REPORT ON THE PRELIMINARY INVESTIGATION OF THE GOODMAN SUBWAY

CANADIAN NATIONAL VIMY MEMORIAL
MAY 2000 & JANUARY 2003



Prepared by Lt Col M I Dolamore MBE
Deputy Chairman
The Durand Group

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REPORT DATA

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Reference No:	Durand/101/03
Author:	Lt Col M I Dolamore MBE RLC
Contact Details:	Deputy Chairman, The Durand Group 5 Wentworth Avenue Temple Herdewyke, Southam Warwickshire CV47 2UA E-Mail: mike@dolamore.demon.co.uk
Photographs:	Lt Col M I Dolamore MBE RLC Lt Col (Retd) PG Robinson
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EXECUTIVE SUMMARY

1. Access into the Goodman Subway was made by the Durand Group in May 2000. Access was made through the interconnection of the Albany Sap with the P.73.J access tunnel into the La Folie system. Access into the latter was through the normal deep level access point and involved a hike along the whole southern leg of the La Folie system. Access was re-made in January 2003 for additional investigative purposes.

2. The aims of these explorations were to: assess the structural stability of the Goodman Subway and its associated subterranean features; note and make comment on any archaeological features that allowed a better understanding of the historical context of the Subway in relation to the Vimy battlefield; and to make recommendations for any further work that might be of benefit.

3. The Goodman Subway was found to be in generally sound structural condition with all of the various access and ventilation points blocked with chalk and clay debris. To the east the tunnel is blocked at a point where Mining and Subway maps indicate there was an exit to the surface. To the west the tunnel is blocked at a point where the maps indicate there was a shaft.

4. A number of new subterranean features, not shown on any of the available plans and maps were noted. An unrecorded store for one of the mapped medium trench mortar positions was discovered as well as a possible additional entrance leading upwards. Where the tunnel connecting the higher level trench mortar emplacements overlies the Subway and other features there is evidence of clay intrusions into the lower levels from above.

5. Only a few artefacts were noted in the Subway. Communications cable and armoured firing cable was found to run along the length of the tunnel. Two bayonets and a number of live grenades, as well as other metallic debris, were discovered. The grenades were left in situ. The most notable feature of the Subway was the extensive array of graffiti on the walls of the tunnel.

6. It is likely that a significant length of the Subway remains clear on the other side of the shaft blockage and it is recommended that access through the blockage be made as a future Durand Group project. In order to facilitate such a project it is imperative that the Albany sap entrance to the Subway be opened up as the P.73.J route is inherently unsafe and has no long term utility.

PRELIMINARY INVESTIGATION OF THE GOODMAN SUBWAY – VIMY NATIONAL MEMORIAL

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PRELIMINARY INVESTIGATION OF THE GOODMAN SUBWAY – VIMY NATIONAL MEMORIAL

1 INTRODUCTION

1.1 As part of the work currently being undertaken to evaluate the general safety of the Canadian National Memorial at Vimy Ridge, France the Durand Group has been assisting the Canadian authorities in evaluating the underground features located within the Canadian site. As part of this work the Durand Group undertook a preliminary investigation of the Goodman Subway in May 2000 with some follow work undertaken in January 2003. This report provides a historical background to the Goodman Subway, details the outcome of the preliminary investigations and makes recommendations for further work.

2 OBJECTIVES

2.1 The objectives of this project were to:

- Gain access to the Goodman Subway through the P.73.J incline of the La Folie Mining System.
- Assess the structural stability of the Goodman Subway and its associated subterranean features.
- Note and make comment on any archaeological features that allow us to better understand the historical context of the Subway in relation to the Vimy battlefield.
- Make recommendations for any further work.

3 HISTORICAL BACKGROUND

3.1 As indicated in Figure 1 the Goodman Subway was one of fourteen subways dug during late 1916 and early 1917 to support the allied attack on Vimy Ridge and its environs on 9 April 1917. The utility of these subways was that they allowed troops to move forward to their attack positions under cover of enemy sight or attack. The requirement for covered subways to provide troops with protection had been learnt largely as a result of the disastrous first day of the Battle of the Somme in July 1916. Then, a significant proportion of the British casualties had been caused before the troops had even reached their own front line through the need to use the crowded and highly vulnerable communication trenches, or in some cases, open ground.

3.2 Accounts from Tunnelling Officers[1] record that *'all the subways had ample head cover, and were most elaborate – containing accommodation for Brigade and Battalion Headquarters, dugouts, assembly chambers, signal offices, bomb and ammunition stores, dressing stations complete with operating table, water tanks and water-bottle filling points, kitchens and latrines. Numerous exits gave access to support, front and assembly trenches, while others again came to the surface well out in No Man's Land. Signal cables were run*

[1] 'Tunnellers ' Page 155.

through and into the mining system and were carried along the laterals; thus uninterrupted communication could be maintained with units on either flank….'. The Subways were an essential component of the battle plan for the assault on Vimy Ridge.

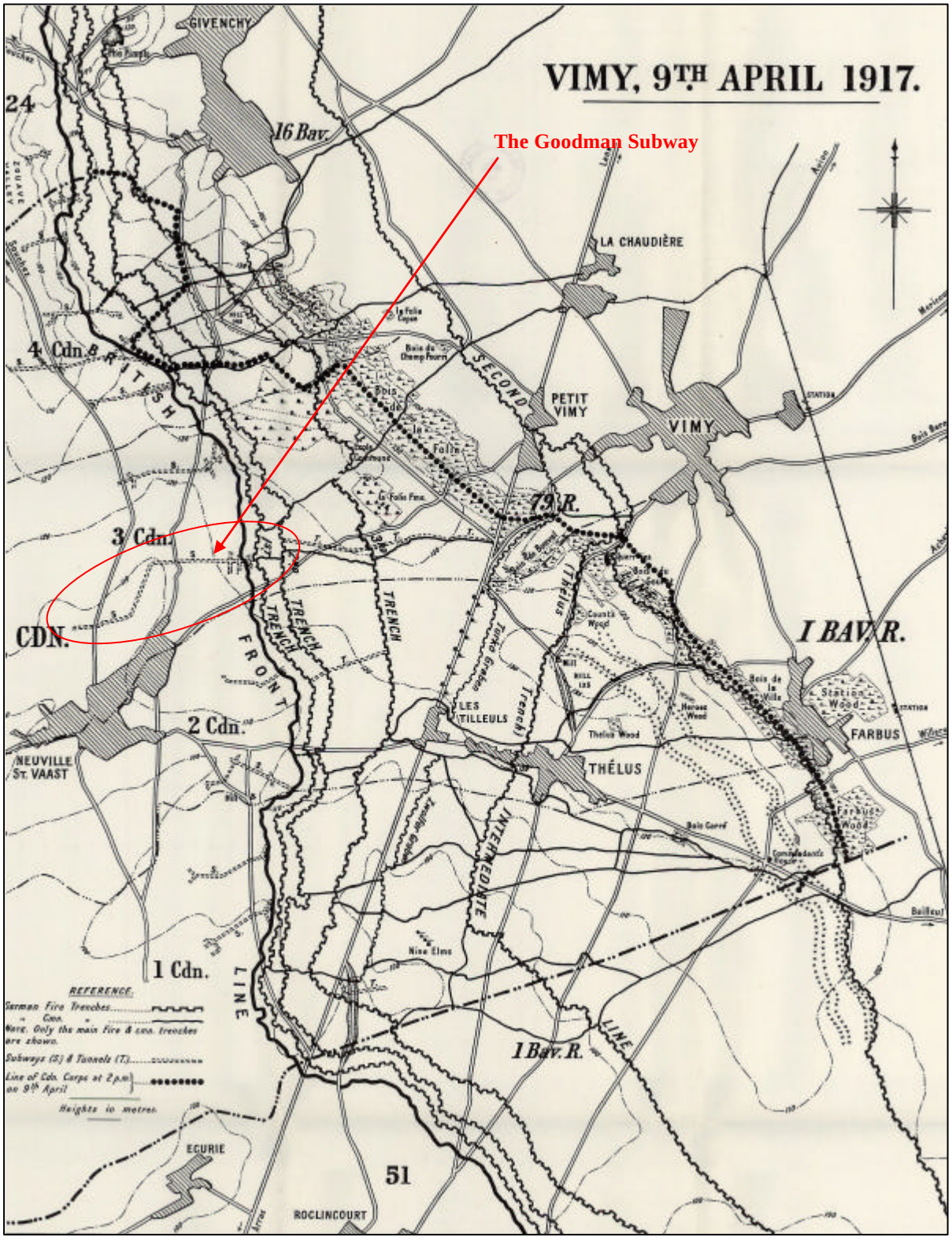


Figure 1. Official History Map of Vimy Ridge including trench lines and subways

3.3 These accounts further record that *'Precautions to prevent flooding of the subways with gas necessitated the erection of gas doors and curtains, and kitchens and latrines had to be ventilated by boring auger holes to the surface…..Most subways were electrically lighted by plant erected by the ubiquitous Australian Electrical and Mechanical Mining and Boring Company. The lighting sets were petrol driven, and precautions were taken to store petrol in locked fireproof dugouts, adjoining the engine-room, and the exhaust was carried to the surface through a borehole.'*

3.4 The Goodman Subway was dug to enable troops to move forward under cover from Neuville St Vaast right up to the front line. The blowing of a wombat mine from the end of the Goodman Subway out into no-mans land 30 seconds after the assaulting troops attacked on the morning of 9 Apr 17 gave the Canadians an added advantage by facilitating communications in the immediate aftermath of the assault. For the purposes of the attack on 9 Apr 17 the Goodman Subway was used by members of the 8th Brigade of the 3rd Canadian Division comprising the 1st, 2nd , 4th and 5th Canadian Mounted Rifles.

3.5 At 1,883 yards[2] the Goodman Subway was the longest of the fourteen constructed to support the attack. The reason for this was that the ground flattens towards the south of Vimy Ridge and therefore longer subways were required to provide adequate protection to the troops moving forward. In the case of the Goodman Subway it was necessary to dig all the way back to the environs of Neuville St Vaast in order to provide suitable protection. The Goodman Subway was constructed by members of 172 Tunnelling Company RE between 2 Nov 16 and 9 Apr 17. It was one of two subways driven by 172 Tunnelling Company RE; the other being the La Folie Subway slightly further north along the ridge.

3.6 The progress of the driving of the Goodman Subway is reflected in the weekly mine reports of the Company for the period. The records for the week ending 9 Nov 16[3] note that *'camouflage screens erected by GOODMAN'* and indicate the initial preparatory work being undertaken by the Company to provide security for their workings. A week later the mine report[4] notes that '*much preparatory work and camouflage done on GOODMAN tunnel, three faces being driven'*. The primary face (No. 1) was driven from Albany trench at trench map reference S.28.c.2.5 and in documentation[5] is referred to as Albany Sap or the Albany Avenue entrance. The second face (No. 2) was started from the sunken road further to the west and the third face (No. 3) close to where Goodman Avenue crosses a sunken road.

3.5 The Goodman Subway was driven at a depth of 26 feet and with dimensions of 6 feet high by 3 feet wide. Initially progress appears to have been swift. However at the end of November and the beginning of December the mine reports[6] note that *'progress in subways [was] being retarded by shortage of fatigue parties'*. In mid December three additional faces were started in order to connect up those sections of the subway already commenced. These were driven from face 3 towards face 2 and vice virca and an additional entrance was dug close to the primary entrance. At this time the mine reports show that the dimensions of the subway were increased to 6 ½ feet high by 3 feet wide.

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2 Official History of the War Military Operations France and Belgium 1917 Volume 1 Page 324.
3 172 Tunnelling Company RE Weekly Mine Report for week ending 9 Nov 16.
4 172 Tunnelling Company RE Weekly Mine Report for week ending 16 Nov 16.
5 War Diary 4th Canadian Mounted Rifles – PRO 95/3872.
6 172 Tunnelling Company RE Weekly Mine Reports for weeks ending 30 Nov 16 and 7 Dec 16.

3.6 Later in the month 172 Coy encountered further problems[7] when *'progress on [the] subways [was] delayed by [the] enemy's mining activity'*. At this time a shaft entrance was opened up further to the west (No. 4). Two faces were driven; one to the east to connect up with the existing workings and the other southwest towards Neuville St Vaast. Although the mining records for this period are missing a 1917 3rd Army Plan (see Figure 2) of all the subways shows that during January and February 1917 the western drive off the subway was lengthened until it reached the intersection of Pylones and Quarries roads. Along this section of the subway the map indicates that a Pioneer shaft was dug to meet the subway and three additional entrances (Nos. 6, 7 & 8) added.

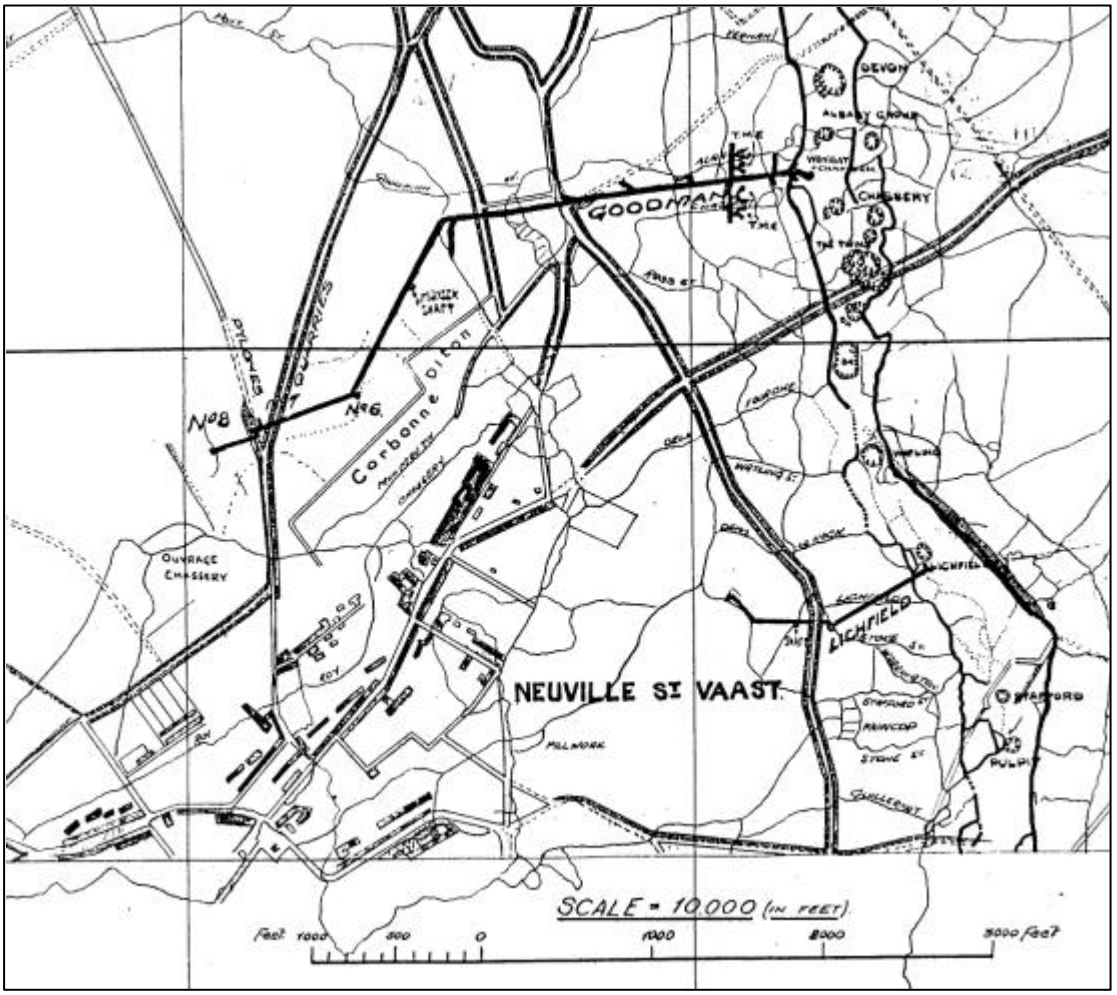


Figure 2 April 1917 3rd Army Map Showing the location of the Goodman Subway in relation to Neuville St Vaast

3.7 The 1st Army (including the Canadian Corps reports) weekly mining synopsis indicate that late 1916 / early 1917 period of offensive mining activity by the Germans which hindered progress, work resumed apace but was again delayed by a '*shortage of timber and transport difficulties'* in late January[8]. These appear to have been rapidly overcome as by mid-February the report states that 413 feet were driven on Goodman Subway in a single week[9]. Electric light was installed in the subway the following week.

