

AWM4

**Australian Imperial Force unit war diaries,
1914-18 War**

Tunnelling & Survey

Item number: 16/4/3

Title: 3rd Australian Tunnelling Company

July 1916



AWM4-16/4/3

WAR DIARY

INTELLIGENCE SUMMARY

(Cover binding not required)

3rd AUSTRALIAN TUNNELLING COY.

Instructions regarding War Diaries and Intelligence Summaries are contained in F. S. Regs. Part II and the War Manual respectively. The pages will be provided in manuscript.

Remarks and references to Appendix

Summary of Events and Information

Hour Date

Page 353

Confidential

War Diary
of
3rd Aust. Tnl. Coy.
for
July 1916.

Compiling Officer J.B.S.

340
AUSTRALIAN
WAR MEMORIAL

WAR DIARY or INTELLIGENCE SUMMARY.

(Erase heading not required.)

Instructions regarding War Diaries and Intelligence Summaries are contained in F. S. Regs., Part II. and the Staff Manual respectively. Title pages will be prepared in manuscript.

Summary of Events and Information

Confidential

Remarks and references to Appendices

Place	Date	Hour	Summary of Events and Information	Remarks and references to Appendices
			<p><i>War Diary</i></p> <p><i>3rd Aust. Div. Col.</i></p> <p><i>July 1918</i></p>	

Confidential Officer

Instructions regarding War Diaries and Intelligence Summaries are contained in F. S. Regs., Part II. and the Staff Manual respectively. Title pages will be prepared in manuscript.

WAR DIARY
or
INTELLIGENCE SUMMARY.

(Erase heading not required.)

3rd Tunnelling Coy.

Army Form 60

356

Remarks and references to Appendices

Summary of Events and Information

Place Date Hour

July 1

Strength of Company. 14 Officers 348 O.R.^s From 2nd + 3rd Reinforcements 1 Officer 60 O.R.^s
Attached B.E.F. 139 O.R.^s

Minning work of a defensive ^{offensive} nature was continued on the Red Lamp, Winchester Colvin Section. Listening work was carried out during the whole month.

July 1

At Colvin on 1/7/16 a mine was fired & a crater formed at (M. 356. 90.40. Sheet 36.S.W.1.)
The enemy, after an intensive bombardment from 8.45 p.m. to 10.45 p.m. at (36 S.W., M. 356. 90.80) rained our lines. A magazine ^{of ours} containing 1300 lbs. of ammonal was exploded ^{by the enemy} near N^o 10 Shaft, which was destroyed. The enemy exploded a mobile charge in N^o 11 Shaft, which was consequently damaged.
Lieut H.V. Seale & Lt. A.L. Kennedy succeeded in withdrawing all the miners during the barrage, but were both ~~seriously~~ wounded when ~~in~~ in a trench shelter & attending to a wounded man. add page 6

- COMPANY ORDER. 39:- Lt. H.V. Seale, Lt. A.L. Kennedy, 998. Sapper H Fisher, 1373 Sps. C. Miller & 2374 Sps. J. Colquhoun wounded 1/7/16.
appreciative reference from G.S. on work of volunteers done on 29/6/16.
" 42:- 2892 Sps. Bolch. A.R. (3rd Rep. A.I.F.) wounded.
" 43:- ~~During temporary absence of Lt. Col. Fawcett from ^{Asst.} Mining Corps Hd. Qrs.~~
~~Capt. J.B. Stone will take over the duties of Co.~~
" 46:- 2nd Lieut. W. Connell reported on 9/7/16 for duty & is attached to N^o 3 Section.

- CORRESPONDENCE. R.41:- Statement in reference to the action of the Infantry in Section "C" on the night of 2/3 July. Appendix 1.
Report from Major L.J. Couker re. Destruction of Shafts. " 2.
Report from Lt. Chestman to O.C. Company re Push-pipe work. " 3.

WAR DIARY

3rd Tunnelling Coy.
8

3RD AUSTRALIAN TUNNELLING COY.
No. 356
Date

Instructions regarding War Diaries and Intelligence Summaries are contained in F. S. Regs., Part II. and the Staff Manual respectively. Title pages will be prepared in manuscript.

INTELLIGENCE SUMMARY.

(Erase heading not required.)

Place	Date 1916	Hour	Summary of Events and Information	Remarks and references to Appendices
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July 9. On 9/7/16 a mine at Winchester was blown & crater formed at (Sheet 36 S.W.1. N.30d. 68.68.)
 COMPANY ORDER N^o 53: - 1206 2nd Cpt. W. Wray wounded on
 Correspondence R+I: - Reports on Winchester "Blow", from Mjr. Coulter:
 Notice Cof M. 249/c. re lecture at Army Mine School by Major David
 Note from Major Coulter to Cof M. 1st Army re Push Pipe Blow at Boars Head. 10/7/16
 Letter from Major Coulter to 184th Inf. Brigade re Push Pipe at Boars Head on 10/7/16

Appendix 4.
" 5.
" 6.
" 7

[10th Page 11

July 14. The work of ^{the 2nd shaft} shaft sinking was started at Hauguesait (M. 30. c 05. 30)
 The 257th Coy. R.E. relieved us on a part of the front from (Sheet 36 S.W.1. M30a. 40. 90)
 to Sheet 36 S.W.3. S.56. 00. 65), i.e. from and including Winchester southwards. Relief completed on 18/7/16
 + New defensive systems and extensions of the Red Lamp System were then started.
 At Red Lamp new work was done at (W. 14a. 10. 30) & (N 136. 35. 00)
 at Hauguesait new work was carried out at N. 136 Central.
 at Tillaloy new work was done at M. 248 Central
 at Chapigny new work was done at M 24 C & d.
 COMPANY ORDER N^o 53: - 1206 2nd Cpt. W. Wray wounded on 17/7/16.

Correspondence R+I: - Letter from Major Coulter to C.O. 2/5 Gloucester Infantry re
 Destruction of Push Pipe on enemy sap at Boars Head.
 31 D.W. 5/54 G. from Lt. Col. G. S. 31st D.W. Ref: Relief by 257 Coy RE.
 from 1st Army N^o 584/G Ref: - Men sleeping in Mineshafts etc.
 Report on St. Crews' and Course at Listening School.

Appendix 8.
" 9.
" 10
" 11

Insert here.
 The 257th Coy. R.E. were informed by us that the enemy was in proximity to this 2nd shaft site - about 200 ft. away. Later they could not confirm our suspicions & therefore stopped work on the shaft sinking at Hauguesait. Weeks later the enemy blew up the position.

WAR DIARY

or

INTELLIGENCE SUMMARY.

(Eruse heading not required.)

3rd Tunneling Coy. 9.

3rd AUSTRALIAN TUNNELLING COY.
No. 356
Date

Instructions regarding War Diaries and Intelligence Summaries are contained in F. S. Regs., Part II. and the Staff Manual respectively. Title pages will be prepared in manuscript.

Place	Date	Hour	Summary of Events and Information	Remarks and references to Appendices
	1916			
July	19.		<p>On the 19th July, the 3rd Aust. Tully Coy. with the 61st Division Infantry attacked opposite Laventie.</p> <p>The Company was ordered by the Chief Engineer XIth Corps to undertake post-pipe operations prior to the assault to enable communication trenches to be quickly constructed, & to throw up crater lips to block machine gun fire.</p> <p>The three sites chosen were at :-</p> <p>No 1 at N 5 d. 10.50. from Rhondda Sap, resulting in a crater 220' long, giving 6' of cover.</p> <p>No 2 at N 14 a. 10.20. from Red Lamp Sabent, resulting in a crater 100' long, giving 6' of cover.</p> <p>No 3 at N 13 d. 48.90 from Red Lamp Sabent, resulting in a crater 150' long, giving 5' of cover.</p> <p>The work was successful, but unavailing, as the 61st Division did not succeed in holding the ground to enable the craters to be formed into trenches, but the 3 craters & particularly No 1 were of great value for first aid dressing to wounded, who had been collected & placed in the craters.</p> <p>2 Officers Major L.J. Coulter & Captain A. Sanderson (the latter returned to duty) and 5 O.R. were wounded. In addition to these two officers Lt. O.R. Howie did gallant work in exploding his post pipe under heavy fire & shell fire after leads had been cut by shell fire. Others conspicuous were 1364 Sgt. Kerby, 4784 Sgt. Shattock & 4785 Sgt. Jackson E.E.</p> <p><u>Intelligence</u>. On 31/7/16 Capt. A. Sanderson was posted to the Command of the Company during the absence of Major L.J. Coulter, in hospital. add pp 17 & 18.</p> <p><u>COMPANY ORDER No 54</u>:- 2896 Spr. W. Vodden, 1049 Spr. E.C. Jenkins wounded on 17/7/16</p> <p>1312 Spr. Archer W.C. injured on 18/7/16.</p> <p>" No 55:- 1001 Lt. J. Fullwood wounded 19/7/16.</p> <p>" 8 O.R. from Reinforcements reported & were taken on strength 19/7/16</p> <p>" No 56:- Major L.J. Coulter & Capt. A. Sanderson wounded 19/7/16 & 1228 Spr. Hucks E.P. wounded 19/7/16.</p>	

D. D. & L., London, E.C.
(10340) W1 W5300/P713 750,000 3/18 E 2688 Forms/C2118/10.

3RD AUSTRALIAN TUNNELLING COY. Army Form C 2118. 356

3rd Tunnelling Coy. 10

WAR DIARY

INTELLIGENCE SUMMARY.

