



February 1918, Loos Salient, The Western Front.

"To the north of Lens near Hulluch, where I went through the workings with Sanderson, the whole defence of the front appears to be underground. The infantry garrison lives underground, trench mortars and their crews are underground. The machine guns are underground and for a mile behind the front line the communication trenches are underground. The light railway delivers stores to the gun emplacements by an even lighter railway - underground!"

Charles Bean, Australian Official Historian of the Great War

PROJECT DESIGN

“Loos Salient - Hulluch Subway”

(Phase 1 - Preliminary excavation)

27th-29th September 2013 (WINGS WAY)

&

4th-6th October 2013 (STRAW ALLEY)

Prepared by

The Durand Group

Sponsored by

THE DURAND CHARITABLE TRUST



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1. Introduction

Hulluch Tunnel (pronounced *oo-loo*), also referred to as Hulluch Subway, is an important First World War underground feature in the Loos (pronounced *losh*) Salient of the Western Front. It is situated between the town of La Bassée and the City of Lens in a mining area of crucial importance to France's pre-war coal needs.

2. Historical perspective

The Battle of Loos (September 25th - October 10th 1915) saw British gains to the north and south of the village although, in effect, the new front line created only a shallow salient still vulnerable to German threat from several vantages. (Plate 1) The villages of Auchy and Hulluch had not been taken in the north and the Germans still had control over several important mining centres on the northern outskirts of Lens from which they had a commanding position over the British support lines.

As the British stabilised their front line, mining sectors were soon established to counter the substantial German underground threat (from south to north): Double Crassier - Copse - Hill 70 (173 and 258 Coys RE); Hulluch-St Elie (253 Coy RE); Hohenzollern - Auchy (170 Coy RE). Although all these sectors were to become heavily engaged in underground warfare during the next two years it is the **Hulluch-St Elie Sector** that forms the basis of this project design.

In January 1916 253 Tunnelling Coy RE was deployed in front of Hulluch which was subsequently divided into two areas - Hulluch and St Elie. (Plate 4) Two sections of sappers were allocated to each area and work quickly began sinking shafts in an effort to counter the enemy underground. In November 1916 a substantial underground communication scheme was commenced - linked to the fighting system that eventually extended for **four miles** as far north as the La Bassée canal.

The *communication subway*, of course, was not a totally new concept and an earlier manifestation in the form of the *Russian Sap* - a shallow, covered conduit driven out into no mans land to aid infantry trench defences and raids - was oft used even before the 1916 Somme Offensive. Leaving aside the artillery bombardments that often preceded or accompanied an actual attack, the infantry, in a seemingly endless cyclical trudge from front to rear lines, had always been vulnerable to sporadic artillery and trench mortar fire. *Wastage* along the front therefore varied enormously. To minimise this in certain *hot spots* a myriad of communication tunnels were constructed, in effect moving the bulk of the troops underground. None was more elaborate than the **Hulluch-St Elie** communication scheme.

In August 1917, after eighteen months, 253 Coy were replaced by 3rd Australian Tunnelling Coy, under the command of Major Alexander Sanderson DSO MC and Bar. An elaborate programme of work was then commenced to defend the tunnels against projected enemy infiltration.



Men of 3rd Australian Tunnelling Company excavating a chamber in the chalk in the Hulluch subway



Cooks of the 3rd Australian Tunnelling Company preparing dinner in the Hulluch-St Elie tunnel system (44 G18a 88.95)

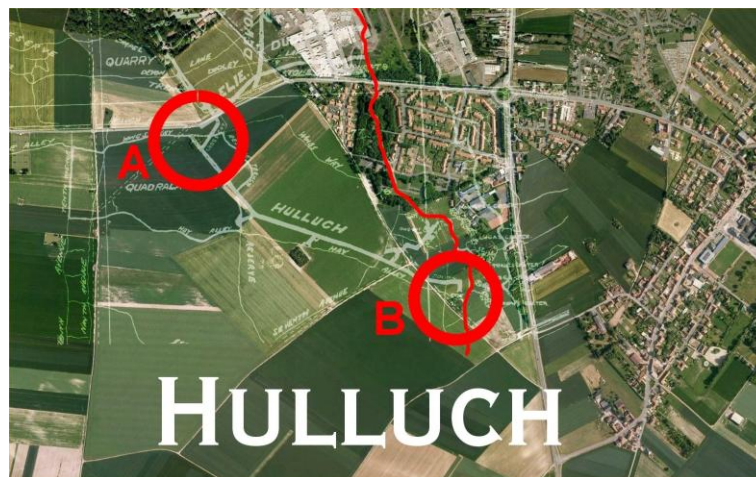
3. Summary of available information:

Four primary archival sources provide us with much information on their workings in addition to the maps and plans available separately, Firstly, the war diary of 253 Coy RE ([253 Coy War Diary and Reports Jan -Jul 1916.pdf](#) and [253 Coy War Diary and Reports Jul 1916-1919.pdf](#) including weekly mining reports. Secondly, the unpublished private memoirs of Lt Francis E Howkins, who served in No2 section in the Hulluch area between 1915 and 1917. ([F E Howkins - Under No Mans Land.pdf](#)) Both these describe some of the early deep mine fighting and the construction of the Hulluch Subway up to August 1917.

Thirdly, Major Sanderson was the chief architect of many of the defensive features to be found in the tunnels and we have access, by permission, to his personal notes on some of the designs he drew for their construction and defence. Lastly, as electrical power and lighting was common to most underground workings, the war diary of the Australian Electrical, Mechanical, Mining and Boring Company (The ABC Company) ([ABC awm4-16-1-1.pdf](#)) is also key to our knowledgebase.

From maps and plans available to us from the National Archives we know that Hulluch Sector had a finite end to the south - in front of Hulluch village. However, it appears to be linked to the two other sectors - Hohenzollern and Auchy - by means of a substantial fighting lateral and possibly a complex series of shallower interconnecting subways. The original First Army Mining Map (Ref: WO153 914) can be easily overlaid on a Google satellite image to show the probable position and extent of the underground system ([Plate 2](#))

After an initial recce by the Project Manager in 2011, a small team from the Group undertook a field survey in August 2012 on land thought to contain several entrances to the Hulluch Subway. Two sites, **A** & **B** were identified as having potential for gaining entry to the overall system.



Linesman software interpretation of the position of the Hulluch Subway based on logged coordinates

4. Project aims & objectives:

Accessing the Hulluch Subway and its associated deep system of fighting tunnels is desirable for a number of reasons. Firstly, it is a logical continuation of the Group's work at Copse and Hill 70 in trying to understand the nature of underground warfare in the Loos Salient between 1915-18. Secondly, it will give the Group an unprecedented insight into why and how such a complex series of tunnels came to be dug for reasons other than supporting an offensive operation (Somme, Arras, Vimy) and what technological innovation was developed to help defend them after their construction when it became evident that the Germans were planning a massive Offensive in the Spring of 1918 to end the war on the Western Front.

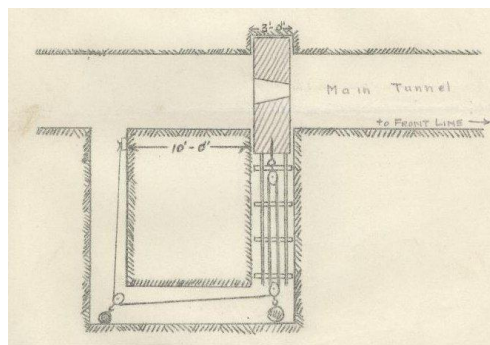
With the Group's efforts to gain access to the Hythe Subway at Hill 70 as yet unsuccessful, it provides us with another opportunity to glean the information at first hand, as many of the defensive features are common to both Hulluch and Hythe environments.

