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# JAPANESE DELIBERATE FIELD FORTIFICATIONS

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### CINCPAC - CINCPOA BULLETIN NO. 94 - 45

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 undated, captured on SAIPAN.

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 EDITOR'S NOTE

This is the most comprehensive set of deliberate field fortification layouts and specifications that has been found to date. Some of the diagrams in this set have appeared in previous publications, supplemented by photographs, sketches, and comments. (In particular, see JICPOA Bulletin #71-44, Japanese Military Installations, 15 June 1944, with Supplement of 25 Sept. 1944. CINCPAC-CINCPOA Special Translation #59, Heavy DP Gun Emplacements, 100mm Type 98, 120mm Type 10 contains supplementary material. For detailed information supplementing the section on AA Installations, consult CINCPAC-CINCPOA Special Translation #62.)

Translations of captured fortification plans issued by area forces have also been published. (GILBERTS: JICPOA Item #3769, Standard Japanese Field Fortifications -- Selected; MARSHALLS: JICPOA Items #8056, Permanent Fortifications, and #6365, Information On Obstacles Used To Impede Landing Craft and Amphibious Vehicles -- 4th Fleet Planning Section; also JICPOA Items #7785, Special Fire Points, Covered Rifle and Gun Emplacements, and #7723, Notes on Beach Obstacles -- 1st Amphibious Brigade; MARIANAS: JICPOA Item #9535F, Plans For Construction of Dummy Batteries On GUAM -- MARIANAS Grp Hq.)

In addition ATIS has published similar reports covering the Southwest Pacific Areas, and Part I of the Japanese Infantry Field Fortification Manual (Enemy Publication #50, 23 Oct. 1943). Further information on fortifications may be found in published Defense Plans of OGASAWARA, PALAU, the MARIANAS, etc.

To a large degree all have been adaptations to local conditions of plans in this set, with emphasis on the use of on-the-spot materials. The Japanese, in fortifying their more remote territories, lacked materials to construct the elaborate installations called for in some of these plans. However, reconnaissance photographs and the experience of recent operations would seem to indicate that we shall, in the homeland, encounter deliberate fortifications which are up to official specifications. Cut-and-cover fortifications will be dug deeper than indicated herein; and/or their walls and ceilings will be thicker. and/or bursting layers provided. Specifications captured on OKINAWA call for walls and ceilings 1.3 - 3.5 meters thick for MG Pillboxes. (Casemates for rapid-fire guns, 2 - 3.5 meters for Regimental or Mountain Gun, 1.3 - 2 meters; Company Command Posts, 2 meters; Artillery Observation Posts, 1.3 meters; Open Emplacements for Rifles and MG, 1.3 meters.) Cave-type construction, with either open-cut or horizontal shaft, will undoubtedly be substituted whenever possible.

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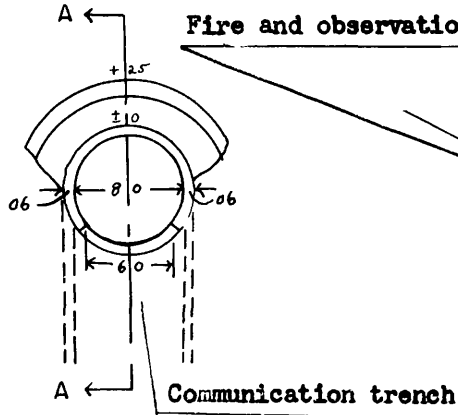
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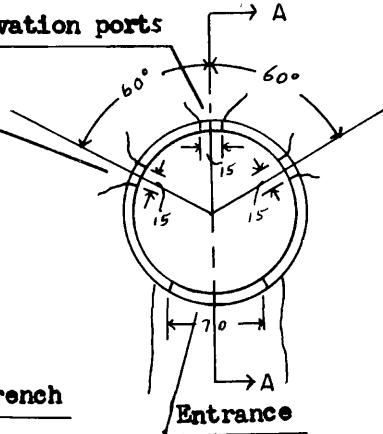
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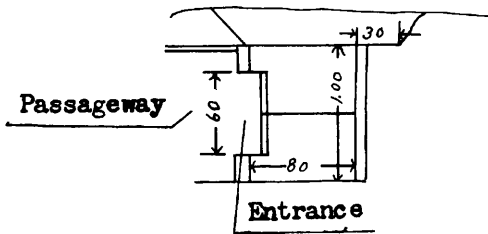


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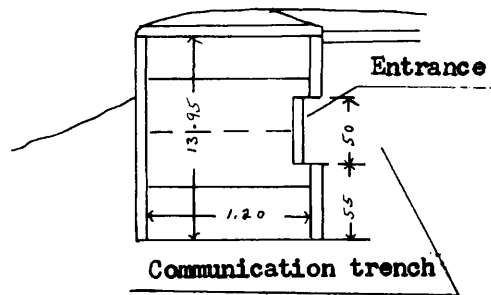
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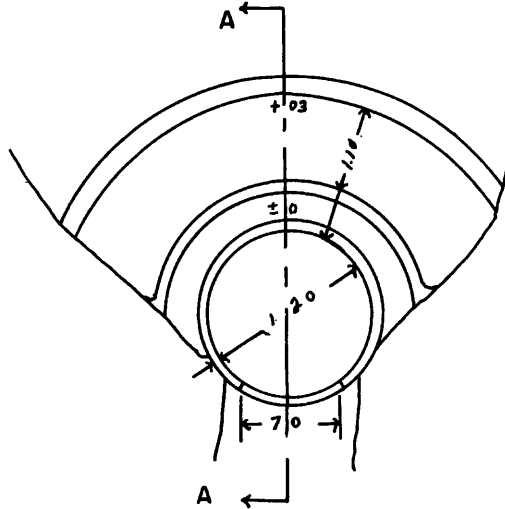
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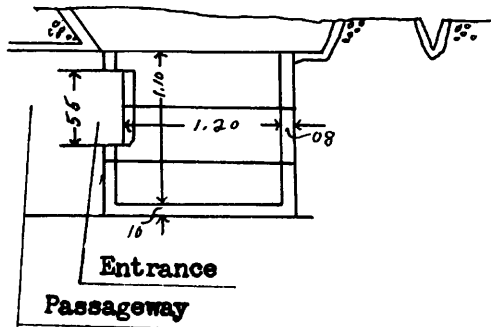
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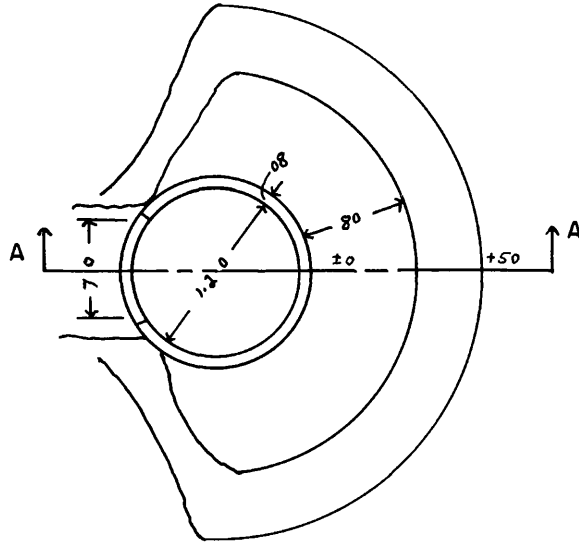
SECTION A-A



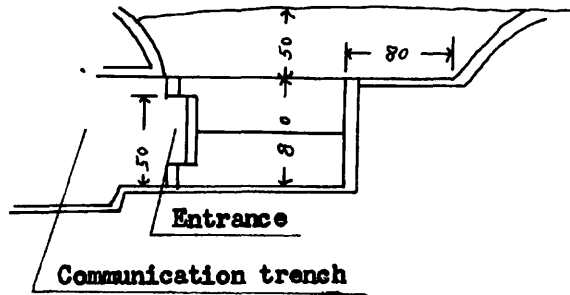
**UNCLASSIFIED**

I - OPEN EMPLACEMENTS

**UNCLASSIFIED** GRENADE THROWER  
PLAN CROSS SECTION



SECTION A-A



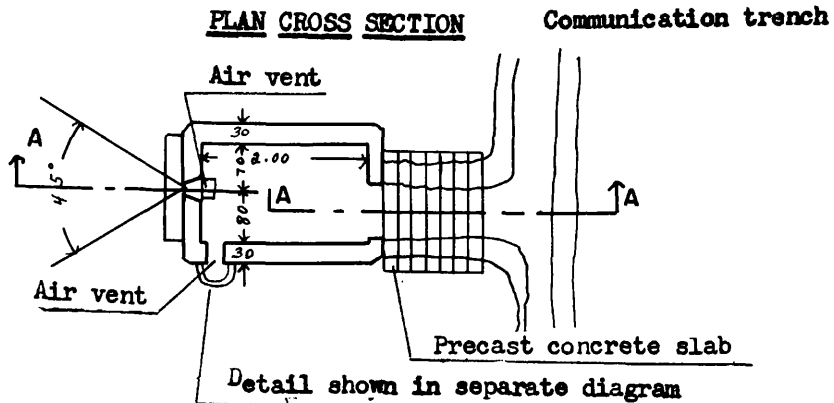
**UNCLASSIFIED**

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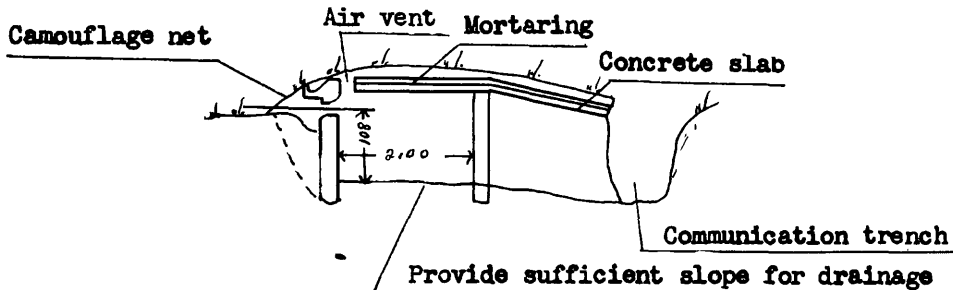
II - PILLBOXES

FOR ONE LMG

PLAN CROSS SECTION



SECTION A-A



**Notes:**

1. In this pillbox the 11th year type, Type 96, or Type 99 LMG equipped with telescopic sights may be used.
2. In the detailed diagram of the fire port the reinforcement is omitted.
3. Disposition of foundation and entrances should take into account factors of local terrain and soil.

List of Required Materials

Accessories

Concrete.....55 cu m  
 Steel reinforcement..... 1 ton  
 Forms { inner.....30 sq m  
       { outer.....25 sq m/?/

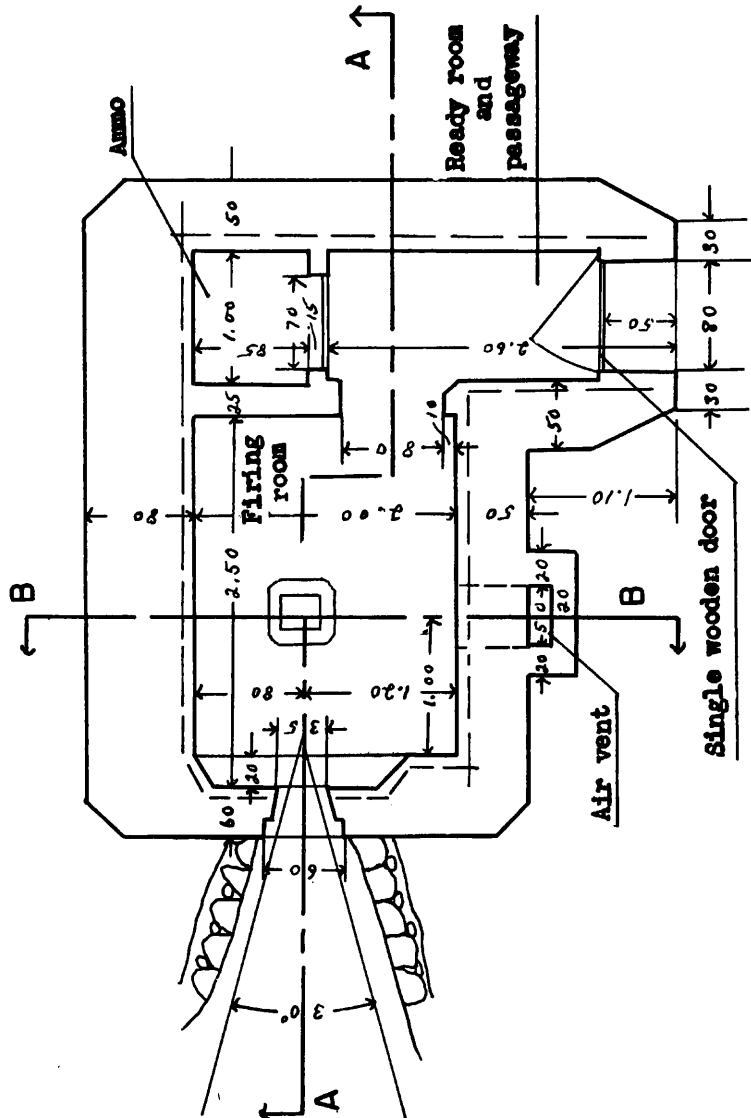
Fire port door.....1  
 Drainage unit.....1

**UNCLASSIFIED**

**II - PILLBOXES**

**FOR ONE FMG - TYPE A**

**PLAN CROSS SECTION**  
(Amount of concrete:  
about 35 cu m)



Reinforcing rods: 16mm dia., c-c .20

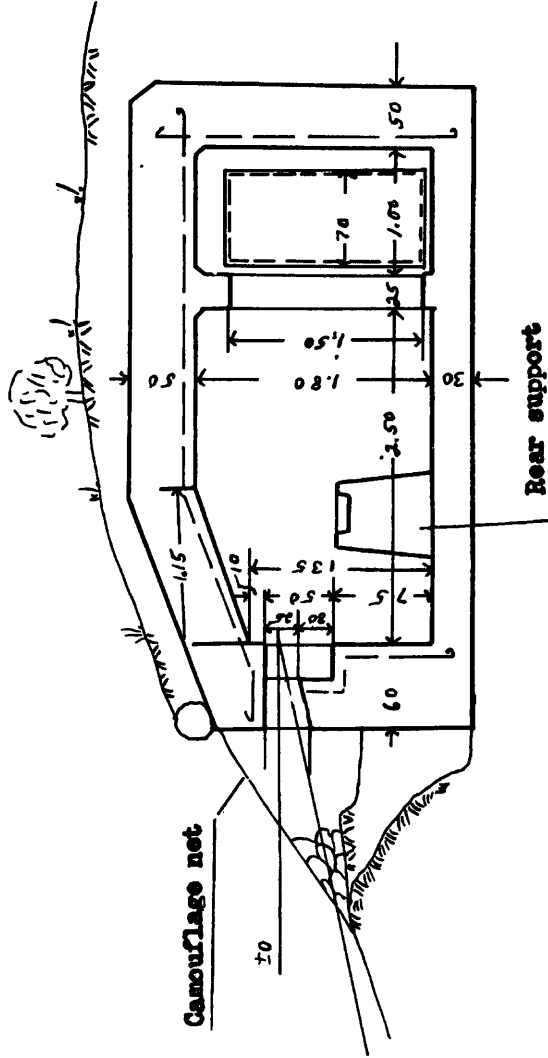
**UNCLASSIFIED**

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II - PILLBOXES

FOR ONE FMG - TYPE A (Continued)

SECTION A-A



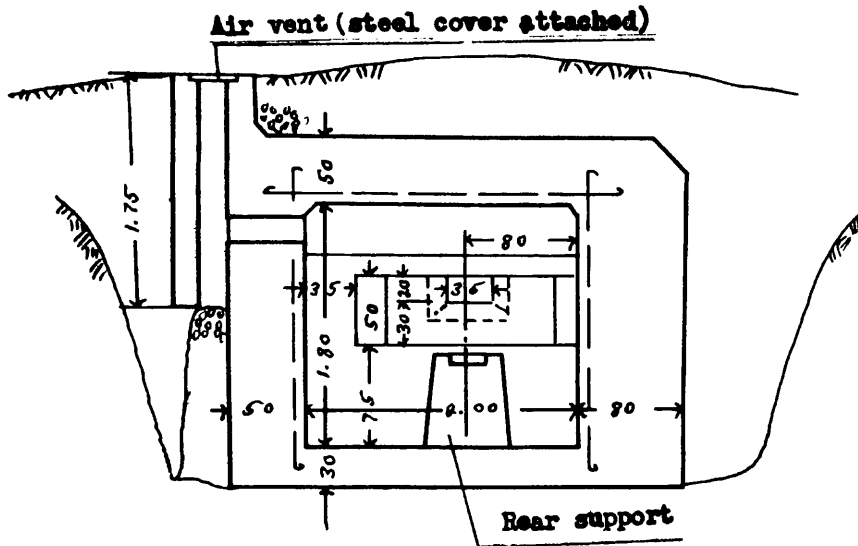
Reinforcing rods: 16mm dia., c-c .20

UNCLASSIFIED

II - PILLBOXES

FOR ONE HMG - TYPE A (Continued)

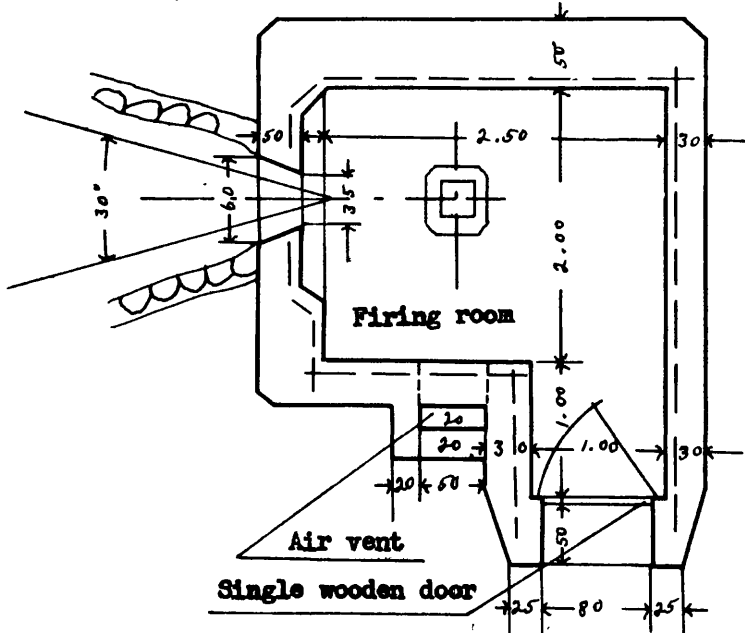
SECTION B-B



FOR ONE HMG - TYPE B

PLAN CROSS SECTION

(Amount of concrete: about 20 cu m)

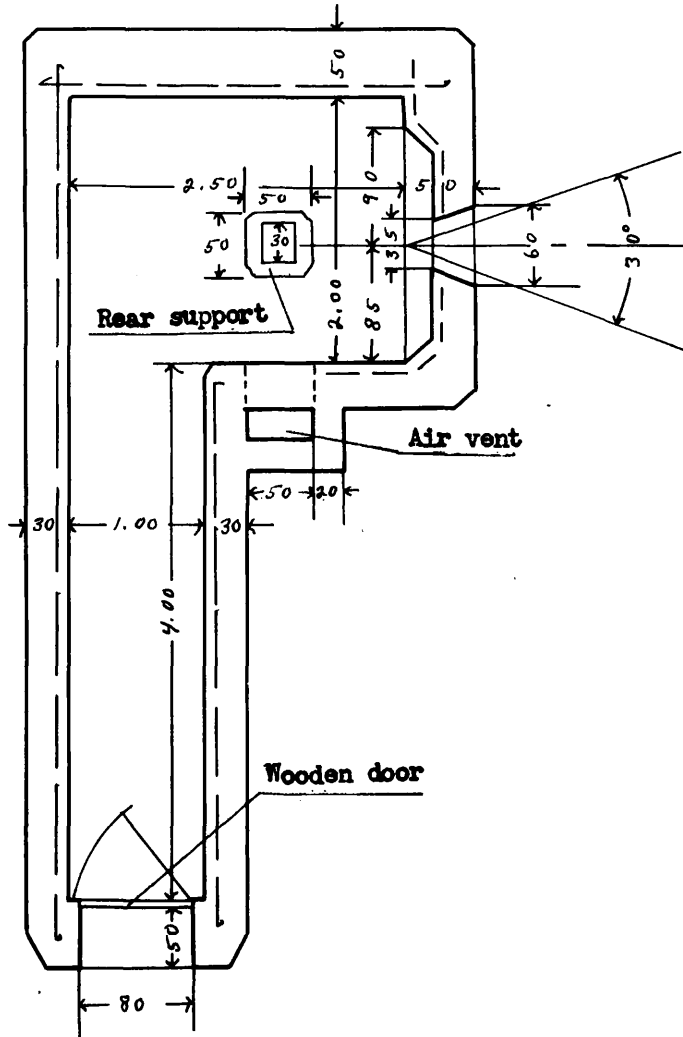


Reinforcing rods: 16mm dia., c-c .20

FOR ONE HMG - TYPE C

PLAN CROSS SECTION

(Amount of concrete:  
about 29 cu m)



Note: Thickness of concrete protective covering is 30-50cm.

Reinforcing rods: 16mm dia., c-c .20

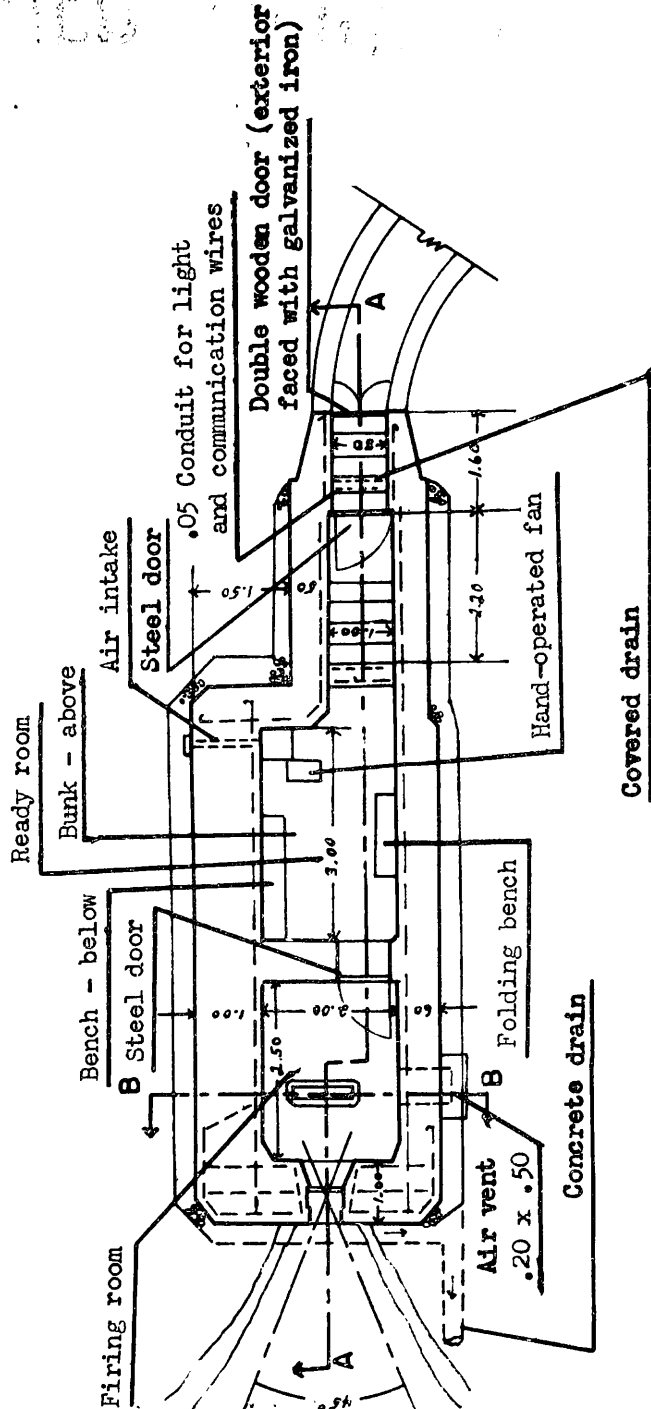
**UNCLASSIFIED**

UNCLASSIFIED

II - PILLBOXES

FOR ONE HMG (FLANK DEFENSE)

PLAN CROSS SECTION



Reinforcing rods: 16mm dia., c-c .20  
 16mm dia., c-c .40

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II - PILLBOXES

FOR ONE HMG (FLANK DEFENSE) (Continued)

SECTION A-A

Double wooden door (exterior faced with galvanized iron)

Precast concrete slab  
Waterproof mortaring

Ready room  
Bunk

Firing room

Camouflage net

Conduit for light and communication wires - .05

Drain

Bench  
Platform for hand-operated fan

Fan room

Reinforcing rods: 16mm dia., c-c .20  
16mm dia., o-c .40

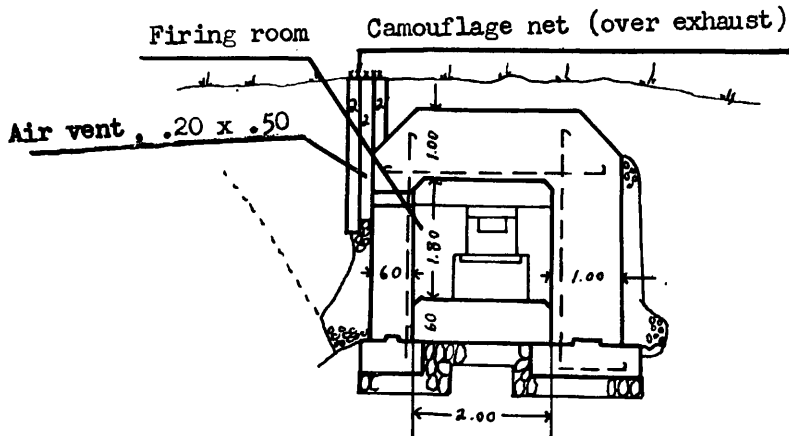
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II - PILLBOXES

FOR ONE HMG (FLANK DEFENSE) (Continued)

SECTION B-B



Reinforcing rods: 16mm dia., c-c .20  
16mm dia., c-c .40

**Notes:**

1. This diagram shows the type of pillbox used for Type 92 HMG.
2. The detail of the fire port is shown in a separate diagram.
3. The fire port wall is camouflaged. If necessary, reduce the amount of area exposed by using slabs of pre-cast concrete; such slabs should not become obstructions to firing.