(Erase heading not required.)

Instructions regarding War Diaries and Intelligence Summaries are contained in F. S. Regs., Part II. and the Staff Manual respectively. Title pages will be prepared in manuscript.

Summary of Events and Information

Remarks and references to Appendices

Place	Date 1916	Hour	Summary of Events and Information	Remarks and references to Appendices
	July.	22.	<p>Company Orders N^o. 57:- Notice of recognition of bravery & good services rendered on 19/7/16 by 3 officers & 5 other ranks. 988 Spr. L. Daily & 994 Spr. W. F. Evans wounded on 21/7/16.</p> <p>58:- 2nd Lieut. J. Robertson reported to the Company for duty & was taken on strength & attached to N^o 2 Section on 21/7/16. Lt. C. W. Whyte was killed by bursting shell on 22/7/16. 1226 Spr. R. H. Cahill & 1288 Spr. M. J. Isaacs wounded 22/7/16.</p> <p>59:- 1272 Spr. V. H. Marrott wounded 23/7/16. Lt. A. C. Morris to be N^o 3 Section Commander from 23/7/16.</p> <p>60:- Lt. G. F. Crawshaw slightly wounded on 23/7/16.</p> <p>66:- 3rd Lt. A. Sanderson of Aust. Mining Corps. is posted to Command N^o 3 Aust. Mining Corps. Coy. R. E. from 30/7/16. (Authority 1st Army N^o 930/159 A. 28/7/16.)</p> <p>Correspondence R & I.</p> <p>Report by Lt. O. R. Howie on Push Pipe Blow at Red Lamp on 19/7/16. Appendix 12 Report by Lt. B. Priestman ... " " " " 19/7/16 " 13 Extract from examination results at 1st Army Mine School concerning } Cpl. Bayle & Sappers. Bray, Carrington & Fowler. } " 14 Print showing construction of entrances to German Dugouts. " 15 Translation of German Pamphlet captured at Fucourt on July 1916. " 16 Authority A. S. Branch of Staff. D/1209 of 26/7/16. for appointment of Lt. } Capt. Sanderson to Command of 3rd Aust. Telp. Coy. & authority for being taken on strength. } " 14a</p>	

26th page 36 of June diary

Added Appendices 15 & 16.

STATEMENT IN REFERENCE TO THE ACTION OF THE INFANTRY
IN SECTION "C"-----ON THE NIGHT OF 2/3 JULY, 1916.

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Corporal Mason states:-

I was having some "crib" at 2.30 a.m. approx. 10A Shaft, I heard someone outside call out "they are over", I went outside and one of our working party came over the roof of the dugout from the back of the shaft. He was in a very frightened state, when asked what he was doing he said "the Germans were over & had taken the fire trench". I turned round to go and see what was the matter when Smith & Eliassen two A.I.F. men came out of a dugout near. We went down to the end of trench to get into the fire trench, we found it blocked with the infantry (Warwicks) crowding out & making for the communication trench. I questioned them as to where they were going they said "the Germans are over". I could not get any satisfaction from them as to where they were going, I asked where their officers were, they said, "they did not know". I then told them their place was back at their posts even if the Germans were over. With the help of Sapper Smith we induced them to go back into the firing line. Just as I got them turned about Sgt. Austin came up and said the working party had run away. I did not see any Germans until later when I looked over the front line into No Man's Land.

Sgt. Austin states:-

At about 2 a.m. on 3rd July, 1916, I detailed a party to certain work opposite 11 shaft under my own supervision. This party consisted of 8 P.W. Party & 2 A.I.F. Sappers. The W.P. suddenly took fright and disappeared over the parapets. The 2 A.I.F. men & myself waited some time and neither heard nor saw anything. We decided to go down to 10A shaft Section H. to find these men to bring them back, when we reached H.Q. we found the infantry (Warwicks "D" Coy) just returning from the 2nd line after having run away from the firing line. The period between when I saw the men disappearing over the parapets and to when I found the infantry returning from the supports would be from $\frac{1}{4}$ to $\frac{1}{2}$ an hour and during this time there was no one in the firing line for a distance of about 100 yards. I did not know the infantry (Warwicks) had left the front line until informed by my Corporal. The reason the men gave for running away was that they were told that the "Germans had come over".

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APPENDIX 2. B

The Controller of Mines,
Advanced First Army/

re Destruction of Shafts at Colvin.

An intensive Hun bombardment was directed on the area bounded by our 10 A & 11 A shafts from about 8.45 p.m.-10.45 p.m. on 1/7/18.

During the strafe a direct hit was apparently obtained on our magazine at Colvin, which held supplies for both Colvin & Ducks Bill, total about 1300lbs ammonal & some gun-cotton. The crater effect of this is about 40ft in diameter & 12ft deep & has badly damaged No.10 shaft.

A hostile raiding party came over and in my opinion placed a mobile charge in No.11 shaft dugout. This destroyed the dugout and upper part of shaft, but, I consider the shaft will be recovered readily.

I purpose putting down a bore hole through the debris of No.10 & pumping the water which has risen in the mine and has stopped repair work to the damaged lateral between shafts 10 & 11.

I consider that this damage was done by a deliberate charge laid in the sap outside the parapet, rather than the heavy bombardment. Both 10 & 11 shafts are used for pumping and means of access only. The working shafts are 10A & 11A, consequently as soon as the water is under control, the mine will be in as good shape as formerly.

Work is proceeding underground in the faces as usual.

L. J. Coyle
Alex. Anderson

Major,

3/7/18.

O.C.No.3 Australian Mining Company.R.E.

Report.

of 7/16.

To G.O.C.

I beg to report that on the evening of the 5th inst at 8 p.m. I met the working party, assigned to me, at Huddy Corner and then proceeded to the Boar's Head Sap.

I sent back to the No. 6 Dump the Pipe Pushing apparatus retaining four (4) men and one N.C.O. at the Sap for the purpose of finding the end of pipe.

We excavated along a face about six feet wide and for a depth of about another six feet but were unable to locate the Pipe. The men worked well but owing to the fact that they were so close to the enemy's lines it was not possible to work quickly on account of the noise.

At two o'clock it was just beginning to get light and the men being about played out I decided to cease operations for the night.

Bluesdeman Lewis
5th Aust. Mining Company
RE

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APPENDIX 4.

MINE EXPLOSION REPORT.

No 3 Australian Tunnelling Coy., R.E.

10-7-1916.

Date	...	...	9-7-16
Time	...	...	11-23 PM
Location	...	...	Munchester
Map Reference	...	...	36 SW 1 30 a 5-5.6.5
By whom exploded	...	...	Major Coullier
If British, on whose authority?	...	...	General Staff 61 st Division
Size of charge	...	...	480 lbs. Ammonal
Depth of Gallery	...	...	26 feet
Distance from British front line	...	...	450 feet
Amount of tamping	...	...	120 ft. 2-10 ft an cushion 143
Reasons for mine	...	...	Mine was laid at time of falling over from 255 Coy RE on 29/5/16 as Boche gallery was heard approaching when apparently 10 ft away. Enemy's work stopped consequently we finished tamping and waited for an opportunity to assist Infantry raid etc. This blow also allows no 15 main to be rapidly extended
Size of crater, if any	...	...	95 x 75 Pear Shaped
Underground damage	...	...	Nil
Surface damage	Silenced machine gun believed to have destroyed MG emplacement
General remarks	
Signed			Major Coullier

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APPENDIX 4

3

MINE EXPLOSION REPORT.

No 5 Acc Mining Coy R.E. Tunnelling Coy., R.E. 1916.

Date	...	...	9-7-16
Time	...	...	11-23. PM
Location	...	...	Manchester
Map Reference	...	...	36. S.W1 M50. a 5 1/2 6 1/2
By whom exploded	...	...	Major Bowler
If British, on whose authority?	...	...	61 st Div. G.S.
Size of charge	...	...	480 lbs ammonal
Depth of Gallery	...	...	26'
Distance from British front line	...	...	450 ft
Amount of tamping	...	...	110' + 2-10' air spaces Total 130'
Reasons for mine	...	...	Boches Gallery had been heard approaching them within 8-10 feet working area. probably for listening purposes. Completed tamping and awaited an Infantry surprise before firing to assist by averting attention
Size of crater, if any	...	...	90 x 75
Underground damage	...	...	Nil
Surface damage	...	...	—
General remarks	...	...	Have reason to suppose enemys gallery destroyed on aft. of shape and direction of crater. Sited a machine gun and believed to have destroyed emplacement large blocks of clay seen against Boche parapet and presume that casualties were caused by debris. Expect that enemy cap to existing crater is considerably damaged
Signed.....			L. Houlton Major acc Mining Coy R.E.

1st Field Survey Company (Printing Section, R.E. 1164).

Plan already sent in
1/6

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O.C., No 3 Amer. Coy., R.E.

Major David, the geological expert of the Australian Mining Corps, will give a lecture at the First Army Mine School HOUGHIN (Sheet 38B.K.15.c.3.8.) at 5 p.m. on July 15th 1916. The subject of the lecture will be "THE GEOLOGICAL STRATA OF BRITISH FRONT WITH REFERENCE TO MILITARY MINING, AND BORING."

As many officers as possible should attend, but will you detail at least four officers from your company to be present.

10/7/16.

W. P. R.
for Controller of Mines,
First Army.

Appendix 6

Copy to 184 Bde.

E. N.

184th Pt Army.

