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THE SOUTHWEST FRONT: HALIFAX CITADEL
A STRUCTURAL AND NARRATIVE HISTORY

by

CAMERON W. PULSIFER

(1978)

PARKS CANADA
DEPARTMENT OF INDIAN
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Abstract

The first one hundred and eleven feet in from the salient angle of the excarp of the left face southern front was built by William Flinn in 1829. The remainder stretching to the sallyport and beyond was built by William Metzler in 1830. Structural weaknesses resulted in the first 63 feet of Flinn's work being torn down in 1833 by Captain Loyalty Peake , and rebuilt with thicker dimensions by Lieutenant Colonel Rice Jones in 1834. The remaining 48 feet of Flinn's work was either left standing or rebuilt at the old dimensions. The portion built by Metzler, though not free of problems, has remained standing to the present day.

Casemates 51 and 52 were constructed in 1829-30. Throughout their history they have been plagued by dampness problems. The middle years of the nineteenth century witnessed a number of attempts to solve these. In the end, as far as documentation shows, they had a system of downpipes installed, and were covered with successive layers of rubble masonry, concrete, coarse shingles, asphalte, and asphalte brick. These casemates were originally designed as casemates of defence, but for a time at least in the 1850's they were used as barrack space. By 1891 they were designated as "Garrison Cells", and remained as such into the 1930's.

Casemates 5 and 6 were first provided for by Lieutenant Colonel Patrick Calder in an Estimate of 1842. The expenditure was authorized in 1846-47, and they were built, probably, in 1847-48. For purposes of water-proofing these two casemates were flagged and hipped, and they were amongst the first in the Citadel to have internal downpipes installed to carry off excess water from the valleys of the dos d'anes. Although originally designed as Quarter Master and Royal Engineer Stores respectively, casemates 5 and 6 have been used for a variety of purposes throughout their history.

The south sallyport was built in 1831, except for a small portion at the parade square end. It was completed presumably when the retaining wall was built in the 1840's. For a time in the 1830's it looked as if a caponnier might be connected up with the ditch exit of this sallyport, but in the end it was deemed prohibitively expensive and none was built.

The expense magazines used in the Citadel before the present ones were built were probably moveable ones. The existing permanent structures were provided for in the 1861-62 and 1862-63 Fortifications Estimates for Nova Scotia, New Brunswick, and probably were built in 1863-64 and 1864-65.

The fourth Citadel's flagstave was in place on the southwest front at least as early as the 1840's. It remained in place here throughout the remainder of the nineteenth century. It was dismantled sometime between 1900 and 1923.

The original chimnies serving casemates 51 and 52 were set back about 10 feet from the face of the escarp above the pier walls. Sometime, probably in the late 1860's, they were moved back 10 feet to their present positions.

There was only one chimney serving casemates 5 and 6 located above their party wall. There is no evidence that it was ever moved. Originally, however, it was as high as those now rising above casemates 51 and 52.

Preface

The following report examines the structural features of the southwest front as designed by Colonel Gustavus Nicolls in 1825, and as built under his direction in 1829-31. It also chronicles, in so far as documentation allows, the alterations and additions which were made to it in the years which followed. It is intended to serve as a reference source for the historical restoration of this portion of the Citadel, which is slated to be undertaken over the next couple of years.

The documentation covering specific structural features of this portion of the fort is frequently inconclusive or missing altogether. Therefore, many conclusions in the following report are based upon extrapolation from what is known of other structures within the fortress, upon deduction, and upon simple guesswork. This accounts for the numerous "presumablies", "perhapses", and "possibilies" scattered throughout the narrative. Where specific documentation exists it has frequently been quoted from at some length, despite the often fractured English. The original wording has been retained since it conveys the essential flavour of nineteenth century Royal Engineering reports, and also because in many cases, any attempt at transposing it into good English would risk altering the meaning.

I am indebted to the staff of the Engineering section and to my colleagues in the Historical Research section for their patience and help during the writing of this report. I would especially like to thank Greg Corkum for his advise and excellent drawings, and, as a complete newcomer to the field of structural history, Jospeh Greenough and Richard Young for clarifying some of the more obscure points of structural detail. The errors which remain, of course, are all my own.

The Escarp: Left Face, Southern Front

In July 1828, the Master General of the Ordnance approved a scheme, proposed in December 1825, by the C.R.E. in Nova Scotia, Colonel Gustavus Nicolls, for the construction in masonry of a fort on Citadel Hill, Halifax. In his memorandum on the subject, the Master General was explicit that for the year 1828 Nicolls "had better limit himself to the preparing of materials, but to proceed in that with all dispatch, and if he considers he has sufficient in the Spring of 1829 he may begin to work."[1] Eager perhaps to be on with a work which had hung fire for the previous three years, Nicolls may have exceeded his instructions somewhat. During the summer and early autumn of 1828 he had his men excavate the ditches of those portions of the fort, - ie. the west ravelin, the northwest and the southwest demi-bastions, - where work was slated to begin during the 1829 building season.

In early November 1828, a contract was tendered for building in 1829, 800 feet of stone wall on the new fort. The foundations of this wall were to be three feet deep, and seven feet, eight inches thick, while the wall itself was to be 25 feet high, seven feet thick at the bottom, and four feet six inches at the top.[2] There were to be counterforts every 14 feet running the full height of the wall, four by five feet each. The three front feet of the wall were to be of "good sound iron building stone", the remainder, including the counterforts, "of good sound iron or blue building stone." Granite, to be provided by the government, was to be used for the corner quoin work.[3] On December 16 a contract for building 400 feet of this wall was signed by William Flinn.[4] To his lot fell the task of building the escarp of the southwest demi-bastion.

Between the 1st of May and the 31st of October, 1829 Flinn built a section of escarp which included that before the casemates of defence in the south portion of the west curtain wall, the flank and right face of the southwest demi-bastion, and a portion of the left face running in approximately 111 feet, nine inches from the salient.[5] Despite this progress, however, Flinn's relations with his employers had not gone smoothly. In June, for example,

Nicolls had been obliged to pull down a portion of the contractor's wall it having been built too high in proportion to its thickness.[6] Later, in September, Mr. Richard Creed, Clerk of the Works in Halifax, informed him that unless his work improved the CRE would be "necessitated to stop [his] proceeding with the wall and call upon the Commissariat to enforce the terms of the contract".[7] Finally in November, after the wall had bulged somewhat, Nicolls decided that a contract would not be accepted from Flinn for the 1830 building season.[8] Instead, his place for that year was taken by another local contractor, John Metzler.