List of Required Materials

Concrete.....110 cu m  
Steel Reinforcement.....25 tons  
Forms { inner.....84 sq m  
          outer.....120 sq m  
Broken Stone.....14 cu m

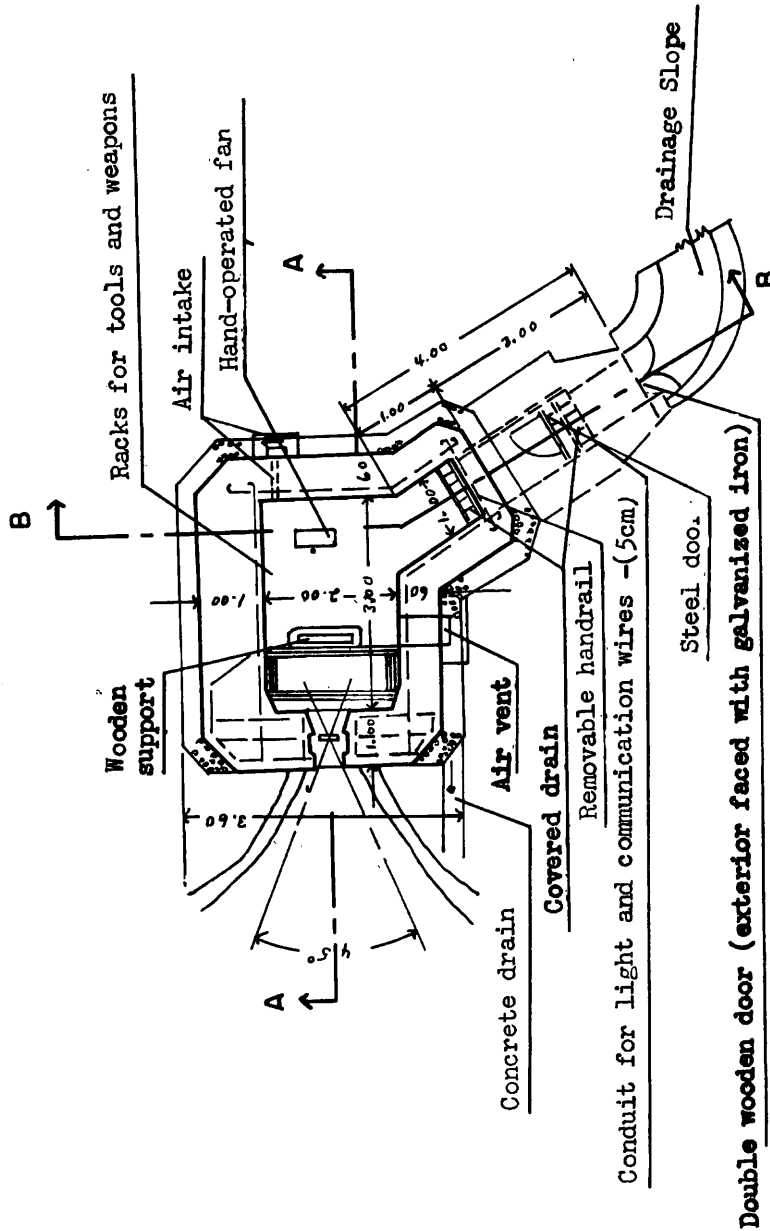
Accessories

Fire port door..... 1  
Steel door, entrance... 11  
Drain covers..... 2  
Intake..... 1  
Exhaust..... 1  
Bunks..... 1 man  
Benches ..... 2  
Drainage unit..... 1

II - PILLBOXES

FOR ONE HEAVY (OR LIGHT) MG (FLANK DEFENSE)

PLAN CROSS SECTION

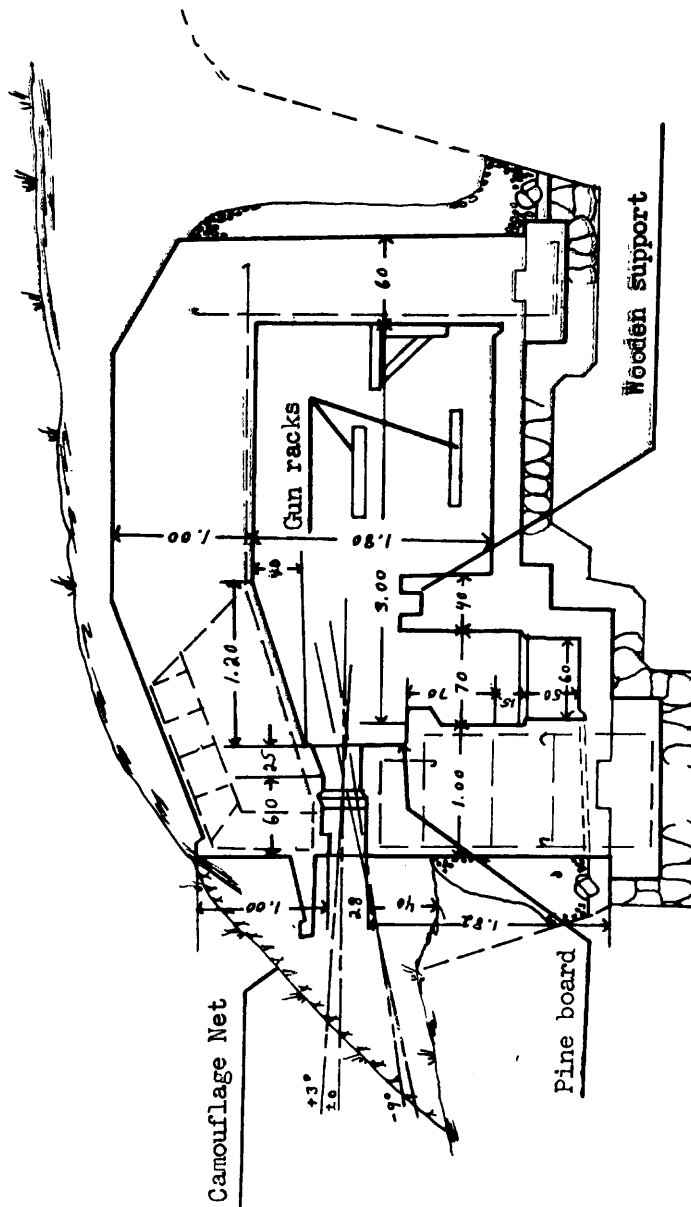


Reinforcing rods: 16mm dia., c-c .20  
 16mm dia., c-c .40

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II - PILLBOXES  
FOR ONE HEAVY (OR LIGHT) MG (FLANK DEFENSE) (Continued)

SECTION A-A



Reinforcing rods: 16mm dia., c-c .20  
16mm dia., c-c .40

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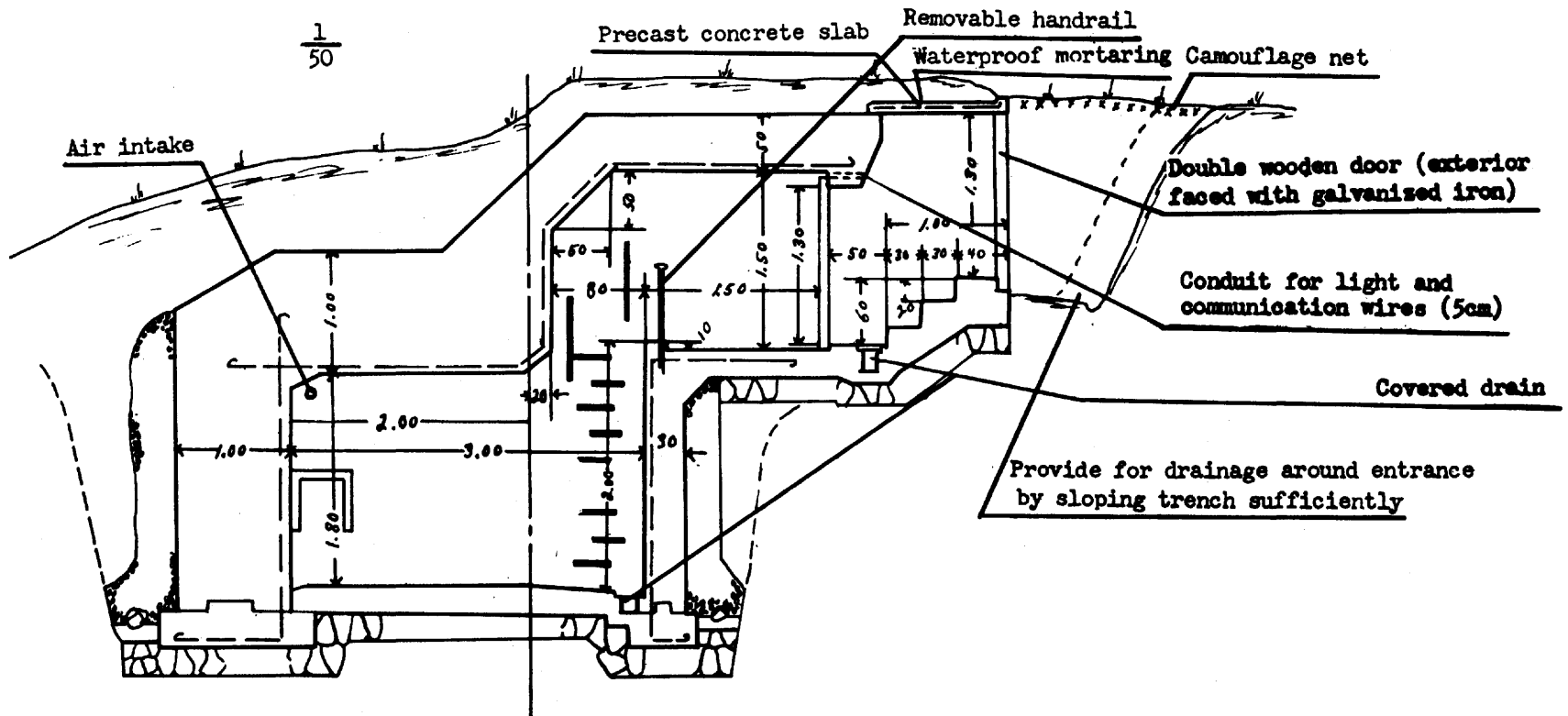
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II - PILLBOXES

FOR ONE HEAVY (OR LIGHT) MG (FLANK DEFENSE) (Continued)

SECTION B-B

$\frac{1}{50}$



List of Required Materials

Concrete.....60 cu m  
 Steel reinforcement...1.7 ton  
 Forms { inner.....55 sq m  
       outer.....85 sq m  
 Broken stone.....12 cu m

Accessories

Fire port door..... 1  
 Entrance door, steel.... 1  
 Entrance door, wooden... 1  
 Exhaust..... 1  
 Intake..... 1  
 Drainage unit..... 1

Reinforcing rods: 16mm dia., c-c .20  
 16mm dia., c-c .40

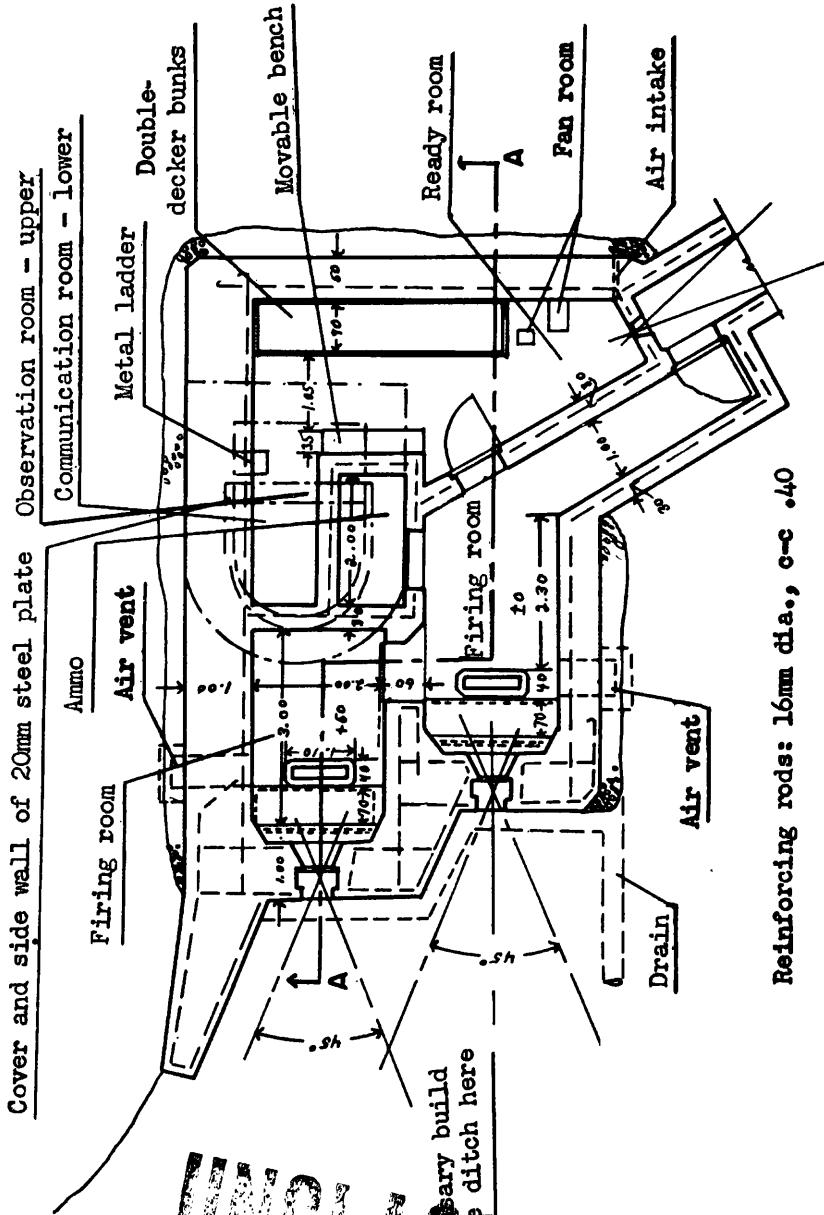
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II - PILLBOXES

FOR TWO HMG (FLANK DEFENSE)  
PLAN CROSS SECTION



Reinforcing rods: 16mm dia., c-c .40

If necessary build  
obstacle ditch here

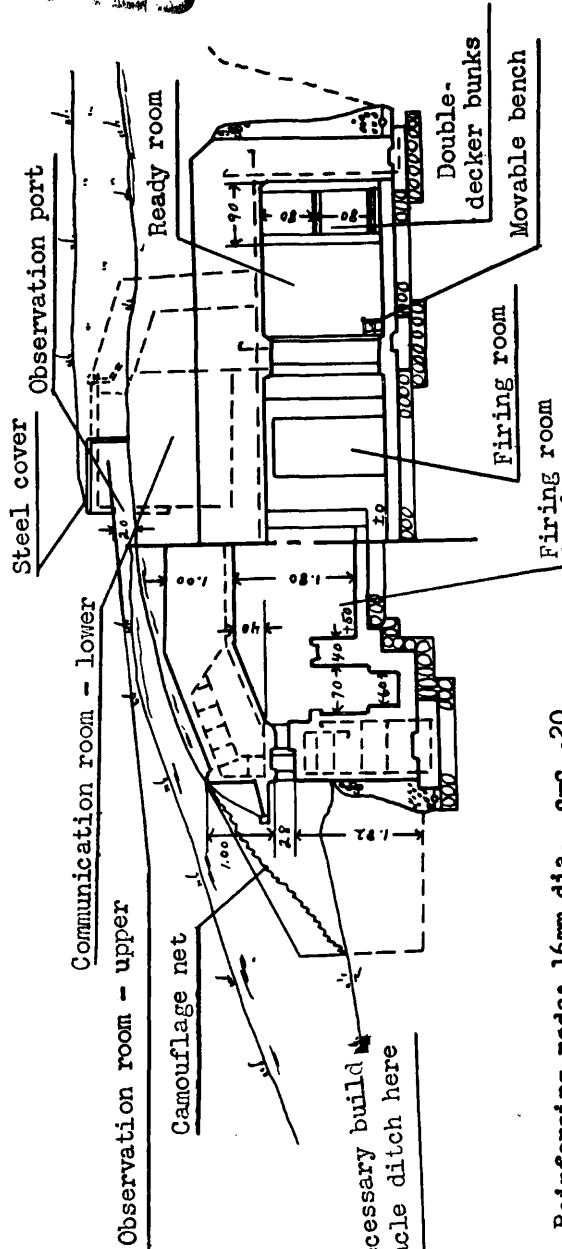
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**UNCLASSIFIED**

II - PILLBOXES

FOR TWO HMG (FLANK DEFENSE) (Continued)

SECTION A-A



Reinforcing rods: 16mm dia., c-c .20

**UNCLASSIFIED**

II - PILLBOXES

FOR TWO HMG (FLANK DEFENSE) (Continued)

Notes:

1. This diagram shows a pillbox for Type 92 HMG.
2. The detail of the fire port and observation room is on another diagram.
3. Conceal fire port wall with a camouflage net. If circumstances warrant, reduce the amount of exposed surface by using a pre-cast concrete slab. Such a protective cover should be easily removable and should present no hindrance to firing even if demolished.
4. The disposition of foundation, drainage, and entrances should take into account factors of local terrain and soil.

List of Required Materials

Concrete.....165 cu m  
 Steel Reinforcement...45 tons  
 Forms { inner.....190 sq m  
       { outer.....165 sq m  
 Broken Stone.....25 cu m

Accessories

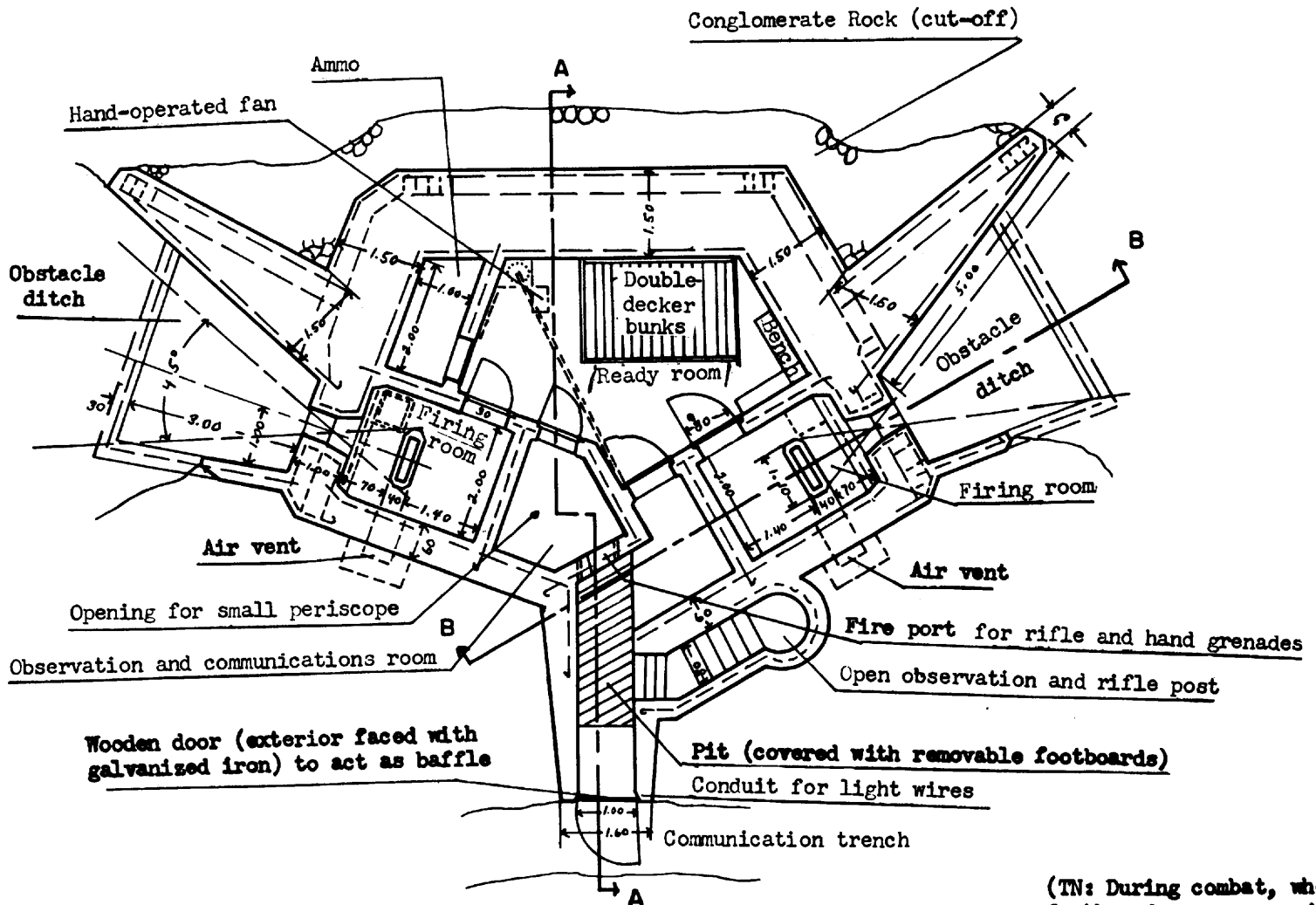
Entrance doors, steel..... 4  
 Entrance doors, wooden..... 1  
 Exhausts..... 2  
 Intakes ..... 1  
 Steel cover..... 1  
 Fire port door, steel..... 1  
 Bunks..... 4  
 Chair..... 1  
 Bench..... 1  
 Metal ladder..... 1  
 Drainage unit..... 1



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FOR HMG (FLANK DEFENSE) 2-WAY

PLAN CROSS SECTION



Reinforcing rods: 16mm dia., c-c .20

(TN: During combat, when footboards are removed, pit serves to neutralize effect of grenades and as an obstacle to troops trying to rush the passageway.)

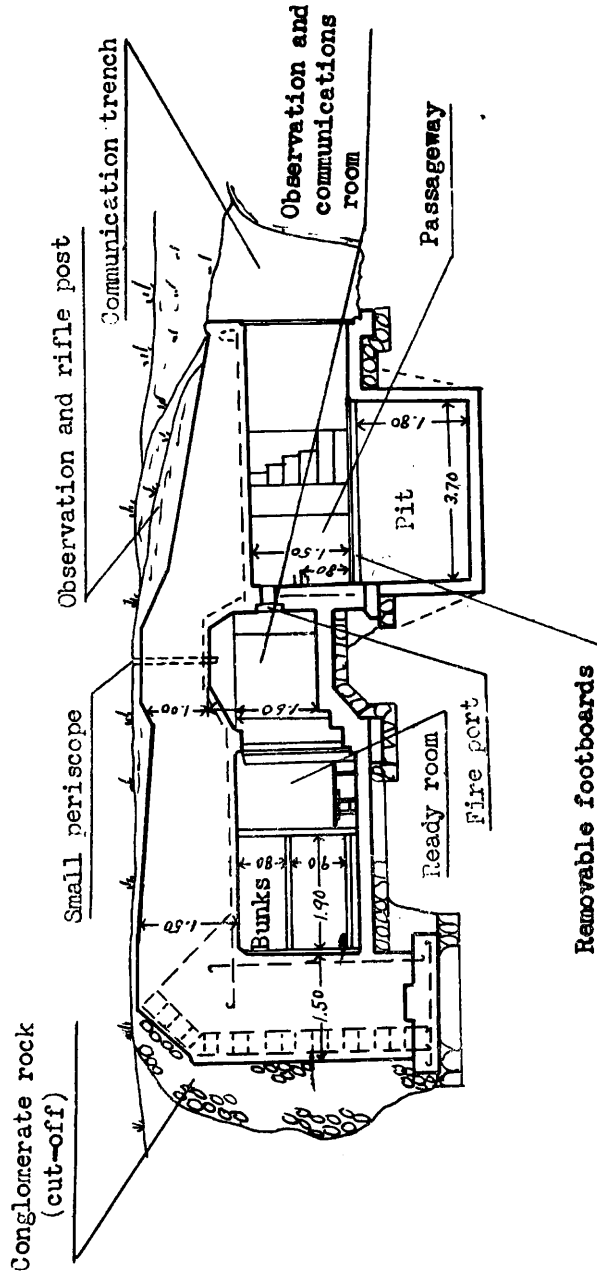
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II - PILLBOXES

FOR HMG (FLANK DEFENSE) 2-MAY (Continued)

SECTION A-A



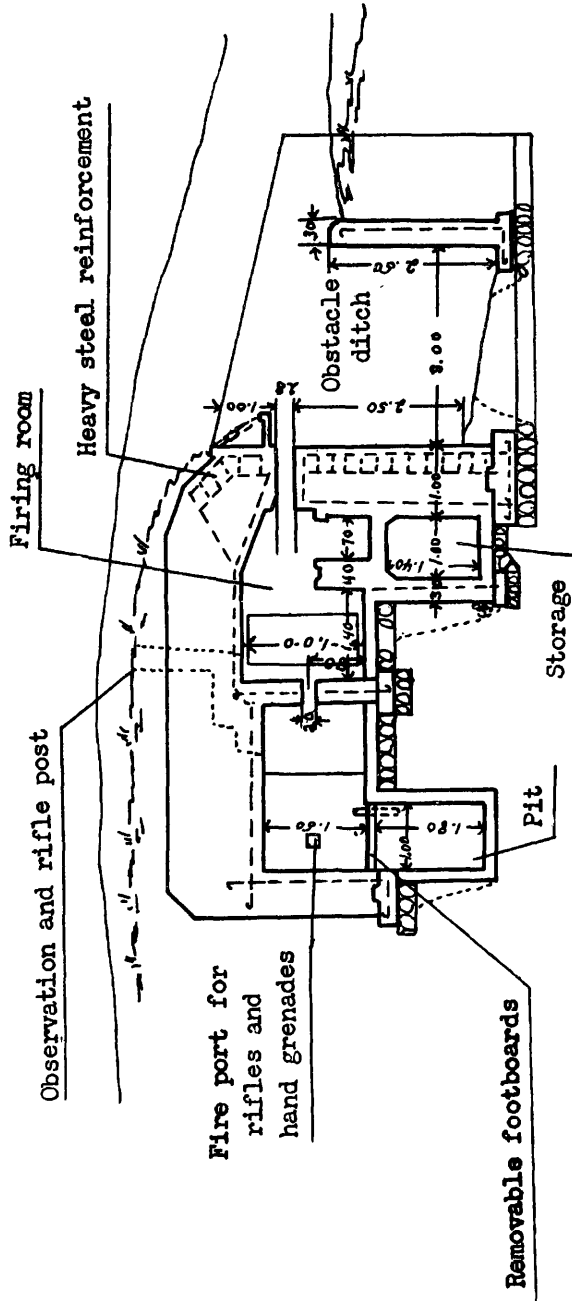
Reinforcing rods: 16mm dia., c-c .20

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II - PILLBOXES

FOR HMG (FLANK DEFENSE) 2-WAY (Continued)

SECTION B-B



Reinforcing rods: 16mm dia., c-c .20

II - PILLBOXES

FOR HMG (FLANK DEFENSE) 2-WAY (Continued)

Notes:

1. This diagram shows a type of pillbox for Type 92 HMG.
2. Details of fire port are on a separate diagram.
3. If necessary, the Observation Room and Firing Room are connected by a speaking tube.
4. Disposition of foundation, drainage, and entrances should take into account factors of local terrain and soil.

