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THE WESTERN HEIGHTS DOVER, KENT

Report No 6: The Entrances to the Fortress: 19th-century infantry and artillery fortifications

SURVEY REPORT

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Photography by STEVE COLE & ALUN BULL

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THE ENTRANCES TO THE FORTRESS

19TH-CENTURY INFANTRY AND ARTILLERY FORTIFICATIONS

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A watercolour of Dover in 1826 by JMW Turner, showing the bridge across the South Lines in the foreground and Dover Castle in the background (Dover Museum: D0006, reproduced by kind permission of Dover Museum)

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GLOSSARY

Artillery store
A subsidiary building in a fort for the storage of equipment for the operation and maintenance of artillery

Banquette
A low parapet over which infantry could fire

Battery observation post
The position from which the area commanded by a battery is observed

Carronade
A short heavy cannon, with a large bore, for close range defence

Chemin des rondes
A passage or sentry path at the top of the scarp wall with a parapet for cover

Counterscarp
Exterior slope or revetment of a ditch

Covered way
A continuous walkway, protected from enemy fire by an earthwork parapet

Curtain
A section of wall or rampart

Drawbridge
A bridge which was hinged at one end only so that the other could be raised, usually by chains

Embrasure
An opening in a parapet or wall through which a gun could be fired

Enfilade fire
Artillery or small arms fire coming from a flanking position to sweep the length of a fortification

Expense magazine
A small magazine in which ammunition was stored for immediate use

Glaçis
The exterior slope of a rampart, usually carefully and gradually extended in a long slope towards the field or ground level

Gun room
An enclosed chamber for an artillery piece; usually designed to fire along a ditch or flank

Lamp recess
An alcove or small tunnel in a wall into which a lamp was placed. In magazines a pane of glass set into a brass frame prevented sparks from entering the chamber

Lighting (lamp) passage
A passage, usually narrow, adjacent to a magazine to allow lamps to be inserted into lamp recesses for illuminating the magazine

Loophole
An opening in a wall through which a musket or rifle could be fired. They are generally internally splayed to provide the defender with maximum range while making it difficult for the enemy to fire in

Machicolation
A projecting gallery, generally above an entrance, with openings for vertical defence of the foot of a wall

Musket
A light smooth-bored infantry weapon

Musketry gallery
A series of chambers with loopholed embrasures allowing musket fire

Parapet
A low wall or earthen breastwork protecting the front or forward edge of a rampart

Piquet house
A small post for a sentry or guard detachment

Postern
A small gate, often concealed, through which the defending troops can make a 'sally' or counter-attack (also called a Sally Port)

Rampart
The main defence of a work, comprising a mass of excavated earth on which a large part of the garrison and its weaponry are situated

Scarp
The exterior slope or revetment of a rampart, or the inner side of a ditch

Shifting lobby
A room next to a magazine or cartridge store in which men changed into and out of magazine working clothes. This was to prevent metal on their ordinary clothing from sparking and thus igniting the gunpowder. Access to the magazine was generally prevented by a waist-high barrier between it and the shifting lobby

Tenaille
A low-lying work sited in a ditch between bastions to protect the curtain

1. INTRODUCTION

Between April and November 1998, the Royal Commission on the Historical Monuments of England (RCHME) carried out survey and analysis of the buildings, underground structures and earthworks associated with the entrances into the 19th-century fortress on the Western Heights in Dover.

The survey formed part of the Western Heights Project, which was undertaken at the request of Kent County Council as part of an Interreg II programme relating to historic fortifications in Kent, Nord-Pas de Calais and West Flanders. The programme was co-ordinated for several partners in Kent by Kent County Council, and funding for the Western Heights was shared between the RCHME and the European Union. The field investigations were the responsibility of staff of the RCHME field office in Cambridge, now part of English Heritage.

This report is no 6 in a series of ten to be produced on the Western Heights fortifications.

Summary

In 1804, after several uneasy years during which a French invasion seemed imminent, the decision was finally taken to build a fortress on the Western Heights, a dominant position at the eastern end of a long ridge stretching away from the western side of the town and port (Fig 1). The aim was to fortify the Heights as an entrenched camp utilising existing earthwork fortifications begun in the 1770s, to accommodate, support and protect a mobile force of some 5,000-6,000 men. That force was to be capable of engaging and stopping a flanking or rearward attack on the town and port or, at the very least, of holding the Heights so that the port could not be used as an enemy bridgehead. The scheme was an improvement of one first devised by Lt Thomas Hyde Page in the 1770s and updated by another engineer, Captain William Ford, under the command of Brigadier General Twiss and the Inspector General of Fortifications, Sir David Dundas (Coad & Lewis 1982, 160-1).

Built in two main phases, 1804-16, and 1858-67, the fortress comprised three powerful independent forts and redoubts - the Citadel, the Drop Redoubt and the North Centre Bastion - linked by a series of defensive ditches and banks called the Lines. The result was a continuous barrier closing off the ridge, further protected by sheer cliffs along the southern face. At the end of the first construction phase in 1815, access to the fortress was through two main entrances; the first, South Lines Bridge, was located at the

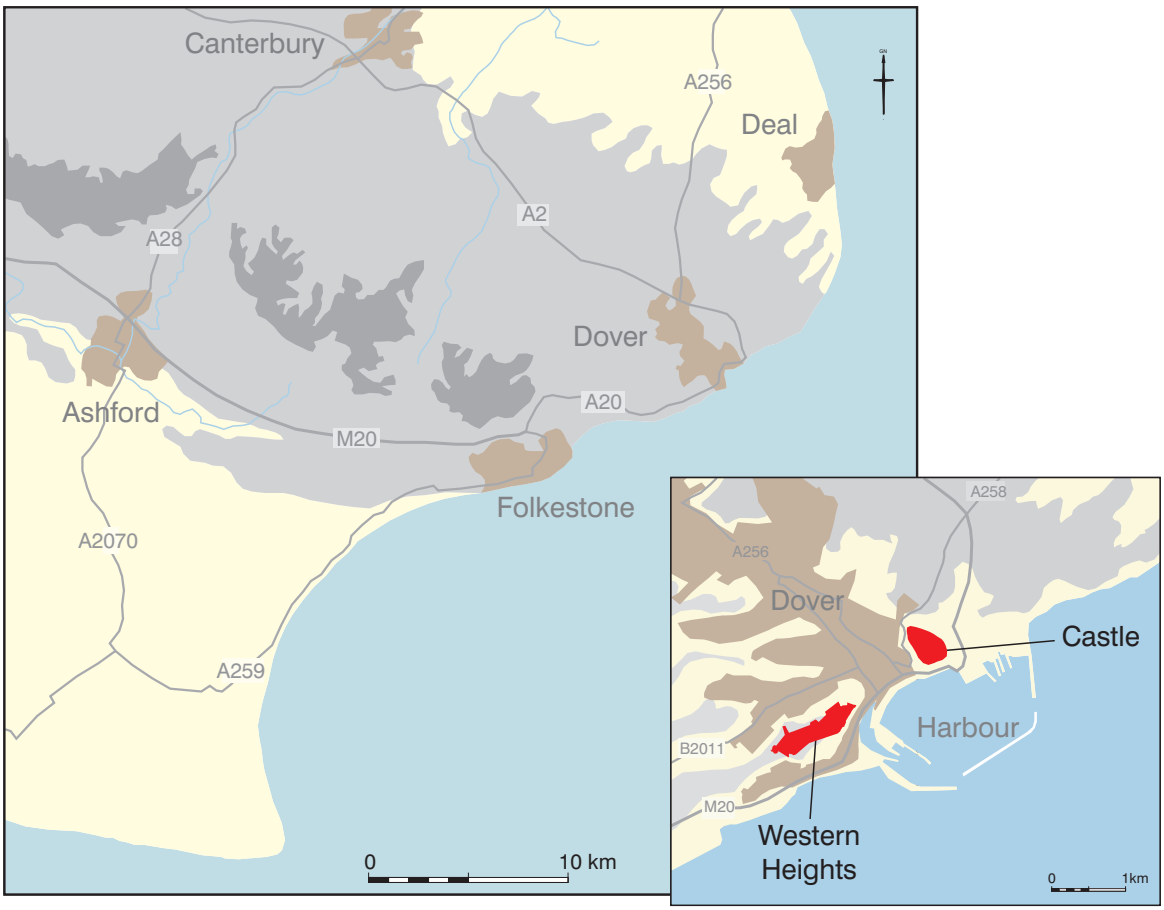

Figure 1
Dover Western Heights, location map (pale yellow = land below 50m OD; light grey = land 50-150m OD; dark grey = land over 150m OD; pale brown = urban areas)

south-western corner where the old Folkestone road entered the fortress. Just inside this point, the South Military Road coming from the harbour took a hairpin turn and made its steep ascent to the Western Heights. The second, North Entrance, was situated at a narrow point of the ridge towards the north-eastern end of the fortress, where the North Military Road completed its more moderate ascent from Dover town (Fig 2 top). A third entrance, called South Entrance or Archcliffe Gate, was added in the 1860s as part of a major revision of the southern defences of the Heights. It was located much higher up the slope, at a point where the South Military Road attained the crest of the ridge (Fig 2 bottom).

Despite several changes in tactical role, the Western Heights remained in military hands until the 1950s; all of the entrances were still in use during the Second World War, though by then the bridge over the South Lines had been replaced by a permanent stretch of road on a causeway (Fig 3; NMR: 106G/UK/801/ partIII/ 6177-8). In 1963 the imposing Archcliffe Gate was demolished and the South Entrance Ditch was partially infilled, although some of its associated features survive. At the same time, the North Entrance

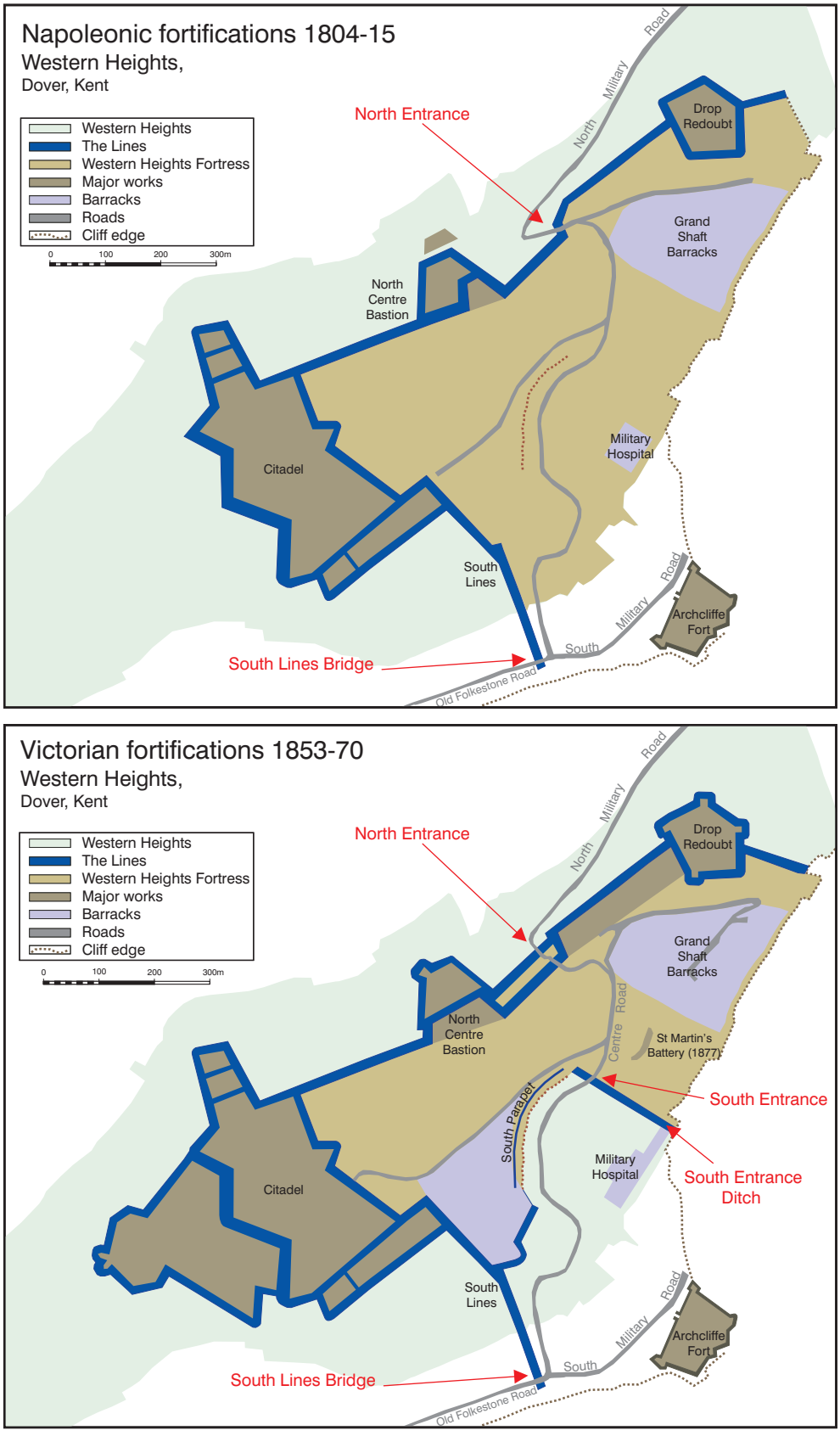

Figure 2
Schematic plans of the Western Heights, showing the principal entrances established by 1815 (top), and the new scheme in place by 1870 (bottom)

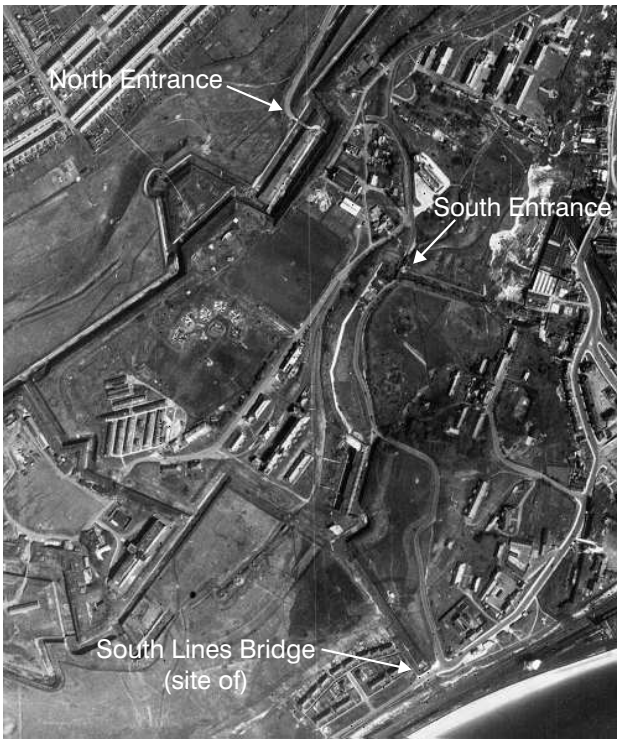

Figure 3
Part of the Western Heights in 1946, showing the North and South Entrances and the site of the South Lines Bridge (NMR: 106G/UK/1442/4 102)

was by-passed and the North Military Road re-routed through a breach in the North Lines; consequently it survives almost complete. The South Lines Bridge has been lost to modern road developments.