Faulty construction techniques were not the only problem with the wall, however. Not mentioned at the time, but much discussed later, was the fact that Nicolls had recommended escarps of exceptionally thin profiles; much less, for example, than Vauban, had recommended.[9] Doubtlessly, this was done to keep expenditures down; but in the rapidly alternating cold and damp of the Halifax climate, it was to prove disastrous.

By the end of October 1830, Metzler had completed the escarp wall of the southern front, beginning where Flinn's work of 1829 had left off, and extending to the southeast salient angle. He also completed a portion of what at that time was proposed to be the left face of the southeast demi-bastion, but which in fact became incorporated into the left face of the southeast salient.[10] As has been mentioned the measurements proposed for the 1830 escarp were with one exception, the same as those proposed for that to be built in 1829.[11] Although documentation on the matter is inconclusive, however, the dimensions of the wall almost certainly are greater. Nicolls himself claimed, somewhat ambiguously, in a letter to the Inspector General of Fortifications of January 1831, that "4 inches was added to the thickness of the wall in the work done in 1830."[12] According to his successor as CRE in Nova Scotia, Lieutenant Colonel Richard Boteler, however, the wall was a full eight inches thicker than that built in 1829: ie., five feet two inches through the top, and seven feet eight inches through the bottom. The foundations, according to Boteler were three feet deep, by eight feet thick. Boteler also shows an interesting change in the counterforts. Instead of running the full height of the wall, as in 1829, they rise only 20 feet, to the same height as the batter.[13] The discrepancy between Nicolls' and Boteler's figures cannot be explained. Since Boteler's figures seem to

have been derived from measurements undertaken during an investigation of the Citadel construction project carried out soon after his arrival at the station, however, they are probably the most reliable guide to the actual dimensions of the wall. Only excavation will tell for sure.

By the end of the 1830 building season, then, the escarp of the southern front was complete, the first 111 feet in from the salient of the southwest demi-bastion having been built by Flinn in 1829, the rest by Metzler in 1830. By then, however, it was obvious, that there were serious problems with the section erected by Flinn, for it was bulging and winding in a number of places. The matter was brought to a head in December 1830, when sections of two walls on the west front collapsed. Nicolls reported the failures to London at the end of January 1831, and thereafter, busied himself with preparing plans for future escarps of increased dimensions. He submitted these to the Inspector General on May 2, 1831,[14] and made a start at rebuilding the breach in the northwest demi-bastion, before official authorization had arrived from London. Anxious, probably, to cut its losses and to avoid further calamities, the Fortifications Department rejected Nicolls' revised plans. Also, for the first time since the Citadel project began, it invoked the thicknesses recommended by Vauban as those required in the escarps of that fortification. In a letter of June 29 the Assistant Inspector General, Fanshawe, wrote that the Inspector General, Sir Alexander Bryce, desired him to say that: "he by no means feels confident with a climate such as that of Halifax that the revetments erected in 1830 are sufficient, and further that he cannot sanction the construction of revetments at Halifax of a less mean thickness than that used by Vauban, whose dimensions have now the advantage of long experience over any calculations that rest in some degree on theoretical data."[15]

The work which Nicolls ordered carried out in 1831 in fact exceeded the dimensions which he had submitted to London in May, and fully equalled those recommended by Vauban.[16] By then, however, it was too late, for in October of that year he was transferred out of the Halifax Command. The problems associated with the Citadel escarps then fell to his successor, Lieutenant Colonel Richard Boteler.

In a report to London of 14 February 1832, Boteler revealed that there were more problems at the Citadel than simply those associated with the escarps. Besides their poor condition, the west ravelin was near collapse, the magazine stood on a piece of ground ten feet above the interior area of the fort, and Nicolls' original design had made little provision for drainage. Also, there were problems to be ironed out regarding the number and location of Cavalier buildings, and the shape of the eastern front.[17] Though shocked by these revelations of the true state of the Citadel, the first concern of the Fortifications department was that the original estimate not be increased.[18] As 1832 wore on, however, Boteler increasingly became convinced that the fort could not be completed effectively without additional expense. Finally, in January, 1833, after an opportunity had presented itself, he set off for London to argue his case personally, but he was lost when his ship went down en route.[19]

Boteler's report of 14 February, 1832, included detailed elevations of the escarps of the northwest and southwest demi-bastions. Notes penned beneath the latter describe it as follows:

Right (or western) face

Section of escarp to the north of the breach (approximately 100 feet) - "cracked, bulging, and winding."

Section to the south of the breach (approximately 50 feet) - "winding, cracked and separated from coinstone."

Left (or southern) face

Section before casemates of defence - "Very considerable bulge and cracks increasing fast, will probably fall soon."

Area of casemates - "no alteration lately."[20]

The same conditions, though perhaps somewhat less severely, prevailed in the northwest demi-bastion. Obviously, something needed to be done. Boteler however, did not think the answer lay in immediate piecemeal or partial repairs, as had been begun by Nicolls to the breach in the northwest demi-bastion in 1831. Rather, he argued that either time should be allowed to ascertain how much of the work done up to then was reliable, "So that a legitimate repair of defined portions may be made, or that it

should be decided to take down the whole or the greater part of the main escarp wall built in 1829 (if that built in 1830, but not yet loaded should be considered sufficiently strong) - as well as the gorge of the West Ravelin ...".[21]

The Fortification department agreed with this assessment, and on March 28 Bryce wrote to the Master General that "as it is possible that the greater part if not the whole of those revetments must eventually be rebuilt, ... I therefore recommend that further time be allowed to ascertain how far they can be relied upon."[22] A note to Boteler of March 30, however, stated clearly that though the Inspector General was "by no means disposed to sanction the hazard of a diminished revetment" his object was. "if possible to save those erected in 1830 and 1831 ... which are still perfect, but which it might be hazardous to load with a solid rampart." Bryce suggested to Boteler that the pressure on the escarp might be relieved by "casemating transversely the ramparts between those already constructed for flank defence, on the North, South and West Fronts." Such a move also would leave "available the interior space which had been proposed for the site of the cavaliers."[23] Though the work of 1830 and 1831 was, for the most part, retained, this is the last that is heard of the transverse casemates. Instead, Boteler argued successfully in favor of a "substantial retaining wall."[24]