7 172 Tunnelling Company RE Weekly Mine Report for week ending 28 Dec 16.
8 1st Army Mining Synopsis (La Folie N. & S.) week-ending 26 Jan 17.
9 1st Army Mining Synopsis (La Folie N. & S.) week-ending 17 Feb 17.

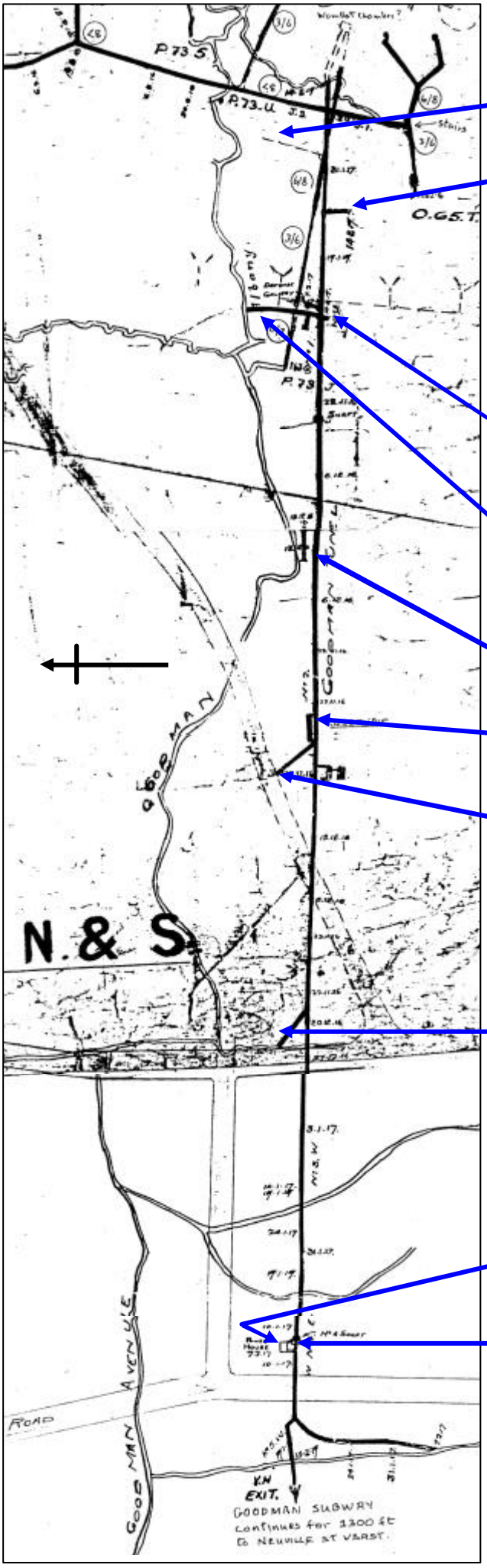


Figure 3.
172 Coy RE Mining Plan corrected to 14 Feb 17 showing eastern end of Goodman Subway

3.8 A 172 Tunnelling Company RE mining map of the La Folie North and South system (see Figure 3) shows the eastern end of the Goodman Subway in some detail, along with construction dates which marry up with the Company Weekly Mining Reports and 1st Army Weekly Mining Synopsis. This indicates various dugouts and other side chambers off the main drive in addition to a Power House (complete by 7 Feb 17) and a Water Reservoir. The reservoir was fed from one of two large 50,000 gallon underground reservoirs[10] dug by two sections of 255th Company. These larger reservoirs had pumping plants installed to feed the water supply points in all of the subways.

3.9 The eastern end of the Goodman Subway as far down as No.5 west entrance close to Goodman Avenue appears to have been largely completed by the middle of Feb 17. The construction dates on the 172 Tunnelling Company RE map show that both the V.H (?) exit west of the sunken road had been reached and the tunnel eastwards completed up to and just beyond the British front line. For all intents and purposes an adequate covered approach for the troops in this area had now been provided. The remainder of the time available to the Tunnelling Company prior to the attack was therefore spent in lengthening the Subway right back into Neuville St Vaast.

3.10 Enemy offensive mining activity in P Sector noticeably increased during the last week of February and into early March as the Germans attempted to upset the preparations for the attack they knew was inevitable but the exact date of which, they were unaware. Despite this increased activity the driving of the Goodman Subway back towards Neuville St Vaast and the installation of entrances and other features appears to have been little affected with significant driven footage[11]. It was not until mid March[12] that progress was again hindered due to lack of transport for timbers. These problems were again soon overcome as the record shows that the Goodman Subway was complete by 1 Apr 17[13].

3.11 At the eastern end of the Goodman Subway a bored wombat mine was situated to facilitate the crossing of no-mans land during the attack. The records[14] indicate that the wombat mine was fired at 5.30 ½ am on the morning of 9 Apr 17 forming a trench 170ft long x 35ft wide x 14ft deep that ran into the German front line. Additionally two forward exits from the subway were opened up into no-mans land and saps driven into the communication trench formed by the fired mine. These again provided protected access to the Canadian troops who used the subway.

3.12 Both the 172 Tunnelling Company RE and 3rd Army maps (see Figure 5) show that towards the eastern end of the subway a series of medium trench mortar (T.M.) positions were constructed that had access off from the subway. The 3rd Army map indicates that there were four such T.M. positions located perpendicular to the subway and a little way behind entrances 1 and 1E. The 172 Company map also indicates a possible four T.M. positions although these are shown as hachured and presumably had not yet been constructed when the map was drawn. The most northerly of the T.M. positions is also shown as a separate emplacement, rather than connected to the others. In this plan this series of T.M. positions is referred to as a Defence Gallery[15]. 3rd Canadian Division records make reference to twelve medium trench mortar positions.

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10 'Tunnellers' Page 154.

11 1st Army Mining Synopsis (La Folie N. & S.) week-ending 3 Mar 17 indicates 389 feet was driven in the Goodman Subway during that week.

12 1st Army Mining Synopsis (La Folie N. & S.) week-ending 18 Mar 17.

13 1st Army Mining Synopsis (La Folie N. & S.) week-ending 1 Apr 17.

14 172 Tunnelling Company RE War Diary – entry dated 9 Apr 17.

15 Extract from 3rd Canadian Division Scheme of Operations PRO WO 95/3838.

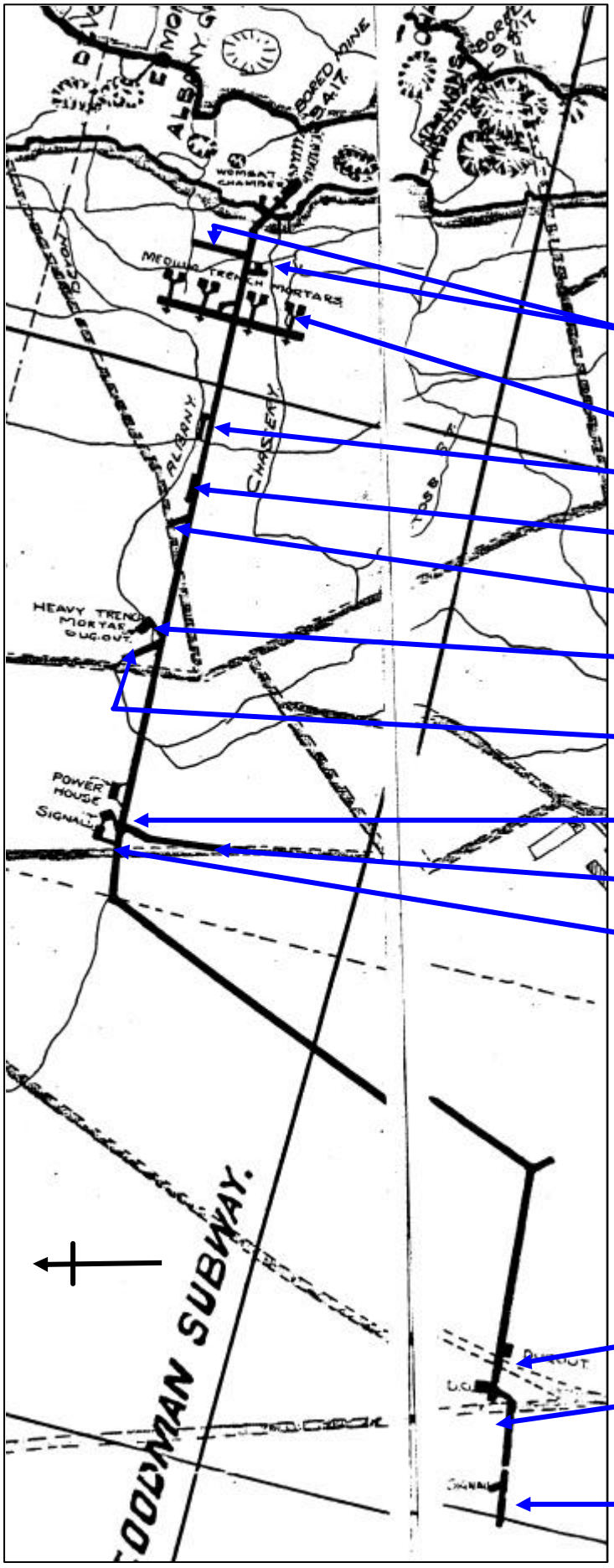


Figure 4.
Canadian Corps
Mines & Subways Plan
showing the Goodman subway

Forward Entrances

Medium Trench Mortars

Additional Entrance

Reservoir

Entrance

Heavy Trench Mortar Dugout

Entrance

Power House

Entrance

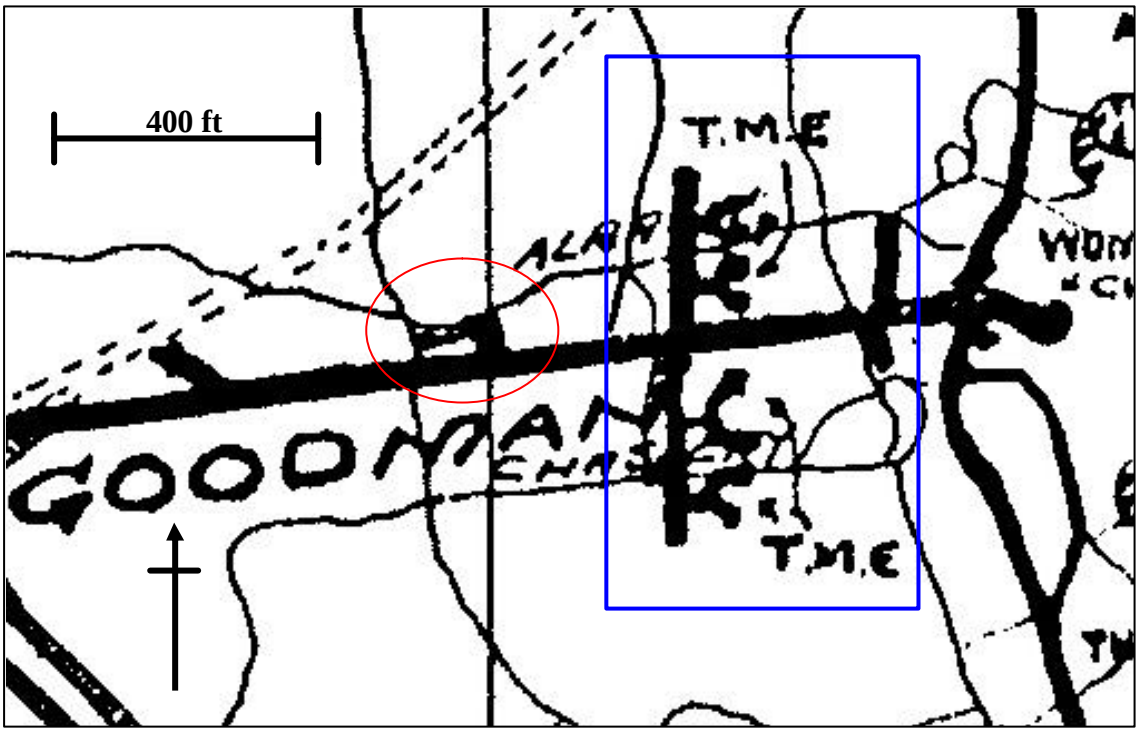
Signals

500 ft

Dugout

D.O. (Dugout)