List of Required Materials

Concrete.....265 cu m  
 Steel Reinforcement...12 tons  
 Forms { inner.....240 sq m  
       { outer.....335 sq m  
 Broken Stone..... 50 cu m

Accessories

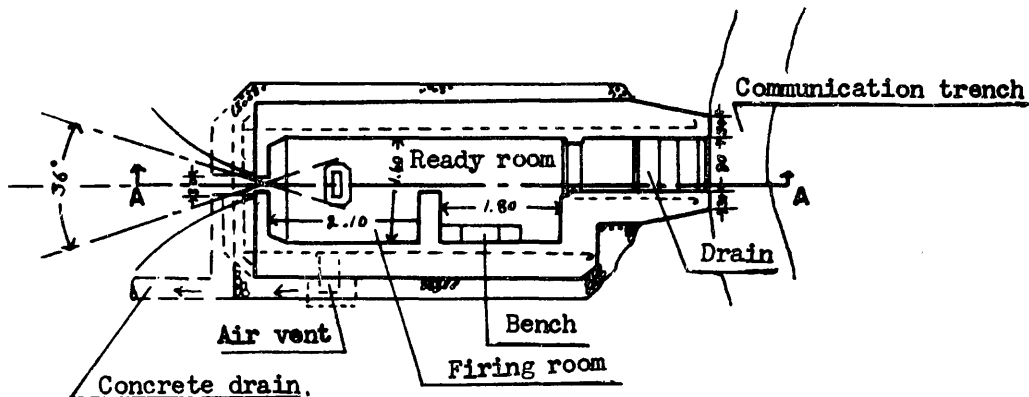
Entrance doors, steel.... 3  
 Entrance doors, wooden... 3  
 Fire port doors, steel... 2  
 Air exhaust vents..... 2  
 Pit cover..... 1  
 Bunks..... 6  
 Bench..... 1  
 Manhole cover..... 2  
 Metal ladders..... 2  
 Covers..... 2  
 Periscope port..... 1  
 Drainage unit ..... 1  
 Miscellaneous.....

**UNCLASSIFIED**

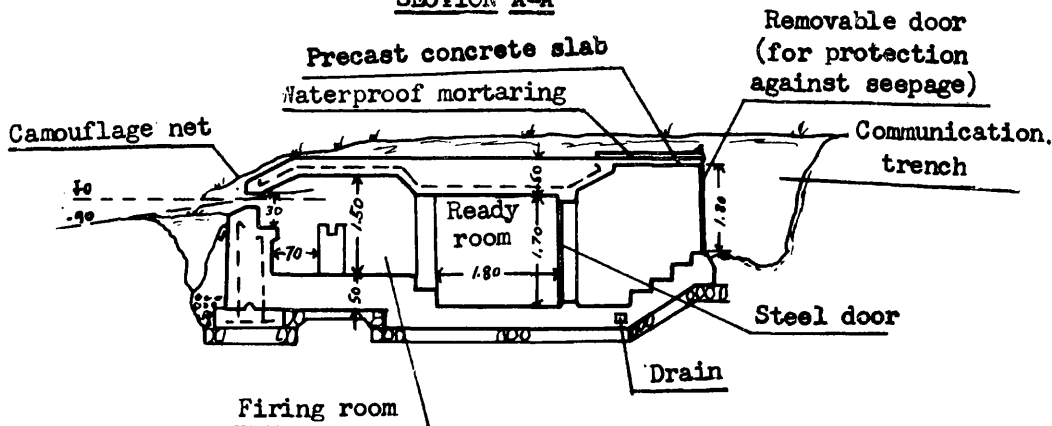
II - PILLBOXES

FOR HMG  
(A) LOW COVER, 1 MG (FRONTAL FIRE)

PLAN CROSS SECTION



SECTION A-A



Reinforcing rods: 16mm dia., c-c .20  
16mm dia., c-c .40

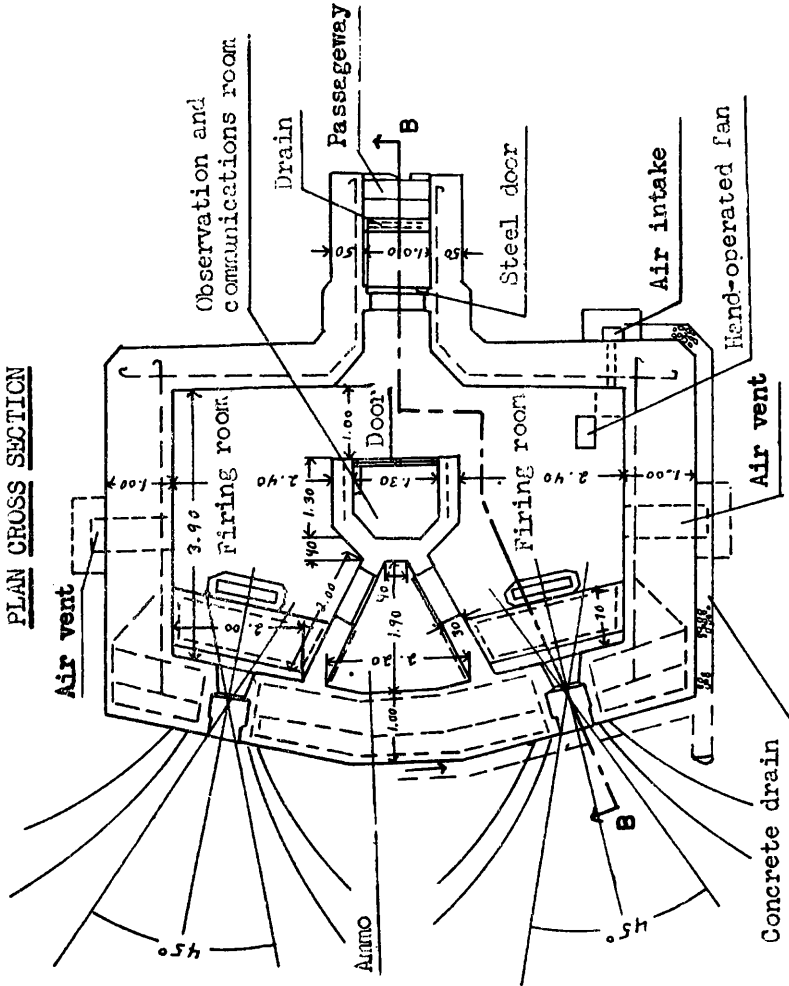
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II - PILLBOXES

FOR HMG (Continued)  
(B) 2 MG (FRONTAL FIRE)

PLAN CROSS SECTION



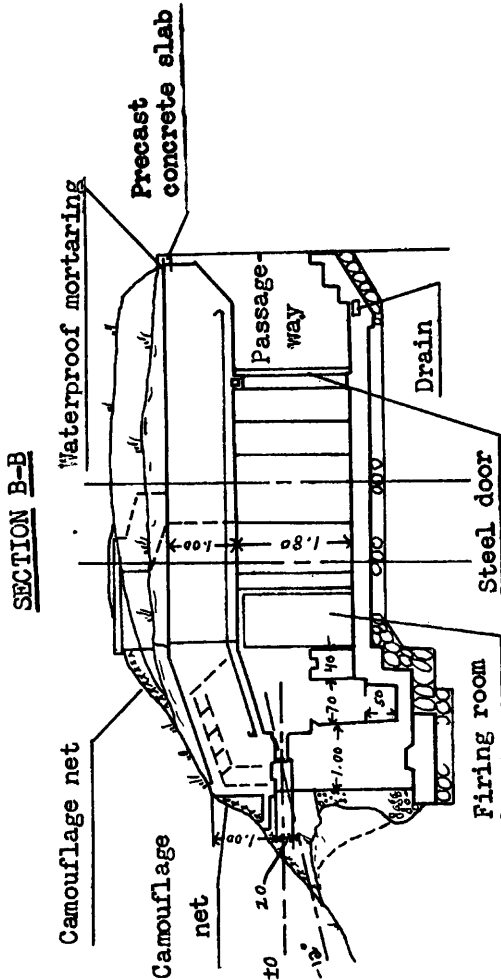
Reinforcing rods: 16mm dia., c-c .20  
16mm dia., c-c .40

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II - PILLBOXES

FOR HMG (Continued)  
(B) 2 MG (FRONTAL FIRE) (Continued)



Reinforcing rods: 16mm dia., c-c .20  
16mm dia., c-c .40

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**II - PILLBOXES**

FOR HMG (Continued)

Notes:

1. This diagram shows a type of casemate employing Type 92 MG.
2. Fire port detail is on another diagram.
3. Camouflage fire port wall with a net. If conditions warrant, the amount of exposed surface may be reduced by using a pre-cast concrete slab; this should be easily removable and should present no hindrance to firing even if demolished.
4. The cover for the Firing Room of the low cover pillbox is to be made of concrete, ratio 1:1:2, reinforcement 5%.
5. The disposition of foundation, drainage, and entrance should take into account factors of local terrain and soil.

I. Low Cover, One MG, Frontal Fire

Concrete.....30 cu m  
 Steel Reinforcement.....1 ton  
 Forms { inner.....42 sq m  
       { outer.....50 sq m  
 Broken Stone..... 8 cu m

Steel door, entrance.....1  
 Exhaust.....1  
 Drainage unit.....1

II. Two MG, Frontal Fire

Concrete.....135 cu m  
 Steel Reinforcement.....5 tons  
 Forms { inner.....125 sq m  
       { outer.....140 sq m  
 Broken Stone.....20 cu m

Entrance door, steel.....1  
 Entrance door, wooden....4  
 Entrance door, steel.....2  
 Steel cover.....1  
 Exhaust.....1  
 Intake.....1  
 Metal ladder.....1  
 Drainage unit.....1  
 Miscellaneous.....

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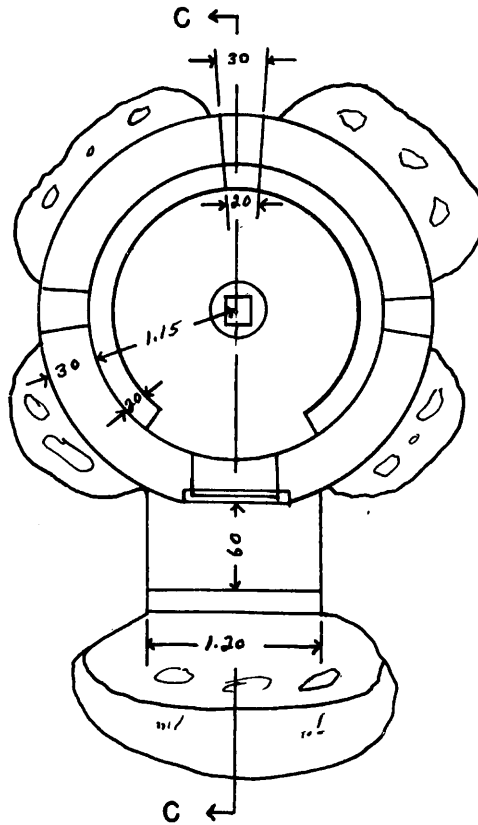
II - PILLBOXES

FOR ENFILADE FIRE ON ROAD IN DENSELY WOODED AREA

Concrete: 9 cu m

Form: 40 sq m

PLAN CROSS SECTION



Reinforcing rods: 16mm dia., c-c .20

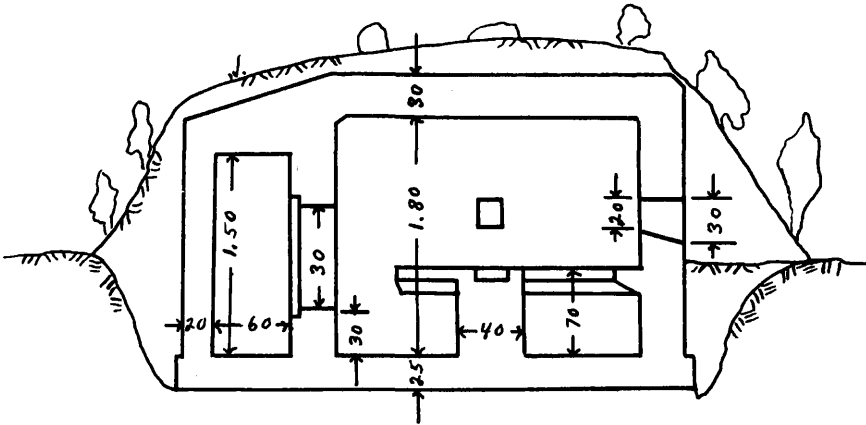
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II - PILLBOXES

FOR ENFILADE FIRE ON ROAD IN DENSELY WOODED AREA (Continued)

SECTION C-C



Reinforcing rods: 16mm dia., c-c .20

Notes:

1. The facing of the fire port should correspond to the direction of the road and the line of fire.
2. Light and heavy machine guns and rifles can all be used.
3. The road is of the rotary type; the width of the road at the rotary section (TN: SHUI NO RO) should be greater than 4m.

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**UNCLASSIFIED**

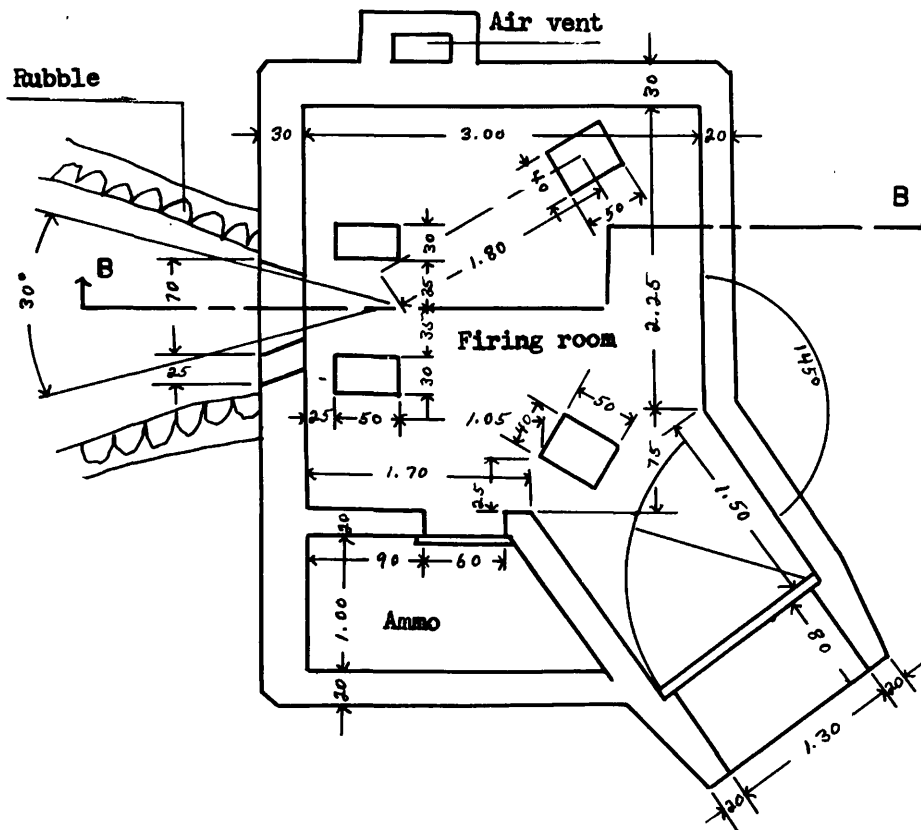
III - CASEMATES

FOR ONE RAPID-FIRE GUN /TYPE I/

Concrete: 15 cu m

Form: 93 sq m

PLAN CROSS SECTION



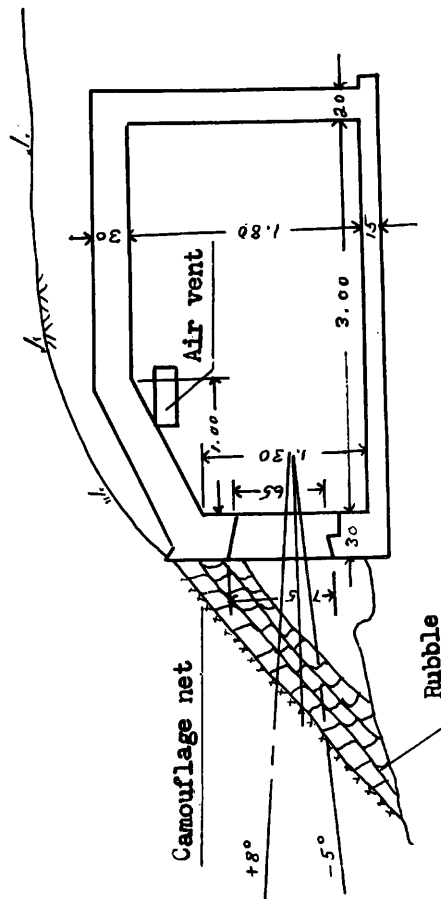
1. The thickness of the wall toward the enemy is 50cm, that of the opposite wall 30cm.
2. Provision is made for the reduction of noise in the firing room.

**UNCLASSIFIED**  
 Reinforcing rods: 1mm dia, etc .20

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III - CASEMATES  
FOR ONE RAPID-FIRE GUN / TYPE I / (Continued)

SECTION B-B

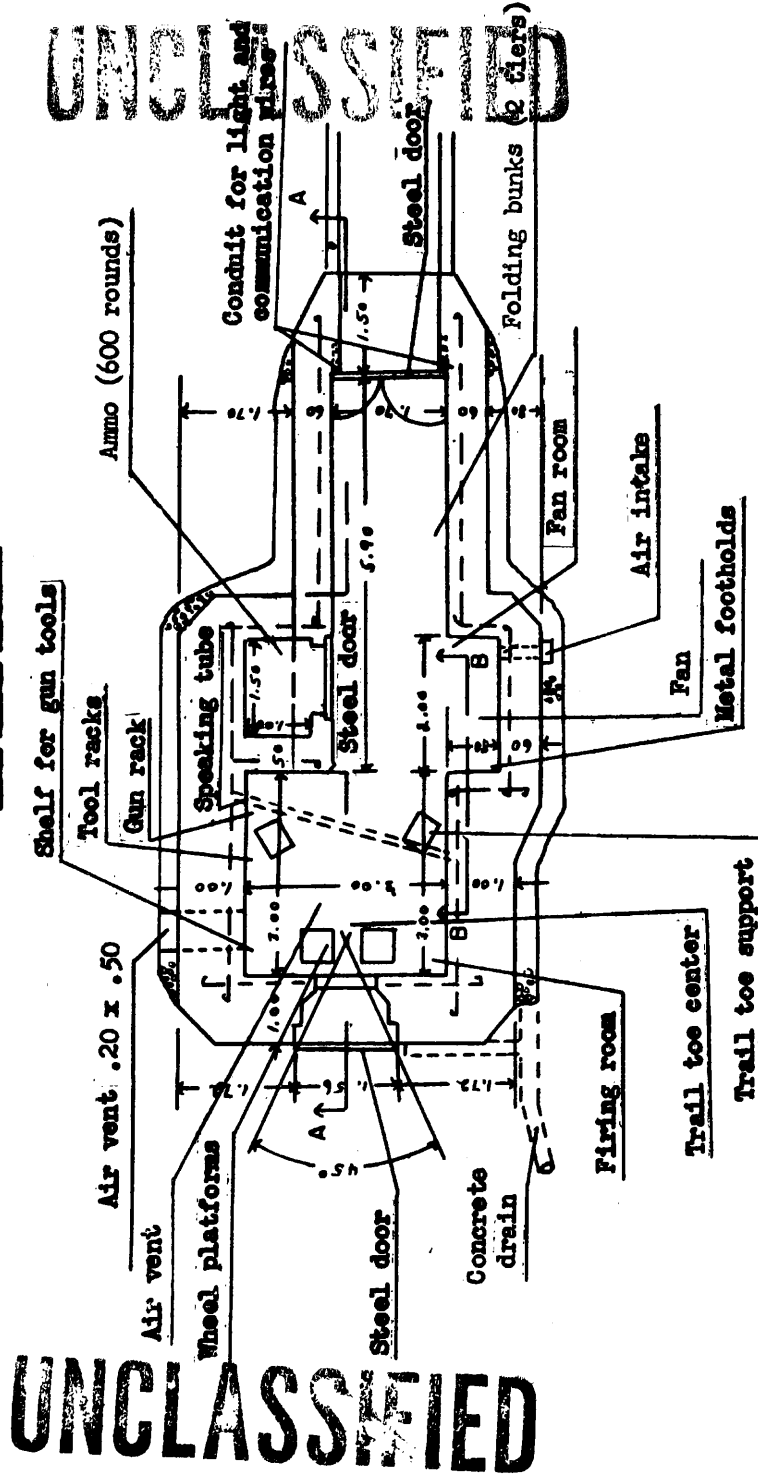


Reinforcing rods: 16mm dia., c-c .20.

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III - CASERMATES  
FOR ONE RAPID-FIRE GUN / TYPE II/

PLAN CROSS SECTION



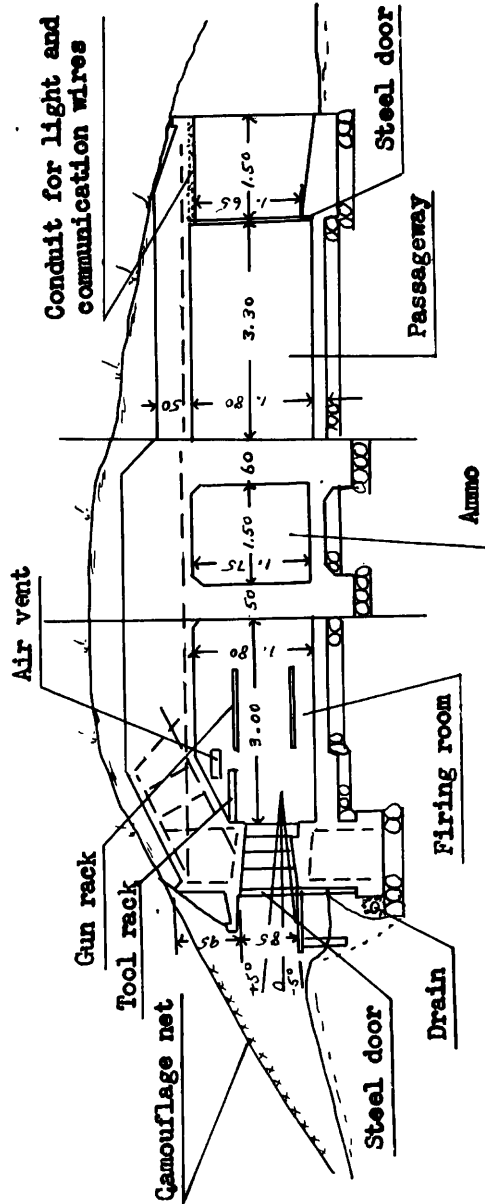
Reinforcing rods: 16mm dia., c-c .20  
 16mm dia., c-s .40

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III - CASEMATES

FOR ONE RAPID-FIRE GUN /TYPE II/ (Continued)

SECTION A-A



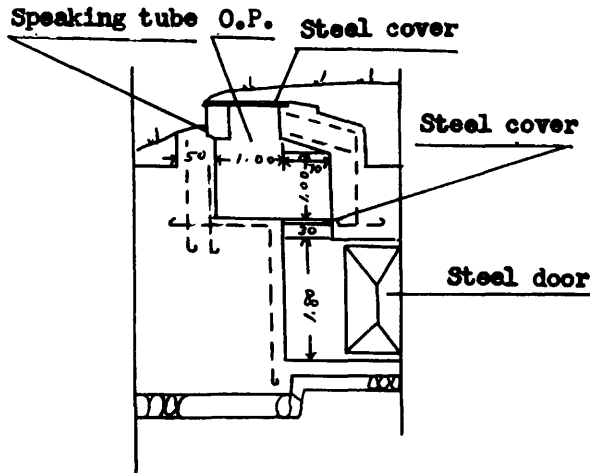
Reinforcing rods: 16mm dia., c-c .20  
16mm dia., c-c .40

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III - CASERMATES

FOR ONE RAPID-FIRE GUN /TYPE II/ (Continued)

SECTION B-B



Notes

1. This diagram shows a casemate employing a Type 94 37mm gun, with a horizontal traverse of  $45^{\circ}$ , and angle of elevation of  $5^{\circ}$ , and an angle of depression of  $5^{\circ}$ .
2. Place one wooden box for empty cartridge cases in the firing room (50 round capacity).
3. Disposition of foundation, drainage, and entrances should take into account factors of local terrain and soil.

List of Required Materials

Concrete.....	117 cu m
Steel reinforcement.....	42 ton
Forms {inner.....	105 sq m
{outer.....	135 sq m
Broken stone.....	20 cu m

Accessories

Steel door, fireport..	1
Steel doors, entrance..	2
Steel cover.....	1
Wheel platforms.....	2
Trail spade ditches...	2
Metal ladder.....	1
Gun tool rack.....	1
Tool rack.....	1
Rifle rack.....	1
Intake.....	1
Exhaust.....	1
Speaking tube.....	1
Drainage unit.....	1
Folding bunk.....	1
Miscellaneous.....	