Re Push Pipe - Boars Head
 I have to report that an attempt was made last night 10/7/16 @ 10.35 pm to explode remainder of pipe & charge put in on night of assault on Boars Head.

The existing broken end of pipe was found & after some house cleaning 3 Ammonal Cannisters removed. These were damaged & the explosive was wet, tho' it was probably that all the damaged ones were withdrawn. Two fresh Cannisters were put in & charge fixed but only another 15-20' of crater was formed of total length now about 60'.

L. J. Coultter Major
 A.C. 183 Aust. Min. Coy R.E.

$$\frac{11}{7/16}$$

✓



Original 256
to CofM advanced 1st Army.

The Headquarters,
184th Infantry Brigade/

re Push Pipe Boars Head.

I have to report that, an attempt was made last night 10/7/16 @ 10.35 p.m. to explode remainder of pipe & charge put in on night of assault on Boars Head.

The existing broken end of pipe was found & after some trouble cleaned and 3 Ammonal cannisters removed. These were damaged and the explosive was wet, though it was probably that all the damaged ones were withdrawn. Two ^{fresh} ~~push~~ cannisters were put in and charge fired but only another 15-20ft of crater was formed. Total length now about 60'.

L. J. Coulter,

Major,

11/7/16.

O.C.No.3 Australian Mining Company.
R.E.

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APPENDIX 8

13

(copy)

The C.O.,

2/5 Gloucesters/

Appendix 8.

re Destroying of "Push-Pipe" on enemy sap, Boar's Head.

A 50lb charge of ammonal was placed on the exposed pipe by Boche parapet by Cpl. Street & myself.

A strong party was at work in the Boche sap, apparently engaged in repairs, as hammering & knocking of timber could be heard.

5 Germans had been seen to enter & proceed along the sap at 3 p.m. by sentries.

A machine gun was situated in some part of the sap adjacent to pipe & traversed regularly.

It is reasonable to suppose that the falling debris & shock would kill or place out of action all people in the part of the sap adjacent to the "Blow".

Time of "Blow" 11.45 p.m. The enemy had been sap in the afternoon, apparently, with the object of being allowed to work in peace.

Sheeling our

(Sgd) L.J. Coulter, Major,

O.C. No.3 Australian Mining Company. R.E.

14/7/18.

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SECRET.

APPENDIX 9

31 Div.
S/54 G

14

No.3 Australian Mining Company.

Under instructions received from the Controller of Mines 1st Army, you will continue to be responsible for the WINCHESTER and COLVIN mining sectors till relieved by No.257 Tunnelling Company on the afternoon of Tuesday next the 18th instant.

It is to be clearly understood that these two ~~section~~ sectors are to be kept under continual observation until such time as the relief by the 257th Tunnelling Coy. on the 18th inst. is complete.

Please acknowledge.

J. Baumgartner

D.H.Q.
16.7.16.

Lt.-Col.
General Staff
31st Division.

First Army No. 584 (G).

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RWV

O.C.

I Corps.

Reference G.H.Q. No.O.A.340 of the 28th January, forwarded to you under cover of my 584 (G) of the 31st January, a case has recently occurred when four of our infantry men, who were asleep inside the entrance to one of our mines, were gassed as a result of an enemy mine explosion, and one of these men died from the effect of the gas.

Attention of all concerned should again be called to the instructions contained in the above mentioned G.H.Q. letter.

Adv: First Army.
16th July, 1916.

Sd. S.M.Wilson, Lt: Col: G.S.,
for Major General,
General Staff, First Army.

- | | |
|----------------------------|----------------------------|
| 8th Division. | 173rd Tunnelling Coy: R.E. |
| 15th Division. | 180th " " |
| 16th Division. | 251st " " |
| 40th Division. | 253rd " " |
| 170th Tunnelling Coy: R.E. | 255th " " |
| | ✓ 258th " " |

No. 692/1 (G.b). 17th July, 1916.

Forwarded for information and necessary action in continuation of I Corps No. 692 (G) dated 31st January, 1916.

G. W. Horden.

Brig: General,
General Staff, I Corps.

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1st Army No. 584 (G).

appendix N^o. 11.

APPENDIX 11.

Adv: 1st Army.

O.A. 340.

It has been reported that the infantry manning the trenches are often in the habit of using the entrances to mine shafts and dug-outs made in connection with mining operations for shelter during bombardment, and, in some cases, for sleeping accommodation.

2. The use of these places by individuals not employed on mining, seriously interferes with the progress of mining work, and in the case of the enemy springing a mine in the vicinity of our mine gallery increases the risk of casualties from gas poisoning, because if the gallery is wrecked the poisonous gases from the explosion pour into the gallery and up the shaft.

3. This danger is not recognised by the Infantry officers ^{or} ~~and~~ men, and the officers of the Tunnelling Companies have great difficulty in keeping men out of these apparently safe shelters.

v4. Will you kindly give the matter your attention, and issue instructions to ensure a discontinuance of the practice.

G.H.Q.
28th January, 1916.

(Sd) J.H. Davidson, Brig-General,
for Chief of the General Staff.

2.

3.

2nd Division.
12th Division.
33rd Division.
Dismounted Division.

No. 692 (G). 31st January, 1916.

Forwarded for information and necessary action.

Sd. J.K. Dick Cunyngham, Major GS.,
for Brig: General,
General Staff, First Corps.

(COPY)

REPORT of PUSH PIPE BLOW at RED LAMP on 19/7/16.

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To O.C.,

No.3 AUSTRALIAN MINING COY.R.E./

I have the honor to report that at 4.38 p.m. 19th inst I exploded the pipe at (Sheet 36 S.W.1) N.13 d 5.7.

The pipe entered the earth at a point about 30ft. in front of our parapet, and was pushed for a distance of 90ft, at a bearing of 170° magnetic.

On the evening of the 18th inst I placed the detonating canister in the pipe and carried the leads (electric & instantaneous fuse) over our parapet. The leads were in good order at 4.15 p.m. on 19th inst, but shortly after that time were destroyed by shell fire. I procured ²⁵50lbs of ammonal and with Sgt.Kerby & Cpl.McKay went around the parapet to the end of the pipe & attached the ammonal to it and successfully exploded the pipe.

The crater formed was about 100ft. long, 30ft. wide at top, average depth about 10ft.

I wish to commend Sgt.Kerby & Cpl.McKay for their conduct throughout the afternoon, especially in accompanying me around the parapet in the face of fairly heavy shell fire. They were admirable. No one was injured.

The destruction of our fuses delayed the explosion 9 minutes.

Coy.H.Q. 20/7/16.

(Sgd) O.R.Howie, Lieut.
No.3 Section,
No.3 Australian Mining Company R.E.

(COPY)

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REPORT re PUSH-PIPE BLOW at RED LAMP on 19/7/16.

To O.C.,

No.3 Australian Mining Company R.E./

I have the honor to report that at 4.30 p.m. on 19th inst I exploded the pipe at (Sheet 36 S.W.1) N 14 A 1.7.

The resultant crater was approximately 150ft., long and an average cover of about five (5) ft. The pushing was started on the evening of 17/7/16 and reached a distance of 91ft. This pipe was pushed through a ditch full of water which flooded the pipe and spoilt the ammonal charge. The following evening 18/7/16 I pushed a further length of 51 pipes totalling 147ft. Total distance pushed 338ft. This later charge completely detonated. Time taken in pushing:-

First 91 feet	4 hours 30 minutes.
Last 147 "	3 " 30 "

Charge per foot run= 3lbs ammonal.

I wish to commend Corporal Wm. Bayes & L/Cpl. E.E. Jackson for the cool & efficient manner in which they assisted me in detonating the pipe-mine on the afternoon of the 19th inst.

Coy.H.Q. 30/7/16.

(Sgd) B. Priestman, Lieut.
O.C. No. 4 Section,
No. 3 Australian Mining Company R.E.

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 Headquarters
 Second Army
 No.A/1825/20
 Date 27.7.16.

Adjutant General's
 Branch of the Staff
 D/1209.

Second Army "A".

The posting of Captain Sanderson, late Australian Mining Corps, to command the 3rd Australian Tunnelling Company, is approved. Please wire the necessary orders and report date of assuming duties.

G. H. Q.,
 26/7/16.

(sgd) . A. COURAGE, Major,
 for A. G..

 O.C., No. 3 Aus. Tun. Coy.

The above copy of letter, authorising the posting of Capt. Sanderson to No. 3 Australian Tunnelling Company, is authority for taking Capt. Sanderson on the strength of No. 3 Australian Tunnelling Company.

G. G. Williams

21/9/16.

Lieut.-Colonel, R.E.,
 Controller of Mines,
 First Army.

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CONSTRUCTION OF ENTRANCES TO GERMAN DUGOUTS. German Field Works. Plate I.