2. HISTORICAL BACKGROUND

The entrances to the Western Heights, 1804-1815

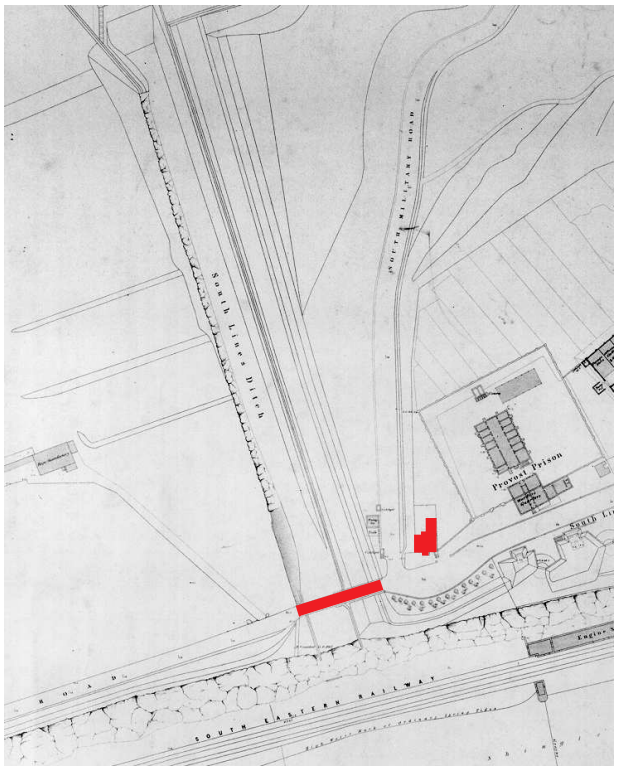

Figure 4
The South Lines in 1893, showing the South Lines Bridge, one of the original entrances into the Fortress. The bridge and the nearby piquet house are shown with red added by the authors (extract from NMR: WD/2396)

War with France ensured the partial completion of the defences on the Heights by 1815, shortly after which work came to a halt. The finished work included the South Lines, a rock-cut ditch and profiled rampart with an infantry ste, securing the south-western flank of the fortress from attack along the old road from Folkestone. This flank was the most vulnerable point on the entire southern face, the remainder being well defended against attack from land or sea by the existing defences concentrated in Archcliffe Fort, in several open batteries along the harbour and by the barrier presented by the sheer chalk cliffs. By constructing the South Lines, the moderate slope between the Citadel and the cliffs was closed to a potential assault from the west that might gain the Heights at a point to the rear of the Grand Shaft Barracks. The initial confidence in the security of the south-western flank is reflected in the location of a Military Hospital in that area by 1806. Entry to the fortress was over a wooden bridge near the southern end of the South Lines (Fig 4). The details of South Lines Bridge are unknown, but it probably comprised a fixed span of wooden construction (Fig 5). The bridge and the ditch of the South Lines were protected from assault by guns in casemates situated halfway down the slope, commanding the full length of the ditch. There was a piquet or guard house to control access just inside the entrance.

The clearest documentary record of the early phase of the North Entrance is a plan appended to a report of August 30th 1815, dispatched to General Mann at the Board of Ordnance (Fig 6). By this date, the Lines which ran along the northern edge of the ridge were in an adavanced state, connecting the Citadel, North Centre Bastion and the Drop

Figure 5
The South Lines Bridge in 1826, showing part of Dover Harbour in the background. Detail from a watercolour by Turner (Dover Museum D0006, reproduced by kind permission of Dover Museum)

Redoubt. The site chosen for the North Entrance was in tactical terms, quite a strong one, at the top of a slight combe, which was flanked by the North Centre Bastion on the west and by the North-East Flank of the Lines on the east. In reaching the entrance, the North Military Road described an elongated loop and was thereby covered by crossfire from those positions. The road probably crossed the Lines on a bridge, suggested on the 1815 plan, but further details are lacking.

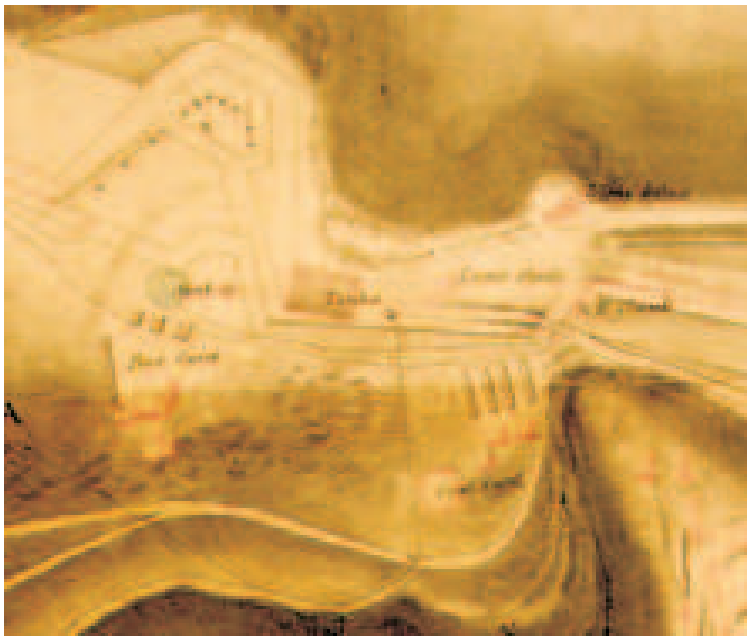

Figure 6
The Western Heights showing the North Entrance as it was in 1815 (extract from PRO: MR/1346, reproduced by kind permission of the Public Record Office)

This was the main entrance for works traffic and building materials, hauled up from Dover along the carefully engineered incline of the North Military Road. Lime sheds and lime kilns were built just outside the entrance and the main works compound was placed just inside. Soon after entering the Fortress, in roughly the same position as the current junction, the road split into three branches: the eastern branch led to the Drop Redoubt; the western one followed the North Lines towards the Citadel; while the southern branch joined up with the South Military Road.

Modernisation of the entrances, 1858-1867

By the middle of the 19th century it had become apparent that the defences on Western Heights, left unfinished since 1815, offered insufficient protection against the penetrative power of more modern artillery - rifled ordnance with improved propellants and charges - which were being routinely deployed by Britain's perceived enemies. The second half of the century was in military terms an arms race, as European nations competed to match and counter one another amid rapid technological developments. Work resumed on the Citadel in 1853 and in the following year General Sir John Fox Burgoyne, Inspector-General of Fortifications, proposed that more money be made available for considerable strengthening of the works on the Western Heights (Coad & Lewis 1982, 185). In 1858, Major WED Jervois further proposed that the Western Heights be completed, broadly as envisaged by Ford during the war with Napoleon Bonaparte. By 1859, worry over both the arms race and the territorial ambitions of Napoleon III prompted the setting up of the Royal Commission on the Defence of the United Kingdom. Its report of 1860 resulted in a major revision of the home defence commands and a massive programme of fortress building over the following decade, including completion and updating of the Western Heights.

This work included extensive work to the North and South Lines, including major revision of the North Entrance and the construction of a new point of entry, the South Entrance or Archcliffe Gate. Different architectural styles were employed for each, though Archcliffe Gate was certainly more ostentatious and probably served as the formal entry to the fortress. However, the North Entrance was a more elaborate defensive scheme and perhaps reflects a greater concern with a potential assault from the north.

A plan of 1860 shows the proposals for the south front of the Fortress (Fig 7). The main tactical aim was the further closure of the south-west flank by a new Line and a new entrance higher up the ridge. The new Line headed north-east from the existing gun rooms of the South Lines along the crest of the slope, keeping above the South Military Road, then turned south-east to run to the cliff face; the road would cross this last stretch by a drawbridge, with a gatehouse beyond. The slope above the road would be cut back to produce a sheer chalk face and the excavated spoil used to carefully grade the ground to the south, so that it could be entirely commanded by firing positions on the new Line. Much of this proposal was carried out and was further enhanced by the construction of gun rooms to cover the new entrance and by the addition of new casemated barracks in the South Front (Pattison & Williams 2001).

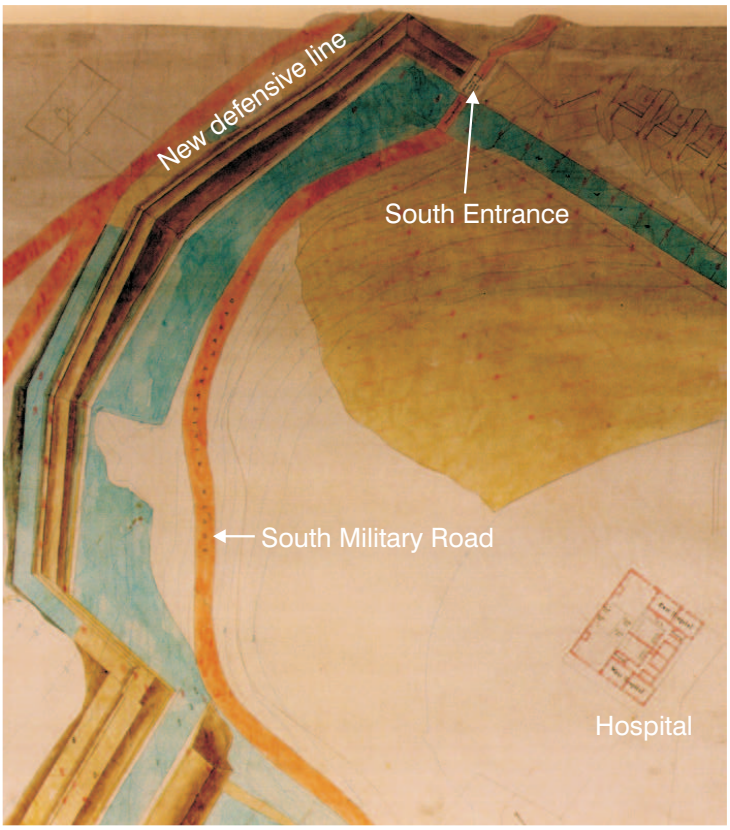

Figure 7
The proposed work around the South Entrance in 1860. Blue = cut; yellowy-brown = fill. Text in white is added by the authors (extract from PRO: MR/1300/3, reproduced by kind permission of the Public Record Office)

Work on the North Entrance began in March 1860 and it was completed in February 1864 (Palmerston Forts Society 1991, 1d). There are no known dates for the construction of the South Entrance, but it seems likely, given dates on record plans, that it was built at roughly the same time. The new entrances are shown on Fig 8.

Adaptation and alteration 1870s-1945

The new entrances were defended by a combination of rifle and carronade fire. In 1887, the South Entrance casemates mounted two 12-pdr carronades, upgraded shortly afterwards to 24-pdrs. At the same date, two 18pdrs were mounted in the North Entrance casemates. These were also upgraded to 24-pdrs but after 1892, in both entrances armament was reduced to a single 24-pdr after. By 1902, all heavy armanent had been withdrawn and defence rested on rifle fire and mobile armament including machine guns (PRO: WO/33/2775; WO/33/254).

In 1877 a new powder magazine was inserted into the passage to the South Entrance gun rooms to serve the newly-built St Martin's Battery, a coastal battery for three 10-inch RML guns situated some 100m to the north-east. At about the same time, the role of the Western Heights was changing to incorporate new ideas about mobilisation, and Dover was to become a key point where troops and equipment could be marshalled in the event of an enemy landing: this included storage of mobile weapons such as field guns. Allied with this change in role, the two bridges at the North Entrance were strengthened in order to support the weight of horse teams pulling heavy mobile artillery pieces.

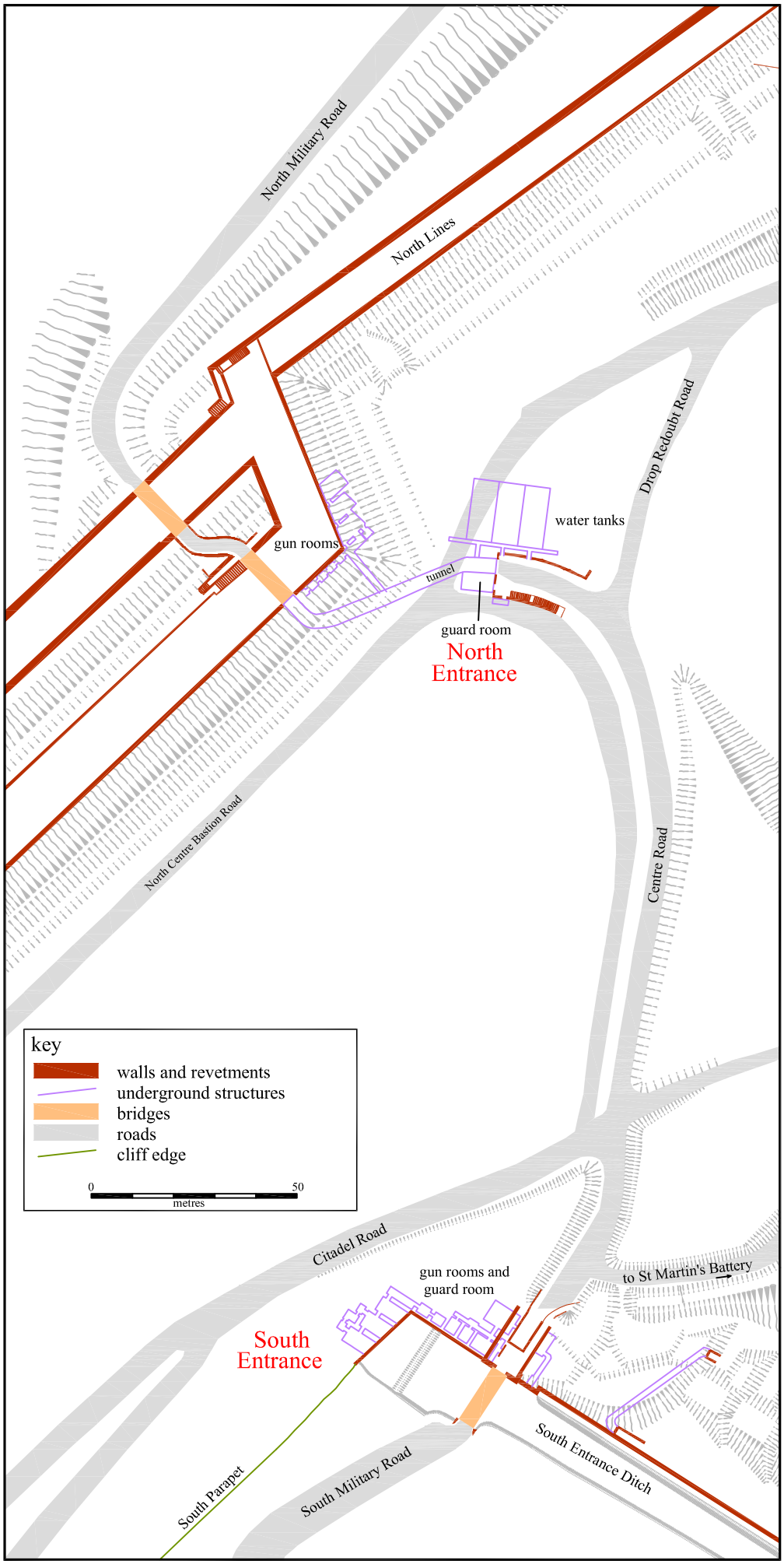

Figure 8 *Plan showing the North and South Entrances following the 1860s remodelling*

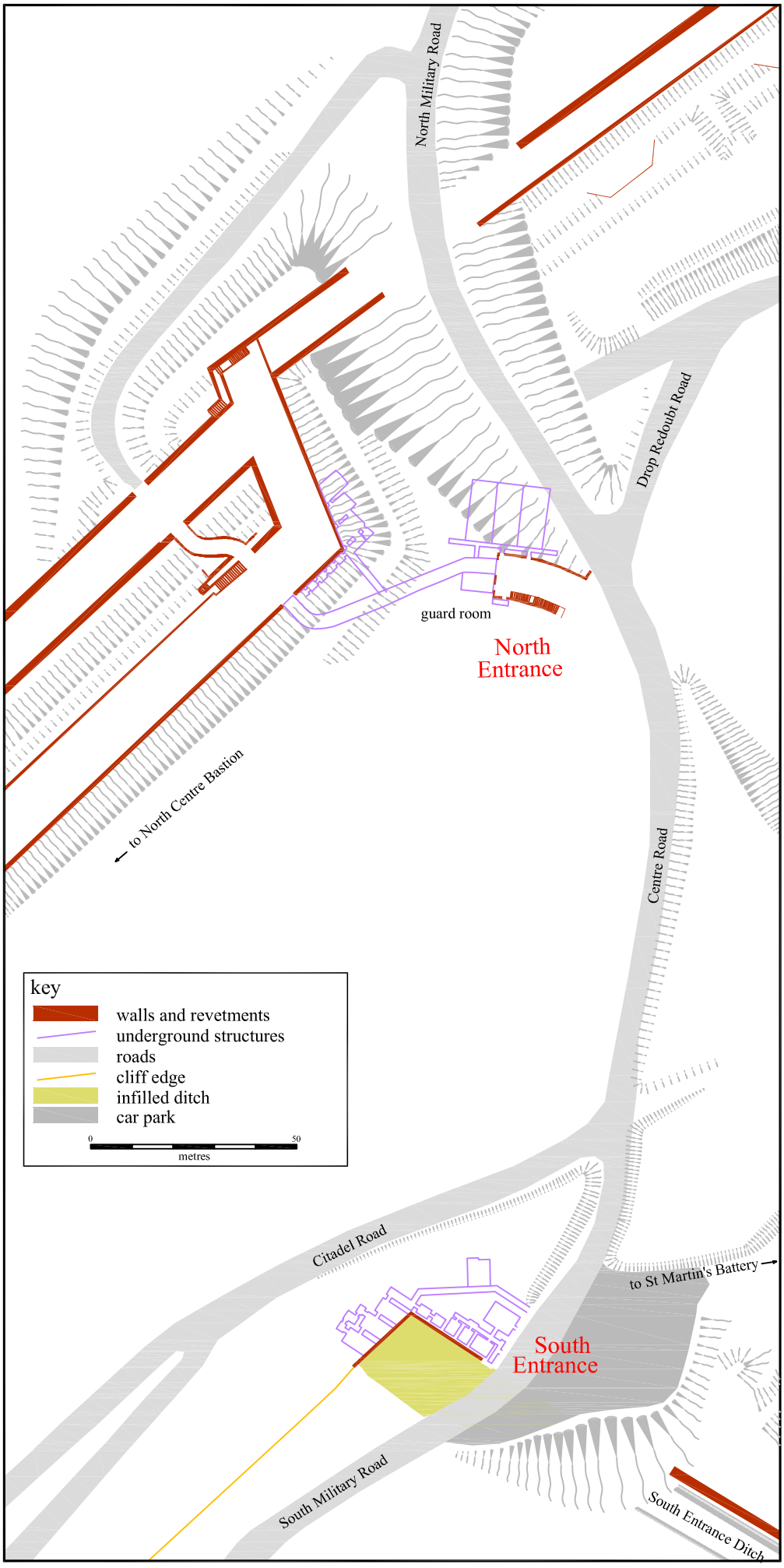

Figure 9 *Plan showing the North and South Entrances today*

In the early years of the 20th century, the North Entrance gun rooms were recommissioned for use as a telephone exchange, and during the Second World War an artillery observation post was built on top of Archcliffe Gate, one of a network of positions across the Western Heights. At the same time, a pillbox was built on the rampart of the North-East Flank, overlooking the North Entrance.