**UNCLASSIFIED**

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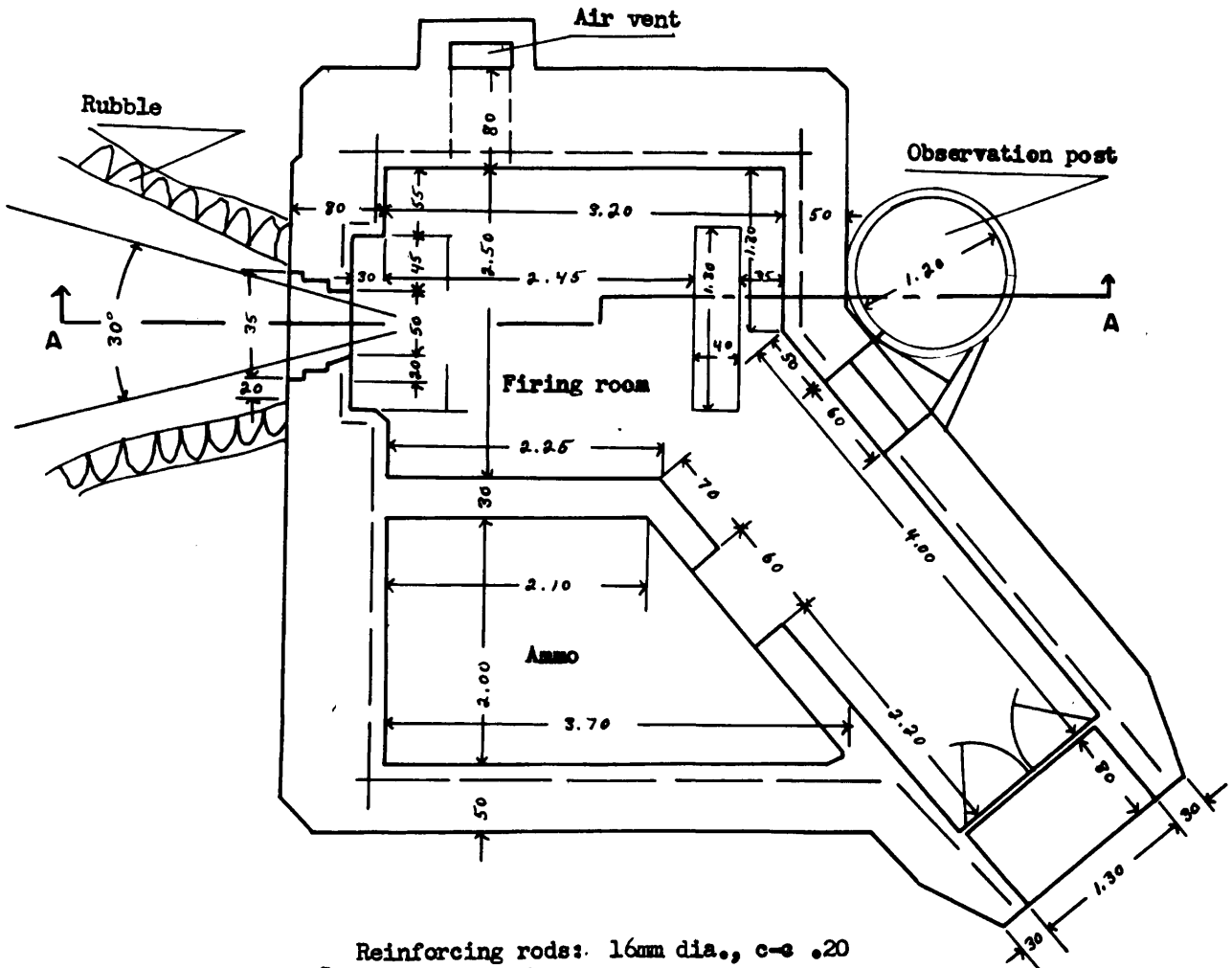
III - CASEMATES

FOR ONE REGIMENTAL GUN /TYPE I/

Concrete: 50 cu m  
Form: 148 sq m

PLAN CROSS SECTION

$\frac{1}{50}$



Reinforcing rods: 16mm dia., c-c .20

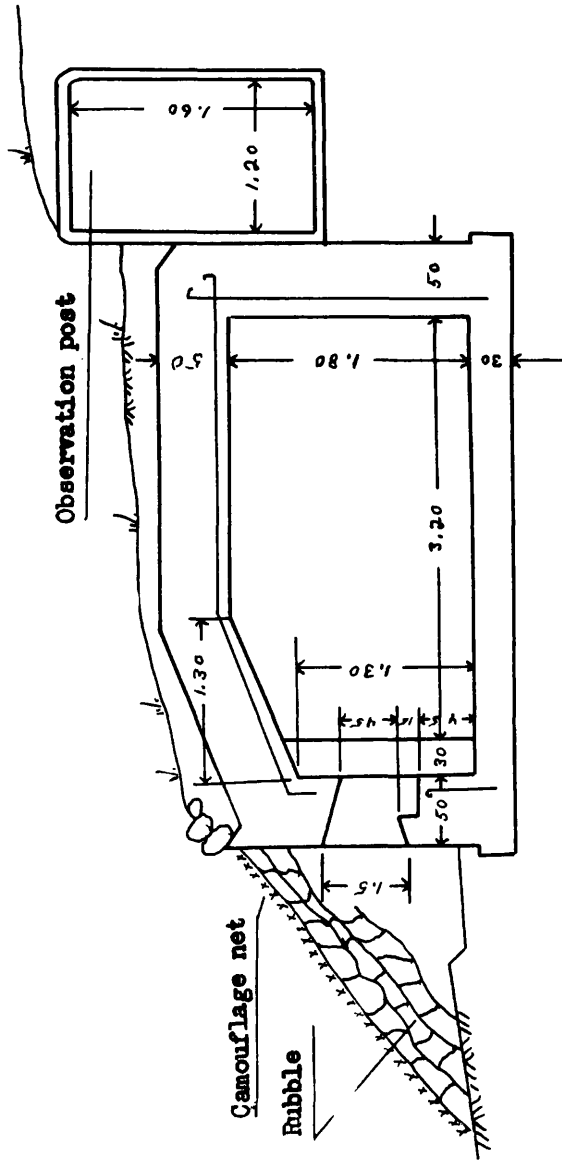
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III - CASERMATES

FOR ONE REGIMENTAL GUN / TYPE I / (Continued)

SECTION A-A



Reinforcing rods: 16mm dia., c-c .20

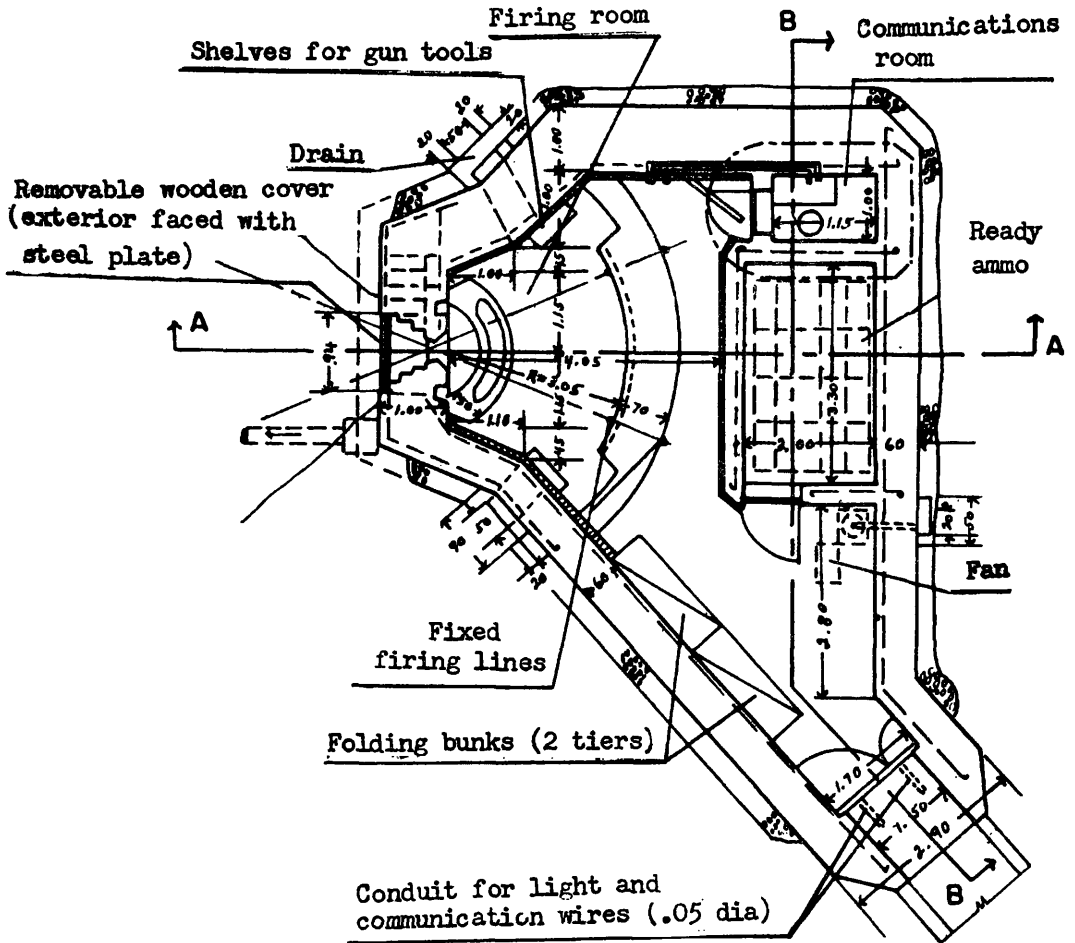
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III - CASEMATES

FOR ONE REGIMENTAL GUN /TYPE II/

PLAN CROSS SECTION

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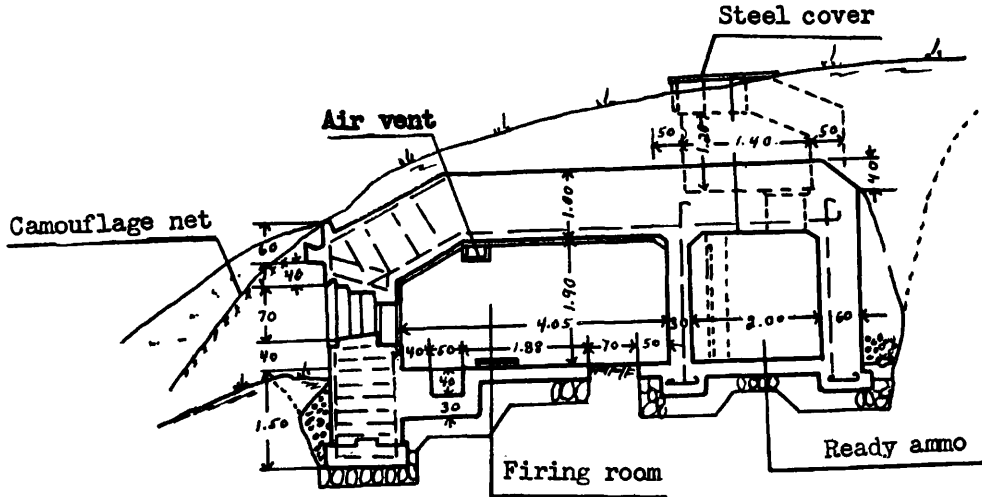


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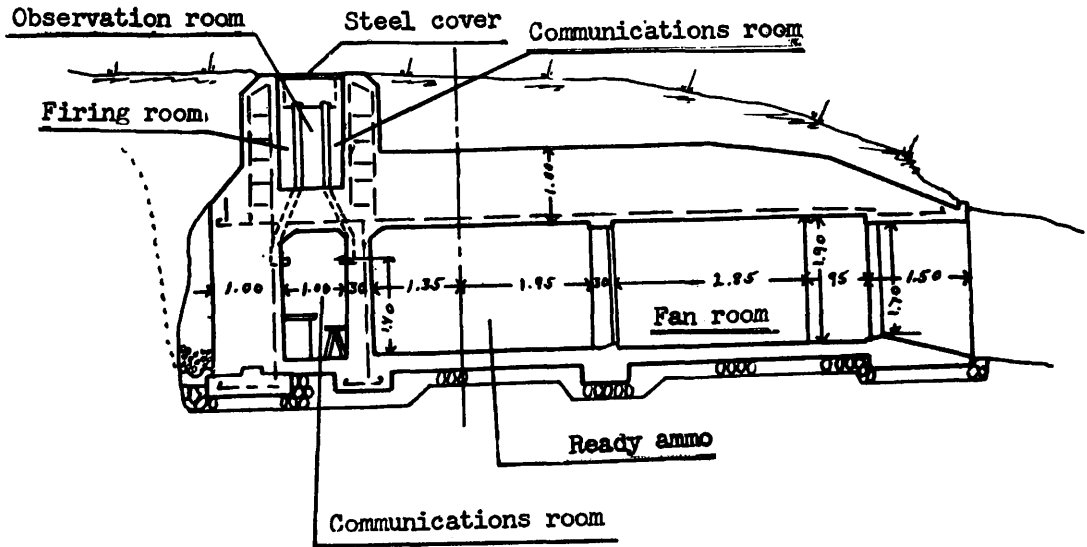
III - CASEMATES  
**UNCLASSIFIED**

FOR ONE REGIMENTAL GUN /TYPE II/ (Continued)

SECTION A-A



SECTION B-B



**UNCLASSIFIED**

**UNCLASSIFIED** ~~SECRET~~ CASEMATES

FOR ONE REGIMENTAL GUN /TYPE II/ (Continued)

Notes:

1. This casemate may be used for both Type 94 and Type 41 Mt Gun; however, angles of elevation and depression must be calculated to meet the specifications of the particular gun employed.
2. The detail of the fire port is shown in a separate diagram.
3. The Firing Room is furnished with an empty cartridge case box, covered; capacity 50 rounds.
4. The disposition of foundation, drainage, entrances should take into account factors of local terrain and soil.

List of Required Materials

Concrete.....145 cu m  
 Steel Reinforcement...5.4 tons  
 Forms { inner.....155 sq m  
       { outer.....180 sq m  
 Broken Stone.....25 cu m

Accessories

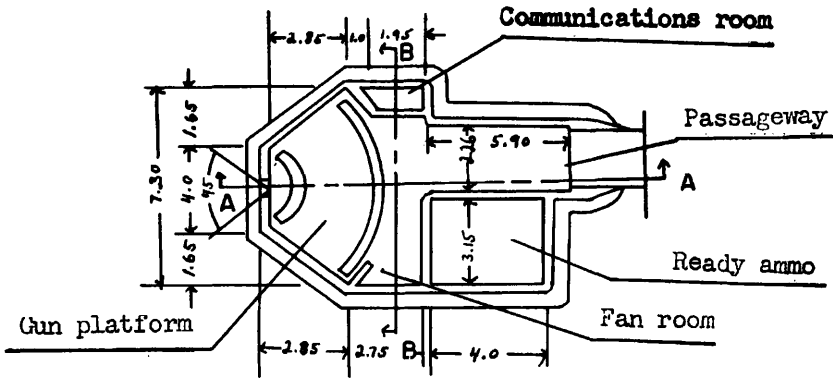
Steel cover..... 1  
 Fire port door, steel..... 1  
 Fire port door, wooden.... 1  
 Trail spade ditch..... 1  
 Entrance doors, steel..... 3  
 Metal ladder..... 1  
 Shelves for firing tools.. 2  
 Communications Room desk.. 1  
 Trail circle platform..... 1  
 Folding bunks..... 4 men  
 Intake..... 1  
 Exhaust..... 1  
 Speaking tube..... 1  
 Rifle and tool rack..... 1  
 Drainage unit..... 1  
 Miscellaneous.....

**UNCLASSIFIED**

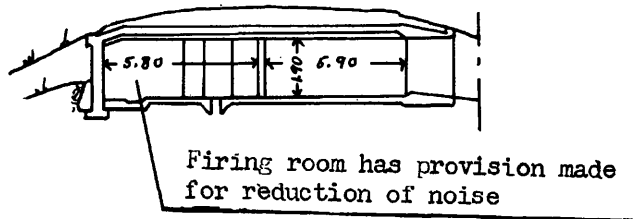
III - CASEMATES

FOR FIELD GUN

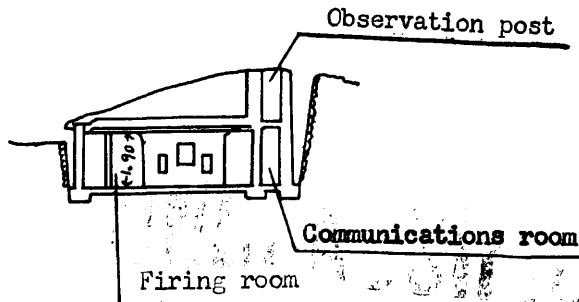
PLAN CROSS SECTION



SECTION A-A



SECTION B-B



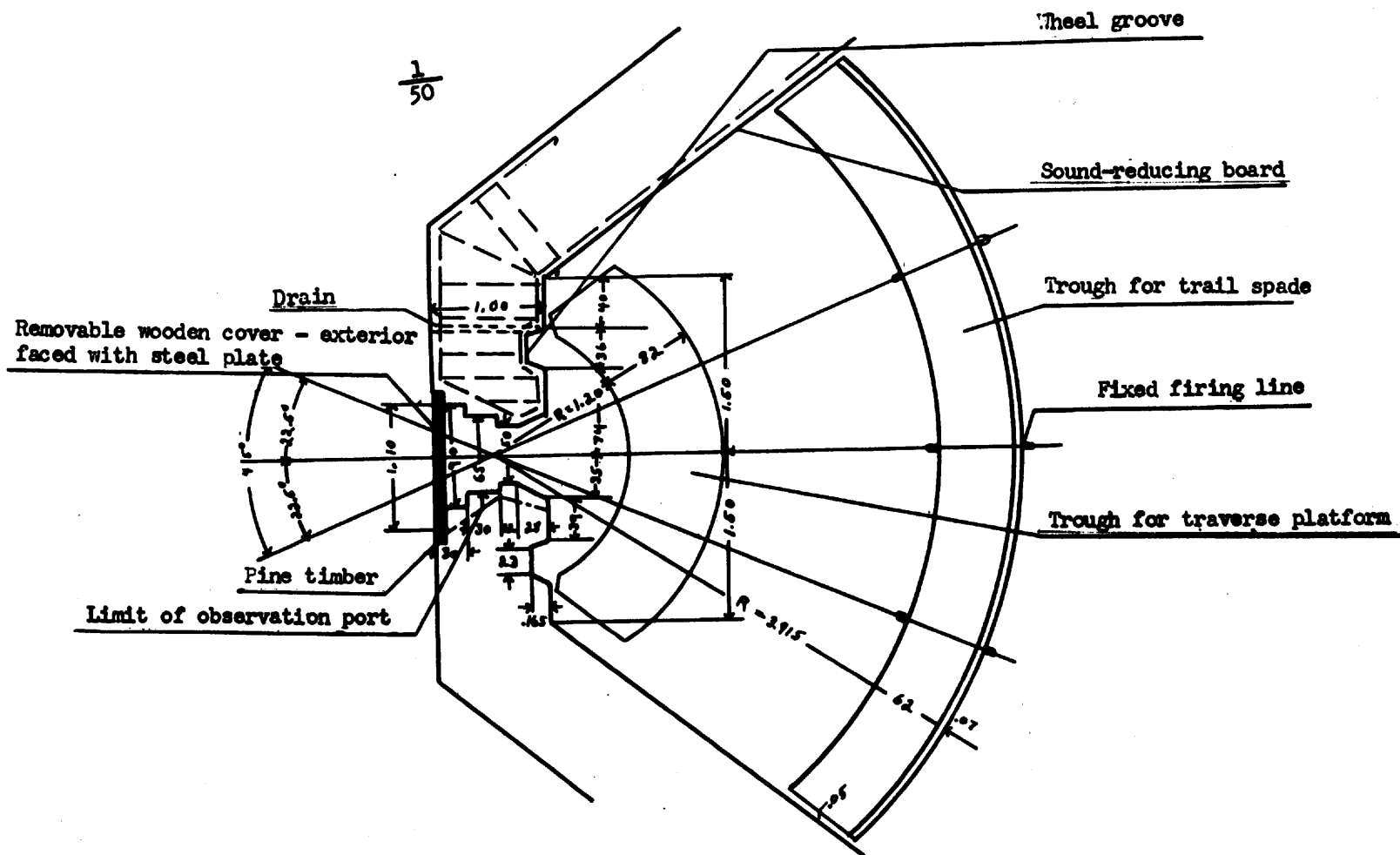
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## III - CASEMATES

### EMBRASURE AND TRAVERSE PLATFORM OF FIELD GUN CASEMATE

#### (A) EMBRASURE AND BASE FOR TRAVERSE PLATFORM

#### PLAN CROSS SECTION



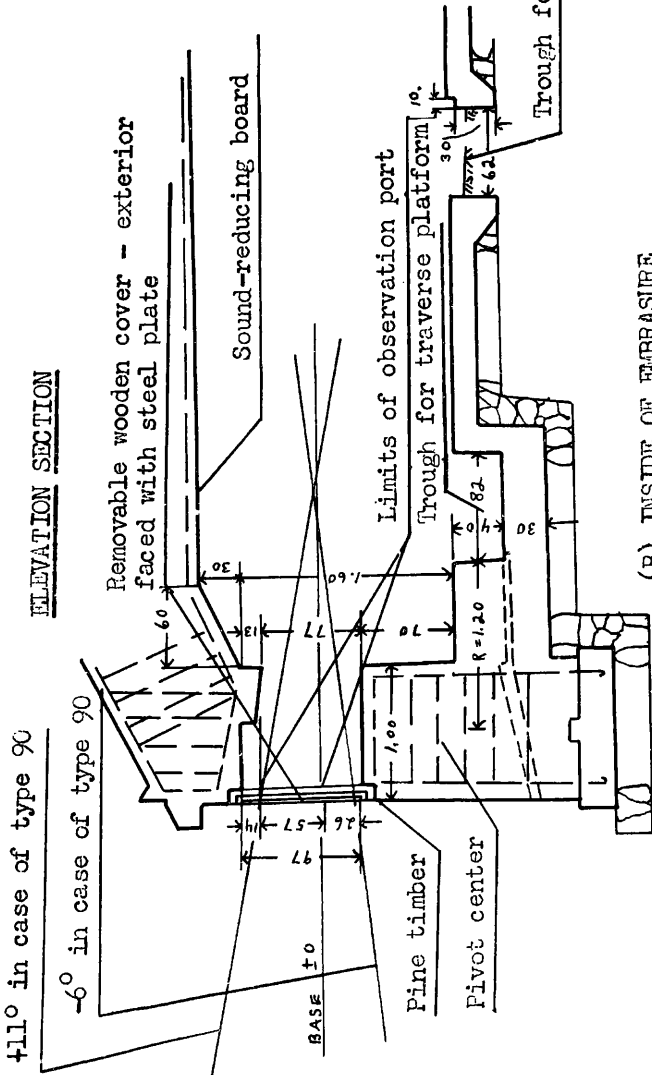
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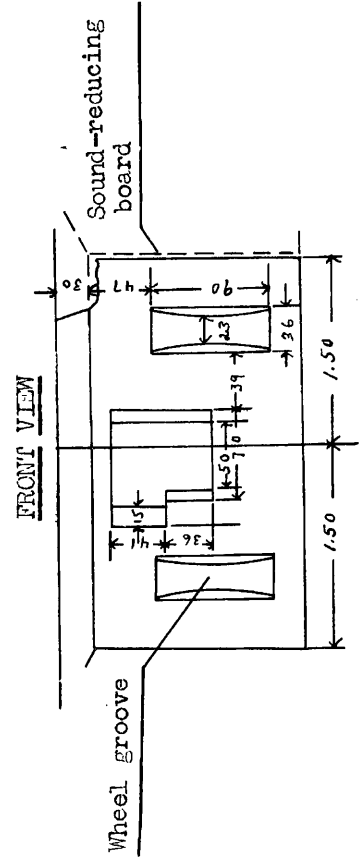
III - CASEMATES

EMBRASURE AND TRAVERSE PLATFORM OF FIELD GUN CASEMATE

(A) EMBRASURE AND BASE FOR TRAVERSE PLATFORM (Continued)



(B) INSIDE OF EMBRASURE



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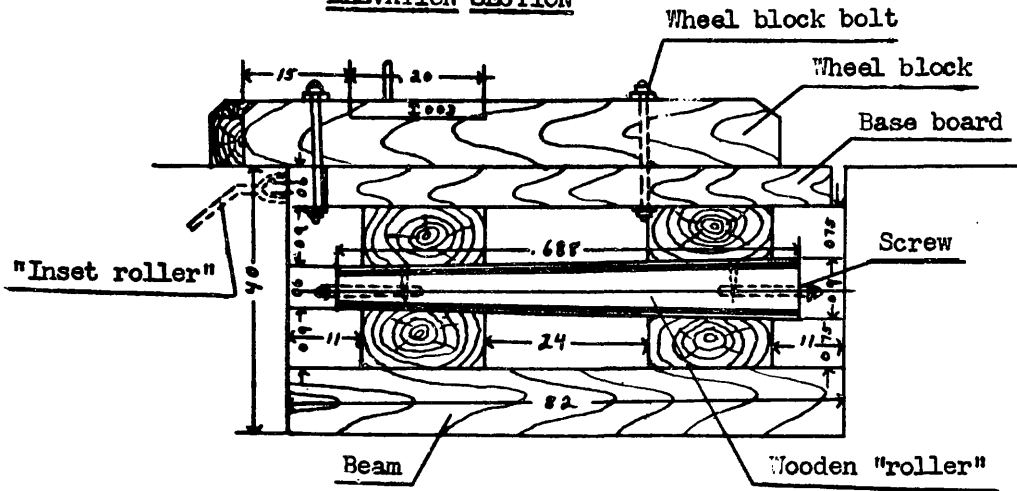
III - CASEMATES

UNCLASSIFIED

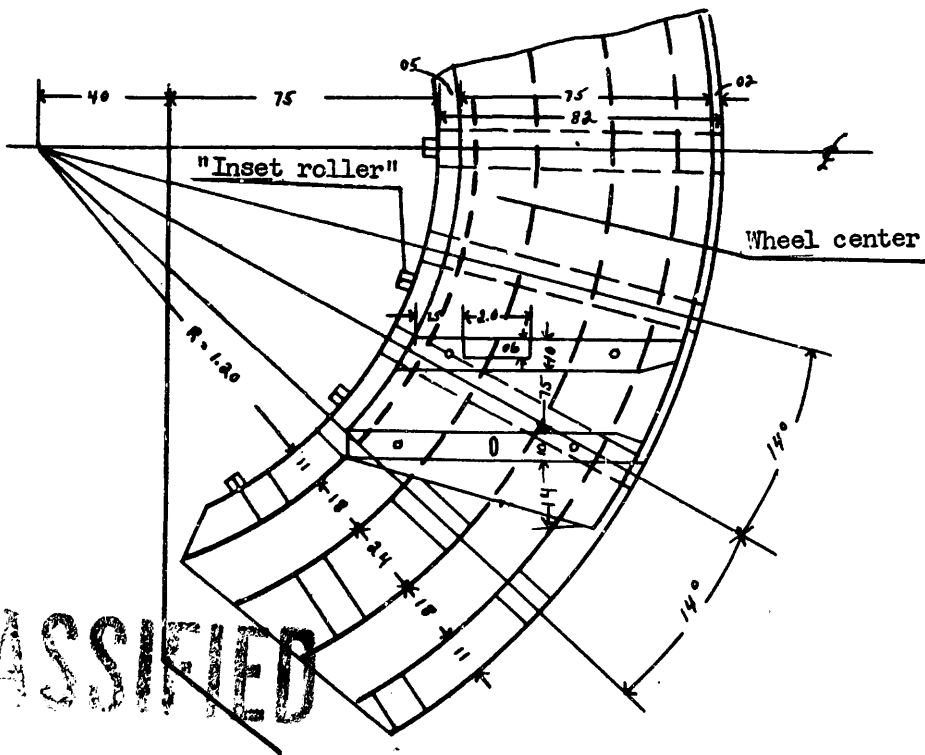
EMBRASURE AND TRAVERSE PLATFORM OF FIELD GUN CASEMATE

(C) DETAIL OF TRAVERSE PLATFORM

ELEVATION SECTION



PLAN CROSS SECTION



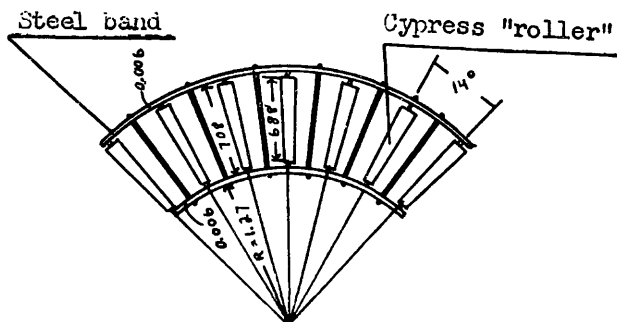
UNCLASSIFIED



**UNCLASSIFIED**  
FIELD CASEMATES

EMBRASURE AND TRAVERSE PLATFORM OF FIELD GUN CASEMATE

(D) GUIDE RAIL



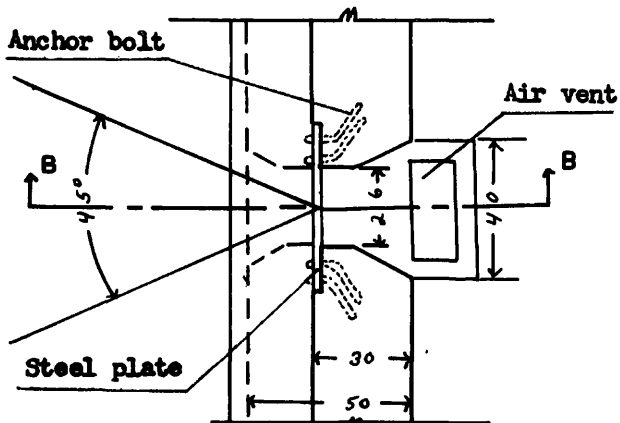
1. This diagram shows the standard construction for employing Type 95, Type 90 and Modified Type 38 Field Gun without removal of wheels and establishes the angle of elevation appropriate to each gun.
2. In the type of casemate in this diagram the Type 95 Field Gun can fire at an angle of elevation of  $17^\circ$  and an angle of depression of  $0^\circ$ ; the Type 90 Field Gun can fire at an angle of elevation of  $11^\circ$  and an angle of depression of  $0^\circ$ ; the modified Type 38 Field Gun can fire at an angle of elevation of  $15^\circ$  and an angle of depression of  $0^\circ$ ; within the observation port(?) the angle of elevation of the Type 90 Field Gun is  $3^\circ$  and the angle of depression of the Modified Type 38 Field Gun is  $6^\circ$ .
3. Sound-reducing wall board is to be installed on the inside surface of the front wall.
4. The detail of the "inset roller" which is used to fix the wheels firmly is similar to the one used in the mountain gun casemate.
5. Use hard wood as much as possible.

