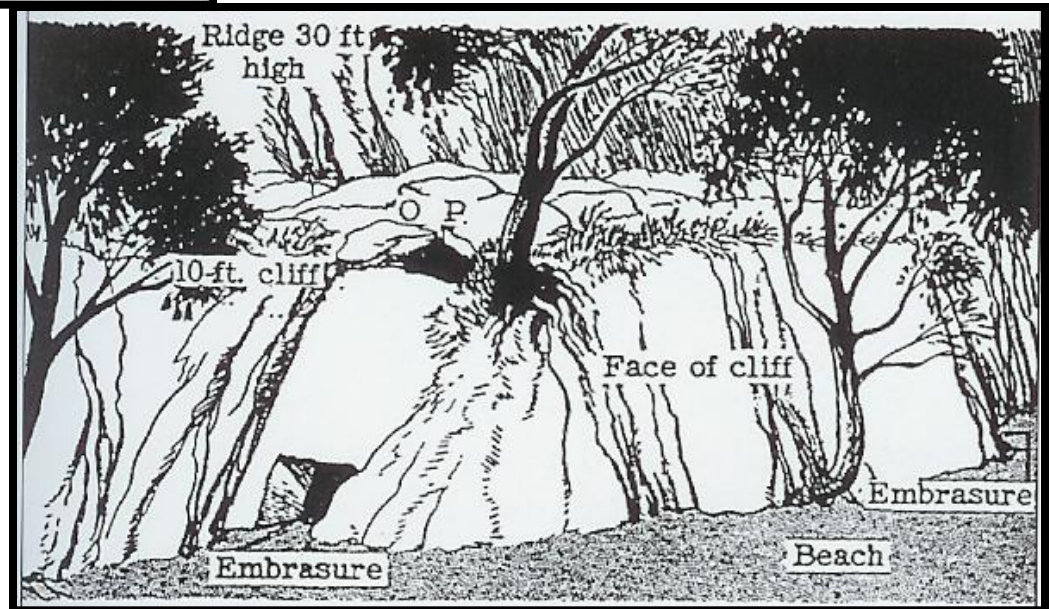
- **Coconut Logs** – interior soft and fibrous, very resilient to impact
- **Ironwood** – common species, hard to work but extremely resilient
- **Steel Staples** – hammered into ends or sides to provide structure
- **Wooden Shipping Crates** – Filled with sand and stacked like bricks
 - Disassembled and used as planking for soil retention in positions
 - Used wire strapping from crates to lash logs together
- **Burlap Rice Bags** – Filled as sand bags after rice used
- **Oil Barrels** – Filled with sand and used as uprights in positions
 - Ends cut out and used as tunnel entrances and crawl tunnels
 - Flattened and used as roofing for revetments
- **Narrow Gauge Railroads** – built to haul supplies on islands
 - After destroyed by air attacks, track used for overhead reinforcement
- **Dimension Lumber** – rare and used in warehouses, piers, or hangers
 - Some islands had portable sawmills shipped in
- **Concrete** – shipped in 50kg watertight sheet metal cans
 - Used only on front of positions or critical areas
 - Coral and local stone used extensively in place of concrete

PRINCIPLES OF CONSTRUCTION



**Dig as deep
as possible,**

**and keep as low a
profile if possible**



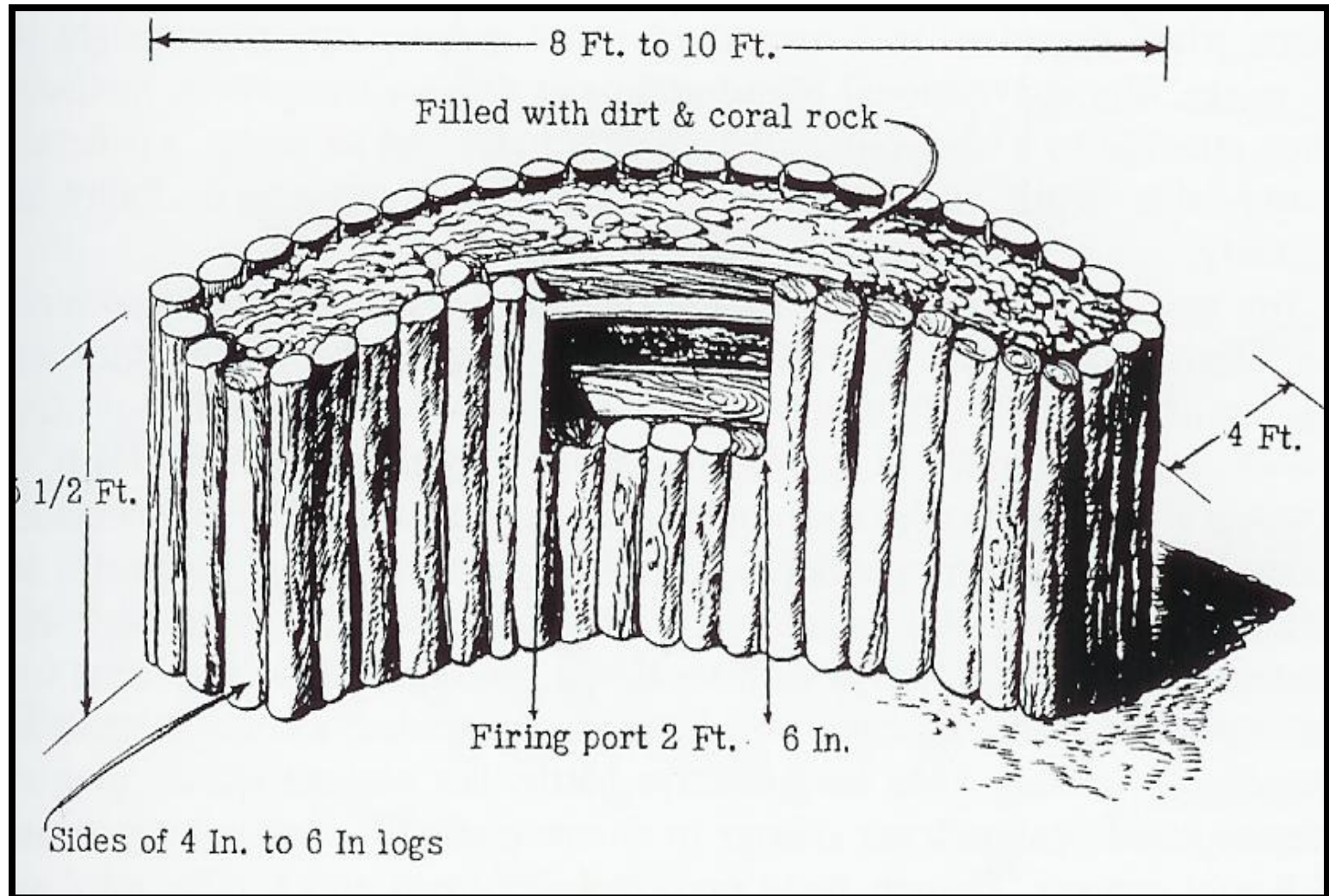
JAPANESE WEAPONS



This schematic demonstrates the comparative ranges and trajectories of the most common Japanese infantry weapons. Extracted from a US 1943 Intelligence Bulletin, the characteristics have been corrected from the wartime publication.

| Weapon | Weight (lbs) | Effective range (yards) | Rate of fire (rpm) |
|--|--------------|-------------------------|--------------------|
| 1. 8mm Model 14 (1925) pistol | 2 | 17 | 8-16 |
| 2. 7.7mm Model 99 (1939) LMG | 21.36 | 1,500 | 850 (cyclic) |
| 3. 7.7mm Model 99 (1939) rifle | 8.8 | 600 | 10-15 |
| 4. 6.5mm Model 38 (1905) rifle | 9.4 | 400 | 10-15 |
| 5. 50mm Model 89 (1929) grenade discharger | 10.25 | 175-710 | 10-20 |
| 6. 7.7mm Model 92 (1932) HMG | 122 | 1,500 | 450-500 (cyclic) |
| 7. 20mm Model 97 (1937) AT rifle | 140 | 1,100 | 12 (semi) |
| 8. 37mm Model 94 (1934) AT gun | 714 | 2,500 | 10-20 |
| 9. 47mm Model 1 (1941) AT gun | 1,660 | 2,500 | 10-15 |
| 10. 81mm Model 99 (1939) short mortar | 52 | 3,280 | 15 |
| 11. 81mm Model 97 (1937) mortar | 145 | 3,100 | 18-30 |
| 12. 70mm Model 92 (1932) battalion gun | 468 | 1,500 | 10 |
| 13. 75mm Model 41 (1908) regimental gun | 1,600 | 2,100 | 10 |
| 14. 13.2mm Model 93 (1933) twin HMG | 87 each | 3,000 | 450 (cyclic) |
| 15. 20mm Model 98 (1938) machine cannon | 836 | 2,000 | 120 |

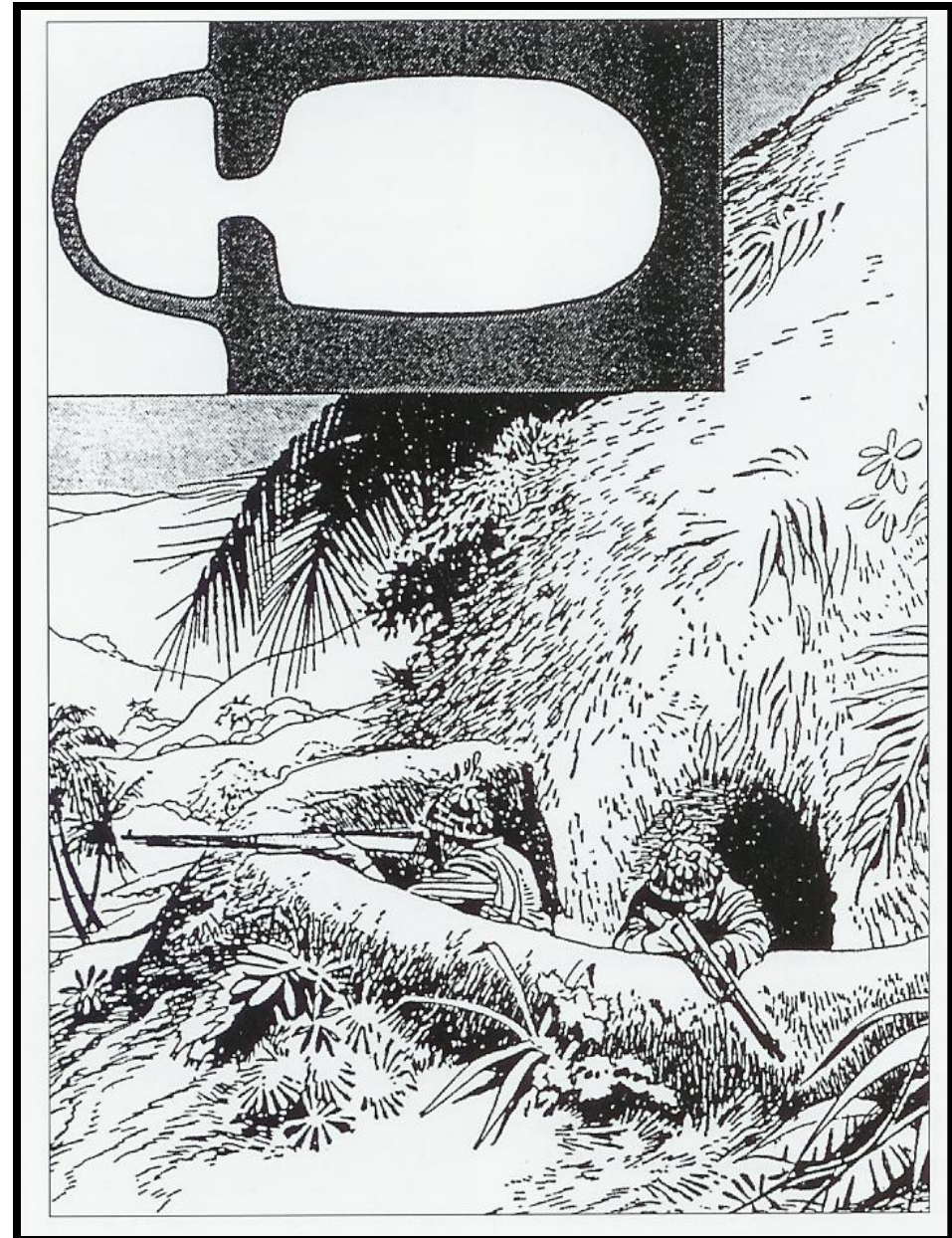
EARLY RIFLE POSITIONS WERE NOT COVERED



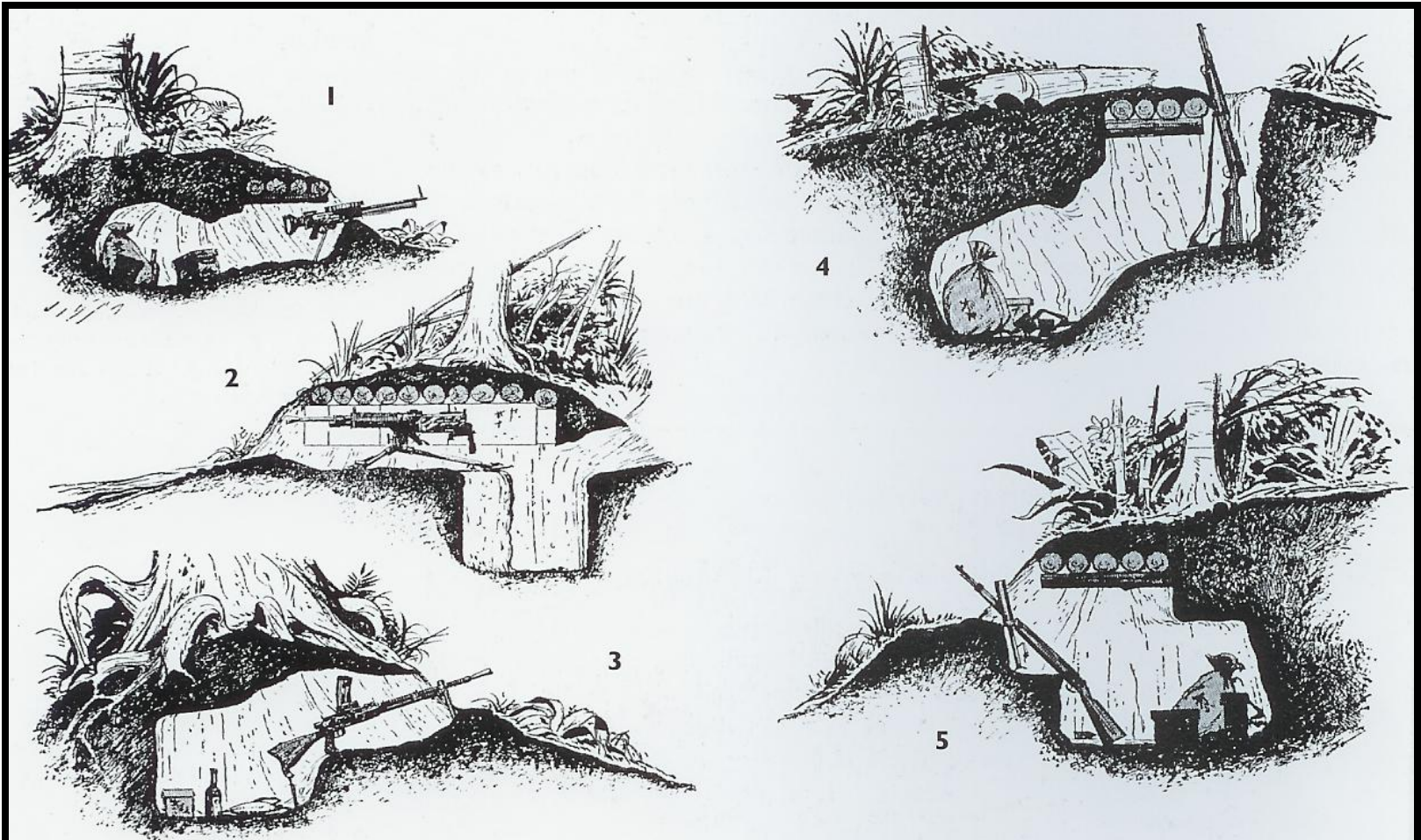
Japanese foxholes were usually small one man holes, but sometimes two and three man positions were connected.

These could be used for a light machine gun (LMG) or grenade positions. (inset diagram shows plan view).

Cave allowed soldiers shelter from artillery and mortar fire.



INDIVIDUAL FIGHTING POSITIONS



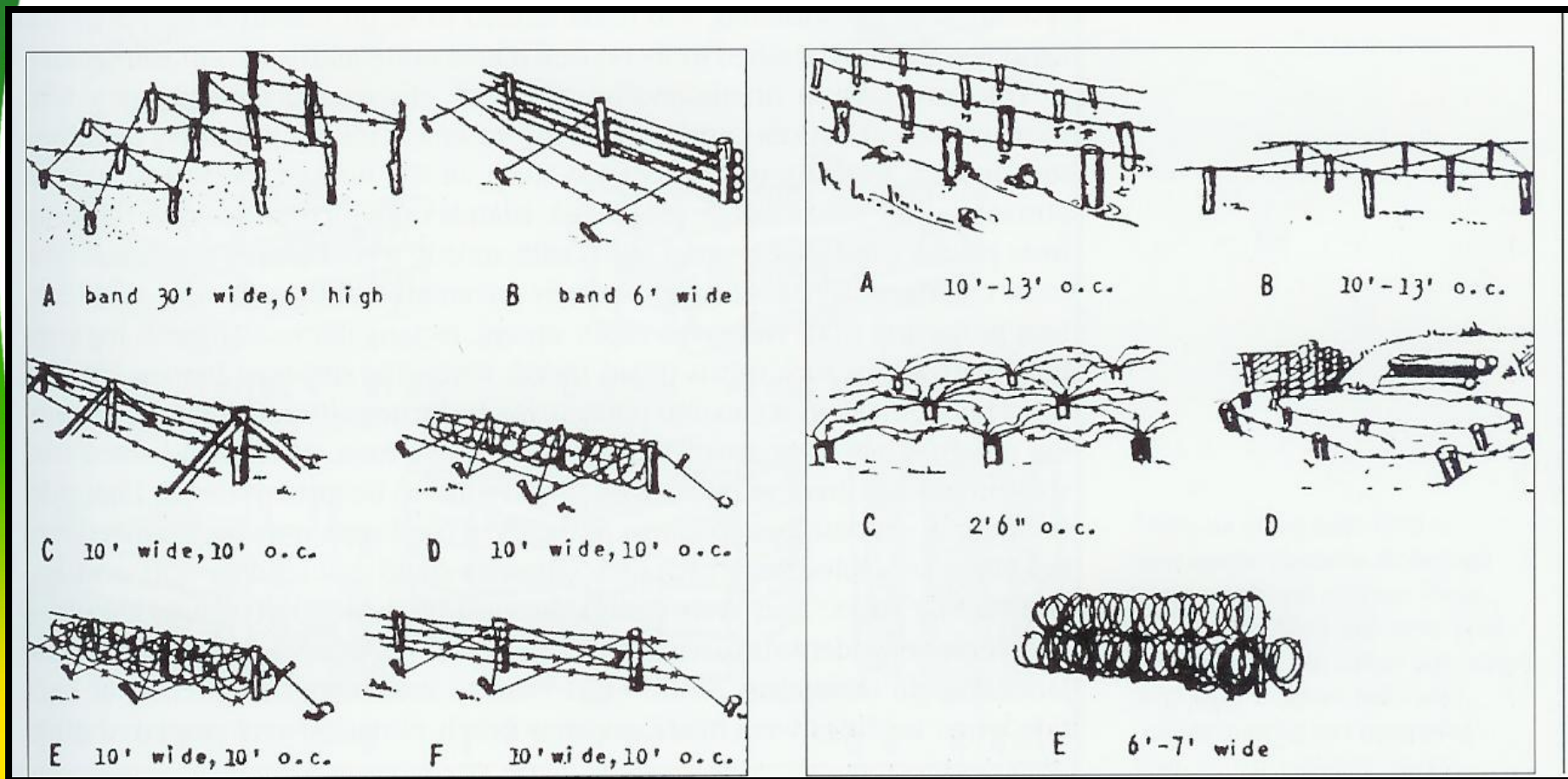
Examples of small Japanese individual fighting positions.

1. 7.7mm aircraft machine gun modified for ground use. 2. 7.7mm HMG. 3. 7.7mm LMG. 4. Rifleman.

5. 50mm grenade discharger.

Such positions, often dug beneath trees, were difficult to detect and offered protection from grenades, small arms, and mortar fire.

JAPANESE BARBED WIRE OBSTACLES



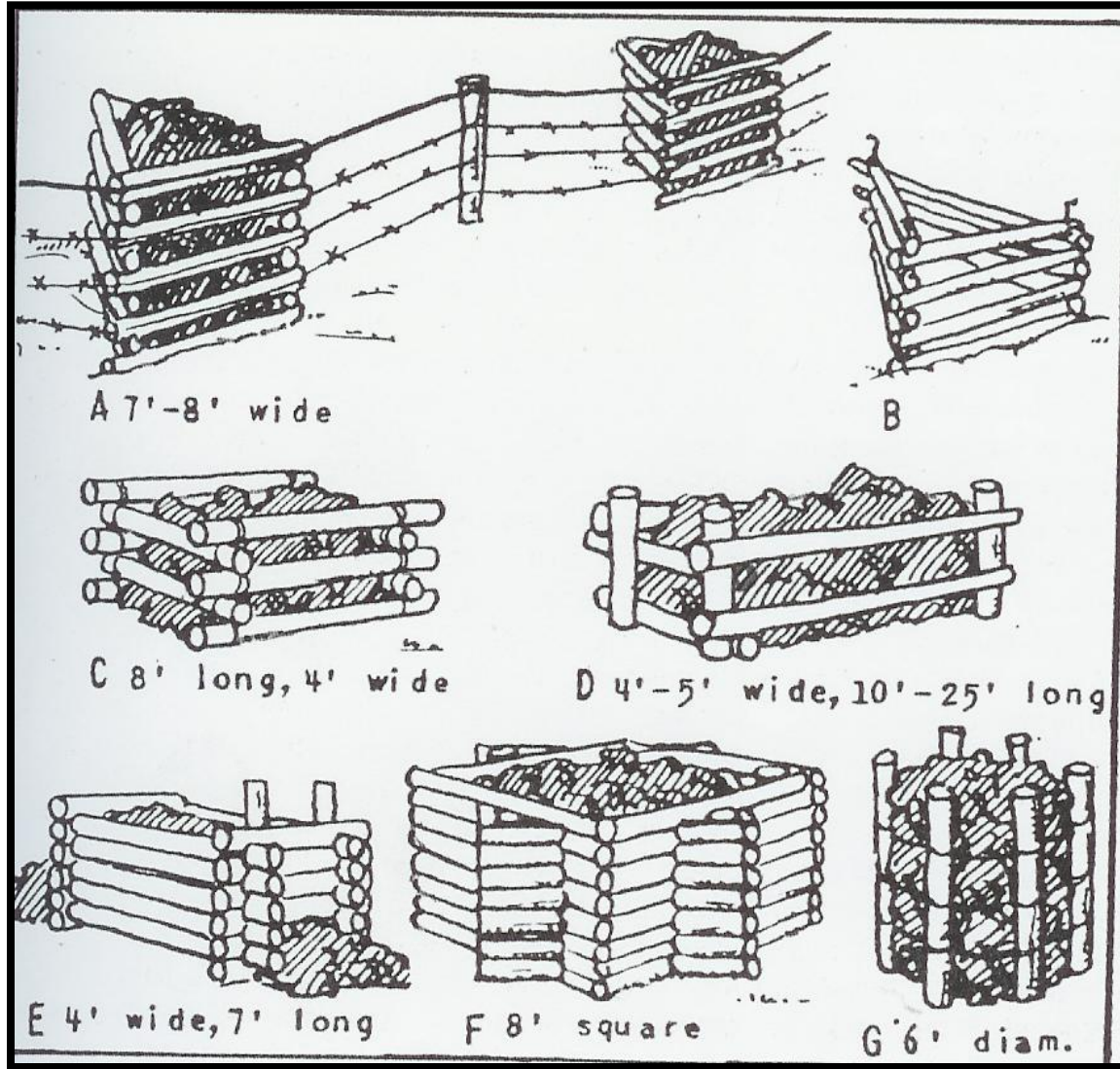
Usually found on beaches or open avenues inland.
Often camouflaged to conceal

The Japanese commonly used sharpened bamboo stakes concealed by tall grass as obstacles because barbed wire was in short supply

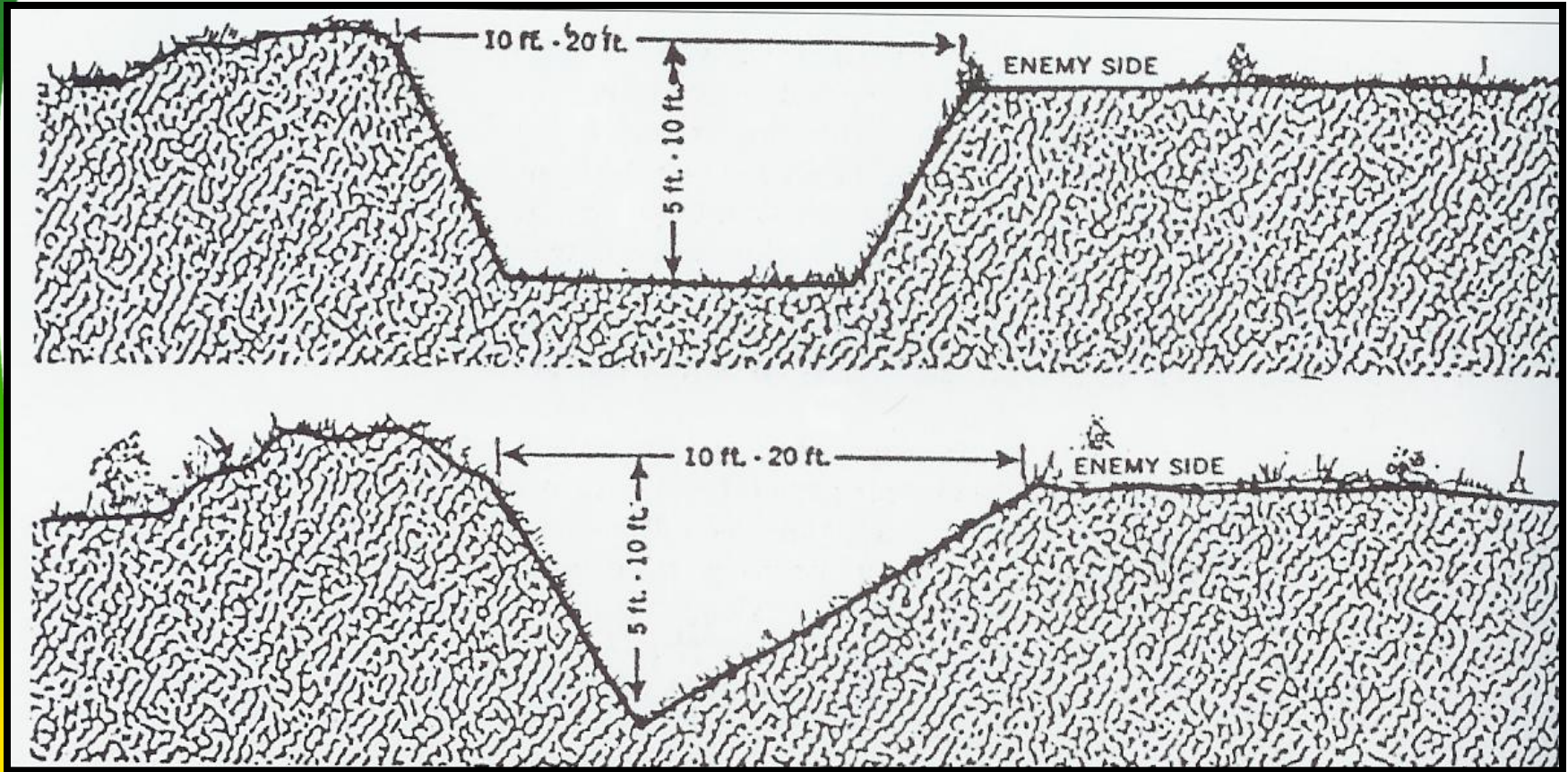


These structures were usually constructed on flanks of key defensive positions and were well camouflaged