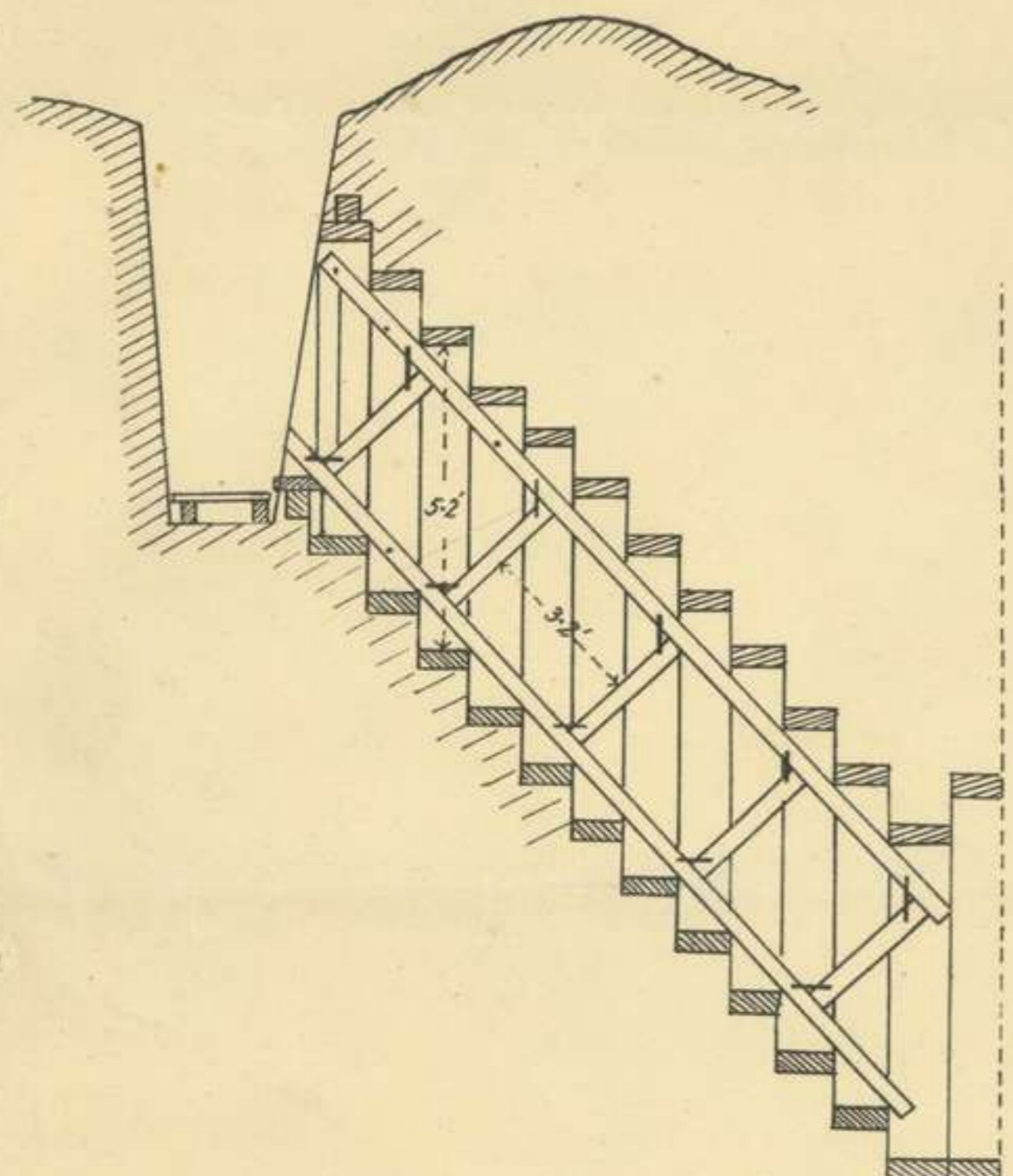
APPENDIX 20

FROM CAPTURED DRAWINGS.

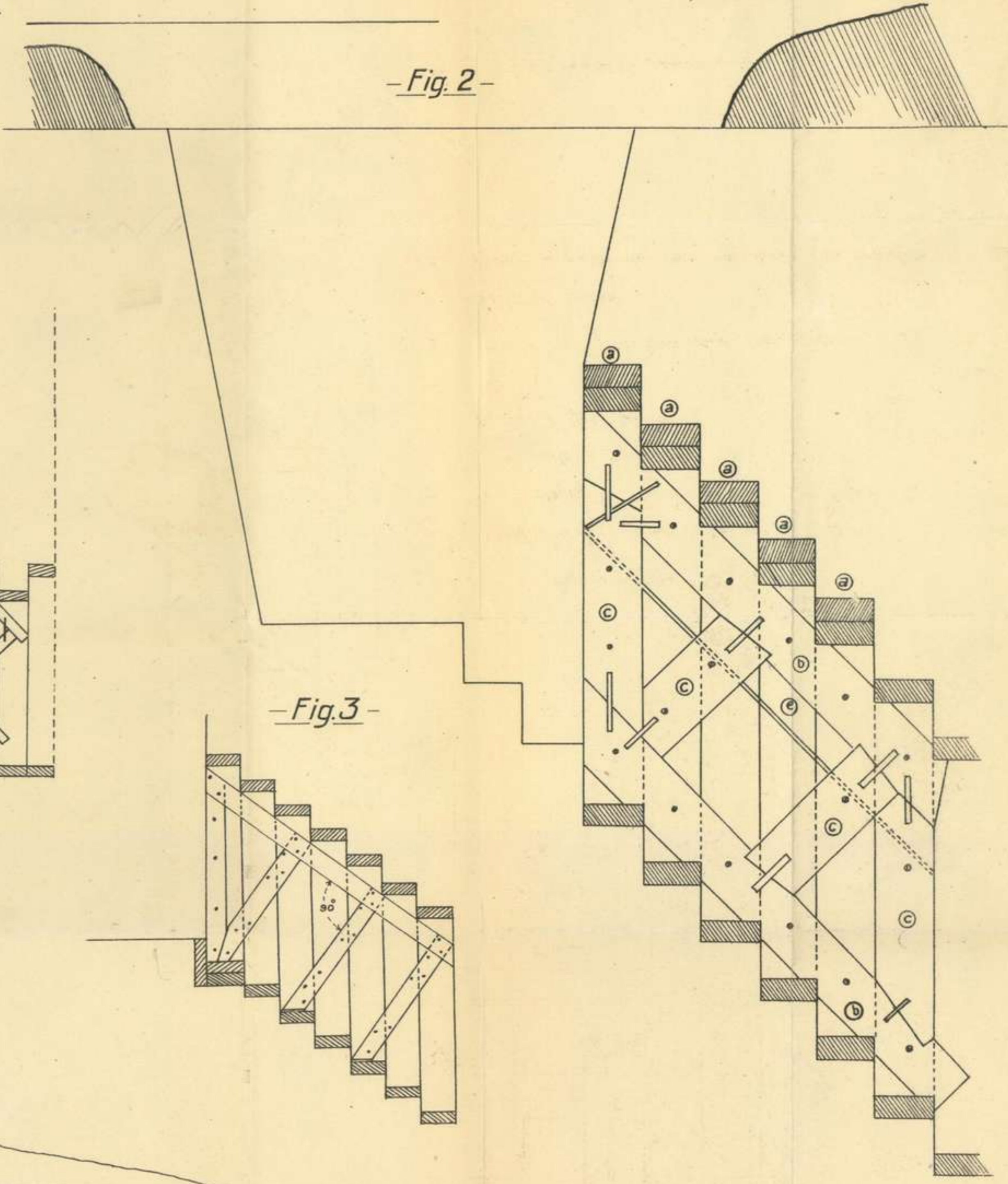
July 1916

NOTE: They would be improved by the addition of a bursting course over the entrance and by shoring the trench opposite the entrance.