Signals



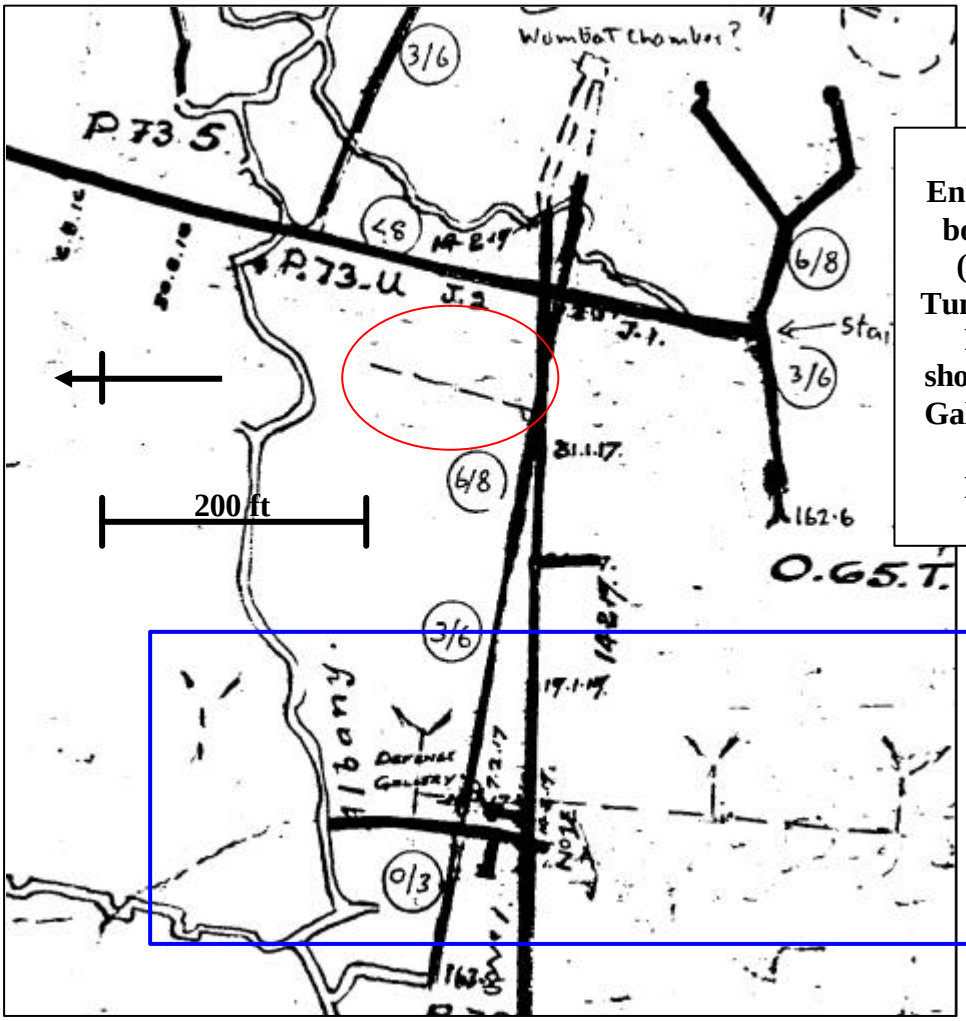


Figure 5.
Enlarged sections of both the 3rd Army (above) and 172 Tunnelling Company RE (left) maps showing the Defence Gallery with Trench Mortar Emplacements (T.M.E.)

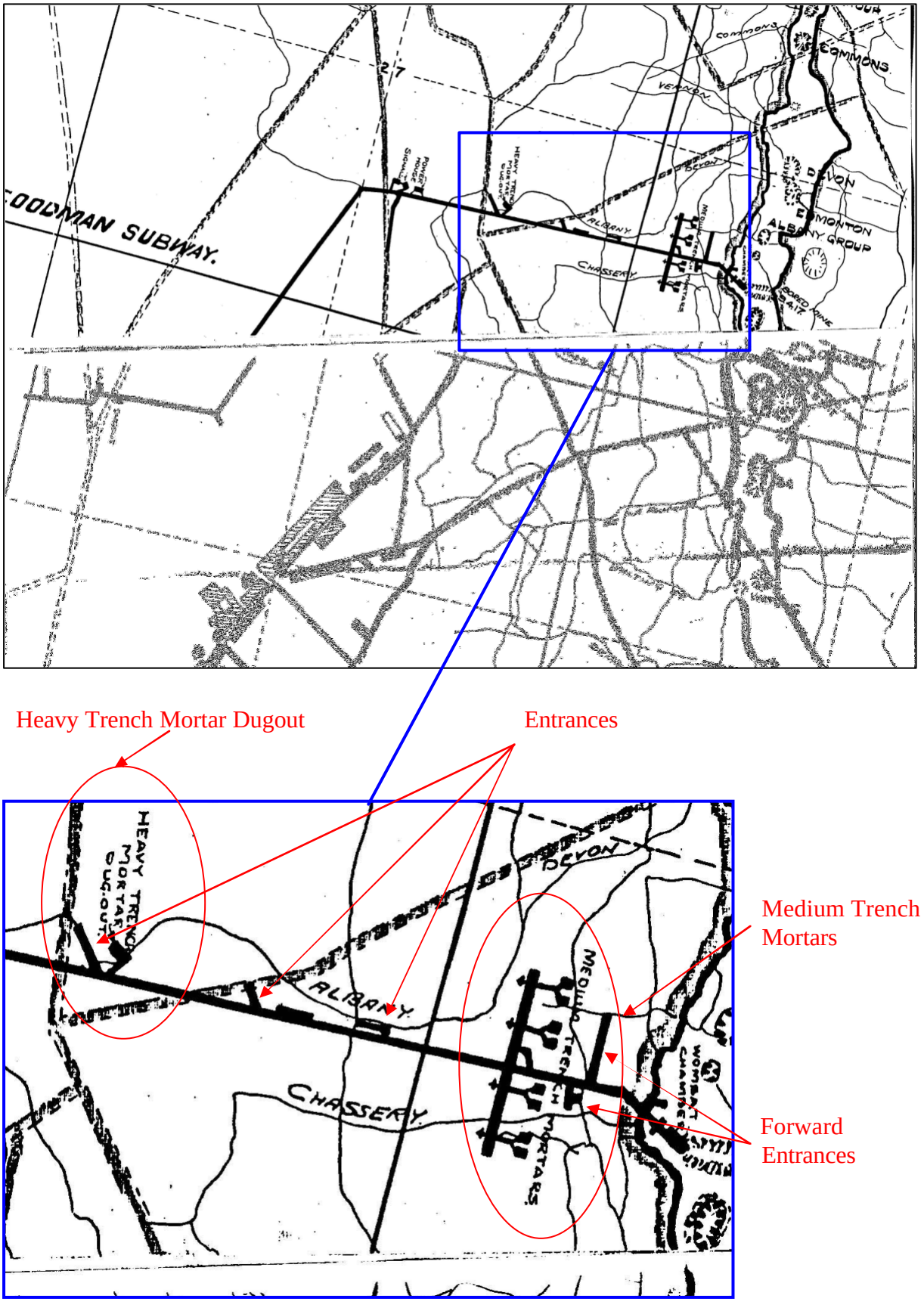


Figure 6. **9 April 1917 Canadian Corps' Mines & Subways plan showing the Trench Mortar Positions & Entrances**

3.13 Towards the eastern end of the subway a small south facing, forward entrance is indicated on the 172 Company map (circled red on Figure. 7) and is shown as having been completed by 14 Feb 17. This entrance is also shown in the same location and configuration on the 3rd Army map. Both maps indicate that is about 50 ft in length, suggesting that it may be a stepped incline. On the 9 Apr 17 Canadian Corps Mines and Subway map (Figure. 6) this entrance is shown as being connected to one of the forward trenches via a small (20 ft or so) north facing sap. If this is the accurate representation then this is likely to be a staircase leading down to a small tunnel leading onto the main subway.

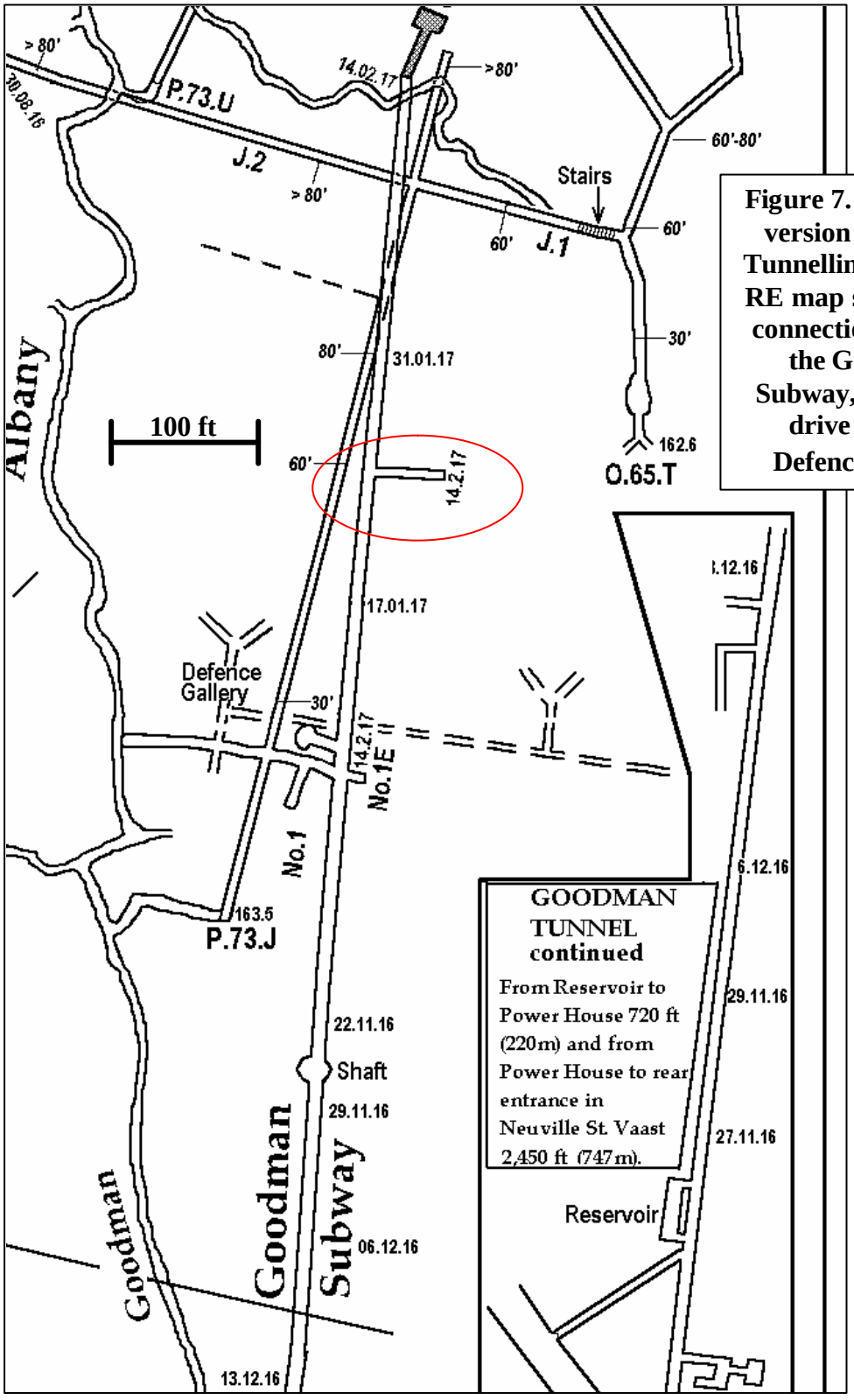


Figure 7. Enhanced version of the 172 Tunnelling Company RE map showing the connection between the Goodman Subway, the P.73.J drive and the Defence Gallery

3.14 Another longer north facing entrance is shown on the 172 Company map as at 14 Feb 17 (circled red on Figure. 5). It is shown as a dotted line and therefore a proposed construction. This tunnel appears to have been approximately 120 ft in length. On the 9 Apr 17 Canadian Corps Mines and Subways map (indicated on Figure. 6) this tunnel is shown as having been constructed and dug out to connect to a communication trench. It is likely that this entrance will be a shallow incline tunnel rather than a staircase. There also appears to be an additional entrance (not numbered) off a communication trench some 200ft to the rear of the Medium T.M. positions (circled red on Figure. 5).

3.15 The 172 Company map clearly shows that the Goodman Subway also interconnects with the P.73.J access incline with a drive (Albany Sap?) off the Albany communication trench (Albany Avenue) connecting both together and also the 1E entrance. This is more clearly seen in the enhanced version of the map shown at Figure 7. This also indicates that this connecting tunnel provides access to the Defence Gallery for the medium trench mortars with the planned access to the southern pits running over the top of both the Goodman Subway and the P.73.J tunnel and therefore at a very shallow depth.

3.16 After the successful Canadian attack on the ridge on 9 Apr 17 the Goodman Subway disappears from the available written records. Having served its purpose in providing protection to the assaulting troops and as an evacuation route for the wounded it appears to have been of little further documented utility. Photographic evidence from the early 1920s indicates that many of the mine tunnels and subway entrances were still open at that time, and it is possible that this may have included the Goodman Subway. It is probable that the entrances to Goodman Subway were deliberately filled in the 1920s as a safety measure.

3.17 In the late 1970s the A26 autoroute was constructed and passes to the immediate west of the ridge, passing over many of the subways, including the Goodman Subway. Figure 8 shows a plan of the subway overlain onto modern topographic mapping of the area. It can be seen that the A26 passes over the Goodman Subway in the area of Number 3 entrance. From evidence gained in excavating 'O' Sector it is highly possible that the builders of the autoroute will have broken into the subway at this point and have then blocked and infilled the section under the road.

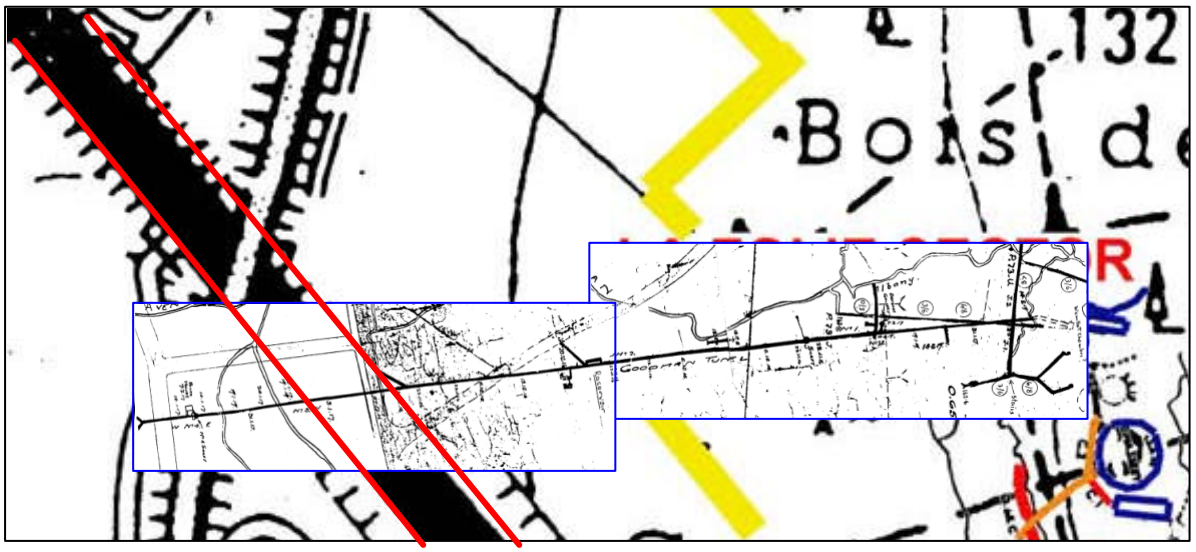


Figure 8. Plan of the Goodman Subway overlain onto modern topographic mapping and indicating where the A26 runs over the subway

4 PREVIOUS INVESTIGATIONS

4.1 In 1989 Lt Col (Retd) Robinson RE lead a small team that made a short preliminary investigation of the Goodman Subway. A small hole was dug through a clay plug blocking the head of the P.73.J access tunnel in order to gain access into the Goodman Subway and a brief exploration made. The photographic record of this early investigation is at Photos 1 to 4 below. Photo 1 shows the P.73.J clay plug in 1989 when initial access was made.