Moreover, entry into the system will give the Group the very real possibility of an uninterrupted walk, through the fighting lateral, from Hulluch all the way to La Bassée - over four miles in distance. Divided into several operational phases, our overall aims and objectives are therefore:

- I. To access, investigate and conduct a survey of the extent of the **Hulluch Subway** and deep tunnel system and record underground features so that a comparison can be made with current historical records.
- II. To undertake an archaeological investigation on the system to determine living conditions, recover and record artefacts and to understand the full significance of the system, in relation to the battleground of Loos both above and below ground.
- III. To provide detail of such investigations to local authorities and interested parties in the form of reports and publications.
- IV. To enable, where practical, permanent secure entrances into the subway and mining system for future investigations.



Major A Sanderson DSO MC and Bar, 3ATC, seated bottom row, middle



Sketch by Major Sanderson of a bascule door design for Hulluch & Hythe Subways



Men of 3ATC utilising a vertical wombat borer to provide ventilation at Cite St Pierre, Lens



Advanced Brigade HQ at Charing Cross, Fosse 7



Engine Room at Wings Way, operated by the Australian Electrical and Mechanical Mining and Boring Company (AEMMB).



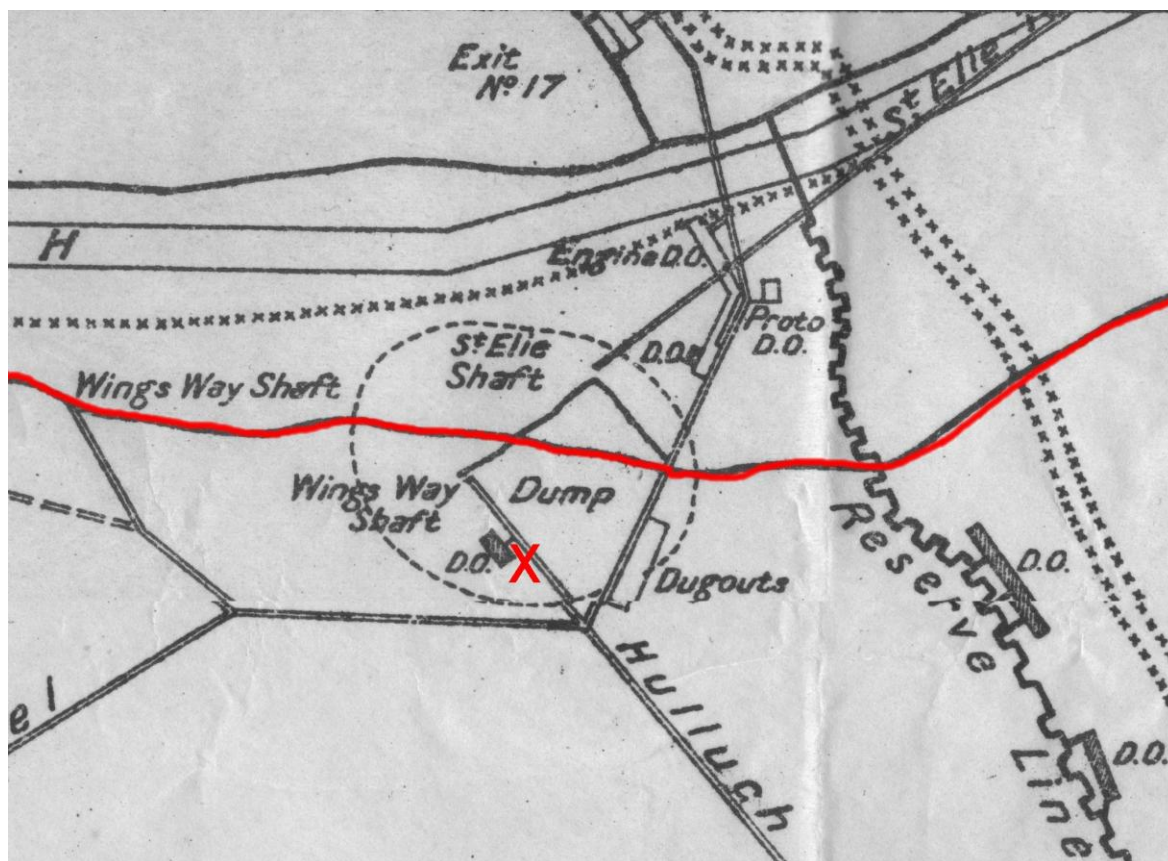
1057 Sapper E. Kelly of 3ATC in a Hulluch Proto Dugout, either 44 G 18a 70.90 or 44 18d 70.95

5. Summary of operational phase objectives

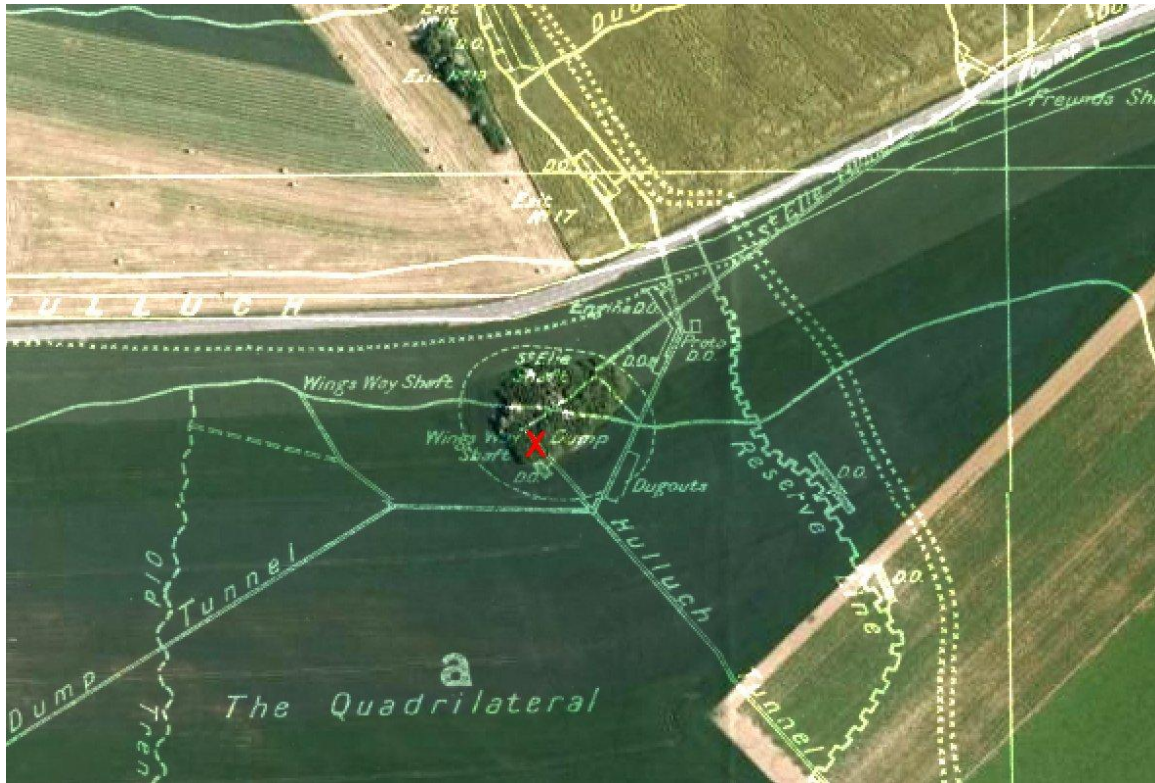
- Phase 1** **Sep/Oct 2013** - Initial excavation involving bucket chain at **WINGS WAY** and heavy plant at **STRAW ALLEY** to verify the location of the selected entrances. If confirmed these entrances will be secured for future investigative potential. Verification may include a preliminary descent into a tunnel if practicable.
- Phase 2** **May 2014** - Secondary excavation to reclaim original entrances and gain full and safe access to the tunnel system. A preliminary reconnaissance of the subway and/or tunnels will assess H&S issues and prepare for future work needs.
- Phase 3** **Sept 2014-15 >** - Detailed investigation and reporting on all underground tunnels and features leading to a full written and multimedia report.