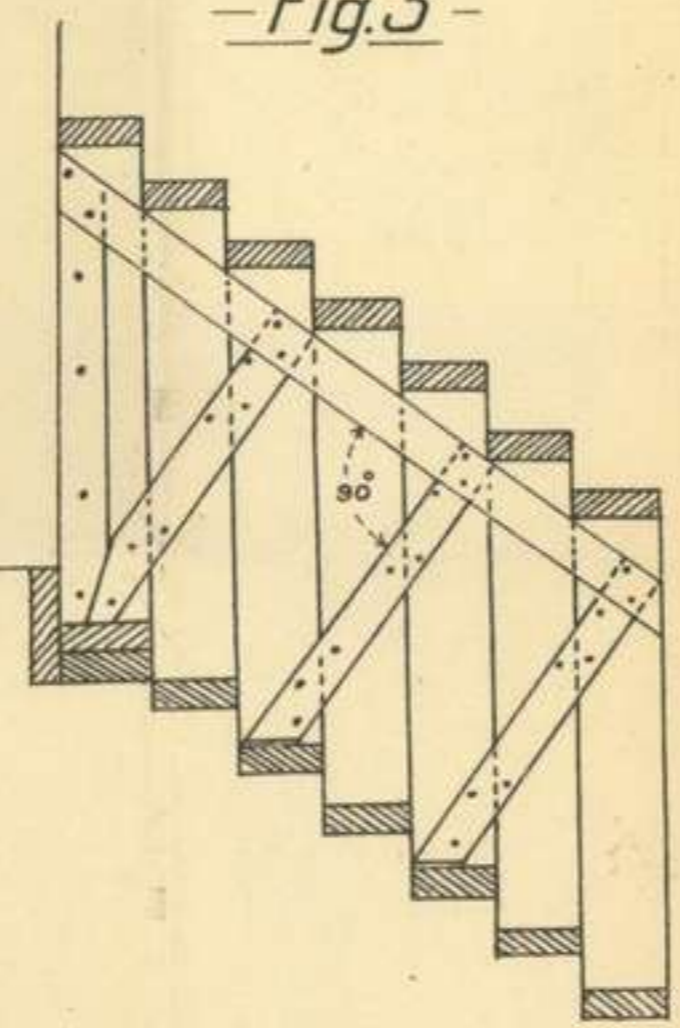
- Fig. 1 -



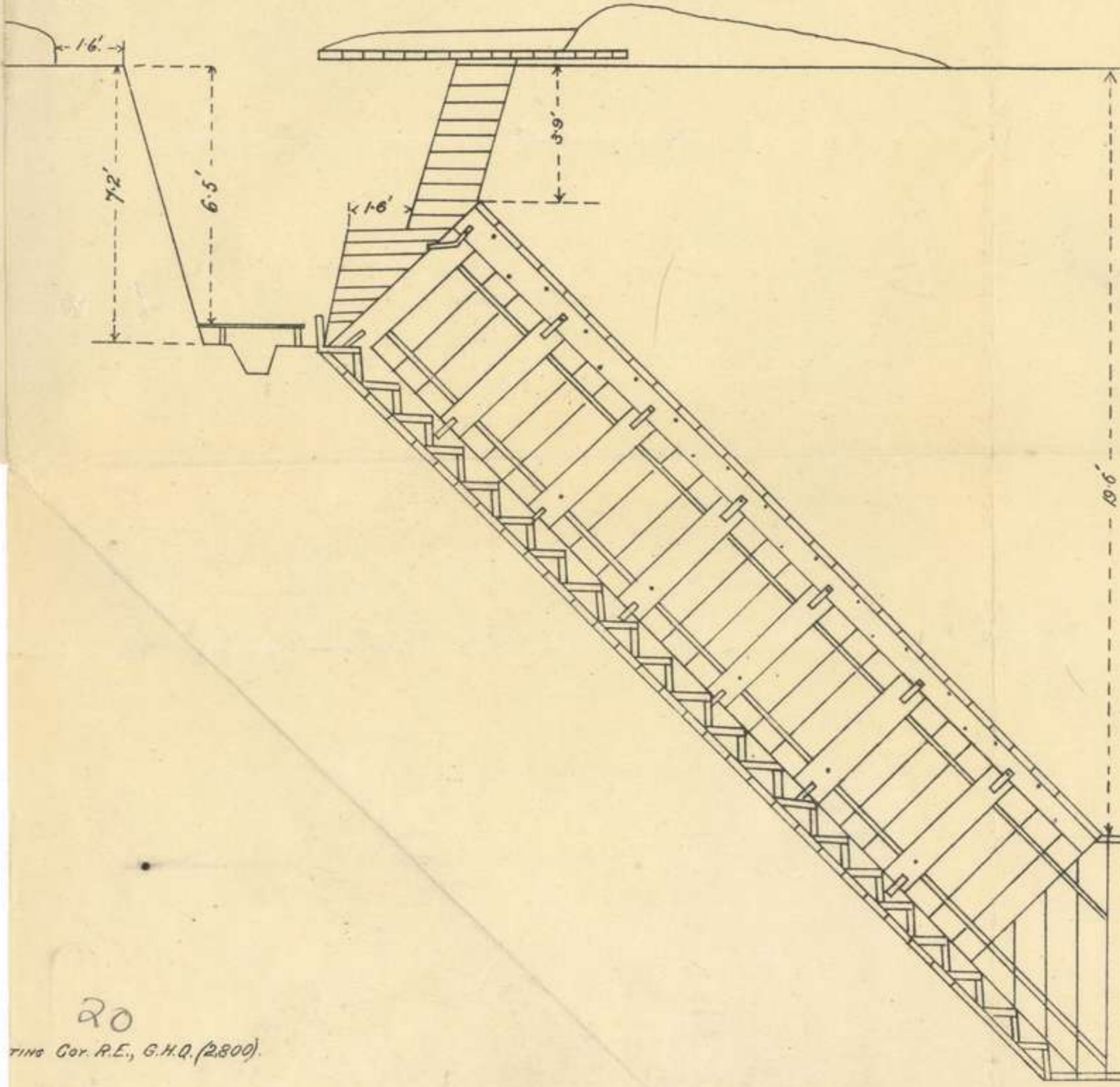
- Fig. 2 -



- Fig. 3 -



- Fig. 4 -



References for Fig. 2.

- (a) Mining frames with double top sills
 - (b) Thick planks notched and fastened to the frames by nails or screws.
 - (c) Struts of thick planks.
 - (d) Dogs.
 - (e) Iron tie rod (to be bent round last strut).
 - o Nails or screws.
- N.B. Further strengthening by angle irons and trenails is desirable.

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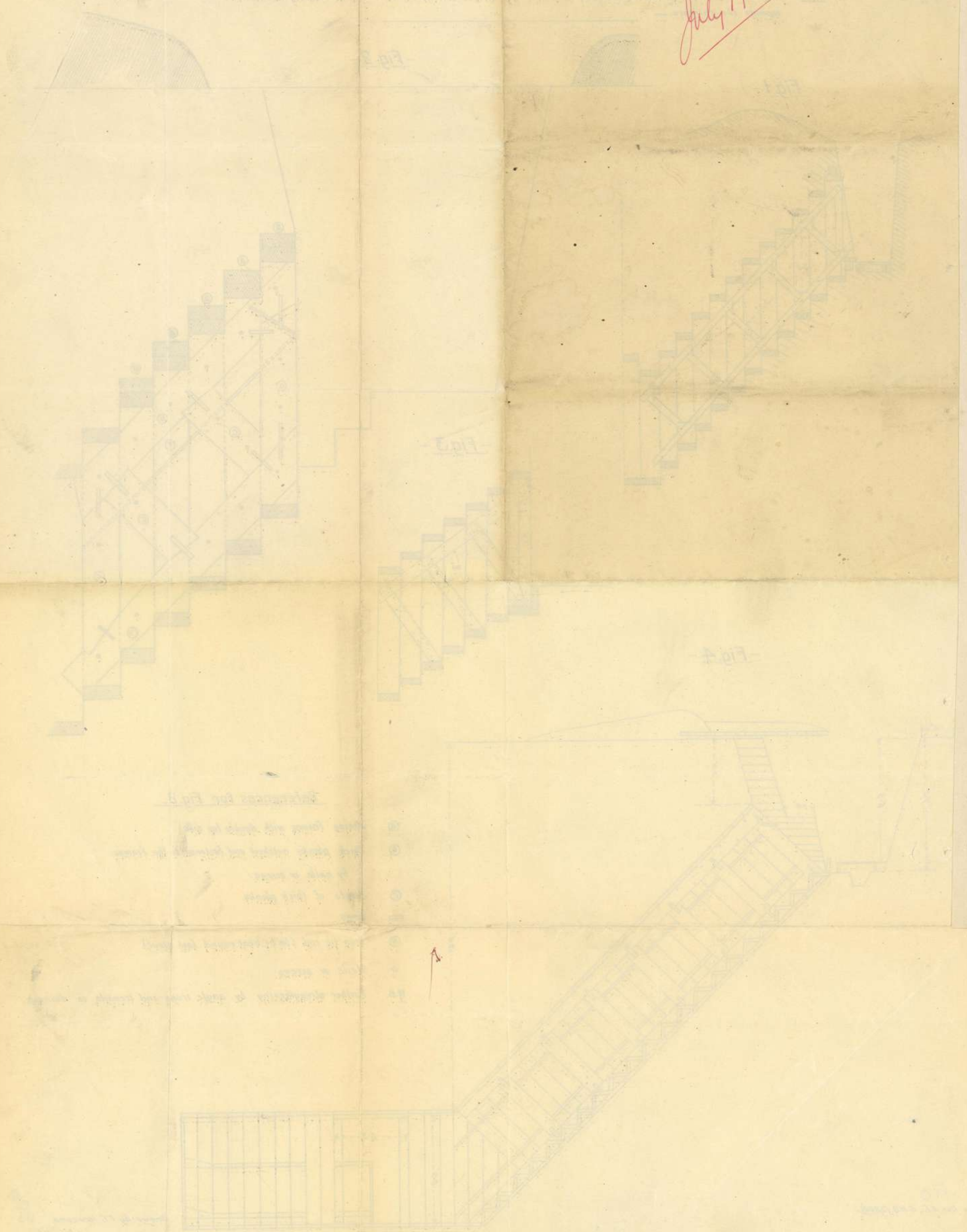
ENGINEER CORP. R.E., G.H.Q. (2,800).

Drawn by F.G. MEXCOMB.
1/CPL. R.E.

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APPENDIX 15

July 1916



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T r a n s l a t i o n

of German pamphlet captured at FRICOURT, July, 1916.

"EXTRACTS FROM THE OLD MINING REGULATIONS"

ISSUED BY THE GENERAL OF PIONEERS, ARMY HEADQUARTERS, LAON, APRIL, 1915.

INTRODUCTORY REMARKS.

The following extracts from the old Mining Regulations are issued as being of value in the present war to supplement the information given in instructional manuals already in the hands of the Pioneer Companies, viz.:- The Pioneer Instructions for Fortress Warfare, and the Demolition Manual (SPRENGVORSCHRIFT).

It is absolutely necessary that the conduct of mine warfare should be in the hands of a Pioneer officer responsible for this service to the sector commander. He must be given a certain independence with regard to the measures that are necessary.

A mine diary and a listening diary should be kept and a mine plan compiled, (see appendices A, B, C and D.) The mine plan is of special importance when decisions as to future action have to be taken. It is not sufficient to calculate charges by means of rough sketches and estimates of distance. They do not permit of sufficient exactness as I frequently have had occasion to point out. Further, it is much easier for a Pioneer officer to explain mine warfare to an Infantry General, and to obtain his decision quickly on any point on which it is required, if he can show him a plan. A good plan of the mine area will also give useful hints as to the enemy's intentions.