Recent History

Following decommissioning of the Western Heights in the mid 1950s, the entrances continued to provide access into and across the Western Heights. During the early 1960s there were extensive and drawn-out negotiations between the War Department and the Dover Corporation regarding the transfer of the bulk of the Western Heights to civilian control. The main sticking point was access, since the Corporation wanted to build a new approach road from the north in order to open the Heights for development, involving demolition of the North Entrance. The War Department refused permission to destroy the North Entrance, considered an extremely important part of the fortifications, but agreed to a proposal to construct a new bridge spanning the North Lines. In the event this plan was abandoned, and in 1967 a breach was effected through the Lines and the North Military Road was re-routed. During the negotiations, in 1964 Archcliffe Gate was demolished and the rest of the South Entrance removed or filled in to accommodate a wider road, a car park and a viewing point (Peverley 1996, 28-30). The surviving elements of the North and South Entrances are shown in Fig 9.

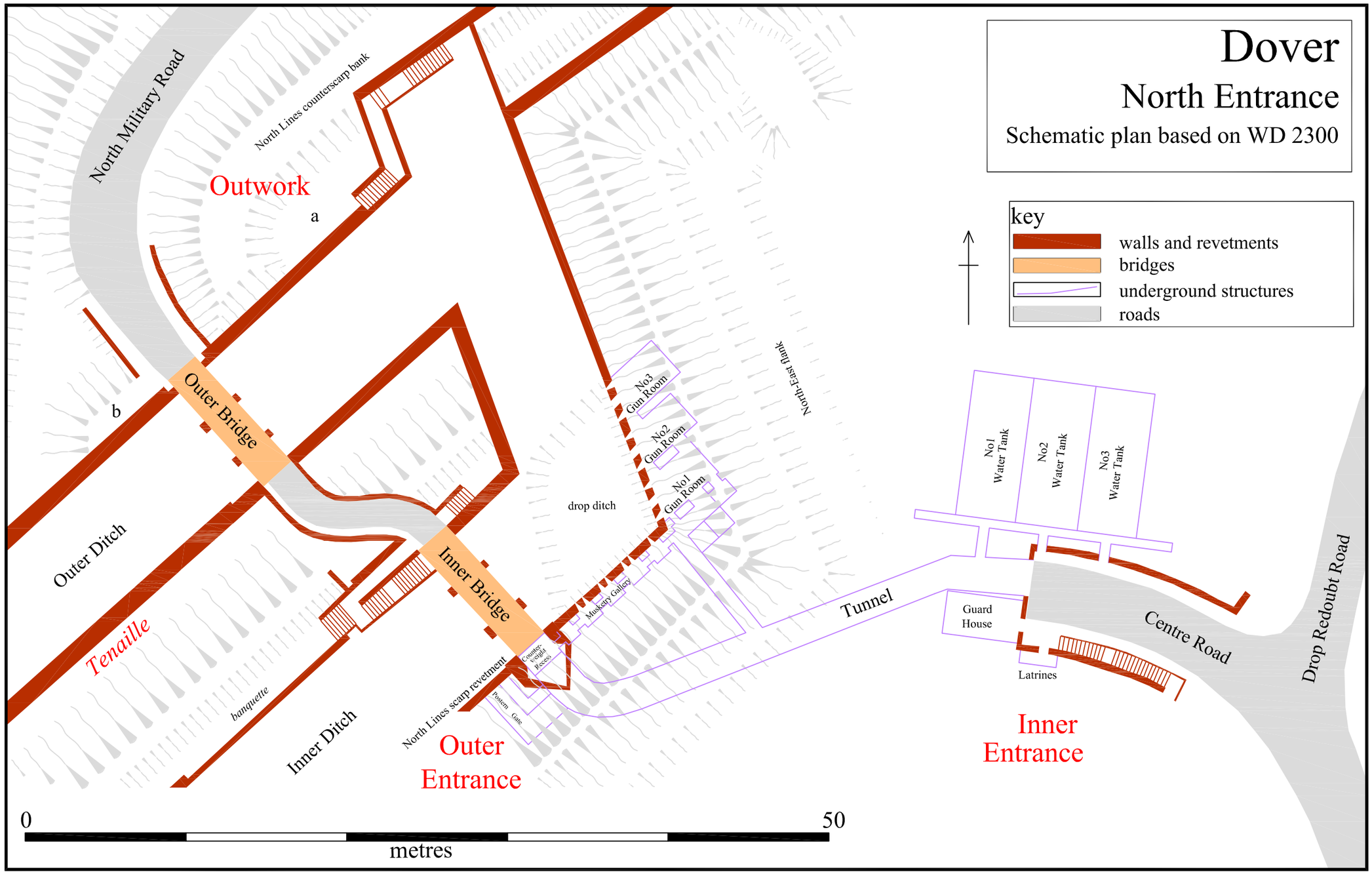

Figure 10 *A plan of the North Entrance, based upon a plan dated 1893*

3. DESCRIPTION AND INTERPRETATION

In the following description, words and letters which appear in **bold** in the text, refer to the figure given at the beginning of that particular section.

THE NORTH ENTRANCE

Summary (fig 10)

Figure 11
The North Entrance, outer entrance from the outer bridge in 1958 (Dover Museum: D07871, reproduced by kind permission of Dover Museum)

The work of the 1860s resulted in a concealed entrance which was protected by elaborate defences. The point of entry remained as before but everything else was totally transformed. The North Military Road, approaching from the north-east, turned abruptly south and narrowed for single file traffic, passing through a cutting in the counterscarp of the North Lines, before crossing the new twin ditches of the Lines on two bridges. Once over the bridges, the road entered a sinuous tunnel passing under the rampart of the Lines, before emerging inside the fortress.

There were eight distinct elements to the defences of the entrance:

1 An outwork protecting the point where the North Military Road breached the counterscarp of the North Lines

2 The two ditches of the North Lines

3 Two bridges, incorporating lifting or falling spans, crossing the North Lines (the outer and inner bridges)

4 A profiled linear earthwork, or *tenaille*, incorporating a *banquette*, between the ditches of the North Lines

5 The outer entrance, with strong wooden gates opening onto a tunnel through the rampart. It incorporates a counterweight recess for the inner bridge and a postern gate providing direct access into the ditches of the Lines

6 A sinuous tunnel passing under the rampart of the North Lines

7 Gun rooms and a musketry gallery for close defence of the Lines and *tenaille*

8 The inner entrance, incorporating a guard house and access to three large water tanks which served the nearby garrison at Grand Shaft Barracks

The outwork (Fig 9)

The approach of the North Military Road is indirect to conceal the entrance from view; it also runs at the foot of North Lines counterscarp and is thereby exposed to fire from it. Moreover, the outer bridge is hidden until the last minute and as the road turns, it does so in a cutting with brick revetments formed at the end of the counterscarp and by a purpose-built earthwork curving with the road on the opposite side. There is a small sheltered position, **a**, overlooking the road cutting in the angle of the counterscarp, possibly for a small body of defending troops, with steps leading down into the outer ditch: this enabled troops to retreat to the postern gate (see below).

Plans dated 1887 show a set of piers for a gate which barred entry to the outer bridge; along with the original road surface, these have not survived (Fig 12; NMR: WD/2300 & WD/2314). One of the plans is annotated 'Block Signal' on the north wall of the cutting, suggesting some form of traffic control, perhaps an adaptation of the Block Signalling system used widely on the railways at this time. Although no traces of this system survive, evidence of a later one takes the form of a switch for a 1950s traffic light, mounted in a strip across the road surface. A small cutback in the counterscarp, **b**, may have been for a sentry.

The outer bridge (Fig 10)

The 1887 plans reveal that the original timber bridge structure was replaced at this time by another, constructed from rolled-iron joists and girders. The renewal and strengthening of the bridge was to enable the safe passage of horse teams pulling heavy artillery pieces and limbers.

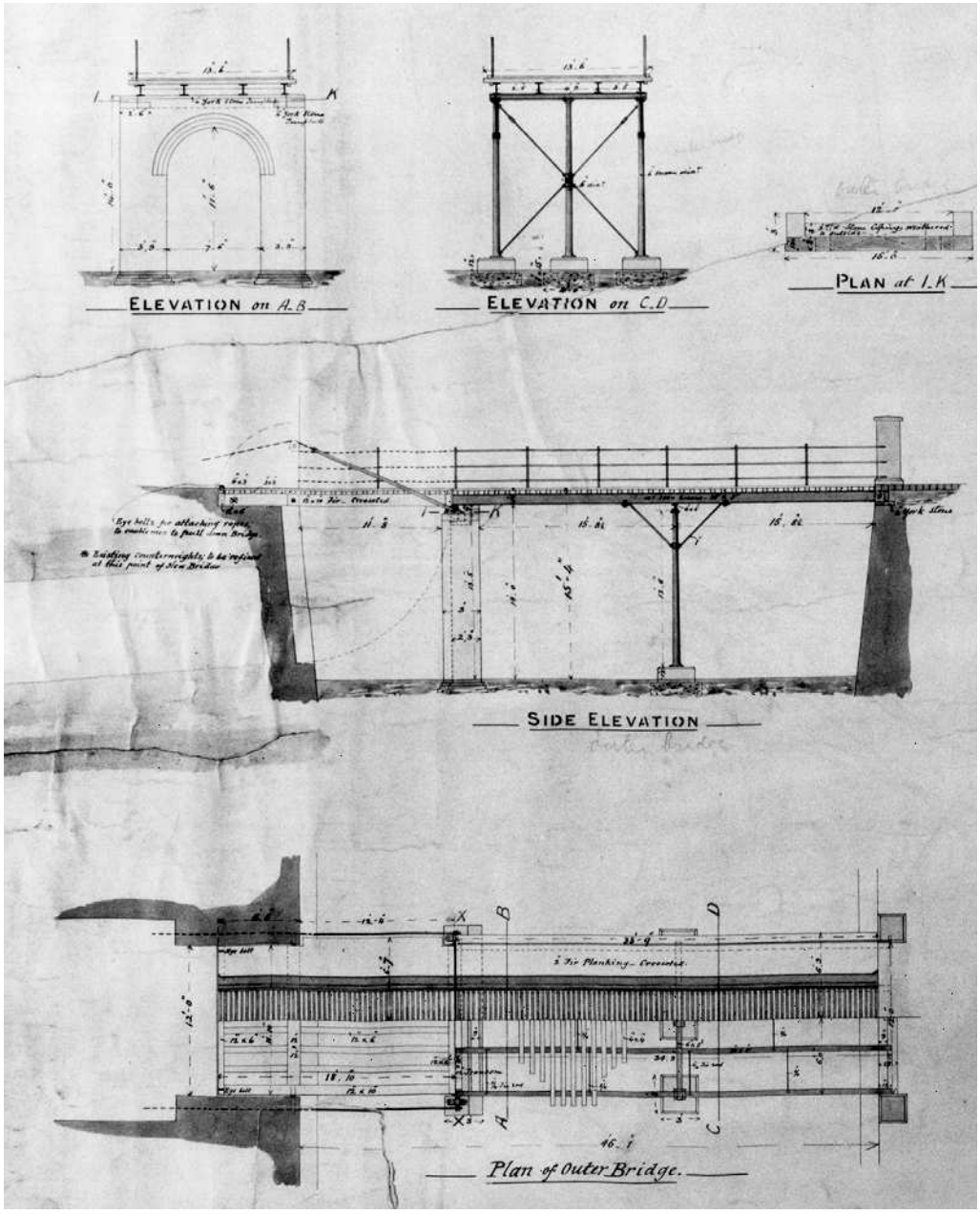

Figure 12
A plan dated 1887, showing the proposed new bridges at the North Entrance (extract from NMR: WD/2315)

The new bridge consisted of a fixed span for the outermost two thirds and a drawbridge forming the inner third (Fig 12; NMR: WD 2314). Part of the fixed span survives, comprising 'I' section girders with a few remaining joists which formerly supported a road bed of wooden planking. The span is supported on two sets of piers: one situated at the centre of the span and comprising three tubular wrought-iron piers, strengthened by bracing rods bolted to cast flanges, and a second set at the *tenaille* end comprising two brick piers linked by a semicircular arch.

The timber drawbridge was replaced at the same time and as the pivot blocks, counterweights and piers were re-used, it is reasonable to assume that the replacement worked in the same manner as its predecessor. The drawbridge was pivoted at the inner end so that it could be lowered in a controlled movement *into the ditch*, coming to rest in a set back in the wall of the *tenaille*. To hold the drawbridge open a form of latch - a canting transom - was pivoted in cast-iron blocks bolted to the stone coping of the brick piers. To provide clearance for the transom to turn and unlatch, the sill of the coping between the pivot blocks was set back and cut at a slight incline. The transom was operated by wrought-iron connecting rods attached by cotter pins at each end of the pivot. When ropes attached at the *tenaille* end pulled the connecting rods the pivot moved the transom and it swung down and unlatched the drawbridge, which could then swing down into the ditch. To stop the entire weight of the drawbridge resting on the transom - and thereby preventing it from becoming unlatched - counterweights were attached at the *tenaille* end. Eye bolts for ropes were also set at this end to allow the drawbridge to be pulled up and closed.

This method of operation enabled a defending force to quickly lower the drawbridge, since it was faster than having to hoist a bridge. Its location when down - in a set back of the *tenaille* wall - may also have prevented grappling, a method known to have been effective in bringing down lifting bridges elsewhere. Once dropped, the difficulty in restoring the span suggests that this operation was for use in an emergency. Sadly, no physical evidence of the mechanism has survived.

The drawbridge was replaced by the current fixed span of steel 'I' section beams, probably during the Second World War or in the 1950s.

The *tenaille* and ditches (Fig 10)

The *tenaille* is formed partly from a long rectangular island of natural chalk, left from the excavation of the twin ditches: the inner ditch follows the Napoleonic line, the outer ditch dates to the 1860s (Fig 13). The ditch sides are revetted in brick or coursed flint with a slight batter. Above the revetment of the *tenaille* an earthwork capping is profiled to create a *banquette* at the rear and a shallow scarp at the front, to enable small arms fire against an attacker approaching the counterscarp. At the western end the *tenaille* incorporated a recessed section to allow the gun rooms in the North Centre Bastion to sweep the ditch and counterscarp of the Detached Bastion.

The North Military Road crosses the *tenaille* in a deep cutting describing an elongated 'S' in plan, with revetted brick walls in English bond (Fig 14). The form of this cutting is deliberate, providing protection against shell-fire, cutting down on ricochet and making it impossible for an enemy field gun or infantry sited at the outwork to take clear shots at the outer entrance.