**UNCLASSIFIED**

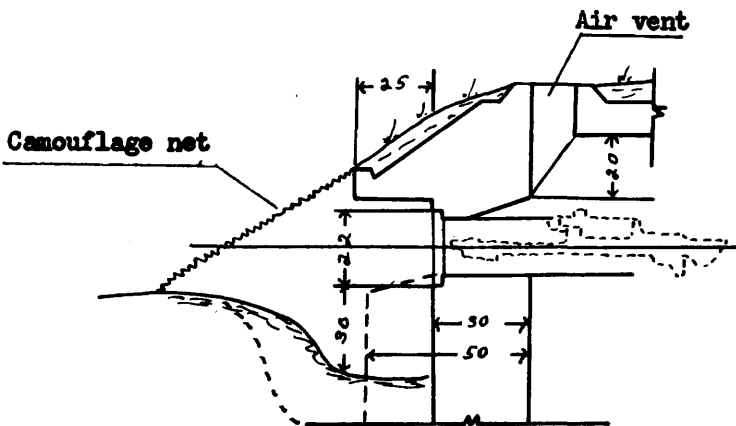
# IV - FIRE PORTS

## DETAIL OF FIRE PORT - TYPE I

### PLAN CROSS SECTION



### SECTION B-B

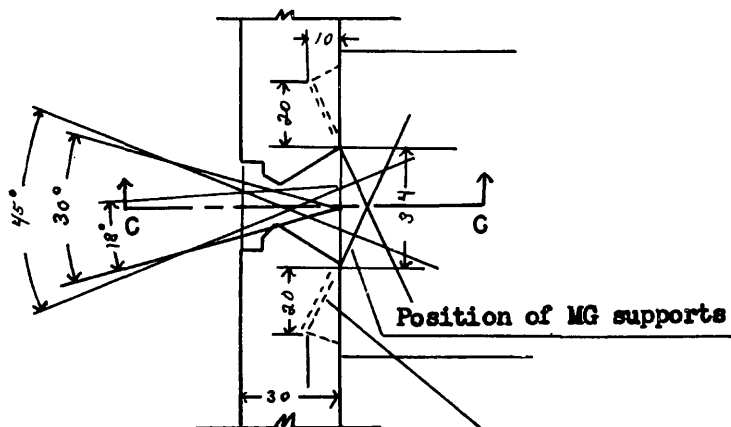


**UNCLASSIFIED**

IV - FIRE PORTS

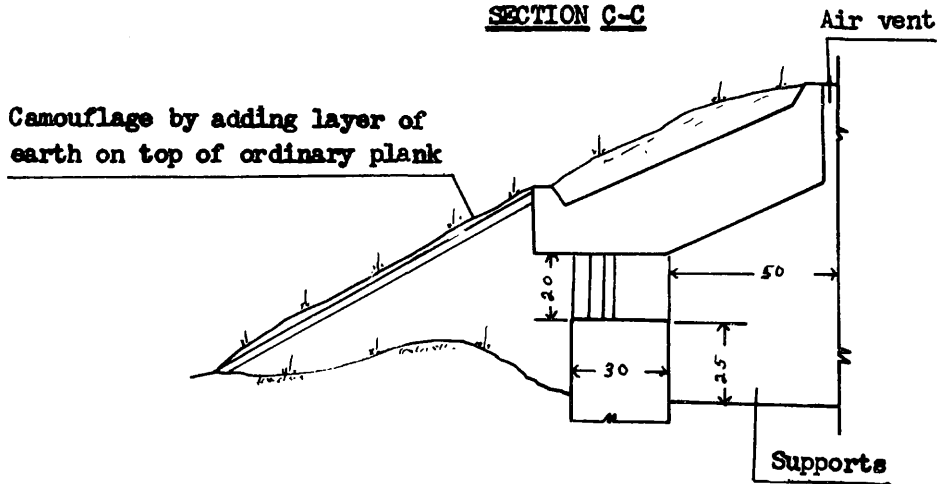
DETAIL OF FIRE PORT - TYPE II

PLAN CROSS SECTION



With firing angle of 45°, make front wall concave

SECTION C-C



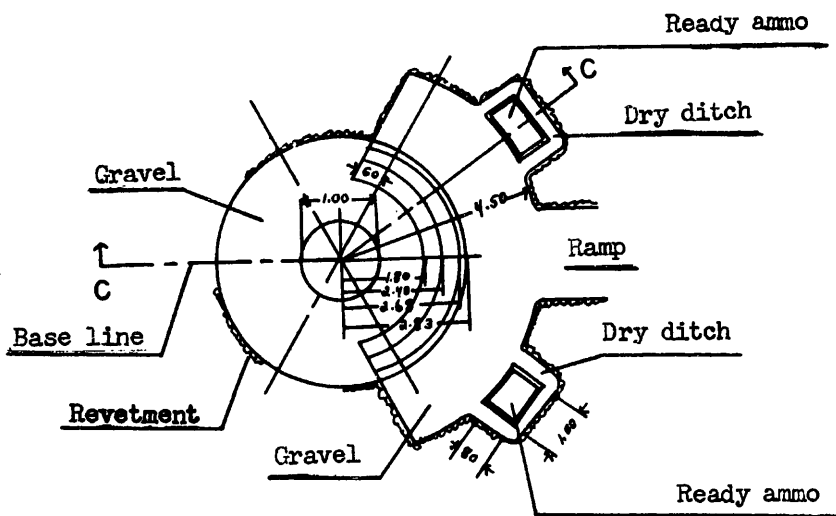
Type I shows the type of port used for firing by inserting the gun muzzle into the fire port without using MG supports; Type II shows the type used when MG supports are used.

**UNCLASSIFIED**

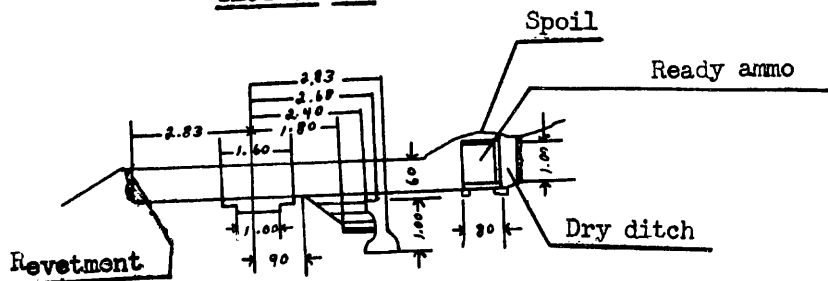
**UNCLASSIFIED**  
GUN PLATFORMS

FOR TYPE 38 FIELD GUN

PLAN CROSS SECTION



SECTION C-C

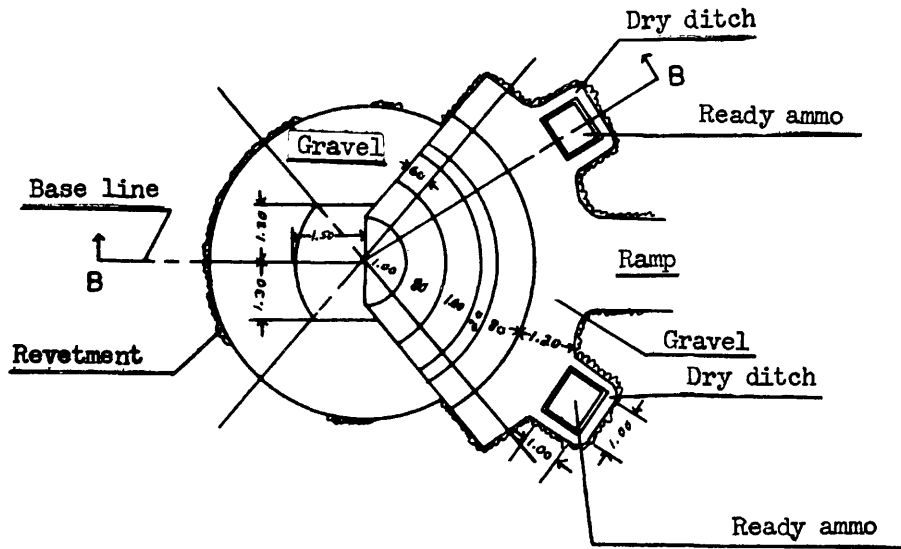


**UNCLASSIFIED**

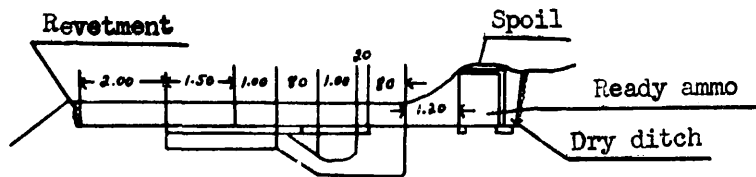
~~UNCLASSIFIED~~ ~~GUN PLATFORMS~~

FOR TYPE 38 10cm CANNON

PLAN CROSS SECTION



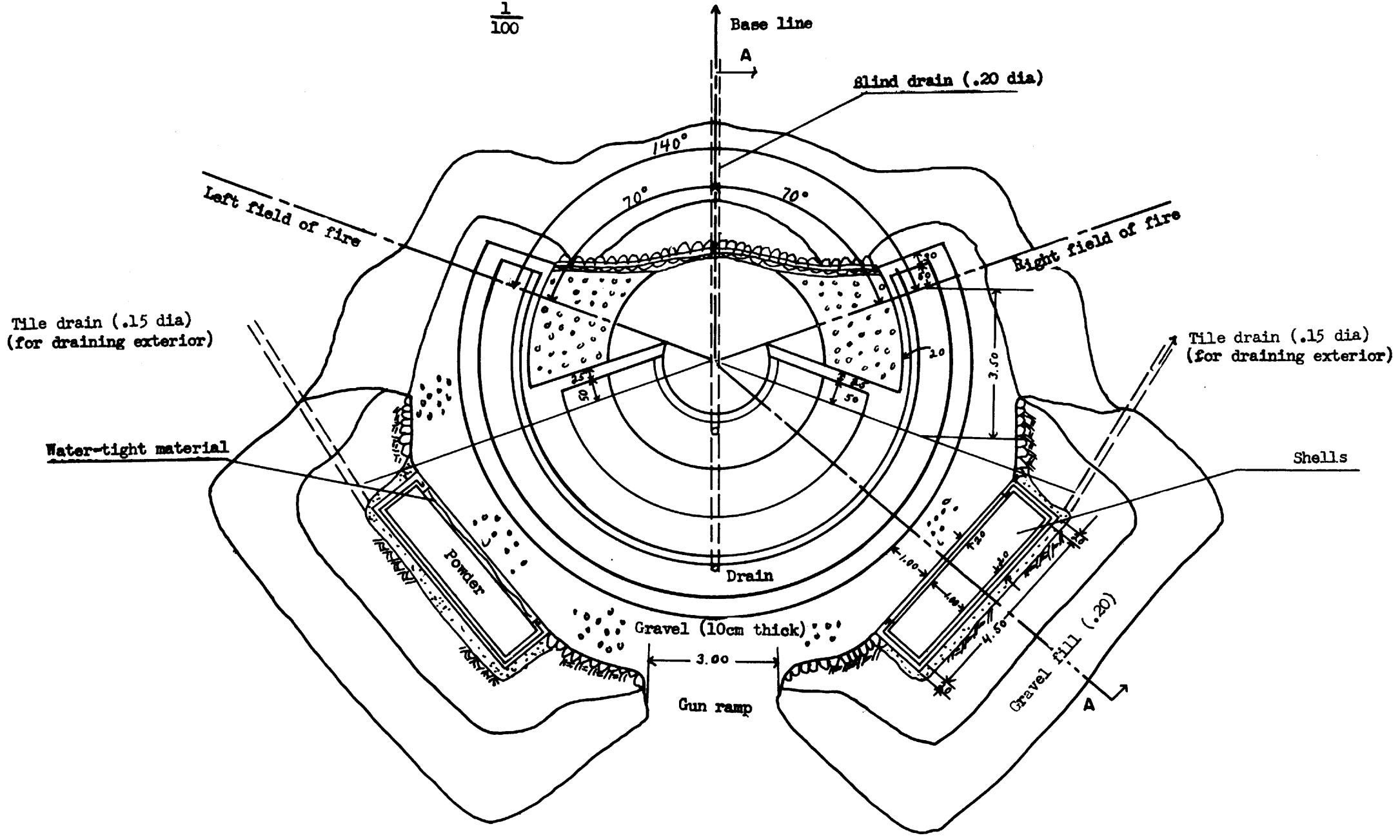
SECTION B-B



UNCLASSIFIED

V - GUN PLATFORMS  
FOR TYPE 89 15cm CANNON  
PLAN CROSS SECTION

$\frac{1}{100}$



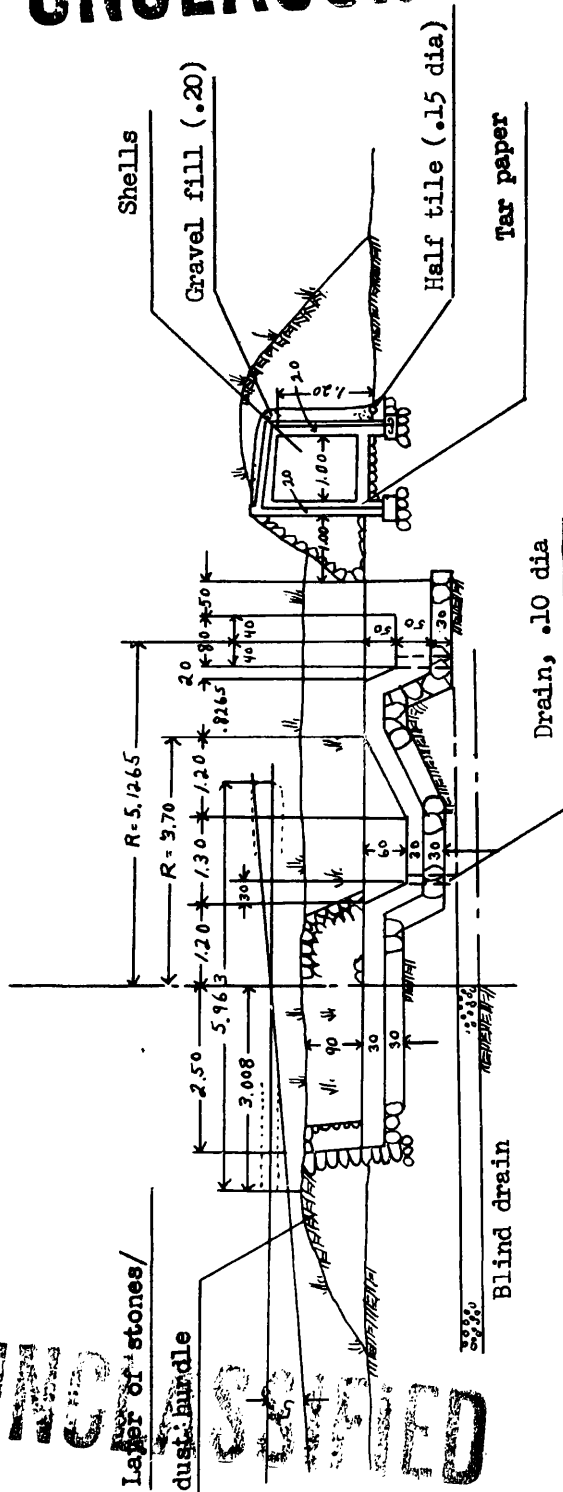
# UNCLASSIFIED

### V - GUN PLATFORMS

FOR TYPE 89 15cm CANNON (Continued)