When Boteler left for England on his fatal voyage of January 1833, he carried with him a set of three revised plans and estimates for completing the Citadel, entailing a considerably increased cost. Included amongst these was an estimate for tearing down and rebuilding the escarps in the northwest and southwest demi-bastions, amounting to £ 9792 8s 2d. In the southwest demi-bastion the estimate provided for:

3690 perches of masonry taken down and removed	£ 276 15s 0d.
4810 cubic yards of earth excavated and removed	£ 200 8s 4d.
5846 perches of iron stone masonry in new escarps	£ 4140 18s 4d.
9525 supl. feet of workmanship front of wall	£ 793 15s 0d.
60 running feet of granite stone coping	£ 18 0s 0d.

320 - - do - do - (old) reset	£ 18 0s 0d.
250 supl. feet of cut granite in new coins	£ 30 0s 6d.
	£ 5448 1s 4d.[25]

The dimensions of the new wall were to be 10 feet through the base, and seven feet, six inches through the top. The foundation was still to be three feet deep, but 10 feet, two inches across. The counterforts were to run back seven feet, and were to run upwards from the base of the foundation to the full height of the wall - ie., 28 feet altogether - , where previously they had not extended below the wall into the foundations. The batter, as in the 1829 and 1830 escarps, measured two feet six inches for 20 feet.[26] These figures fully equalled those recommended by Vauban, and they were in fact the dimensions of the wall which was actually built.

Boteler also wished to substitute granite for the iron stone which had been used up to then in facing the walls.[27] Whether he also advocated that the new stone be laid in the ashlar manner, with its squared edges, horizontal courses, and vertical joints, is unclear, however. What is certain, is that most of the walls rebuilt, and all those newly built, thereafter were faced with granite. Also, they were <u>all</u> laid in the ashlar manner.

After the building season of 1831, work on the Citadel escarps had come to a halt, as a decision was awaited on the fate of those already built, and on the form of those remaining to be built. With one exception, work did not begin again until 1838, after a revised estimate for completing the Citadel had finally been approved in London. The exception was a portion of the flank, the whole of the right face, and a portion of the left face of the southwest demi-bastion, which was taken down and rebuilt in 1833 - 34. Where the authorization and the money for this work came from, the available documentation does not make clear. Nevertheless, the wall was pulled down in 1833 by Captain Peake, whom Boteler had left in command in Halifax upon his departure for England. Also, after tearing down the wall, Peake found the foundation to be in such poor shape, "the mortar not having set and many of the stones very small, and closely laid", that he deemed it necessary to take it up, and replace it completely. In doing so, he increased the dimensions from seven to ten feet across, as had been rec-

ommended By Boteler.[28] The wall which is now standing appears to have been rebuilt in the summer and fall of 1834 by Lieutenant Colonel Rice Jones, who had arrived to replace Boteler as CRE in Halifax the previous October.[29]

According to Lieutenant Henry Wentworth, who had worked closely with Boteler in the preparation of his estimate for completing the Citadel, the deceased CRE had believed it would be necessary to take down, and evidently rebuild according to the new dimensions, all the work done in 1829. This included, according to Wentworth, "111 feet of the left face from the salient angle and the whole of the right face and flanks 270 feet in length of the S.W. Bastion ...".[30] Such an amount of work would push expenditures higher than originally estimated but, observed Wentworth, "Boteler having been strictly cautioned against admitting any inferior work and being referred to Vauban's dimensions, estimated for doing things in the very best and most substantial manner."[31]

In fact, it appears the full 111 feet of 1829 escarp in the left face were not rebuilt according to the new dimensions, but rather only about 63 feet eastwards from the salient angle. The remaining 48 feet - ie. those in front of the casemates of defence - probably were left at the 1829 thicknesses.

The one responsible for this decision seems to have been Captain Peake. As Joseph Greenough suggests, Peake probably saw Boteler's death as a tremendous opportunity to prove his abilities to his superiors in London.[32] Knowing the value which they placed on economy, Peake, in June 1833, sent off four estimates which attempted to show how the Citadel could be completed at a cost within the original estimate.[33] Thus, he proposed that many of the expenditures recommended by Boteler either not be gone ahead with, or else be reduced. Peake's fourth estimate shows that one area where he proposed to make reductions was in the pulling down and rebuilding of defective escarps. His estimate for such work in the northwest and southwest demi-bastions was over £ 3000 less than Boteler's (£ 6624 as opposed to £ 9792).[34]

In a note written beside the detailed itimization in the estimate Peake explained:

> Opposite those parts of the escarp etc. which it appears necessary should be taken down and rebuilt a yellow line has been drawn on Plan No. 1. Upon careful inspection of the remainder and calculating on the arches of relief already existing or to be introduced for other

favourable circumstances more pulling down than herein provided for cannot be recommended merely because the walls have a bad appearance on the face.[35]

The mention of "arches of relief... to be introduced for other favourable circumstances" may possibly refer to the Inspector General's proposal of March 30, 1832, to casemate the ramparts in order to relieve pressure on the escarps (See above) - a proposal which in fact, was never acted upon. By the "arches of relief already existing" Peake probably meant the casemates of defence, before which, in the southwest demi-bastion at any rate, a portion of escarp at the 1829 thicknesses appears to have been left standing.