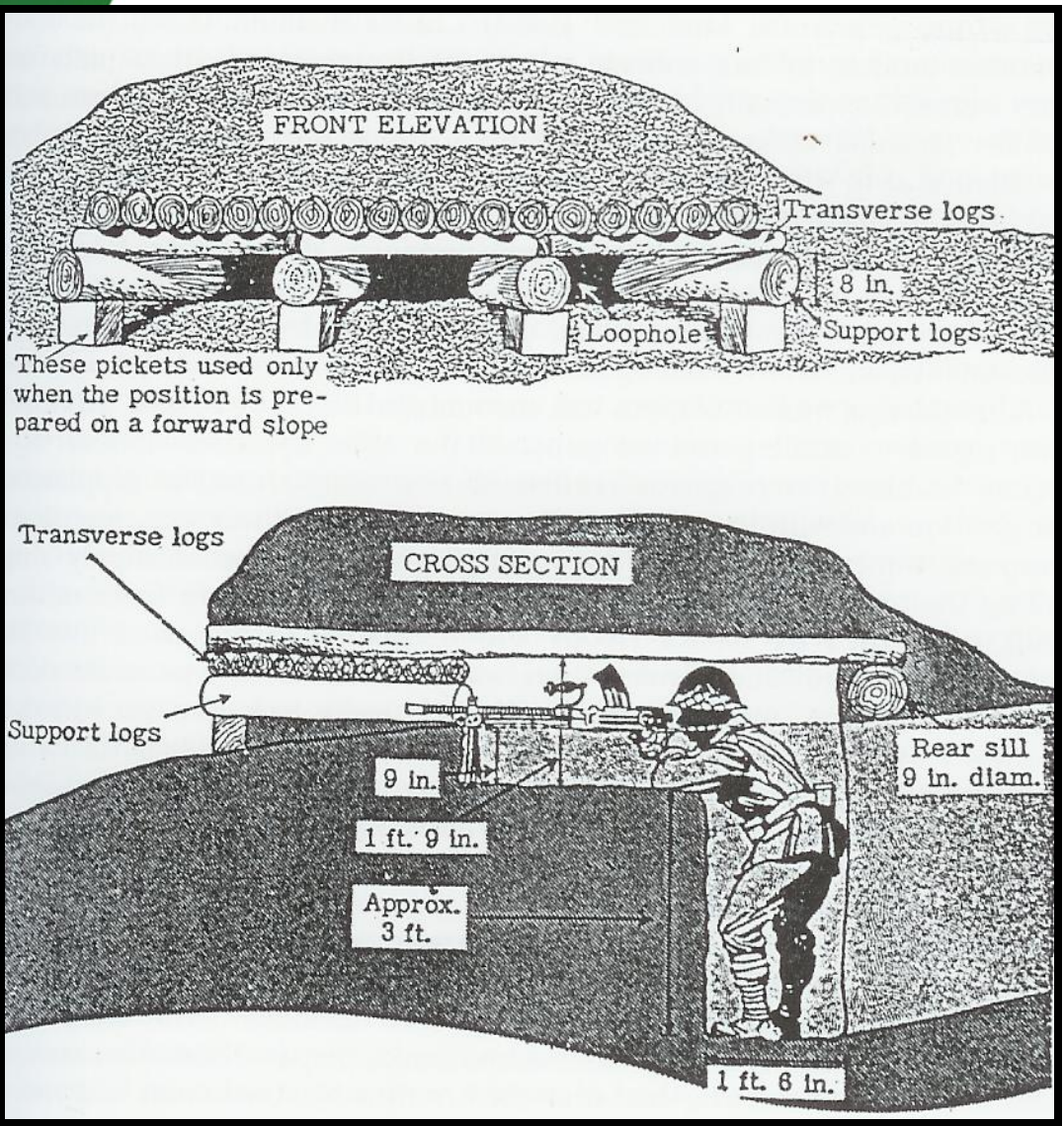
Log cribs were often used as landing beach obstacles, intended to damage landing craft and Amtracs



Cross sections through Japanese anti-tank ditches



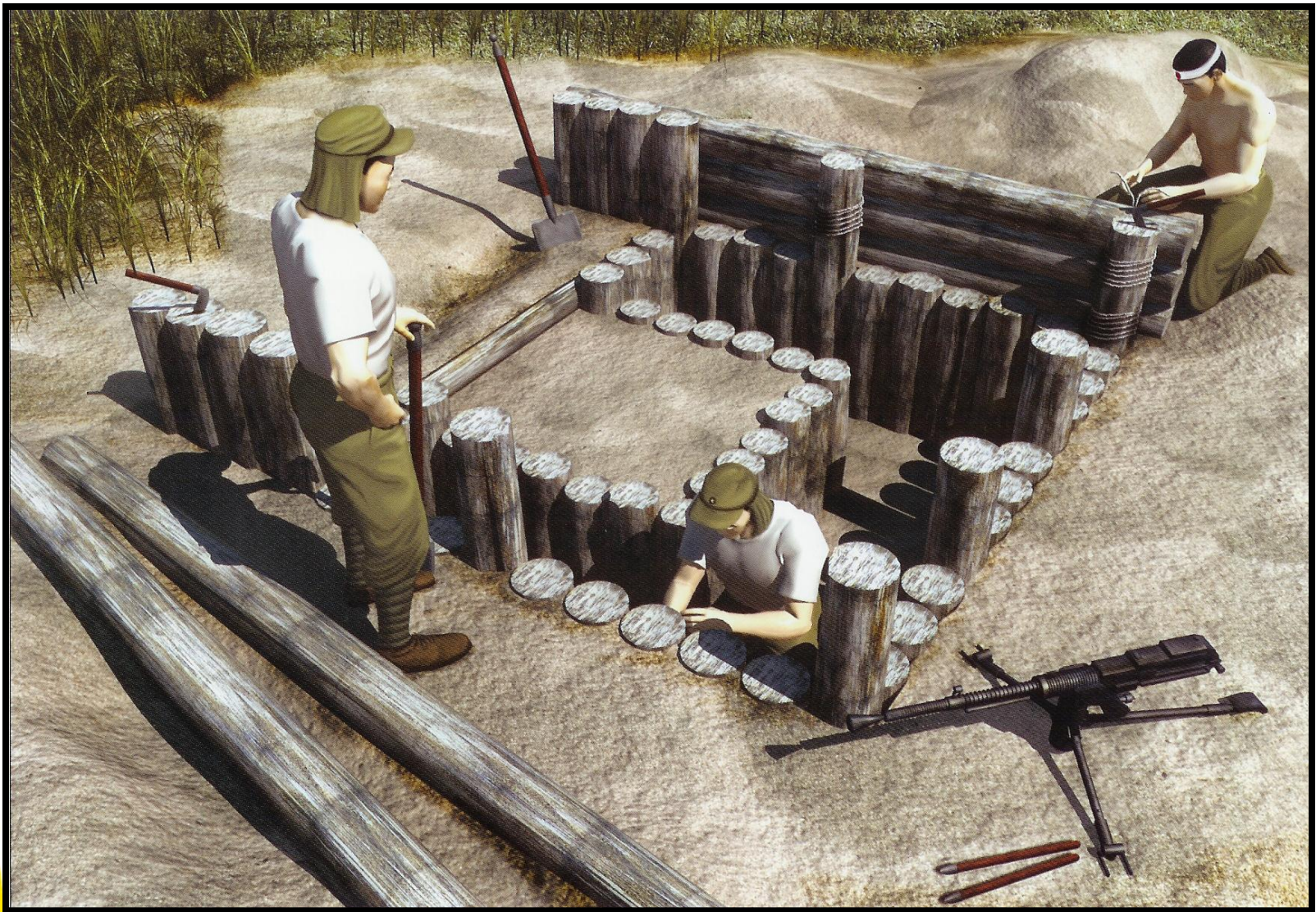
Almost all were hand dug and ranged with artillery and mortar fire to prevent use by enemy infantry.



Typical Light Machine Gun position with three firing ports.

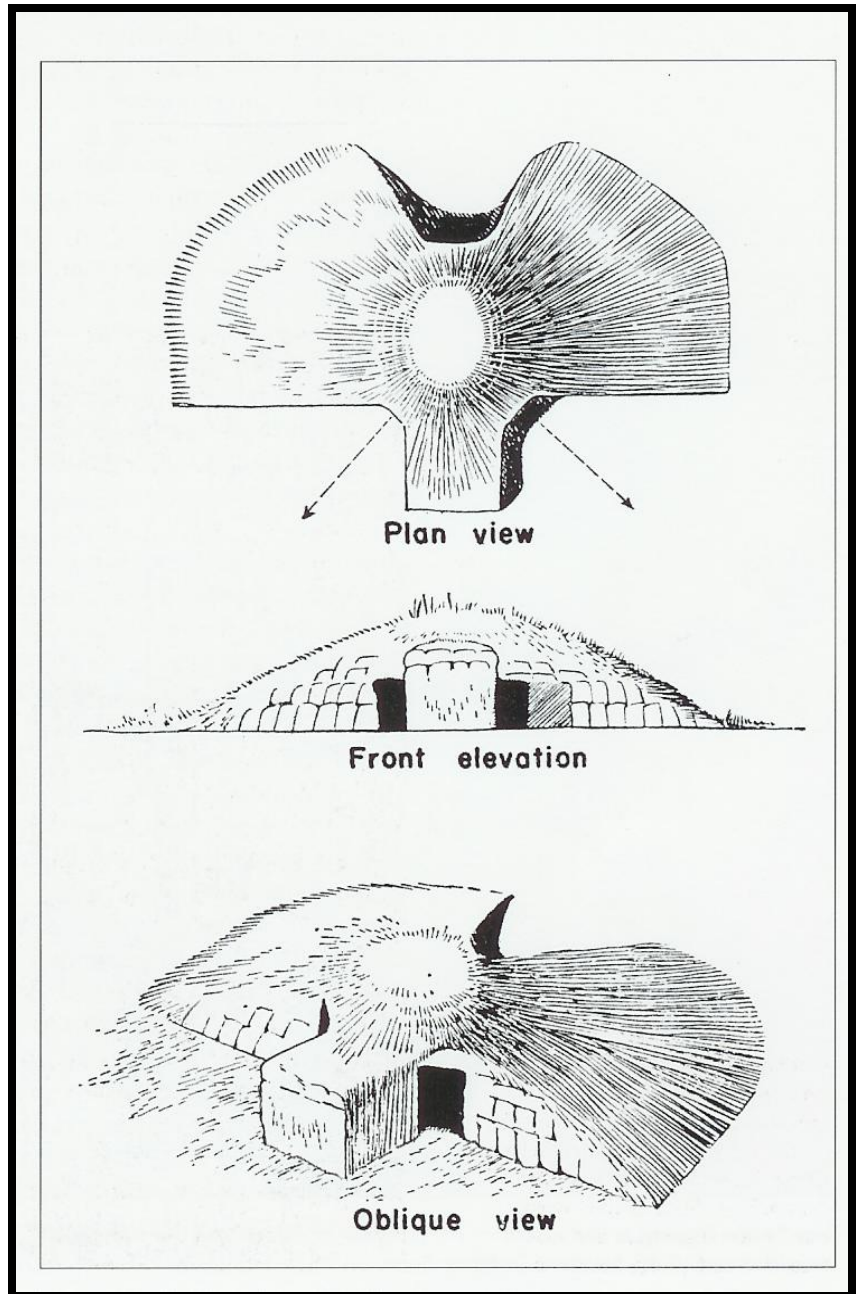
Weapon had to be moved from port to port to cover different sectors of fire

Heavy Machine Gun crew building pillbox from local materials

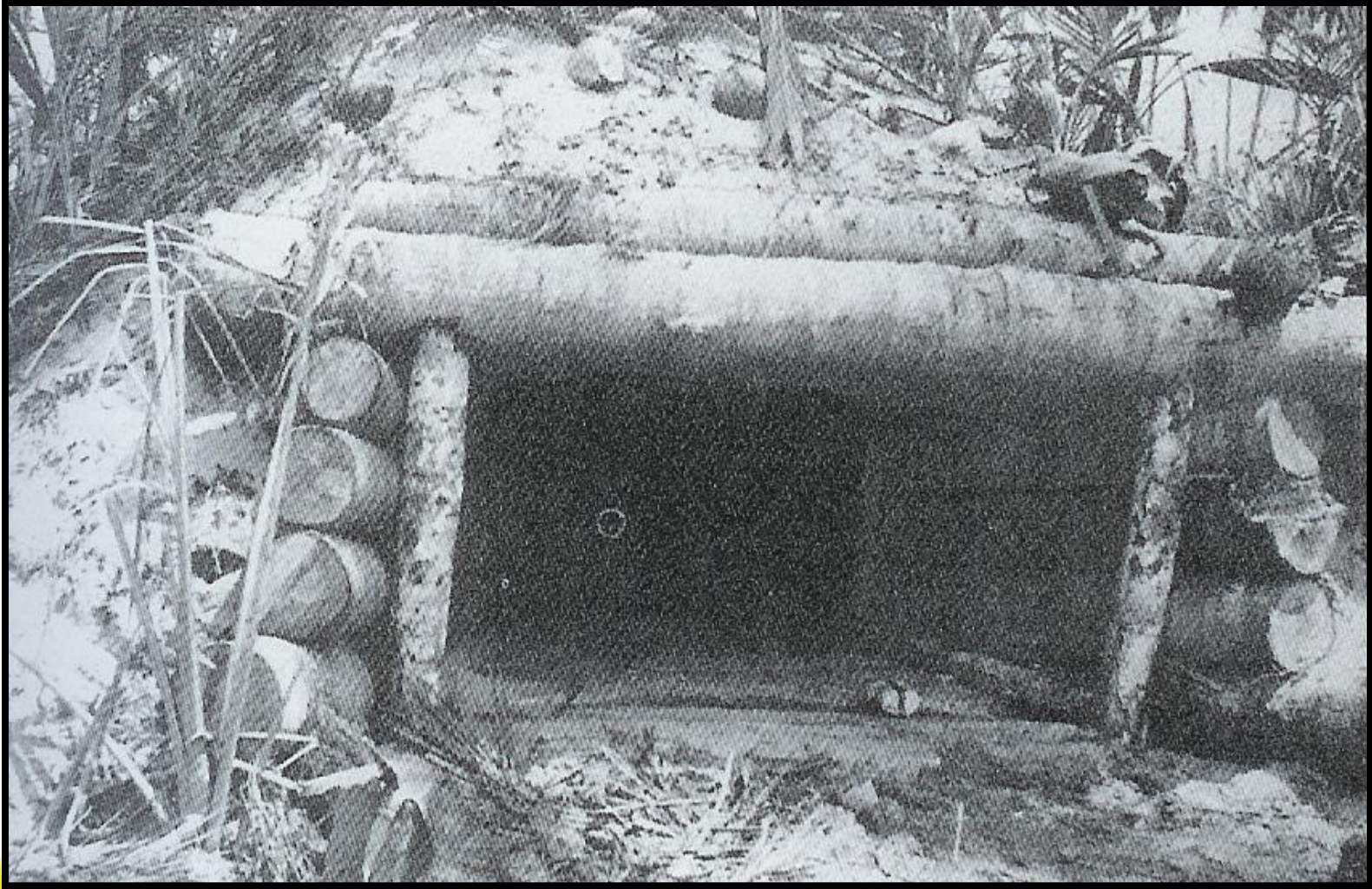


**Typical layout of
“double day bunker”
housing two Heavy
Machine Guns, each
with individual sector
of fire.**

**Bunker divided into
two compartments to
prevent both from
being taken out by a
single satchel charge
or bazooka.**



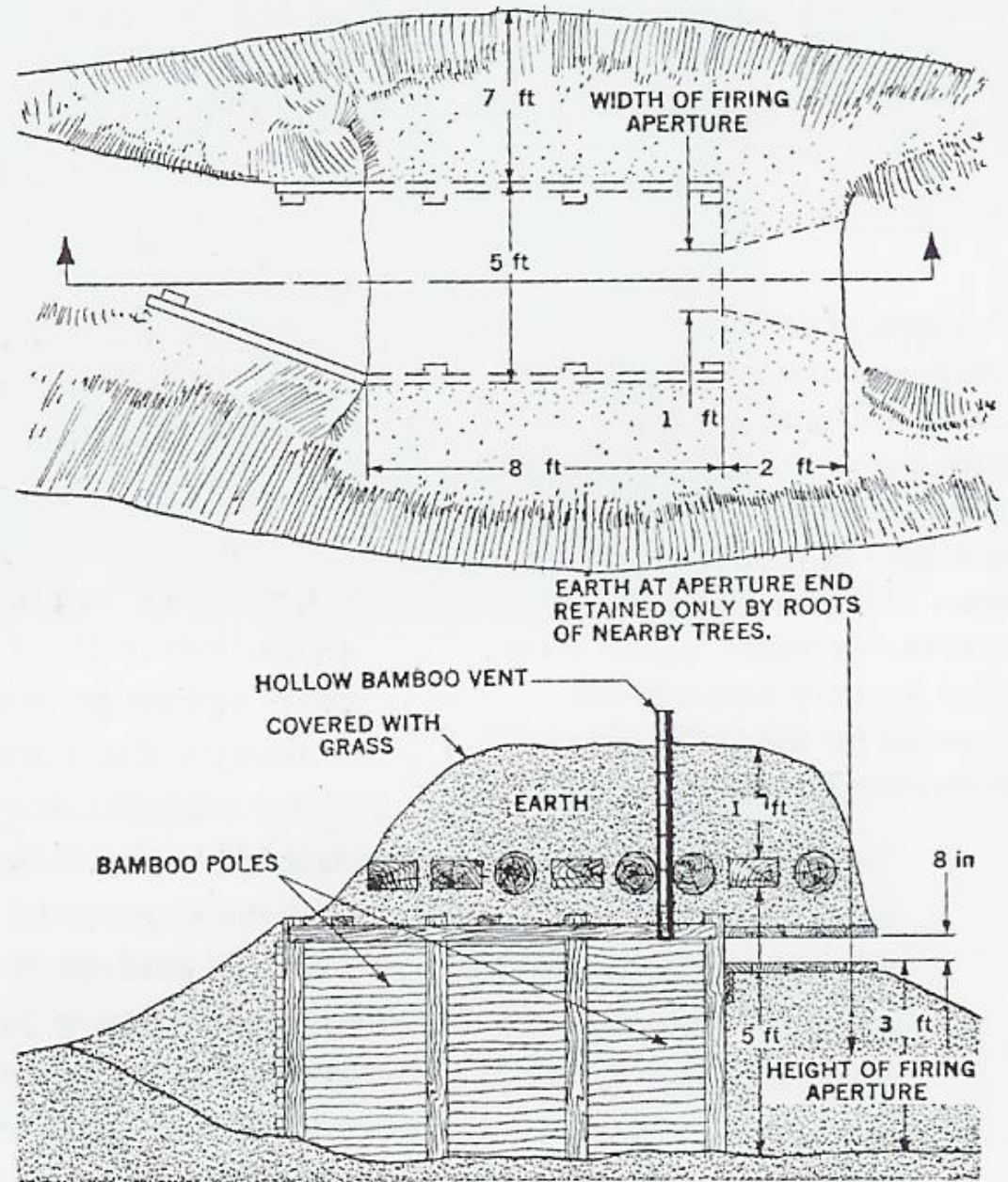
Heavy built 75mm gun bunker on Bougainville



(1-quart GI canteen near entrance for size reference)

Large rifle position constructed with bamboo and planks.

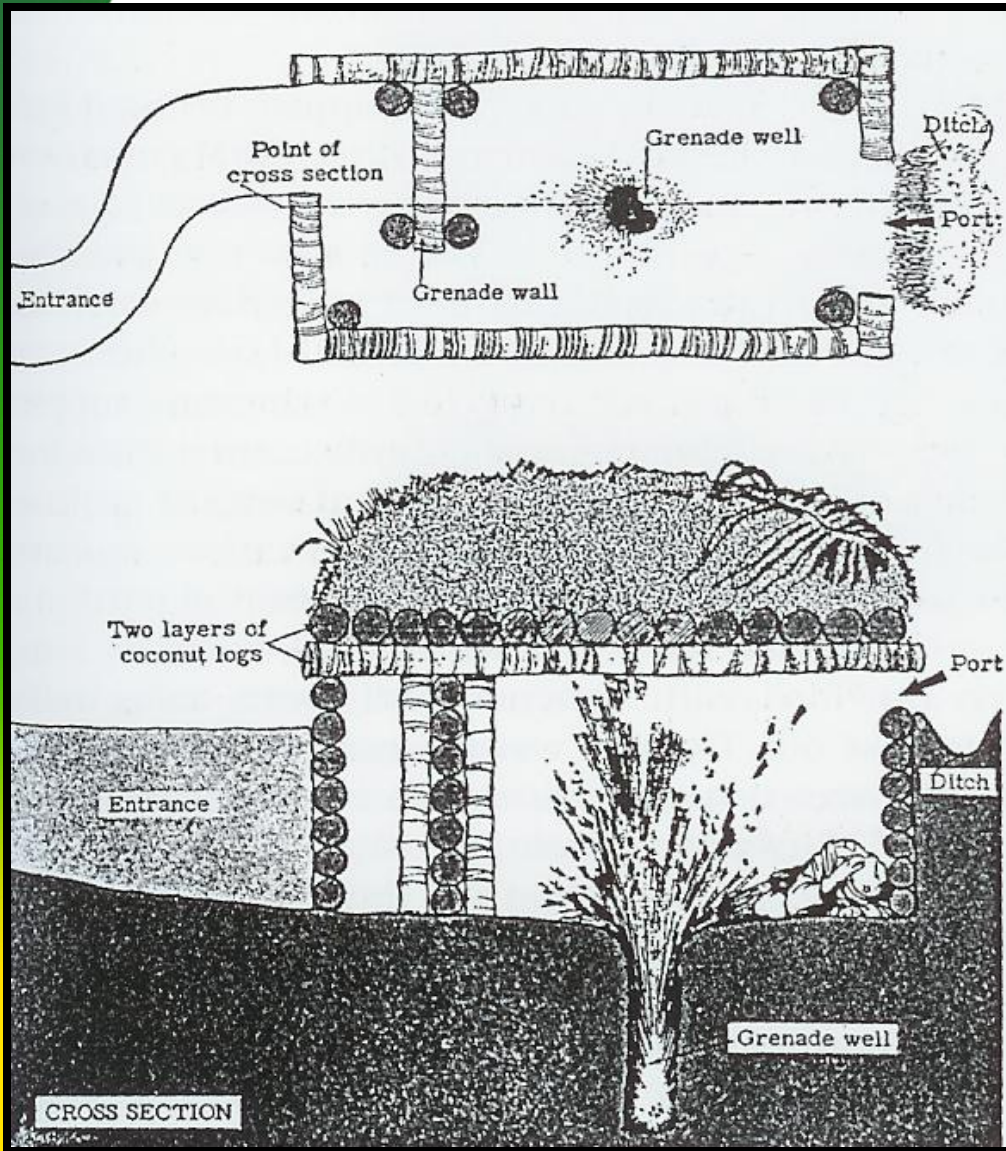
Notice the bamboo vent in ceiling to alleviate buildup of toxic weapons fumes



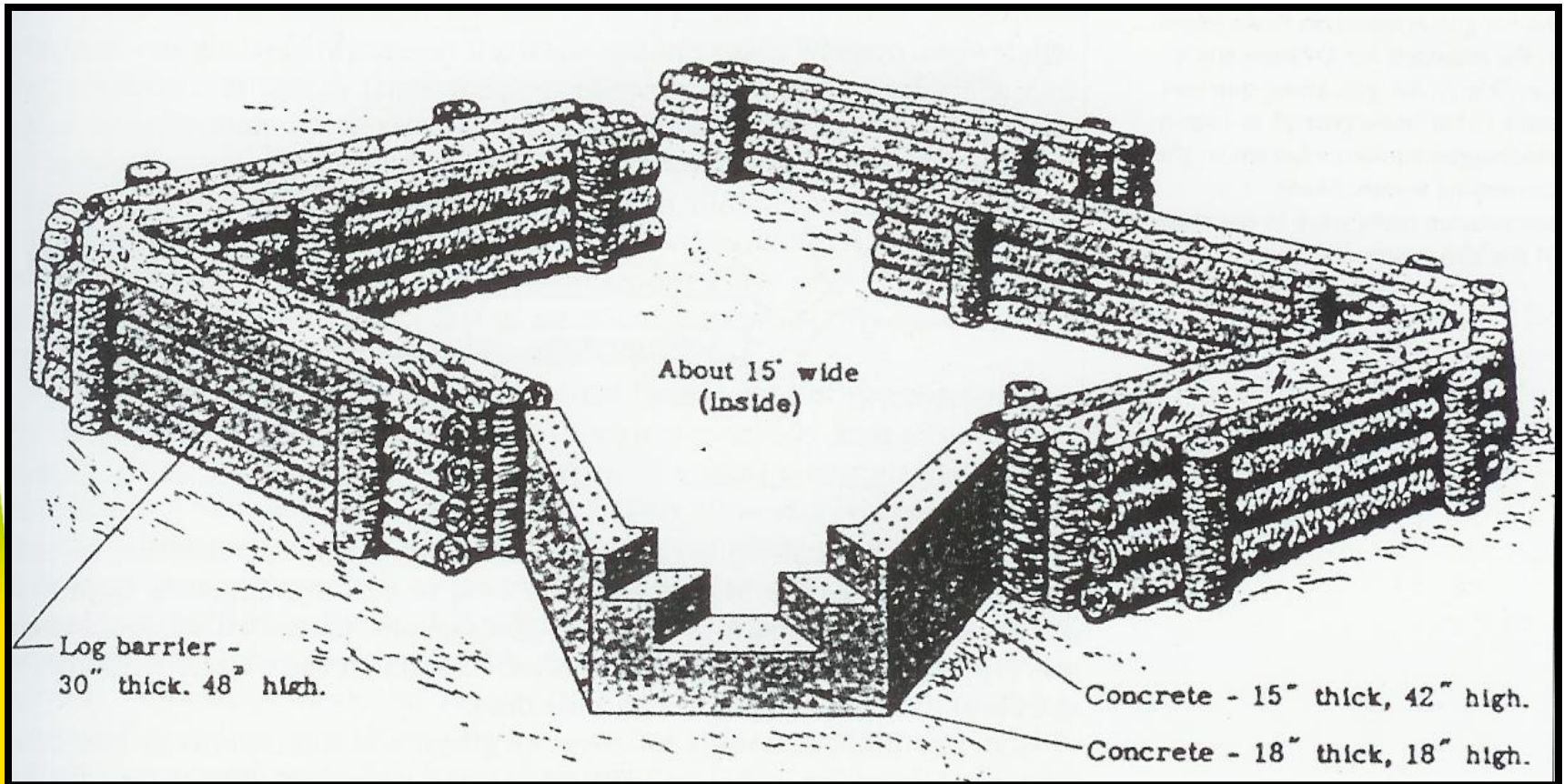
As war progressed the Japanese learned that American GI's preferred using grenades to neutralize pill boxes.