Photo 1. P.73.J clay plug in 1989



Photo 2. 4 No.5 Mk1 Grenades found in the Goodman Subway in 1989



Photo 3. (left)

The blocked entrance of access No. 1E at (I)

Note the chalk debris spill with little evidence of clay suggesting this is a deliberate infill

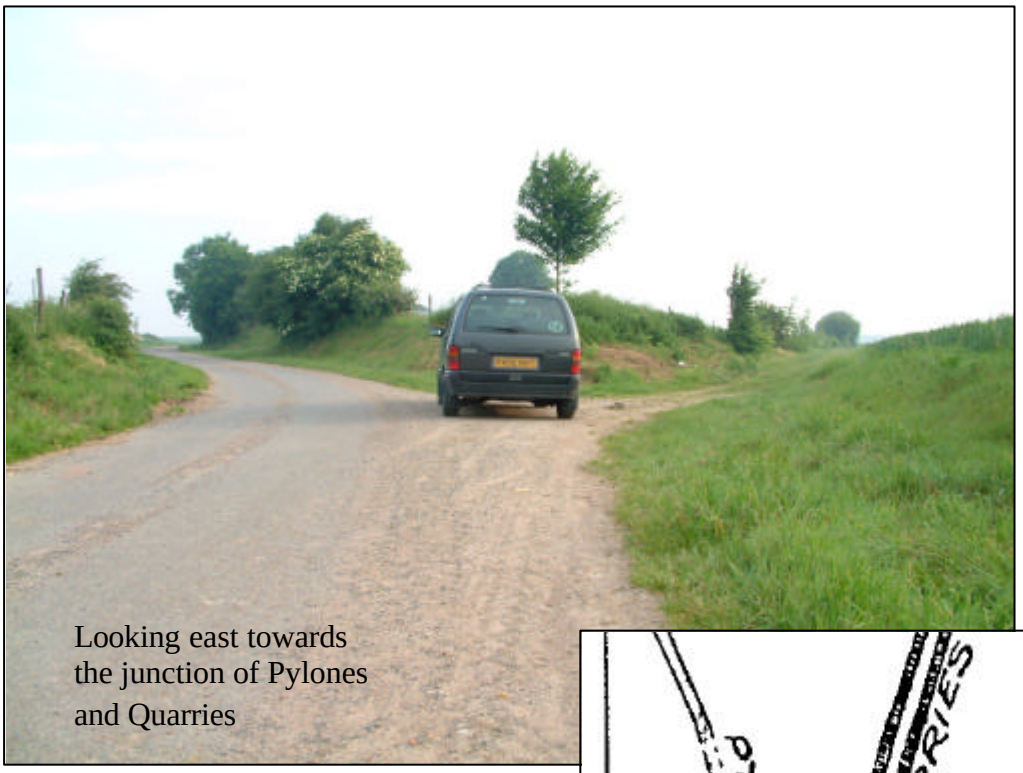


Photo 4. (right)

View into the trench mortar ammunition storage area at (H)

Note the red metal can and the wire netting originally used for bedding and out of place in an ammunition store

4.2 The original entrances to the Goodman Sub way at Neuville St Vaast had previously been investigated. Their location has been clearly identified on the ground but have all been in filled and no access is possible. The location of associated dugouts at both No. 7 entrance and at the Pylonnes, as mentioned in various war diary accounts, have also been clearly identified. These can be seen at Photos 5 – 8.



Looking east towards the junction of Pylones and Quarries

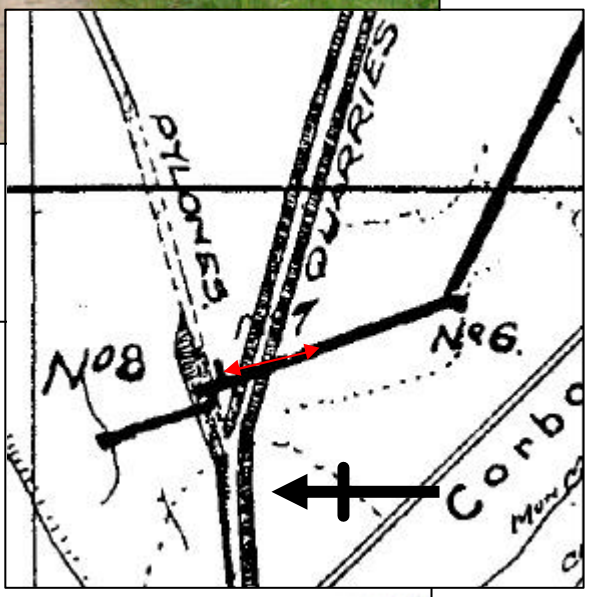
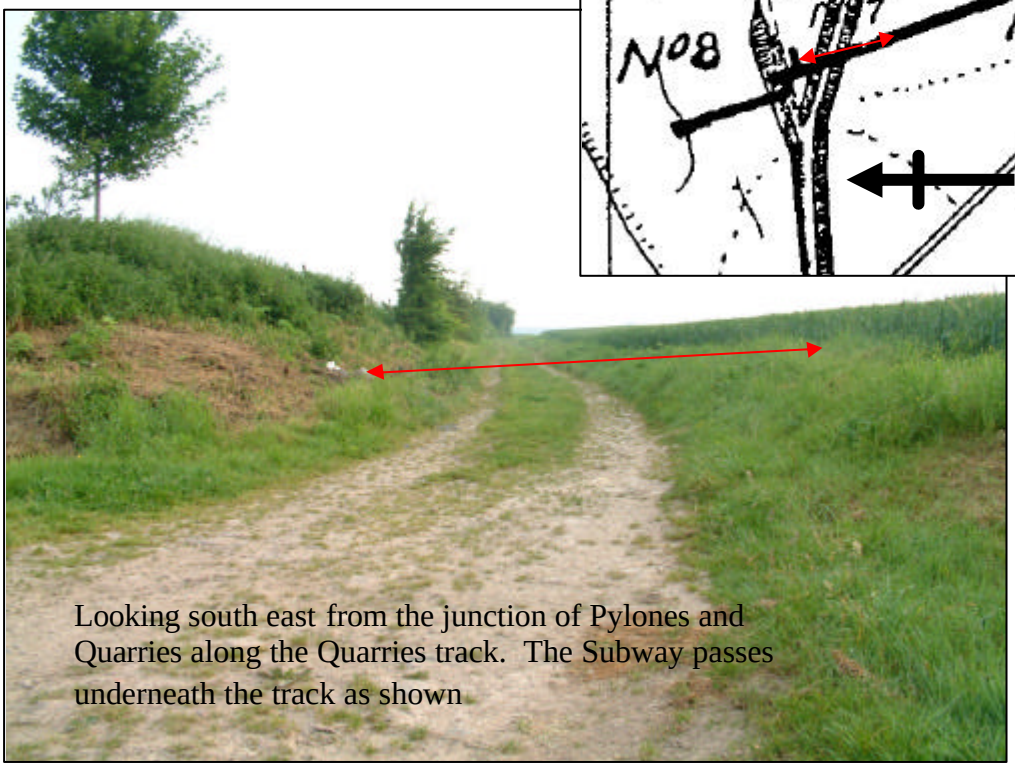
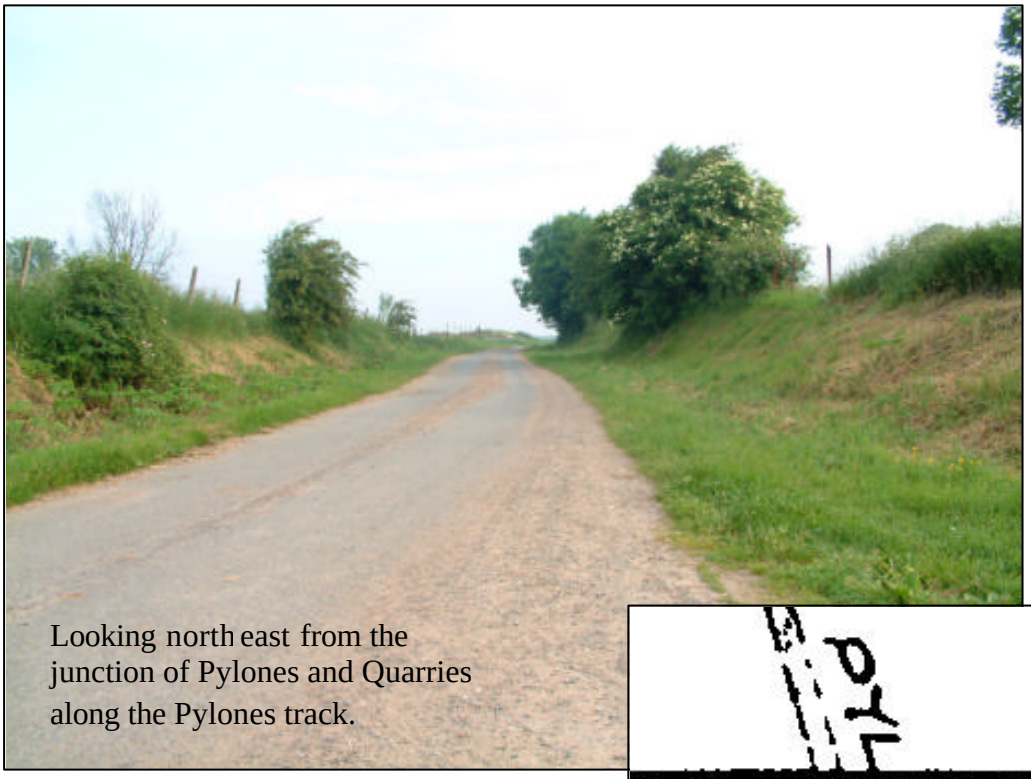


Photo 5. (above)

Photo 6. (below)



Looking south east from the junction of Pylones and Quarries along the Quarries track. The Subway passes underneath the track as shown



Looking north east from the junction of Pylones and Quarries along the Pylones track.

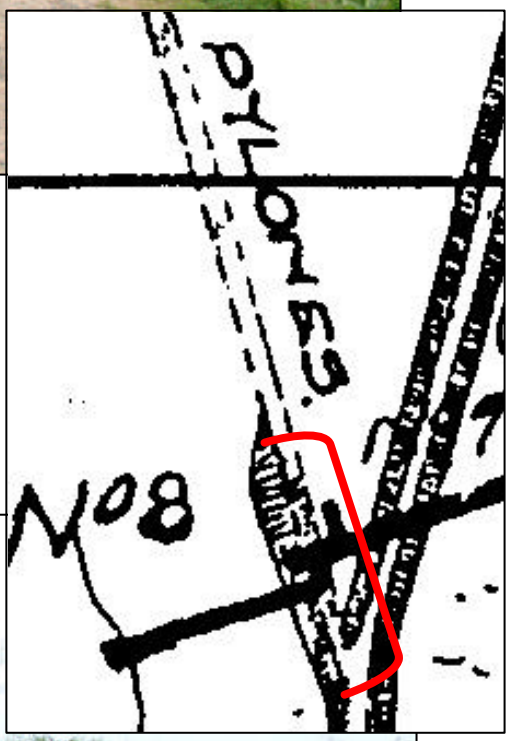


Photo 5. (above)

Photo 6. (below)

View of the embankment to the east of No. 8 entrance now overgrown with nettles





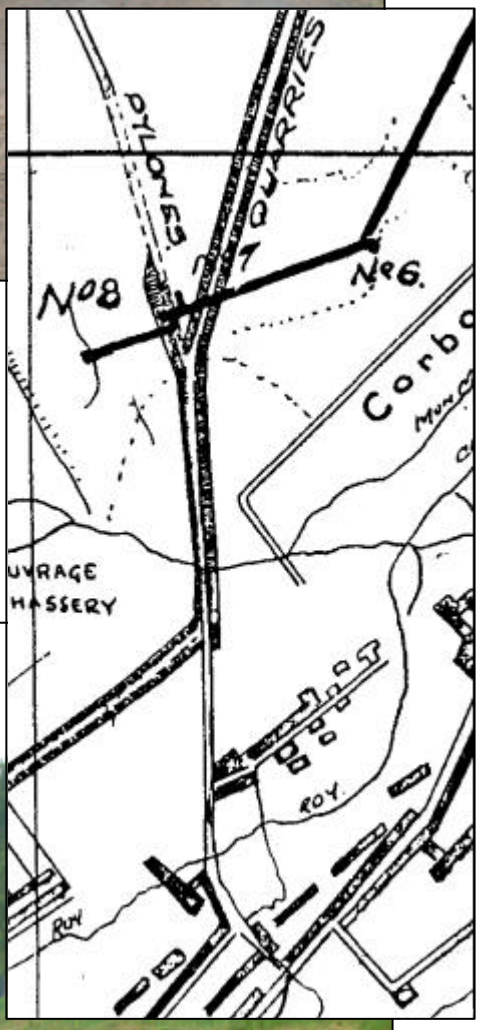
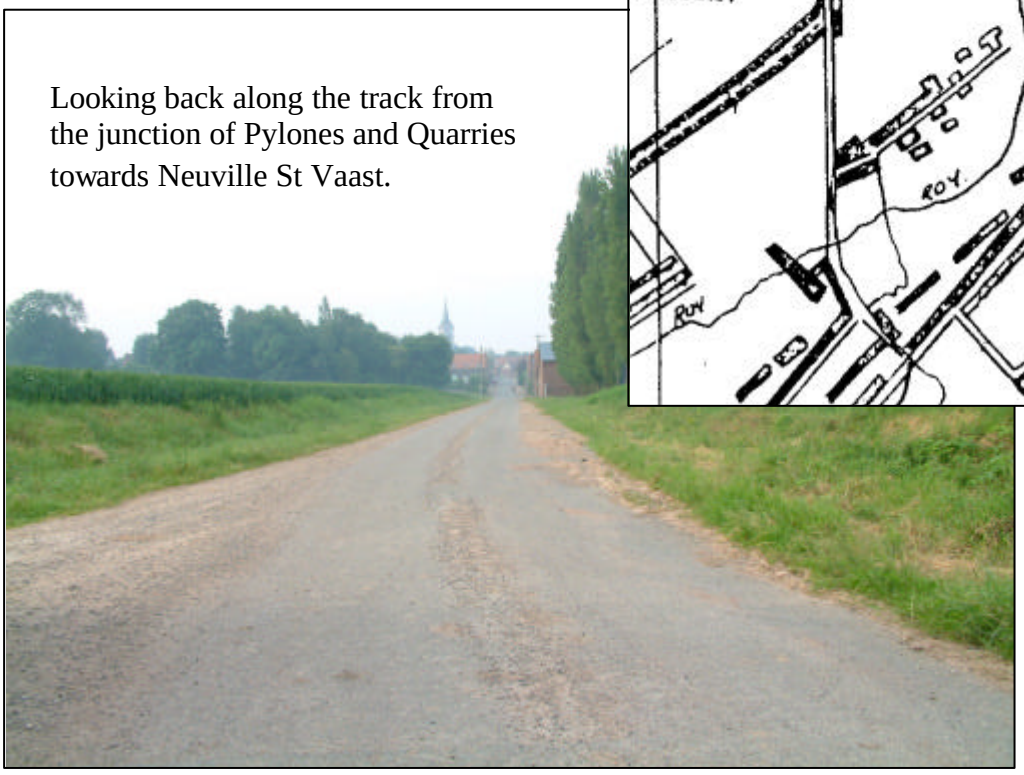


Photo 7. (above)

Looking at the embankment where the Pylones dugouts were originally located

Photo 8. (below)

Looking back along the track from the junction of Pylones and Quarries towards Neuville St Vaast.