Phase 1 of the project will first excavate a collapse that has occurred close to the **WINGS WAY** shaft leading into the Hulluch Subway.

Wings Way trench runs east to west parallel to the D39 road between Vermelles and Hulluch. It passes through a chalk spoil dump several of which are located in the surrounding area. On 7th November 1916 a spur was dug from the trench and an incline started (referred to as a shaft). By 21st November 33' of incline had been driven and by December over 100'.

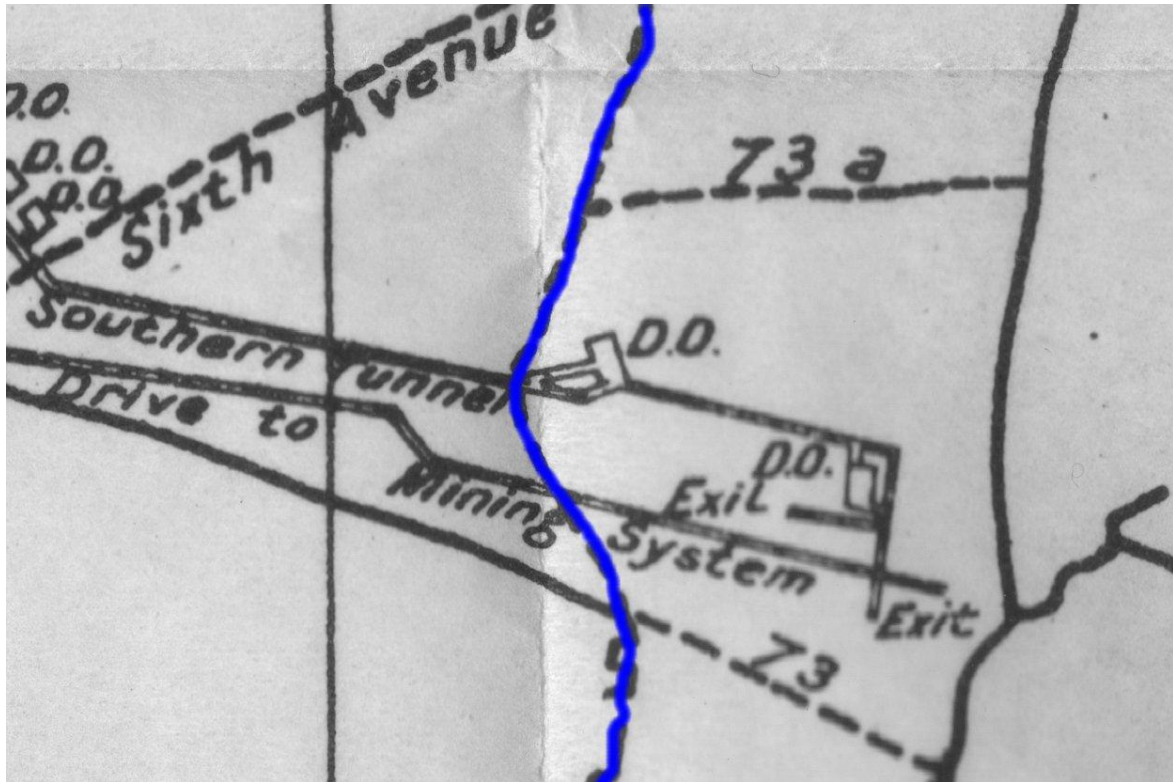


The current collapse is marked **X** - close to a dugout coming off the incline to the tunnel. The intention is to excavate the collapse using traditional bucket and chain method so as to minimise disruption and damage to the surrounding environment.

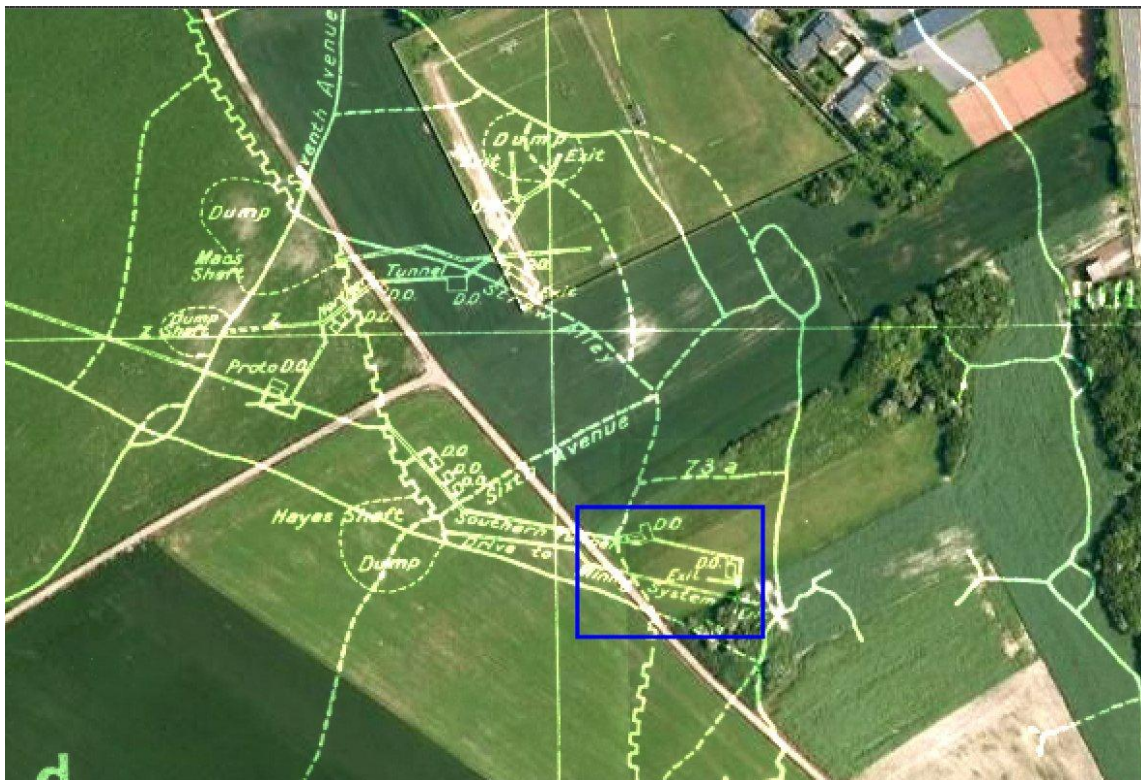


Group recon at the ground collapse at **WINGS WAY**

The second part of Phase 1 will try to break into an inclined dugout close to the junction of STRAW and HAY alleys. **STRAW ALLEY** is a trench running across the Hulluch Southern Tunnel. and there is the possibility that a recent collapse here may be related to the dugout (centre of image) linking both trench and tunnel.



Good, secluded access to the site is available, away from the public gaze. The ground is currently fallow and has been for several years so a JCB will be used to quickly remove the topsoil in order to accurately plot the trench and tunnel lines.