They shifted to constructing their rifleman positions with redundant grenade protection measures:

- Grenade well
- Overhead cover
- Grenade ditch
- Grenade wall

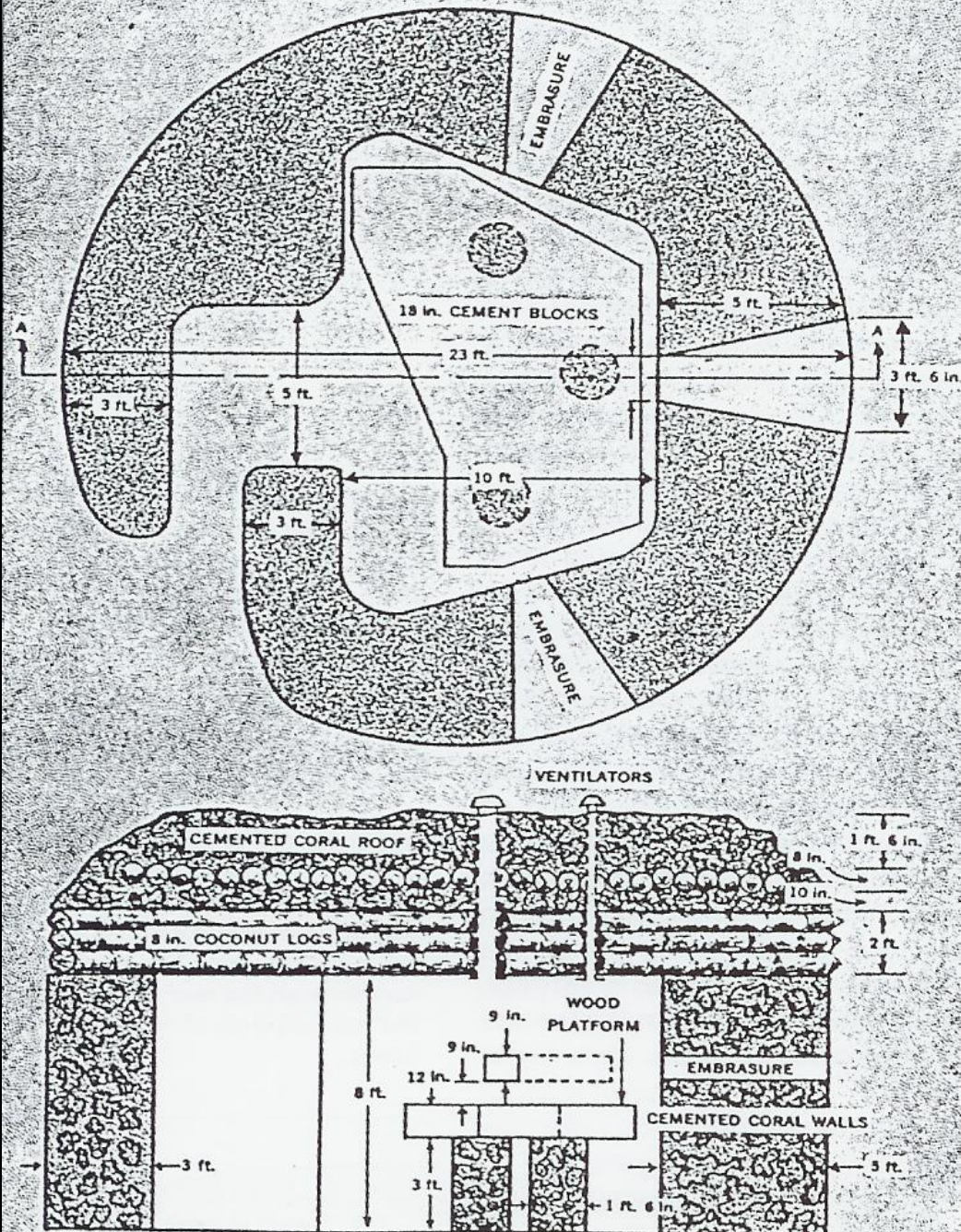


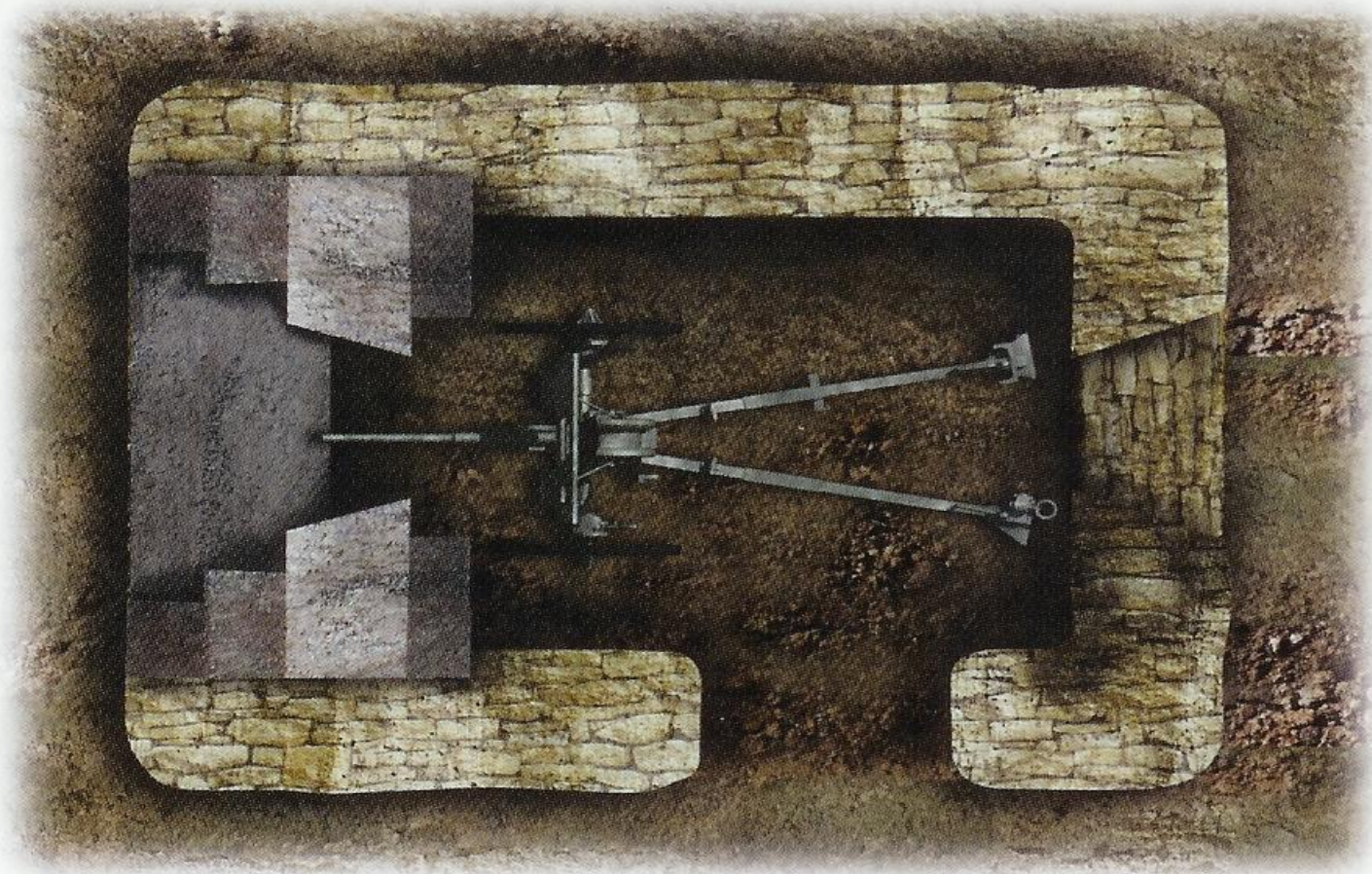
Open-top anti-tank gun position with concrete embrasure and sides protected by double coconut log walls filled with sand.



**Coral Masonry
pillbox with walls
3 to 5 feet thick.**

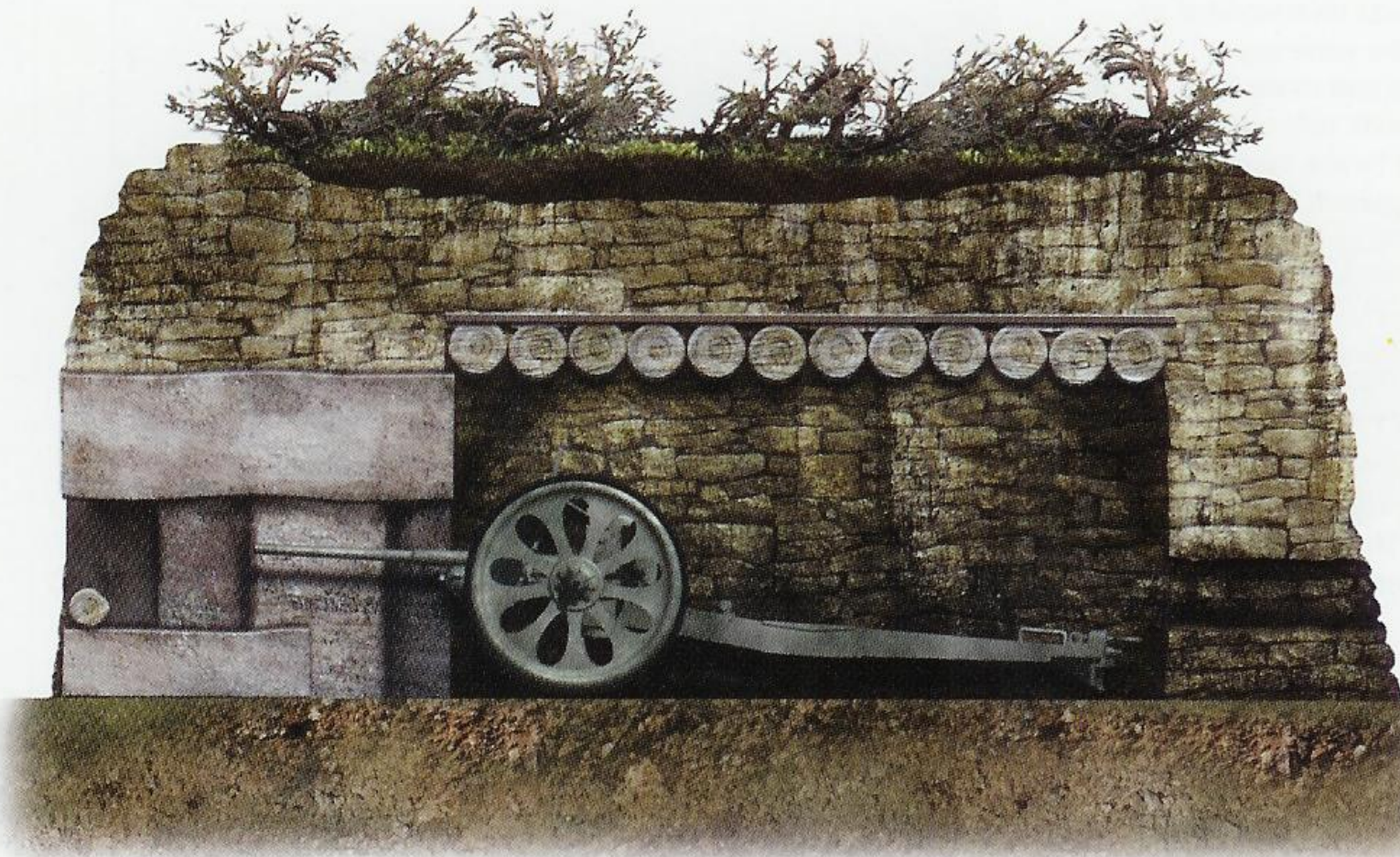
**Platform on inside
was for mounting
of heavy machine
guns.**





Antitank gun casemate

AT guns were provided with robust protection, knowing they would be subjected to heavy fire. This type of position, used from 1944, was built at ground level. It had a 6ft-thick reinforced concrete front with a stepped embrasure. The side and rear walls were 3ft thick and made of concrete-bonded coral rock. An entrance, large enough for the 37mm Model 94 (1934) AT gun, was located in the side and an LMG embrasure protected the rear. The ceiling comprised 6–9in. logs topped with corrugated sheet metal on which 3–5ft of cement and coral rock was laid. The poured concrete gave the casemate the appearance of having been “melted.” Vegetation was planted on the roof and around the casemate. Up to 100 rounds of ammunition could be stowed in ready racks within such a position.



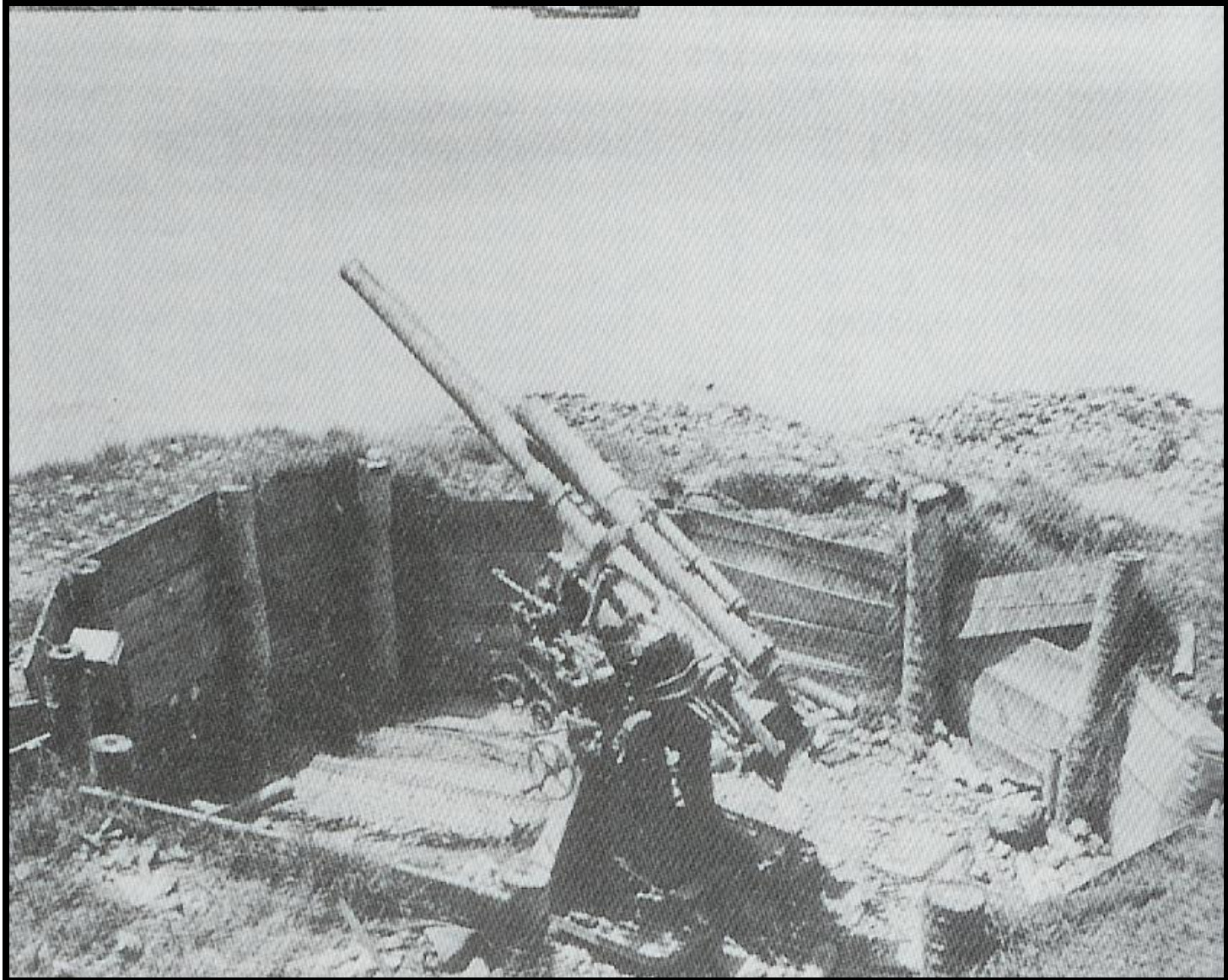
- **Cut away view through antitank gun casement**

75mm self-propelled gun placed in timber revetment casement on Pelileu Island

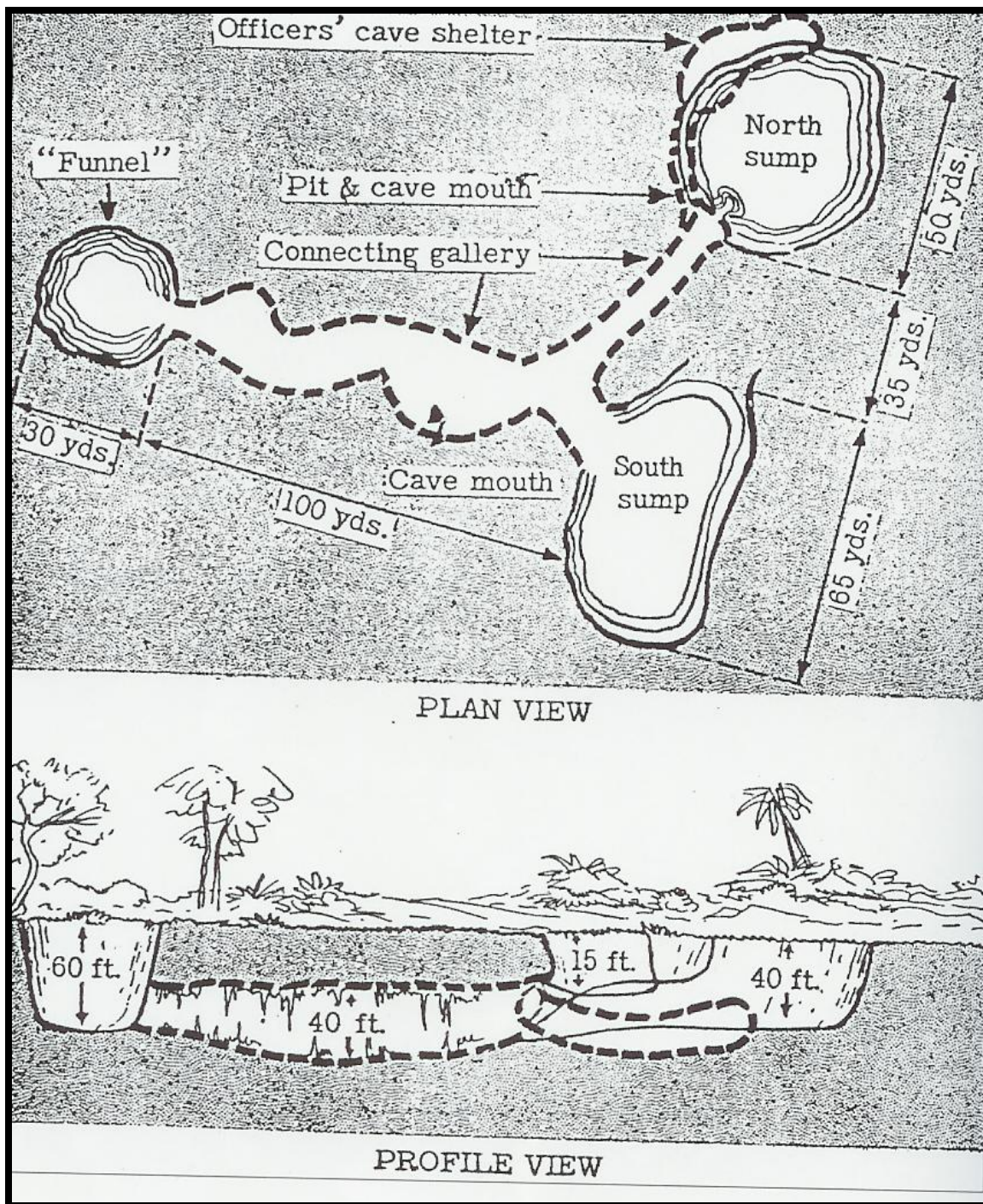


Position cover was destroyed by naval gunfire

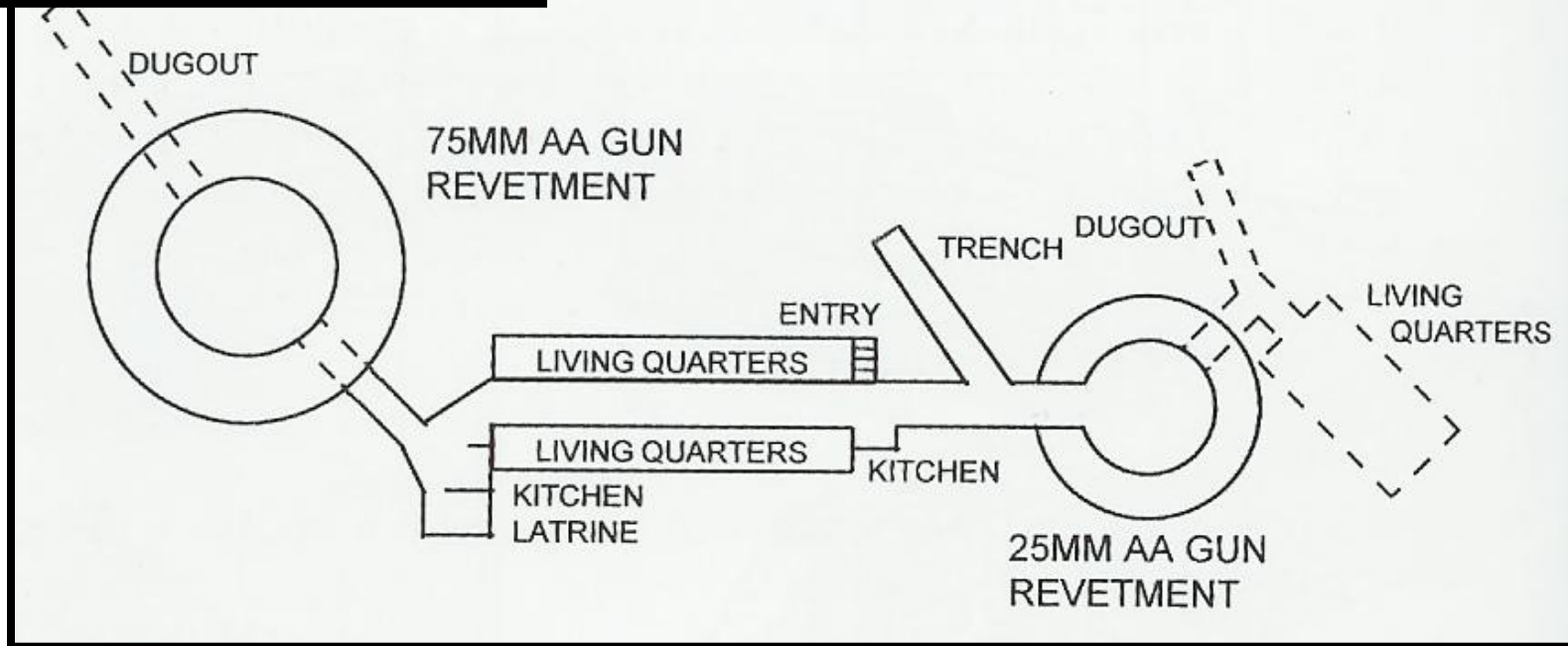
80mm AA gun at Makin Atoll Plank-log rivetment position



Collapsed Cave complex with “sumps” on Biak Island in western New Guinea. These are natural lava tubes. The sumps were craters where the tube roofs had collapsed. This complex housed 900 Japanese troops



25mm Model 96 Anti-Aircraft gun emplaced for both air and beach defense



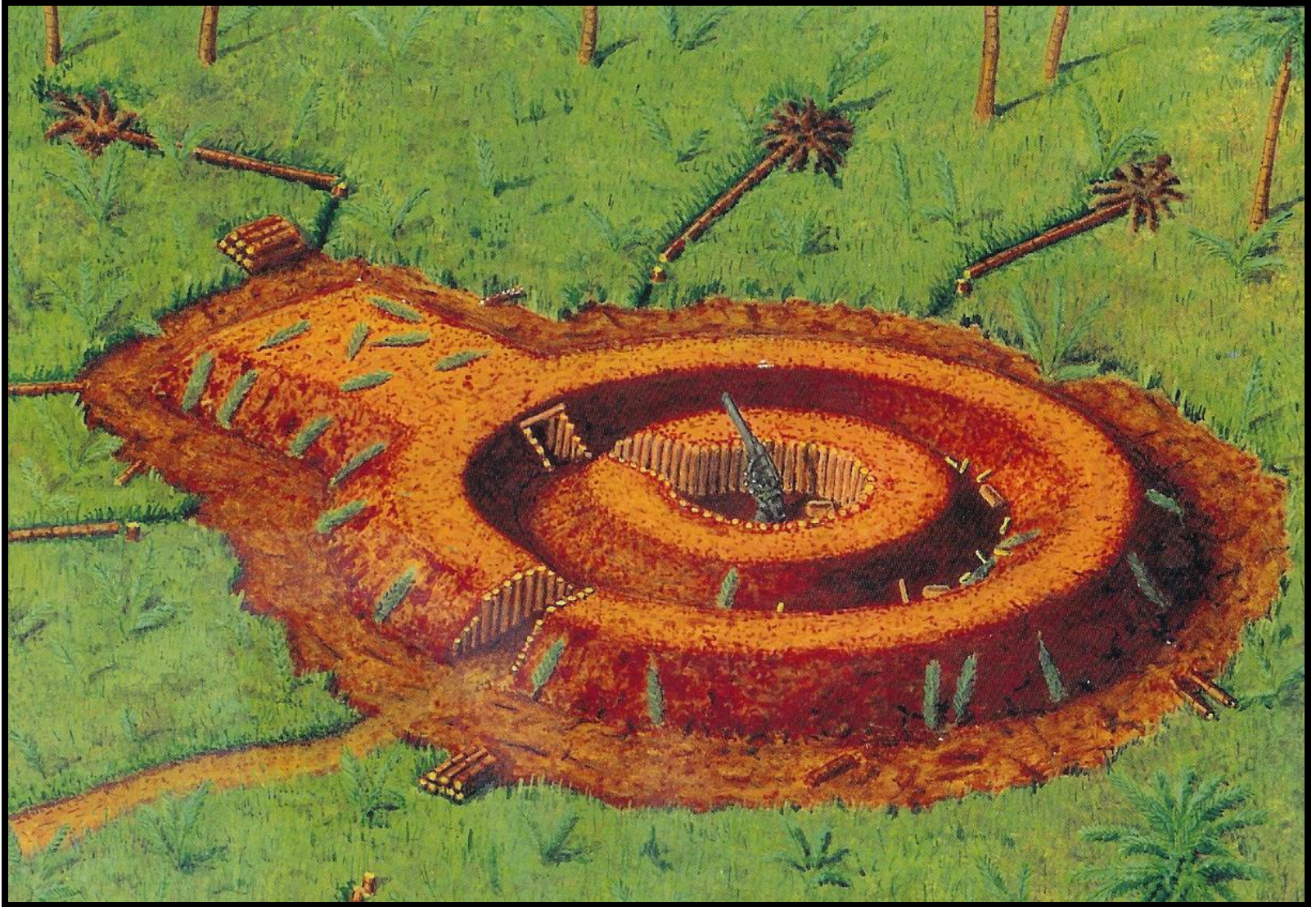
Typical layout of AA gun position

Dummy AA gun with “straw man crew”



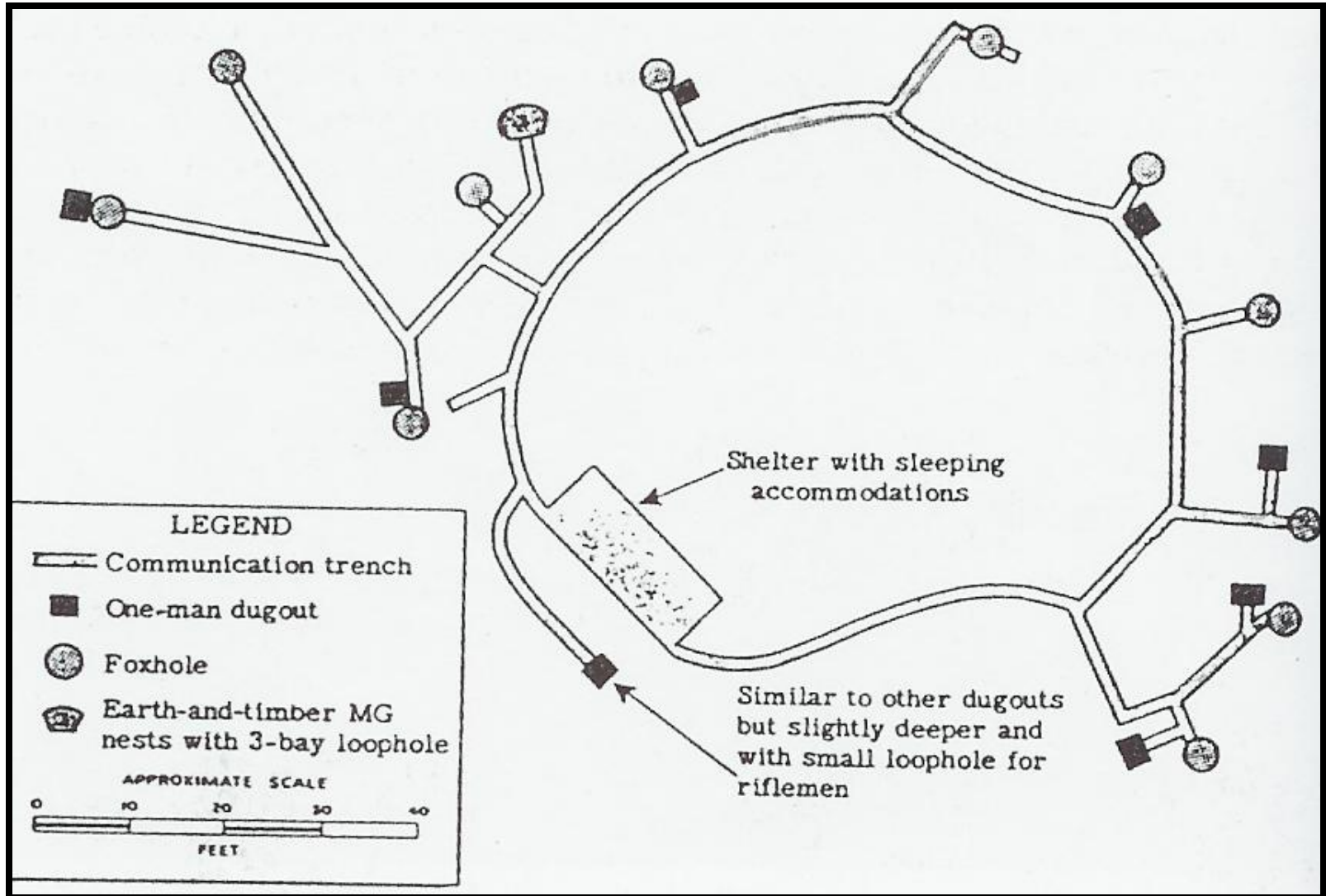
The Japanese commonly employed decoys and dummies to throw off photo interpreters and artillery spotters