Peake's estimate for the work to be done in the southwest demi-bastion amounted to £4038 5s. 8d., a saving of £1400 compared with Boteler's (See above). It provided for 826 perches of masonry fewer to be taken down and removed than Boteler's, and for 1526 perches of masonry fewer in the new escarps.[36] Its details follow:

2864 perches of masonry taken down and removed	£143 4s 0d.
4500 cubic yards of earth excavated and removed	£187 10s 0d.
4320 perches of Iron Stone Masonry in new escarpe	£3060 10s 0d.
7125 supl. feet of workmanship in front of wall	£593 15s 0d.
60 running feet of free stone coping to complete	£18 0s.0d.
225 running feet of free stone coping (old) to reset	£5 12s.6d.
250 supl. feet of cut granite in coins	£30 4s. 2d.[37]

Unfortunately, the "Plan No. 1" mentioned above, showing those lengths of old escarp which Peake proposed to take down and those which he proposed to leave standing, is unavailable. However, with one small exception, Peake's estimate for the work to be done in the southwest demi-bastion was duplicated exactly by his successor, Lieutenant Colonel Rice Jones, who rebuilt the wall in 1834. (The exception was that Rice Jones provided for 20 perches of masonry less in the new escarps, at a saving of just under £15). The latter estimate provides the following information as to the lengths of wall pulled down and rebuilt in the southwest demi-bastion, viz.:

Right face S.W. Bastion	-	200 ft.
Left face " "	-	63 ft.
Flank " "	-	35 ft.[38]

Since this was the estimate approved by authorities in London, though some four years after it was originally proposed, and the work referred to above actually carried out, it probably serves as the most reliable guide to the length of wall actually rebuilt.[39]

Writing in December, 1835, Rice Jones commented on the recently rebuilt wall in the southwest demi-bastion:"... the right face is built entirely of rough hammered granite with chiseled edges on draft and laid in courses; the parts of the left face and flank that have been newly rebuilt are of well wrought iron stone tying in with the old work."[40] Though, built of ironstone, however, the rebuilt section of the left face marks a distinct contrast from the remainder of that face with its smaller, rougher hewn, stones. In the rebuilt section, the ironstones are about the same size as those of granite on the rebuilt right face, and they appear to have been laid in a fashion approximating the ashlar method that also had been used on the right face.

The dimensions of the new escarp were almost exactly the same as those which had been recommended by Lieutenant Colonel Boteler in January, 1833 (See above) - ie. ten feet through the bottom and seven feet six inches through the top. The counterforts ran back seven feet, and were five feet across next to the wall and three feet four inches at the tail. They may, however, have ended about a foot below the top of the wall, - the only detectable deviation from Boteler's proposed specifications. The foundations, put in by Peake in 1833, were three feet deep and 10 feet three inches thick.[41]

The first sixty-three feet or so of the left face, southern front, having been torn down and rebuilt then, there remains a problem with the remaining forty-eight feet or so of 1829 escarp. Peake's estimate No. 4 of June, 1833, contained a provision for "repairs to Casemates S.W. Bastion" amounting to £182 ie:

240 perches of masonry taken down and removed	£12 0s 0d.
240 perches of Iron Stone masonry	£170 0s 0d.[42]

This may refer to rebuilding the escarp in front of the casemates. It remains unclear whether the work was ever carried out, however. As has been observed, the face of this portion of escarp is still composed of smaller rough hewn ironstone masonry. It is unlikely that £170 would have been spent on new stone for the escarp when the old stone would have served as well. Also, the costs of all the other pulling down and rebuilding work that was done at this time appears in the estimates submitted to London by

Rice Jones in 1834 and 1836, but this is the last that is heard of this particular item. Whether, rebuilt or not, however, it appears from the available documentation that this portion of escarp remains at the 1829 dimensions.[43]

By the end of the 1834 building season, then, the escarp of the left face, southern front, as now standing, was complete. It consists of three separate portions: the first 63 feet or so running eastwards from the salient angle was built by Rice Jones in 1834, and is the thickest of all, being 10 feet through the bottom and seven feet six inches through the top; the next 48 feet or so was built by Flinn under contract from Nicolls in 1829 (though possibly rebuilt by Peake in 1833), and is the thinnest, being seven feet through the bottom, and four feet, six inches through the top; the remaining portion, stretching to the sallyport was built by Metzler in 1830, and is seven feet eight inches through the bottom, and five feet two inches through the top. Though the entire front is built of ironstone, the individual stones in the face of the first portion are quite large, are squared, and are laid in regular even courses; those on the faces of the remaining two portions are smaller, rougher hewn, and laid in a more irregular pattern.

For the next twenty years, the history of the left face southern front remained relatively uneventful. In 1856, however, there was a brief flurry of concern over the state of the Citadel escarps, especially those still standing which had been built by contract. As has been seen this definitely included the last half of the left face, southern front which had been built by Metzler in 1830, and very probably the 48 feet before that as well, built by Flinn in 1829. It will be remembered, that in 1832 the Fortifications Department concluded that the 1830 and 1831 escarps, though of inferior dimensions to those recommended by Vauban, should be left standing, but that "time should be allowed to ascertain how far they [could] be relied upon", (See above). Writing in 1843, Rice Jones confirmed that these portions of the escarp were "recommended to be left untouched, but to be carefully watched until towards the completion of the Citadel, when a better judgement might be formed as to how far [they] could be trusted."[44] The fate of the surviving contract escarps remaining to some extent uncertain, their upkeep, evidently, was neglected. According to a Committee which investigated the state of the Halifax defences in 1856 these walls, "which were originally in a very rough description, have never, from the doubt that has already attached to them,

been pointed and attended to, and water has penetrated both from the front and from the rear, which must ultimately destroy them ...".[45]

Lieutenant General Gaspard Le Marchant, the General Officer Commanding in Nova Scotia in 1856, who had inspired the aforementioned Committee, thought that " ...considering their object no work can be in much worse state than the walls of the West Curtain and a great part of the South Front...".[46] The Committee agreed that the walls were in poor shape - "the facing stones are in various instances unsuitable in dimensions for such walls. They are of a weak profile, being inferior to that which Vauban prescribes, and not in as satisfactory a state as the remaining escarp walls built by the Dept."[47] Nonetheless, the Committee thought they would be retained. The walls were perfectly covered from the foot of the glacis, only about three feet of the west front being visible from Windmill Hill, 666 yards distant. Hence, they could only be breached if an enemy reached the counterscarp, from which the difference in time required to breach a weak, as opposed to a solid wall, was only a matter of a few hours. Therefore, the Committee was of opinion that "with careful stopping and pointing which can be done at a trifling expense ... they are likely to stand for many years."[48]

The recommendation of the Committee was accepted and the walls left standing. The annual estimate for 1856 contained a sum for repointing the masonry, and thereafter the process seems to have been kept up on a regular basis. The Citadel never having been subject to a siege, however, it is impossible to say whether the decision to retain the contract escarps was a justified one.