Figure 13
A view along the tenaille *in 1958, showing both bridges, with the Drop Redoubt and Dover Castle in the background* (Dover Museum: D07902, reproduced by kind permission of Dover Museum)

The road across the *tenaille* has been resurfaced but the granite kerbstones are almost certainly part of the original construction and are similar to those used elsewhere in the North Entrance. At the inner end, there are two piers with sandstone anchor blocks for pintle hinges, from which gates would have closed off the inner bridge when the drawbridge was raised. Additional brick piers on both sides of the roadway were for pedestrian gates formed of spear-finial iron railings; these provided access to the *banquette* via short flights of steps, while the western gate also led to a flight of steps into the inner ditch. The short flight to the west was destroyed at some time during reconstruction of the road, leaving a section of brick wall protruding from the present slope. The colour, bond and rough finish on the inner ditch side suggest that it was originally built

Figure 14
The road in its cutting through the tenaille (NMR: AA00/9825)

against the natural chalk and therefore acted as a retaining wall. The flight into the inner ditch was constructed in brick and incorporated a removable landing spanning two brick piers, an obvious security precaution if the inner ditch fell into enemy hands. The steps formed part of a route to the postern gate for both reinforcement and withdrawal (NMR: WD/2300).

The road has undergone a number of alterations. The earliest was the insertion of sandstone rubbing-blocks at ground and waist height in the revetment walls, to absorb the damage caused by wheeled transport coming off the outer bridge; numerous scars and scratches are visible in the brickwork. Another modification was to straighten the course of the road; this involved demolition of a section of the revetment wall and part of the chalk profile, exposing the retaining wall for the steps to the *banquette*. The revetment wall was rebuilt using Fletton bricks capped by a crude soldier-course and the road given a concrete kerb, suggesting that the work dates to the Second World War or to the 1950s, probably to ease the curve for large motor vehicles. The latest noticeable modification was the installation of traffic lights in the 1950s: one of the gate piers on the outwork was cut down to provide a mount for the lights and a switch remains embedded in the road.

The *tenaille* would have played a major role in defending the North Entrance. In the event of a determined attack, the defenders could abandon the outwork: any troops there could descend the steps and retreat to the postern gate. An attacking force in the outwork, attempting to take the outer bridge or establish positions along the top of the counterscarp would come under volley fire from the *tenaille*, while the drawbridge of the outer bridge could be dropped. Reinforcements from the Fortress could reach the *tenaille* either via the inner bridge, shielded by the sinuous curve of the road there, or via the postern gate and steps from the ditch. Furthermore, if the *tenaille* was lost, defenders could withdraw to the outer entrance and close the drawbridge of the inner bridge. The enemy would then have to attack the fortress curtain wall and outer entrance from the reverse slope of the *tenaille*, making them vulnerable to fire from the top of rampart of the North Lines. An assault from the ditch could be repelled by carronade and musket fire from the gun rooms. Only prolonged bombardment would reduce the outer entrance sufficiently to enable a practical assault, by which time a counter-attack could have been planned and mounted.

The inner bridge (Fig 10)

The road passes from the *tenaille* onto the inner bridge. Like the outer bridge, this also had a fixed span but the moving span comprised a *true* drawbridge which survives *in situ*. The fixed span was reconstructed *c*1887 to the same specification as the outer bridge,

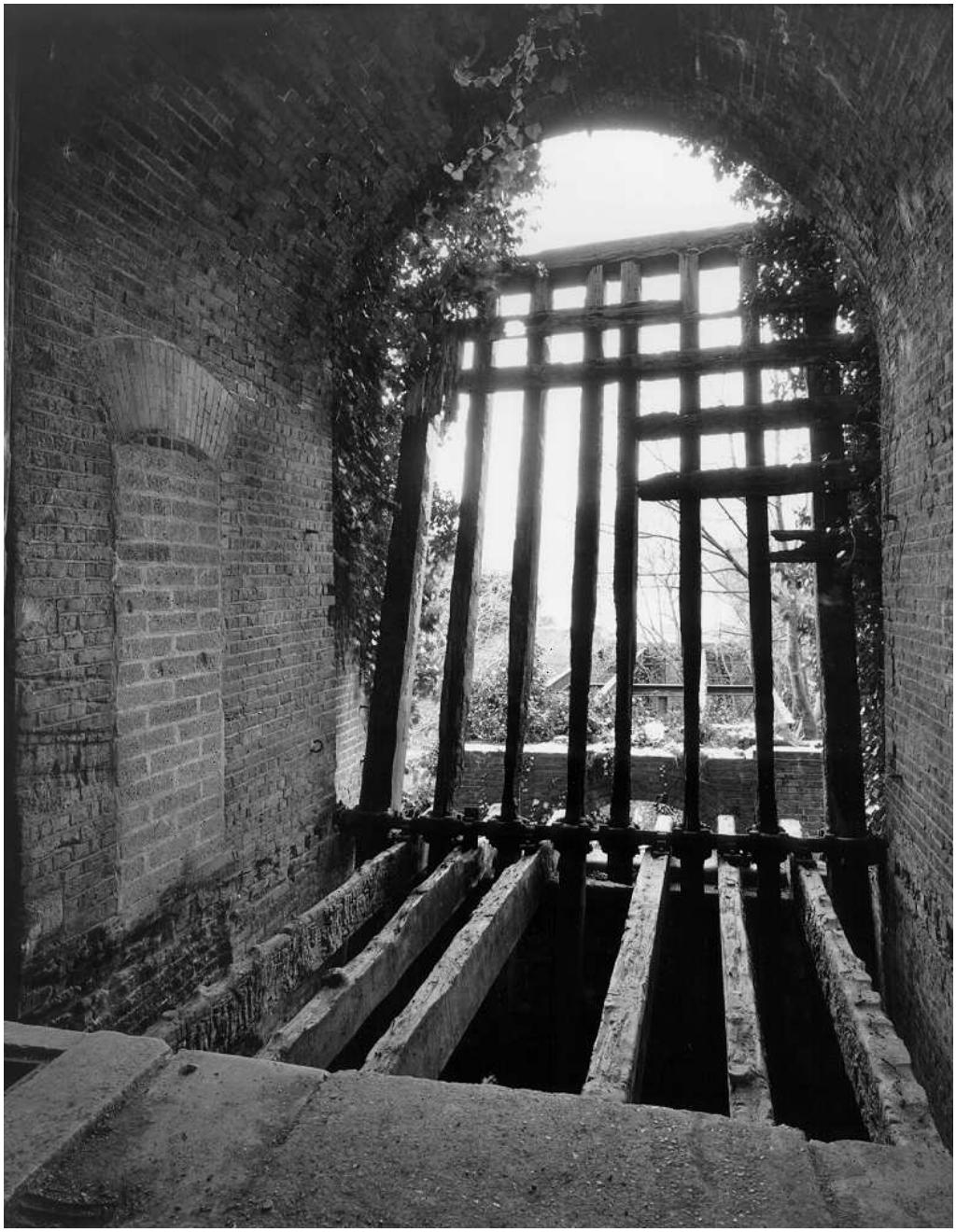

Figure 15
The remains of the inner bridge in its raised position
(NMR: AA00/9841)

with rolled-iron joists and beams, three tubular iron-piers forming a central support and a brick pier supporting the end of the fixed span (Fig 12). The drawbridge rested on the brick pier and had its pivot in an entrance chamber recessed into the curtain wall.

The drawbridge survives in the closed position against the curtain wall, forming an outer gate and sealing the entrance chamber in the thickness of the curtain (Fig 15). Its pivot is a

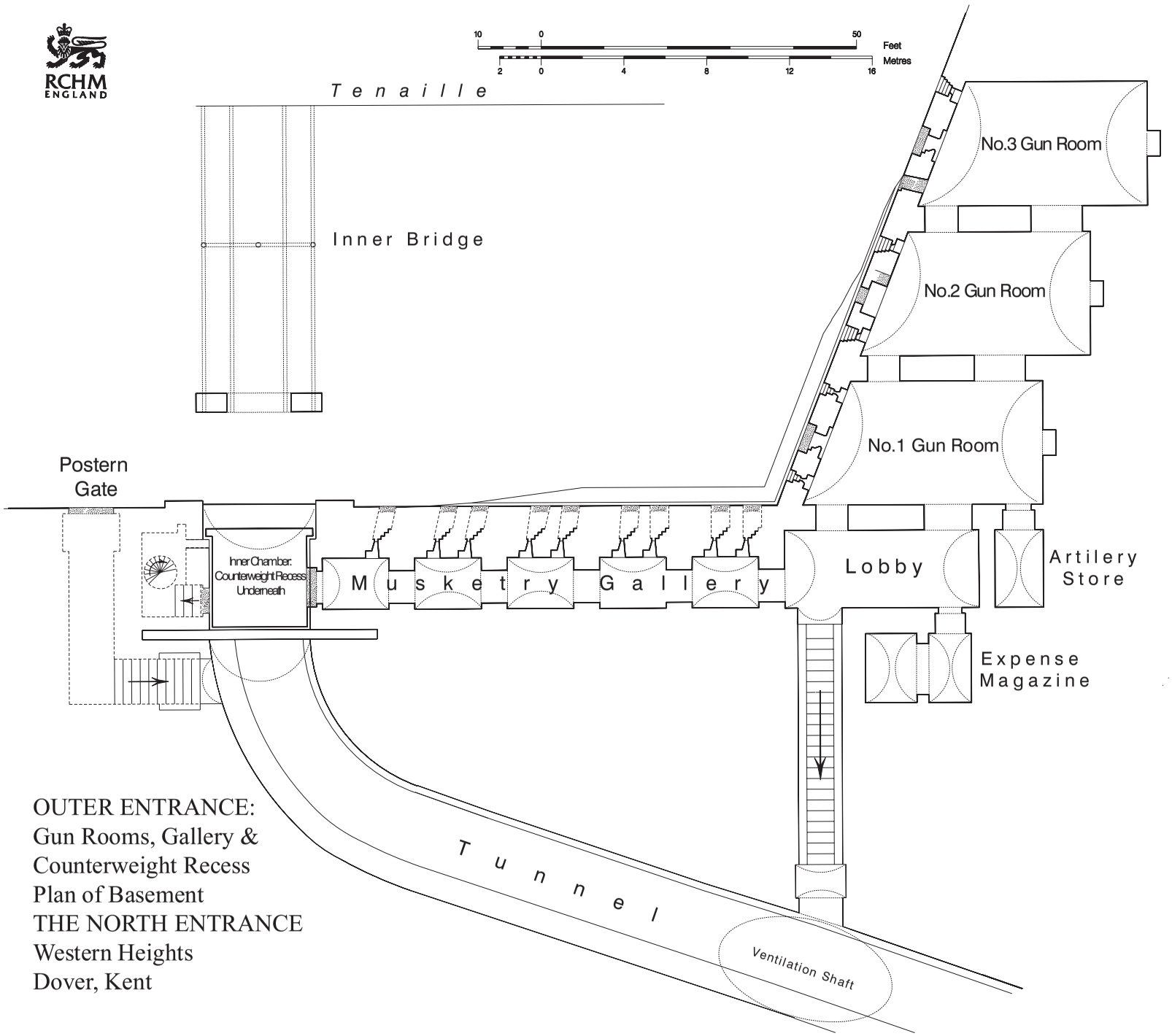

Figure 16
RCHME plan of the Outer Entrance: gun rooms, musketry gallery and counterweight recess

cast-iron rod set in cast-iron bearing blocks attached to the top of the curtain wall inside the entrance chamber. A ratchet is attached to the western end of the pivot rod, probably to retain the bridge once it had been raised. The absence of the drawbridge from the rebuilding plans of 1887, and the very substantial scantling of the timbers used in its construction, suggest that it pre-dates the rebuilt fixed spans, and this is confirmed by its depiction on a plan dated 1863 (see Fig 19). The framework of the drawbridge has double-pegged mortice joints and a double-planked roadbed which extends across the front section. The beams of the rear section carry the counterweights which extend beneath the road into the counterweight recess, a rectangular pit over which the road passed on timber joists (Fig 15). As the drawbridge opened, the beams came up from the recess and interleaved with the road joists forming a solid bed. An axial beam at the rear of the drawbridge rested against the underside of the road joists when in position, preventing further movement. Traffic could then pass over the bridge and into the entrance chamber. Guard chains or ropes were originally provided for the drawbridge and the iron pintles for these are still visible in the entrance chamber on each side of the inner gate.

Figure 17
The counterweight recess with the bridge counterpoise weights in position (NMR: AA00/9846)

The Outer Entrance (Fig 16)

The drawbridge closed against the curtain wall to form an outer gate, which sealed the entrance chamber. Beneath this chamber is the **counterweight recess** which accommodates the huge cast- iron weights attached to the end of the drawbridge. The recess also contains the surviving mechanism for the drawbridge, comprising a hand-operated winch mounted on the floor in a shallow, segmental-arched apse in the rear wall (Figs 17-18). Steel cable from the winch was connected to the counterweights

Figure 18
The winch in the counterweight recess (NMR: AA00/9847)

via two sets of pulleys mounted on the curtain wall side of the recess. Slots set at the springing points of the inner of the two arched-orders of the entrance chamber may have been part of an earlier mechanism to operate the drawbridge. A shaped stone groove leading from the top of the winch apse to road level may also form part of this system.

However, a plan of 1863 demonstrates that while the drawbridge remained unaltered during the 1887 reconstruction, the operating system which survives is a replacement (Fig 19). Before this date, a different system was in place, mounted in a small **winch room** at road level on the western side of the entrance chamber. The doorway is now bricked-up but retains a rubbed-brick segmental head (Fig 20). A small hand-winch in this room was connected to the pivot via a geared-shaft running through the wall, and the winch raised or lowered the drawbridge by turning the pivot, assisted by a counterweight. This method would have put a lot of pressure on the winch, which might explain the later arrangement with the winch in the counterweight recess. Following the installation of the new mechanism, a cast-iron spiral staircase inserted into the winch room provided access down to the counterweight recess. A semicircular-headed doorway with a gritstone keystone arch in the eastern end of the counterweight recess led directly to the musketry gallery, though it has since been blocked.

The tunnel (Fig 16)

The drawbridge closed against a semicircular arch of two plain orders flanked by projecting piers topped with rounded stone copings. A pair of heavy sliding wooden doors form an inner gate which enabled the entrance chamber and the bridge to be closed off from the **tunnel**. The doors are strongly constructed with raked boarding and rise to the full height of the tunnel entrance with the tops shaped to fit against the vault (Fig 21).

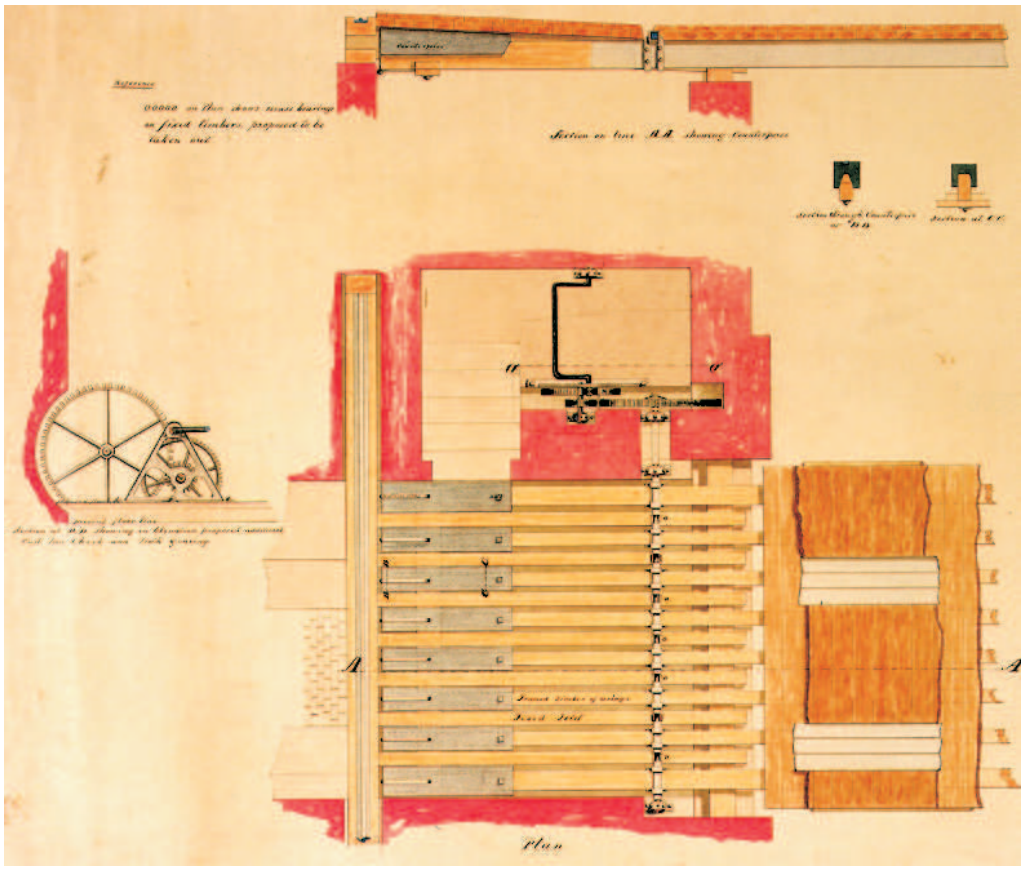

Figure 19
A plan dated 1863, showing part of the inner bridge and its counterpoise weights and lifting gear (extract from NMR: WD/2308)

Figure 20
The blocked doorway to the winch room, with the remains of the bridge in the foreground (NMR: AA00/9842)

Suspended from a rail in a recess in the roof, and guided by another in a similar recess running along the floor of the entrance chamber, the doors slide back into slots in the walls, stopping flush to allow traffic to pass unimpeded. Iron levers at the base of the inner faces of the doors were to assist in closing them, while iron rings set in the tunnel walls may have formed pulley mountings for further assistance. A wrought-iron latch and a substantial door bar in iron staples, secured the door on the inside.