The Project will be expedited according to Durand Group H&S Protocols and procedures listed at the end of this document.

6. Conclusion

The Durand Group thanks you for taking the time to read this project design. It should, of course, be seen as a general outline of the proposed work schedule for the Durand Group over any project period. Due to the unpredictability of the results of an operation it is not possible to outline every action. Through experience the Group has learnt that having a broad plan of campaign enables it to be reactive to the changing scenario that occurs on a daily basis.

A copy of the Group CONSTITUTION is available should you wish to know more about how the Group operates and how we administer ourselves.

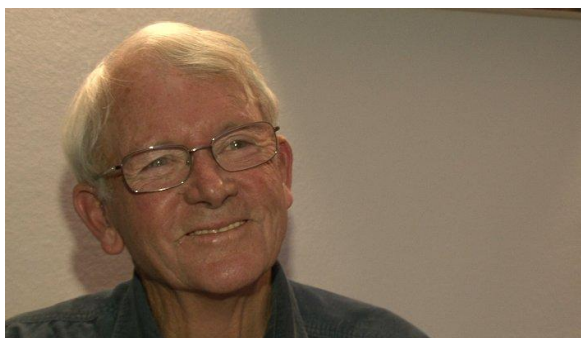
By following the Group PROTOCOLS ensures that safety is maintained as paramount importance to the project at all times.

The Group are also committed to working with our French, British, German and Canadian colleagues in both historical and archaeological contexts and sharing knowledge with the local communities.

Should the Group prove successful in accessing the Hulluch Subway and its associated system of deep fighting tunnels, the results will surely prove to be an important addenda to the Durand Group's work in the Loos Salient as will add to our sum of knowledge about the techniques and methods employed in underground warfare between 1914-18 both offensively and defensively.

Finally, we are very fortunate to have the good wishes and active participation of a number of descendents from those who served during the underground war on the Western Front in the Loos Salient. This includes:

- *Ian Morse*, grandson of Major Richard Morse DSO - CO of AEMMBC
- *Robin Sanderson*, grandson of Major Alexander Sanderson DSO, MC and Bar - CO of 3ATC
- *Peter Farrow*, grandson of 2nd Lt Francis Howkins - 253 Tunnelling Company RE
- *Marc Gurrey* - grandson of Capt Francis D Gurrey MC - 173 Company RE



Ian Morse



Robin Sanderson



Francis Donald Gurrey 173 Coy RE



2nd Lt Francis Howkins 253 Coy RE



7. Who we are.

The Durand Group is a fraternal association of individuals who have voluntarily undertaken to work together to further research and investigation into military related subterranean features. Founded in 1998, the central ethos is derived from that of the tunnellers of the First World War - mutual trust, personal compatibility and confidence in the competence, capability, resolution and support of all members.

The Group is an eclectic mix of individuals, many of whom are leaders in their fields whether military or civilian. We have a strong historical team - three of our members have several publications currently in print ranging from WW1 Battleground history to munitions and booby traps. Others provide historical research services, film making skills and consultancy on a number of military related issues including work for the UK Armed Forces. We also have two leading specialists in WW1 artefacts.

We have several engineers - including a forestry specialist and a mining engineer - and three consultant surveyors. Over the past decade our five-strong archaeological team has amassed a huge wealth of experience both above and below ground. We have five former explosive ordnance disposal specialists from the British Army and one former civilian battlefield ordnance disposal contractor. One of our newest members is currently serving in a staff role in Afghanistan whilst on secondment from the Irish Guards.



Olympia, London - February 2008



Carrière Wellington, Arras - July 2009

Each project the Group takes on will utilise some or all of this skill set and gives us an unrivalled presence in the field of battlefield archaeology and investigation. Some of our work can be found here on YOUTUBE:

http://www.youtube.com/results?search_query=the+durand+group&aq=f

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8. PROJECT SAFE SYSTEM OF WORK

The risk assessment has identified the following precautions to be taken to mitigate the risks of accidents occurring from the identified hazards

PROJECT: LOOS SALIENT - HULLUCH SUBWAY	FOR THE ATTENTION OF: Aidan Cleary
LOCATION: Hulluch, Pas de Calais	FROM: Andy Prada
DATES: 27th-29th September / 4th-6th October 2013	REVIEW DATE:
PROJECT MANAGER: Andy Prada	
H&S OFFICER: Chris Martin	
DESCRIPTION OF PROJECT: Preliminary Excavation of sites	
HAZARDS	PRECAUTIONS TO TAKE - SAFE SYSTEM OF WORK
Plant/vehicles involved in road accidents en route and in contact with persons causing impact and crushing injuries.	Group members will ensure that their vehicles are roadworthy and suitably insured. <i>Transporting of JCB, will be by its own trailer and will be loaded, secured and driven by Sylvain only.</i> All Group trailers and vehicles will not be loaded beyond their maximum capacity and will be inspected before being used on the road. Safety critical items will be checked before setting off (lights, couplings, tyres and pressures, straps and fixings). Only essential personnel will be on site during site setting up and non-essential personnel and on-lookers to be kept away. Vehicles should be guided by banks-man wearing a high-vis coat and designated parking area identified. Working and rest/welfare areas to be located well away from vehicle movement areas.
Contact with buried services (gas, electricity, water) resulting in fire, explosion, burns, electrocution or high pressure injuries.	In France it is illegal to bury services below farm land. However, if possible consult with the land owner for information on buried services before digging. A member of the Group must act as a 'banks man' to watch to identify evidence of buried services during mechanical digging. The land will be surveyed prior to dig for obvious signs of services (inspection covers, gullies, marker posts or posts carrying cables). Where buried services are suspected avoid using mechanical digging and only hand-dig. If buried services are discovered re-assess situation, for possible alternative location or other ways of avoiding the buried services, before proceeding.

JCB coming into contact with persons leading to impact and crushing injuries.	JCB to be operated only by Sylvain and only when there is a banks-man available to direct operations. The digging area will be cordoned off with hazard tape fixed to road pins and only essential personnel permitted within the cordon. Banks-man must wear high-vis coat and have a whistle capable of attracting the drivers attention when directing digging operations and be an experienced member of the Group. Members of the public and on-lookers to be managed away from the digging area and not permitted within the cordon while JCB is operating. Project members to be reminded of the dangers of large machinery operating close by and to keep outside the cordon unless essential personnel. The area within the cordon will be a PPE area and all persons will wear safety footwear, high-vis and hard-hat while JCB is operating.
Collapse of excavation sides (due to insecure sides, surcharging and the additional weight of JCB) leading to persons being buried.	All precautions as identified above to be taken. In addition to this the excavation sides will be sloped or battered back when deeper than 1.2m. Where this is not possible the excavation will be supported using bulk timbers, Acro's, shuttering etc. All spoil will be deposited away from the edge of the excavation (distance at least equivalent to the depth of excavation) and vehicles, plant & equipment to be kept away from excavation edges. No persons will be permitted in the excavation while JCB is operating. JCB will be operated at a safe distance from any excavation or operate in its own excavation with no persons present. A safety inspection of all excavations will be carried out daily (prior to commencement of works) and more frequently in wet weather conditions.
Equipment & other items falling into the excavations and on top of persons resulting in head and other injuries.	Excavation to be cordoned off with hazard warning tape and only authorised persons and plant permitted inside. Persons and plant/equipment will not be permitted to be located on the edge of the excavation while persons are working below. A designated access into the excavation will be identified and used at all times. All items will be stored away from the excavation edges and no items will be thrown into the excavation (always handed or lowered). All persons involved in the excavation will wear a hard-hat and suitable safety footwear.
Unauthorised persons entering the site resulting in any of the hazards identified above.	The site will be supervised at all times when field operations are taking place. Excavations will be cordoned off with hazard tape fixed to road pins to serve as an exclusion zone to all non-essential persons/vehicles. All visitors to be supervised at all times while on site. Suitable notices to be displayed warning of 'Danger Excavations' & 'No Entry'. At night excavations, plant and facilities to be secured against access and covered where deemed necessary.
Group members handling intrinsically harmful objects (sharp, jagged, rusty metal etc) leading to cuts and abrasions and possibly bacterial infection.	All persons involved in excavation work will wear protective gloves at all times when manual working and handling intrinsically harmful items (rigger-type gloves are suitable). First aid will be available on site for minor cuts and lacerations and emergency arrangements are to be confirmed for more serious incidents. Project personnel to be reminded to ensure their tetanus inoculations are up-to-date and to use protective equipment. Hard-hats will be worn within the cordon and knee pads will be available for those who will be kneeling for prolonged periods. Washing facilities (clean water and soap available on site) and food and refreshments will be provided away from work area. Project personnel reminded of the importance of personal hygiene. Personnel should cover up bare skin wherever possible by wearing appropriate overalls.