80mm Model 3 Anti-Aircraft gun emplaced in “donut” position



These were usually well camouflaged with palm fronds

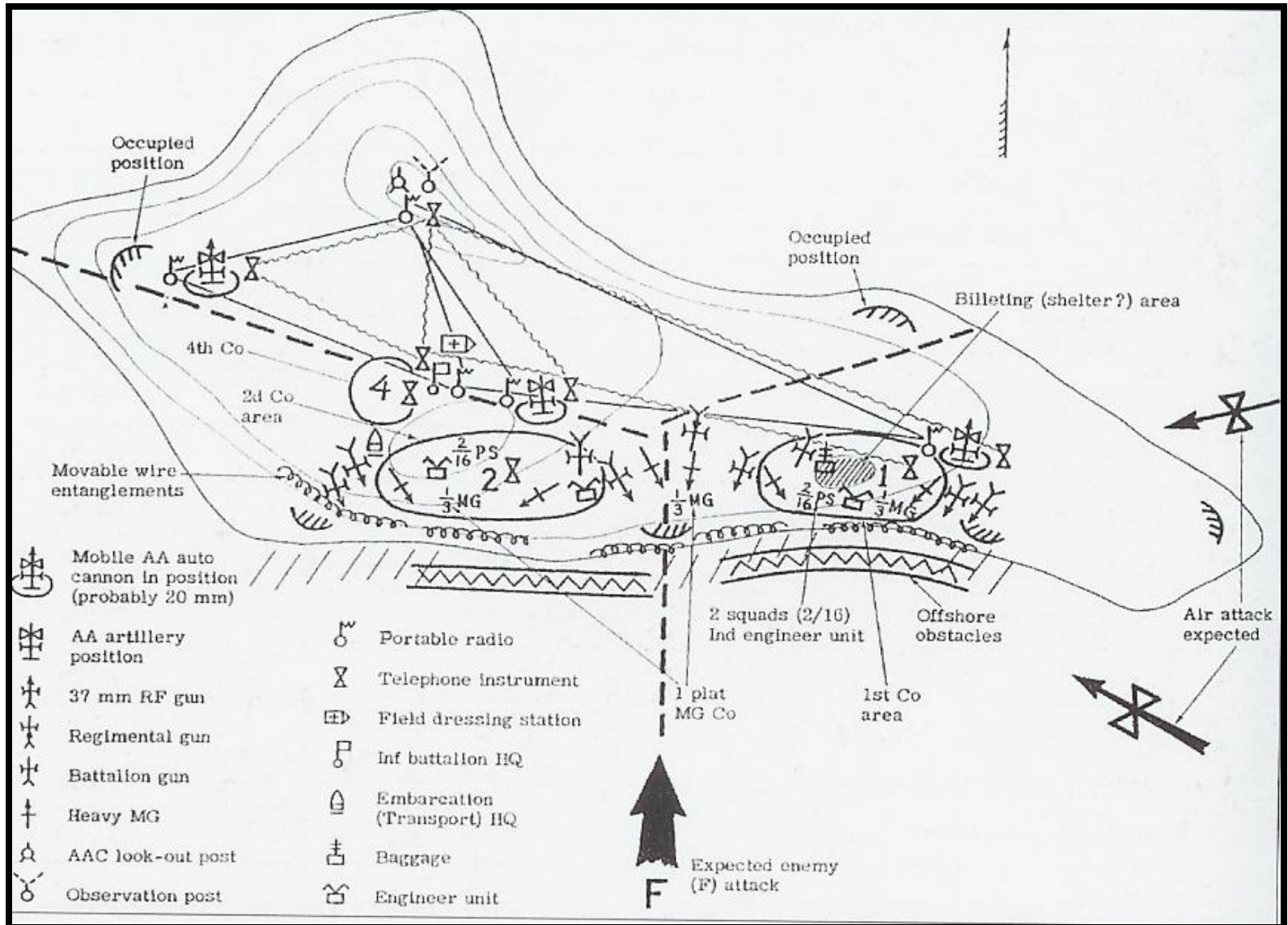
Island defenses were usually situated to provide all-around defense



Section position comprised of foxholes, pillbox and sleeping shelter

Shemya Island defensive positions in western Aleutian Islands

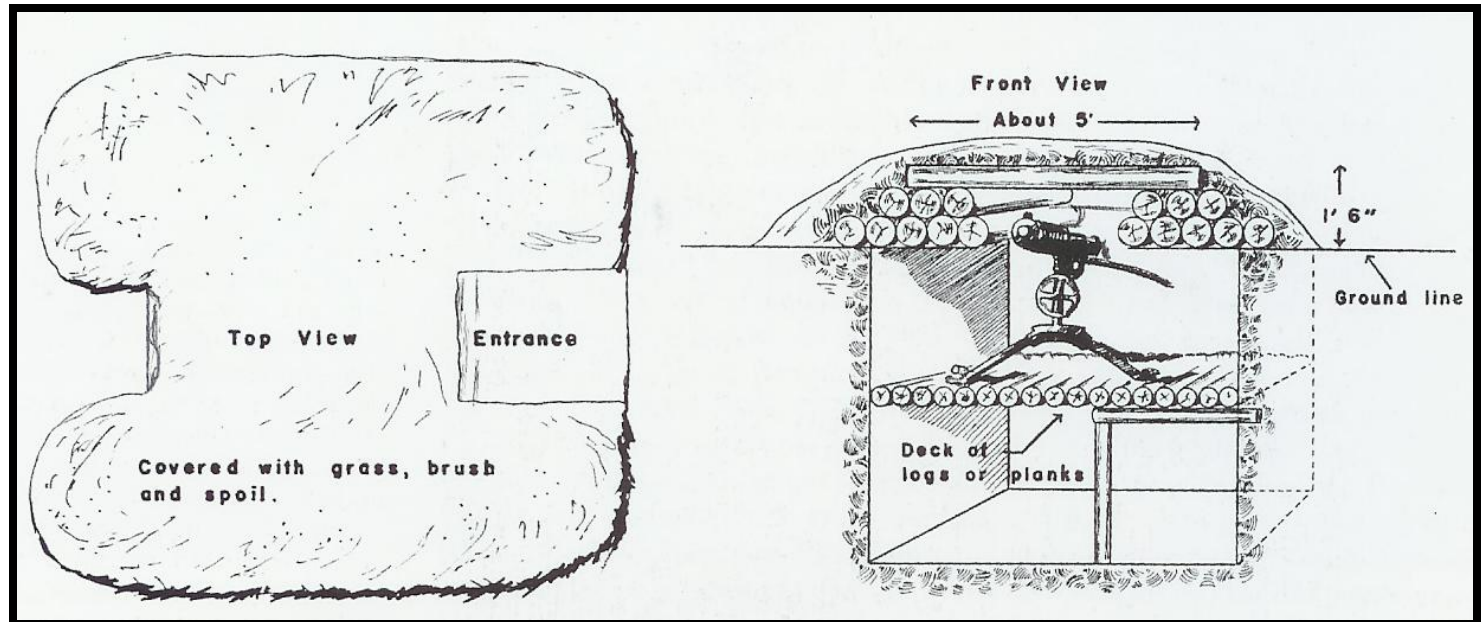
Drawing adapted from captured Japanese sketch.
(Island measures 2.25 by 4.25 miles)

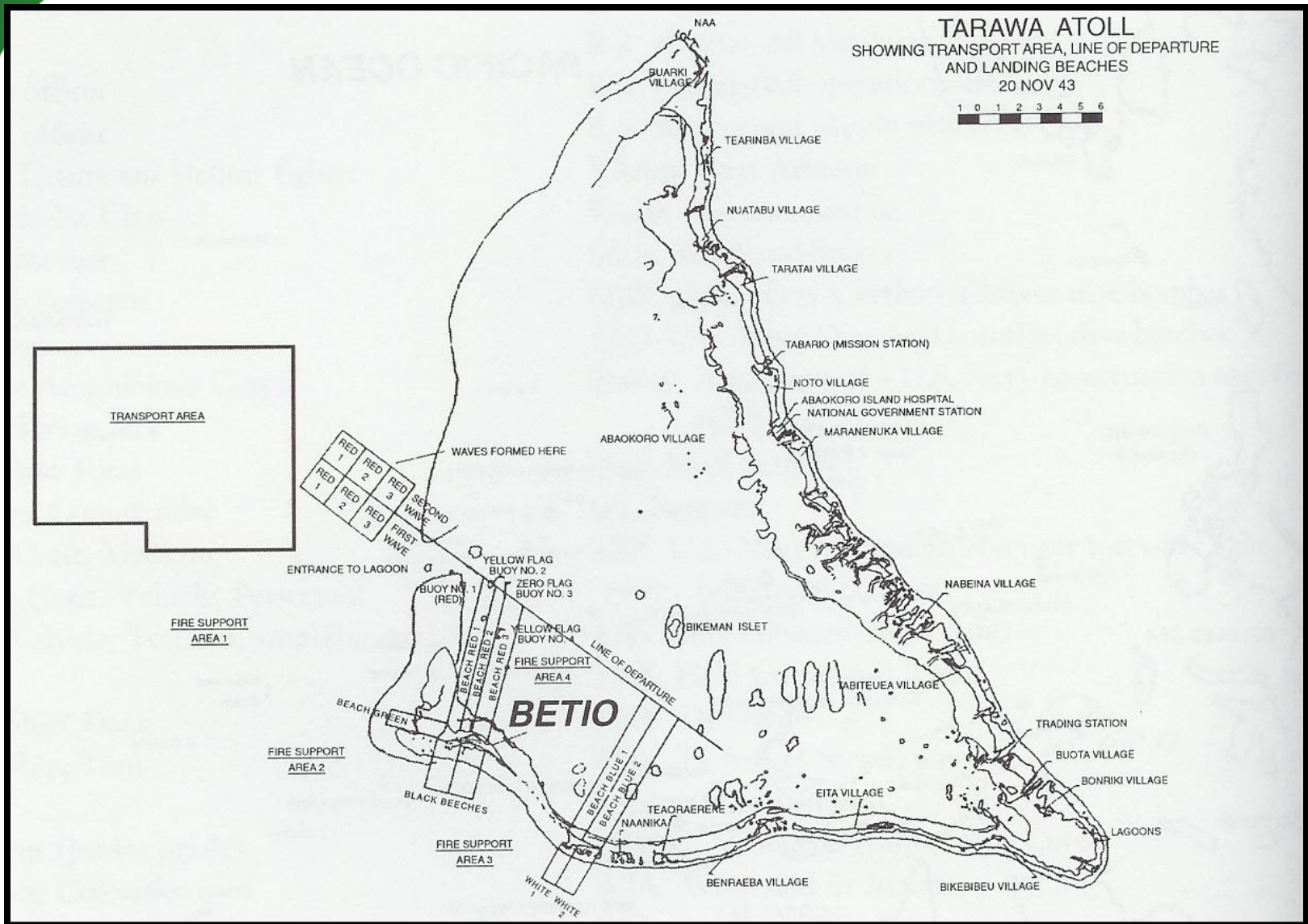




Left: Heavy Machine Gun Pillbox Firing Port built beneath a living tree on Tarawa.

Below: Rough sketch of an HMG Pillbox



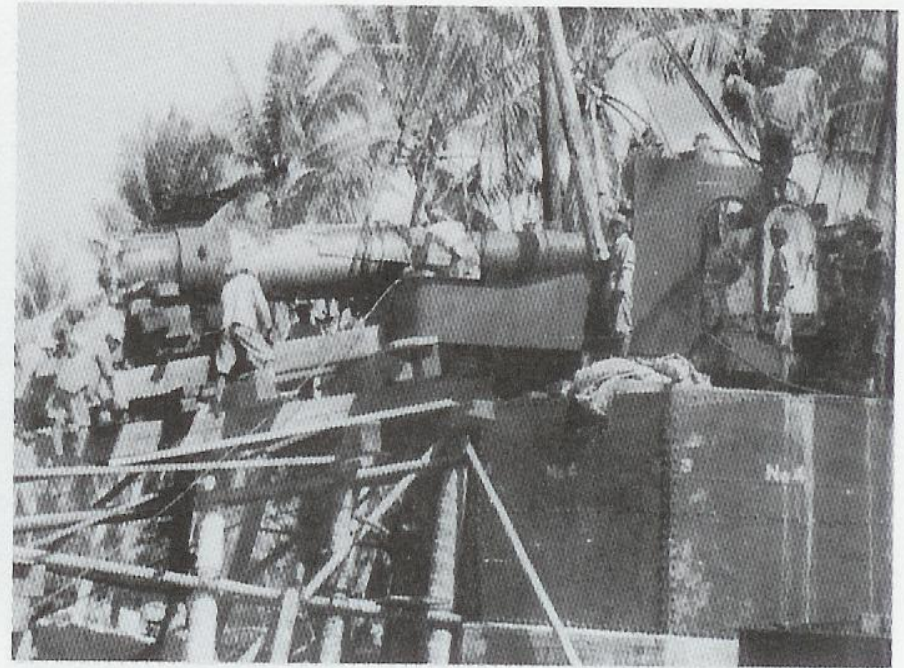
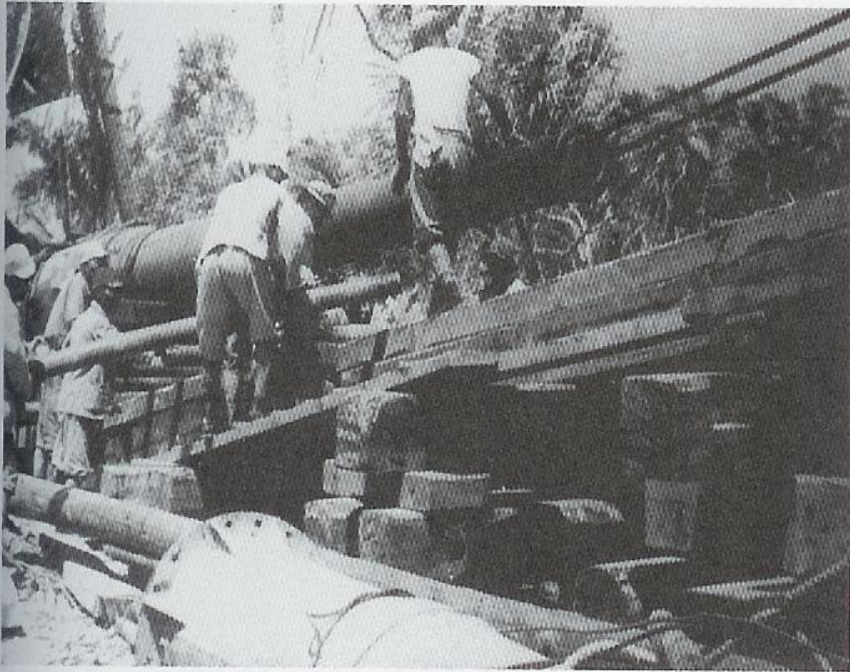


Tarawa Atoll in the Gilbert Islands

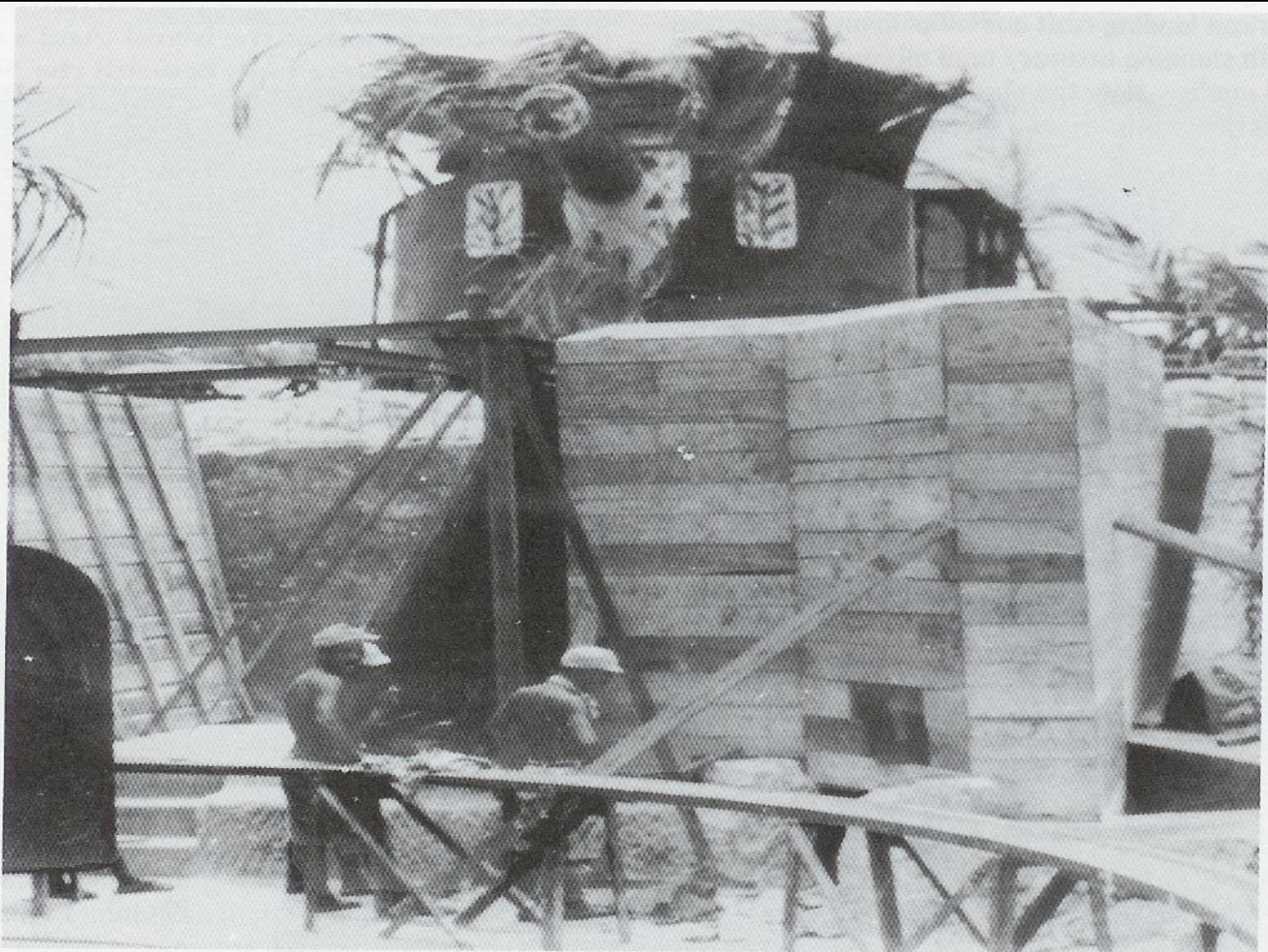
**Aerial oblique
view of Tarawa
Atoll taken by
B-24 bomber
crew September
1943**



Construction of Tarawa's Defenses



In the photo to the left, Imperial Navy gunners and labor troops maneuver the gun assembly of one of Betio's four Vickers 8-inch naval rifles into position along an inclined plane. In the photo to the right, the gun is lifted and eased into its mount by means of an improvised block-and-tackle. (Stanley C. Jersey Collection)

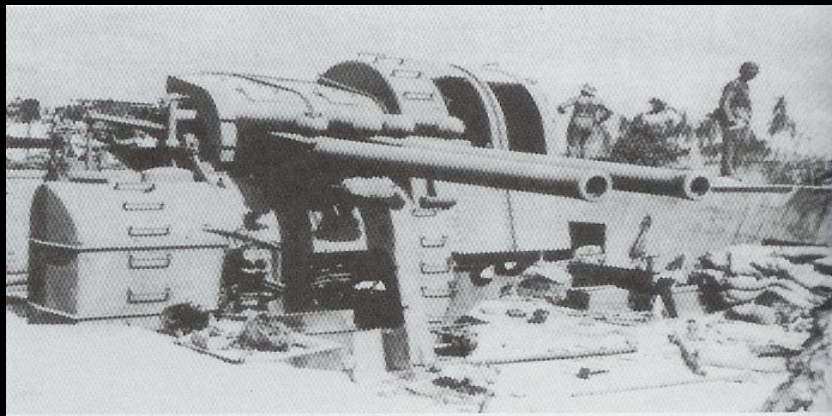


Wood forms are still in place around the concrete emplacement housing the dual-8-inch gun battery located on Betio's southwestern tip. Shown here is the upper gun mount. The steel door of the lower mount can be seen to the left.

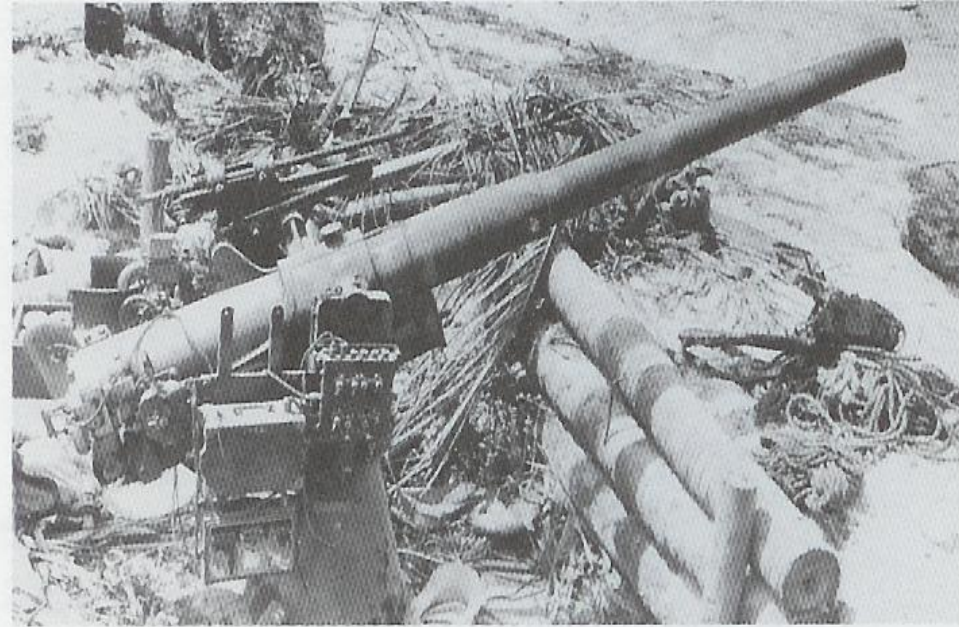


This huge sand-covered concrete bunker was the center of the Japanese defenses on Beach Red-3. The photo was taken from a Japanese officer's camera after the battle. Note the palm-frond camouflage. This is probably the southeastern corner of the bunker.

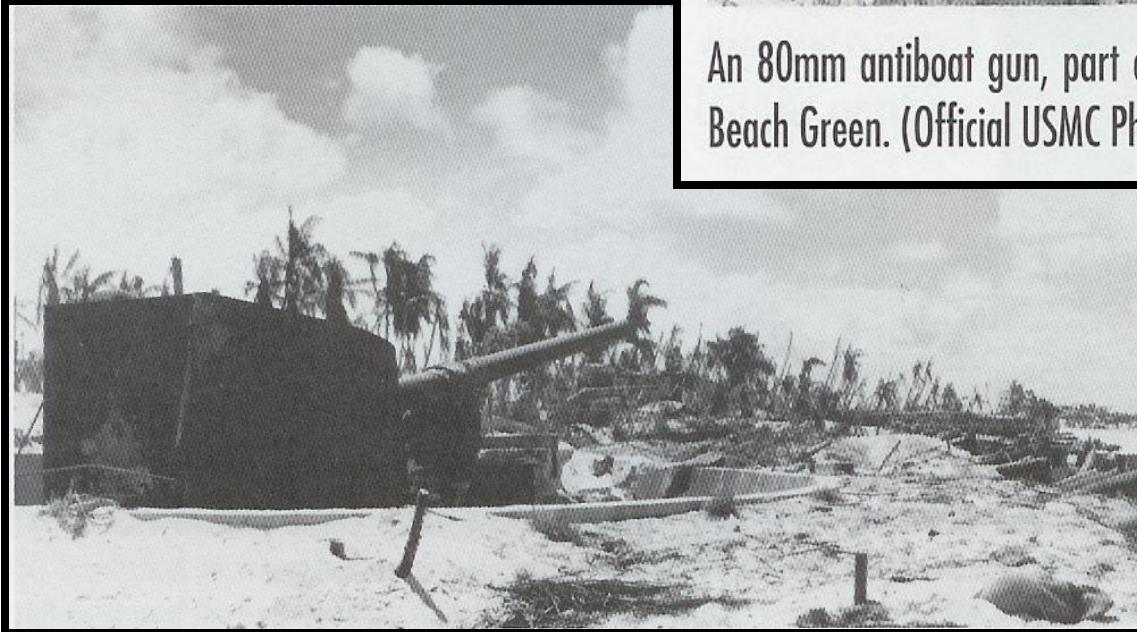
Tarawa's Large Guns



This is a frontal view of the westernmost dual-5.5-inch dual-purpose mount deployed on Beach Black-1. This could be the same mount as the one pictured to the left. (Official USMC Photo)



An 80mm antiboat gun, part of the three-gun battery overlooking Beach Green. (Official USMC Photo)

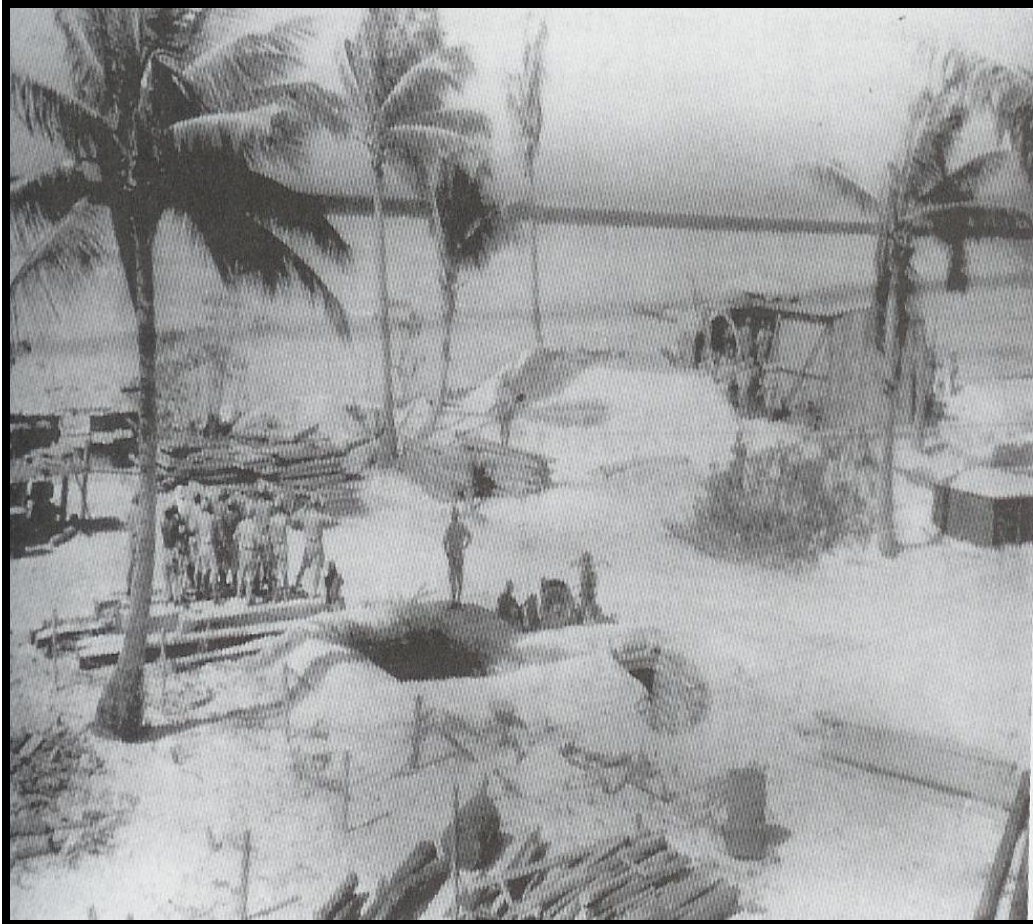


13 mm AA machine guns



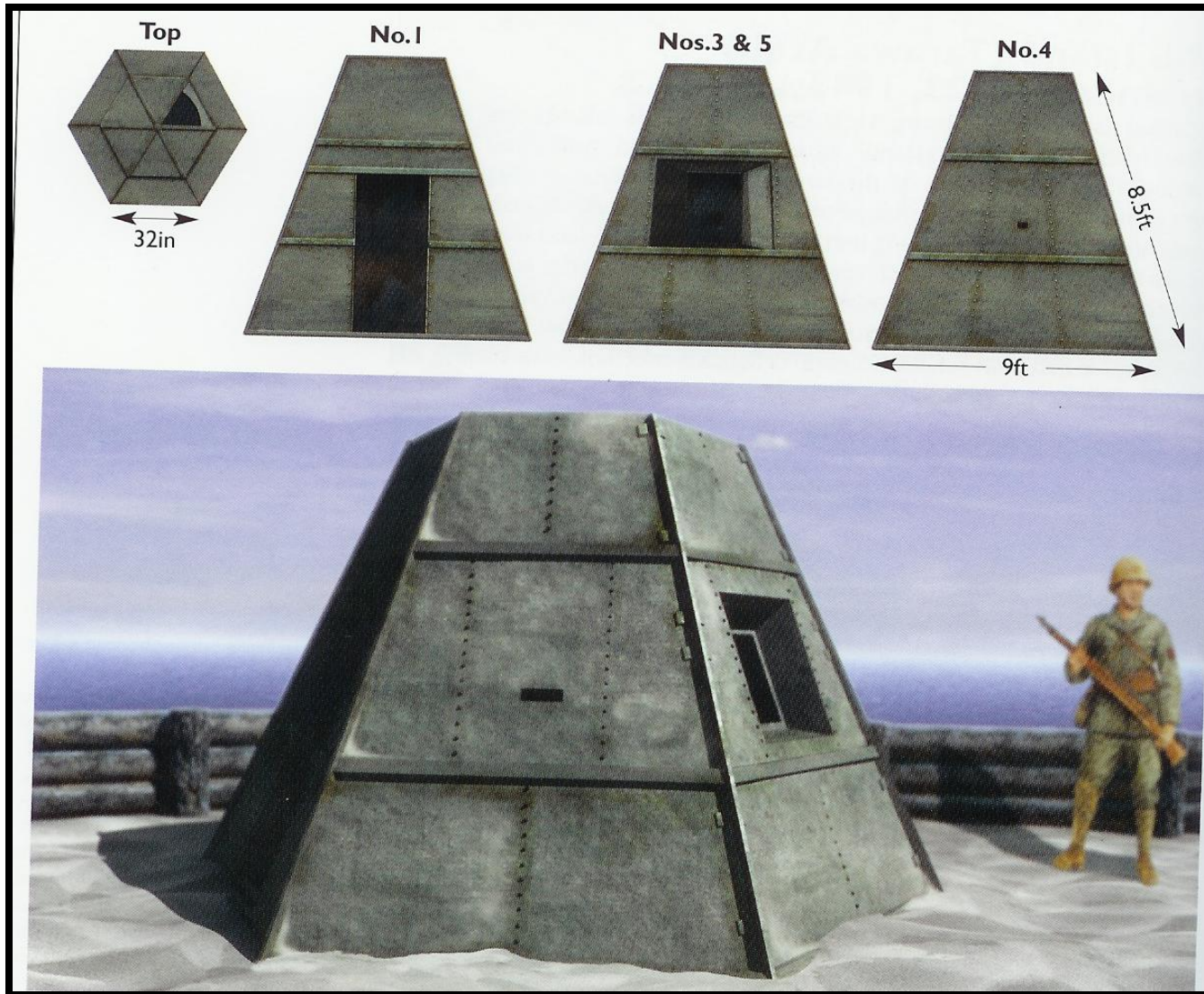
Arguably the deadliest weapons in Betio's arsenal were 13mm anti-aircraft machine guns like this one and similar 13mm infantry heavy machine guns. Note the anti-aircraft gunsight, the pedestal mount, and directional tags pinned to the log revetment. The entrance to the underground crew shelter can be seen in the center of the photograph. This gun was deployed near the airfield, probably north of one of the taxiways. The position is built to allow the gun to fire north at ground level. (Official USMC Photo)

14 cm Naval rifle positions under construction



Rigosentai officers look on as gunners test-fire one of Betio's large-caliber coast-defense guns, probably one of the pair of 14cm naval guns emplaced just south of the island's northwestern point. Note the bunker in the center of the photo and the many signs of ongoing construction work.