### SECTION A-A

1  
100

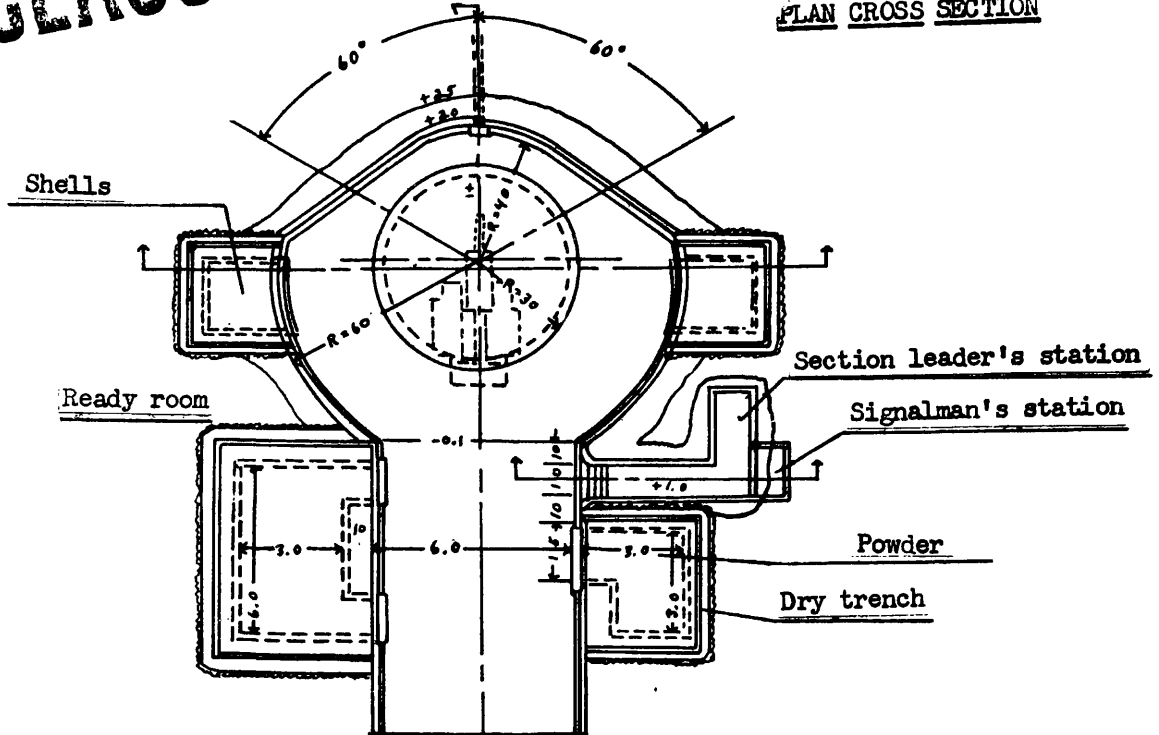


**UNCLASSIFIED**

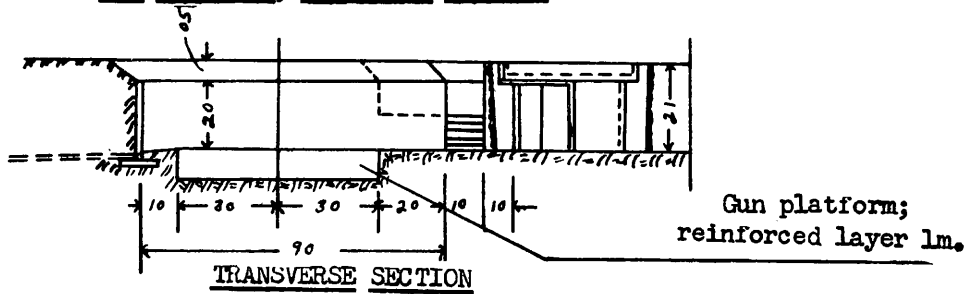
V - GUN PLATFORMS

(WITH SHELTER) - FOR HEAVY MORTAR

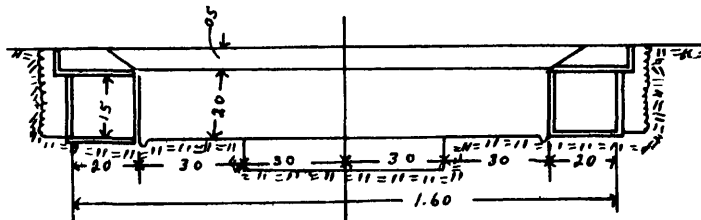
PLAN CROSS SECTION



GUN PLATFORM; ELEVATION SECTION



TRANSVERSE SECTION



SECTION LEADER'S STATION  
ELEVATION SECTION

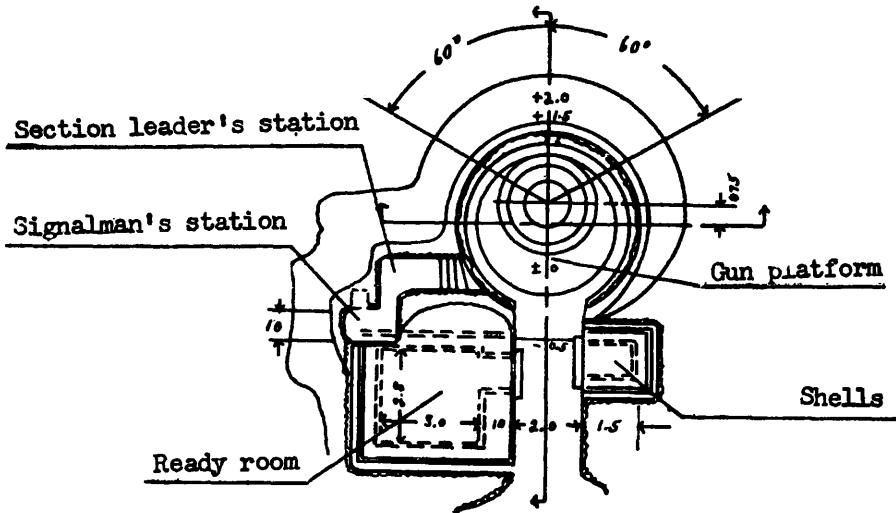
**UNCLASSIFIED**



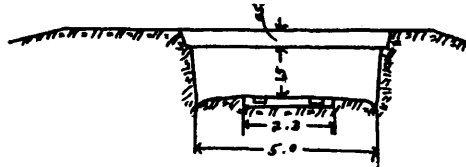
V - GUN PLATFORMS

(WITH SHELTER) - FOR MEDIUM TRENCH MORTAR

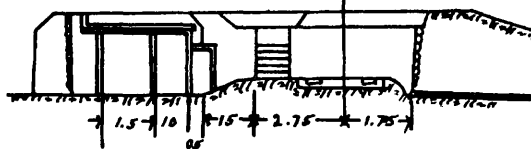
PLAN CROSS SECTION



GUN PLATFORM, TRANSVERSE SECTION



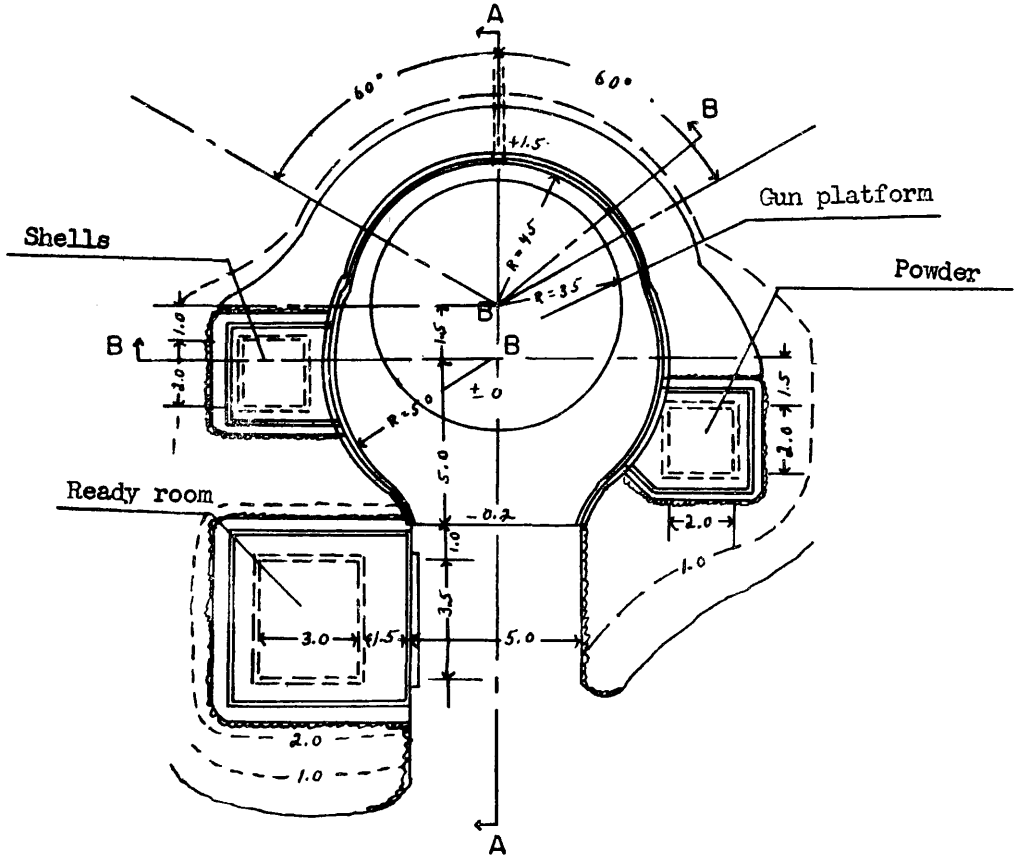
LONGITUDINAL SECTION



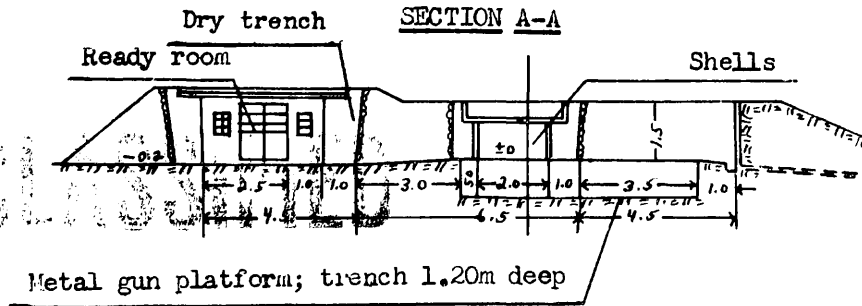
**UNCLASSIFIED** **GUN PLATFORMS**

(WITH SHELTER) - FOR TYPE 45 24cm HOWITZER

PLAN CROSS SECTION



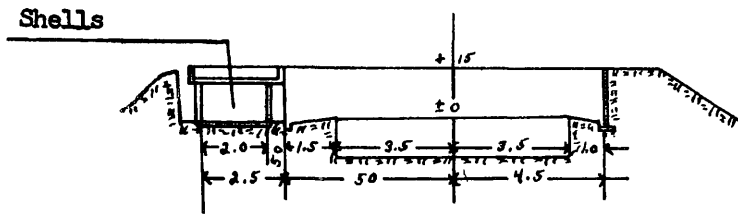
SECTION A-A



~~UNCLASSIFIED~~  
UNCLASSIFIED  
GUN PLATFORM

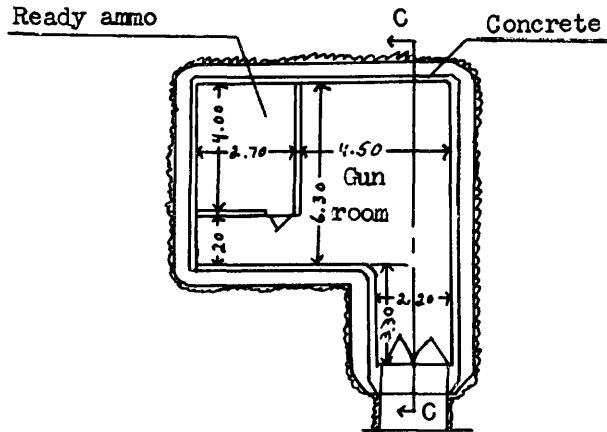
(WITH SHELTER) - FOR TYPE 45 24cm HOWITZER (Continued)

SECTION B-B

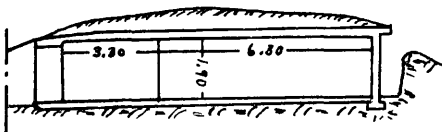


(WITH SHELTER) - FOR TWO FIELD GUNS

PLAN CROSS SECTION



SECTION C-C

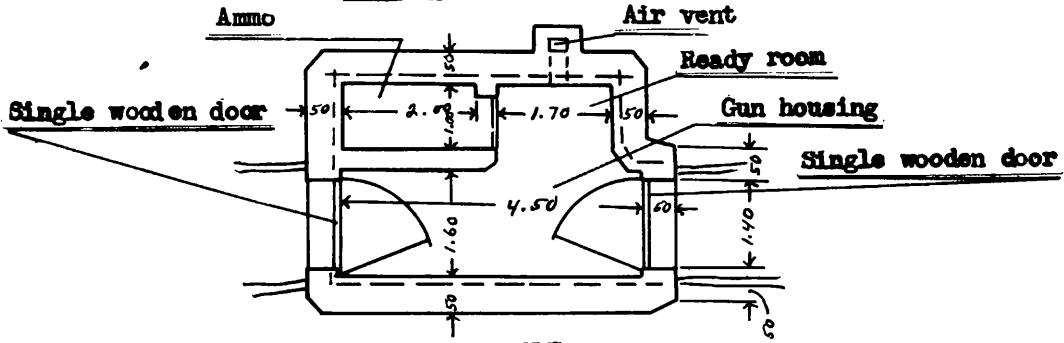


~~UNCLASSIFIED~~  
UNCLASSIFIED

VI - ~~READY SHELTER~~ **UNCLASSIFIED**  
 FOR ONE RAPID-FIRE GUN

(Amount of Concrete: about 35 cu m)

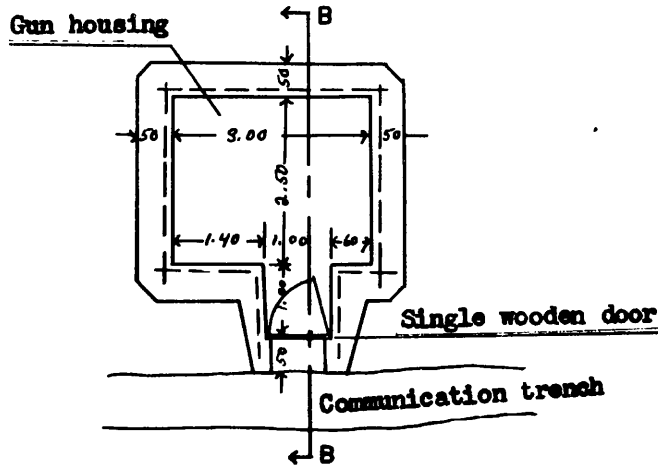
PLAN CROSS SECTION



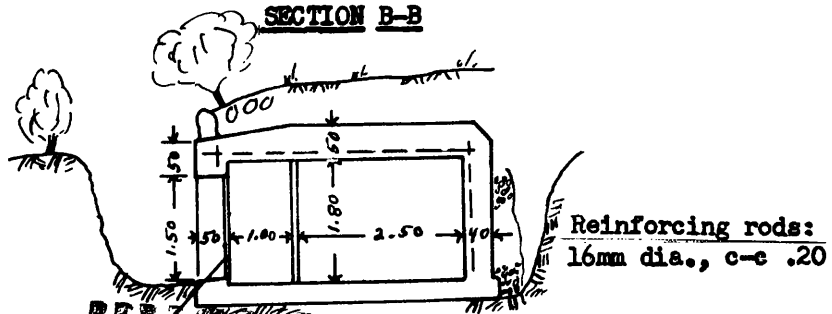
FOR HMG

(Amount of Concrete: about 27 cu m)

PLAN CROSS SECTION



SECTION B-B



**UNCLASSIFIED**

**UNCLASSIFIED**

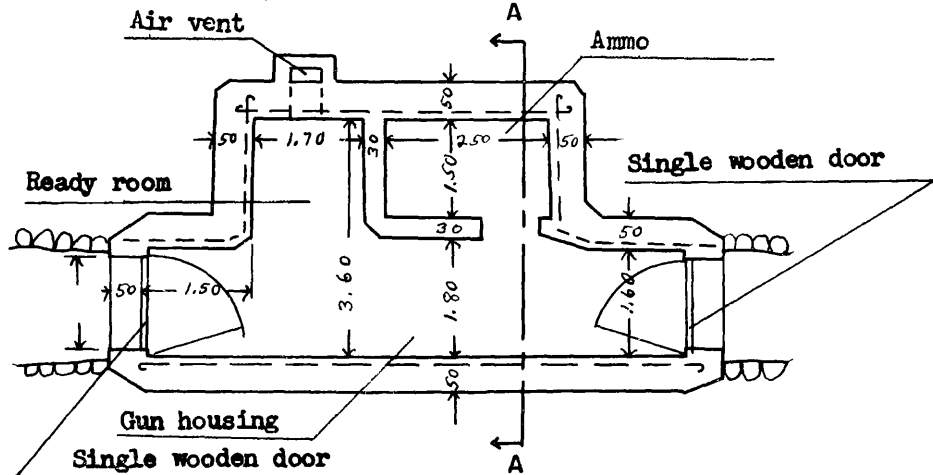
READY SHELTERS

FOR TWO RAPID-FIRE GUNS /TYPE I/

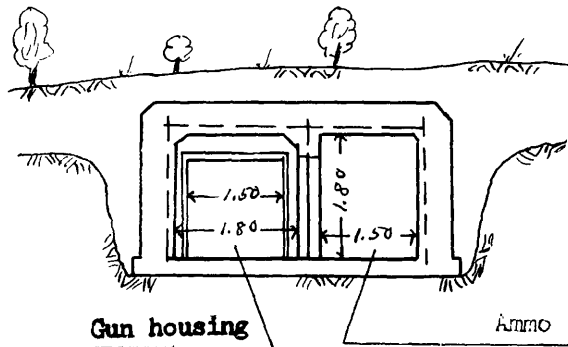
(Amount of Concrete: 50 cu m)

$\frac{1}{100}$

PLAN CROSS SECTION



SECTION A-A



$\frac{1}{100}$

1. Where seepage is likely to be a problem, provide for drainage by adding a layer of gravel on the roof and around the sides.
2. Disposition of foundation should take into consideration factors of local soil.

Reinforcing rods: 16mm dia., c-c .20

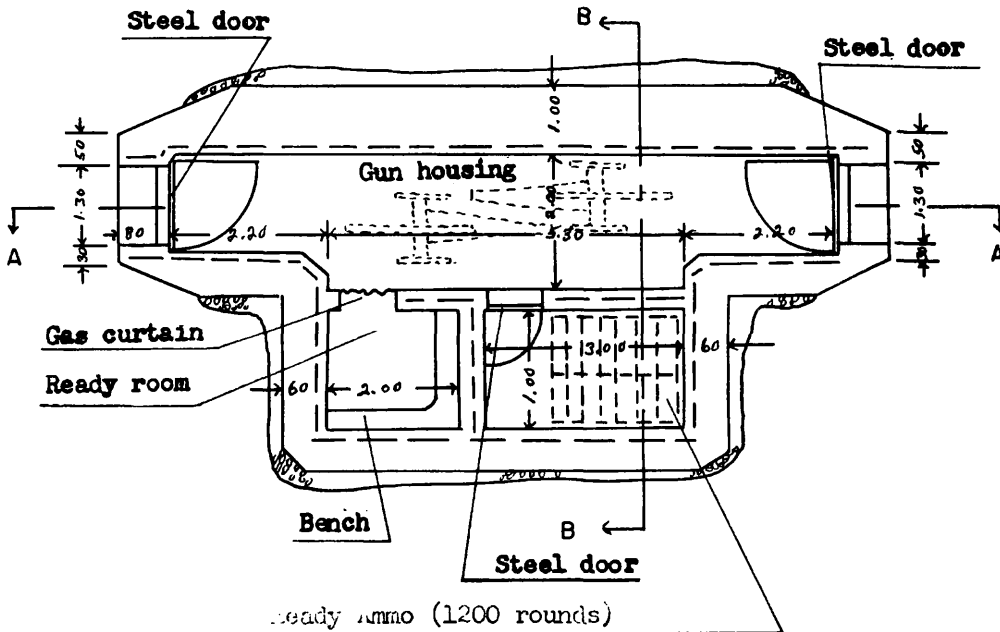
**UNCLASSIFIED** 66

**UNCLASSIFIED**

VI - READY SHELTERS

FOR TWO RAPID-FIRE GUNS /TYPE II/

PLAN CROSS SECTION



List of Required Materials:

Concrete.....175 cu m  
 Steel reinforcement... 35 tons  
 Forms { inner.....100 sq m  
       { outer.....165 sq m  
 Broken Stone..... 20 cu m

Accessories

Steel doors.....2  
 Wooden doors.....1  
 Gas curtain.....1  
 Bench.....1  
 Intake.....1  
 Exhaust.....1  
 Drainage unit....1  
 Miscellaneous....

Reinforcing rods: 16mm dia., c-c .20  
 16mm-dia., c-c .40

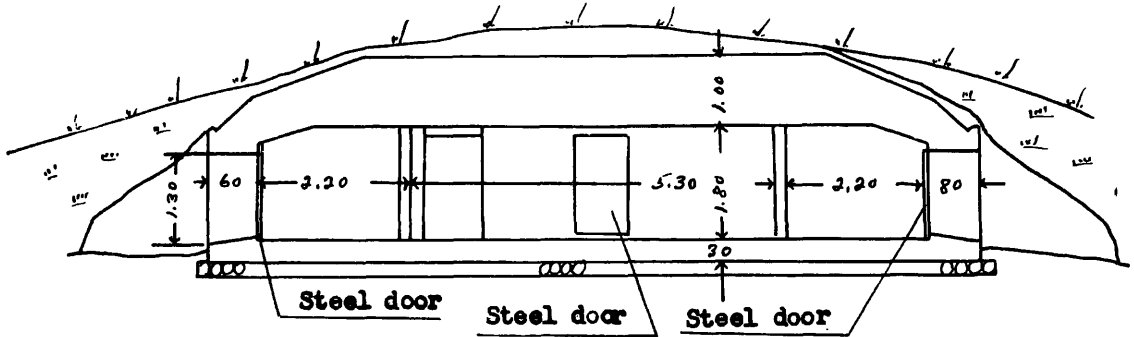
**UNCLASSIFIED**

**UNCLASSIFIED**

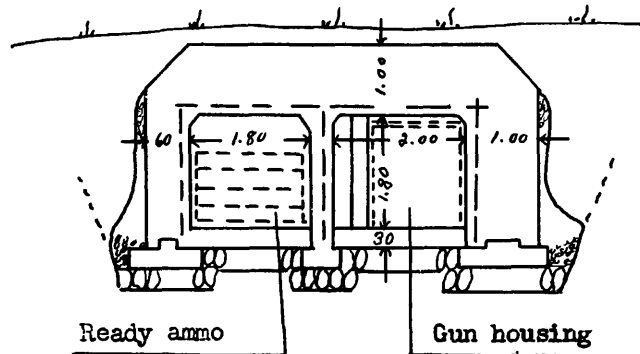
VI - READY SHELTERS

FOR TWO RAPID-FIRE GUNS /TYPE II/ (Continued)

SECTION A-A



SECTION B-B



1. The diagram shows a shelter housing two Type 94 37mm rapid-fire guns.
2. This may be substituted for the customary Rapid-Fire Gun Emplacement.
3. Disposition of foundation, entrances, and drainage should take into account factors of local terrain and soil.

**UNCLASSIFIED**

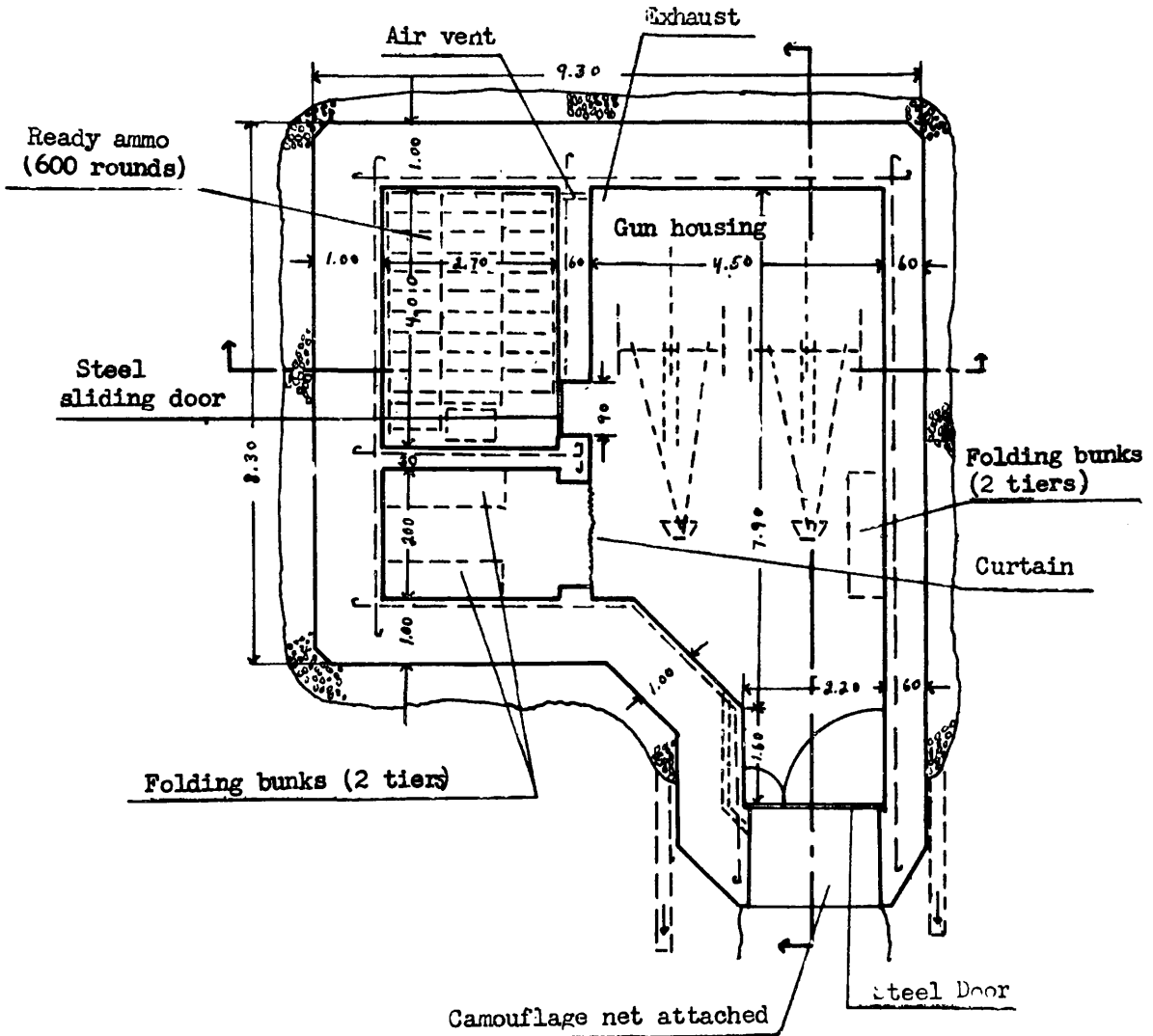
Reinforcing rods: 16mm dia., c-c .20  
16mm dia., c-c .40

VI - READY REFUGES

**UNCLASSIFIED**

FOR TWO FIELD (OR MT) GUNS

PLAN CROSS SECTION



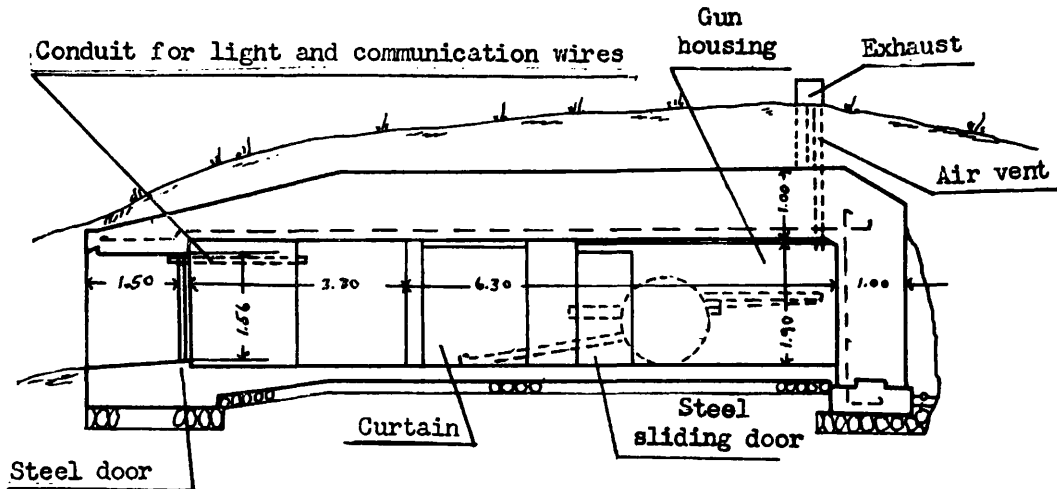
1. Diagram indicates a 2 gun shelter for Type 90 Field Gun.
2. Endeavor to conceal entrance with camouflage net.
3. Disposition of foundation, drainage, entrances, should take into account factors of local terrain and soil.



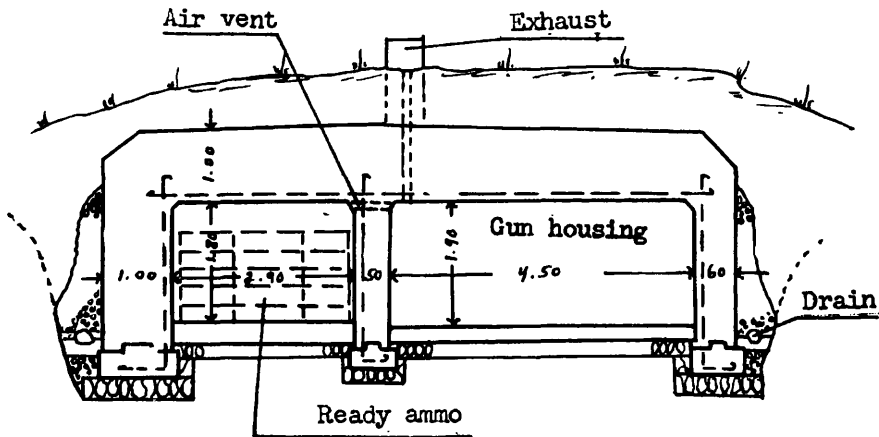
**UNCLASSIFIED**  
 VI - READY SHELTERS

FOR TWO FIELD (OR MT) GUNS (Continued)

SECTION A-A



SECTION B-B



List of Required Materials

Concrete.....	100 cu m
Steel reinforcement.....	5.5 ton
Forms (inner).....	155 sq m
Forms (outer).....	220 sq m
Broken stone.....	33 cu m

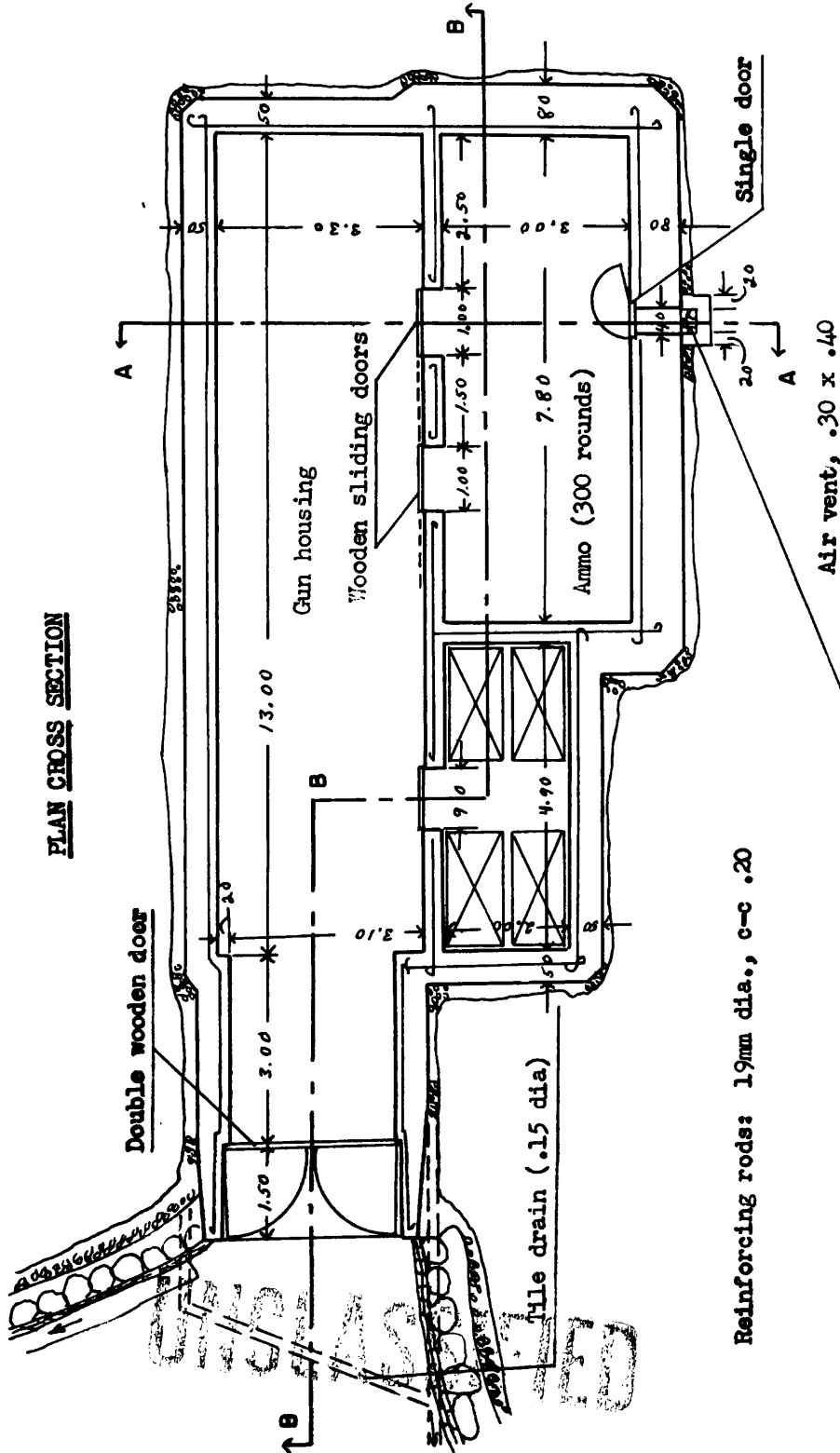
Accessories

Exhaust.....	1
Steel entrance doors.....	2
Folding bunks.....	6
Drainage unit.....	1
Miscellaneous.....	1

VI - READY SHELTERS

FOR TYPE 89 15cm CANNON AND TRACTOR

PLAN CROSS SECTION

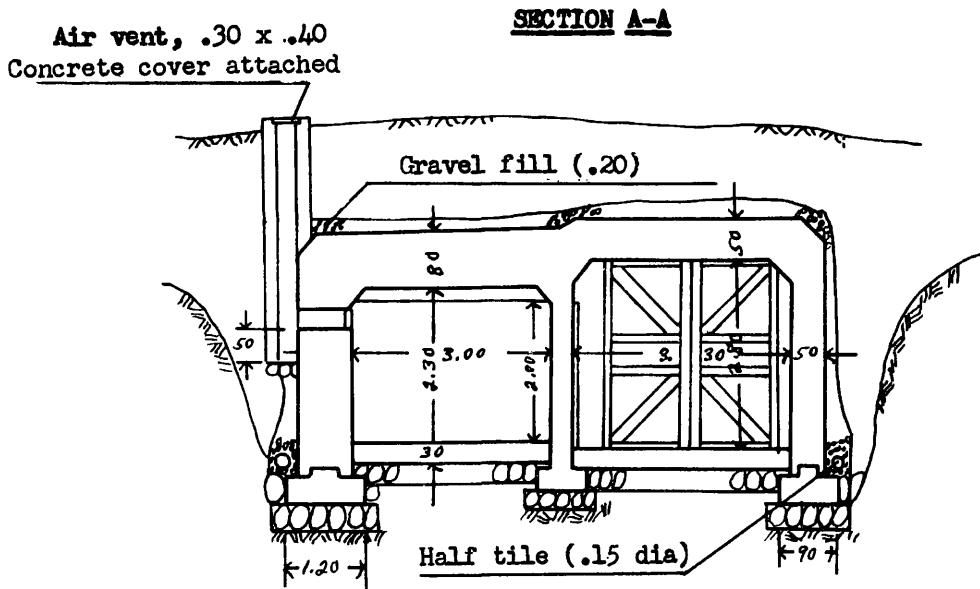


Reinforcing rods: 19mm dia., c-c .20

**UNCLASSIFIED**

VI - READY SHELTERS

FOR TYPE 89 15cm CANNON AND TRACTOR (Continued)



At times when it is feared the magazine will be exploded by enemy shells, build it apart from shelter. Regardless of the disposition indicated in the diagram, the foundation is adapted to the terrain.