Manually handling heavy and awkward items such as manoeuvring trailers, equipment, buckets of spoil, large rocks, Acros, bulk timbers etc. resulting in sprains and strains.	Group members must have a reasonable level of fitness and be able to handle buckets filled with spoil. Group members and volunteers will be given light duties where preferred and where it is known there is an existing ill-health condition but this must be communicated to the Project Manager. Personnel will be assisted by other members if required and all members will be advised not to attempt to lift/move any item they don't feel capable of moving (this will be reinforced during induction briefings). Where possible 'Pet' will be used to reduce the risks of moving very heavy and awkward items. Spoil within tunnels will be removed by bucket chains reducing the need for an individual member of staff to move spoil long distances. Where significant amounts of spoil needs to be removed mechanical aids (ratchets, gin-wheels and conveyor belts etc.) will be considered where practical. All persons to wear suitable gloves (rigger gloves), hard-hats and safety footwear.
Collapse of excavation sides (due to insecure sides and surcharging) leading to persons being buried.	A dynamic risk assessment will be carried out to determine the stability of the excavations sides. If they are regarded as being unstable excavation sides will be sloped or battered back when deeper than 1.2m. Where this is not possible the excavation will be supported using bulk timbers, acre's, shuttering etc. All spoil will be deposited away from the edge of the excavation (distance at least equivalent to the depth of excavation and preferably in an area 45 degrees profile clear of excavation) and vehicles, plant & equipment to be kept away from excavation edges. A safety inspection of the excavation will be carried out daily and more frequently in wet weather conditions. Loose materials around the entrance to any excavation will be removed prior to entry and where this is not possible kick-boards or containment sandbag walls will be installed to prevent materials from falling into the excavations.
Hazardous atmospheres within excavation (oxygen deficient or presents of toxic gas) leading to poisoning or asphyxiation.	Excavations not usually in areas of known contamination. Land owner will be consulted to determine any known contamination. Excavation well ventilated. Excavation to be evacuated where hazardous atmosphere is suspected and gas detection will be used where hazardous atmosphere is suspected and during initial safety inspections. Portable ventilation fan to be used to provide additional air where oxygen levels fall below 19%.
Thick undergrowth concealing various hazards.	Site will be cleared in order to reveal concealed hazards. Site will be marked out with tape to identify working area. Persons involved in clearance activities will wear safety footwear, overalls and rigger-gloves. Hard-hats will not be necessary unless there are overhead obstructions. Eye protection may be required by dynamic risk assessment. Where portable powered tools are used the precautions outlined in 'Use of portable electrical and fuel powered tools and equipment' will be taken. Prior to clearance work EOD persons will inspect area for munitions.
Contact with rotating and moving parts of equipment, objects being ejected from equipment or material being machined, electrocution, burns from hot equipment and fires from fuel powered equipment.	Only experienced members of the Group to operate portable power tools. Others may be given instruction on the use of portable equipment while being supervised by experienced persons. All equipment to be inspected before use and defects corrected where necessary. All equipment will be operated and maintained in line with the manufacturers instructions and any training and instructions will be to the manufacturers standards. Personal protective equipment will be worn by operators especially eye protection, 'rigger' gloves and safety footwear. Electrical equipment will be limited to 110v and where this is not possible all circuits will be protected by RCD. All fuelling activities will be carried out away from the immediate work area and there will be no smoking permitted during any fuelling or decanting activities. A suitable fire extinguisher will be carried as part of the site equipment. Portable fuel generators will be located away from any excavations while in operation and down-wind by at least 5m

	(to prevent fumes from entering excavation).
Deliberate or accidental entry to the site of unauthorised persons resulting in slipping, tripping and falls into excavations.	The site will be supervised at all times when field operations are taking place. Excavations will be cordoned off with hazard tape fixed to road pins to serve as an exclusion zone to all non-essential persons/vehicles. Notices to be displayed warning of 'Danger Excavations' & 'No Entry'. Excavations, plant and facilities to be secured against access and boarded, sand bagging where deemed necessary, before the site is left for the night and at the end of the project. All onlookers and visitors will be kept outside exclusion zones unless supervised.
Insecure rocks, slabbing, collapse leading to crush injuries and entrapment.	Prior to investigation work a safety inspection will be carried out to assess the condition of the tunnel and determine any additional safety works to be carried out. Where a dynamic risk assessment identifies an unacceptable risk of collapse shoring will be introduced to prevent collapse. If this is not viable the tunnel will not be investigated further - this will be a collective decision by the team. Where the tunnel is safe to continue regular inspections will be carried out and prior to any entry by the team. While under ground persons will wear hard-hats, overalls, gloves and safety footwear. The area immediately over the surface entrance to a tunnel will be cordoned off with no access to unauthorised persons or plant/vehicles. When the weather is wet a temporary tented structure will be erected over the tunnel entrance to reduce the ingress of water.
Steep incline resulting in persons and equipment falling from height or onto persons below resulting head injuries and bone fractures.	Where un-stepped steep inclines are present (anything greater than approx. 30 Degrees or where it is thought that persons could slide freely) access will be supported by a safety line and harness with a belay arrangement from the surface (with a safety-anchor man). All tools and equipment will either be handed down the tunnel or lowered on a rope (never thrown down). Where a bucket-line is required persons located on a steep slope will either be tied to a safety rope or temporary steps will be cut into the slope. SELF-BELAY SYSTEMS WILL BE AVOIDED.
Low oxygen levels and the presence of toxic gas leading to: Toxic Gas: = poisoning, asphyxiation. Low Oxygen: = disorientation, unable to recognise hazards, hypoxia and asphyxiation.	Gas detection meters will be used where it is likely that oxygen levels will be deficient and to identify the presence of toxic gases. If toxic gases are present the tunnel will be evacuated until gases are reduced to safe levels. Where oxygen levels are low air will be fed into the tunnel via a positive pressure fan (and flexible hosing) run from a generator on the surface. Members of the Group will be reminded of the dangers of toxic gases and the affects of oxygen deficiency and the early signs and symptoms. Where oxygen alarms are sounded a dynamic risk assessment will be undertaken as to what action will be taken if existing air hoses cannot reach the excavation site. Some works may be able to be continued for a short while however, if oxygen levels fall below 19% the area should be evacuated until levels can be raised (ideally 21% should be achieved). An emergency air supply should be available on site to facilitate evacuation of an asphyxiated individual.
Unplanned emergency underground leading to casualty being unable to be extracted to receive medical attention.	An emergency extraction procedure will be established (and written) and be followed in the event of an emergency underground. This will include emergency extraction process, clear responsibilities, full contact details of emergency services in the area (including Hospital A&E and specialist emergency services). This emergency procedure will be tested at a suitable interval (to be written into the emergency procedure). A full first aid kit will be available on the surface and a smaller version carried underground. All persons working underground will be logged on an in/out board to be maintained on the surface adjacent the entrance to the tunnel. Communication will be maintained with the surface at all times (usually via voice communication) and the distance between members of the group should be kept to a minimum (calling distance). Basic medical records will be kept on site of all persons who will be working