These were not the final problems with the contract escarps on the southern front, however. A photograph dated September 1923, shows a pair of timber buttresses supporting a section of the wall on the left face, about ten to fifteen feet east of the casemates of defence.[49] These probably had been installed in 1920, at the same time that similar supports had been placed against the right and left faces of the southeast salient.[50] Perhaps this was done because a section of the wall had bulged at this point, and appeared in danger of collapse. Indeed, a slight bulge can still be discerned in approximately this position. These buttresses were still in place in 1950.[51] By 1955, however, they were gone.[52]

The left face, southern front was described in 1936 as "in poor condition badly cracked", and as a section of the escarp upon which it was

"considered necessary to carry out work to prevent collapse."[53] Evidently, little or no work was carried out at this time, however, and the timber buttresses remained in place. In 1951, however, when the Citadel was being converted from a somewhat run down defence installation to a restored national historic park, provision was made for the following work to be done during the ensuing year: "Continuation of restoration of outer and inner walls of the Citadel. This work will be more in the line of pointing up various sections of the walls to prevent deterioration through seepage, also to correct any bulges which are appearing in the masonry of the walls which have not yet collapsed."[54] Probably at this time the wall was thoroughly repointed. Because it is in such reasonably good condition today, more extensive work may have been done at that time, but there is no documentation to support this contention. Whether the whole southern front was done, or just the portions built in 1830, is unclear.

At any rate, the external appearance of the left face in 1977 can be described thus: the first 63 feet or so eastwards from the salient angle of the southwest bastion, consisting of large ironstones, with squared edges, laid in horizontal courses, is in fair condition, with some stones having fallen out, and others protruding further than they should; the next 50 feet or so, in front of the casemates of defence and beyond, is in poor condition, with much cracking and some bulging; the next 50 to 60 feet are in fair condition with some winding and cracking; the remainder of the wall, stretching to the sallyport, and indeed beyond to the southeast salient angle, although composed of the smaller, rougher hewn ironstones, appears to be in as good a shape as any wall in the fortification.

Structural Details and Analysis

Most of the information necessary here can be found in the body of the above report, or in the attached illustrations. Therefore, to avoid needless repetition, where applicable only the page of the report, or the figure number, on which the information can be found will be supplied here.

Superficial appearance -

See last paragraph, above.

Profiles

There are three profiles extant in the left face, southern front. (See figures 1 and 2). As far as the section rebuilt in 1834 is concerned, it should be noted that, as Richard Young points out, in a similarly rebuilt section in the flank portion of the southwest demi-bastion, the thicker profile was not carried through the full length of rebuilt escarp. Rather, a portion of the rebuilt wall, although in external appearance similar to the rest, in fact remains at the old dimensions.[55] Only excavation will tell if this is also the case with the rebuilt section of the southern face.

Counterforts - See figures 1 and 2.

The counterforts of the rebuilt section of the left face, southern front, run back seven feet, and are five feet wide next to the wall, and three feet four inches wide at the tail. They extend upwards from the bottom of the foundation to somewhere near the top of the wall. (See above). The 1849 plan shows two counterforts of these dimensions, about eight or more feet apart behind this section of escarp.[56]

The 1828 contract called for counterforts, four by five feet each, 25 feet high, spaced every fourteen feet. (See above). The 1849 plan shows there to be only one buttress left behind the portion of escarp which remains at the 1829 thicknesses. This is located three or four feet to the east of casemate 51,[57] presumably because it was part of the section that does not seem to have been rebuilt.

The 1829 contract called for buttresses of the same dimensions, and the same distances apart, as that of 1828. (See above). The 1849 plan shows there to be five such buttresses behind the section of escarp built according to this contract, by Metzler in 1830. The three farthest east abut against the pier walls, and the party walls of casemates five and six. The two easternmost actually protrude into the casemates.[58]

Foundations - See figures 1 and 2

Coping

Richard Young has shown that the 1829 contract for coping called for "... free stone ... 3 feet wide, and four inches thick ... no stone to be less

3 feet long ...". Noting that the coping on the northwest demi-bastion contained a groove chisled ten inches form the outside edge, and that it was sloped towards the front to facilitate drainage, he speculates that the original coping in the southwest demi-bastion was the same. A personal inspection of the full length of the right face, and the few yards of the left, which were uncovered in the fall of 1977, has shown that if the original coping here was grooved, none of it has survived. Rather, the front four or five inches of the coping on these portions of the wall are smoothly planed and sloped towards the ditch, while the rest, running back about two feet, nine inches, appears to be even, but slightly vermiculated.

The plans which accompanied Rice Jones's Estimates of 1834 and 1836 show only a single piece of coping, stretching back about two feet eight or nine inches from the edge of the wall. The profile of the southwest demi-bastion on the 1836 plan shows an interesting variation, however. It shows two adjoining pieces of coping covering the whole top of the wall, the back piece slightly overhanging the rear of the rubble portion of the wall.[59] An inspection of the uncovered portion of the right and left faces shows that this in fact is what was done, though it is nowhere reflected in any of the Estimates.

It may probably be assumed, that this type of coping extends along the full length of rebuilt escarp on the left face. The coping on the portions of escarp which follow may be like that from the northwest demi-bastion described by Richard Young (See above). Again, only excavation will tell for sure.

Endnotes

The Escarp: Left Face, Southern Front.