Pre-fabricated Steel Pillbox erected on site



Only Used on Betio Island on Tarawa Atoll

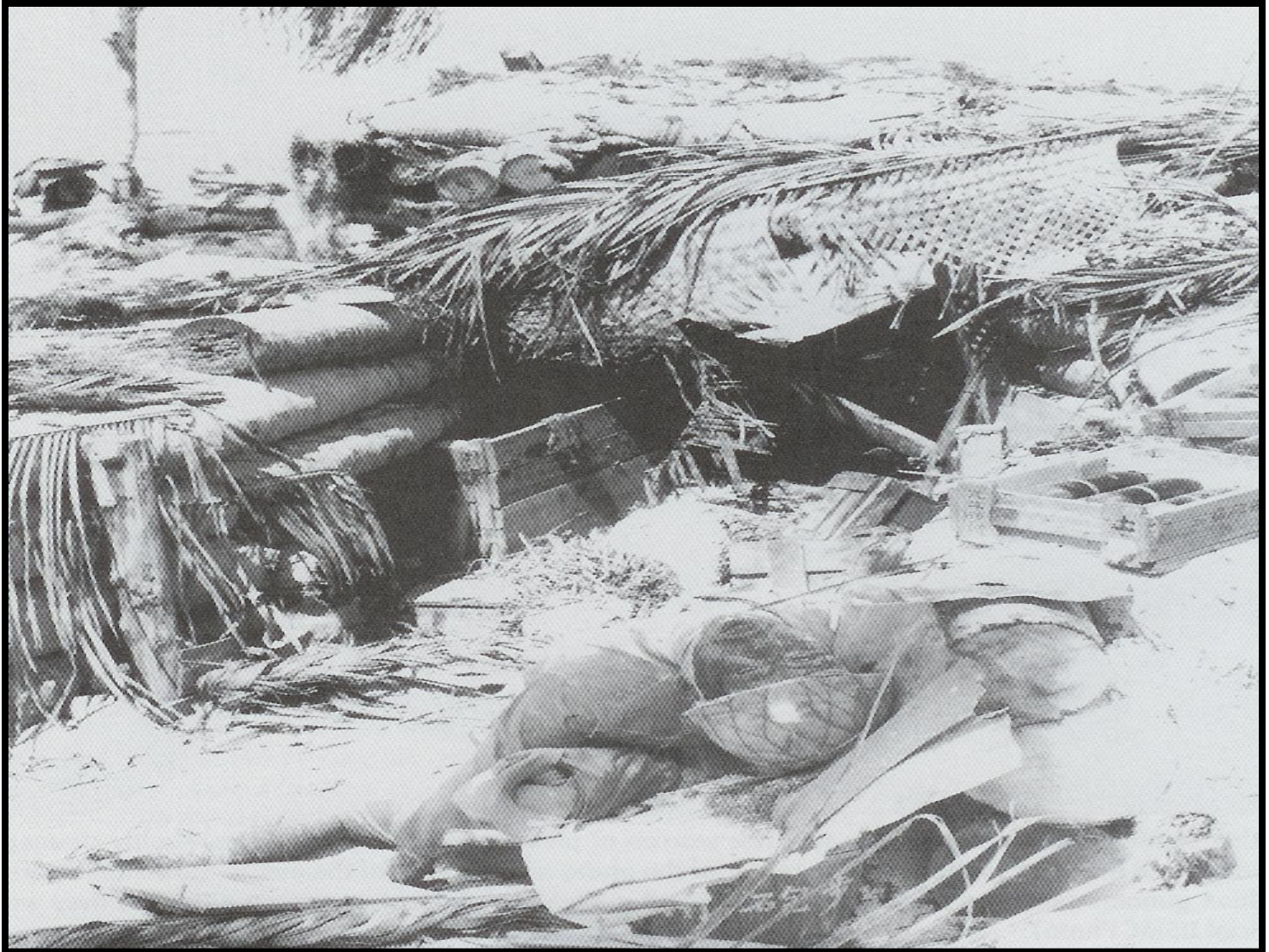


This prefabricated steel pillbox, photographed after taking a direct large-caliber hit during the battle, was one of several identical sector command posts overlooking Betio's beaches. (Official USMC Photo)

U.S. Marine standing in hand-dug antitank ditch on Tarawa



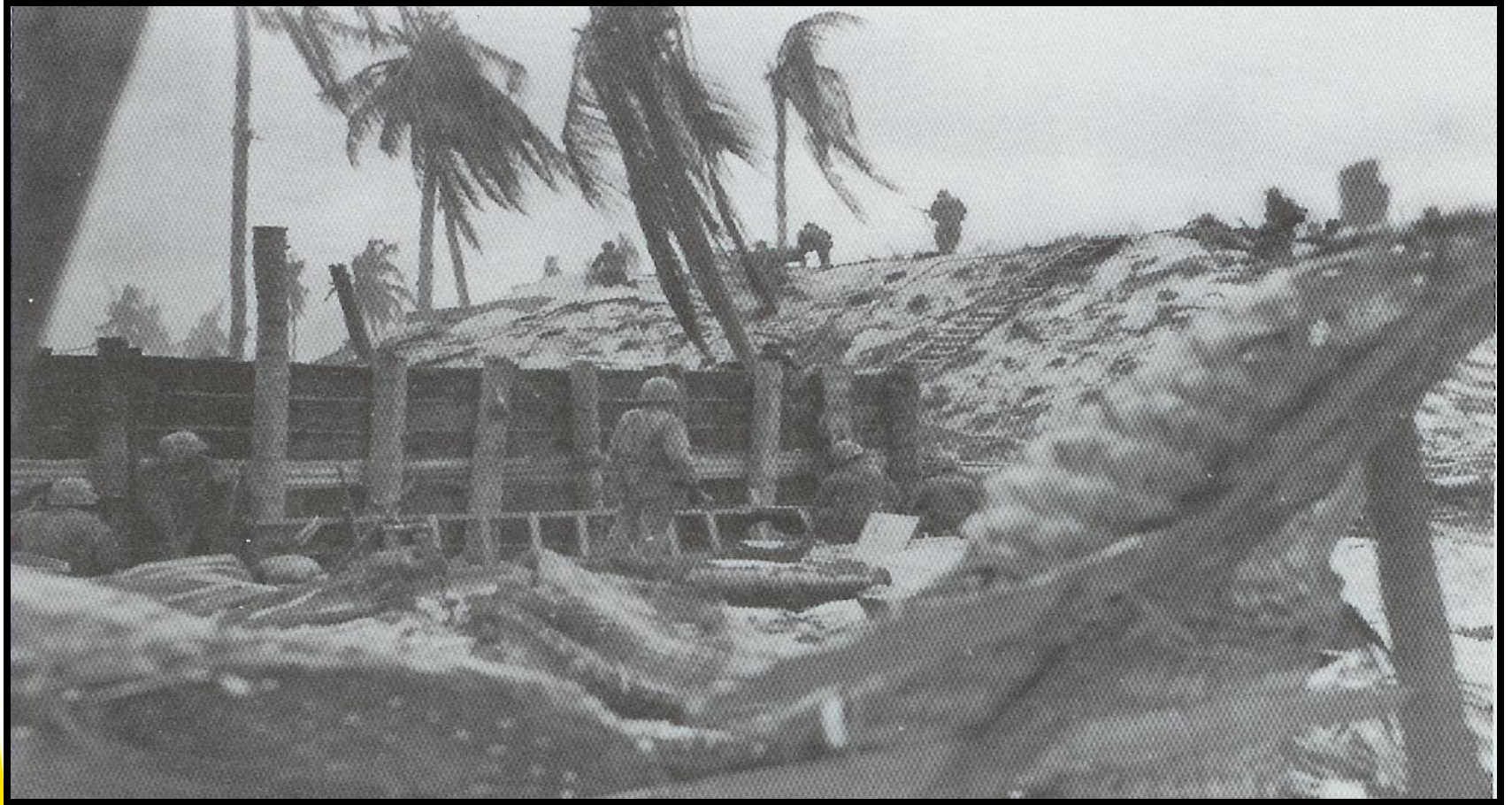
Beach front Pillbox camouflaged with palm fronds and matting





The inside of a beach-defense machine-gun pillbox, looking out at the beach it covered. Heavily obscured in shadow are the bodies of several members of the gun crew, and the barrel of their heavy machine gun can be seen pointing upward and to the right in the lower right corner of the unusually large firing aperture. (Official USMC Photo)

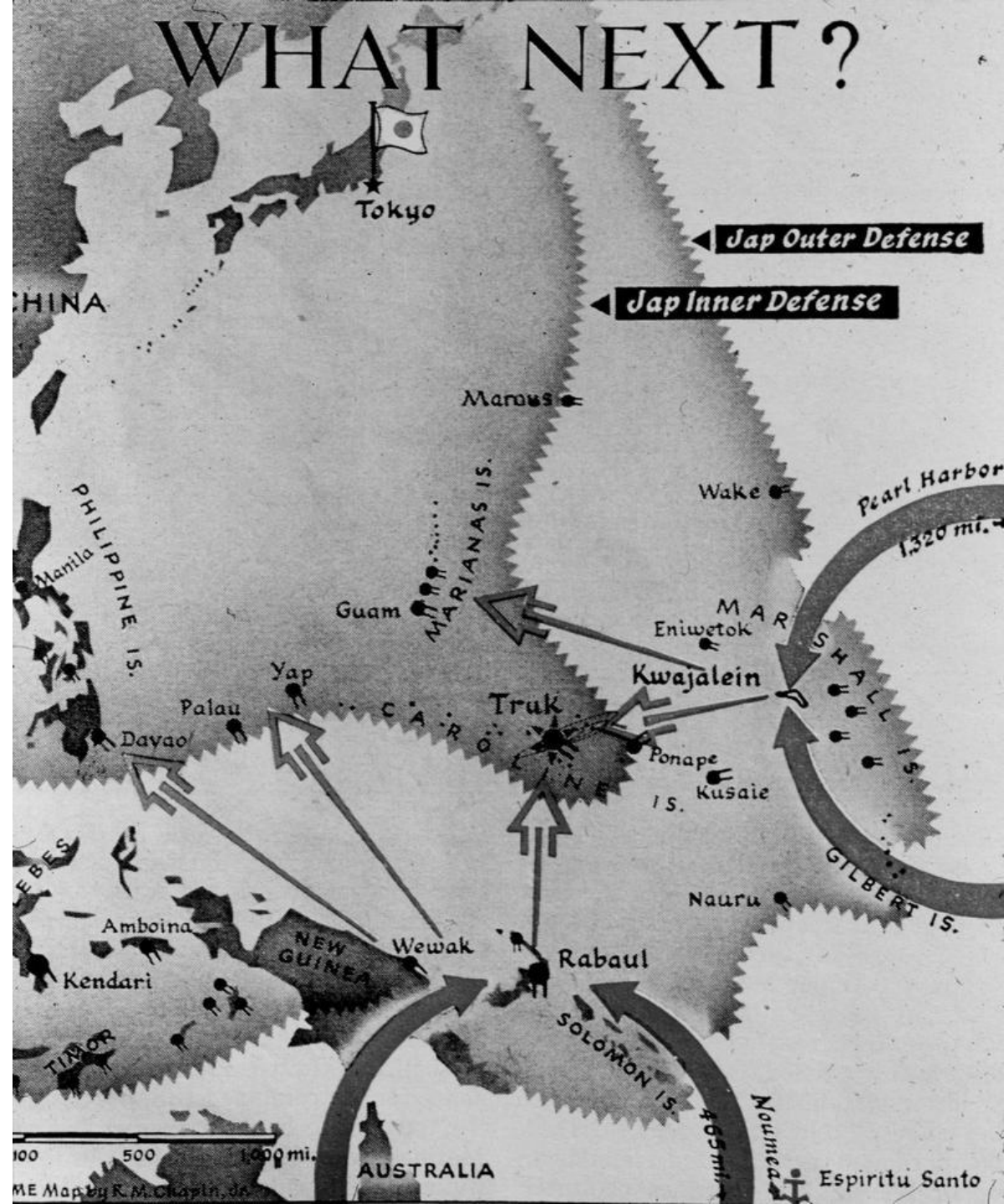
Marines assault sand covered concrete bunker



Concrete Command Bunker



"What Next?"
from *Time*
magazine in
January 1944
The heavy
losses on
Tarawa sparked
a debate about
the wisdom of
continuing the
island hopping
campaign





Iwo Jima

Why Attack Iwo Jima ?

- Iwo Jima was only 650 miles from Japan, about halfway between the American bomber bases in the Marianas and the Japanese home islands
- More B-29's were lost to engine failure than to enemy action during the bombing of Japan in 1944-45
- Air Sea Rescue was unable to keep pace with the number of ditchings and bail-outs between the Marianas and Japan
- An American airfield on Iwo Jima would allow:
 - Crippled B-29s an alternate landing site
 - A base for more search and rescue aircraft
 - Escort fighter aircraft to protect the B-29s in their raid on Japan
- 2,400 crippled B-29s ended up making forced landings on Iwo Jima, saving 24,000 lives

Underestimating the Cost

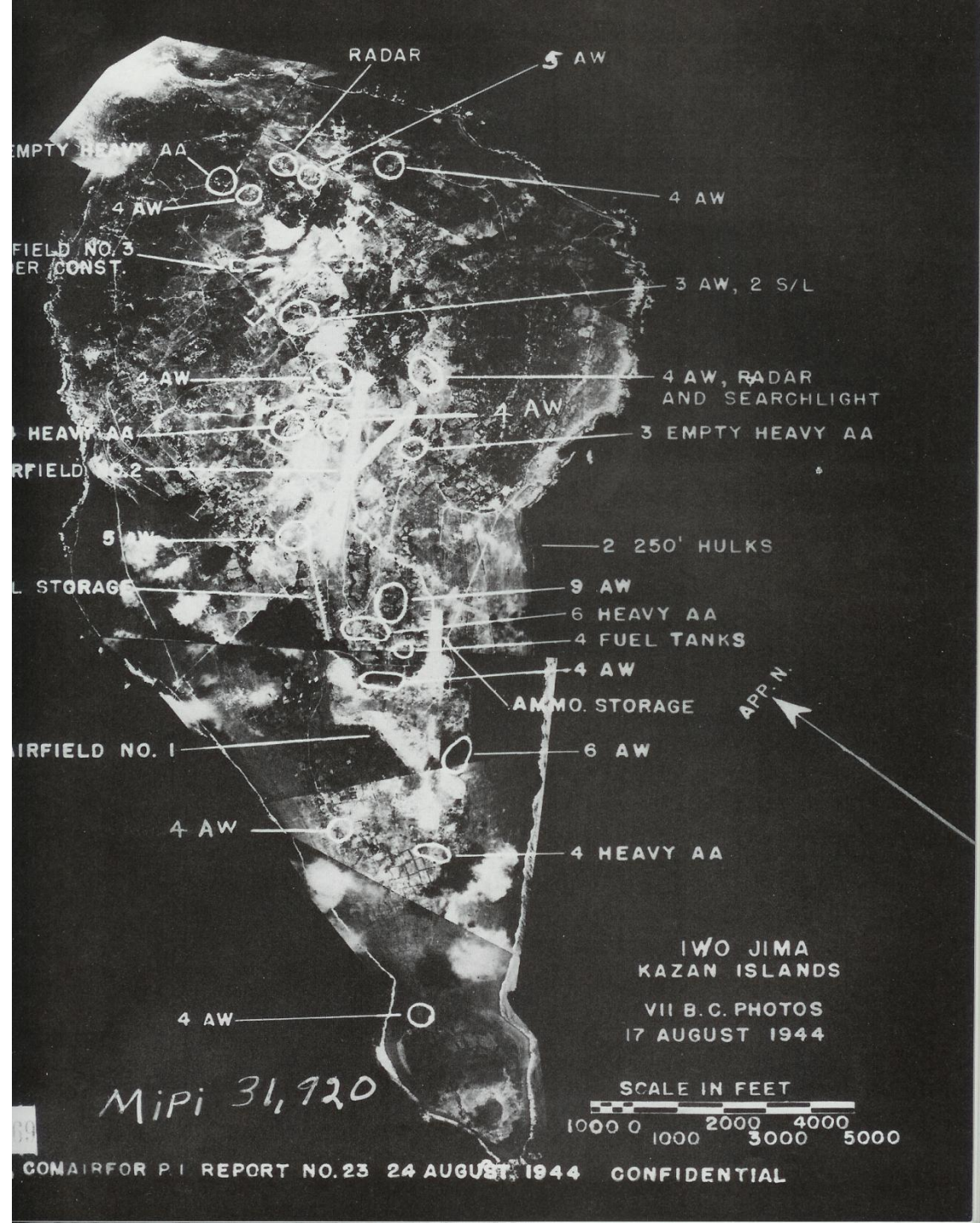
- **The Japanese included Iwo Jima and the Bonin Islands in their Inner Defense Ring**
- **The invasion was preceded by 10 weeks of heavy bombing by U.S. Forces, the largest preliminary bombardment up to that point in the war.**
- **The Japanese were well protected within 16 miles of tunnels hewn out of the resistant volcanic rock. The American bombardment only served to which only heightened Japanese expectations of an attack. The impact of this bombardment was greatly overestimated by planners**
- **60,000 U.S. Marines and 10,000 Navy Seabees were involved in the assault**
- **Between 20,000 and 27,000 Japanese defenders**

Intelligence map of Iwo Jima defenses based on a dozen aerial photos imaged on August 24, 1944

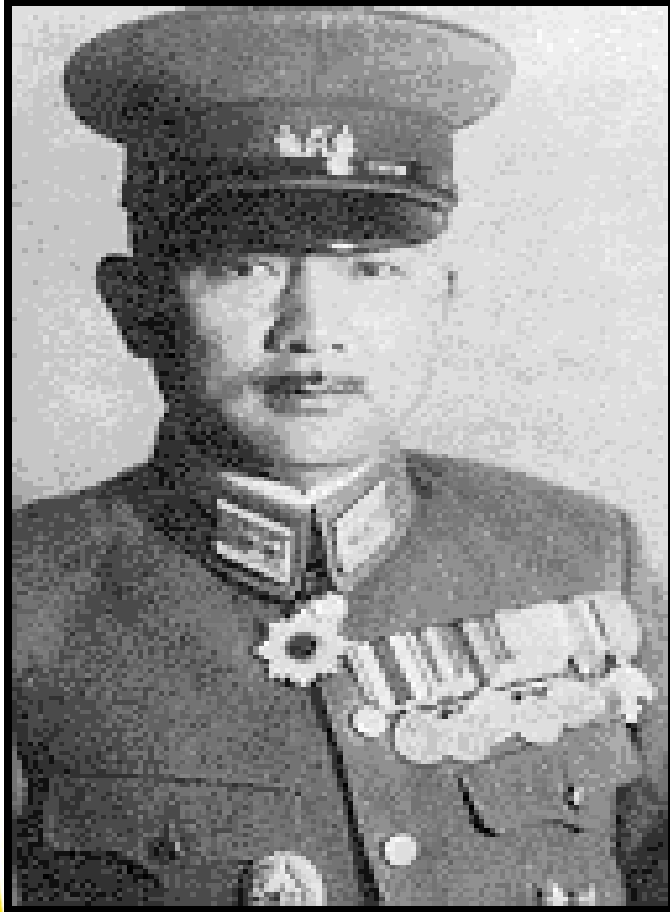
The only identifiable features were above-ground entrenchments

“AW” = Automatic Weapon

“AA” = Anti-Aircraft



General Kuribayashi was the Japanese Commander at Iwo Jima



General Kuribayashi was considered by his peers to be a brilliant career officer. He volunteered for the assignment, knowing it meant certain death.

An aristocrat, he was educated in Canada and toured the US before the war. His preparations, fortifications and strategy were subsequently appreciated as marvels of modern warfare.

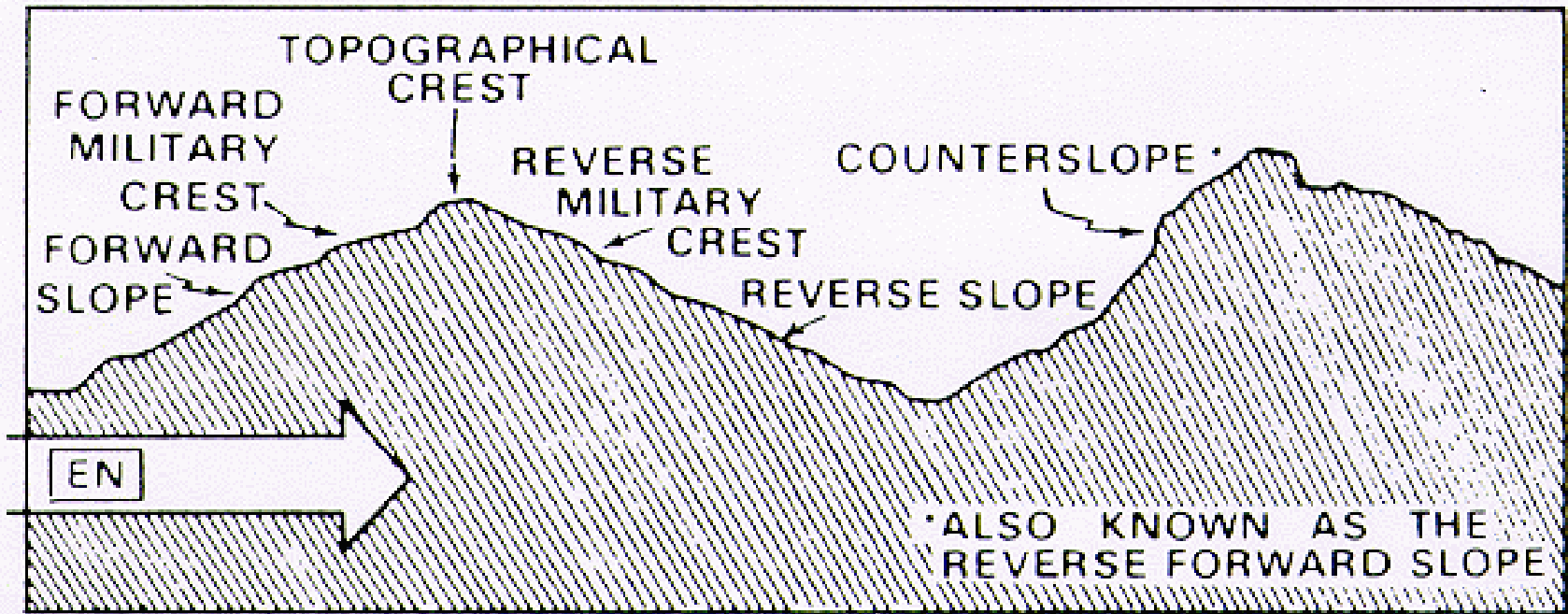
JAPANESE DEFENSIVE STRATEGY

- ❑ **The Japanese tactics would be defense in-depth, reverse slope defense, and concealment.**
- ❑ **No suicide counter-attacks, as in previous Island battles.**
- ❑ **The Japanese built 800 hardened pillboxes and over 16 miles of tunnels on Iwo Jima, which was only 8 square miles in size.**
- ❑ **Their strategy called for “no survivors.” They would fight to the death.**
- ❑ **Each Japanese soldier was instructed to kill at least 10 Americans.**
- ❑ **Instead of repelling the Americans at the beaches, they waited until the Marines congested the beaches, then called down devastating artillery fire.**

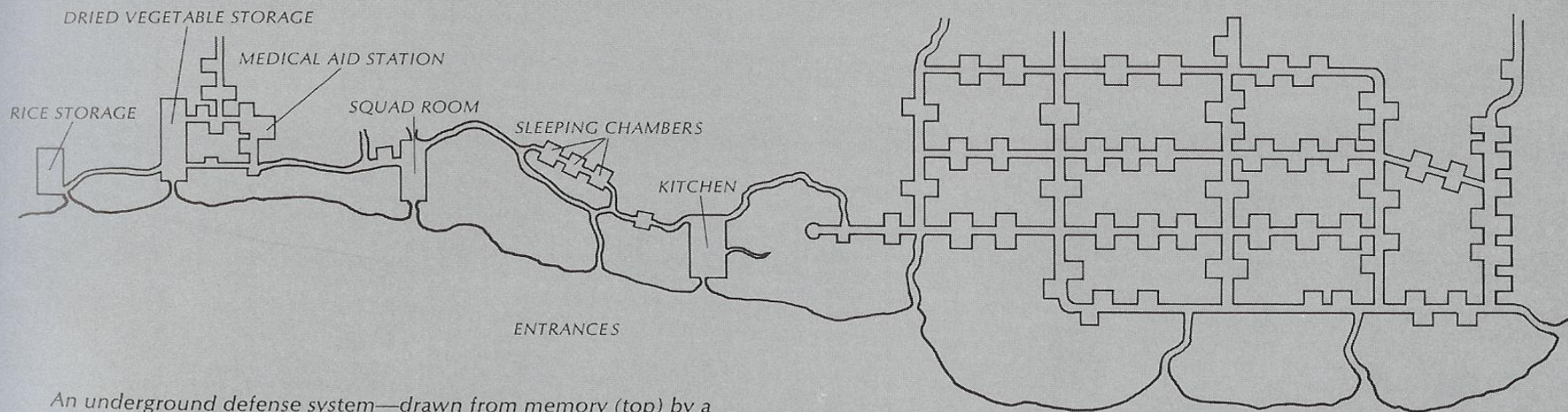
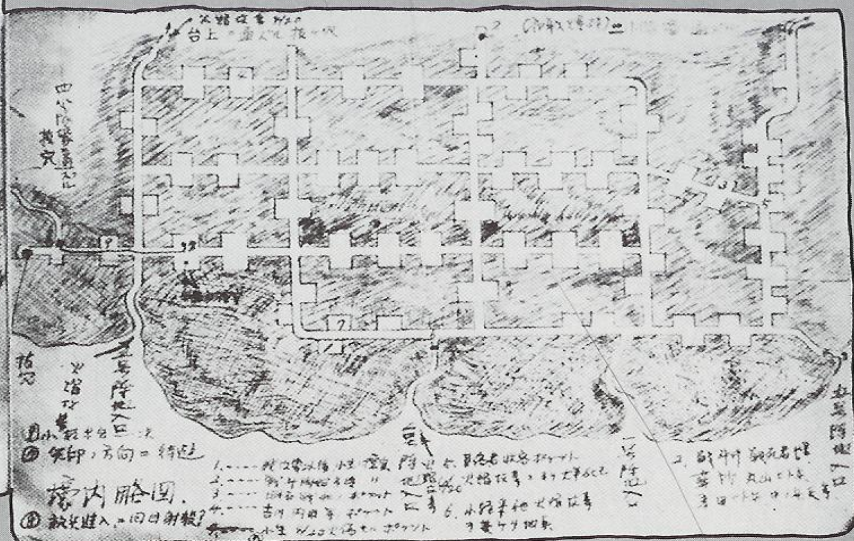
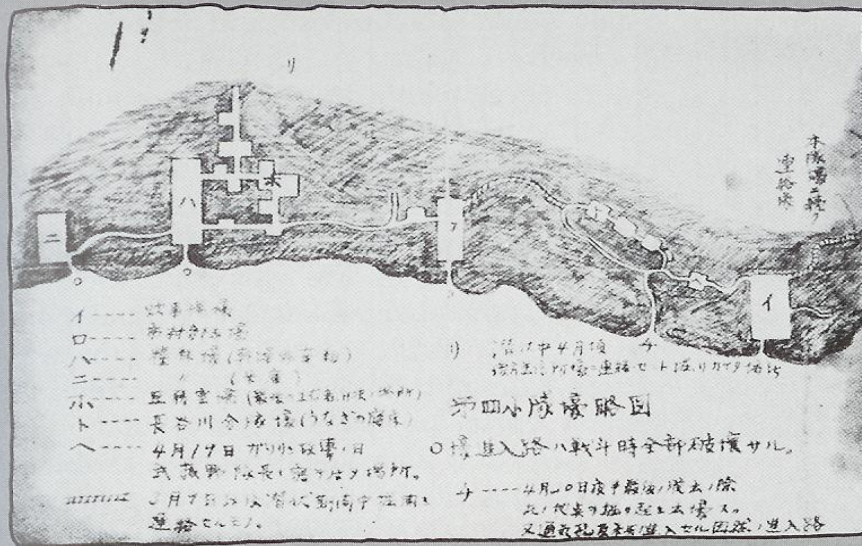
BEACHES BECAME KILLING ZONES

- ❑ The beaches on Iwo Jima were comprised of loose angular volcanic sand and cinder. A wave cut bench 20 to 35 feet high created a formidable obstruction at the rear of the backshore zone.
- ❑ This escarpment afforded line-of-sight protection for the Marines, but greatly restricted their inland movement. The loose volcanic ash made it nearly impossible to climb up the beaches with heavy packs
- ❑ The Japanese were instructed not to return fire once the Marines landed, waiting for the beaches to become congested. This was intended to create greater chaos and improve the likelihood of increased casualties when they called down artillery fire.
- ❑ The Japanese used Mt. Surabachi for their artillery spotters
- ❑ The high angle of the backshore escarpment made return fire very difficult. The Americans were pined down and couldn't see where the enemy gun positions were located
- ❑ Forward air controllers in light aircraft flying overhead couldn't pin down the enemy gun positions either because they were so deeply entrenched and well concealed
- ❑ Anti-tank mines were emplaced on the slopes and were very effective against American tanks and Amtracs

REVERSE SLOPE DEFENSE



- The Japanese used reverse slope defenses with much success in the Philippines, Iwo Jima and Okinawa campaigns. Most defensive positions are emplaced on forward slopes, below the topographic crest. By fortifying the reverse slope forward artillery spotters cannot see the targets to call down covering fire on them.
- The Japanese manning reverse slope positions would remain concealed and allow advancing troops to pass over and around them, then open up at close range, then retire into the labyrinth of caves connecting the various gun positions.
- At Iwo Jima many of the Marines never saw an enemy soldier the entire time they were on the island because the Japanese were underground and usually attacked at night, retreating to their bunkers by day.