5 ADDITIONAL HISTORICAL REFERENCES

5.1 The Goodman Subway is mentioned in a wide range of War Diaries, Operation Orders, Schemes of Attack and other post-conflict documentation. The known references are documented below and shed further light on the nature and use of the Goodman Subway, or Goodman tunnel as it is frequently referred to.

DATE	SOURCE	CONTENT	COMMENT
(a)	(b)	(c)	(d)
Mid Mar 17?	HQ 3rd Canadian Division Location Report – PRO WO 95/3838	Goodman Tunnel occupied by 52nd Bn of 9th Canadian Infantry Brigade	Link to graffiti in tunnel
4 Apr 17	Instructions to units of the 8th Canadian Infantry Brigade for the attack and capture of Vimy Ridge - Plan of Attack – Infantry Details PRO WO 95/3868	The two leading Companies of the 5th C.M.R. who will be in GOODMAN TUNNEL prior to ZERO, will at ZERO plus 20 minutes commence to file out of the TUNNEL, and take up a position in our old front and support trenches	Link to possible graffiti
4 Apr 17	Instructions to units of the 8th Canadian Infantry Brigade for the attack and capture of Vimy Ridge - Plan of Attack – Infantry Details PRO WO 95/3868	The Third and Fourth Companies will have moved from their positions in the PYLONES and will have formed up in GOODMAN TUNNEL. The Third and Fourth Companies who are detailed as carrying parties will have the supplies to be carried distributed among the men, and will have move into the TUNNEL with their head under BAY STREET, where they will remain until further orders. In the event of their being needed for tactical purposes, the supplies will be stacked neatly along the Southerly side of the TUNNEL.	Link to possible graffiti
4 Apr 17	Instructions to units of the 8th Canadian Infantry Brigade for the attack and capture of Vimy Ridge - Plan of Attack – Smoke and Gas Details- PRO WO 95/3868	No.4 Company, Special Coy., R.E. have installed 4" Stokes Mortars in the medium T.M. Emplacements in the GOODMAN TUNNEL, and will be firing gas bombs at stated times prior to Zero day, and if the wind be favourable, will put the smoke barrage in front of the SWISCHEN STELLUNG at Zero hour.	Note that the medium TM emplacements contained 4" Stokes mortars firing smoke
Apr 17	Extract from 3rd Canadian Division Scheme of Operations PRO WO 95/3838	Complete Goodman Subway, including the twelve Medium and one Heavy Trench Mortar Emplacements branching off of it, and the Store recesses.	Note number of medium TM emplacements

(a)	(b)	(c)	(d)
4 Apr 17	Instructions to units of the 8th Canadian Infantry Brigade for the attack and capture of Vimy Ridge - Plan of Attack – Traffic Details - PRO WO 95/3868	This subway is under control of Lt-Col. LANG, with H.Q. in TUNNEL under BAY STREET to whom all matters of traffic must be referred. For IN traffic only, except for Runners, parties of one or two Officers who may go against the traffic. For the purpose of ventilation, when this TUNNEL is being used for the accommodation of many troops, no men will be allowed on the steps of the exits, and the men in the TUNNEL must sit down to allow more space for the free passage of air currents.	Note command and control details for the use of the subway
4 Apr 17	Instructions to units of the 8th Canadian Infantry Brigade for the attack and capture of Vimy Ridge - Plan of Attack – Signalling Arrangements - PRO WO 95/3868	The Brigade Signal section will extend the wires laid at the entrance of GOODMAN TUNNEL to the Advanced H.Q. of the Brigade and Battalions as soon as the situation permits.	Note the use of communication cable along the subway
5 Apr 17	War Diary 4th Canadian Mounted Rifles – PRO 95/3872	Battalion Hdqrs in Goodman Tunnel S27.d.8.7. on the night of April 5/6th	Note location of 4 CMR Bn location
7 Apr 17	War Diary 4th Canadian Mounted Rifles – PRO 95/3872	On night of 7/8th "B" Company moved up from PYLONES and relieved "A" Company in front line, room having been found for them in tunnel, running off ALBANY SAP & TUNNELLERS DUGOUTS	Note the referral to the Albany Sap
7 Apr 17	2 CMR Operation Order No.44 PRO WO95/3871	Goodman Tunnel will only be used for in traffic, except for runners. "D" Company will use Goodman Tunnel on Y Z night as follows: if zero hour is within one hour of dawn, the company will enter at Bay St at 3.30 am, and will clear the tunnel by 4.30am. If zero hour is more than one hour after dawn, the company will commence moving in at 4.30am, and remain in tunnel from VERT HALO to 100 yards west of Bay St	Note one of the entrances is known as the Bay St entrance
9 Apr 17	War Diary 5th Canadian Mounted Rifles – PRO 95/3873	2.30 am – "A" Company entered Goodman Tunnel followed by "D" Coy and halted with head at Bay St. 4th CMR in tunnel ahead	

(a)	(b)	(c)	(d)
Apr 17	Extract from 3rd Canadian Division Scheme of Operations PRO WO 95/3838	Battle Headquarters, Assembly & Jumping Off Trenches – Reserve Battalion (5th CMR) HQ in Ross St S.27.d.6.4. – Bn assembled with 2 Companies in Goodman Tunnel and 2 Companies in deep dugouts at S.3.a.2.7	
9 Apr 17	War Diary 5th Canadian Mounted Rifles – PRO 95/3873	5.50 am – "A" and "D" Companies commenced filing out of tunnel via Albany Ave entrance (as the P.S line entrance had just been crumped in) and took up a position in our old front and support trenches. "A" Coy in area of 1st CMR Bn and "D" Coy in area of 4th CMR	Note reference to Albany Avenue entrance
9 Apr 17	War Diary 5th Canadian Mounted Rifles – PRO 95/3873	1020 am – on account of the tactical situation at this time "C" Coy and HQ details were ordered forward into Goodman Tunnel and Battalion HQ moved from Ross St and established with 4th CMR Battalion in Goodman Tunnel	
10 Apr 17	Appendix B to 2 CMR Operation Order No.44 PRO WO95/3871	At 4.00 am the personnel for the attack commenced to assemble. "B" Company which had been holding our front line trench system, withdrawing its patrols and manning the first or "A" jumping off trench. C Company followed into "B" trench, the existing front line or fire trench. "D" Company filing out of CENOT CAVE via the Goodman Tunnel occupied "C" a recently constructed trench, whilst "A" Company moved into the old support line renamed "D" trench.	
6 Apr 17	8th Canadian Machine Gun Company Operation Order No. 63 – PRO WO 95/3874	Brigade Reserve Dumps in recesses of Goodman Tunnel. Also a supply of petrol tins filled with water will be held in Brigade dumps in Goodman Tunnel and Battalion Dumps	Note use of tunnel recesses for the storage of water and other stores

6 ACCESS INTO THE GOODMAN SUBWAY

6.1 A plan of the section of the Goodman Subway investigated is at Figure 9. The plan shows the trench line running alongside the subway and the P.73.J access tunnel into the La Folie mining system. The letters on the plan indicate areas of interest that will be discussed later whilst the numbers on the plan indicate chalk walls where graffiti was found, and which is documented later. Access into the subway was achieved via the intersection with the P.73.J incline tunnel leading from the La Folie system. This involved a considerable underground hike from the existing La Folie entrance.

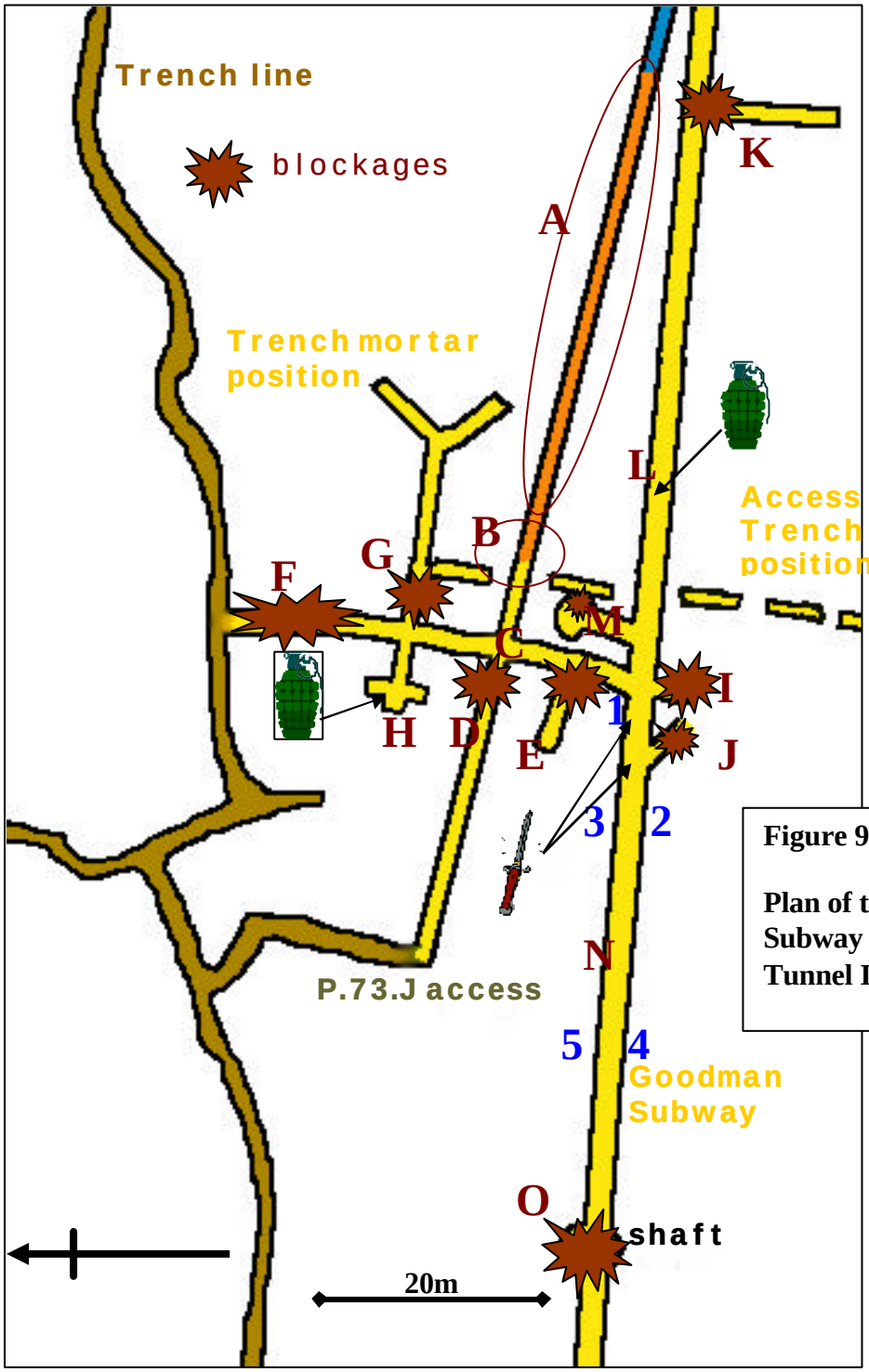


Figure 9.

Plan of the Goodman Subway and P.73.J Access Tunnel Intersection

6.2 The incline up to the intersection is in poor condition throughout its length, with extensive roof slabbing evident and some significant chalk falls evident on the ground. Towards the intersection the condition of the tunnel deteriorates significantly as it runs along the chalk/clay interface. Photo 9 shows the approach tunnel at (A). It should be noted however that the existence of original communications cable over the surface of many of the chalk falls indicates that these occurred during the run-up to the 9 Apr 17 attack rather than being recent.



Photo 9.

View of the P.73.J access tunnel at (A) leading up to the intersection with the Goodman Subway. Note the roof slabbing and debris on the floor

6.3 Approximately 10m from the intersection there is the clay plug that has been extruded through a fissure in the chalk above and which blocks the P.73.J tunnel (B). The small hole through this plug that had been made in 1989 was enlarged and then monitored for several months to check the integrity of the clay spill. It was noted that the clay plug had not moved any further and so the hole was widened further to allow a single person to crawl through. This is a temporary solution for reconnaissance purposes only. Any future requirement to frequently access the Goodman Subway via this route will require the access hole through the clay plug to be supported. Photo 10 shows the plug from the eastern side. Photo 11 shows the plug from the western side. Compare with Photo 1 showing the plug in 1989.



Photo 10. View of the clay plug at (B) from the east



Photo 11. View of the clay plug at (B) from the west

6.4 On the other side of the clay plug the tunnel rises steeply for the last 10m until it hits the connecting tunnel at (C). At this point the tunnel widens out to form a slight chamber that is partially blocked with a large ingress of chalk debris that has run down the blocked access tunnel at (D) that leads up to the Goodman communication trench. Photo 12 shows members of the Durand Group atop this rubble pile with the access tunnel at (D) shown on the left hand side of the picture.