	underground. These records will consist of full names/addresses, next of kin, blood group and any allergies or special medical conditions (any allergies and special medical conditions will be volunteered by persons and not made mandatory).
Discovery of live munitions leading to detonation or release of lethal gas.	Munitions likely to be found will not present a danger unless tampered with or left in a situation where it could be accidentally disturbed. All munitions, or any other unidentified item, will be reported to the project EOD for identification and assessment. On discovery the designated EOD will determine the required action (whether the munitions can be left in a suitable place underground or whether it needs to be moved or totally avoided). All munitions, if safe to do so, will be moved to an area where they can easily be seen and away from any accidental disturbance and indicated by mine tape. All persons will be reminded of the possible presence of unexploded munitions and that they should not be handled.
Lack of welfare facilities leading to spreading of bacterial contamination causing sickness and ill-health.	Each project will arrange for welfare facilities to be available to all project staff. It is appreciated that this is likely to be basic facilities however, these facilities will be adequate to ensure a reasonable standards of personal hygiene, shelter, rest, food, washing and sanitary provision. A separate rest area will be identified and a tent/marquee will be erected unless alternative shelter is available. Clean water and soap will be provided and a means of drying hands. Antibacterial gel may also be considered (although not as a substitute for soap and water). Project staff will be reminded and encouraged to wash hands after project work and prior to eating. Food will be arranged and basic hygiene standards observed with respect to chilled and uncooked food stuffs (cool bags will be used to transport and store chilled foods). Toilet facilities will be provided via a portaloo and located at a suitable distance from the welfare facilities - unless alternative toilet facilities are available.
Uneven ground conditions and accessing lower or higher levels of ground causing slipping, tripping and falling resulting in cuts bruises and possible fractures.	All persons will wear stout footwear and gloves should be available. Where surveying works are either on or adjacent roads DG personnel will wear high vis. Jackets. 'Travel' first aid kits (appropriate for the numbers of persons involved) will be carried. All surveying parties will carry a means of communication (mobile phone) in case of the need for assistance or emergencies.
Complete or partial detonation of explosive causing multiple fatal or major injuries.	Only experienced and qualified EOD personal are to undertake this task. A separate risk assessment is to be undertaken prior to any render safe activity. This type of operation must only be conducted as a formally planed task and not undertaken on an ad hoc basis.
Bacterial infections from animal waste and contraction of common diseases including: Lymes Disease from tick bites, Weils Disease from infected rat and cattle urine and faecal matter.	Each project will arrange for welfare facilities to be available to all project staff. It is appreciated that this is likely to be basic facilities however, these facilities will be adequate to ensure a reasonable standards of personal hygiene, washing and sanitary provision. Clean water and soap will be provided and a means of drying hands. Antibacterial gel may also be considered (although not as a substitute for soap and water). Personnel will be reminded and encouraged to wash hands after project work and prior to eating. Personnel will also be briefed on the risks of Lymes & Weils Diseases and a guidance leaflet on both diseases ("Leptospirosis Are You At Risk INDG84" from the Health & Safety Executive and "Lymes Disease by Dr Robert Hicks" from BBC Health) will be kept in the first aid kit (specifically instructions on how to remove ticks from skin). Where activities are in areas where animals are located personnel will be reminded to wear protective gloves and increase hygiene standards.



SECTION A. HEALTH & SAFETY GUIDELINES

General

A copy of the Durand Group Health & Safety Guidelines to be given to visitors before entering the safety perimeter of a task site. Group members should ensure that both they and any visitors understand them.

Everybody should feel able to point out things that they feel do not follow the Health & Safety Guidelines.

Before Starting Work

Ensure that:

- (i) you have signed the Conditions for Participation in Durand Group Projects or Activity and that if they have not been previously notified, your personal and next-of-kin details are correct. If you have any special medical condition (e.g. asthma), you must notify the Project Manager.
- (ii) your name is on the Nominal Roll if going on a tour, or on the Site Register Board during a project excavation.

Be aware of emergency procedures and the task safety plan and know the location of safety equipment.

For high-risk tasks: know the evacuation point, Emergency Rendezvous Point, and location of the safety wallet.

Fire

Handle fuel downwind and *down slope* of any other activity - never near tunnel or excavation entrances. Keep away from naked flames, sources of heat, electrical equipment, and two-way radios.

Position vehicles and irreplaceable archive material for easy evacuation, safety permitting.

Explosives

Don't touch unfamiliar items - leave for EOD personnel. Minimise personnel in high risk areas. Take care when digging, particularly with mechanical plant. Checks first with metal detectors advised.

Biological Hazards

Ensure tetanus immunisation is up-to-date. Wear protective equipment. Clean and dress wounds quickly. Report serious infections to other team members.

Chemical Hazards

If effects of chemical agents are suspected, check with Military / EOD personnel. If in doubt, take casualty straight to nearest hospital.

Machinery

Approach machine operators from the front, out of machine range, and wait for acknowledgement. Operators should show that machine is safe before visitors approach.

Safety Equipment

Keep unused safety equipment in separate, marked areas. Wear approved-type safety helmets, free from cracks and scratches. Avoid dropping helmets, and only place upright on ground. Don't tread on safety lines and protect them from damage.

Tours Underground

Task Leader to ensure that everybody is fully briefed and that all have suitable personal protective equipment.

Task Leader to agree and record Planned Exit Time and Cut-Off Time. Everybody should aim to have exited safely by Planned Exit Time. Task Leader **MUST** notify the Nominated Contact when everybody is safely out. If everybody is not out by the Cut-Off Time, Nominated Contact is responsible for raising the alarm.

Teams to be a minimum of 3 people - in the event of a casualty, one to stay with the casualty and one to raise the alarm.

Minimum Individual Items:

- Safety helmet, primary light, secondary light, (plus spare batteries), essential personal medication.

Recommended Individual Items:

- Coveralls/long-sleeved clothing, safety footwear, water bottle, high-energy food.

Minimum items for each team underground:

- First-aid kit, waterproof notebook and pen, direction markers.

Recommended Items for each team underground (Project Manager/Task Leader to assess risk and determine):

- Multi-gas detector, safety rope (if steep inclines likely).

Check everybody is present at periodic intervals. Make no deviation from planned routes unless agreed with the Task Leader first. Mark the route using pre-arranged method. Leave markers in place until it is confirmed that nobody is left behind.

Avoid dislodging material from above - watch out with protrusions from back of helmets. Proceed through hazardous areas one by one, with first person carrying safety kit.

Consider aborting trip after a minor collapse. After a major collapse, priority is raising the alarm.

Carry out regular gas checks. If toxic gases detected above limits, wait until area has been vented or supplied with piped air.

Emergency Procedures

In the event of injury, render first aid. See a doctor after any serious injury, particularly head injuries. If in doubt take casualties straight to hospital.

Notify authorities of serious accidents immediately. Send somebody to agreed Emergency Rendezvous Point, to guide emergency services and to ensure information in the Safety Wallet is passed on.