Extracts from the old Mining Regulations.A. A T T A C K.

It is desirable to attack the enemy's defensive mine system on as broad a front as possible in order to induce him to scatter his available resources.

Mine systems with a narrow front can be turned by the attackers' galleries and attacked in flank, where they can only offer..

offer slight resistance. Usually a mine attack commences with the driving of a number of inclined galleries whose entrances are in a trench specially dug for the purpose.

1. Mine Plans.

When entering up work in the mining diary, listening reports which have had an influence on the measures taken should be quoted. Listening reports should be entered up in the listening diary directly they are received.

The mine plan must not only show our own work below and above ground in the mining area, but also the enemy's defensive system so far as it is known (this should be in dotted lines).

The deductions drawn from listening reports should also be shown on the mining plan. If they are confirmed by further reports, the situation of the enemy galleries which they disclose should be marked or indicated on the plan.

2. Commencement of Galleries.

If the sap heads are not commenced from the Infantry position, the trench from which they are begun should have the same general direction as the Infantry position. These sap heads should be at such a distance from the supposed positions of the faces of the enemy's galleries that the attacking miners can form a crater, (before they have driven into the zone of danger of an enemy blow,) without damaging their own trench. The distance between the front edge of this trench to the face of the nearest gallery of the enemy should not be less than 20 metres.

After a zero point has been fixed as datum for levels, the directing lines should be fixed, and the height of the sill of the first frame and the inclination of the various galleries settled in accordance with the plan of attack.

It is often important in mine warfare to destroy the enemy's galleries when they are still distant by means of over-charged mines and thus to form large and deep craters. For this purpose it is necessary, if possible, to go deeper than the hostile..

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hostile galleries and to use sufficiently large charges.

In calculating the necessary dip of the galleries, care should be taken to set the entrance in such a way that water will not accumulate in front of it. Also, in order to be able to fire a large charge in the gallery, it should be at least twice as long as the shortest line of least resistance. In calculating the length, care must be taken that when the mine is fired the crater does not destroy the Infantry trenches and the dugouts in them.

If the enemy mines are so deep that the desired depth cannot be reached by inclined galleries, it will be necessary to be content with less depth and to obtain the desired result by an increase in the charge.

The distance apart of galleries should be at least two or three times the length of the shortest L.L.R., so that a single enemy blow will not damage more than one of them; and at the same time, at such a distance apart that the enemy cannot drive undetected between two of them.

It is advisable for every attack to have from 6 to 8 galleries, (numbered in arabic figures from right to left), as the enemy will attack on the widest possible front in order to ensure success. This number of galleries should also prevent the attack being enveloped by the enemy and will facilitate future mining operations undertaken from the craters.

In removing earth from the galleries, spoil heaps behind the entrances are to be avoided, as they might betray the situation of the galleries to the enemy. The mine dugouts should be roomy and strongly constructed so that they are proof against howitzer fire and that the explosives are well protected.

3. Pushing Forward Attack Galleries.

The attacker must expect that some of his galleries will be destroyed by the enemy's camouflets. It is desirable, therefore, not to drive all the galleries the same length, but to hold..

hold back those from which it is intended to make craters. Thus the defender will be induced to use his galleries against the most advanced galleries. The attacker will then be in the position to complete undisturbed the galleries which he has delayed.

It is generally desirable either to fire several mines simultaneously, or the second and third very soon after the first, because if only one crater is formed the defender can devote his whole attention to it, and by a suitable combination of galleries will be able to make further progress exceedingly difficult.

If the ground permits, various forms of bored mines can be utilised in the attack.

If the attacker makes quick use of charges in borings he also will be in a position to destroy the enemy's works by means of camouflets, which will be very valuable.

Bored mines can in certain circumstances be used to form craters, as they mean great economy of time.

In addition bored mines can be made use of for making galleries and also for loosening very soft ground, such as loam or plastic clay.

4. Duties of the Non-commissioned Officer.

Non-commissioned officers have assigned to them the duties of superintending the work in the galleries, arranging for the removal of the earth, and for the bringing up of the necessary material. Before withdrawing their men from a gallery they must hand over the work and the tools and also the results of the last listening reports. During a shift great care must be taken that the prescribed direction and levels are maintained and that the work is pushed forward with all possible energy. The N.C.O. of a mining gang fixes the time for the relief of the various men, and is responsible that earth is not heaped up in the galleries and that only the personnel absolutely necessary for the..

for the execution of the work is kept in them.

As soon as hostile miners are heard working, or a hostile gallery is broken into, the non-commissioned officer should go to the spot and then report to the Officer either personally, or, if the circumstances are such that he ought not to leave his post, he may send a message by a miner.

Before the new shift takes over, the N.C.O. of the old shift should measure and level the length of the gallery from a known fixed point, record the result with the number of the gallery on paper, and hand it to the Officer.

5. Listening Duty.

As soon as the galleries approach the faces of the enemy system, work in the latter must be listened for. For this purpose work in all the galleries should be stopped simultaneously for ten or fifteen minutes, in order to obtain information from the sounds heard as to the distance, direction and level of the enemy's work. The nearer the enemy, the more frequent must be the listening periods, even if they are only ^{very} short.

Only specially trained and suitable miners should be used for listening duties. The listener should put his ear as close as possible to the ground; for this purpose it is best to make a small hole.

No definite rules can be given for judging distance, as sound waves travel differently in different ground. The following, however, can be accepted as constant:-

1. Work in galleries with frames at intervals can be heard further than in galleries that are completely cased in.
2. The plainer the work in one and the same enemy gallery is heard, the nearer it is.
3. If the distinctness of the sound of work increases, the enemy is getting nearer.
4. If the distinctness of the sound of the enemy's working decreases it can usually be concluded that he is busy with loading and tamping.

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5. Before the enemy comes very close (under three metres) it will generally be possible to distinguish clearly between the sounds of the various tools in use.

All experience shows that the miner is always inclined to judge that the enemy is too near rather than too far off. The best means to estimate as accurately as possible is to listen to the work in one's own headings, the distances of which are known, and to compare the sounds heard with those made by the enemy.

As soon as the Officer in charge has given the order for work to be resumed after listening, the N.C.Os. and the miners who have been listening should report to the Officer and give the result of their observations. If the information is very important, the Officer should himself go to the listening place.

6. Craters.

If the situation of the enemy's galleries is more or less known, or fixed through reliable listening, or through the enemy firing camouflets, galleries should not be run directly towards them, but rather between two of them, for when a mine is fired the enemy galleries will then be struck in the flank and thus destroyed for a greater length.

When it is intended to fire a mine the pioneer officer in charge should be informed in order that he may take measures to arrange for consolidating the crater. When the mine is ready for firing, a report should be made to him and he will then order the withdrawal of the men in the trenches and the galleries which are within the radius of possible effects of the mine. The galleries in the neighbourhood of the charged mine should be properly strutted before the mine is fired, if it is intended to make any further use of them. The pioneer officer in charge will give the order to fire. Unless there are special reasons, the firing should be postponed until nightfall so that the consolidation of the crater and the construction of the necessary communication trenches can be carried out under cover of darkness.

7.

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7. Advance from Craters.

The position and size of the crater should be entered on the plan as soon as possible after the explosion. When this has been done, the pioneer officer in charge after sizing up the situation, can settle what orders should be given for the further advance from the crater. The solution of this problem requires energy and endurance. As the enemy will usually be close up to the crater with only the heads of his listening galleries destroyed, he will generally be in a position to attack any new galleries made, as well as the rim of the crater, by means of camouflets. If, however, several craters are formed simultaneously or soon one after another, the attention of the enemy will be distracted and he will have a number of things to attend to at the same time.

If several craters can be connected up, a new mine trench can be formed from which the attack can again be made on a broad front.

As a rule two or three galleries should be driven out of each crater; they should be as deep as possible and therefore must be commenced near the bottom of the crater. They should be given such direction that they gradually gain their proper distance from each other.

If the enemy's galleries are very deep it may give good results, if one or two shafts are sunk in the crater and the galleries commenced from these. As soon as the galleries have gained the necessary length they should be charged. After each fresh blow the advance should be continued from the crater in the same manner as has been described above.

In certain circumstances, bored mines can be used to form craters; the borings should be made from the edge of the crater at an angle of 45° . The chambers formed by firing small charges are then filled with suitable charges. If this process can be carried on, a very important acceleration of the attack can be obtained.

8..

- 8 -

8. Dummy Galleries.

In order to interfere with the enemy's listening arrangements special inclined galleries should be run out from the craters, or from the mine trench, in which work should be carried on noisily.

9. Breaking into Enemy's Galleries.

If enemy's galleries are met with, every effort should be made to break into them, and if necessary to take possession of them by force of arms. Before the materials in the enemy's gallery is removed the following measures should be arranged for:-

The mining detachment, strength about one officer and ten men, armed with revolvers and daggers should break into the exposed gallery and take possession of it as far as it is possible to go, and then build a barricade, or if necessary render it useless to the enemy. Barricades can be made either by erecting a timber bulkhead and then firing a charge, or simply by firing a charge. In order to impede any advance of the enemy towards the barricade or the charge, before the barricade is quite complete or the charge primed, stink bombs or stink balls (made out of hair, tow, and sponge soaked in petrol) should be thrown into the enemy's gallery. If the miners break into a main gallery from which there are branches, the latter should be searched to see if they are not connected with other parts of the defence system. If this is the case, the miners must safeguard themselves against being cut off by the erection of barricades. Care must be taken that men and material are ready to carry up timber and tamping to the miners if it should be required.