An underground defense system—drawn from memory (top) by a Japanese prisoner of war and later diagramed (above) by postwar Japanese investigators—was located east of Iwo Jima's second airfield. The network was dug more than 32 feet deep, with 17 entrances along its 540-yard length, and sheltered 300 men. All of the defenders died in battle or committed suicide except for the private who drew the map; he was captured unconscious after he had shot himself.

The andesitic volcanic ash was easily carved into a myriad of shapes, including the ersatz light tank, using a tree branch as a barrel



This “tank” was repeatedly targeted and reported as “killed” by several Marine tankers

A black and white photograph showing a desolate, rocky landscape. In the foreground, a hand is visible, protruding from a pile of rubble and debris. The ground is covered in rocks and ash, with some small, dark objects scattered around. The overall scene is one of devastation and tragedy.

A Japanese soldier's hand sticks out of rubble
from the pre-invasion bombardment

Iwo Jima, Bonin Islands
February 1945

Marines pose with captured Japanese Flag from reinforced concrete blockhouse with artillery piece

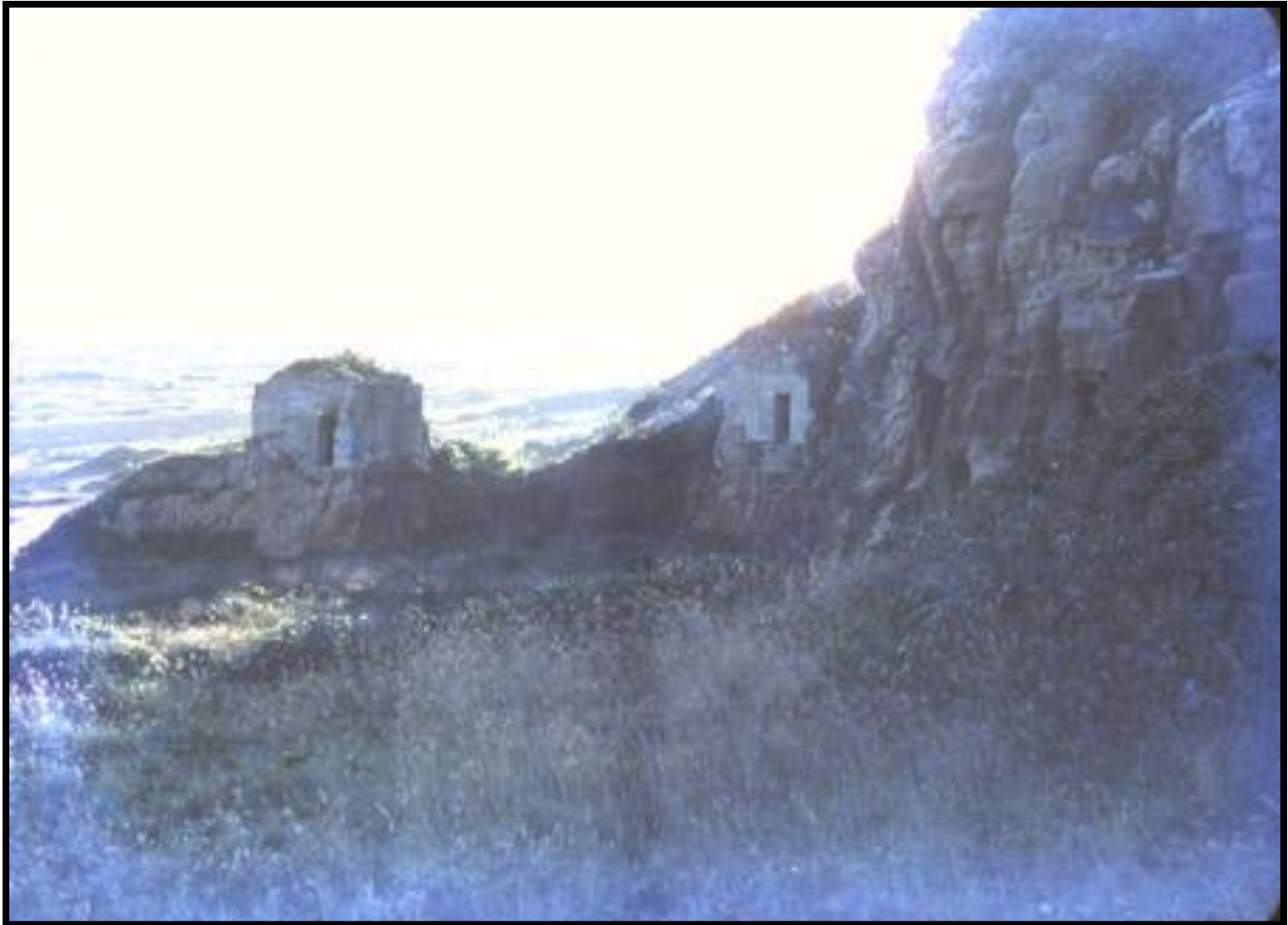




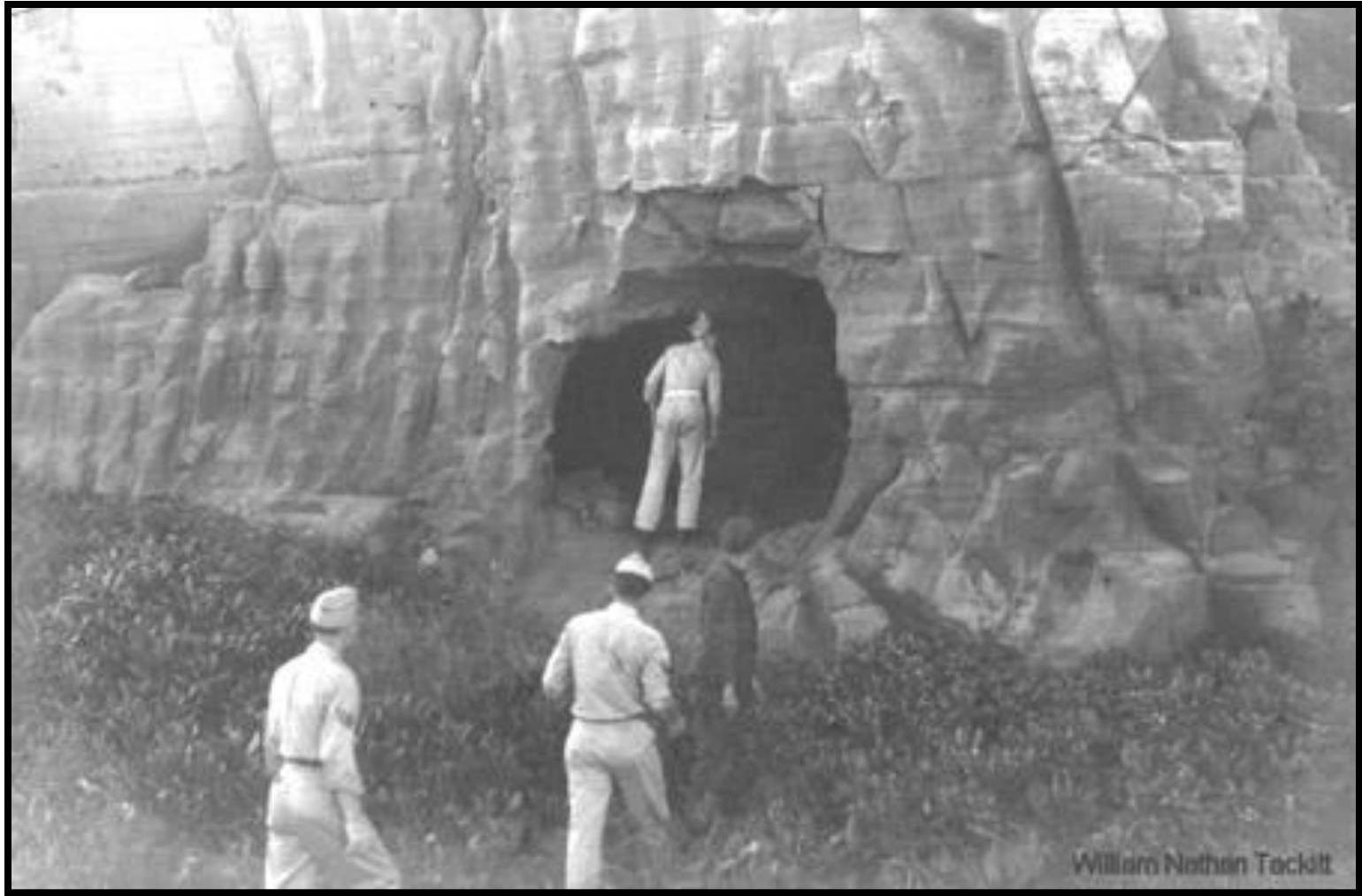
Running past concrete pillboxes knocked out by naval gunfire, two Marines flee Japanese sniper fire

**Iwo Jima, Ryukyu Islands
March 2, 1945**

Remnants of Japanese defenses near base of Mt. Suribachi on Iwo Jima - 1950



Natural caves like this were enlarged by the Japanese defenders on Iwo Jima



Desk located in command bunker and artillery barrels still present today on Iwo Jima



Marine Staff Ride standing on a Japanese artillery position during a visit in 1980

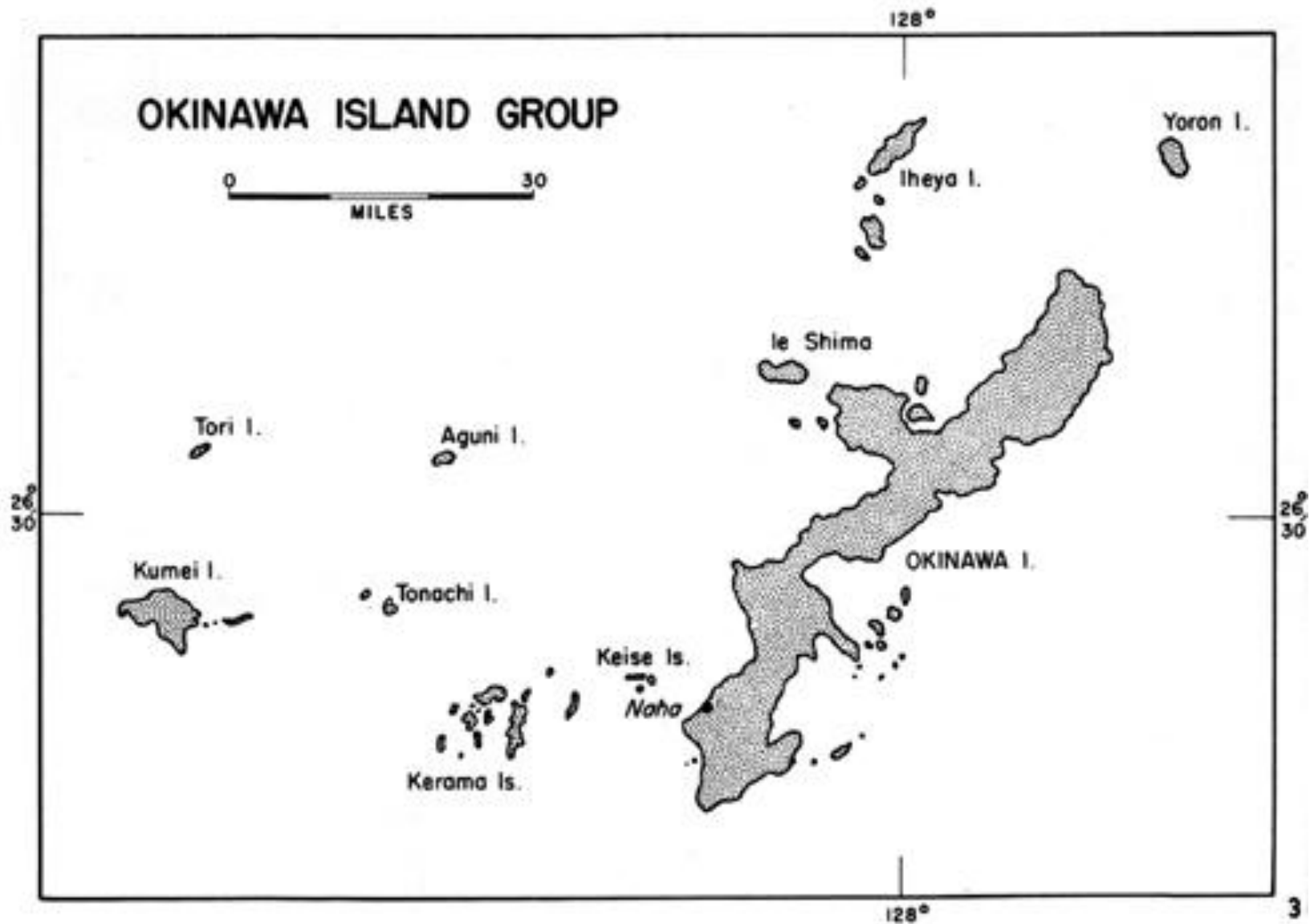


Iwo Jima – The Costliest Battle in American Military History

- U.S. personnel
 - 6,821 Killed
 - 19,217 Wounded
 - 2,648 Combat Fatigue
 - 28,686 total casualties (**48% of the forces engaged**)
 - 1/3 of all Marine casualties in the Pacific War
 - 27 Medals of Honor awarded, more than any other battle
- Japanese forces
 - 21,844 estimated killed
 - 216 military POWs taken
 - 867 civilian prisoners (last one surrendered in 1951; 6 years after the battle)



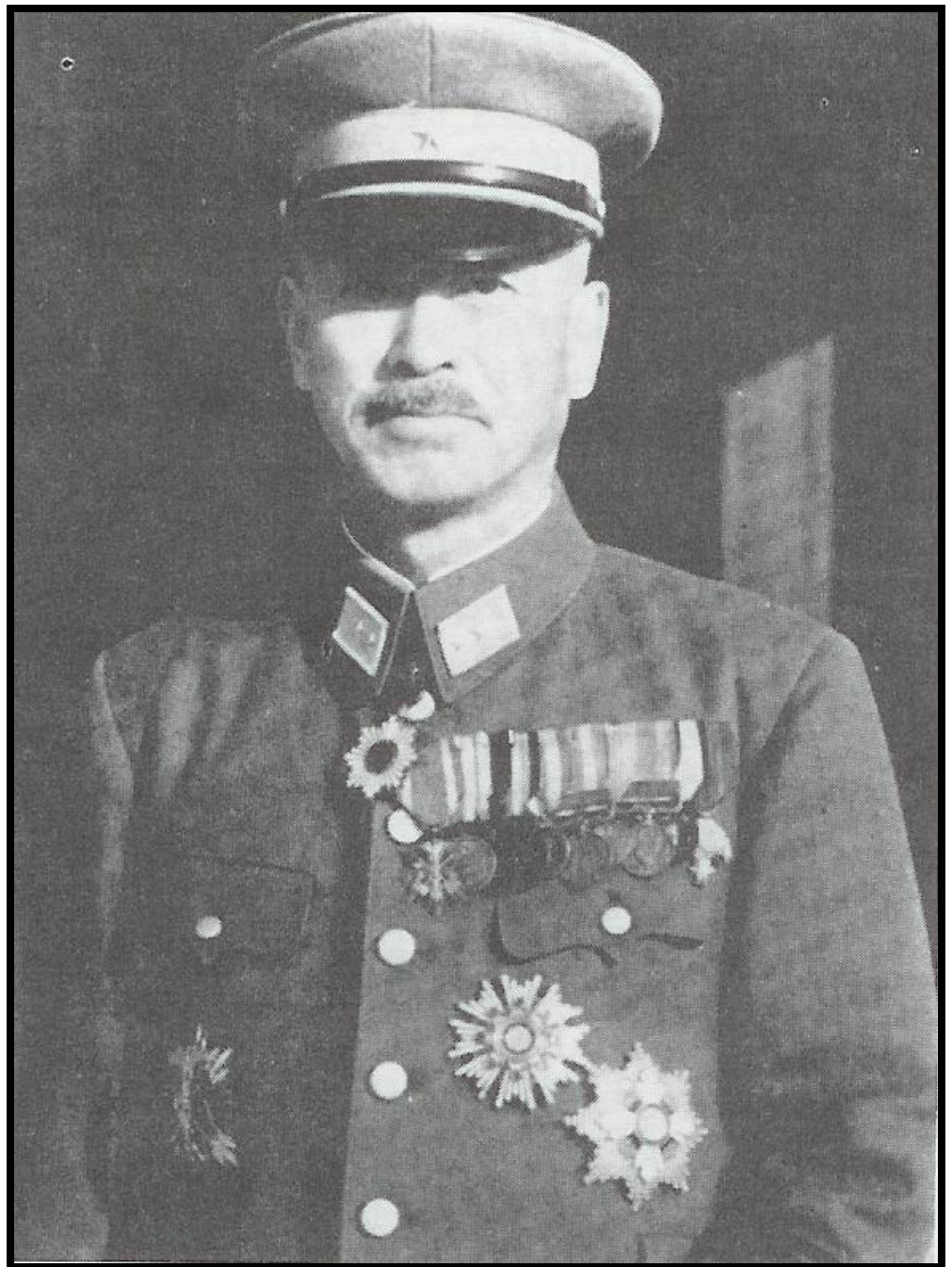
Okinawa



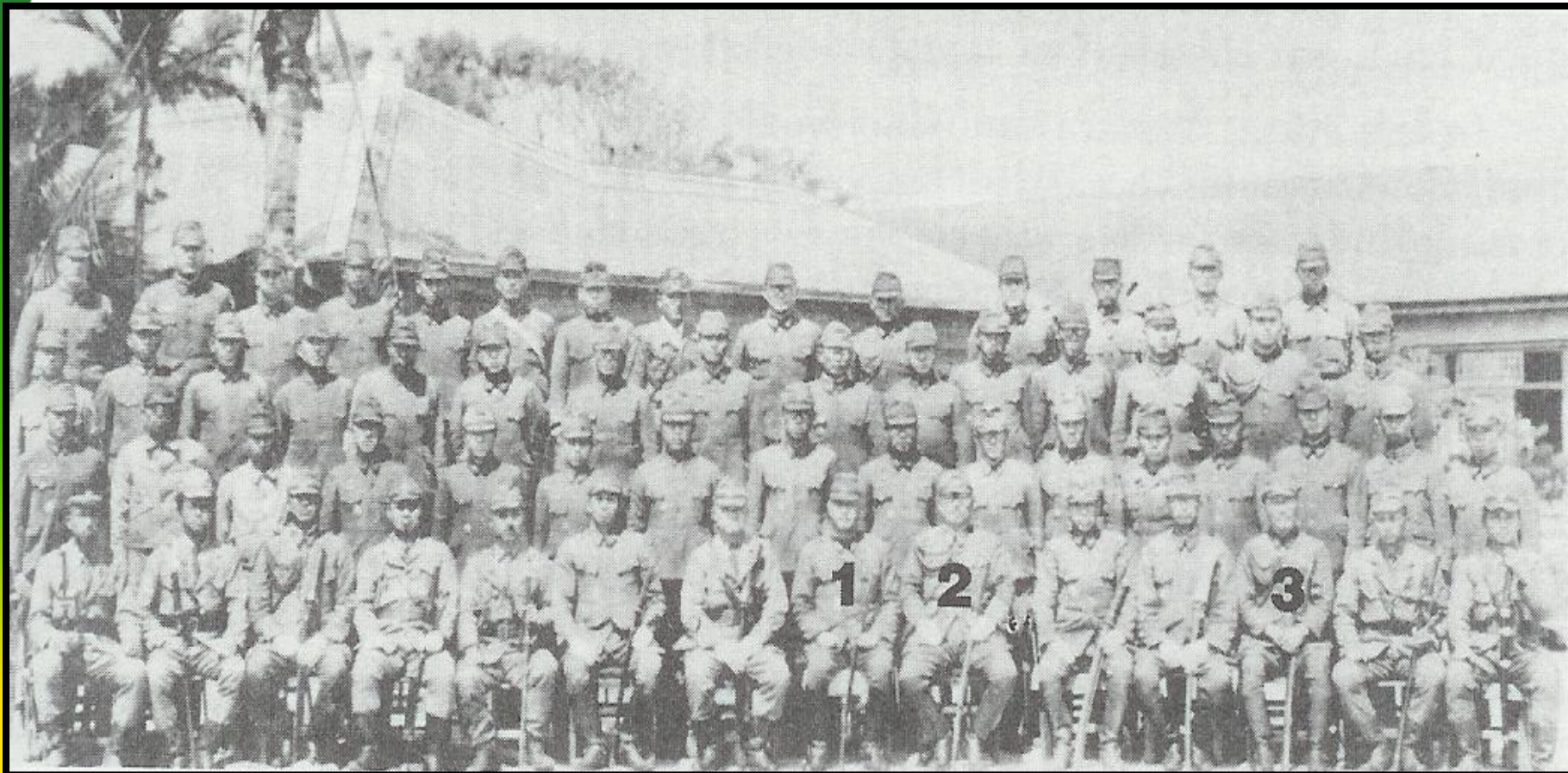
Okinawa Order of Battle

- **Japanese Forces**
 - **100,000 troops**
 - **198 pieces of artillery Of 70-mm. or larger**
 - **24 150-mm. howitzers.**
 - **100 antitank guns of 37-mm. and 47-mm.**
 - **37 light tanks**
 - **47 medium tanks**
 - **Numerous rockets and mortars up to 250 mm.**
- **American Forces**
 - **183,000 troops**
 - **327 ships**
 - **750,000 tons of supplies**

**Lieutenant General
Ushijima Mitsuru,
Commander of the
Japanese 32nd
Army on
Okinawa**



Japanese 32nd Army Staff, February 1945



- 1) Lieutenant General Ushijima Misuru
- 2) Lieutenant General Cho Isamu
- 3) Colonel Yahara Hiromichi

“Okinawa Mood”

- **Japanese soldiers felt that their homeland brethren had abandoned them**
- **Japanese Garrison was only comprised of two and a half divisions**
- **Believed Americans would land 6 to 10 Divisions**
- **Estimated U.S. firepower on ground 12 times greater than Japanese**
- **Americans had air and naval dominance over the island**

“The Road To Certain Victory”

Japanese propaganda pamphlet printed and distributed stated “sleeping tactics”, using tunnels and fortifications, could defeat the Americans’ superior numbers and technology. This was intended to motivate troops to work on their fortifications.

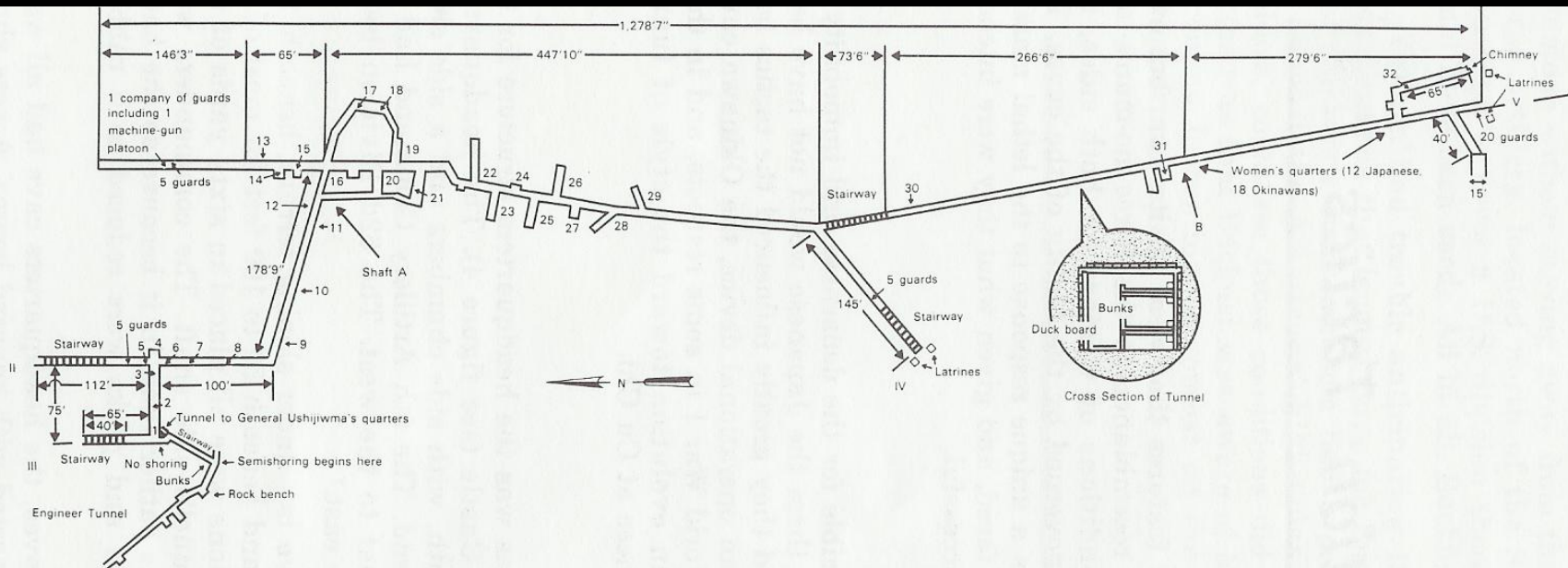
***“Confidence in victory will be born from strong fortifications”* was the soldier’s slogan.**

Going Underground

- 100,00 men of IJA would live underground
- 60 miles of tunnels in South Okinawa
- Concentrated in an area 3 to 12 miles wide and 16 miles long
- Mostly consisting of pillbox caves

Typical Pillbox on Okinawa shows the layered logs, rocks and earth used in their construction. Original opening was much smaller and almost undetectable. This one was hit by a bazooka.