Priority in rescue is to establish communications with a trapped team, then ensuring they have sufficient air pending a rescue. If the trapped team exits by an alternative route, they **must** leave details where they will be seen by a rescue party. Alternative exit routes not pre-arranged should only be attempted if there is a high degree of urgency and likelihood of success, otherwise the trapped team should wait for rescue a safe distance from the collapse. As soon as a team has exited, they must ensure that the Task Point-of-Contact is notified.



SECTION B. GROUP PLANNING GUIDELINES

INTRODUCTION

The Durand Group undertake a variety of operations as part of their research into underground warfare in WW1, each of these operations requires meticulous planning. As the Project Manager for each operation may differ, there is the requirement to provide a basic framework from which he/she can formulate a Project Plan that is easily distributed and understood by all those involved in the project. This approach will ensure that all aspects of an operation are considered and either included or excluded from the plan as appropriate.

AIM

The aim of this protocol is to provide a consistent structure to the planning of Durand Group operations. The Protocol should be used as a basic planning tool, but it is not exhaustive and each operation will need to have specific factors included within the project plan.

PLANNING

To aid planning an operation can be broken down into a number of phases. These phases include a number of areas that need to be considered before proceeding onto the next phase. For Durand operations there are 4 phases, these are:

- (1) Initiation Phase
- (2) Planning Phase
- (3) Execution Phase
- (4) Report Publication

(1) Initiation Phase

The work put into the start of any project is crucial to its eventual successful outcome. The importance of this phase can not be over stressed. As a group we need to ensure that when we undertake work on a historical site that we have enough evidence to justify the activity that we are doing.

Identify Project. All projects start with the initial concept stage, this may come about through information received, a hole appearing in a field, request for assistance or through archival research. The important thing for any potential project is to decide whether it fits within the Group's ethos, is a suitable project for the Group to undertake and do we have the necessary skill set.

Conduct Research. This is a critical stage, without thorough and effective research most projects are likely to fail. Research may include site visits, survey activity, archival material or even anecdotal information. It is imperative that we obtain as full a picture of the intended target as possible. This will give us the best chance of having a successful operation. It is only after we have either exhausted research opportunities or are satisfied that we have sufficient evidence that we should consider undertaking any formal project.

Identify Project Aims. The aim of the project should be clearly thought through and articulated. This will ensure that the project remains focused and does not become sidetracked. Aims should be simple i.e. Locate and gain entry to tunnel entrance at.... Record Graffiti in

Obtain Group Agreement. Before proceeding further with any project the initial concept should be submitted to the Committee for consideration. This will normally be brought to the Group at the AGM and once agreed recognised as a Group project and planned into the Groups timetable, initial dates for the project can be set. For short timescale projects or projects not requiring major Group input agreement can be sought via e-mail or ad-hoc committee meetings.

Obtain Landowners Permission. At what point this is required is difficult to specify, but before any major activity is undertaken the landowner must have authorised the activity. Consideration will also need to be given to any local or national legislation and authorities that may need to be involved/informed or authorise the project. i.e. French Archaeology authorities, local Mayor etc.

Initiate Project Plan. The initial project plan can be put together using the protocol template. Sections will need to be completed as the information becomes available. But the plan should show the aim, objectives and outline the initial recce requirements.

(2) Planning Phase

Initial Reconnaissance. The aim of the initial recce is to determine the activity that will need to be undertaken on the ground to achieve the aim of the project. The recce party should consist of the PM and those members of the group who have the necessary expertise to identify blocks of work. In particular consideration should be given to:

- EOD clearance
- Archaeology
- Undergrowth Clearance
- Construction
- Site/Entrance Security
- Reconstitution
- Vehicle routes & signing
- Emergency Services

Identify Key Stages. In order to evaluate progress against the plan it is important to identify key stages and their interrelationship with one another. This ensures that work does not get ahead of itself in one area when it is reliant on the finished product from a previous work block. It also helps in identifying manpower, equipment and assessing timescales. E.g. it is important that any EOD clearance or initial archaeology is undertaken prior to any construction work.

Identify Timescale. It is important that a realistic timescale is allocated to each block of work. In general the plan should not go below half days and for planning purposes work on a 6 hr day.

Identify Personnel and Equipment requirements. Having identified the work blocks need to complete the task it is now necessary to identify manpower and equipment needs. Consideration also needs to be given to the costs associated with equipment hire/purchase etc. As PM make as much use of specialist knowledge as you can, do not assume that you are required to identify everything. A generic kit list is available and the core membership skills should also be drawn up. Confirm personnel availability.

Agree Project Dates. Having identified the key stages of the project and their interrelationships it is now possible to outline a planned work schedule. It may be necessary for activity to be undertaken over a number of weekends or for different expertise to be on site at different times. Actual dates need to be confirmed and plotted into the group's diary. Much will depend on the availability of key personnel and equipment.

Update Project Plan. The Project Plan now needs to be updated with the information obtained. It will now be necessary to identify the risks associated with the project and the specific Health and Safety requirements. These should be written up and attached to the Project Plan when it is disseminated.

Disseminate Plan. The Project Plan should now be disseminated to all members of the Group irrespective of their attendance. This will ensure that every member of the Group is aware of what is being undertaken and allows those who may not have been consulted to make comment if they consider it necessary.

Book Equipment. Having identified the equipment requirement and key work blocks it is necessary to book any specialist equipment that may be required for the project.

(3) Execution Phase.

This is the main activity phase of the project and involves the majority of personnel and activity. It is generally the most strenuous part of the project for the PM as he/she will have to balance the expectations of all members of the group with the aims of the project. It's during this phase that all the effort put into the earlier planning phases pays off. As the saying goes 'good planning prevents piss poor performance' but remember that 'no plan survives first contact with the enemy' therefore as the PM you will need to be flexible and adaptable to the way that the plan unfolds in execution. Generally this phase will have the following work blocks:

Equipment and Personnel Check. Ensure that the equipment and personnel that you are expecting are serviceable and will be there when you need them.

EOD clearance. Before any work starts on a known WW1 battlefield a clearance operation should be undertaken by qualified EOD personnel. This should involve a surface search and a check with a metal detector. This will not guarantee that the area is completely clear of unexploded ordnance (UXO) but it will ensure that items presenting an immediate hazard are cleared. Throughout the execution phase personnel should be aware of the potential risk of coming across UXO.

Initial Archaeology. If during the initial recce there was a recommendation for an initial archaeological phase then this should be undertaken after the EOD clearance but before any construction takes place. It may follow surface clearance which is designed to remove undergrowth and trees but should be done before any surface disturbance. It may be necessary to undertake these first 2 elements some weeks before the main project.

Initial Construction Work. It may be necessary to undertake some pre-emptive work prior to the major project phase. This will generally be undertaken by a small team with the aim of facilitating the major construction phase. E.g. construction of safety cage in winch chamber.

Main Project Work. This will involve the bulk of the work to achieve the project's aim. It will involve the majority of personnel and equipment and will require tight control. Particular attention will need to be paid to H&S issues and risk mitigation. The PM should ensure that there is a formal briefing before the start of work each day and that personnel are aware of the relevant emergency procedures that are in place. A debrief should be held each evening to allow any relevant lessons or points to be raised and discussed. Throughout this phase there will be the need to undertake a certain amount of archaeology and a continuous need to re-evaluate the plan. The PM should always have in mind the question 'what will I do if this does not work out the way I have planned it?'

Record Results. As one of the major aims of the Group is to promote a greater understanding of underground warfare there is the need to maintain a record of activity and items of interest. Included in this is survey activity that may be undertaken. This is apart from the general archaeology recording of recovered artefacts.