Photo 12. Durand Group members atop the rubble pile (D) at the intersection of the P.73.J access tunnel and the connecting tunnel into the Goodman Subway

6.5 The chalk debris pile extends 5m to the south along the connecting tunnel and nearly reaches the roof of the tunnel and one is required to crawl down into the Goodman Subway. It is possible that originally there were some steps here leading down into the subway. Just before the tunnel meets the subway the No.1 entrance runs off to the west and is completely blocked with chalk debris, as can be seen in Photo 13. There is no evidence of any clay infill in the entrance.

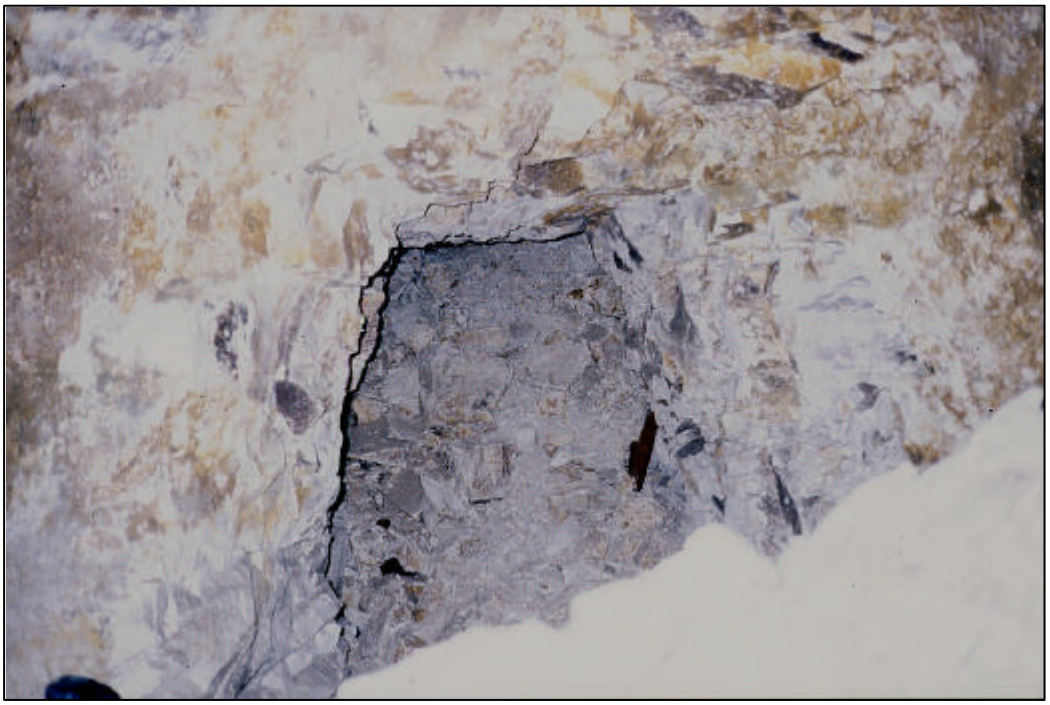


Photo 13. View of No. 1 Entrance at (E) showing the chalk debris blockage

6.6 To the north of the rubble pile the connecting tunnel runs off to join the Albany communication trench. However, it is blocked after some 10m at (F) with clay and earth infill as shown in Photo 14. Significantly, a number of fairly modern beer bottles are evident in this infill, suggesting that the fill is modern rather than originating from the WW1 period. The inclusion of bottles was also significant as these could also be found on the surface, clearly marking where the original entrance had been and subsequently collapsed as seen in Photo 15.



Photo 14.
View of the blocked entrance off from the Albany communication trench. Note the beer bottles in the clay infill.



Photo 15.
Albany communication trench entrance partially collapsed and showing the same beer bottles as that found in the fill underground

6.7 Running between the rubble pile and the Albany communication trench entrance are two features of interest. To the east there is the entrance to a trench mortar position at (G). This is completely blocked by chalk rubble as shown in Photo 16. It is clear that this tunnel led up to the trench mortar position and may have been stepped. The two mortar pits to the north of the Subway have collapsed but are visible on the surface. Of interest is the fact that where the clay plug in the P.73.J tunnel has extruded, it is directly below where the projected connection to further trench mortar positions are indicated on the various maps.



Photo 16.
The blocked entrance to the trench mortar position at (G)

6.8 To the west is a trench mortar ammunition storage area (H). The various maps show this as an open-ended single drive, short tunnel. However, exploration of the feature revealed that the storage area takes the form of a crucifix shape - an 8.7m long drive, some 2.7m in height, with two side tunnel storage areas. The northern one of these is 6m in length and a number of No.5 Mk.1 grenades were discovered amongst the chalk debris on the floor. The southern arm is some 2.9m in length. The short drive appears to be filled with chalk debris suggesting that originally it may have been accessible from the surface. The blocked tunnel is shown in Photo 17.

6.9 Further to the east past the rubble pile the connecting tunnel joins the Goodman Subway itself. Opposite this junction there is the 1E entrance, indicated on the plan at (I). This is completely blocked with mixed chalk and clay debris which spills out into the main tunnel, causing a partial blockage. The extensive nature of the clay spill suggests that this entrance is, indeed, a staircase rather than an incline tunnel.



Photo 17
The blocked storage drive of the trench mortar storage area indicated at (H) on the plan

6.10 At (J) there is another access tunnel into the Goodman Subway that is not shown on any of the available tunnel plans. This appears to be a staircase some 3m to the west of the 1E entrance and, presumably, joins this entrance at some higher level. It is, however, completely blocked with solid clay infill and is inaccessible. The reason why there should be two exits into the subway from the single 1E entrance above is unknown. It is possible that this provided direct access to the southern medium trench mortar pits rather than the proposed shallow tunnel having to cross the P73J incline.

6.11 The Goodman Subway itself is clear to both the east and west to a distance of about 23m in each direction. The main subway varies from 2.1 to 2.2m in height along its length and is approximately 1.2m wide. To the east the subway is comparatively clear up to the area of the southern side tunnel. At this point (K) the tunnel is completely blocked by chalk and clay rubble, suggesting that the side tunnel originally exited to the surface and has, at some point, been deliberately infilled. The blockage is shown in Photo 18.

6.12 Half way along this stretch of tunnel there has been a slight roof fall. This can be seen in Photo 19. This fall partially covers a set of four armoured firing cables which run along the left hand side of the tunnel (see Photo 20). It is assumed that these firing cables were the ones used to fire the wombat mine on the morning of the 9 Apr 17. If that is the case then one pair would have been used to fire the mine with the other pair used as a back-up system, in case the main firing cable pair failed.



Photo 18.
The blocked eastern end of the Goodman Subway in the vicinity of the southern side tunnel



Photo 19.
View along the eastern part of the Goodman Subway that is accessible showing the firing cables running along the left hand side of the tunnel and the partial roof collapse



Photo 20. Close-up view of the two pairs of armoured firing cable running along the left hand side of the Goodman Subway

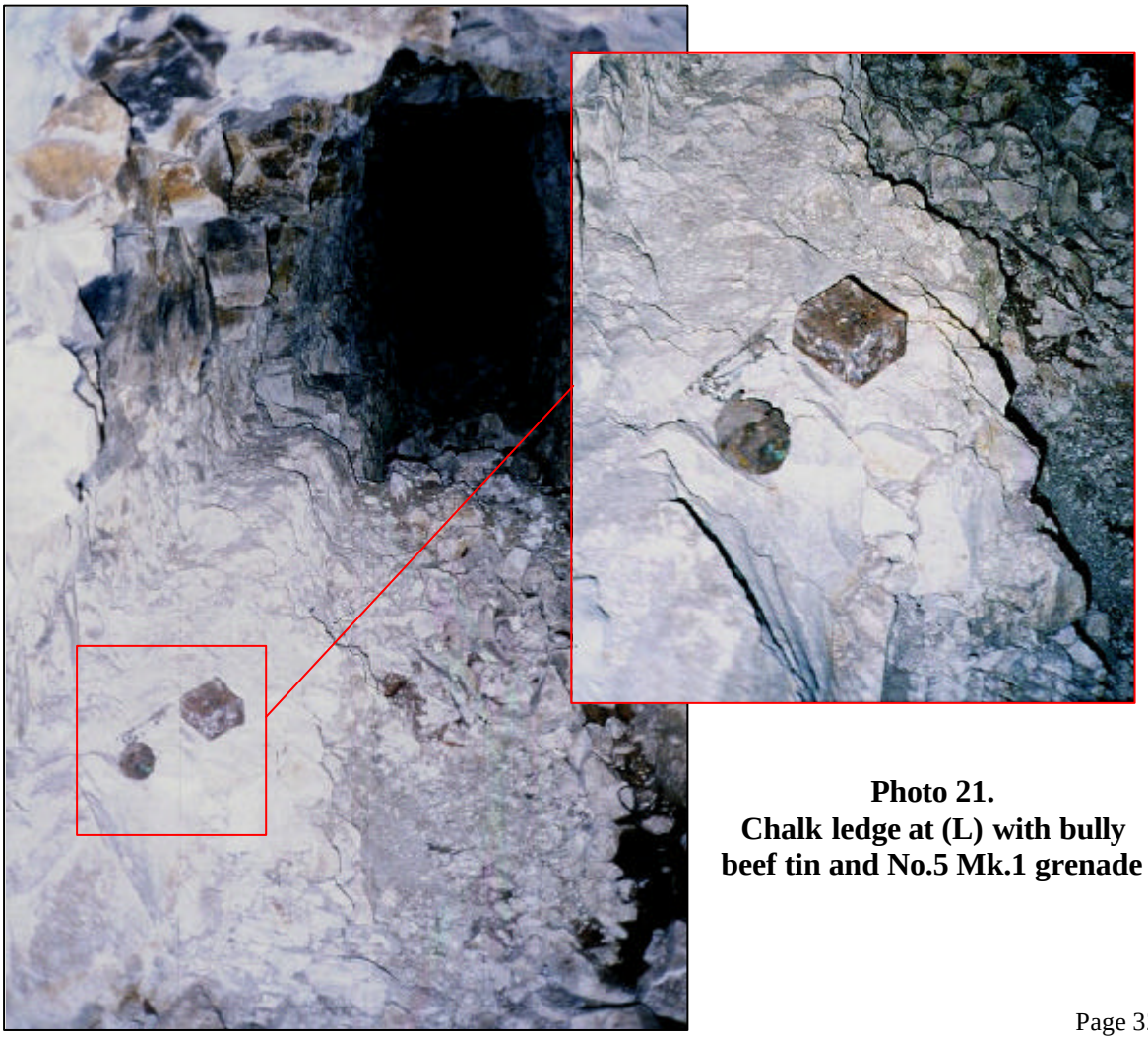


Photo 21.
Chalk ledge at (L) with bully beef tin and No.5 Mk.1 grenade

6.13. At (L) there is a chalk ledge on the left hand side of the subway tunnel approximately 3m long and 0.5m high. This is shown in Photo 21. On this ledge there were found the rusty remains of a British bully beef tin and a No.5 Mk.1 grenade in poor condition. A close up view of the grenade is shown in Photo 22. It should be noted that although the condition of the grenade was generally poor the safety pin was still in situ.



Photo 22. No.5 Mk.1 Grenade found at (L) in the Goodman Subway

6.14 At (M) there is a small side chamber off the northern side of the tunnel. This chamber contains chalk debris on the floor and the entrance to it is shown in Photo 25. The purpose of this chamber is unknown although it could have been used for stores. The chamber is some 2.4m deep by 2m wide and is 2.1m in height. The small connecting tunnel is some 3m long and 1.5m in height and is approximately 5.9m from the main junction between the Goodman Subway and the Albany communication trench access tunnel. This chamber contained a small number of items of graffiti on the chalk walls, shown in Photos 23 and 24.

6.15 Of interest is the clay filled cavity in the right hand corner of the chamber, which can be seen ringed in Photo 25 and close up in Photo 26. It should be noted that from the various mining plans the proposed connecting tunnel between the higher level trench mortar positions runs over the right hand corner of the chamber. It is possible that this was originally a staircase that has subsequently been filled by a clay extrusion from the filled in higher level. Alternatively, this could simply be a collapse through from the connecting tunnel that has subsequently become blocked by extruded clay.

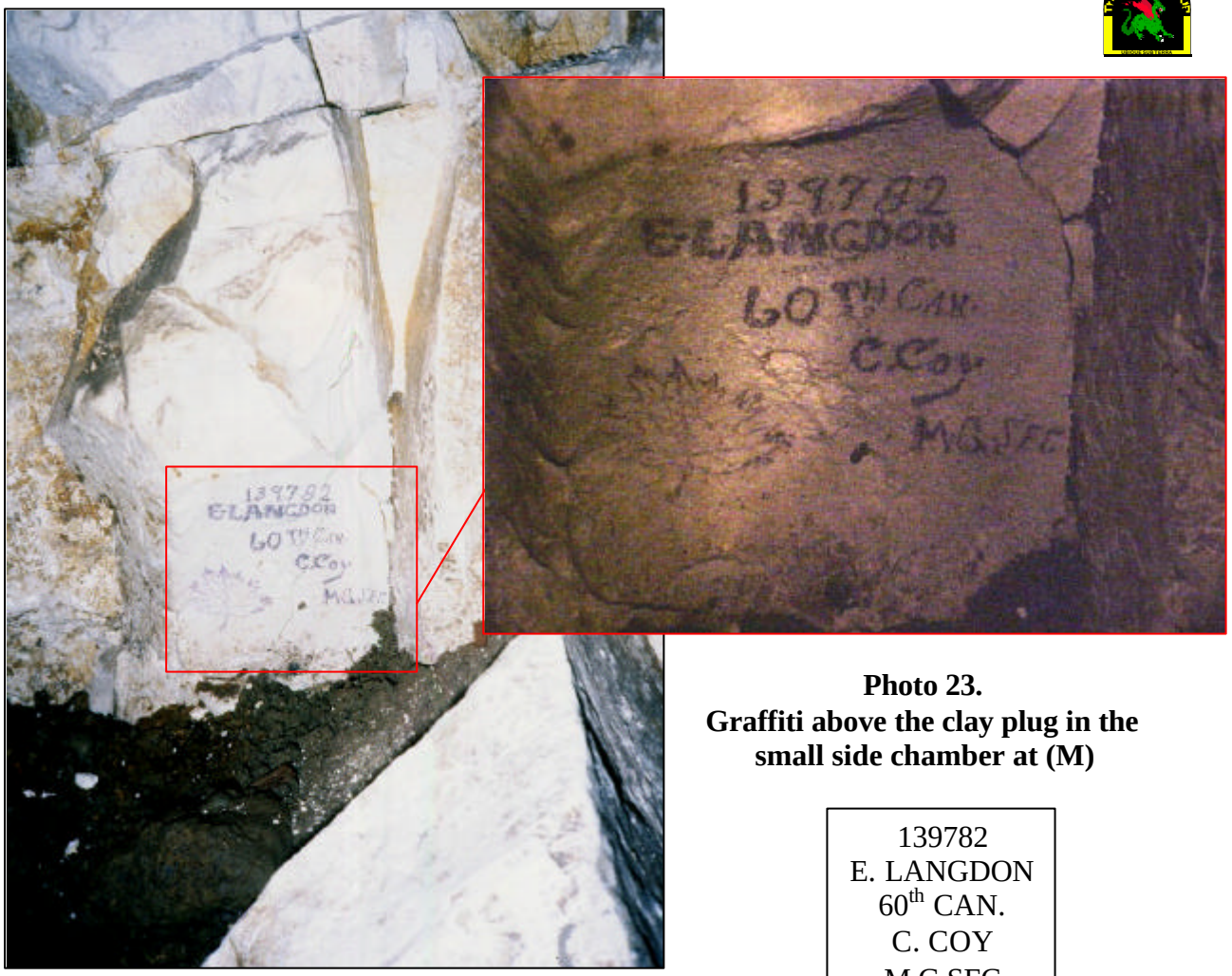


Photo 23.
Graffiti above the clay plug in the small side chamber at (M)