When the crater is formed, if no enemy galleries are exposed, the detachment can be used to make dugouts in the crater, and the necessary preparations for commencing galleries. Listening must also be done at the walls of the crater. It is most important that all this, or as much of it as possible, should be carried out as soon as possible after the explosion and before..

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and before the enemy can take counter measures and overwhelm the crater with shells.

If no resistance is encountered in the galleries it must be assumed either that the enemy has given them up on account of bad air, or, in expectation of our breaking through, has laid charges in them. It is therefore desirable before taking possession of a gallery to send a couple of men forward to reconnoitre, provided with safety lamps and breathing apparatus. If a charge is found, the leads should be cut or water poured over it, so as to make it harmless as soon as possible. If the captured galleries are suitable for use in the attack, one end should be connected to our own galleries and the other end barricaded so that the enemy cannot return. In certain circumstances such a gallery may be very useful for watching the enemy. If no use can be made of a gallery it will generally be better to destroy it completely, using a number of small charges fired simultaneously for the purpose.

B. D E F E N C E.

1. Plan of Minefield.

The plan of a mining area must not only give an exact representation of the mine system but should also shew the surface situation. For this purpose it is desirable that 0.5 m. contours should be shown. There must further be marked on it, with dimensions, the main defence galleries, and the listening galleries. There should be a note as to the nature of the ground, the position of the barrier gates and the mine chambers which have been constructed. There should also be a list of the conventional colours used and a table of mines; see Appendices C and D.

2. Preparatory Measures.

(A). The protection of the mine entrances against hand grenades and light howitzers.

(b). Provision of ventilating pumps, air pipes, leads for firing the mines and for telephone.

(c)..

(c). Provision of lanterns and candles for lighting the galleries.

(d). Provision of signboards.

(e). The erection of doors in the galleries.

(f). The execution of borings to investigate the nature of the ground.

(g). The provision of tamping material in the branch galleries and back portions of the main galleries, and the construction of recesses to form small stores in the walls of the galleries.

(h). Preparation of ventilation apparatus.

(i). The driving of boreholes from the listening posts in the first line, if the ground permits. Some of these should be driven in an upward direction so that should the enemy advance above ground he may be impeded by firing small charges and compelled to resort to mine warfare. Others should be driven horizontally so that should the enemy attack underground his galleries may be blown in by camouflets.

(j). Provision of boxes with revolvers and daggers near the entrances to the main galleries.

3. Duties of the N.C.Os.

The N.C.O. distributes the working party placed under his orders, and conducts and checks the listening service and any work that has to be carried out. He should be on the spot when charging is taking place and be present where danger or special circumstances demand. Although the results of listening should be reported at fixed intervals, special occurrences or observations should be reported at once. If the circumstances do not permit of the N.C.O. leaving the gallery himself, he should send a suitable man to report to the officer and act on his own judgement until the latter arrives. Before the change of a shift he must record the work that has been executed exactly on paper and hand it to the officer. He must instruct the N.C.O. of the.

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of the relief accurately as to the situation and the work in hand. The listeners are not to be withdrawn from their posts until the new shift has taken over.

As soon as the handing over of the work and tools has taken place, both N.C.Os. report to the officer. Each N.C.O. should receive a sketch of the projected work on which the situation, length and distance apart of the branch and listening galleries are shown.

4. Security.

As soon as the commencement of mine warfare is expected, the "service of security" should be instituted.

It consists of :-

(a). Listening.

As soon as mine warfare begins a watch should be formed from the men of each shift, whose duty will be to provide listening posts for the whole system. If there are not enough men, two or three of the galleries must be attended to by patrol posts. As soon as any conclusion can be drawn as to which galleries of the system are threatened by the attacker, every branch in the probable mining area should be provided with a post at which two men are always on duty; the other galleries that are not immediately threatened should be visited by a patrol post in each shift.

Officers and Non-commissioned officers must keep a sharp lookout on the listening service and check the accuracy of the results reported by their own observations. At what time these are entered up in the listening diary will be fixed by the engineer officer in charge. The reports of the posts can either be made by telephone, or verbally by one of the men of the post, who should report to the engineer officer accompanied by the non-commissioned officer concerned, either at a fixed hour, or if the circumstances should require, at once. The other
man..

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man remains in the gallery. If work is in progress, it must be stopped simultaneously for ten or fifteen minutes before the listening period. This can be done most easily by the officer giving a signal whistle at the entrance of the main gallery both for stopping and recommencing work. In general, the rules given with regard to listening in the attack, see A 5, apply equally to the defence. The boreholes made from the listening galleries should be used with great precaution, as they do not always conduct the sound truly and may easily lead to errors in judging distance and direction.

(b). Reconnaissance.

In order to obtain more exact information as regards the number and situation of the attackers' galleries than is possible by listening, creeping patrols of one officer and two or three tunnellers should be sent out by night towards the enemy's trenches, or raids should be undertaken by Infantry, who should be accompanied by an Engineer officer with a few Tunnellers for reconnaissance purposes. Parties of Tunnellers may also be detailed to follow, carrying ready fused charges of about ten lbs. which should be put into the enemy's galleries and fired as soon as he has been driven out of the mine trench.

5. Execution of the fight below ground.

The advance of the attacker by means of galleries and his blowing of craters should be countered by the defender by means of well timed firing of camouflets, for the purpose of destroying the galleries of attack and when possible the charges in them.

In firing camouflets it should be borne in mind that the enemy's galleries can best be destroyed from the flanks which the defender must endeavour to gain by enveloping the enemy.

The preservation as far as possible of our own mine system must always be borne in mind. With this in view the placing of charges in the main galleries should be avoided as long as possible..

as possible, for if fired then a very great part of our mine system may be lost without doing the enemy compensating damage. An enemy's gallery which threatens one of our main galleries is best attacked by breaking out from one of the listening galleries lying on its flank. Any of our own galleries which stand in danger of being damaged by one of our camouflets should be very carefully strutted.

More or less damage, however, will be done to our own mine system by firing camouflets and thus in a certain sense the duration of our resistance will be shortened. For this reason, therefore, camouflets should not be used as a means of defence unless it is necessary and a good result seems assured.

Nevertheless the enemy must not be permitted to approach so close that he can reach the listening galleries or the charge in the time required by the defender for loading and tamping.

If the enemy is getting close to a gallery the chamber should be completed as noiselessly as possible, and charged and tamped as far as the first bulkhead, behind which the advance of the enemy should again be listened for. If the enemy approaches the immediate vicinity of the gallery, while this work is in progress the tamping should be completed and the mine fired. If, however, the enemy suspects what we are doing and does not push forward the attack gallery, the tamping should not be continued but opportunity should be waited until the enemy advances again and comes within dangerous distance. It is not desirable to take any action if the enemy passes by our gallery; it should only be blown when the enemy commences charging.

If the enemy is heard making a chamber in front of the heads of the listening galleries and if he can blow these, even by means of a camouflet with the maximum charge possible
under..

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under the circumstances, the defender should charge and fire at once; if necessary one of the galleries may be pushed forward for the purpose.

If the enemy makes his chamber so far distant that the defender has not enough time to get within reach and charge and tamp, before the enemy will in all probability have completed his chamber and charging, and if Bored charges cannot be made use of, it will be better for the defender to confine his efforts to listening. The defender will then be able, to strut the galleries which lie within the danger zone, close the doors at the head of the galleries that are not in danger, and to withdraw the men from the listening galleries, before the mine is fired.

As soon as a camouflet has been fired the ventilation apparatus should be examined by men wearing breathing apparatus and, if necessary, put in order, and removal of the foul air at once be commenced.

When the air has become sufficiently pure for the galleries to be entered again, the tamping should be removed, or if this entails too much work, a new branch should be broken out behind it and carried past the gallery that has been destroyed.

If the ground permits of bored mines being used against/^{the enemy} who is approaching the listening galleries, the defender has the chance of making use of camouflets whilst the enemy's galleries are still at a considerable distance from the listening galleries. The enemy will then be induced to fire his charges prematurely and our own mine system will not be damaged. It may also be desirable in certain circumstances to attack the enemy with bored mines from the spots most in danger, to load them very quickly and to fire camouflets. If the enemy attempts to use bored mines, he must be attacked so that his borer is smashed by bored charges whilst at work, or at any rate his work impeded. If the enemy is successful in forming a bored chamber..

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chamber this must be destroyed by a camouflet.

6. Unloading of enemy's mines.

As a rule an attempt to approach an enemy's mine without attracting his attention, and to unload it, can only very exceptionally be made because the time between the charging of the chamber and the firing of the mine is relatively very short. The attacker, therefore, if there is any danger of the defender being able to reach the charged mine, will usually fire it even if it has only been partially tamped or has no tamping whatever. If the defender does have an opportunity of unloading an enemy's mine, the firing leads should be first cut through and then the powder drenched with water or removed.

7. Action after a blow.

If the attacker blows and forms a crater the galleries of the defensive mine system which lie within the area of its effects should be examined in exactly the same way as after the firing of a camouflet, freed from foul air and repaired. Galleries should be driven towards the crater so that it may be entirely enveloped.