Figure 21
The blocked road tunnel and doorway to the postern gate, with the remains of the bridge in the foreground (NMR: AA00/9840)

Immediately beyond these doors, the western wall of the tunnel contains an entrance onto steps leading down to the **postern gate** (Fig 21). The door in the curtain wall is now blocked (and externally, is not readily detectable), but tie-back recesses in the chamber walls show that the doors opened inwards. This suggests that its main purpose was to provide an escape route for the infantry if they were driven from the *tenaille*, as the doors could be closed behind them and barred.

The semicircular-vaulted tunnel follows an elongated 'S'-shaped course as a defensive measure against ricochet. The road surface was formed from large pine blocks, each 16cm square, set in tar between granite kerbs, though many have been robbed out. The use of wood blocks was intended to deaden the noise of solid wheels and horses hooves in the tunnel. On the eastern side of the road is a stone pavement, wide enough for a single person and defined by a raised kerb. Ventilation and some light for the tunnel are provided by a single elliptical-cone shaped shaft rising vertically from the top of the vault; a magnificent piece of brickwork closed at the top by an iron grille (Fig 22). Halfway along the western side of the tunnel, a recess with a stone sill and lintel and a stout timber surround is possibly part of the Block Signalling system.

The gun rooms and the musketry gallery (Fig 16)

Access to these rooms is through a set of doors in the eastern wall of the tunnel, opening onto a stair-passage which descends to the north-west. The semicircular-arched doorway has an iron-barred fanlight and part of one of an original pair of reinforced doors (double thickness timber with iron sheet between) on strap hinges. The doors, held open by hooks in tie-back recesses in the passage, could also be barred from the inside, the door-bars

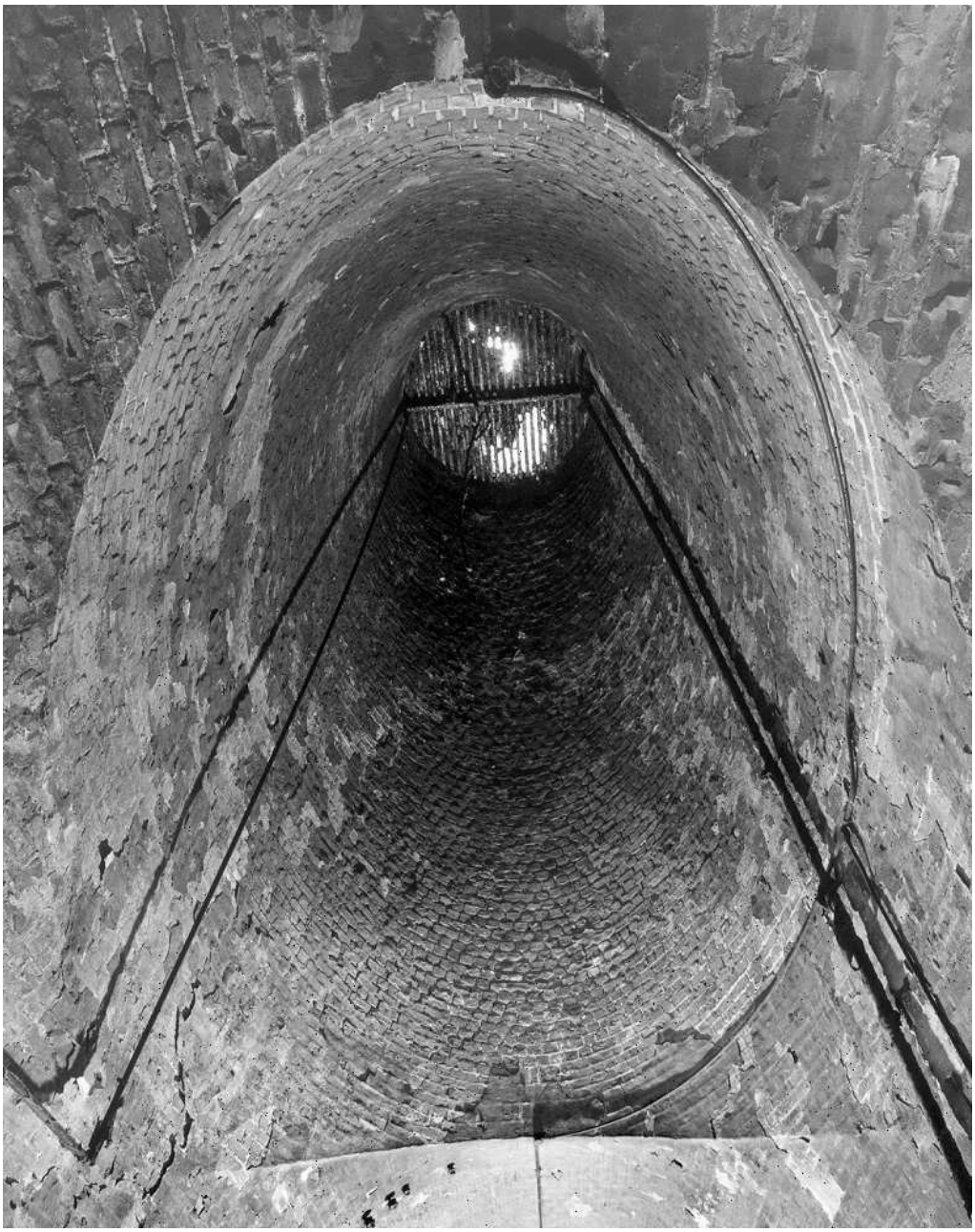

Figure 22
The vertical elliptical opening in the roof of the road tunnel (NMR: AA00/9827)

resting in sandstone slots in the passage walls. Barring the doors on the passage side allowed the defenders to hold the gun rooms against an enemy who had taken the tunnel.

The stair passage has a semicircular vault and a steep stone stairway with stone wheeling platforms along either side (Fig 23). To assist with the movement of artillery pieces on these platforms, large iron pulley-rings were set in sandstone blocks in the passage walls

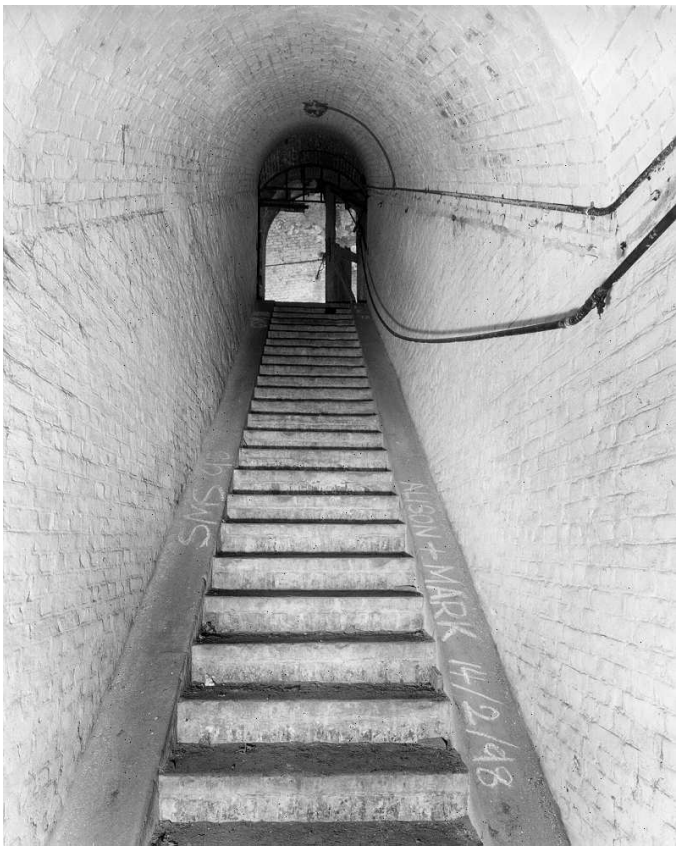

Figure 23
Steps leading up fromthe gun rooms to the road tunnel; note the wheeling ramps on either side to enable heavy guns to be moved easily (NMR: AA/009830)

at the top of the stairs. The stairs emerge into a brick-vaulted lobby area serving both the gun rooms and the musketry gallery.

An **expense magazine** on the south-east side of the lobby was for the storage of ammunition for the guns (NMR: WD/2300). The magazine is of broadly the same plan as other examples on the Western Heights, comprising an entrance lobby leading to the magazine via a door in a stout timber frame. Ventilation was through air-bricks in the lobby wall, leading into a cavity extending around the magazine and entering it through missing headers in the interior walls. Also inside, there are wooden battens set into the walls which supported a timber lining and possible storage shelves, and the remains of a suspended timber-floor with vents below it. All surviving metalwork is non-ferrous.

The **musketry galler**y is reached via a short groined entrance from the lobby. It is built to the general Western Heights plan with five semicircular vaulted casemates linked by short interconnecting passages; similar examples can be found in North Centre Bastion (Pattison 2001). The first four casemates each contain two musket loopholes below an earthenware ventilation pipe in the centre of the wall above; the fifth, due to its position next to the counterweight recess, has only one loophole. The loopholes have varying internal angles to allow them to enfilade the face wall of the gun rooms and the corresponding corner and re-entrant angle of the *tenaille*. They are constructed entirely in brick with stepped courses on the exterior face for protection against ricochet. Wooden plugs in each jamb suggest that internal wooden shutters may have been provided. The exterior faces of all of the loopholes have been sealed with brickwork, and internally the

gallery ends at a blocked semicircular archway which formerly opened into the entrance chamber above the counterweight recess.

The three **gun rooms**, comprising semicircular-vaulted casemates with stone flagged floors, are arranged in echelon to give a field of fire down the inner ditch westwards towards the North Centre Bastion. Access to them from the lobby is through two doorways; subsequent doorways in the party wall of each gun room align with these, effectively forming two passages through the three rooms. The passage nearest the front wall provides the shortest route from the lobby and the stairs, the other passage forms a route from each gun room to the expense magazine.

The gun rooms are practically identical in plan, and very similar to those elsewhere on the Western Heights (Fig 24). The rear walls each contain a central fireplace surmounted by an iron-louvre vent. Each front wall contains a central carronade embrasure, with a stone sill and lintel and splayed and stepped brick anti-ricochet walls, flanked by musketry loopholes. The loopholes - two per gun room - are of the same form as those in the gallery and intended for close defence; the only exception is the last loophole in no 3 gun room, which appears to be angled to cover the return of the *tenaille*. Wrought-iron rings in the vault of each casemate were for handling and moving the carronades. Ventilation was via an earthenware pipe over the carronade embrasure: the pipe emerges through the exterior wall and is closed by an iron grille. Additional ventilation was via circular earthenware pipes in the crown of the vaults.

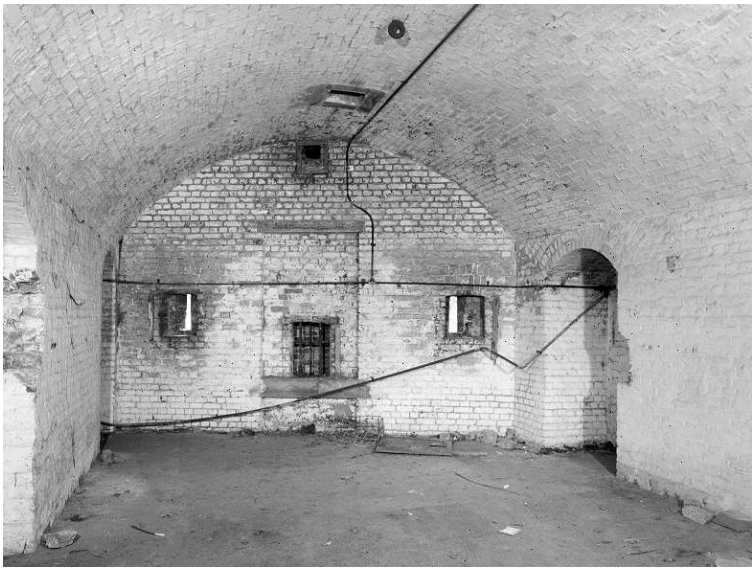

Figure 24
No 2 gun room, showing the central carronade embrasure flanked by two musket loopholes (NMR: AA00/9831)

A small room off the south-eastern corner of no 1 gun room is labelled '**Artillery Store**' on a plan dated 1893 (NMR: WD/2300). Artillery stores contained all equipment for the maintenance and operation of artillery pieces, such as oil, cleaning cloths and rammers. This one

takes the form of a simple rectangular brick chamber with a single door and evidence for shelves on the inside walls.

The musketry gallery and the gun rooms were becoming obsolete in the 1890s when mobile armament was taking over from fixed guns. In the early part of the 20th century the musketry gallery was abandoned and its loopholes were probably blocked at this time. However, the gun rooms were adapted for other uses, notably as a telephone exchange according to a plan of 1912 (PRO: WO/78/5101). The exchange was located in nos 2 and 3 gun rooms, with the carronade embrasure in no 2 converted into a doorway to provide direct access to the ditch, while in no 3, the embrasure and one of the loopholes were converted into windows. The remains of electric light fittings in no 3 as well as insulators and brackets in no 2 are further evidence for this change in use. The conversion probably also involved blocking one of each pair of interconnecting doorways between nos 2 and 3, while the remaining one was provided with a doorframe.

The Inner Entrance (Fig 25)

The tunnel emerges onto the Centre Road through the inner entrance, which is set back to form the end elevation of a deep cutting, together with the adjacent entrance to a casemated guard house. The cutting is retained by high, curving, revetment walls in English bond brickwork, with the same rolled sandstone coping as the inner entrance elevation, although topped with a square-section wrought-iron balustrade. The southern revetment contains the entrance to the guard house **latrines**, located in a small, brick vaulted room. Inside are two WC stalls, a urinal and a sink (Fig 26). Immediately east of the latrine entrance, a set of steps with stone treads and another, similar wrought-iron balustrade, climbs to a higher level where a Royal Engineer's Yard, a chapel, school and other buildings formerly stood. The steps may also have formed a sentry route from the guard house to the North Centre Bastion, providing a short cut to Bastion Road running behind the rampart of the North Lines.