1. PANS, MG 12, R.E. 54, p. 15, Memorandum by the Master General of the Ordnance, 15 July, 1828..
2. The wall may be 6 inches thicker through the top, however. Nicolls' successor as C.R.E. in Nova Scotia, Lieutenant Colonel Richard Boteler showed the thickness through the top of the 1829 excarp as being 4 feet, 6 inches. Public Record Office, MPH 205, [SIN 651], "Plan of Fort George", Lt. Col. R. Boteler, 14 Feb. 1832. Also, the 1829 contract for the escarp to be built in 1830 followed the specification of the 1828 contract exactly, except for the thickness of the top of the wall, which was to be 4 feet, 6 inches.
3. PAC, MG 12, W.O. 55, Vol. 1558(7), f. 70, "Specifications for building a Stone Wall on Citadel Hill ...", 12 November, 1828, in "Committee on the State of the Citadel and Harbour Defences of Halifax, Nova Scotia", Appendix L, 5 May, 1856.
4. Ibid., Vol. 887, f. 711, "William Flinn's Contract for a Wall at Citadel Hill", 16 Dec., 1828.
5. PRO, MPH 205, [SIN 651], "Plan of Fort George, Halifax, N.S. ...", R. Boteler, 14 Feb., 1832;and "Fort George, Halifax, N.S." "Elevation of South West BAstion, No. 7", R. Boteler, 14 Feb., 1832.
6. PAC, MG 12, W.O. 44, Vol. 207, p. 250, Mr. Creed (Clerk of the Works) to W. Flinn, 26 June, 1829.
7. Ibid., p. 251, Mr. Creed to W. Flinn, 7 September, 1829.
8. PANS, MG 12, R.E. 54, pp. 66-67, Nicolls to Sir A. Bryce, Inspector General of Fortifications, 28 January, 1831.
9. John Muller, A Treatise Containing the Elementary Part of Fortifications, in J. J. Greenough, The Halifax Citadel, 1825-1860: A Structural and Narrative History, Manuscript Report Series No. 154 (Ottawa: Parks Canada, 1974), Vol. 1, p. 65.

10. PRO, MPH 205 SIN 651 "Plan of Fort George, Halifax, N.S. ...", Lt. Col. R. Boteler, 14 Feb., 1832.
11. PAC, MG 12, W.O. 55, 1558(7), ff. 71-72, "Specifications for building a Stone Wall on Citadel Hill, 1000 feet in length ..." 15 October, 1829 in "Committee on the state of the Citadel and Harbour Defences, Halifax," 5 May, 1856, Appendix M.
12. PANS, MG 12, R.E. 54, Nicolls to Sir Alexander Bryce, 28 January, 1831.
13. PRO, MPH 205, [SIN 651], "Fort George, Halifax, N.S., Plan No. 8: Escarps", R. Boteler, 14 Feb., 1832.
14. PAC, MG 12, W.O. 55, Vol. 868, fols. 486-491, Nicolls to Bryce, 2 May 1831.
15. PANS, MG 12, R.E. 54, pp. 26-27, Fanshaw to Nicolls, 29 June, 1831.
16. See Richard J. Young, The West Front: Halifax Citadel, Manuscript Report Series No. 206 (Ottawa: Parks Canada, 1977), p. 28.
17. PAC, MG 12, W.O. 55, Vol. 869, fols. 473-475, Boteler to Bryce, 14 Feb., 1832.
18. See, for example, Ibid. fols. 471-472, Bryce to Lt. Col. Cowper, 28 March, 1832.
19. See Greenough, Halifax Citadel, pp. 85-105.
20. PRO, MPH 205 SIN 651 "Fort George, Halifax, N.S., Elevation of Southwest Bastion, No. 7", R. Boteler to Bryce, 14 Feb., 1832.
21. PAC, MG 12, W.O. 55, Vol. 869, Boteler to Bryce, 14 Feb., 1832.
22. Ibid., Bryce to the Master General of the Ordnance, 28 March 1832.
23. PANS, MG 12, R.E. 54, pp. 35, 36, Fanshaw to Boteler, 30 March, 1832.
24. PAC, MG 12, W.O. 44, Vol. 227, f. 312, "Report on Lt. Colonel Boteler's Plan and Estimate for the completion of Fort George, which was sent to England on the Calypso Packet on the 29th January, 1833, "Lieut. H. Wentworth, 12 June, 1833.
25. Ibid., f. 334, Boteler's "Independent Estimate for the completion of Fort George, Halifax, Nova Scotia, No. 3, "Lieut. H. Wentworth, dated "the end of January, 1833".
26. Ibid., f. 334.
27. Ibid., f. 312, "Remarks on Lieut. Col. Boteler's Plan and Estimate for the completion of Fort George ...," Lieut. H. Wentworth, 12 June, 1833.
28. PANS, MG 12, R.E. 54, p. 86, "Halifax Citadel. Statement shewing the Expenditure from Commencement in 1828 to the 30th November, 1835," Lieut.

Col. Rice Jones, 16 Dec., 1835.

29. See PAC, MG 12, W.O. 44, Vol. 227, f. 101, "Copy of a Plan sent with Annual Estimates for work in 1832 - Halifax, Nova Scotia," G. Nicolls, 13 January, 1836. Insert: "Section of Escarp of S.W. Bastion built by Lieut. Col. Jones K.H. in 1834." Also, Ibid., f. 186, "Explanatory Statement upon Nicolls' Observations No. 2 dated Quebec, 13 January, 1836 upon the Project and Estimate for completing the Citadel at Halifax," Lieut. Col. Rice Jones, 30 April, 1836. Here, Rice Jones, arguing in favour of the use of granite ashlar on the right face of the southwest bastion, made the statement that the wall "after two serious winters is in every respect as perfect as when first finished". This would date the wall as having been built in 1834.
30. Ibid., f. 313, "Remarks on Lieut. Col. Boteler's Plan and Estimate for the completion of Fort George ...", Lieut. H. Wentworth, 12 June 1833.
31. Ibid., f. 313.
32. Greenough, Halifax Citadel, I, p. 106.
33. PAC, MG 12, W.O. 44, Vol. 227, Estimates Nos. 1, 2, 3, and 4", ... for the completion of Fort George at Halifax," fols. 339-399, Capt. L. Peake, 12 June, 1833.
34. Cf. Ibid., f. 334, "No. 3. Independent Estimate for the completion of Fort George ...", Lieut. H. Wentworth for Lieut. Col. Boteler, "dated end of January, 1833; and Ibid., f. 398, "No. 4. Estimate for the probable Expense of pulling down and rebuilding defective work at Fort George, Halifax," Capt. L. Peake, 12 June, 1833.
35. Ibid., f. 398.
36. According to the Oxford English Dictionary, Compact Edition, 1971, a perch was a measure of stonework 16½ feet long, and usually 1½ feet in breadth, and 1 foot in thickness.
37. PAC, MG 12, W.O. 44, Vol. 227, f. 398, "No. 4. Estimate for probable expense of pulling down and rebuilding defective work at Fort George... Southwest Bastion."
38. Ibid., f. 271, "Estimate for the completion of Halifax Citadel. Item 19. Pulling down and rebuilding defective work." Lieut. Col. Rice Jones, 15 March, 1834.
39. Rice Jones submitted to London two sets of Estimates for the completion of Fort George: that of 15 March, 1834, and another on