Reinforcing rods: 19mm dia., e-c .20

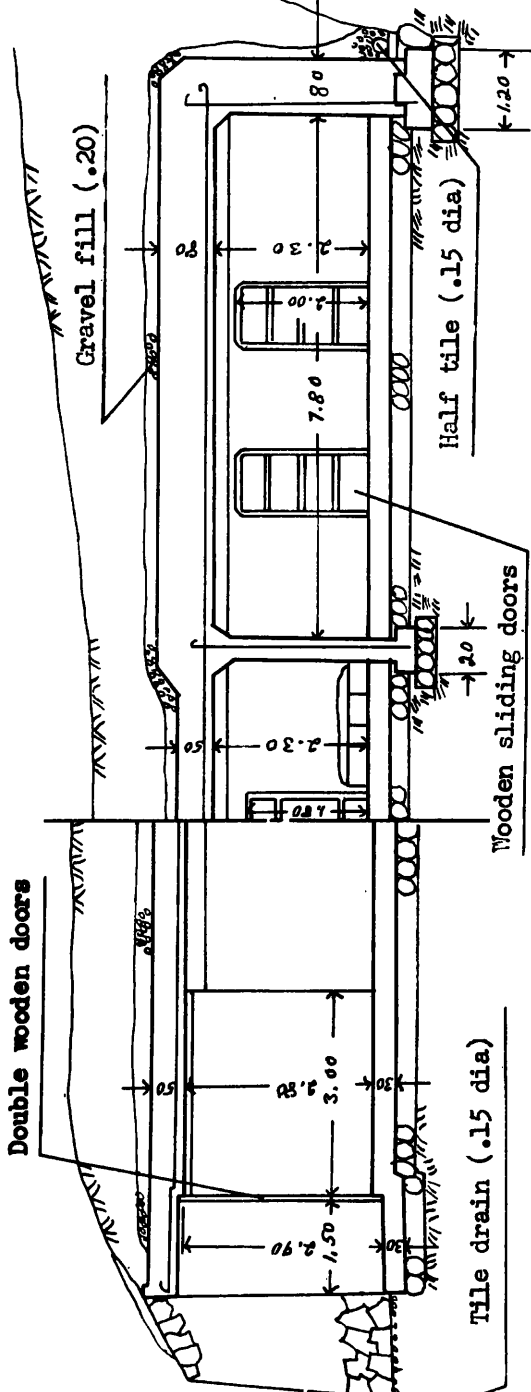
**UNCLASSIFIED**

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VI - READY SHELTERS

FOR TYPE 82 15cm CANNON AND TRACTOR (Continued)

SECTION B-B



Note:

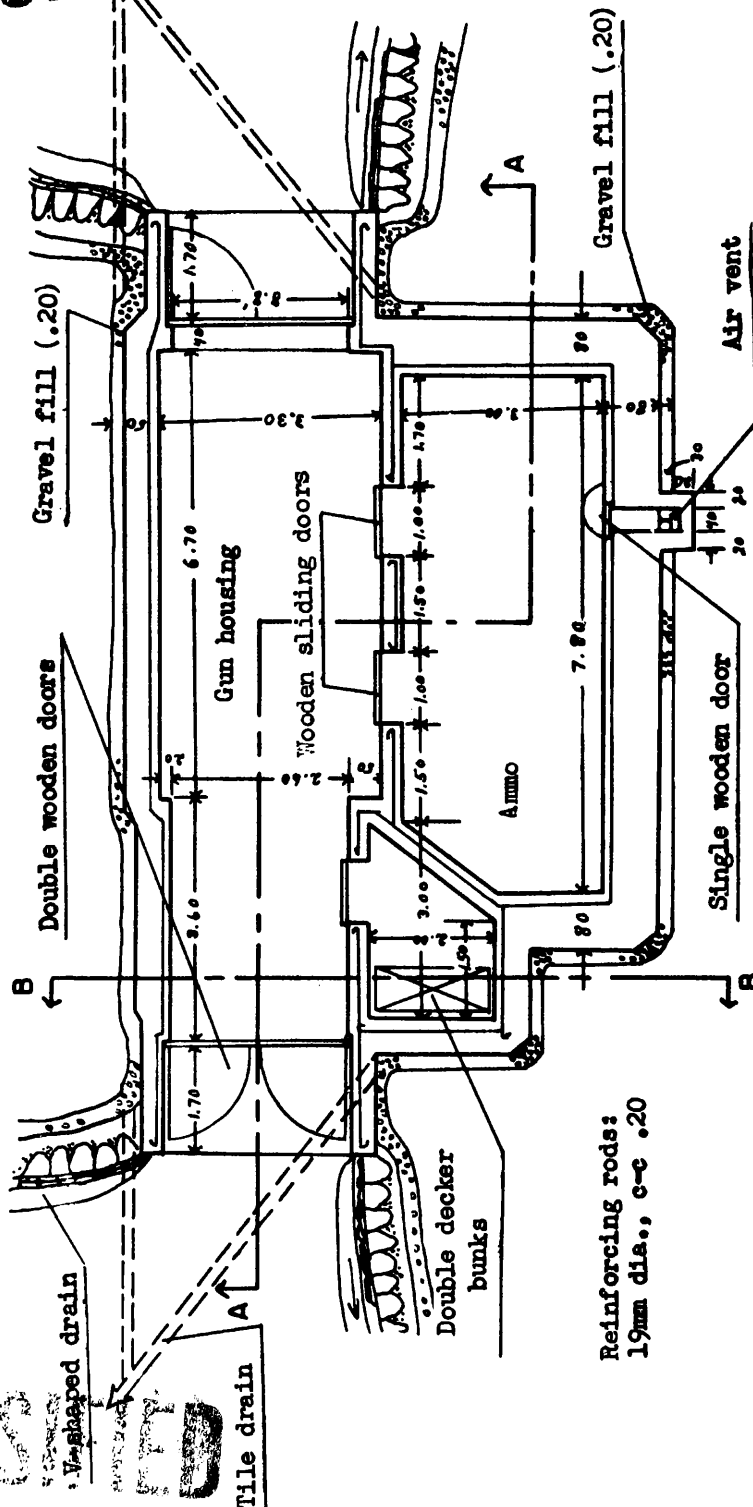
Shows type of shelter capable of housing gun without uncoupling tractor gear.

Reinforcing rods: 19mm dia., c-c .20

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VI - READY SHELTERS  
 FOR TYPE 89 15cm CANNON AND FOR TRACTOR  
 (A) CANNON HOUSING  
PLAN CROSS SECTION



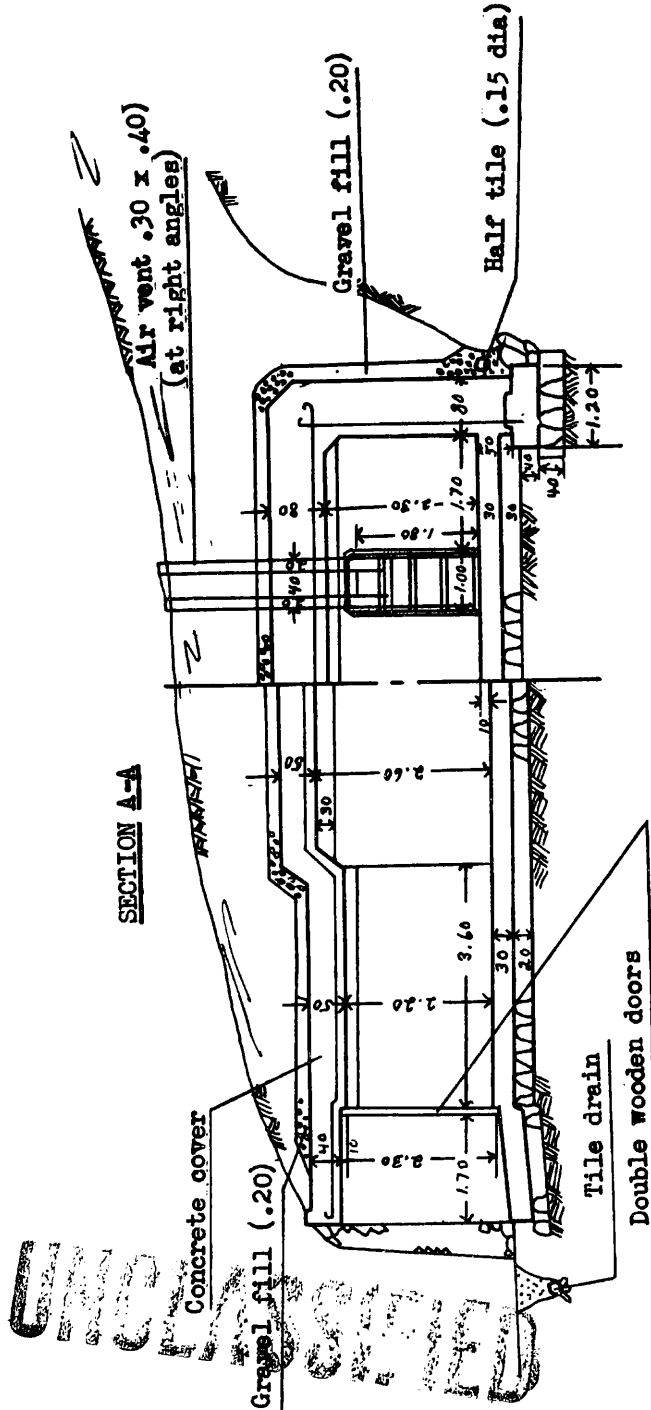
UNCLASSIFIED

Reinforcing rods:  
 19mm dia., c-c .20

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CONCRETE CONSTRUCTION SPECIAL TRANSLATION NO. 58

VI - READY SHELTERS  
FOR TYPE 89 15cm CANNON AND FOR TRACTOR  
(A) CANNON HOUSING (Continued)

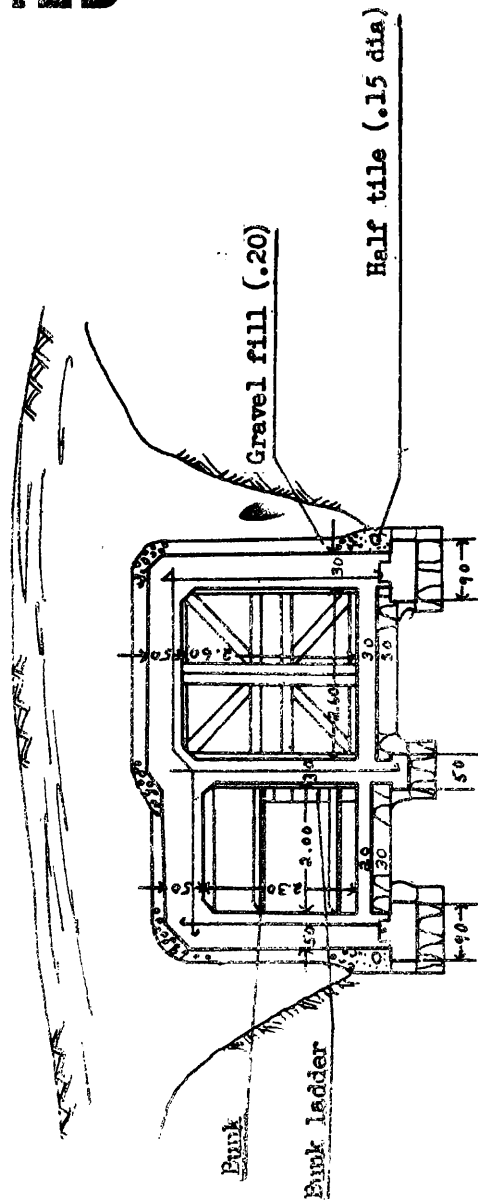


Reinforcing rods: 19mm dia., o-c .20

UNCLASSIFIED

VI - READY SHELTERS  
FOR TYPE 82 150mm CANNON AND FOR TRACTOR  
(A) CANNON HOUSING (Continued)

SECTION B-B



1. Type housing gun.
2. At times when it is feared the magazine will be exploded by enemy bombs, separate it from casemate.
3. Regardless of the disposition in the diagram, foundation is adapted to local terrain.

Reinforcing rods: 19mm dia., c-c .20

UNCLASSIFIED

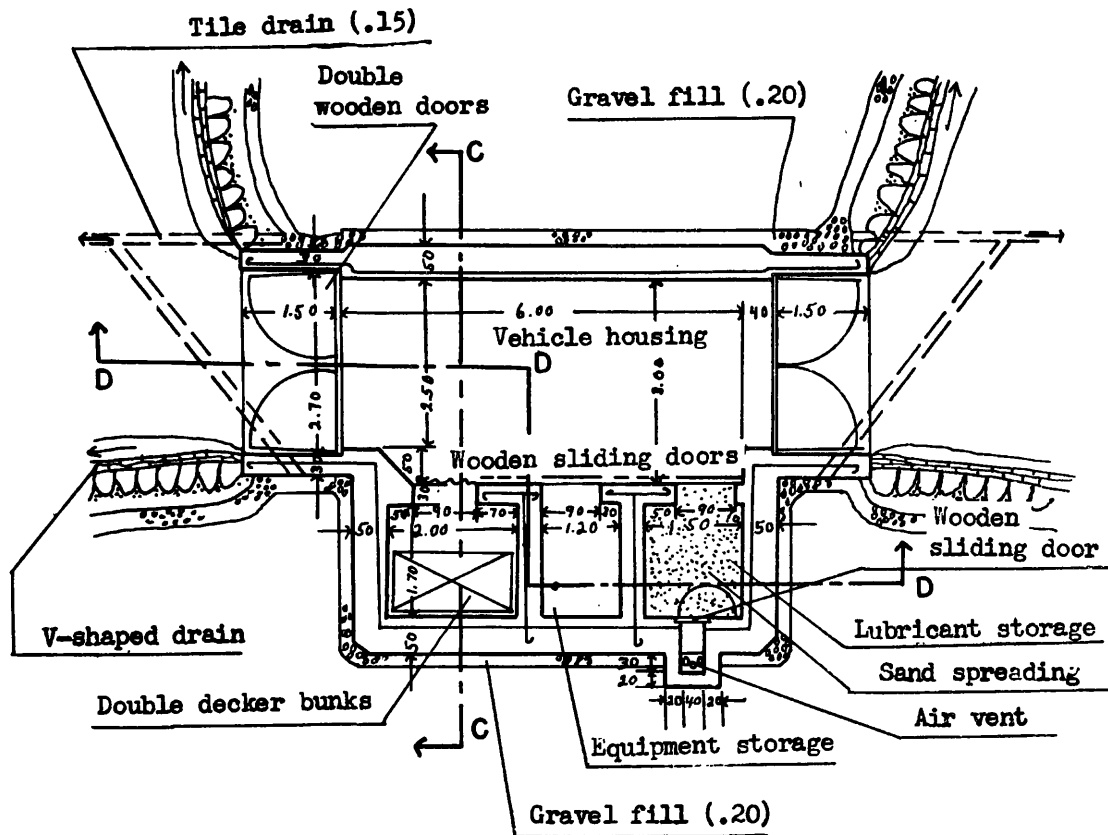
VI - READY SHELTERS

**UNCLASSIFIED**

FOR TYPE 89 120mm CANNON AND FOR TRACTOR

(B) TRACTOR HOUSING

PLAN CROSS SECTION



Reinforcing rods: 19mm dia., c/c 20

**UNCLASSIFIED**

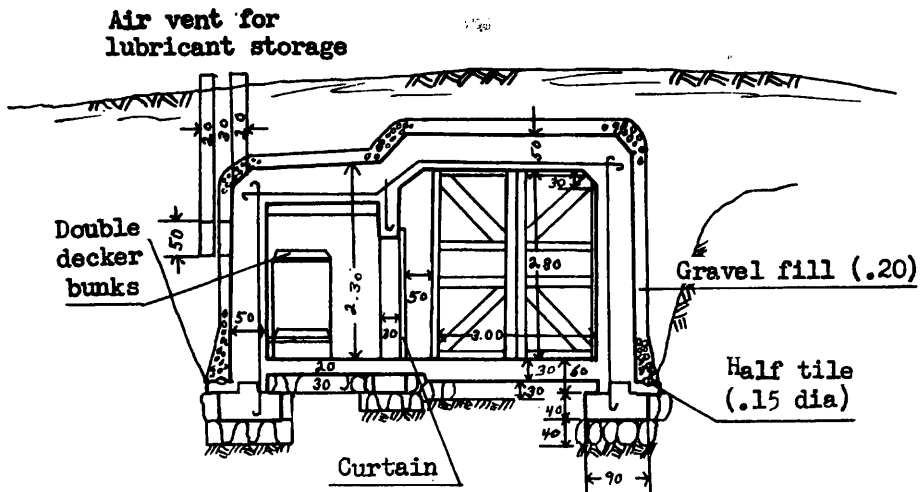


**UNCLASSIFIED** VI READY SHELTERS

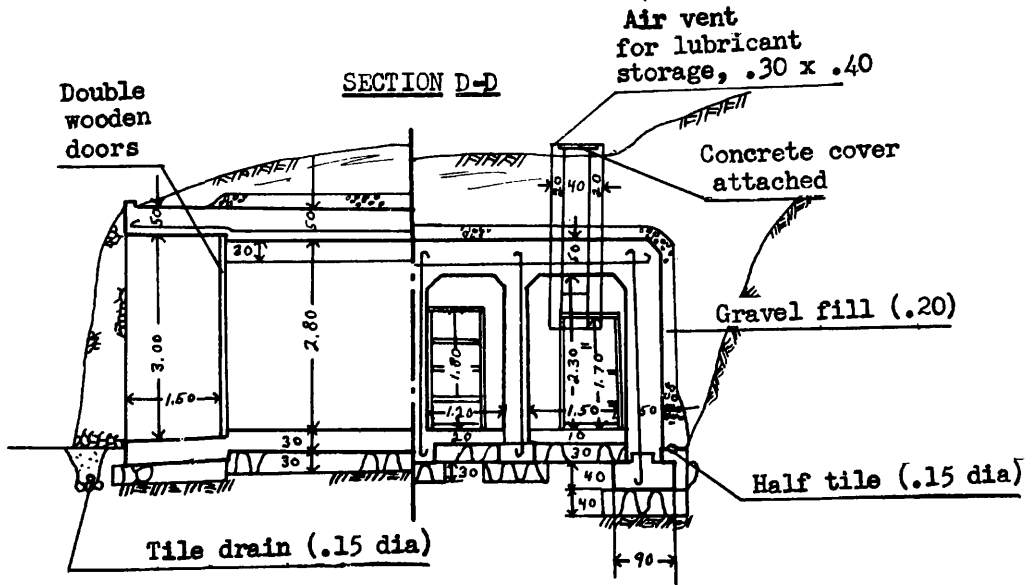
FOR TYPE 89 15cm CANNON AND FOR TRACTOR

(B) TRACTOR HOUSING (Continued)

SECTION C-C



SECTION D-D



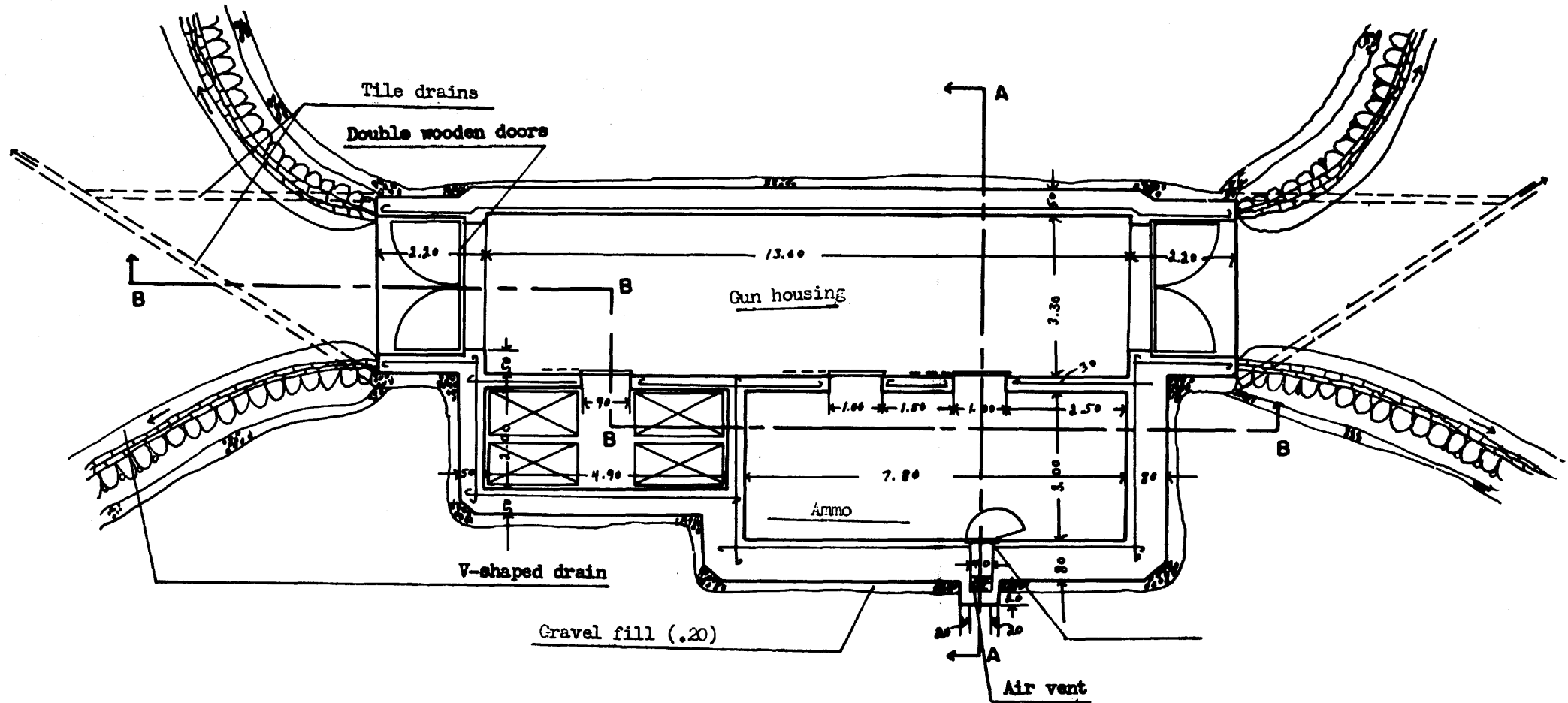
Reinforcing rods: 19mm dia., c-c .20

**UNCLASSIFIED**

VI - READY SHELTERS

FOR TYPE 89 15cm CANNON AND TRACTOR

PLAN CROSS SECTION



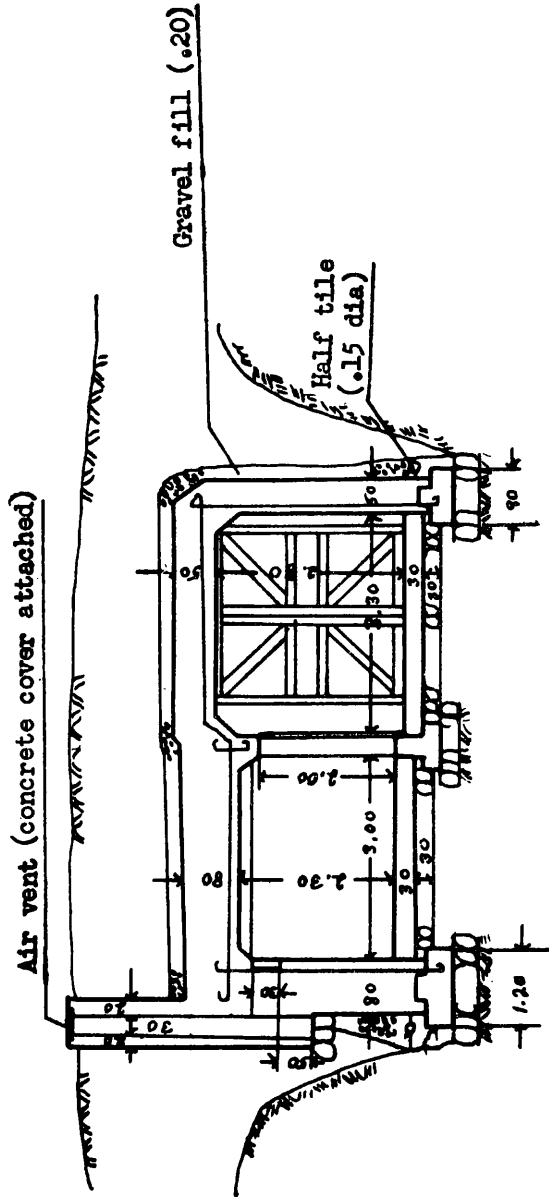
Reinforcing rods: 19mm dia., c-c .20

UNCLASSIFIED

VI - READY SHELTERS

FOR TYPE 89 15cm CANNON AND TRACTOR (Continued)