The entrance elevation comprises two semicircular arches of three orders with sandstone plinths and polychrome brickwork in buff, red and cream (Fig 27). The right-hand arch is the entrance to the tunnel, while the left-hand arch contains the guard house. Door and window openings and the outer order of the arches have red-brick jambs and heads, and the entrance is topped by false machicolations in red-brick with cross details in courses placed below a sandstone coping with a roll moulding. The front wall of the guard house is set back in the archway and contains a door and window with arched and chamfered

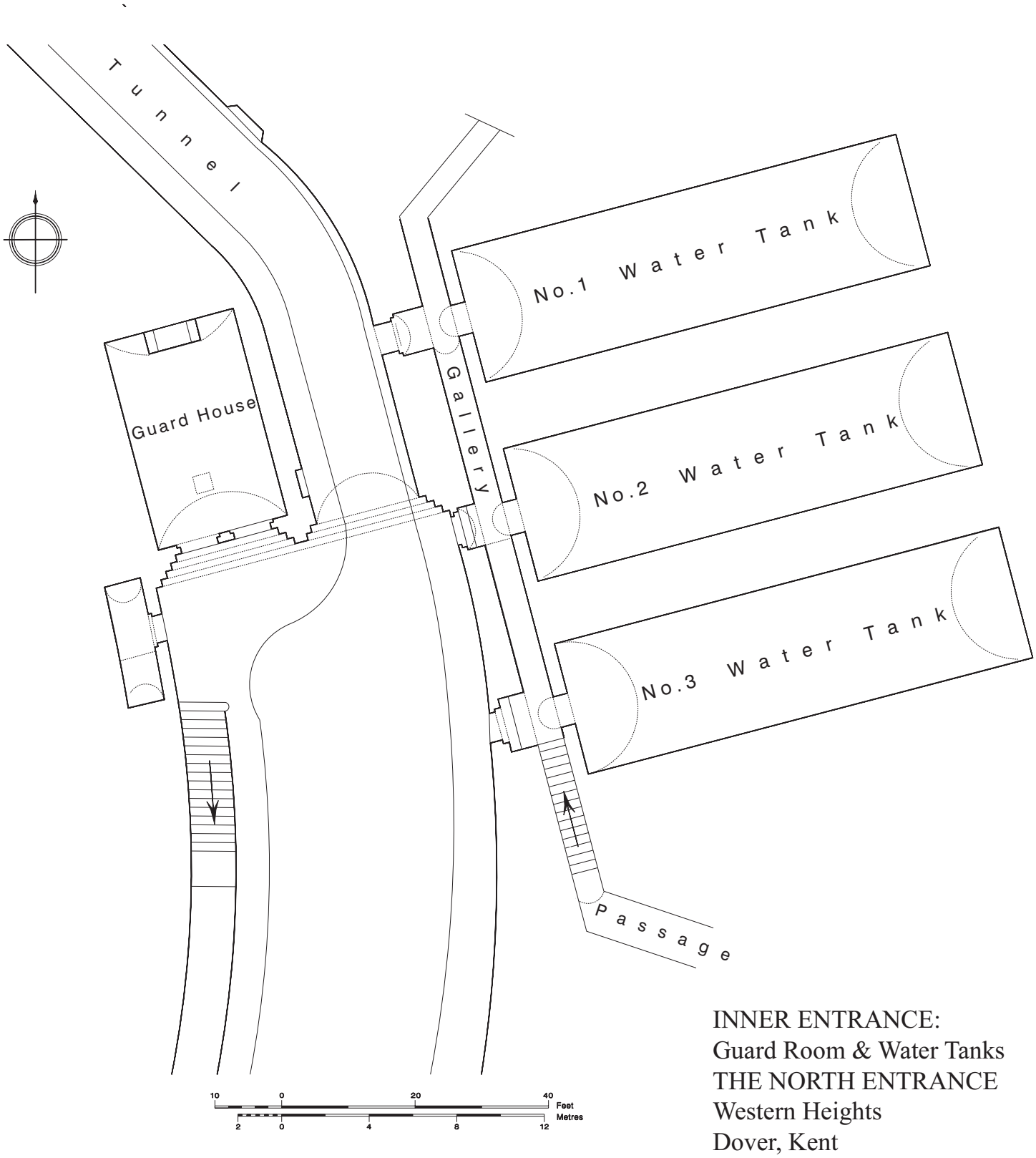

Figure 25 *RCHME plan of the Inner Entrance: guard house and water tanks.*

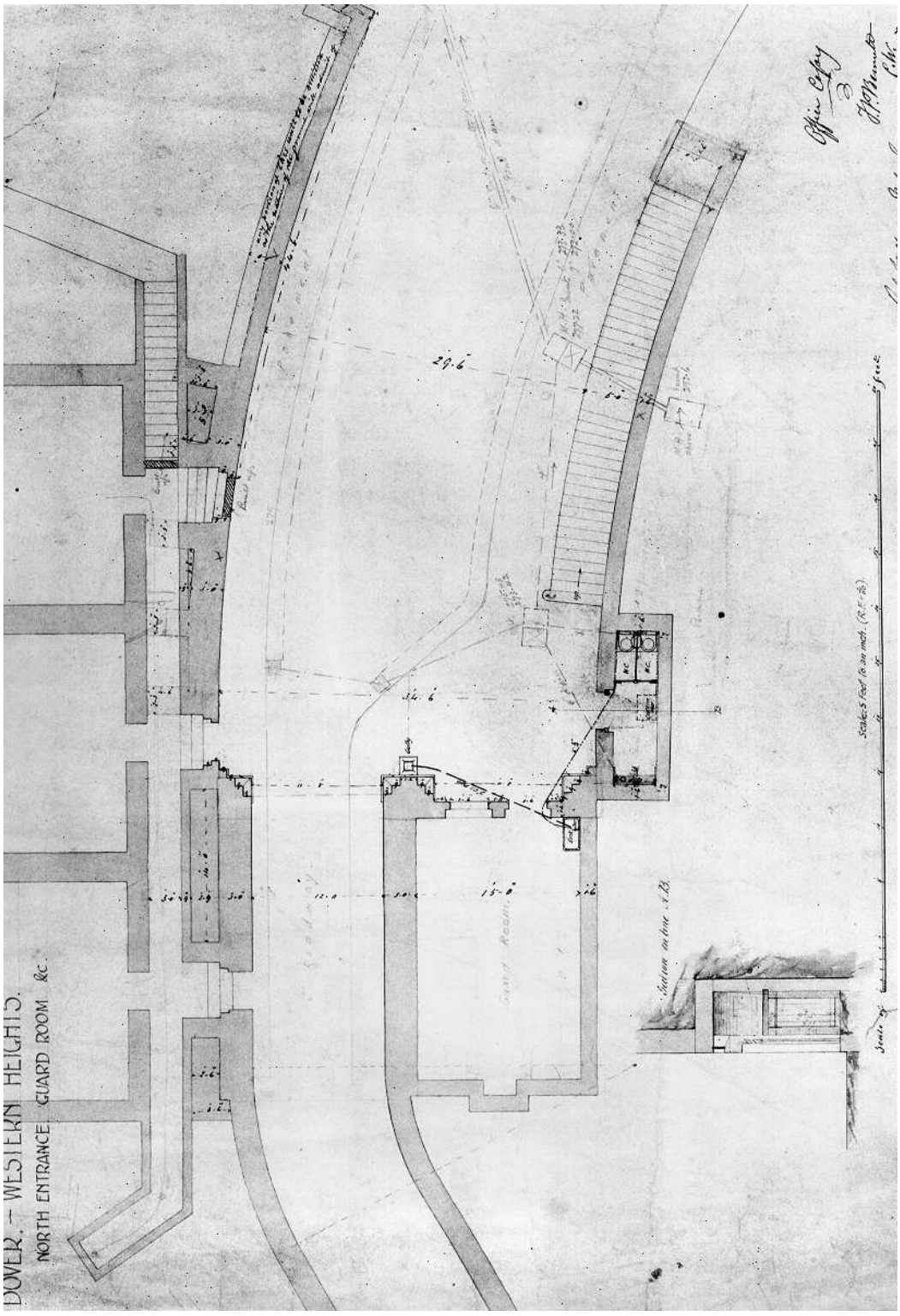

Figure 26 *A plan of the Inner Entrance, dated 1861* (NMR: WD/2305)

Figure 27
The Inner Entrance, showing the road tunnel and the guard room; the blocked doorways on the right flank wall lead to the water tanks (NMR: AA00/9818)

heads in imitation of tracery. The contrast is quite striking between this decorative, private, hidden entrance and the plain Outer Entrance.

The **guard house** is a semicircular vaulted casemate built parallel to the road tunnel. It has the rotten remains of a suspended close-boarded pine floor, and a large brick-built stack in the centre of the rear wall. A plan of 1860 shows a *recessed* fireplace in this position without the present *projecting* stack. The present stack may be the remains of the "Hot Air Closet", shown on a plan of the following year, used for drying the clothes of the guard after sentry duty. This is typical of the contemporary concern for the health of the private soldier and the desire to apply the latest technology to its solution (Figs 27-8). The closet consisted of a clotheshorse occupying a compartment with a second flue behind the grate and the main flue; the clotheshorse was supported on rails which were designed to slide into the compartment through a slot in the left hand side of the stack. The dimensions of the existing stack broadly match those on the plan, but unfortunately no evidence for the rails of the clotheshorse survive. A Belfast sink was added in the south corner of the guard house by 1861: this is still *in situ* and has a slate splash-back. Remains of equipment racks for the guard are located on the side walls.

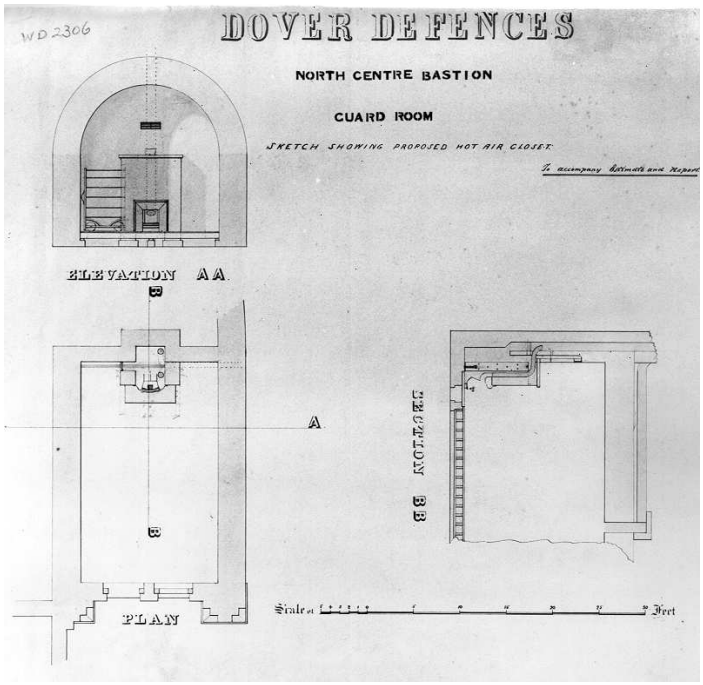

Figure 28
A plan dated 1861 showing details of the hot air closet inserted into the guard house
(NMR: WD/2306)

The guard house is unusual in having no direct communication with the tunnel, the place it is guarding. It is also unlike the other entrance guard rooms on the Western Heights - at the Citadel and the Grand Shaft - since it has no detention cells or orderly room, the nearest ones being those provided at the South Entrance (see below). Annotation to one of the 1861 plans refers to the guard house as "North Centre Bastion Guard Room", indicating that it served a wider function (Fig 26). It is probable that the cells and the prisoner's room in the South Entrance catered for those problems at both entrances, while this guard house served strictly for administrative purposes and sentry duty.

Behind and parallel to the northern revetment of the cutting is a semicircular vaulted **gallery**, reached through two doorways in the revetment and another in the tunnel. Each doorway leads down steps onto the stone-flagged floor of the gallery, to face doorways in the opposing wall; these open onto three huge sunken **water tanks**. These replaced two earlier tanks which had been built during the Napoleonic phase to serve the Western Heights garrison. These stood further west in the angle between North Centre Bastion and the North Lines (Fig 5; PRO: MR/1346). The earlier tanks were removed to enable the construction of the *tenaille* and twin ditches of North Entrance.

The tank doorways originally had stout wooden doors with locks for security. The tanks could not be closely investigated but in essence are identical segmental vaulted casemates, water-proofed with a hard cement or render up to the springing point. Although partly filled with silt and brick debris, the floor of each tank is sunk at least 3m below its entrance and was reached by metal handholds descending from the doorway. Mounted on each doorframe are the remains of a device consisting of two pulley wheels

at either end of a steel or iron strap with one pulley wheel suspended over the tank (Fig 29). The small diameter of the pulleys and the thin section of the strap suggests that this is a water level indicator rather than a support for maintenance uses, but there is no other evidence. A narrow-bore pipe emerging beneath the doorway of each tank was probably for overflow rather than the main supply, as pipework of a larger bore running beneath the gallery floor was probably for the main supply, entering the tanks at a lower level.

Figure 29
No 2 water tank, with the pulley in the foreground (NMR: AA00/9837)

There is clear evidence that the tanks pre-date the construction of the rest of the North Entrance complex. Firstly, doors were provided opposite each tank rather than having a single entrance to the gallery. Secondly, there seems no other reason for the different floor levels between the gallery and Centre Road. Thirdly, there are double rows of headers in the revetment wall above the semicircular heads of the external doorways, which suggests that the upper section of the revetment wall was added to a pre-existing, external wall of the water tanks. This situation clearly resulted from the necessity to build and secure the new tanks before demolition of the old ones, and before construction of the rest of the new North Entrance. This was probably rectified at the end of the construction process, and is shown on a plan of 1900, on which the doorways opposite tanks 2 and 3 had been blocked, so that the tunnel could no longer be entered without passing the guard house (NMR: WD/2451). A plan dated 1929 of the Citadel suggests that the tanks were then used for the Grand Shaft Barracks as storage tanks and were still connected to the pumped water supply at the Citadel (WD/unref).

Figure 30
The Inner Entrance, showing the new route of the Centre Road which by-passes it (NMR: AA00/9815)

A roughly-hewn **passage** is depicted on the 1861 plan, driven into the chalk from the south end of the gallery (Fig 26). This passage descends steeply downwards and contains a brick-built set of steps, before turning abruptly to the south-east. The last section is now blocked but a plan published in 1900 shows that this passage connected with the main pipe gulley below the Centre Road, suggesting that the passage served as access for maintenance (NMR: WD/2451).

Before the abandonment of the North Entrance in 1967 the only modification was the resurfacing of the road and the installation of a traffic-light switch in the road surface.

THE SOUTH ENTRANCE (ARCHCLIFFE GATE)

Summary (Fig 31)

The new South Entrance of the 1860s was not as elaborate as the North Entrance but there *was* provision for defence in depth, comprising four elements:

1 South Entrance Ditch and St Martin's Flank

2 A drawbridge across South Entrance Ditch

3 Archcliffe Gate

4 Casemated gun rooms covering South Entrance Ditch

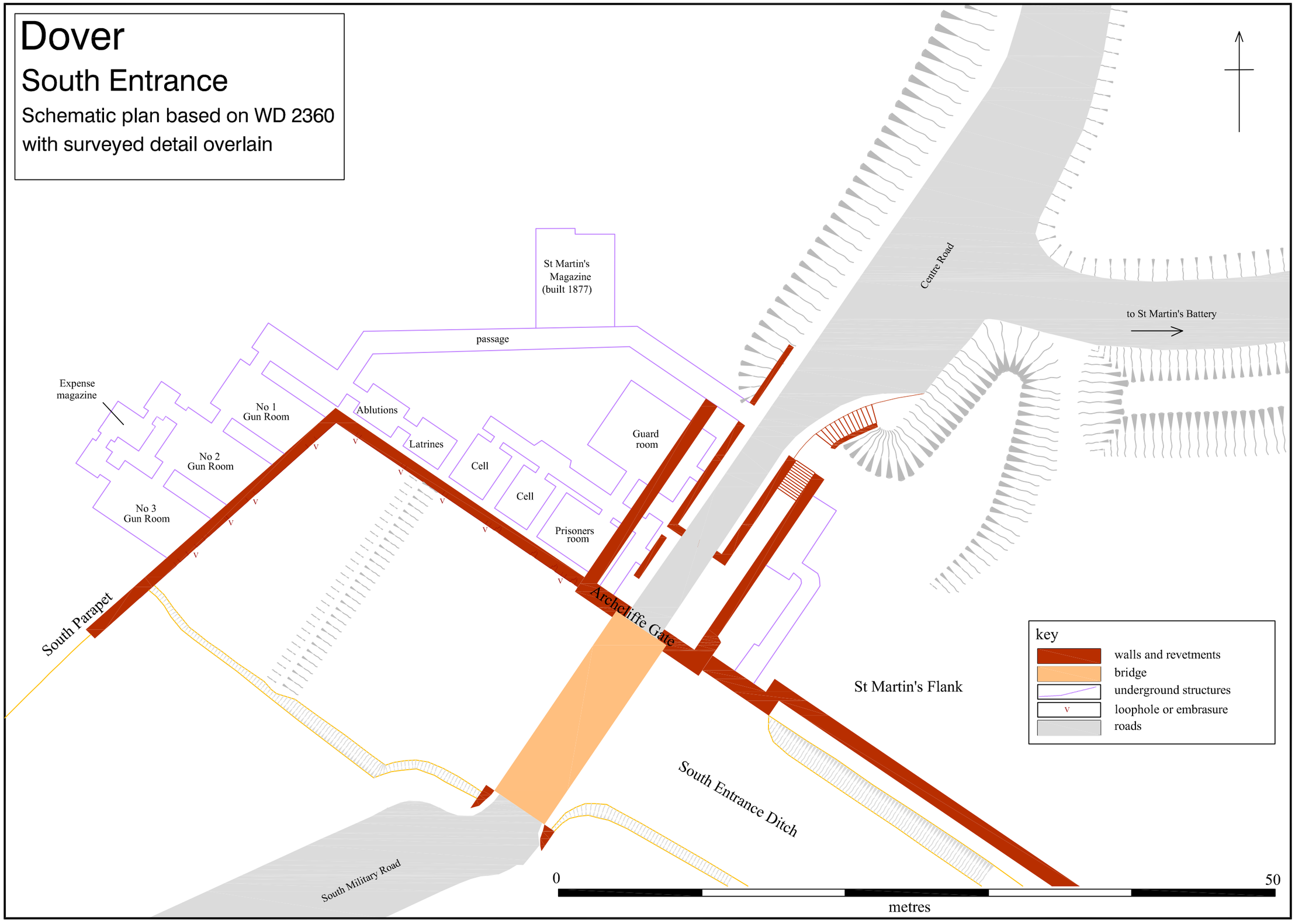

Figure 31 *A plan of the South Entrance, based upon a plan dated 1876*

The entrance was part of a defensive Line that barred access to the ridge top, comprising South Entrance Ditch and a complex rampart known as St Martin's Flank. The ditch was cut down the steep hill from the South Parapet to the edge of the cliff overlooking the harbour. Behind the ditch revetmenst at the northern end, casemated gun rooms were equipped with carronade embrasures and musketry loops, angled to cover both the ditch and a bridge crossing it into the fortress. The shorter length of rampart north of the bridge was a simple earthwork but to the south, St Martin's Flank was a more complex work, built in tiers descending the slope. Its purpose was to cover the South Military Road and the south-western approach to the new entrance, as far as Archcliffe Fort. The bridge gave onto the Archcliffe Gate, from which access was gained to the guard house and gun rooms, built under the rampart.

As a result of the demolition of Archcliffe Gate and its bridge in 1964, very little is now visible of the South Entrance complex. The gun rooms survive but are sealed off and much of South Entrance Ditch is infilled.

South Entrance Ditch (Fig 31)

Much of the northern half of the ditch has been partially infilled, the central section entirely so, while the southern part re-emerges in woodland on the steep slope and is traceable, in a damaged state, to the cliff edge.

At the northern end, sections of the scarp revetment forming the north-east and north-west faces of the ditch are extant, built to a slight batter using stock brick laid to English bond. The north-western section incorporates several vents and embrasures from the gun rooms, above which and between brick courses can be seen a layer of asphalt which served to seal and waterproof the casemates (Figs 32-3). There are three large circular ceramic vents which coped with the smoke produced from firing of the carronades, and the upper parts of four musket loopholes of the standard Western Heights design; a further seven loopholes are obscured by made- up ground.

The north-east scarp revetment is similar but lacks the large circular vents required by the gun rooms; parts of four musket loopholes of the standard pattern are visible, serving rooms in the guard house, with the asphalt layer above them. A plan of 1876 shows loopholes with a much simpler internally splayed design, and in different positions to those visible today (see Fig 36). This may result from a remodelling after 1876.

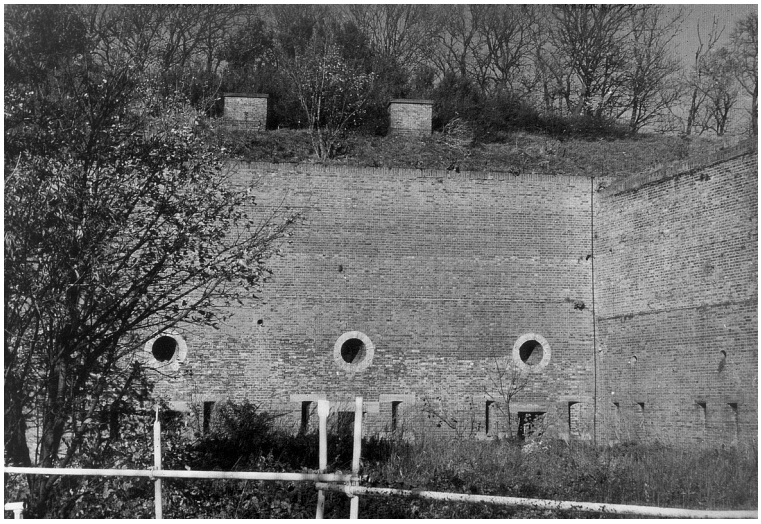

Figure 32
The scarp revetment of South Entrance Ditch in 1959, with the circular smoke vents, carronade embrasures and musket loopholes of the gun rooms clearly visible
(NMR: A.5513/6)

The southern end of the ditch emerges on the steep slope. The scarp is revetted, initially with the same brickwork, except that the top is finished in a quarter-round profile. Erosion at the base reveals a thickness of 1½ bricks set against chalk bedrock. The remainder of the revetment, to the cliff edge, has been repaired in a fine concrete refacing of 20th-century date. The only exception is the brick entrance façade of the Hospital Postern, where an arched opening, formerly with a gate and drawbridge, leads to a tunnel under St Martin's Flank, which carries a path between the Military Hospital and Grand Shaft Barracks (Pattison and Williams 2001a).

At the top of the scrap revetment, a second wall, in faced flint with brick string courses, is set back about 1m from the main one. This formed the low parapet of the *chemin des rondes*, a sentry path associated with St Martin's Flank.

Figure 33
The scarp revetment of South Entrance Ditch in 1999, showing how the infilling of South Entrance Ditch has sealed the embrasures and loopholes. The smoke vents remain visible but blocked
(NMR: AA00/8595)

The counterscarp survives for the southern half of the ditch. It comprises an unrevetted chalk face, except near the cliff edge where there is a short section of faced flint retaining wall, incorporating two blind alcoves finished with round relieving arches in brick. This

feature formerly supported a retractable bridge leading to a set of steps into the ditch, giving access to Hospital Postern (NMR: WD/2358 & WD/2374).

St Martin's Flank (Fig 31)

This was an earthwork rampart built in four main tiers to compensate for the steep slope, set back from the South Entrance Ditch leaving a wide berm, along the western edge of which ran the ***chemin des rondes***, or sentry path, with an integral parapet providing cover for musketry. The rampart was built at a higher level overlooking the sentry path, each tier built to an L-shaped plan with *banquettes* facing south-east and south-west.

The Bridge (Fig 31)

The South Military Road crossed the South Entrance Ditch over a bridge to Archcliffe Gate. In common with other bridges on the Western Heights - at the North Entrance and the Citadel - three quarters of the bridge span was fixed with the remainder a drawbridge (Pattison *et al* 2002). A plan of 1876 shows the original design (Fig 34). The bridge was carried on three pairs of piers, of a cruciform section and probably in cast-iron, which

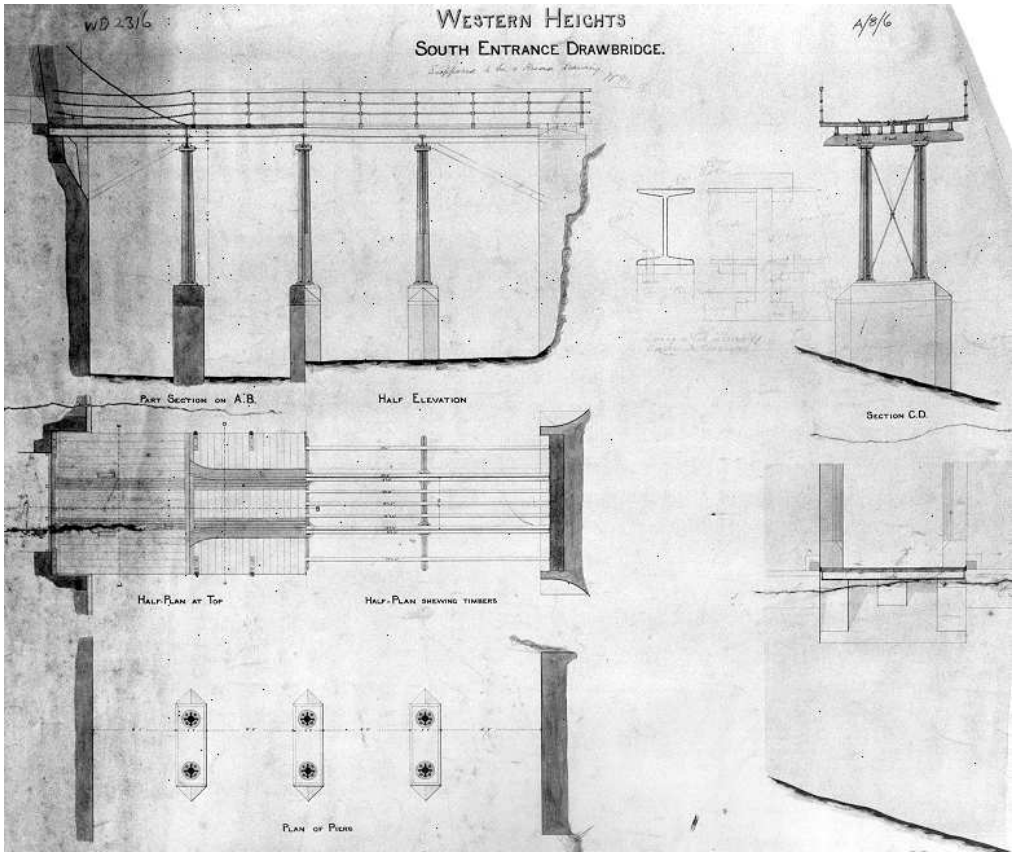

Figure 34
A plan dated 1876, showing the bridge at the South Entrance (NMR: WD/2316)

Figure 35
Archcliffe Gate in 1959, showing the Second World War observaton post on top (NMR: A.5513/5)

were bolted through flanges to masonry or brick abutments in the ditch bottom. The piers were cross-braced with iron rods and braced at their tops by wrought-iron 'I' section beams bolted to flanges on the tops of the piers. The 'I' section beams supported the road which comprised timber decking on axial timber joists. Long plates, probably of cast-iron, were incorporated in the timber road bed, and flanges on the outside of these plates suggest that they formed a guide way for the wheels of artillery carriages or other wheeled transport. Handrails along the fixed part of the bridge span were secured in cast stanchions placed at the edges of the decking.

The drawbridge pivoted at its north-eastern end, the pivot incorporated into the masonry of Archcliffe Gate, and was closed by lifting chains running from pulley slots which were visible above the archway of the gate on a photo taken in 1959 (Fig 35). When the drawbridge was closed it acted as an outer gate to the entrance. The photograph further reveals that at some time the drawbridge was replaced by a fixed span with tubular handrails.

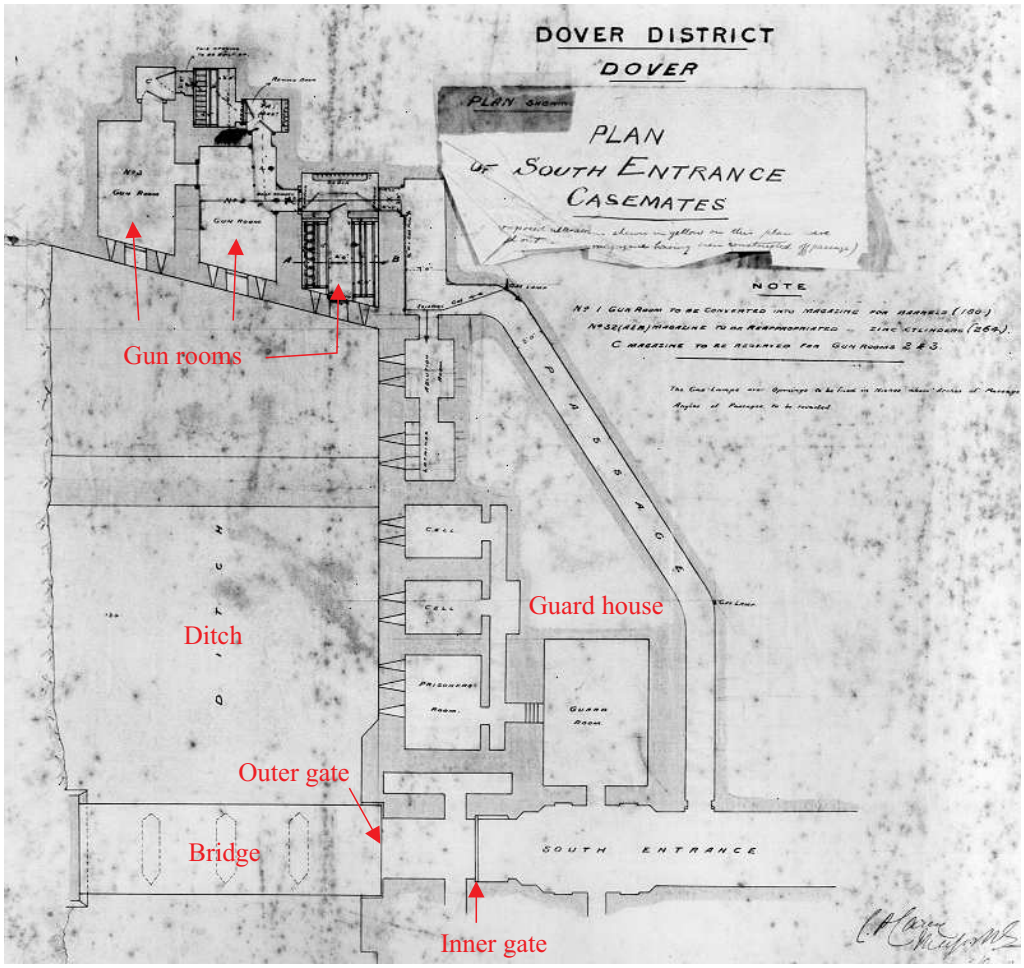

Figure 36
A plan dated 1876 of the South Entrance. Texi in red is added by the authors (NMR: WD/2358)

Archcliffe Gate (Fig 31)

Exterior

Very little survives of the gatehouse above ground. However, a plan of 1876 and several fine photographs, including one taken in 1959, provide the basis for the following description (Figs 35 and 36).

The gatehouse, boldly projecting above the curtain and rampart, was constructed primarily of brick in Flemish bond, resting on a granite or gritstone plinth. The architectural style can be described as Gothick, in sharp contrast to the Italianate details of the inner gateway of the North Entrance. The gateway comprised a four-centred arch of three orders, flanked by projecting piers with their tops coped out to mimic turrets. Running between the turrets and surmounting the gateway, was an embattled

machicoulis with three four-centred arches, probably in buff-coloured brick, springing from tapering stone corbels. It is possible that the machicolations may have functioned as murder holes, like those provided in one of the *caponiers* during the contemporary re-working of the Drop Redoubt (Brown *et al* 2000, 23). A fine-grained stone, probably sandstone, was used for the sloping copings of both turrets, the merlons of the *machicoulis* and the cyma-shaped string course beneath it. The same stone was probably used for the drip moulds in each embrasure of the *machicoulis* battlement and the sills and lintels of small slit-shaped loopholes at the bottom of each projecting pier.

Access to the roof of the gatehouse was at the rear on the south-eastern side, by flights of steps broken by a short landing. A short flight of steps on the roof appears to have led to the top of the *machicoulis* on its north-western side, further evidence that it was functional rather than purely decorative (Fig 36).

During the Second World War an artillery observation post, part of a network of such posts across the Western Heights, was added to the top of the gatehouse (Fig 35; PRO: WO/192/45). To increase its field of view across the harbour, most of the coping of the south-eastern turret was removed. The observation post, a low brick-built structure with a concrete slab roof, had wide embrasures with heavy vertically-sliding steel shutters, to enable panoramic views over the harbour: it may have served the 6-inch guns of St Martin's Battery. Barbed wire enclosed the roof of the post.