1 February, 1836. The provision for tearing down and rebuilding the defective escarps in the southwest demi-bastion are exactly the same in both. See PAC, MG 12, W.O. 55, Vol. 873, f. 710, "Revised Estimate for completing the Citadel, Halifax ...", Lieut. Col. Rice Jones, 1 Feb., 1836. This was the Estimate finally approved by the Lords of the Treasury in March, 1838. As has been seen, however, the old walls were actually tonn down and a new foundation put in, in 1833. The wall was rebuilt in 1834. Where the money for this came from it is impossible to say. It may, however, have been taken from surplusses from previous years' grants, then, since these costs were surplus to the original Estimate, the money recouped when Rice Jones' revised Estimates were approved in March, 1838.

40. PANS, MG 12, R.E. 54, p. 86, "Halifax Citadel. Statement shewing the expenditure from the commencement in 1828 to 30th November, 1835," Rice Jones, 16 December, 1835.

41. These specifications have been derived from the following sources: PAC, MG 12, W.O. 44, Vol. 227, f. 271, "Estimate for the completion of the Halifax Citadel. Item 19." Rice Jones, 15 March 1834. Ibid., f. 101, "Copy of Plan with Annual Estimates for Works for 1832 - Halifax, Nova Scotia", G. Nicolls, 13 January, 1836, Insert: Section of Escarp of S.W. Bastion built by Lt. Col. Rice Jones K.H. in 1834." PANS MG 12, R.E. 54, pp. 86-87, "Statement showing the Expenditure from the commencement in 1828 to 30th November, 1835", Rice Jones, 16 Dec., 1835.

42. PAC, MG 12, W.O. 44, Vol. 227, f. 398, "No. 4. Estimate for the probable expense of pulling down and rebuilding defective work at Fort George, ..." L. Peake, 12 June, 1833.

43. This contention is supported by the 1849 plan of the Citadel in PAC, MG 12, W.O. 55, Vol. 883, f. 791, "Citadel, Halifax, N.S. to accompany Returns shewing the proposed Appropriation," Lieut. Col. H. J. Savage, 9 January, 1849.

44. PANS, MG 12, R.E. 54, Rice Jones to the Inspector General of Fortifications, "... reporting upon certain Papers relative to the Works at the Citadel at Halifax," 1 March, 1843.

45. PAC, MG 12, W.O. 55, Vol. 1558(7), f. 52, "Proceedings fo the Committee ordered by Lord Panmure, Secretary for War, for the purpose of reporting on the Defences of the Harbour of Halifax, Nova Scotia", 5 May, 1856.

46. Ibid., f. 23.
47. Ibid., f. 22.
48. Ibid., f. 23.
49. Department of National Defence Photograph, PAC, C-8080, K. A. 9.17.
50. Brenda Dunn, "The Halifax Citadel, 1906-51: the Canadian Period." Manuscript on file, Halifax Defence Complex, Parks Canada, 1977, p. 131.
51. See, for example, Department of National Defence Photograph, PAC, Acc. No. 1970-170, Box 4683, HS-12464.
52. See Ibid., DND, C.F.B. Rockcliffe, PC-881.
53. IAND, HQ, HC 2, Vol. 12, Park No. 162256, J. R. La Fleche, Department of National Defence, to the Deputy Minister, Department of the Interior, 29 July, 1936.
54. Ibid., Vol. 3, Park No. 162257, 1951-53, J. Smart, Dept. of Resources and Development, to Mr. Childe, Superintendent of Historic Parks and Sites, 27 September, 1951.
55. Young, West Front: Halifax Citadel, p. 7.
56. PAC, MG 12, Vol. 883, f. 781, "Citadel, Halifax, N.S., to accompany returns shewing the Proposed Appropriation"; H. J. Savage, 9 January 1949.
57. Ibid., f. 781.
58. Ibid., f. 781.
59. PAC, MG 12, W.O. 44, Vol. 227, f. 101, "Section of Escarp of S.W. Bastion built by Lieut. Col. Jones, K. H. in 1834."

Casemates of Defence - Southwest Demi-Bastion (Nos. 51 and 52)

Casemates 51 and 52, as casemates of defence, were part of Colonel Nicolls' original design for the Citadel. In the General Estimate of 20 December, 1825, a sum of £10,804 was included to provide for "Sixteen casemates under the ramparts, ... & steps to descend to 3 of them."[1] Each of these casemates was to hold 6 men who, according to Nicolls, writing in 1835, in periods of emergency, "were to be ready on the spot in case of assault which such a small work without a covert way is at any moment subject to."[2]

There are many discrepancies in the various plans which Nicolls submitted with his Estimate. For example, one shows steps descending to three of the pairs of casemates in the four demi-bastions, while another shows them descending to all four.[3] Since, however, the estimate quoted above specifically mentions steps descending to only three pairs of casemates, it may safely be assumed that this was Nicolls' original intention. It may be noted as well that on both these plans the steps are shown as descending directly towards the rear of the casemates, instead of, as was in fact done in the two sets of steps which were actually built, at right angles to them.

Another area of confusion concerns the positioning of the casemates under the ramparts. Although, there are some discrepancies in the original plans, it seems that generally all the defence casemates, except those in the southwest and northwest demi-bastions, were at first intended to slant back under the ramparts so that they formed a straight line with the ditch of the ravelin which they were intended to flank. Those in the southwest and northwest demi-bastion, however, are shown consistently as slanted thus for only about three sevenths of their length, after which they angle slightly inwards, or eastwards, for the rest.[4] Presumably, this design was meant to obviate congestion next the rear of the adjacent face of the demi-bastion (i.e. in the southwest demi-bastion, the right face), which would have occurred had they been allowed to slant back without bending. In the end, only the casemates in the southwest and northwest demi-bastions were built according to the original plans. All the others were swung

around so that they sat square under the rampart with only their gun ports and loop-holes angled towards the ravelin ditch which they flanked. Unfortunately, nowhere in the Citadel correspondence for this period is the reason for this explained. (See figure **4**).