SECTION A-A



Reinforcing rods: 19mm dia., c-c .20

UNCLASSIFIED

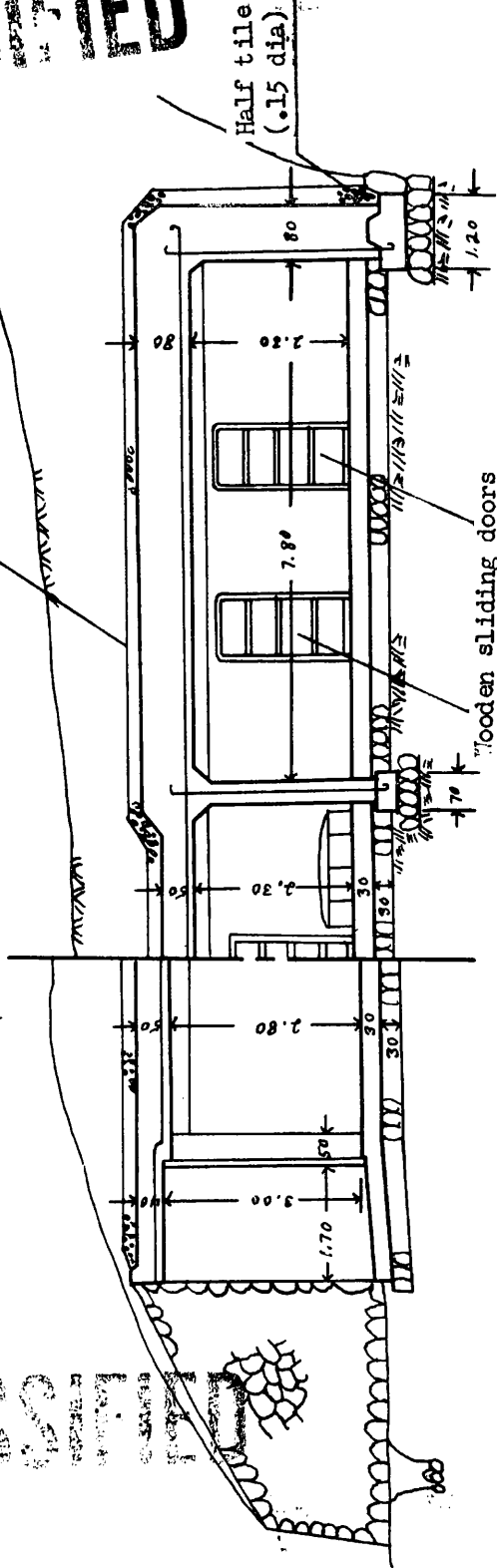
UNCLASSIFIED

VI - READY SHELTERS

FOR TYPE 89 15cm CANNON AND TRACTOR (Continued)

SECTION B-B

Gravel fill (.20)



Reinforcing rods: 19mm dia., c-c .20

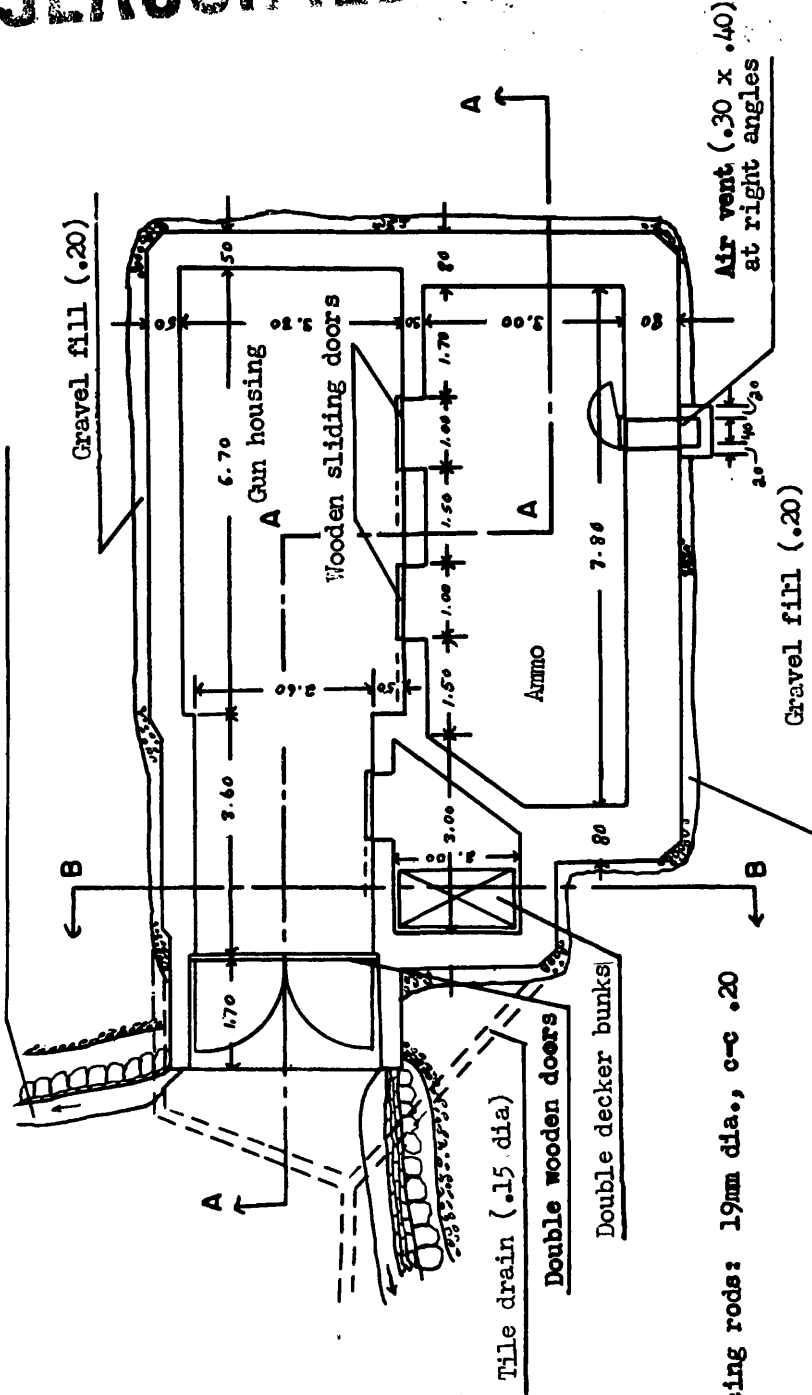
UNCLASSIFIED

UNCLASSIFIED

VI - READY SHELTERS  
FOR TYPE 89 15cm CANNON AND FOR TRACTOR

(A) CANNON HOUSING  
PLAN CROSS SECTION

V-shaped drain

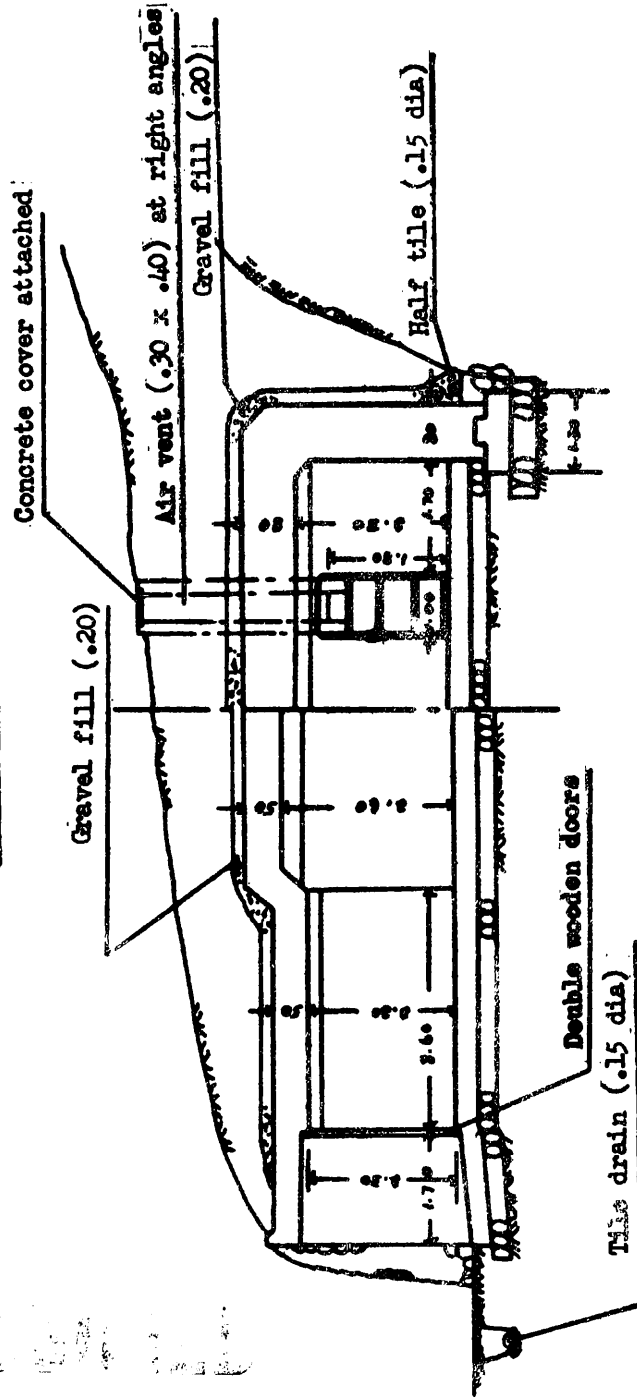


Reinforcing rods: 19mm dia., c-c .20

UNCLASSIFIED

**VI - READY SHELTERS**  
**FOR TYPE 82 15cm CANNON AND FOR TRACTOR**  
**(A) CANNON HOUSING (Continued)**

**SECTION A-A**

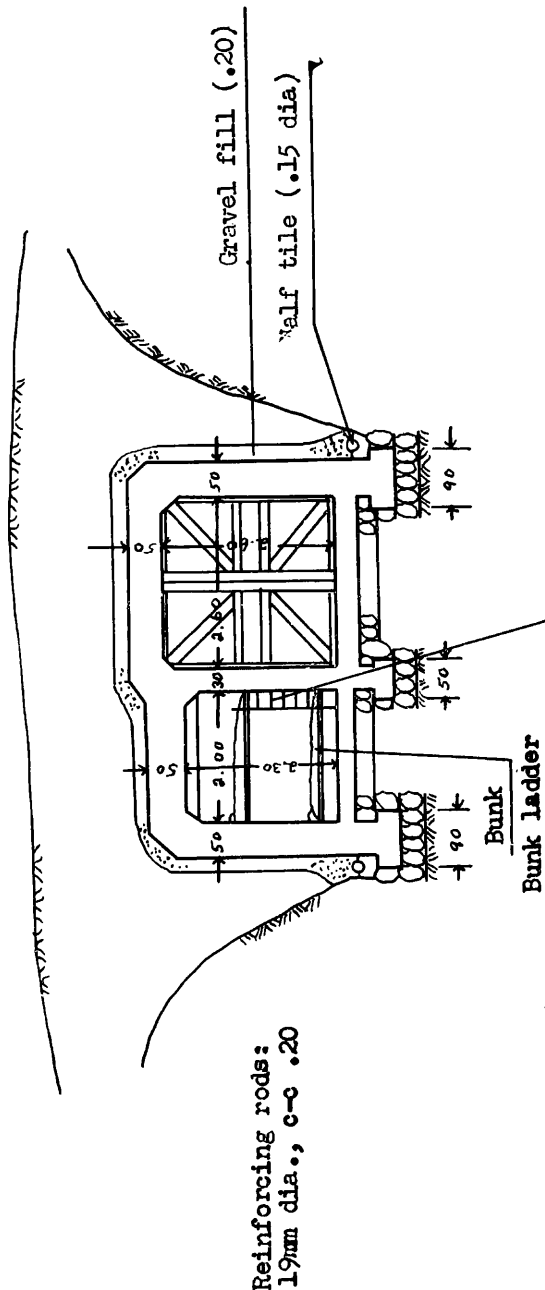


Reinforcing rods: 19mm dia., c-c .20

**UNCLASSIFIED**

VI - READY SHELTERS  
FOR TYPE 89 15cm CANNON AND FOR TRACTOR  
(A) CANNON HOUSING (Continued)

SECTION B-B



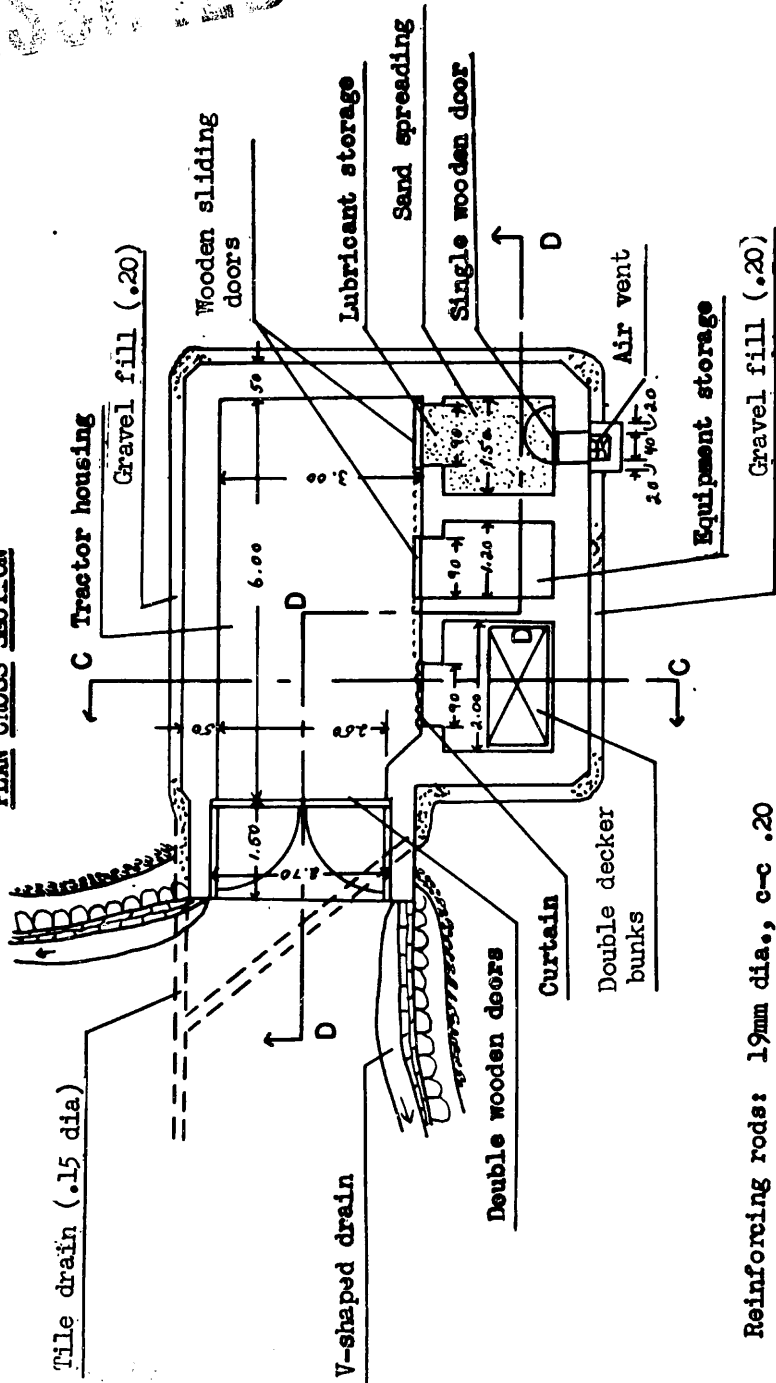
Explanatory Notes:

1. At times when it is feared that the magazine will be exploded by enemy bombs, build it apart.
2. Regardless of the disposition in the diagram, the foundation is adapted to the terrain.

**UNCLASSIFIED**

VI - READY SHELTERS  
FOR TYPE 89 15cm CANNON AND FOR TRACTOR

(B) TRACTOR HOUSING  
PLAN CROSS SECTION



Reinforcing rods: 19mm dia., c-c .20



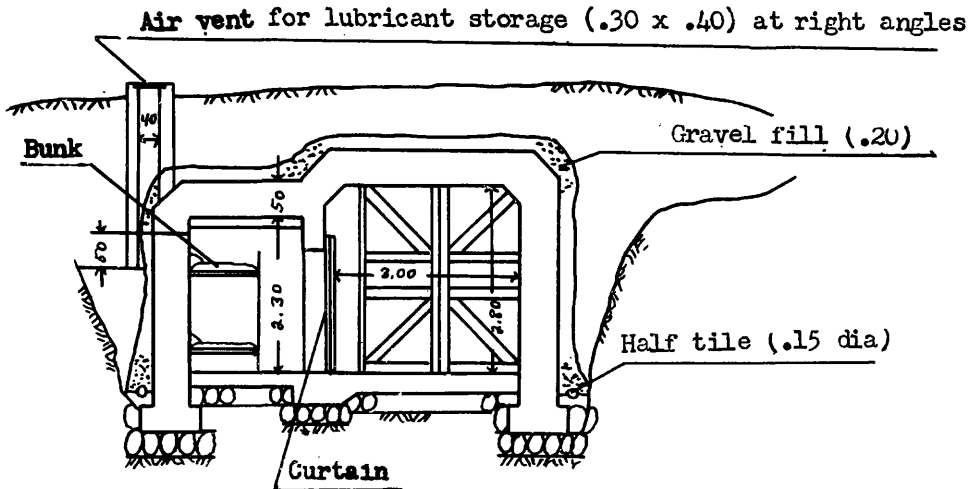
VI - READY SHELTERS

**UNCLASSIFIED**

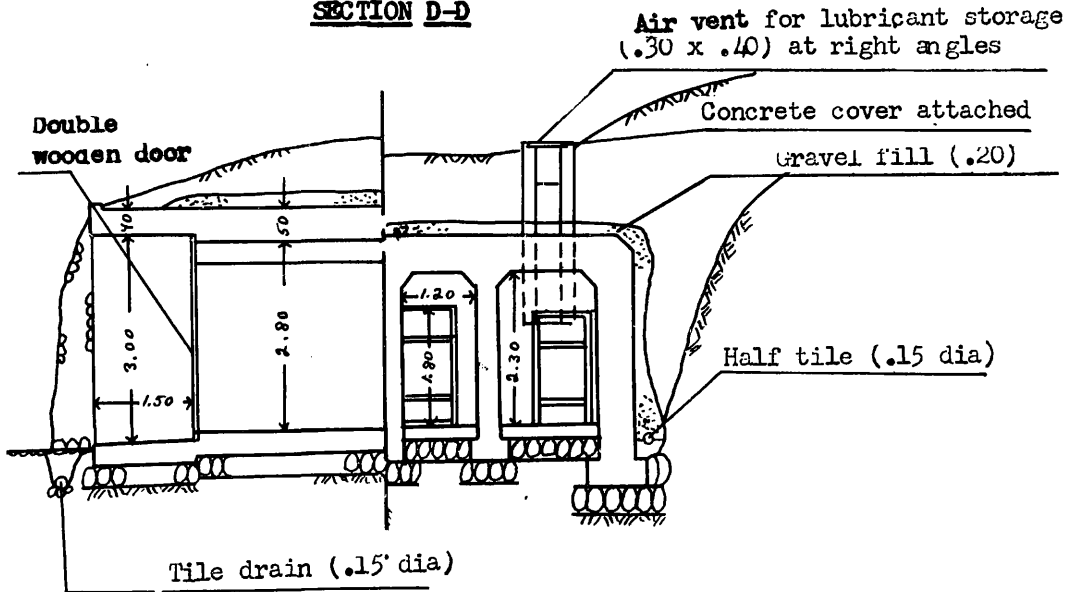
FOR TYPE 89 15cm CANNON AND FOR TRACTOR

(B) TRACTOR HOUSING (Continued)

SECTION C-C



SECTION D-D

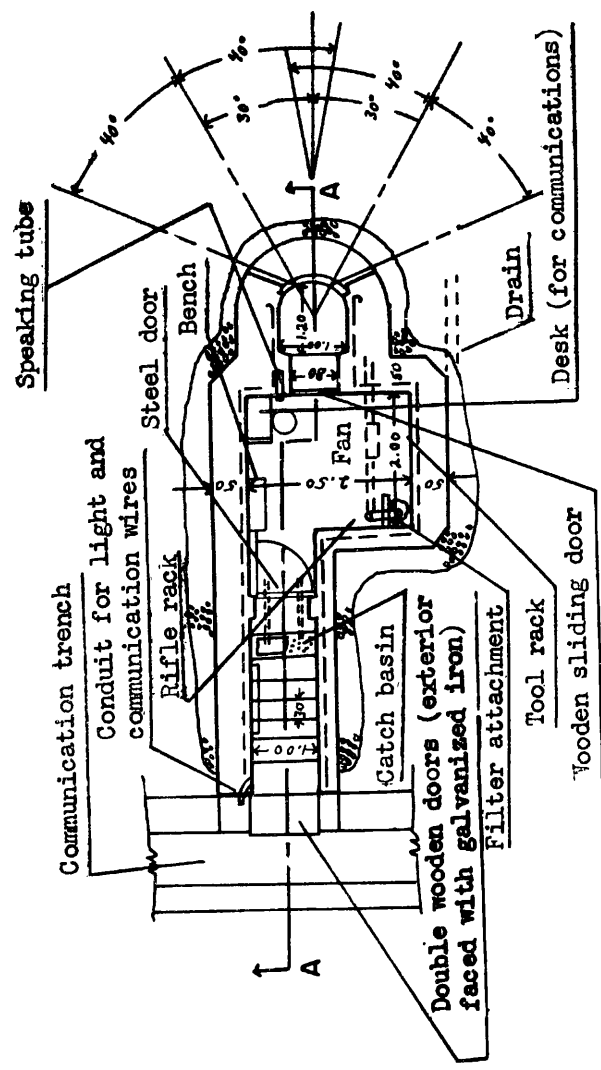


. Reinforcing rods: 19mm dia., c-c .20

**UNCLASSIFIED**

VII - OBSERVATION POSTS  
/TYPE I/

PLAN CROSS SECTION



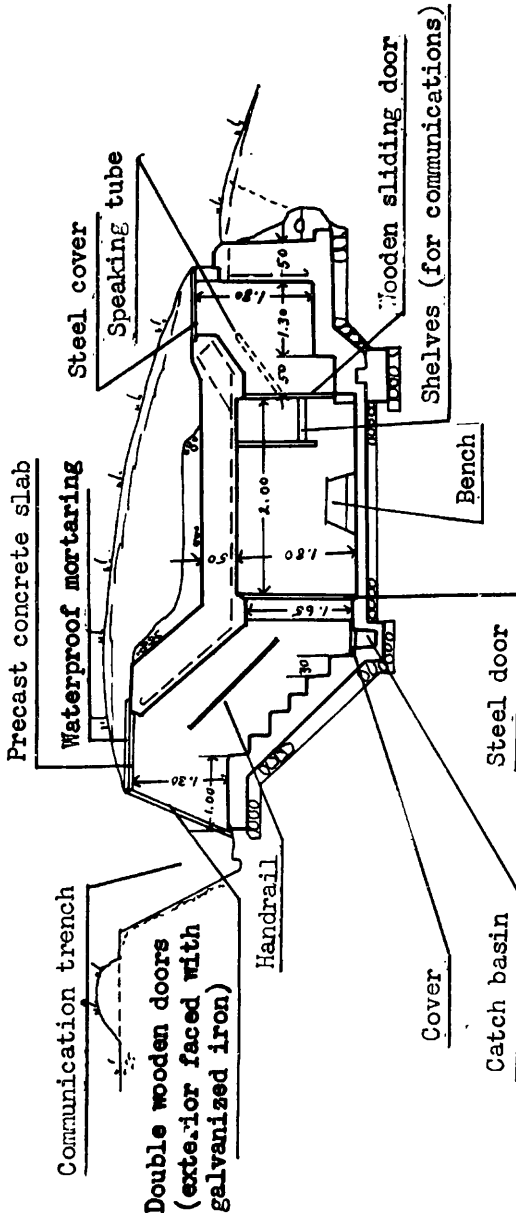
Reinforcing rods: 16mm dia., c-c .20  
 16mm dia., c-c .40

**UNCLASSIFIED**

VII - OBSERVATION POSTS

/TYPE I (Continued)/

SECTION A-A



Reinforcing rods: 16mm dia., c-c .20  
16mm dia., c-c .40

**UNCLASSIFIED**