Clear and reconstitute site. As we are privileged to be working on these sites we have a duty to ensure that they are returned as close as possible to their original state. This will only be possible if during the initial recce sufficient detail of the site was recorded. The project plan also needs to allow sufficient time for site clearance and equipment maintenance. This is normally an area that is forgotten in the excitement of the project. However the group has invested considerable resources into obtaining equipment and proper maintenance and cleaning are imperative to ensure that the kit remains serviceable and safe to use. This is particular important for safety equipment.

Write and Publish report. ‘the jobs not finished until the paperwork is done!’ Unless the information we have gathered is consolidated into a report it might as well not have happened. We need to ensure that our activities and discoveries are available for future generations as well as being made available for today's researchers. The production of the report will be a collective effort with input from a variety of individuals within the group. It is the responsibility of the PM to pull the report together and to chase inputs. We should aim to have the report out within 6 months of completing a project. The distribution will depend on the aims of the project and those who have been involved. If the project will be ongoing for a number of years, i.e. ‘O’ Sector, then an interim report should be published at the conclusion of a major phase of work. A copy of the report should be placed with the Archives Member.



Description

The entrance to the Advanced Headquarters of the Nos 1 and 4 sections of the 3rd Australian Tunnelling Company, in the Hulluch underground system. The Hulluch underground system was a huge subway that consisted of several miles of galleries, large chambers for dining rooms, sleeping apartments and offices, and was able to accommodate 2000 troops.



SECTION C.

CONDITIONS FOR PARTICIPATION WITH DURAND GROUP PROJECTS OR ACTIVITY

The undersigned are Full or Associate Members of the Durand Group or are participating voluntarily with the Durand Group as a Guest.

In signing each signatory is voluntarily acknowledging and accepting the following:-

- a. Any work on a battlefield site involves unpredictable risk from a variety of causes, including risks associated with unexploded munitions, sudden ground collapse into cavities, protruding and sharp military detritus and biological or chemical contamination.
- b. Project activities involving excavation below ground level, and investigation of subsurface features, can entail serious risk of injury or death arising from many causes including sudden collapse, flooding, falls, strain injuries and respiratory hazards from gases, low oxygen, dust and chemicals from abandoned explosives.
- c. Project work often requires the use of heavy plant, ac electrical equipment, compressors, power tools and heavy lifting. Individuals are not to operate equipment with which they are not familiar, and when doing so to take all relevant safety precautions, to know their own physical limitations and when not engaged in plant or machine tool operations are personally responsible for remaining at a safe distance from the operations.
- d. Each individual is responsible for personal medical insurance cover for any illness or for injuries incurred, regardless of cause, or any other medical condition arising from or in the course of participation. They are strongly advised to have suitable Life Assurance and cover for 3rd party liability, or (in the case of an organisation) to have suitable Corporate cover.
- e. Individuals are responsible for their own possessions and for equipment or stores for which they are personally accountable.
- f. Acknowledging, through signing, that he (or she) has been briefed on project safety, administrative and emergency procedures or **(alternatively) undertakes to personally ensure that they are so briefed and that they will not participate in the project until they have been briefed.**
- g. Every participant in a Group activity, or Group associated activity has a duty to exercise prudence and common sense, apply appropriate safety considerations and be aware of activity such as to avoid placing themselves or others unnecessarily at risk. In the event that any person has a concern for safety, or what they judge to be unsafe practice, they have a definitive responsibility to bring this to the **immediate attention** of others in the vicinity, and to whoever is responsible for supervision.

Furthermore all signatories understand that all Durand Group activity within Private Land Sites has been agreed at the request of the Group (except work done under formal contract) to access the Sites solely on the understanding that this is at the signatories own risk. The Land Owner does not accept any liability whatsoever for any accident or misadventure arising in the course of Group activity (accept as may be otherwise covered under contract terms).

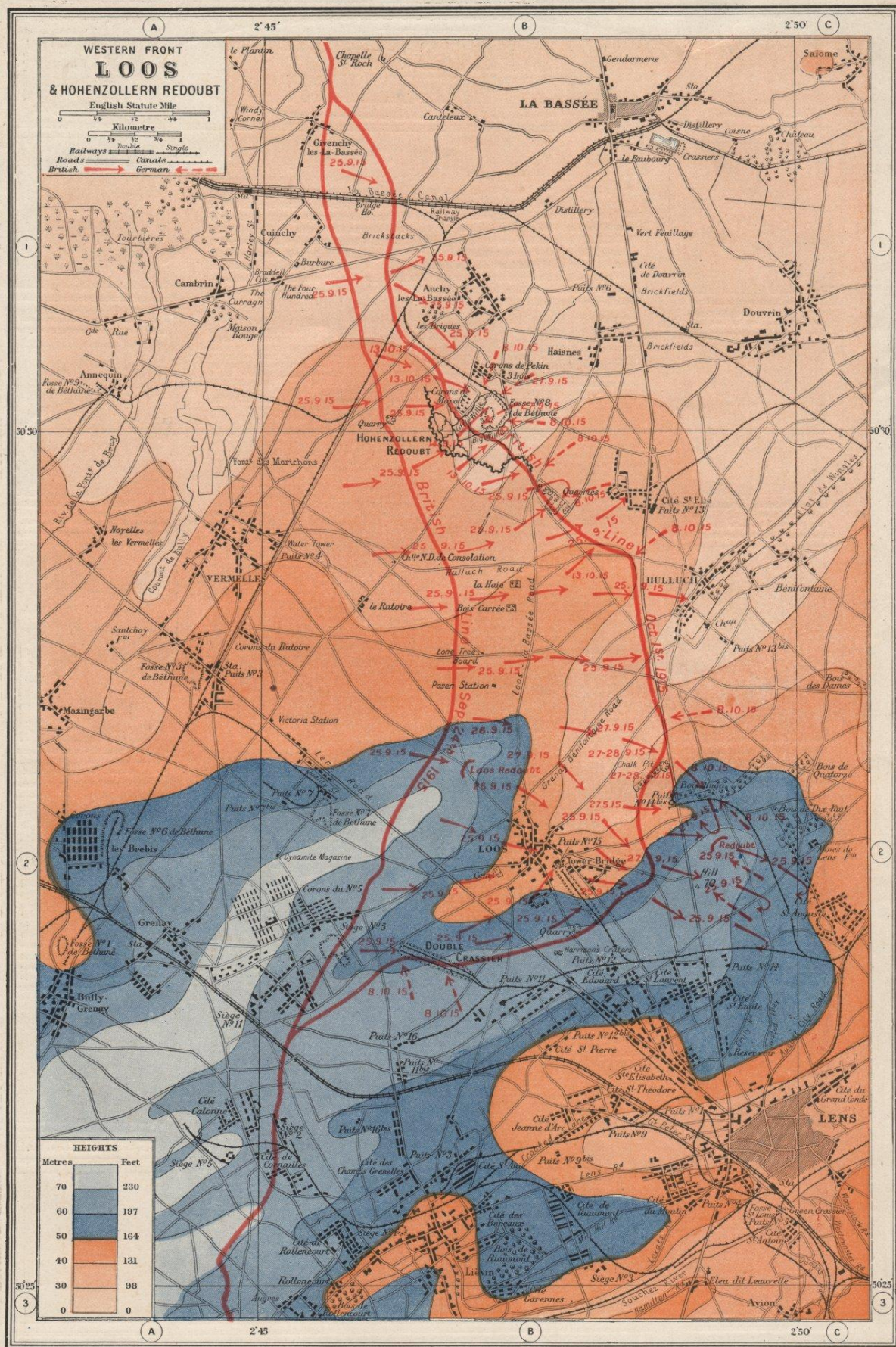


Plate 1