The advance of the attacking Tunnellers from the crater should be impeded in exactly the same way as at the opening of mine warfare. It will often be possible by using suitable charges to blow in a rim of the crater and thus to deprive the attacker of cover. At this period of mine warfare, a watchful and active defender should always have an advantage over the attacker. The defender should make an extensive use of bored mines just as the attacker does. The attempts of the attacker to advance from craters with their assistance is best combated by firing bored charges.

If a gallery has been exposed by a blow and the enemy has by this means got into the mine system, he must be driven back by force of arms to a suitable distance so that the bulkhead doors may be closed.

When..

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When the protective barrier has been formed, a part of the mine gallery can be blown in by firing a small charge either partially tamped or without any tamping whatever. If a gallery has to be hastily abandoned without there being any intention of destroying it, the advance of the enemy can be checked by erecting a hasty barricade of baulks and gabions filled with earth which will form quite a considerable obstacle.

8. Breaking into Enemy's Gallery.

As a rule it has been the experience that in each collision between the defender and the attacker underground the former has lost more or less of his galleries. This, however, should be avoided as far as possible. An unexpected meeting of the hostile galleries, a so-called "breaking in", cannot occur if the defender is watchful. If, however, it does occur through there not being sufficient men in the mine system, the action taken should be similar to that described under No.7.

9. Abandonment of Galleries.

Galleries which must be abandoned because they cannot be held any longer must be destroyed if they are likely to be of any use to the enemy. For this purpose a number of small chambers or boreholes should be made in the walls, which can be charged and provided with firing circuit as required. These charges are best placed behind a suitable bulkhead door or a hasty barricade. The approach of the enemy to one of these barricades can be delayed by the use of stink balls. When only a short time is available, charges of about 110 lbs. of powder in sacks or barrels laid at intervals of about five metres on the floor of the gallery can be used. They can be fired simultaneously as soon as the gallery to be destroyed has been isolated from the rest of the mine system by two to four metres of tamping. Where the ground is loose, galleries revetted with wood can be most easily destroyed by knocking out the stanchions and removing the topsills.

16.

MINE DIARY SHEET

DAY OF MINE WARFARE	DATE	OFFICERS	ON WORKS.				TIME	SUPERINTENDING OFF.	ORDERS	WORK DONE	REMARKS.
			TUNNELLERS		WORKING PARTIES						
			N.C.O.	MEN	N.C.O.	MEN					
COLOUR of DAY											

APPENDIX A 37

16.

LISTENING DIARY SHEET

APPENDIX B 356

DATE	HOUR	GALLERY 1	GALLERY 2	GALLERY 3	GALLERY 4	GALLERY 5	GALLERY 6	GALLERY 7	GALLERY 8
	9 AM								
	11 AM								

APPENDIX B

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INSTRUCTIONS FOR MINE PLANS

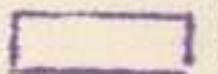
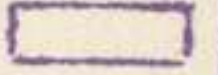
PLAN. SCALE 1/200
SECTIONS. SCALE 1/100

APPENDIX C

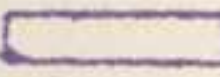
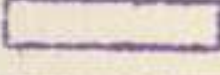
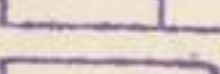
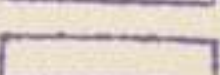


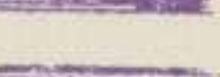
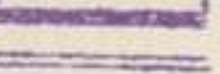

APPENDIX D

CONTOURS AT 50m INTERVAL

RED CONTOURS (potted) AND LEVELS OF GROUND
BLUE LEVELS IN DEFENCE SYSTEM
BLACK LEVELS IN ATTACKERS SYSTEM

- MONDAY 
- TUESDAY 
- WEDNESDAY 
- THURSDAY 
- FRIDAY 
- SATURDAY 
- SUNDAY 

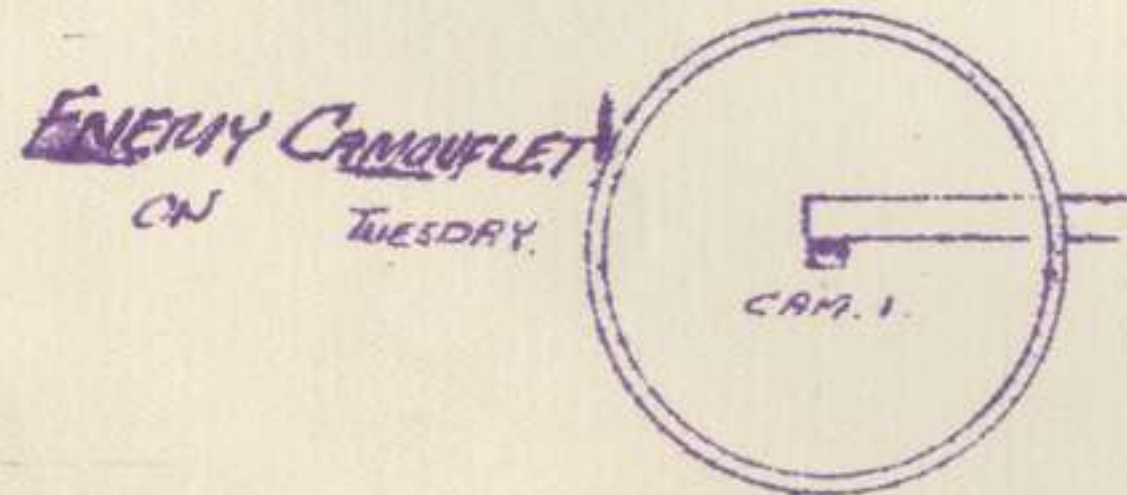
IF NO WORK IS DONE ON ANY DAY, THE COLOUR IS NOT USED

-  MASONRY GALLERYS.
-  WOOD CASED GALLERIES MADE DURING MOBILISATION
-  GALLERIES MADE DURING TIME IN BATTLE COLOUR ACCORDING TO THE DAY
-  MADE MONDAY DESTROYED TUESDAY
-  DESTROYED AGAIN ON WEDNESDAY
-  MADE MONDAY DESTROYED TUESDAY CLEANED UP AGAIN ON WEDNESDAY
-  MADE MONDAY DESTROYED TUESDAY AND CLEANED UP, DESTROYED AGAIN WEDNESDAY AND AGAIN CLEANED UP THURSDAY.
-  RESULT
-  BORE MINES WITH COLOUR OF DAY

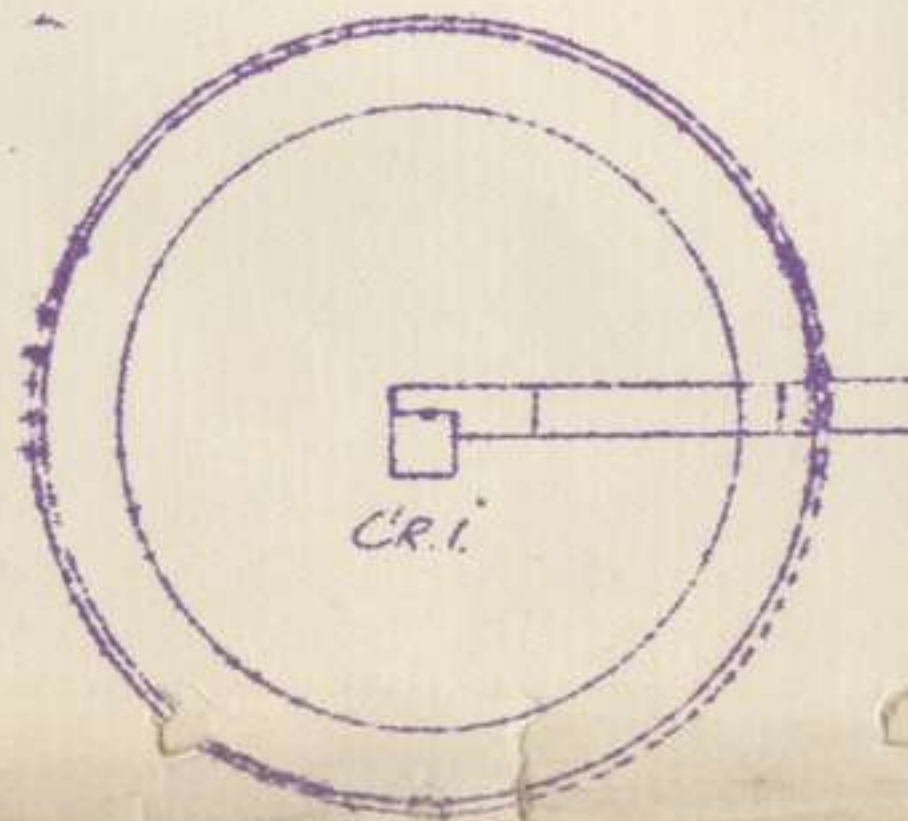
CHARGE TABLE
SHEET.

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No	DAY	DESCRIPTION OF BLOW	W	DISTANCE & CENT. OF CHARGE (MTR) DIA	CLASS OF GROUND	POWDER CHARGES		DIAMETER OF CRATER		REMARKS
						CALCULATED	USED	CALC.	ACTUAL	
1	5 AUGUS Monday	CRATER I	7.5		Y	1265	1300	7.5	8.0	
2		CRATER II	7.0		-	1749	1750	8.75	9.0	
3		CAMOUF I	4.50	5.75	-	107.00	100.00	5.75	5.25	*GREATER CHARGE GREATEST
4		BORED MINE I			-	-	-	-	-	



ENEMY CRATER BLOWN ON WEDNESDAY



APPENDIX D

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