139782
E. LANGDON
60th CAN.
C. COY
M.G.SEC

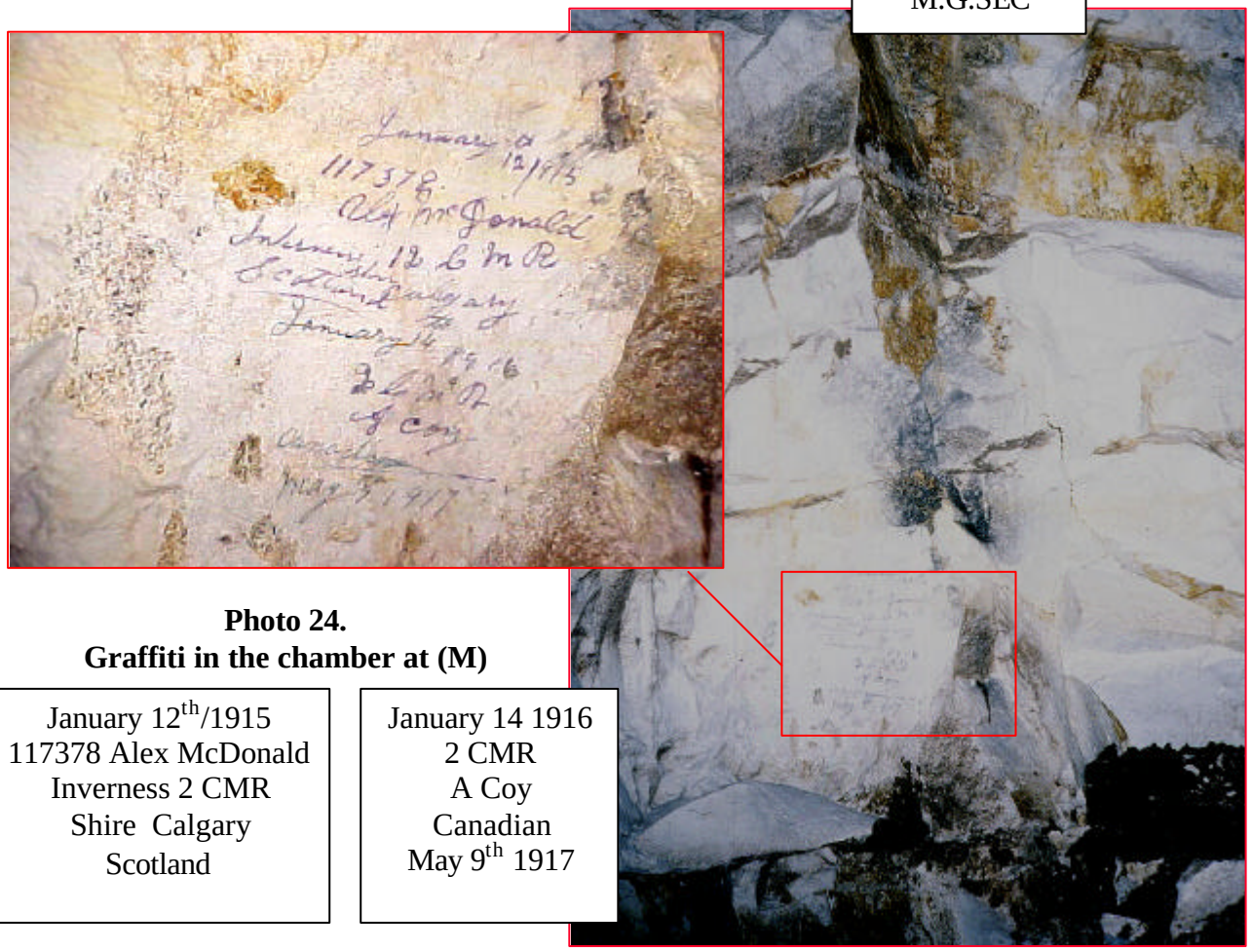


Photo 24.
Graffiti in the chamber at (M)

January 12th/1915
117378 Alex McDonald
Inverness 2 CMR
Shire Calgary
Scotland

January 14 1916
2 CMR
A Coy
Canadian
May 9th 1917



Photo 25.
The entrance into the side chamber at (M) – location of clay plug ringed



Photo 26.
The clay plug in the side chamber at (M), perhaps from the TM tunnel above

6.16 Turning to the west along the Goodman Subway it is possible to go approximately 23m along the tunnel before it is blocked by a fine chalk and clay infill, originating from above. This is shown in Photo 27. Examination of the maps indicates that this blockage is at the location of the shaft (O). It is presumed that this shaft was blocked deliberately at some point after the war. A close reconnaissance of this blockage (Photo 28) indicates that the clay has firmed solid but is easy to dig into. It is therefore assessed that it would not be a difficult job to dig through this plug and gain access to a greater length of the subway.



Photo 27.
The blocked shaft along the western arm of the tunnel (O)



Photo 28.
Preliminary investigation of the blockage in the shaft

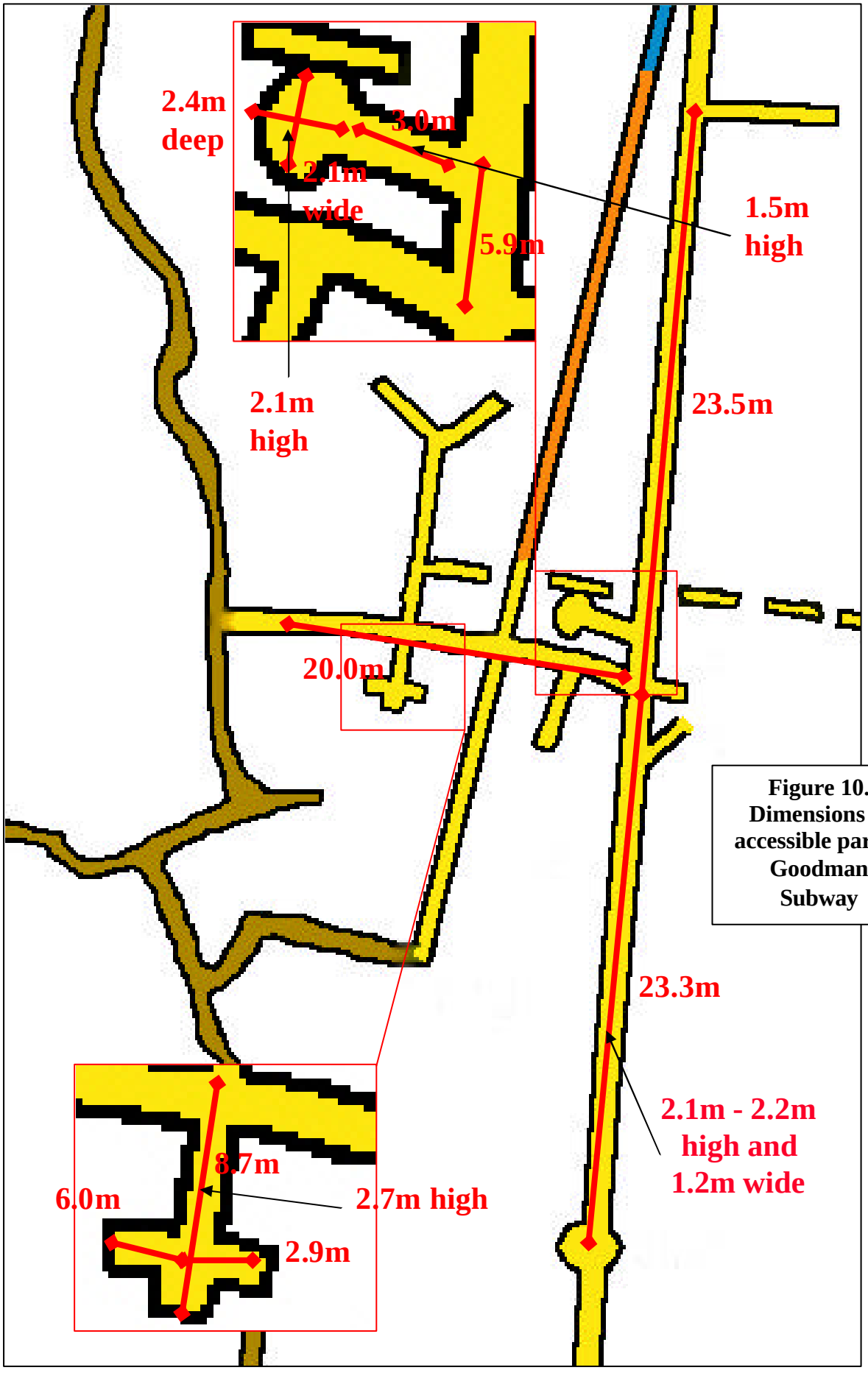


Figure 10. Dimensions of accessible part of Goodman Subway

7 ARTEFACT RECOVERY

7.1 Within the small area of the Goodman Subway currently accessible there were few significant finds. In addition to the remains of the bully beef tin and No.5 Mk.1 grenade found in the main tunnel; a number of other similar grenades have been observed in the chalk debris on the floor of the trench mortar store at (H). All of the grenades have been left in situ and will require recovery and disposal at some future point.

7.2 Two British bayonets were recovered from the main Goodman Tunnel. The first, recovered in May 2000 was virtually complete with the wooden stock in good condition. This bayonet is shown in Photo 29. The second bayonet was found beneath the chalk debris on the floor close to the same location. This is shown in Photo 30. The location of both bayonets is close to the area where the main graffiti panel is and close to the possible staircase to the upper levels.



Photo 29. (above) British bayonet in the main tunnel



Photo 30. (right) British bayonet recovered from the floor debris

8 GRAFFITI

8.1 The length of Goodman Subway that can be accessed contains an extensive array of graffiti. This mainly takes the form of names and numbers of soldiers who passed through the subway written in ink and pencil on the chalk walls. Regimental badges and short rhymes can also be found. In most cases these are written and drawn straight onto the chalk faces. In some cases it is clear that the author has first cut a flat face on which to write. The standard of writing and drawing varies from the very crude to the reasonably sophisticated. In one case a carving of a maple leaf has been attempted although this now only partially survives.

8.2 The graffiti can be found in four main areas. A small selection can be found at (1) as you enter the main subway from Albany sap. The main panel of graffiti is at (2). On the opposite wall of the tunnel at (3) there are a few further examples. Further along the tunnel to the west, close to the blocked shaft, further examples can be found on both side walls of the tunnel at (4) and (5). The only other graffiti to be found in the subway are in the side chamber at (M), which have already been described. There are no examples of any graffiti on the roof anywhere in the tunnel area so far explored. This report does not seek to document all of the graffiti discovered – this will be the subject of a separate report – and only a few examples from each area are included. These examples are shown in Photos 31 – 38.



Photo 31. '172 RE' carving at (1)



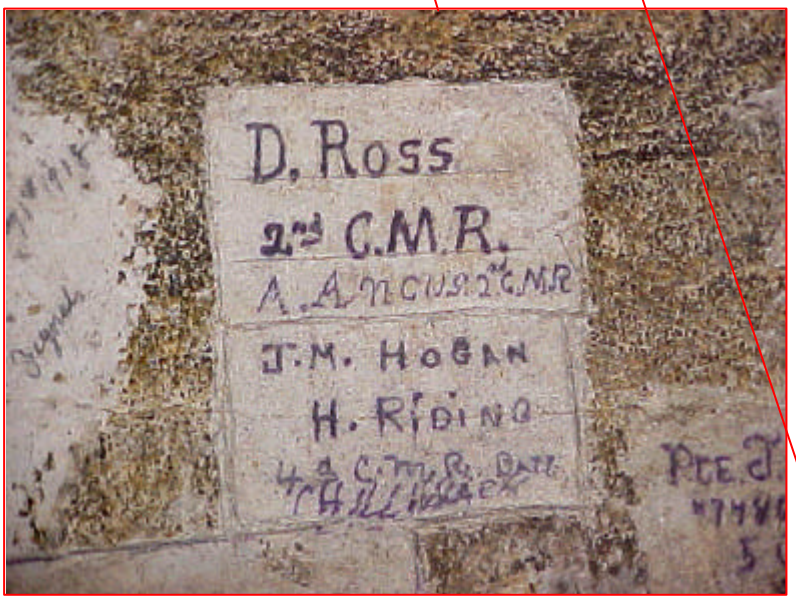


Photo 32. (above)
The main graffiti panel at area (2)