Interior (Figs 31 & 36)

The road passed under the rectangular vaulted chamber of the gatehouse, where opposing doorways in the side walls opened into identical short blind casemated passages. These served as sentry posts and each had a single musket loophole opening to the exterior through the projecting piers of the entrance façade. Although visible on the 1959 photograph, these loopholes are not shown on the plan of 1876. The remains of the northern passage survives as a broken opening on the edge of the present road, giving onto a shattered barrel vault which ends after 2.7m.

Immediately beyond the sentry posts was the inner gate, comprising a pair of strong wooden doors opening inwards to rest in setbacks in the side walls. Beyond the inner gate, the gatehouse was carried back in two narrow ranges with flat roofs which slightly projected over the unroofed roadway (NMR: 106G/UK610/ptIV/6361-2). An entrance in the southern range led to a small chamber containing two musketry loopholes piercing

the curtain south of the entranceway and covering the southern flank of the bridge. At the end of the southern range was the flight of steps to the roof.

The northern range contained two entrances, the first opening into a large **guard room** under the rampart. An internal doorway in its south-western wall led down steps into a blind-ended passage, off which were doorways to three further casemated rooms - a **prisoners room** and two **cells**. All three were provided with musket loopholes piercing the curtain and covering the approach to the gatehouse, indicative of their dual function. Only the outer part of this complex can now be seen, comprising a broken opening on the north-western side of the road giving onto the collapsed barrel vault of the guard room.

The gun rooms and the musketry gallery (Figs 26 & 29)

The second and innermost doorway of the northern range of the gatehouse provided access to the gun rooms and musketry gallery via a long, dog-leg **passage**, probably largely intact but now sealed off. It is shown on the plan of 1876 as a simple passage with gas lamps positioned at both angles. At the inner end, the passage opened into a lobby-like area which provided access to both the gun rooms and the musketry gallery.

The three **gun rooms** are arranged in echelon, with embrasures and loopholes covering the upper section of the ditch. The extremely steep downward slope of the ditch - well illustrated on Fig 29 – throws some doubt on whether or not the carronades and muskets in the gun rooms could be sufficiently depressed to cover the entire ditch; perhaps they were concerned with the ditch only as far as the bridge.

The gun rooms are intact but inaccessible. Each had a central carronade embrasure with a musket loophole to each side, all with sandstone sills and lintels and the usual brick-built anti-ricochet steps. The most noticeable features are the large circular smoke vents - one per room - located immediately above the carronade embrasures: these remain visible but blocked. Such vents are not found in gun rooms anywhere else on the Western Heights. The plan of 1876 shows that, like their contemporaries in the Drop Redoubt, these gun rooms have brick-built semicircular-vaulted casemates with timber suspended-floors. Fireplaces were located in the party walls and are shown on a plan of 1881 and on a photograph of 1959, clearly rising in these walls. An expense magazine was located to the rear and accessed through lobby entrances off the rear walls of nos 2 and 3 gun rooms (PRO: WO/78/2426/2; NMR: A.5513/6).

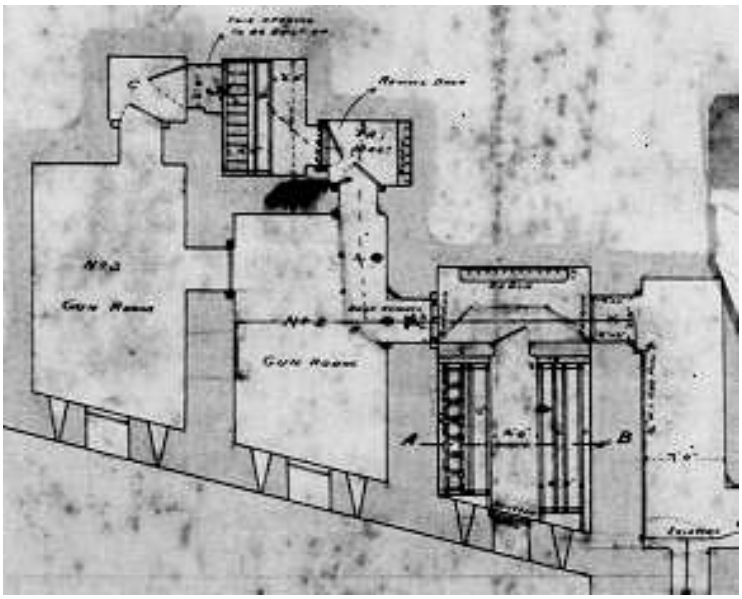

Figure 37
An extract from the 1876 plan, showing the proposed conversion of the the gun rooms into a magazine for St Martin's Battery
(NMR: WD/2658)

The **musketry gallery** conformed to the conventional Western Heights plan of small vaulted casemates linked to one another by short passages. Each casemate had two stepped brick-built embrasures and a ceramic ventilation pipe set high in the vault, examples of both remain visible in the revetment wall. On the 1876 plan, the two casemates are labelled as '**Ablutions**' and '**Latrines**'. At this date, so soon after completion when the Western Heights was still designated as a fortress, this is likely to be the original peacetime function. As such, it is the only example of a defensible latrine found on the Heights (NMR: WD/2358).

St Martin's Battery main magazine (Fig 31)

Between 1876 and 1878, plans were made to create a magazine in the South Entrance complex to serve St Martin's Battery - a new battery of coast artillery situated on the other side of Centre Road. Alterations to the 1876 plan show the proposed conversion of no 1 gun room into a magazine for 180 barrels of powder (Fig 37). Two-thirds of the room were to be partitioned off with access through a single central door; inside, racks for the barrels were to be inserted along the side walls and the embrasures in the end wall were to

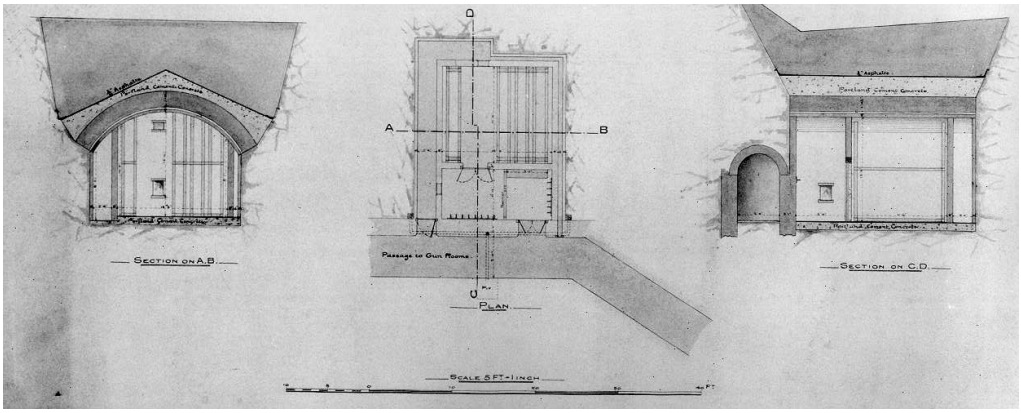

Figure 38
A plan dated 1878, of the new magazine for St Martin's Battery
(NMR: WD/2360)

be blocked. The remaining third of the room was to be a shifting lobby with new barriers across both old entrances. Under the same proposals, the old expense magazine was to be converted for storage of 264 zinc cylinders (which contained made-up cartridges). The lobby for no 3 gun room was to be converted into a small magazine to serve the remaining carronades in nos 2 and 3 gun rooms.

However, a short, undated note attached to the plan *reads "the proposed alterations shown in yellow on this plan were not carried out, a new magazine having been constructed off passage".* A plan of 1878 shows the new magazine in detail and provides a completion date of 31/12/1877 (Fig 38). It had a simple rectangular plan, with double doors leading from the passage into a shifting lobby. Double doors opened from the lobby into the magazine, which had a wooden floor and racking. A second door in the passage gave onto a lamp passage running along one side and halfway around the rear wall of the magazine, with lamp recesses giving light into the shifting lobby and the rear wall of the magazine. The lamp passage also served to ventilate half of the magazine through a vent in the rear wall, the remainder ventilated by a conventional cavity.

4. SURVEY AND RESEARCH METHODS

The archaeological survey of the North Entrance was carried out by Moraig Brown, Paul Pattison, Duncan Garrow and Anwen Cooper. Control points and some hard detail were supplied using a Wild TC1610 Electronic Theodolite with integral EDM. Data was captured on a Wild GRM 10 Rec Module and plotted via computer using Key Terra-Firma software on a Designjet 750C+ plotter. Archaeological detail was supplied at 1:1000 scale using conventional graphical methods.

The architectural survey of the North Entrance was carried out by Andrew Williams, Moraig Brown and Adam Menuge, using conventional graphical methods.

Site photography was carried out by Steve Cole and Alun Bull.

The report was researched and written by Andrew Williams and Moraig Brown and edited by Paul Pattison. The drawings were prepared by Moraig Brown and Andrew Williams, using MicroStation, AutoCAD and CorelDraw software, and the report was assembled by Moraig Brown using CorelVentura software.

The site archive (NMR numbers TR 34 SW 502 & 503) and a copy of this report have been deposited in the National Monuments Record, the archive of the RCHME (now part of English Heritage), at the National Monuments Record Centre, Great Western Village, Kemble Drive, Swindon, Wiltshire SN2 2GZ, to where all enquiries should be directed.

5. ACKNOWLEDGEMENTS

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WO/78/2426/2 *South Front Barracks: Index to the Single Line Appropriation Plans*, dated 1897

WO/78/5101/6 *Dover Defences Master Plan Location of electric light emplacements*, dated 1912

B) National Monuments Record

Historic Maps & Plans

WD/unref(erenced) *Dover Western Heights Citadel Barracks and Western Outworks Ground Floor Plan*, dated 1st November 1929, with alterations to 30th July 1947

WD/2300 *Dover Western Heights Plan shewing occupation*, dated 1893

WD/2305 *Dover Western Heights North Entrance Guard Room Etc*, dated 1860

WD/2306 *Dover Defences North Centre Bastion Guard Room, sketch showing proposed hot air closet*, dated 1861

WD/2308 *North Centre Bastion, Western Heights Dover Plans & sections of portion of bridge at entrance to tunnel, showing proposed counterpoise weights and additional tooth gear for lifting bridge*, dated 1863

WD/2314 *Dover Western Heights Proposed new bridges at North Entrance*, dated 1887

WD/2315 *Dover Western Heights Plan shewing proposed new bridges at North Entrance*, dated 1887

WD/2316 *Western Heights South Entrance Drawbridge*, dated 1876

WD/2358 *Dover District Plan showing proposed main magazine for St Martin's Battery in South Entrance casemates*, dated 1876

WD/2360 *Dover St Martin's Battery South Entrance gun rooms, plan and section of main magazine*, dated 1878

WD/2374 *Dover South Front Barracks & Hospital plan, showing occupation*, dated 1895

WD/2396 *Dover Archcliff Yard Plan Shewing Occupation*. Dated *c*1893, based upon an OS sheet surveyed 1858, revised 1871 and 1881

WD/2451 *Dover Western Heights Grand Shaft Barracks Record Plan of Warrant Officers Quarters No 3*, dated 1900

Historic photographs

A.5513/5 Western Heights Bridge and Gateway, South Entrance, dated 10/11/1959

A.5513/6 Western Heights NW end of ditch, SW of St Martin's Battery, dated 10/11/1959

Aerial Photographs

106G/UK/442/4102 (30/04/1946)

106G/UK/610/Part IV/6361-3 (05/08/1945)

106G/UK/801/Part III/6177-8 (13/09/1945)

MAL/66080/104 (05/12/1966)

MAL/67039/126 (11/05/1367)

MAL/68056/124 (20/08/1968)

C) Dover Museum

D00006 A watercolour of the Western Heights in 1826, drawn by JMW Turner

D00823 Detail from a watercolour of the Western Heights in 1826, drawn by JMW Turner, engraved by G Cooke and published by J & A Arch, London

D07871 Photograph of the North Entrance in 1958 by John Peverley

D07902 Photograph of the view along the *tenaille* in 1958 by John Peverley

7. PHOTOGRAPHS TAKEN DURING THE SURVEY

All of the following are B&W negatives, unless stated otherwise:

North Entrance

AA00/8661 Exterior. North Entrance gun rooms from the inner ditch (the south-west)

AA00/9815 Exterior. View from south in North Military Road showing entrance to guard house (left) and road tunnel (right)

AA00/9816 Exterior. View from south in North Military Road showing entrance to guard house (left) and road tunnel (right)

AA00/9817 Exterior. View from south showing entrance to guard room and road tunnel with sensor to former traffic light system, front left

AA00/9818 Exterior. View from south showing entrances to road tunnel, guard room, latrine (left) and water tanks (right)

AA00/9819 Exterior. West retaining wall and steps leading to site of Royal Engineers offices, viewed from northeast

AA00/9820 Exterior. Steps leading to site of Royal Engineers offices, railing, detail

AA00/9821 Exterior. View from south on steps leading to site of Royal Engineers offices, showing entrances to guard room and road tunnel

AA00/9822 Exterior. Brickwork over entrance to guard room and road tunnel, detail

AA00/9823 Exterior. Brickwork to entrance to guard room and road tunnel, detail

AA00/9824 Exterior. View showing remains of outer bridge and tenaille beyond, from north

AA00/9825 Exterior. View from south showing revetments to road on tenaille

AA00/9826 Exterior. Exterior. Tenaille, view showing pedestrain access gate with spear finials

AA00/9827 Interior. Road tunnel, lightwell in roof, view looking up

AA00/9828 Interior. Road tunnel, view from northwest showing lightwell in foreground and entrance to stepped passage to gun rooms (left)

AA00/9829 Interior. Road tunnel, entrance to stepped passage leading from tunnel to gun rooms and gallery

AA00/9830 Interior. Stepped passage leading from gun rooms and gallery up to tunnel

AA00/9831 Interior. Gun room no 1, view from east showing loopholes and carronade embrasures

AA00/9832 Interior. Gun room, ceiling showing vents

AA00/9833 Interior. Gun room no 1, entrance to magazine

AA00/9834 Interior. Gun room no 1, magazine

AA00/9835 Interior. Gallery, view showing recent blocking at far end

AA00/9836 Interior. Gallery, detail showing gun embrasures

AA00/9837 Interior. Doorway to water tank showing remains of pulley to former device for measurement of stored water

AA00/9838 Exterior. View from north on top of tenaille, showing inner bridge and raised span bridge leading to road tunnel

AA00/9839 Exterior. View from ditch showing remains of inner bridge and raised span bridge leading to road tunnel

AA00/9840 Interior. Blocked road tunnel, doorway to postern gate and remains of road bed joists in foreground, view from north

AA00/9841 Interior. Raised span bridge, inner bridge beyond and blocked doorway to former winch room, view from southeast

AA00/9842 Interior. Blocked doorway to original winch room and retracted sliding door in west wall

AA00/9843 Interior. Retracted sliding door in east wall and pulley ring

AA00/9844 Interior. Doorway to postern gate in west wall by span bridge, view from east

AA00/9845 Interior. Blocked postern gate leading to ditch, view from south

AA00/9846 Interior. Counterweights to span bridge (bridge closed), view from counterweight recess

AA00/9847 Interior. Span bridge counterweight recess; view showing winch

AA00/9848 Interior. Span bridge counterweight recess, view showing spiral stair connecting conterweight recess to former winch room

South Entrance

AA00/8669 Exterior. South Entrance Ditch; circular brick surround to ventilator for No 3 gun room, view from the south-east

AA00/8670 Exterior. South Entrance Ditch; circular brick surrounds to ventilatosr for gun rooms, view from the south-east

AA00/8671 Exterior. South Entrance Ditch; circular brick surrounds to ventilators for gun rooms, view from the south-east

AA00/8593 Exterior. South Entrance Ditch; circular brick surround to ventilator for No 3 gun room, view from the south-east (Colour)

AA00/8593 Exterior. South Entrance Ditch; circular brick surrounds to ventilators for gun rooms, view from the south-east (Colour)

AA00/8595 Exterior. South Entrance Ditch; circular brick surrounds to ventilators for gun rooms, view from the south-east (Colour)

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The National Monuments Record contains all the information in this report - and more: original photographs, plans old and new, the results of all English Heritage and RCHME field surveys, indexes of archaeological sites and historical buildings, and complete coverage of England in air photographs.

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ENGLISH HERITAGE

The Royal Commission on the Historical Monuments of England (now part of English Heritage) gathers information on England's heritage and provides it through the National Monuments Record

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