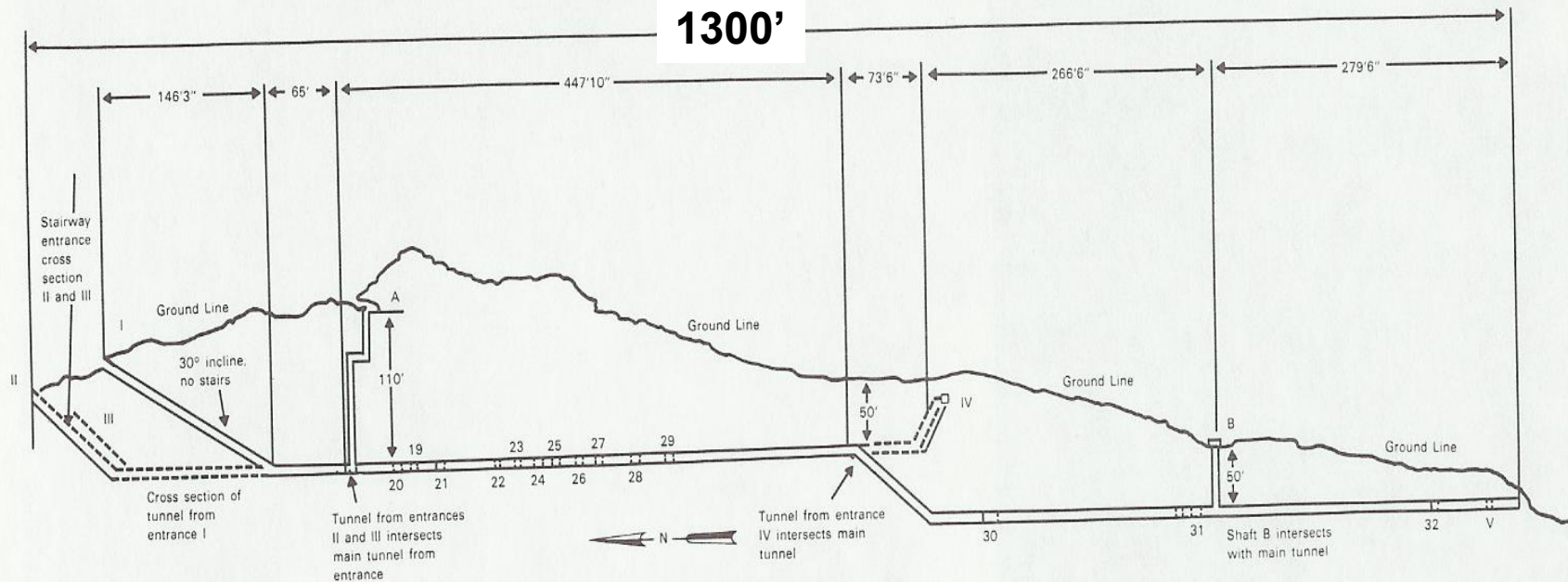


| No. | Area/Room Designation |
|-----|--|
| 1 | Commanding general's office and quarters |
| 2 | Chief of staff's office and quarters |
| 3 | Staff officers |
| 4 | Senior adjutant's office and quarters |
| 5 | Clerks and messengers |
| 6 | Operations office |
| 7 | Formerly commanding general's office and quarters, 44th IMB, later quarters for 10 women typists |
| 8 | Commanding general's pantry |
| 9 | Telegraph section |
| 10 | Weather section |
| 11 | Material and personnel section |
| 12 | Reconnaissance section |

| No. | Area/Room Designation |
|-----|---|
| 13 | Signal section |
| 14 | Telephone and switchboard |
| 15 | Officers' quarters |
| 16 | Order distributing center |
| 17 | 32d Army intelligence section |
| 18 | Operations section, 24th Division |
| 19 | Operations section, 24th Division |
| 20 | Commanding general's office and quarters, 24th Division |
| 21 | Staff office, 24th Division |
| 22 | Telegraph section supply room, 32d Army |
| 23 | Intelligence section, 44th IMB |
| 24 | First-aid station |

| No. | Area/Room Designation |
|-----|--|
| 25 | Air intelligence section, 32d Army |
| 26 | Dispensary |
| 27 | Staff officers' quarters |
| 28 | Construction section |
| 29 | Medical officers' office |
| 30 | Staff office, 44th IMB |
| 31 | Commanding officer (Rear Admiral Ota) and officers' quarters, Okinawa Naval Base Force, 10-17 May 1945 |
| 32 | Kitchen |
| A B | Secondary entrances and ventilation shafts |
| I-V | Primary entrances |

Plan View of 32nd Army HQ below Shuri Castle on Okinawa



| No. | Area/Room Designation | No. | Area/Room Designation |
|-----|---|-----|--|
| 19 | Operations section, 24th Division | 27 | Staff officers' quarters |
| 20 | Commanding general's office and quarters, 24th Division | 28 | Construction section |
| 21 | Staff office, 24th Division | 29 | Medical officers' office |
| 22 | Telegraph section, supply room | 30 | Staff office, 44th IMB |
| 23 | Intelligence section 44th IMB | 31 | Commanding officer (Rear Admiral Ota) and officers' quarters, Okinawa Naval Base Force, 10-17 May 1945 |
| 24 | First-aid station | 32 | Kitchen |
| 25 | Air intelligence section, 32d Army | I-V | Primary entrances |
| 26 | Dispensary | A B | Secondary entrances and ventilation shafts |

Cross Section of 32nd Army HQ below Shuri Castle on Okinawa

- Battalion Command Post
 - Company Command Post
 - 50mm Grenade Discharger
 - Heavy Machine Gun
 - Light Machine Gun
 - 47mm AT Gun
 - 70mm Howitzer
 - 75mm Gun
 - Trench
 - Mines
 - Antitank ditch
 - Platoon number
 - Company number
- 500 yards

Artist rendering of 32d, defense Okinawa

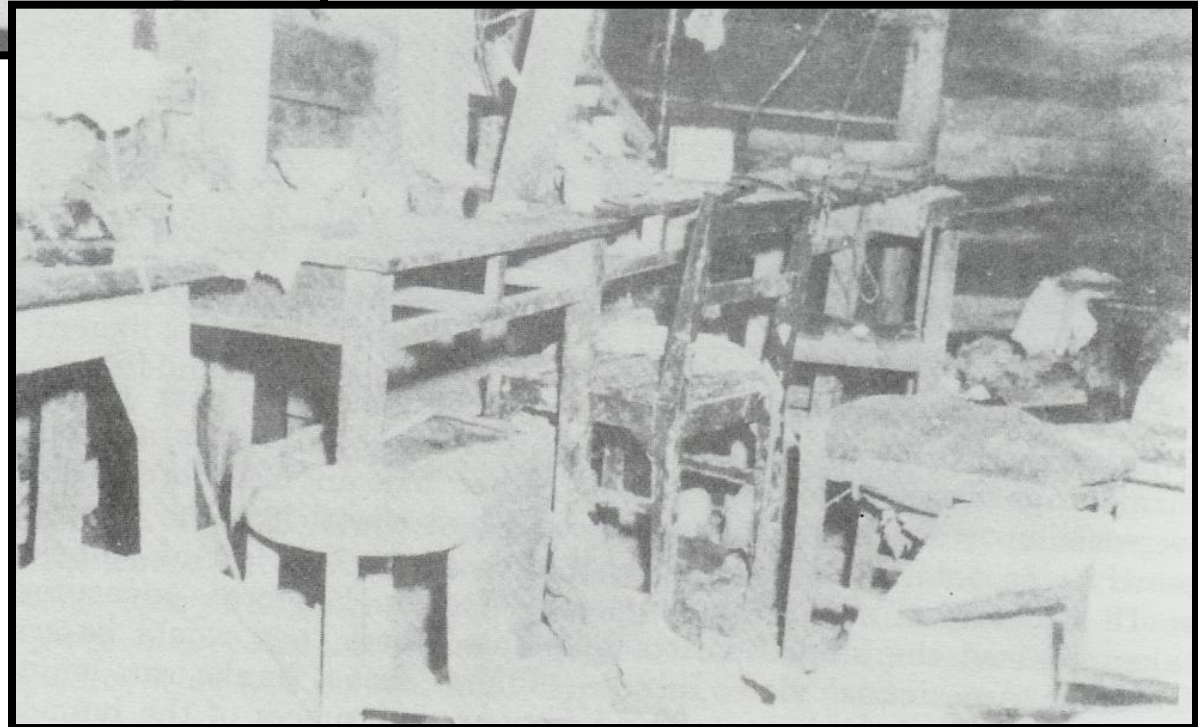


Photos from inside 32nd Army HQ Cave

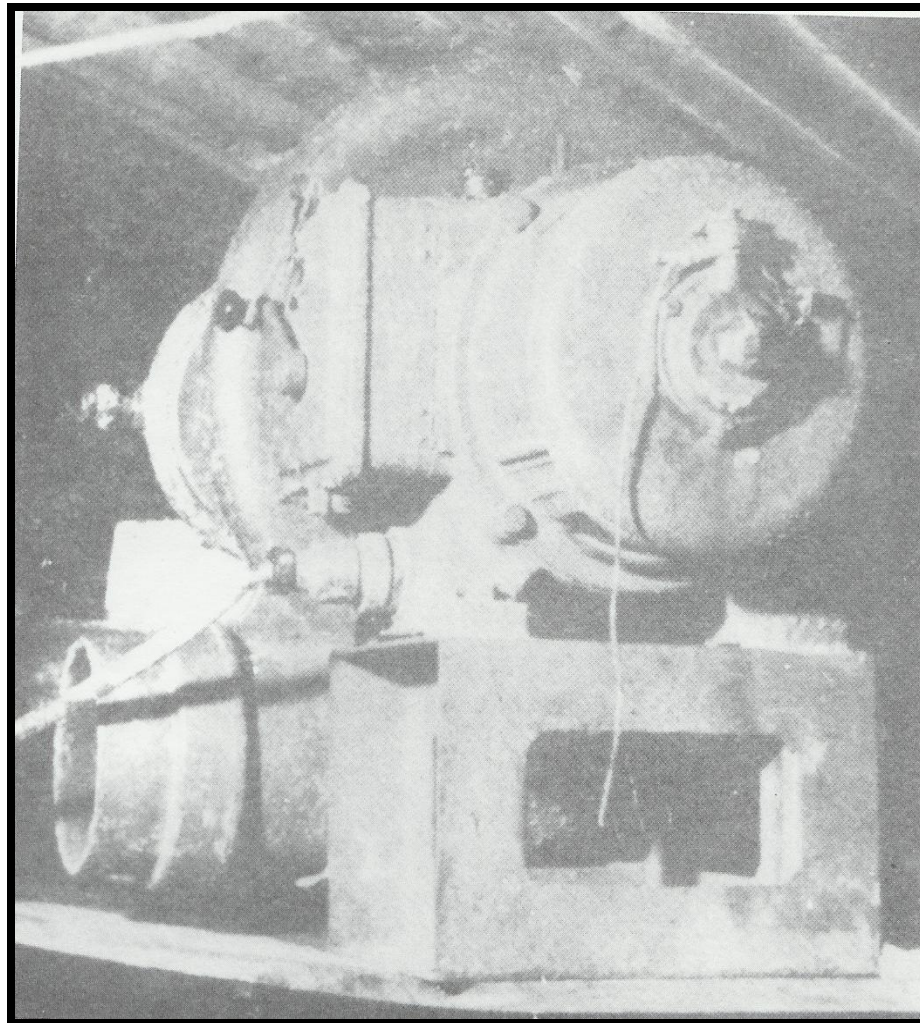
HQ Cave Office



HQ Cave Vertical
Shaft Entrance



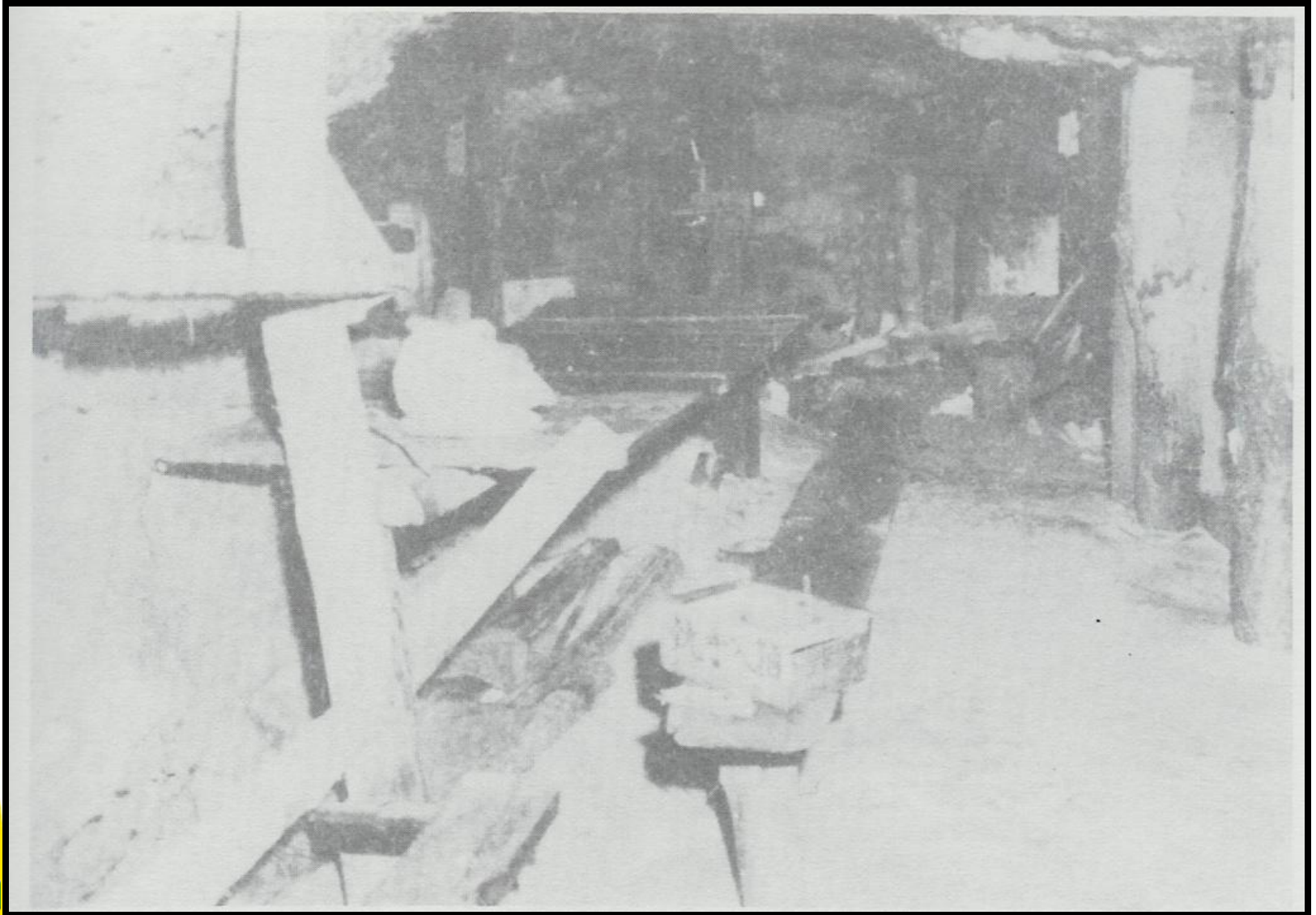
Motor used to Run Headquarters Cave Ventilation Fans

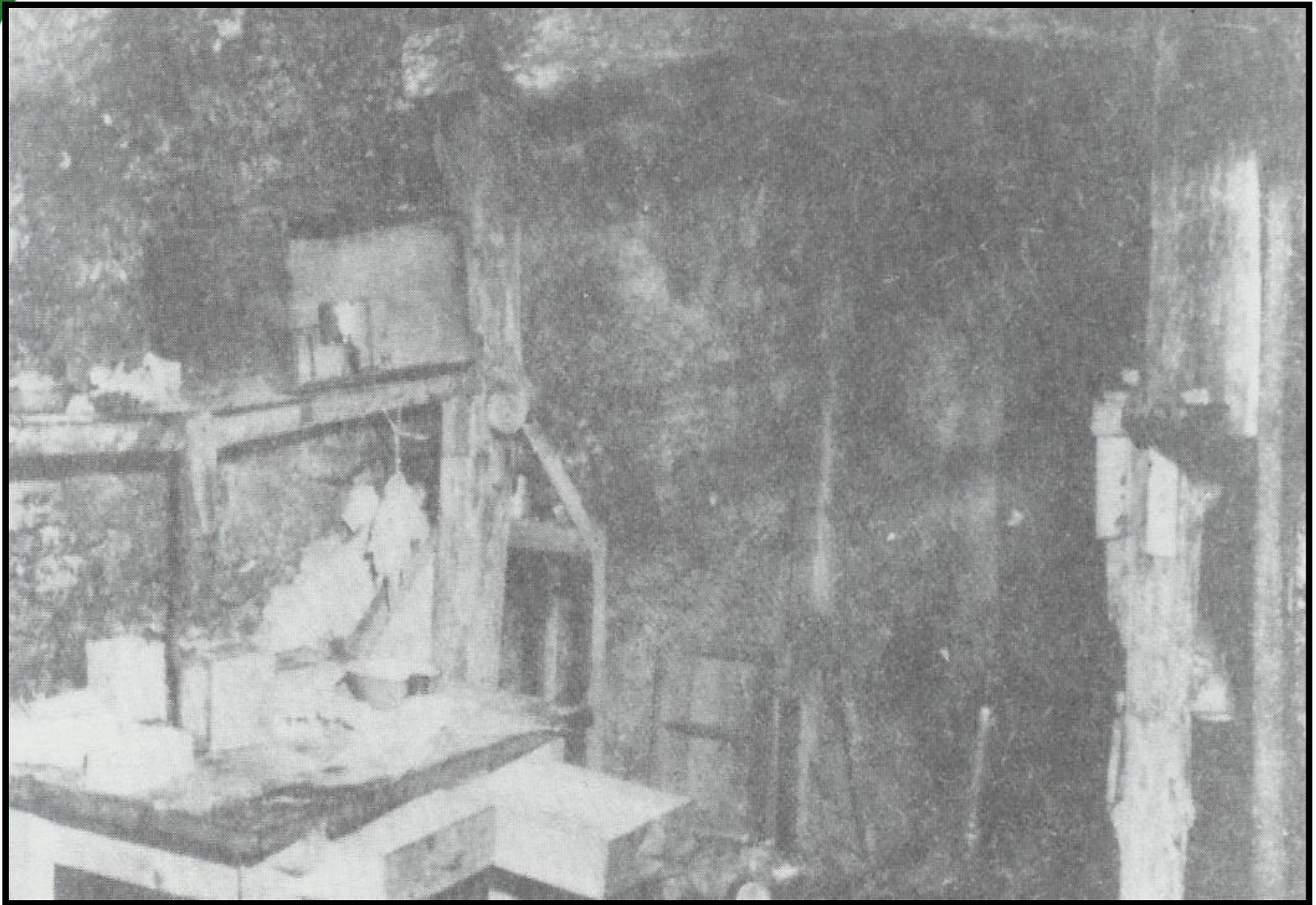


The Hills of Okinawa Honeycombed with Caves and Dugouts.



Underground Mess Hall on Oroku Peninsula, Okinawa



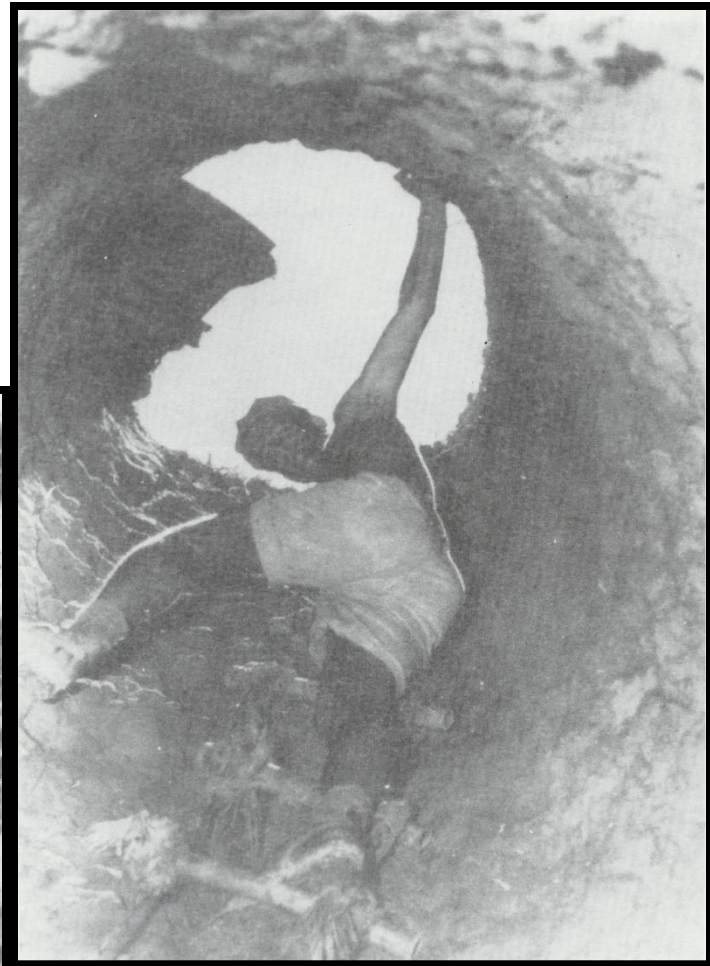
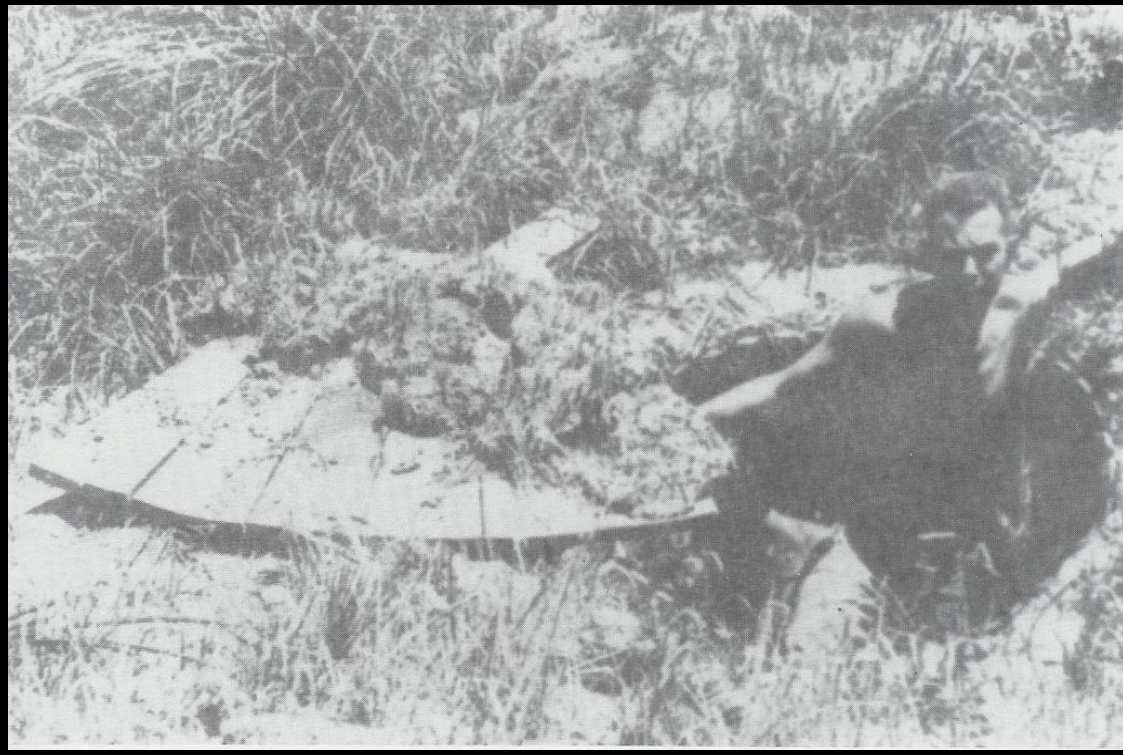


Commander's Office in Pillbox Cave Complex



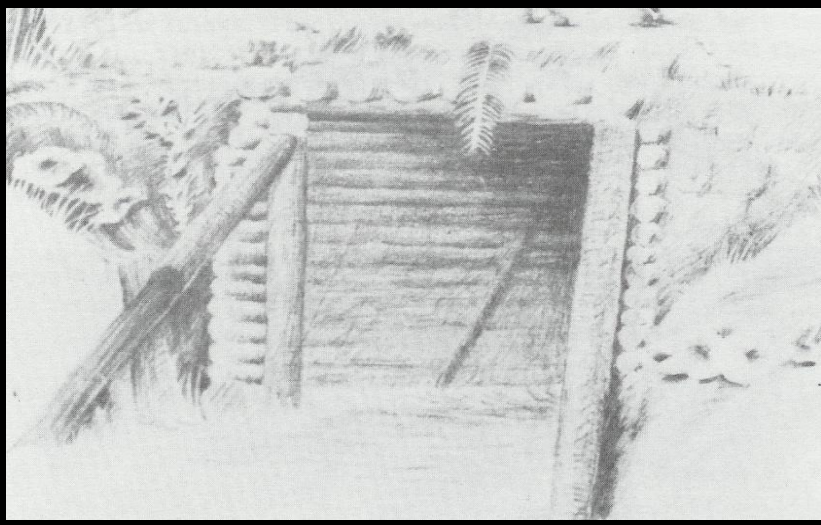
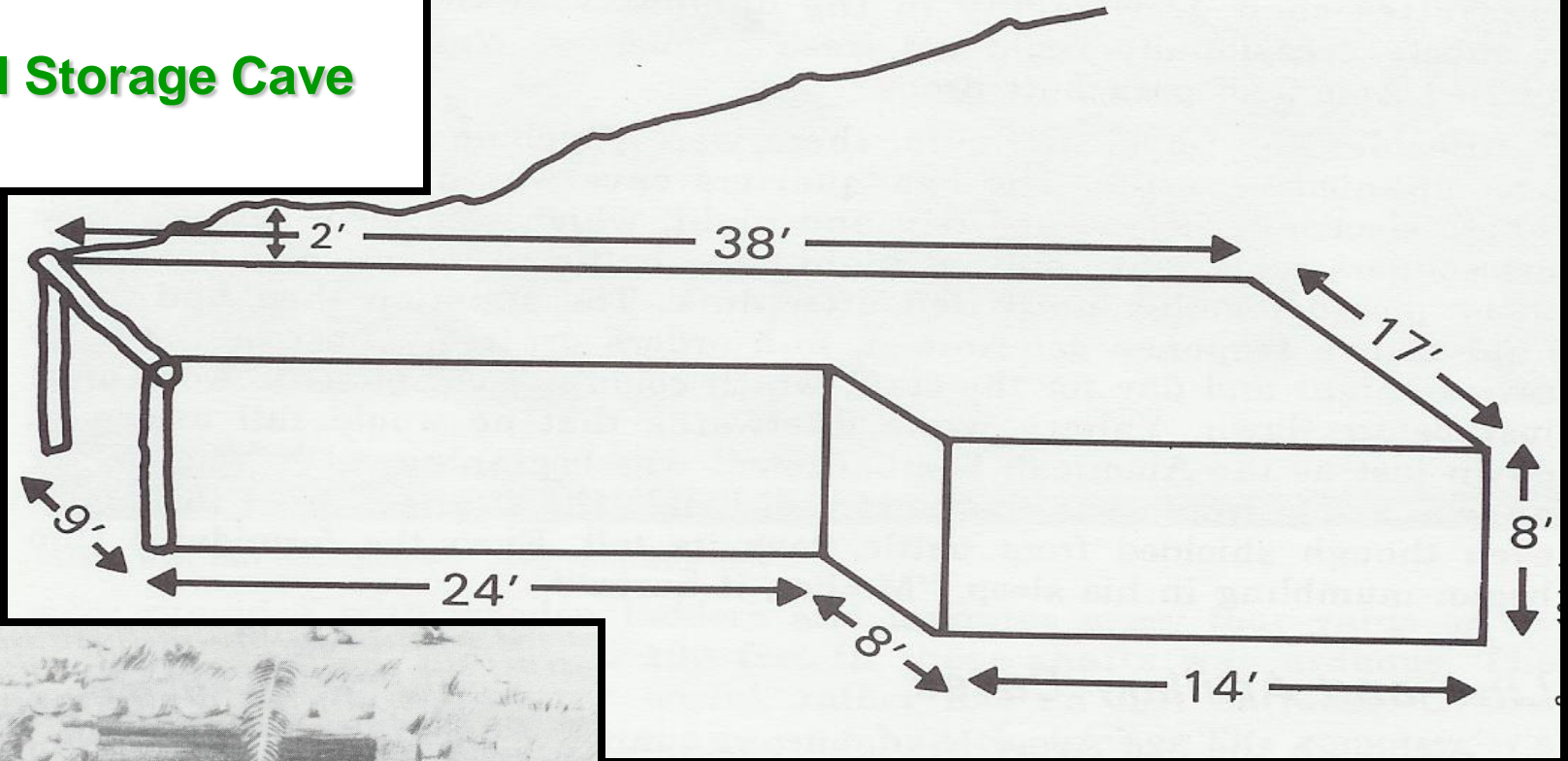
**Dummy
Artillery
Position**