Photo 33. (left)
One of the examples of ink written names



Photo 34. (right)
Ink drawing of three interlocking fish

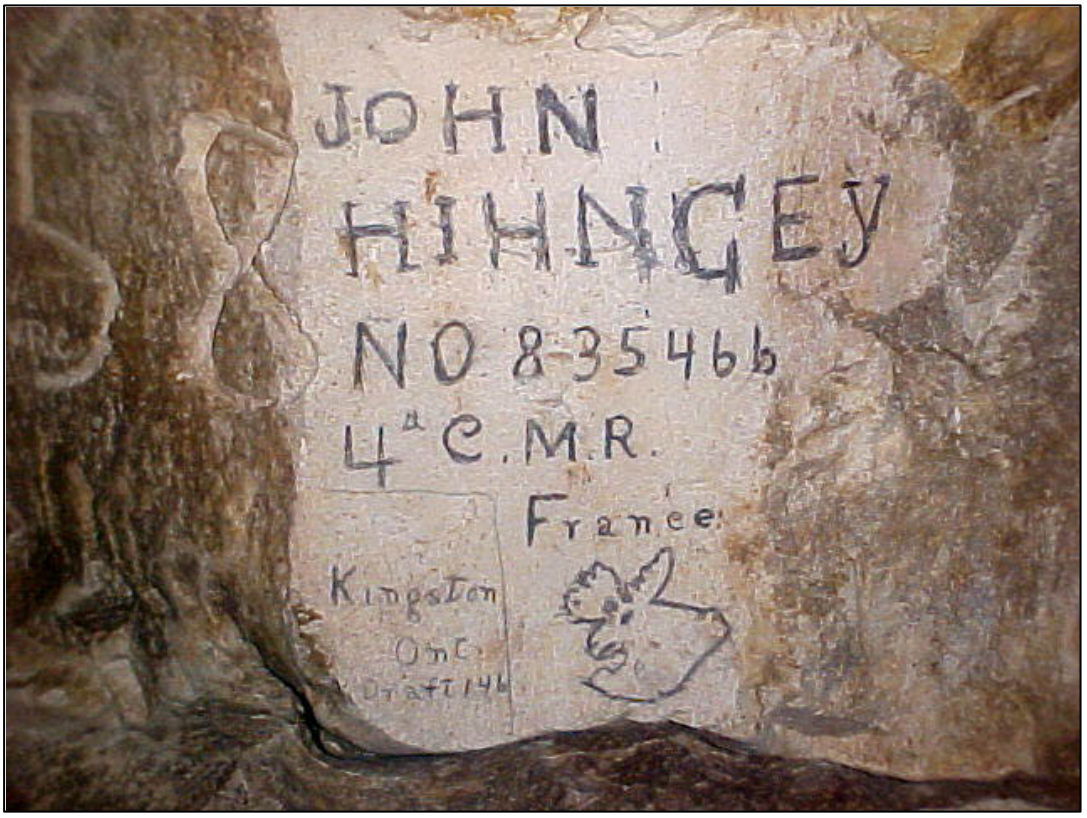


Photo 35. 'John Hihngey, No 835466, 4th C.M.R., France Kingston, Ont, Draft 146' – area (1)

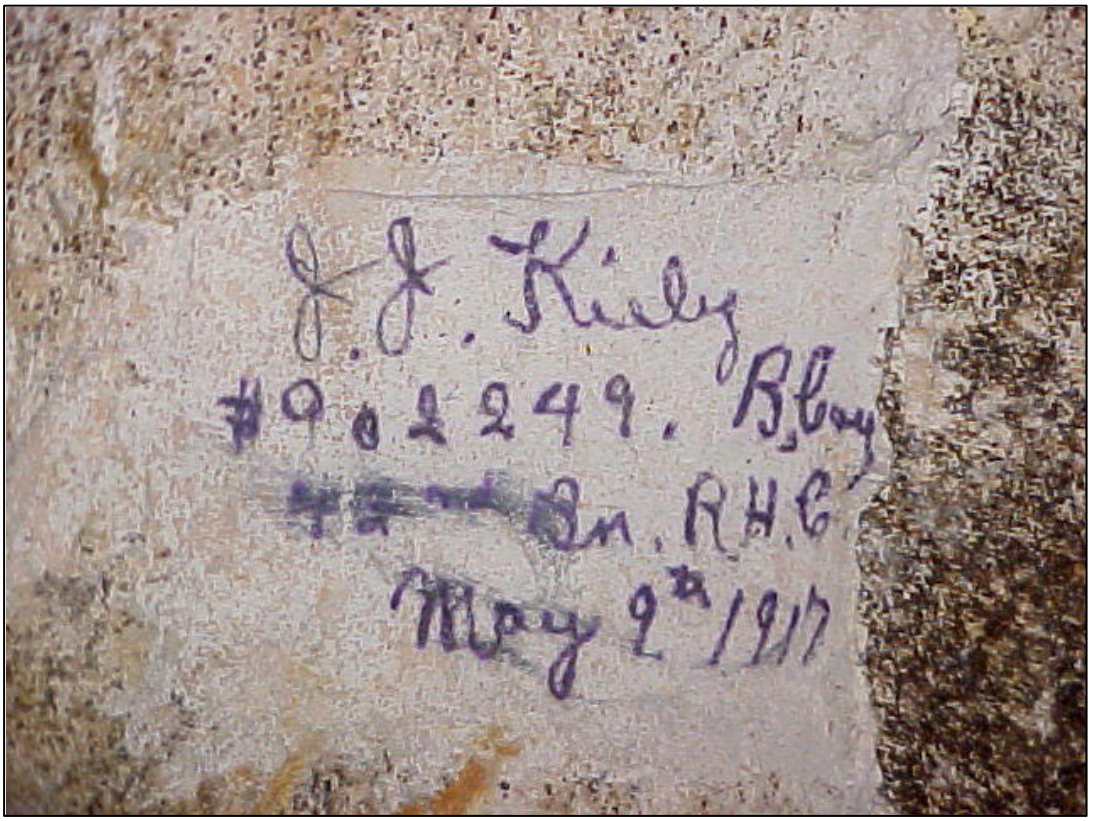


Photo 36. 'K K Kiely # 902249, B Coy, 42nd Bn RHC, May 9th 1917' – area (4)



Photo 378. 'Pte A.E. Leger, 22nd Batt, French Canadian, Montreal, Canada' – area (3)

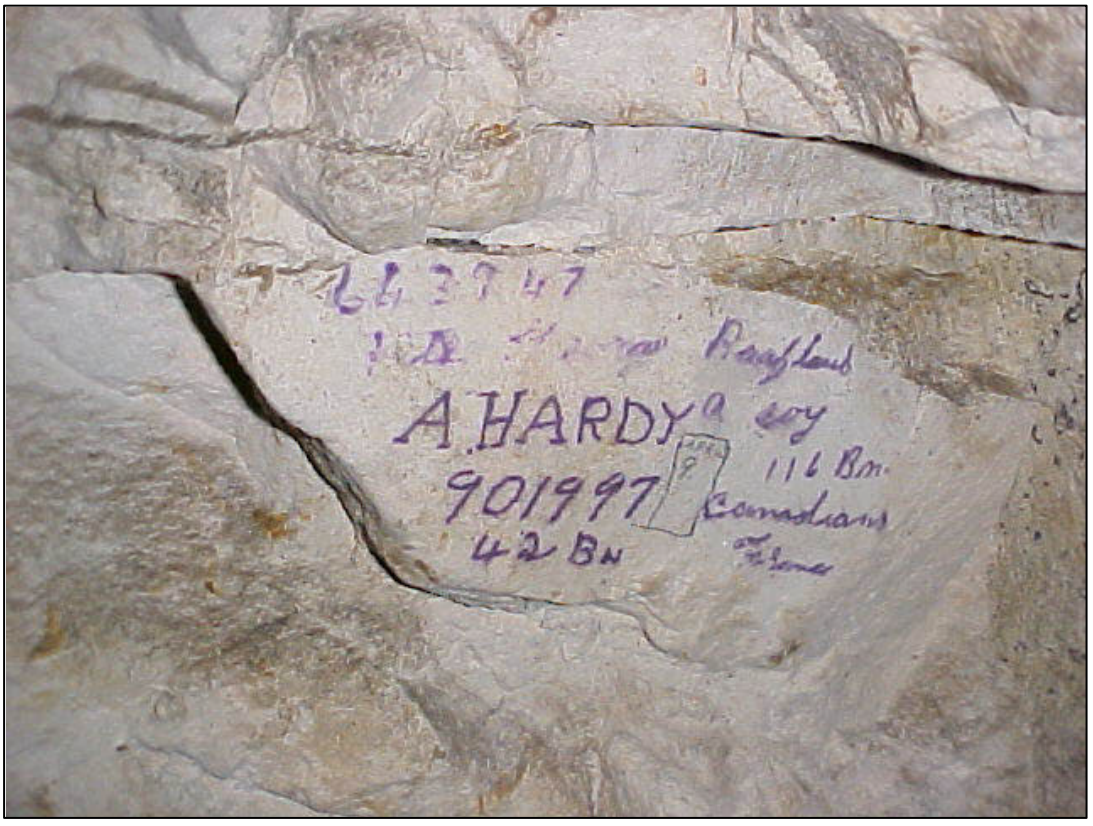


Photo 38. 'A. Hardy, 901997, 42 Bn' and other scrawls at area (5)

9 SUMMARY AND RECOMMENDATIONS

9.1 The aim of accessing the Goodman Subway was achieved although the access route used is inherently unsafe and cannot be considered an acceptable long term access option. The general stability of the Goodman Subway itself, however, appears to be good with very little evidence of slabbing or other chalk falls. What falls there are appear to be contemporary to the WW1 period as in some cases communication cable lies on top of chalk debris.

9.2 The various chalk and clay blockages all appear firm and in little danger of immediate major slippage. The blockage in the shaft is likely to be not more than a few metres thick at the top and should be fairly simple to dig through and support. This would gain access into a further extensive section of the Goodman Subway. It is likely that this would be at least 700 ft to entrance number 2, where it is possible that the tunnel could be blocked due to blockage of the entrance.

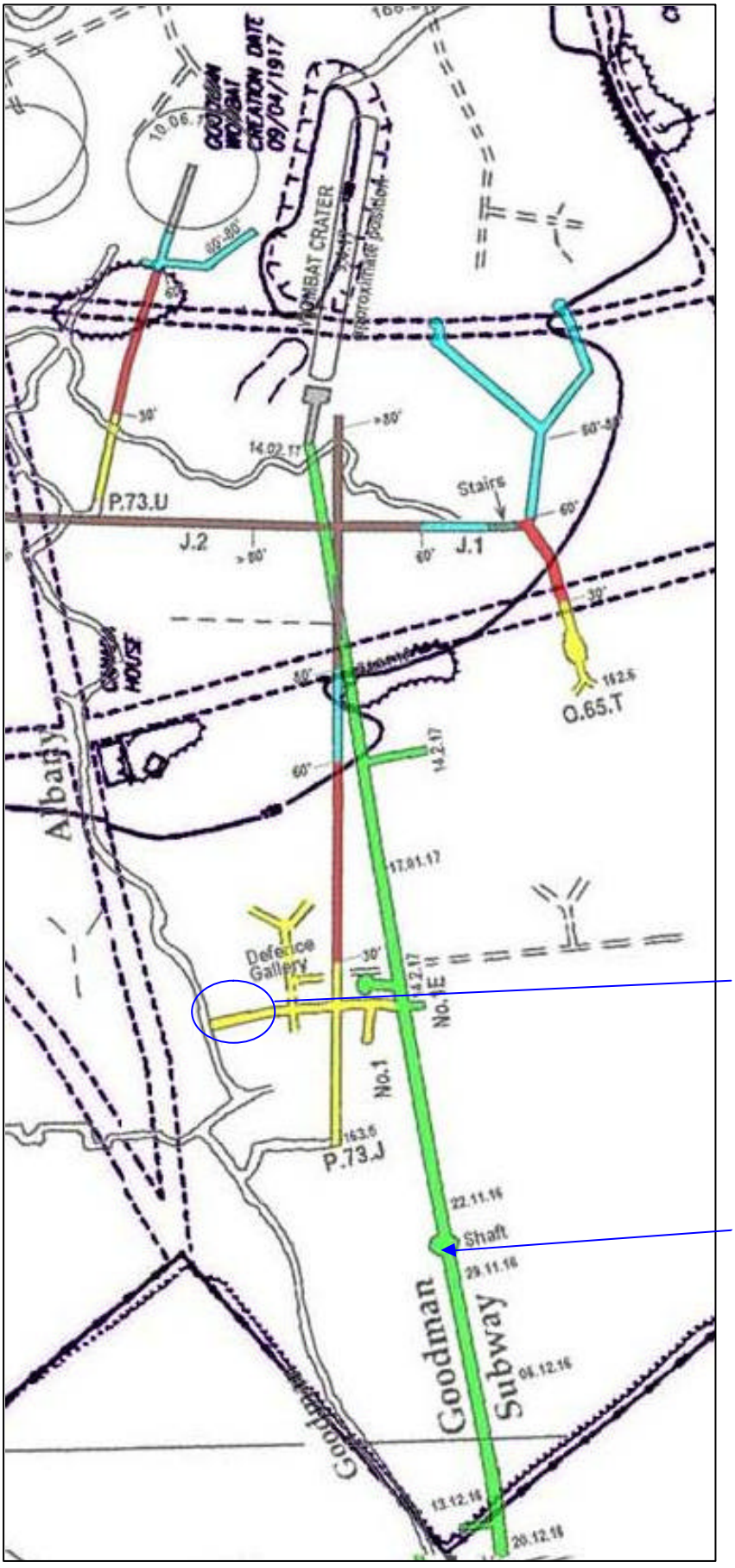
9.3 It is possible that the Subway could be clear as far as entrance number 3, some 1200 ft further west along from the shaft. Access through the blockage in the shaft could therefore give access to the water reservoir, various side chambers and the heavy trench mortar emplacements. Based on the extensive amount of graffiti found in the short length of the Subway accessed thus far, there are likely to be further extensive examples elsewhere in the Subway, particularly close to the entrances and trench mortar positions.

9.4 The graffiti discovered in the Goodman Subway is to be published as a supplementary volume to this report. The extensive portfolio within the Subway is a highly valuable historical archive, the future of which needs to be carefully considered. The graffiti provides a very personal record of the men who used the Subway during the war, and especially during the assault on the Ridge – many of whom no doubt were killed on 9 Apr 17 and beyond, and have no known grave.

9.5 In view of the potential historical evidence still to be discovered within the Subway it is recommended that the blockage at the shaft be dug through to allow access to the west of the tunnel. The P.73.J access tunnel is not, however an acceptable long term route into the Subway. It is further recommended that the Albany sap entrance be opened up to provide a safer access into the tunnel. This route would also negate the need to move material along the length of the La Folie system to get up the P.73.J tunnel, thus providing a shorter and quicker access route.

9.6 Assessment of the Albany sap entrance on the ground indicates that the first 3m or so of the tunnel from the Albany trench has collapsed. The existence of modern beer bottles in both the infill of the obvious depression along the line of this sap and in the debris underground, suggest that this was a later collapse that has been infilled more recently. It is likely that the quantity of material to be excavated to gain access is not that considerable, and that it is a feasible engineering project for the Durand Group.

9.7 A more detailed engineering reconnaissance would be needed to establish the full feasibility of this recommendation. Prior to such an operation, plans for the permanent securing of the entrance would also need to be evolved, in order to protect the subterranean features. This is an essential pre-requisite for any such project; temporary solutions are not deemed an acceptable option. Details of the proposal are shown at Figure 11.



Sap entrance to be opened up

Blocked shaft Requiring clearance

Figure 11.

Modern topo map laid over historical mining plans

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