Vertical Shaft of Pillbox Caves

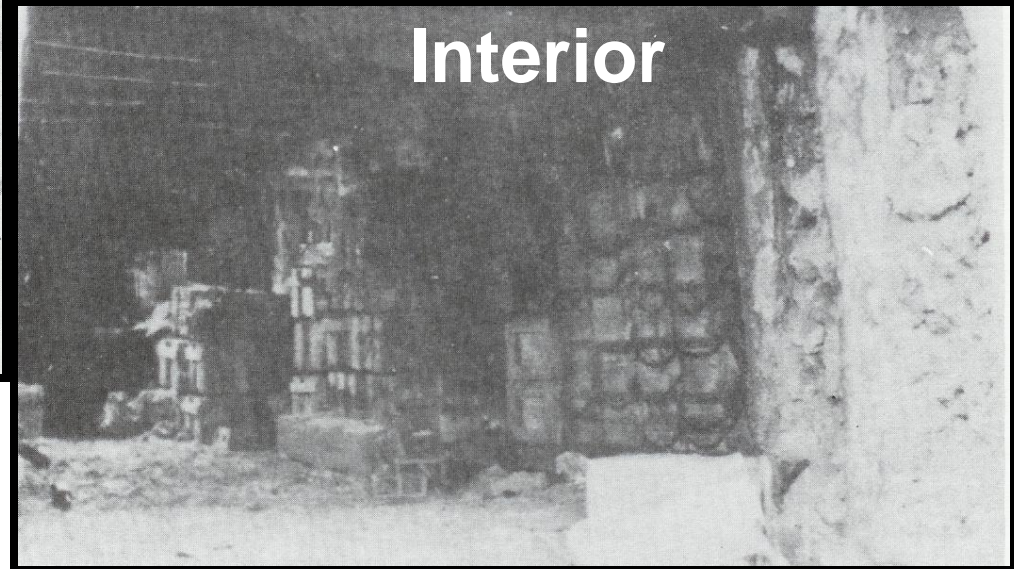


**Sod Covered Lids made Entrance
Nearly Undetectable**

Typical Storage Cave



Entrance



Interior

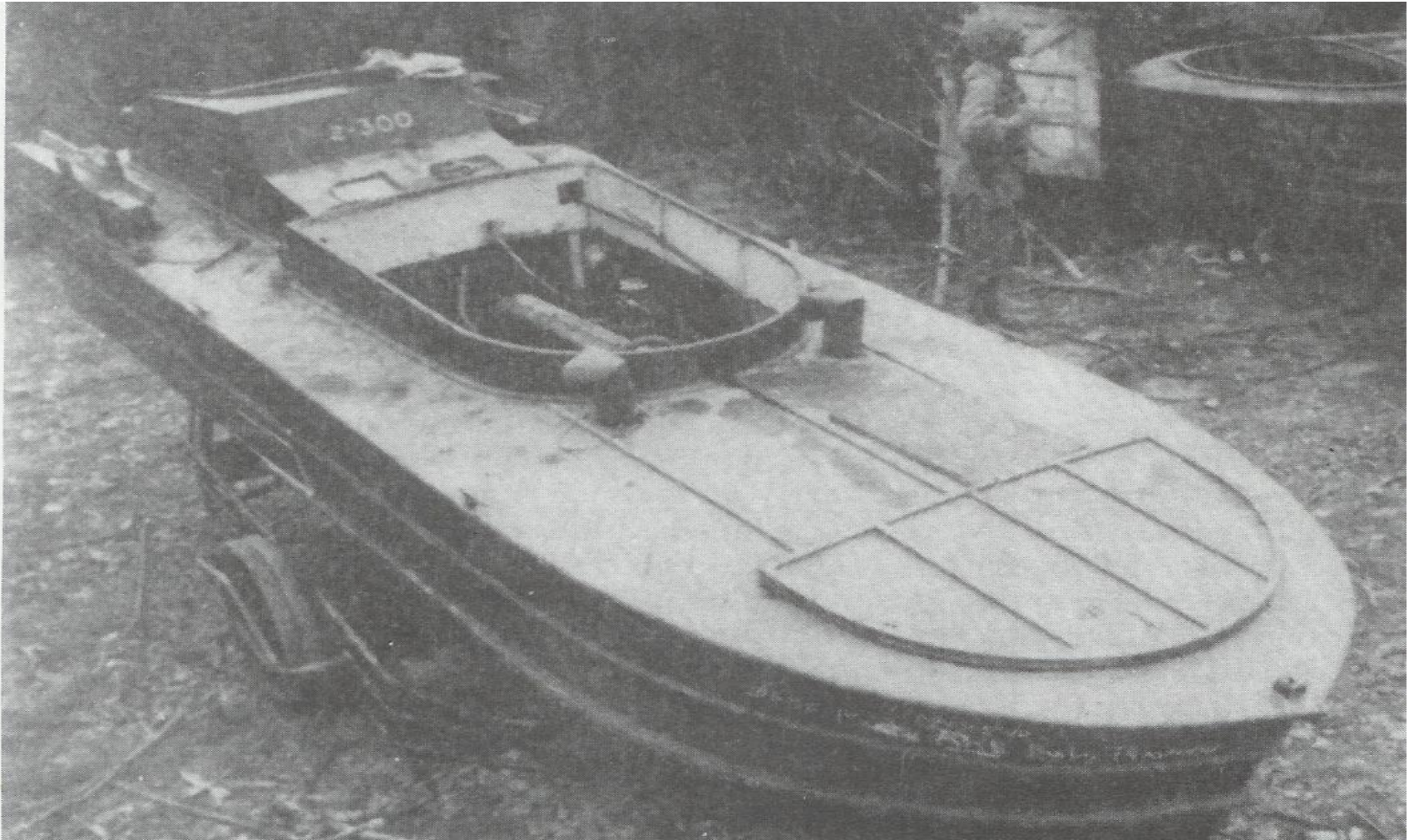
Supply Cave Entrance



**Entrance protected
by former rice
shipment bags
filled with sand.**

**Also camouflage net
with most of its inter-
woven vegetation
blown away**

Japanese Kamikaze motorboats for use on Okinawa



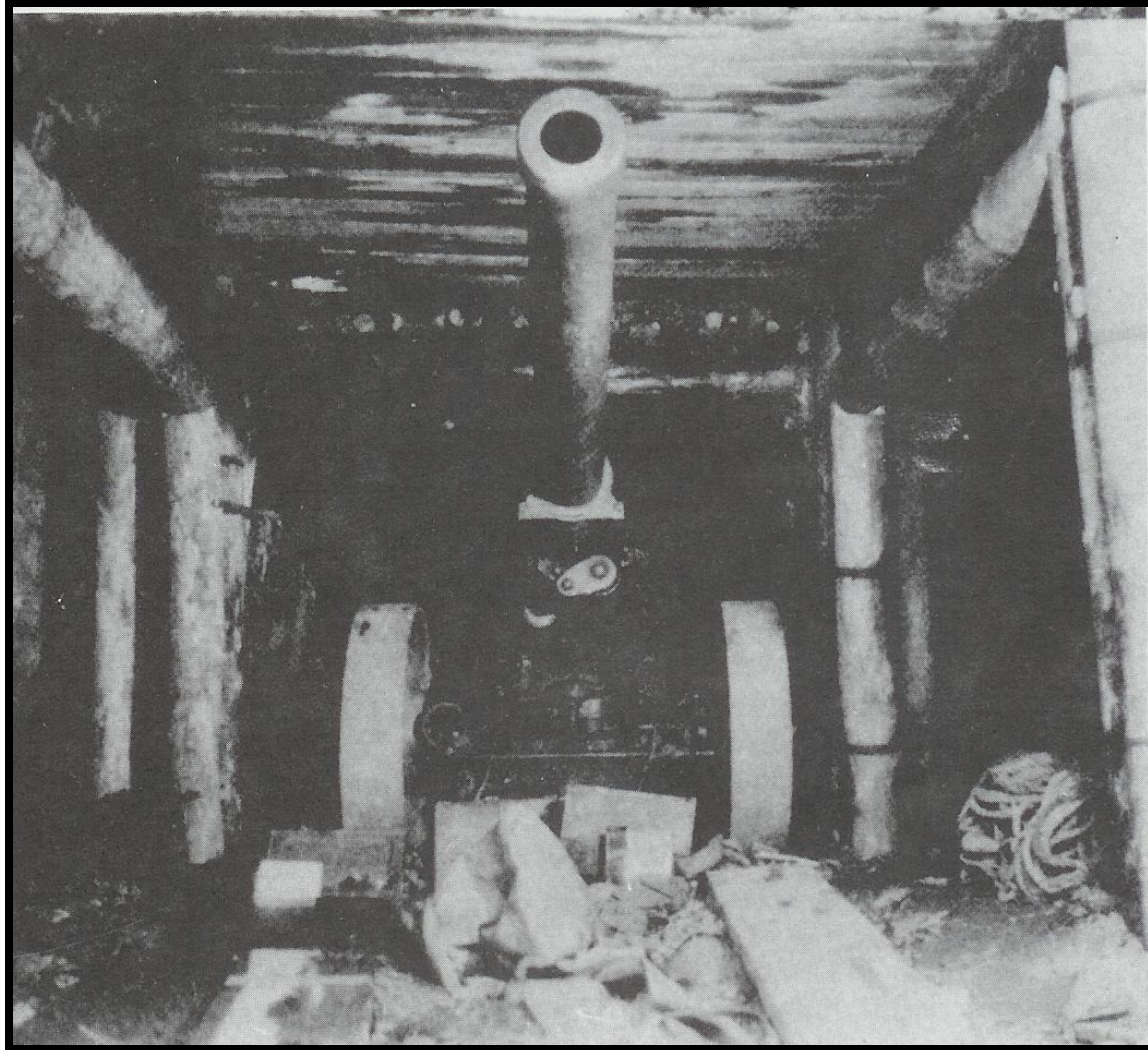
Wooden Beams Supported Earthen Walls in Pillbox Caves



ted earthen shafts



Large Guns Rolled on Rails or Planks



Marines fire captured IJA 70mm gun on Okinawa



Caves Linked by Communication Trenches

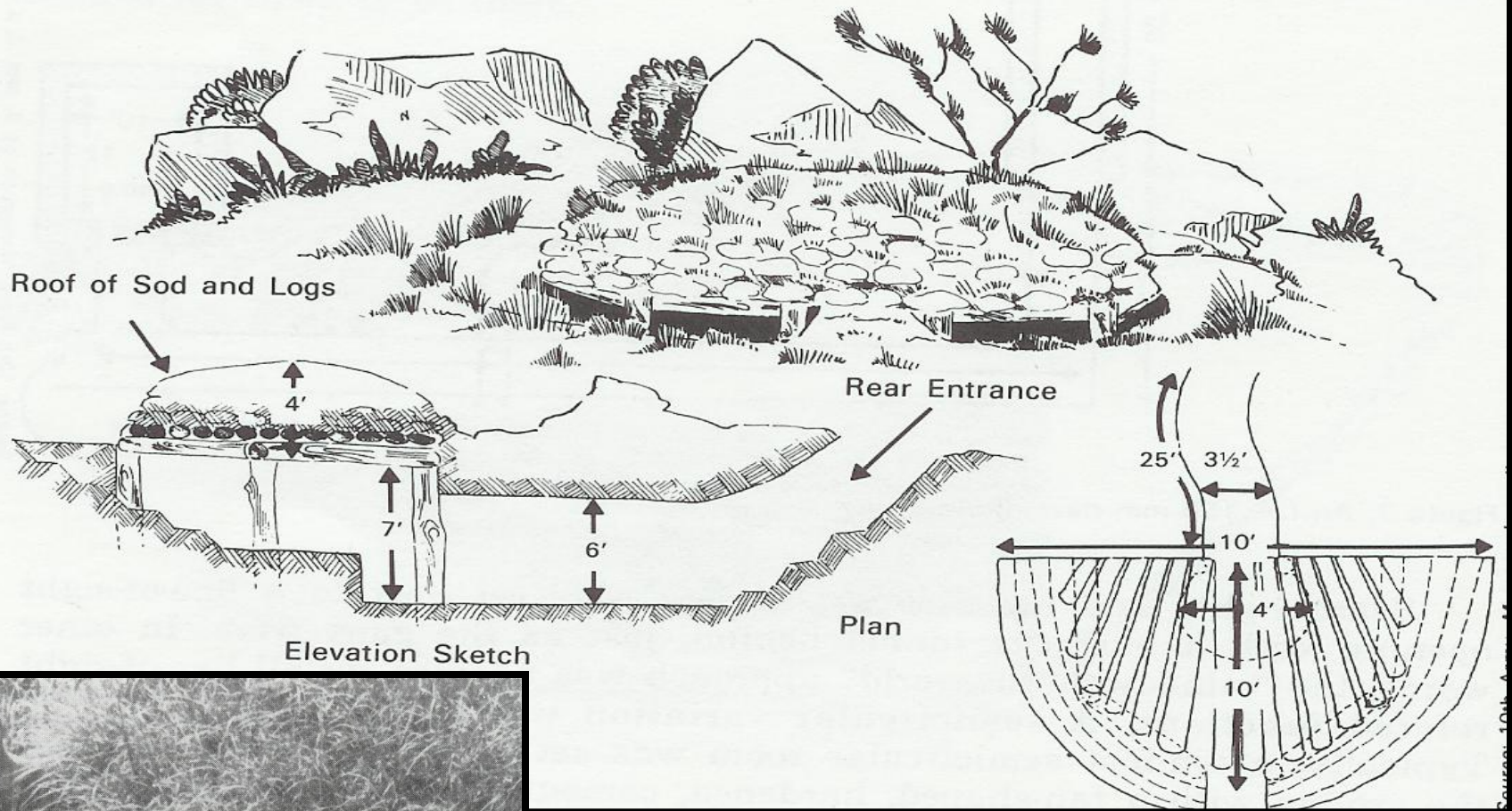


Bamboo Arches overhead to support camouflage

Aerial photo of village on Okinawa

Notice Japanese trucks covered in camouflage in right side of picture





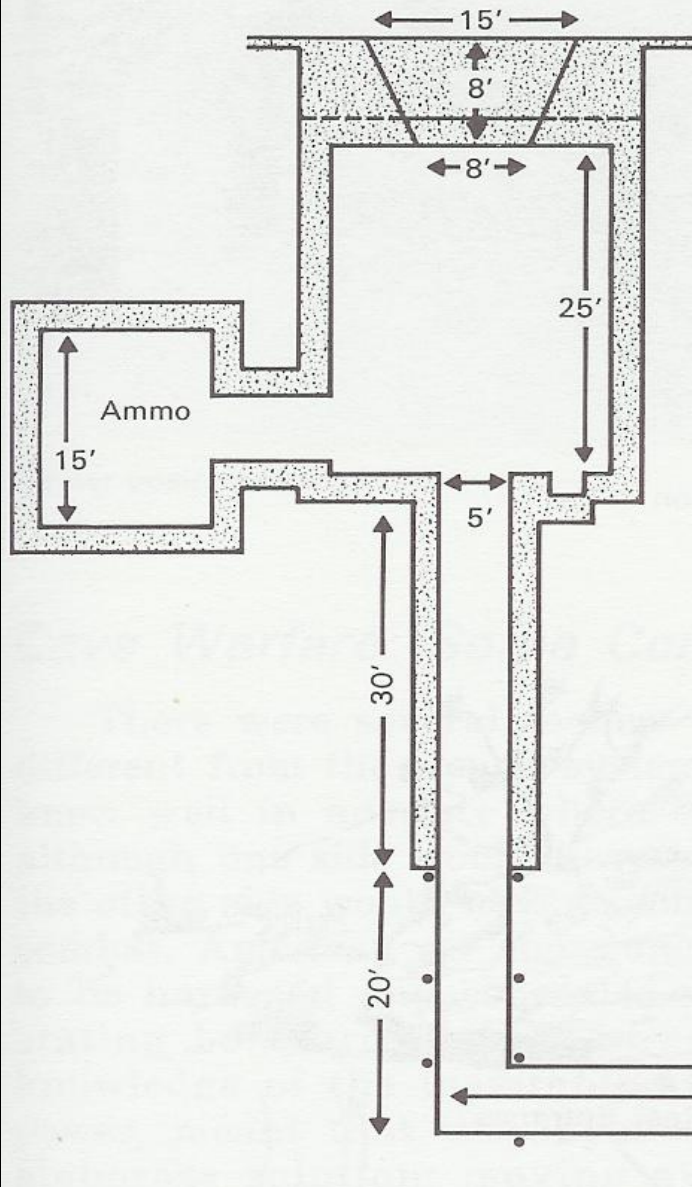
Typical entrenched IJA mortar position on Okinawa

IJA 127-mm Anti-Aircraft Gun



**Dummy AA
Gun Covered
W/ Camouflage**



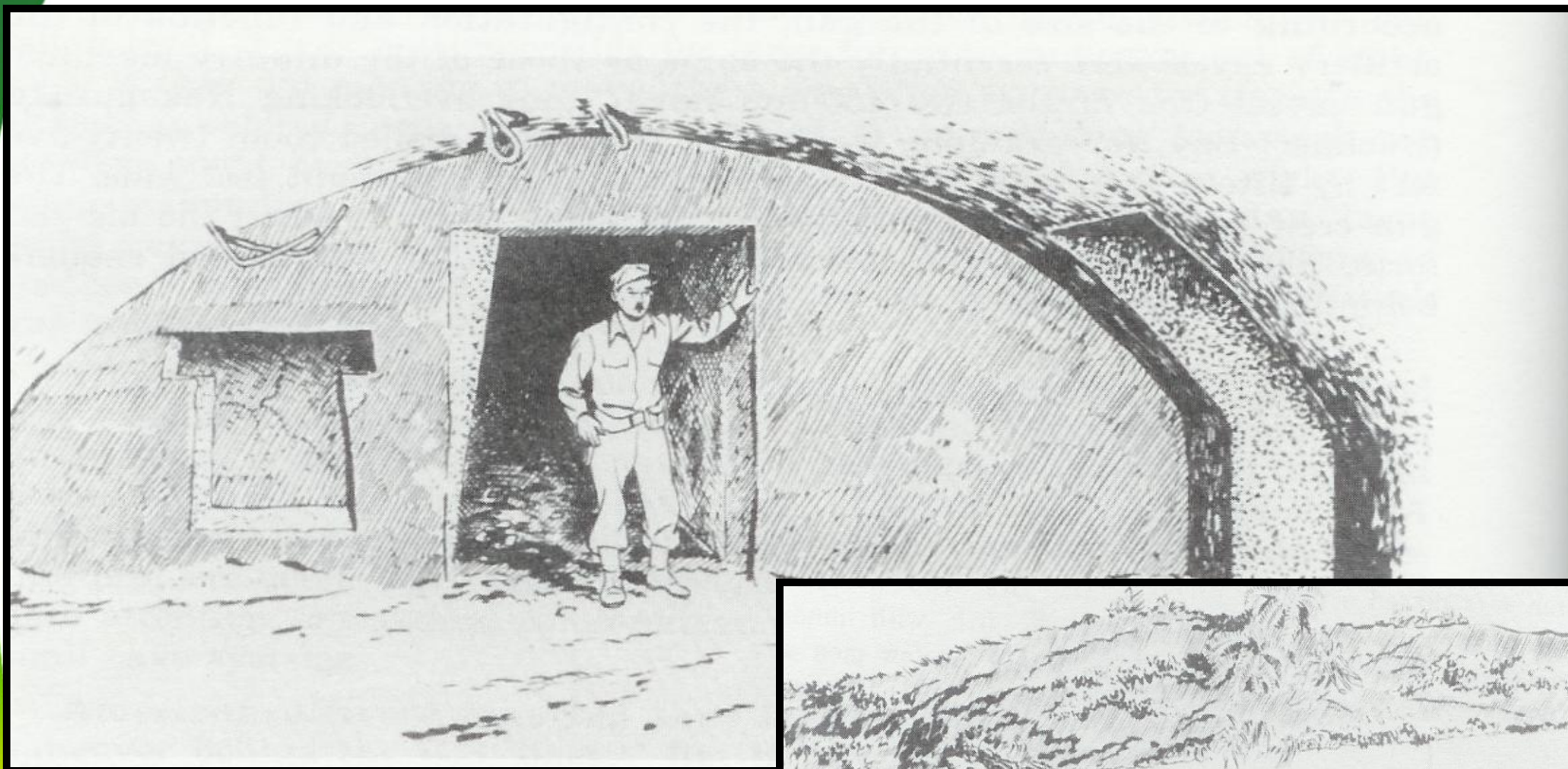


Typical IJN 150-mm Naval Gun Position

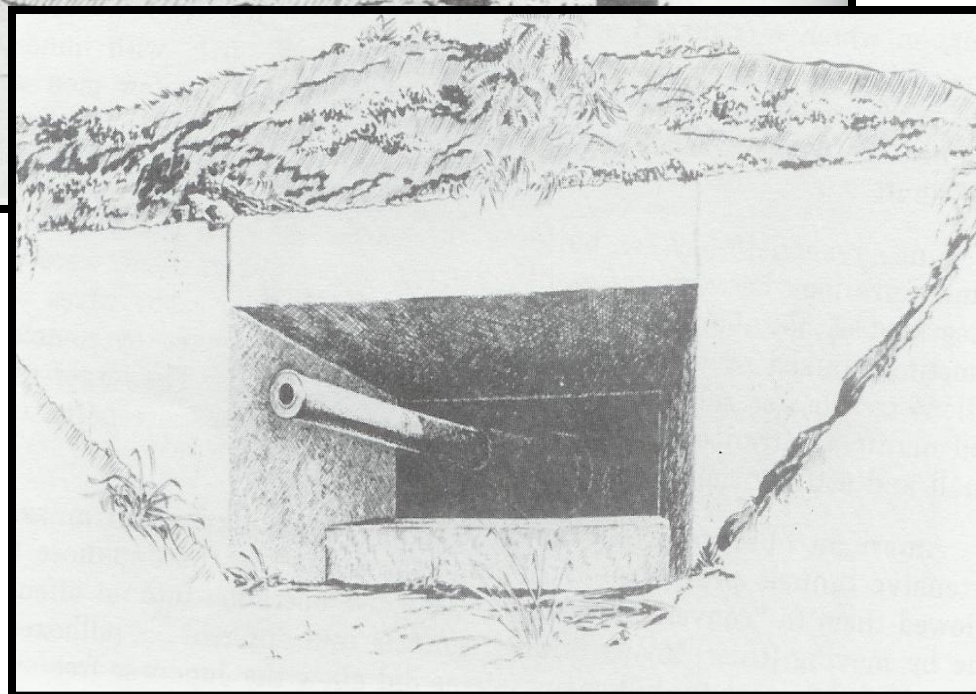
IJN 150-mm coastal defense gun position

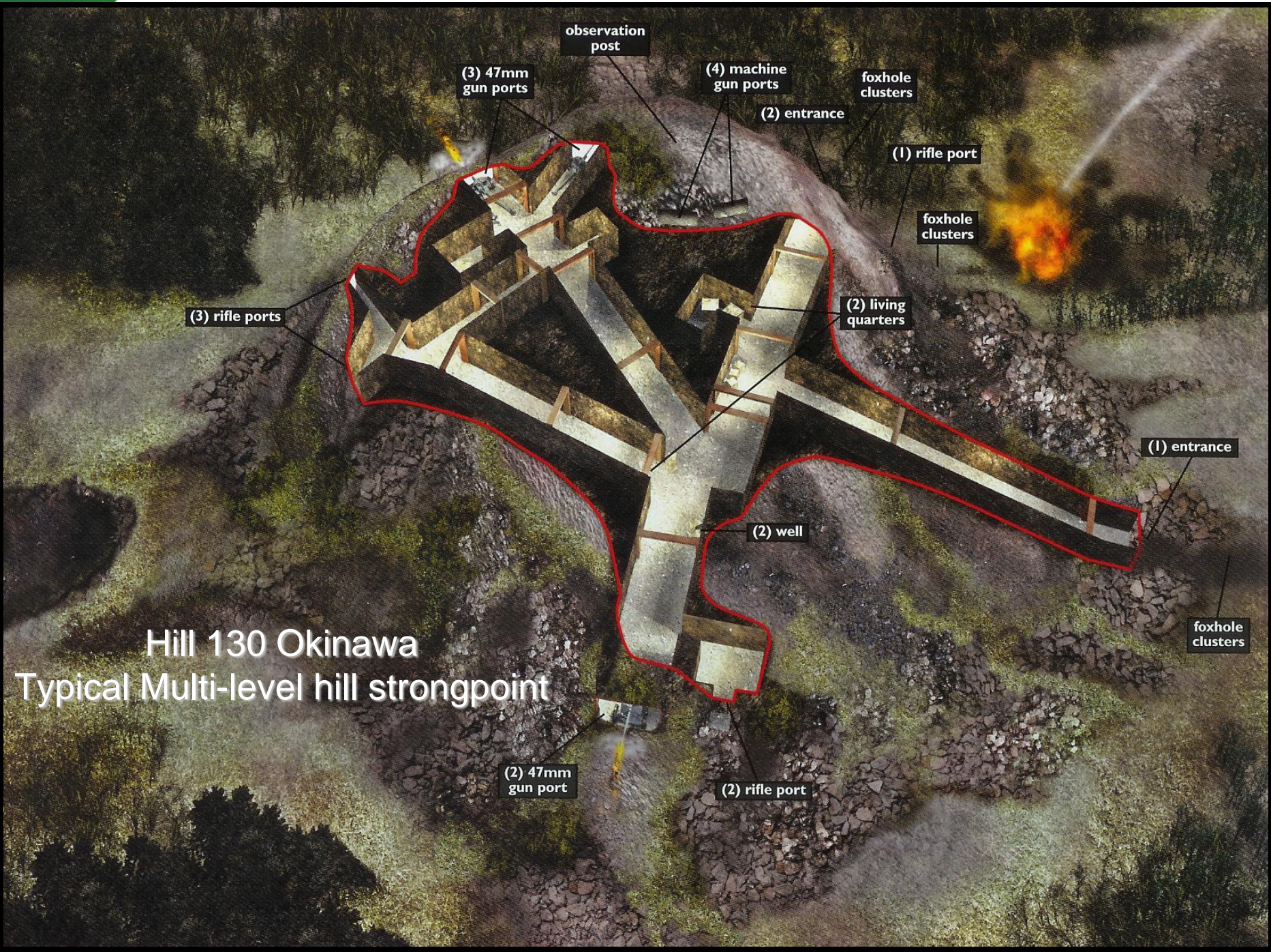


Rear Fire Room Wall of Naval Gun Position



**Firing Port of
150-mm Naval Gun
Position**

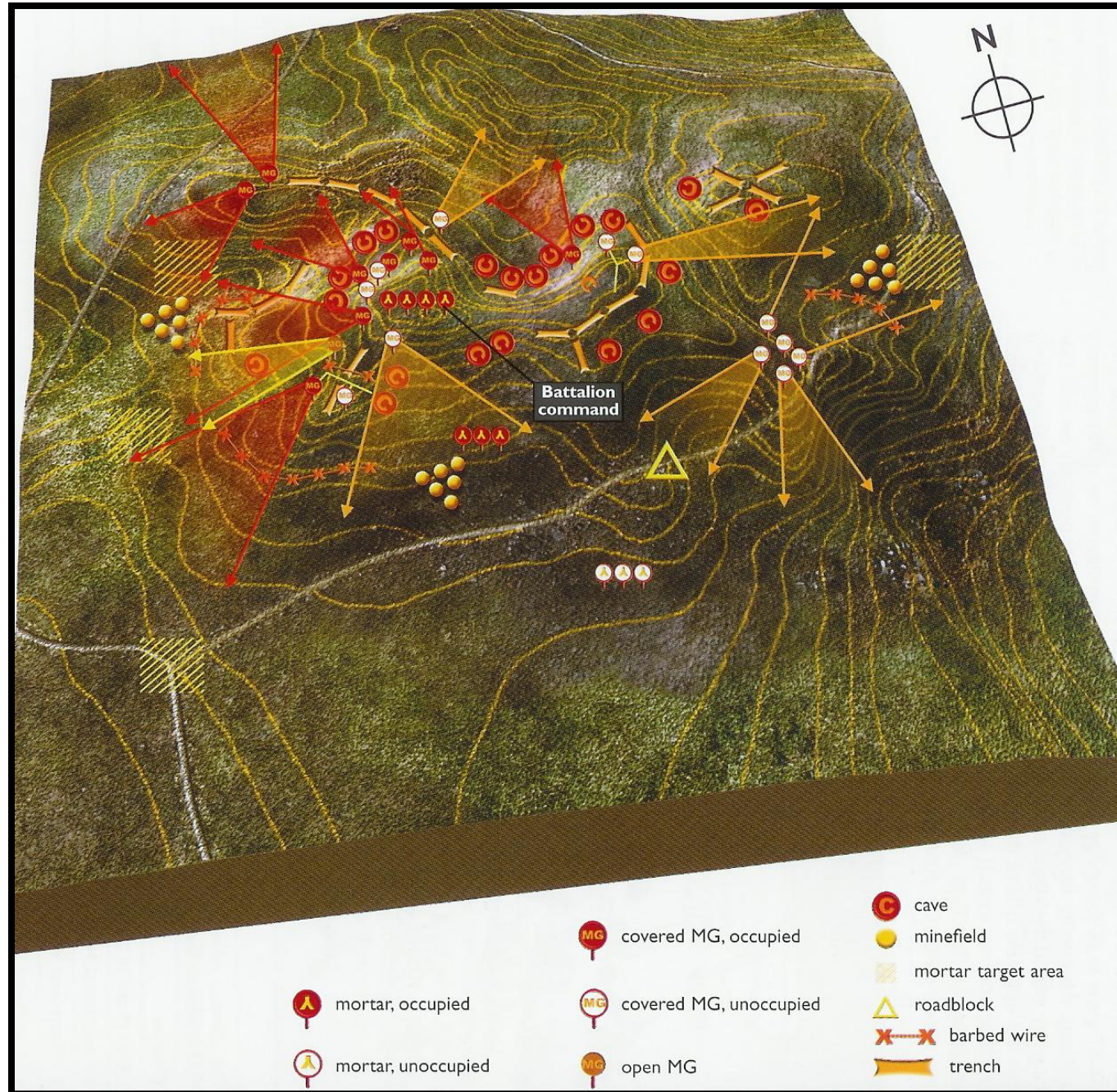




Hill 130 Okinawa
Typical Multi-level hill stronghold

Hill 145 Okinawa 1-14 Infantry Company

- 360 perimeter
- 7 mortar pits
- 21 caves
- 10 MG positions
- positions
- Wire & Mines
- Pre-planned mortar TRP's



SUMMARY

- **The Japanese Army and Marines quickly adapted and changed their defensive doctrines to accommodate Allied tactics**
- **They were extremely clever in use of available island resources**
- **They established and implemented many defensive principles still in use today, such as Reverse Slope Defense**

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