Documentation on the construction of the casemates of defence is very slight. An 1828 plan shows that those in the southwest demi-bastion were to be "included in the supplementary Estimate for 1829."[5] Probably, they were built to the springing of the arches in that year, and the arches carried the next, since this seems to have been the process followed with those built on the west front.[6] The steps and retaining wall area were probably completed by the end of the 1831, or early in the 1832, building season.[7] It should be noted however, that the steps remained of wood until 1857, or 1858, when the present granite ones were put in (See below). The rest of the masonry in this area (except round the doors and windows which is of granite) is of ironstone, which was the building stone in general use at the Citadel in 1831. It should be noted also, that an 1831 plan is the first that shows the steps, as they were actually built, descending at right angles to the rear of the casemates.

Nicolls' plans and estimates for the Citadel provided no detailed information as to the structural features of the casemates of defence. There is no information, for example, on the dimensions of the pier and party walls, or on the size of their foundations. As found drawings show their length to be about 35½ feet, while the thickness of the party wall is about three and a half feet.[8] The thickness of the pier walls is uncertain. It may, however, be about five feet, since this seems to be the thickness of those in the casemates of defence on the west front, which were built about the same time.[9] All of these walls are about six and a half feet from the flooring to the spring of the arches.[10] They are composed of rough hewn, but apparently coursed, ironstone. As for the foundations, it may be, as Richard Young speculates concerning those for the casemates on the west front, that they are about three and a half feet deep, since it is unlikely that they would be much deeper than the foundations for the 25 foot high escarp wall.[11] Excavation in casemates nine and ten has shown, as well, that they were about six inches wider than the walls they supported, so as to provide a sill for the floors.[12] The dimensions of the foundations for casemates 51 and 52, then, may be something approximating the following:

Casemate 51 (north wall) 35½ feet x 3½ feet x 5½ feet

Casemates 51 and 52 (party wall) 35½ feet x 3½ feet x 4 feet

Casemate 52 (south wall) 35½ feet x 3½ feet x 5½ feet

Not surprisingly, Nicolls' plans and estimates are similarly uninformative about the finishings of these casemates. An estimate drawn up by Peake in June 1833, however, included a provision - for "completing two casemates of defence on the North Front [i.e. casemates 21 and 23] in the same manner that other casemates have been finished."

It called for:

229 Perches of Brickwork in arch to ditto
19 Squares of tiling laid in cement
143 Square yards of brick on edge Paving
361 Supl. feet of cut granite to doors and windows
10 cubic feet of oak in door frames
39 Supl. feet of 3 inch oak plank frame in doors
58 Supl. feet of Sashes and frames glazed complete.[13]

Since these casemates are bigger and are shaped differently than casemates 51 and 52, the quantities of materials enumerated here can be ignored; but the individual items referred to doubtlessly provide further clues as to the structural attributes of casemates 51 and 52.

Another structural problem with these casemates concerns the connecting passage between them through the party wall. It is located about 16 feet in from the retaining wall of the casemates, is about three feet wide, and extends the full height of the wall.[14] None of the earlier plans indicates the existance of such a passage. Indeed, none are shown between any of the originally projected pairs of casemates.[15] But passage ways in fact had been built between casemates 9 and 10, and between 11 and 12, on the west front, (there were subsequently bricked in). It is unlikely, however, that the passage way between 51 and 52 was part of the original construction. An 1842 plan, for example, shows the party wall of casemates 57 and 58 unbroken by such a passage way.[16] Since these two casemates are more or less mirror images of casemates 51 and 52, and were designed and built in the same manner, it may be safe to assume that the party wall was intact between the latter set of casemates at this time as well. Another plan of the Citadel, however, dated January, 1849, shows passage ways to have been pushed through the party walls in both these sets of casemates.[17] Thus it can be safely assumed then that the passage way

between casemate 51 and 52 was built sometime between 1842 and 1849, by Lieutenant Colonel Calder. Why it was built remains unknown. Perhaps it had something to do with their being contemplated at this time as possible barrack space.[18] If this was the case however, why none were cut through the party walls of any of the other pairs of defence casemates which were under contemplation as possible barrack space, remains a puzzle. In building the passage way, an appropriate number of ironstones in the party wall seem to have been knocked out, and then the jambs formed of red brick set in mortar.

The prospect of using the Citadel casemates for barrack accommodation opened a complex and frustrating set of problems for the Engineering staff in Halifax, - i.e. rendering them free from leakage. As Joseph Greenough puts it in his report: "An empty casemate which leaked was one thing; a leaky barracks was something else again."[19] Of all the Citadel casemates, the number of which had increased considerably over the originally projected 16, the defence casemates in the southwest demi-bastion were two of the dampest.

The Commanding Royal Engineer upon whom the brunt of the problems fell was Lieutenant Colonel Henry John Savage, who had arrived in Halifax in July 1848. Accommodation difficulties had been exacerbated by a recent War Office decision to increase the amount of space per man in army barracks. This rendered necessary the utilization of additional space within the Citadel for the housing of troops.[20] Thus, in November 1848, Savage had two members of his staff, Major Burmester, and Mr. Hawken, the Clerk of the Works, undertake "a minute examination of every casemate in the Citadel, reporting the present state of each, whether the walls arches, etc. of any were sufficiently free from damp to receive Troops (when their fitments are completed); also the mode of their construction with respect to the mode adopted to prevent leakage, ..."[21]

Burmester and Hawken described casemates 51 and 52 in the Southwest demi-bastion as "very damp ...[and] unfit for troops."[22] The staunching method in use up to then for these casemates, was identified by Burmester and Hawken as "Tiles set in mortar and flagging laid dry."[23] It evidently had had little or no effect. They also noted that the escarp wall had leaned out from the end of the arches of these casemates "from three to four inches", while the

retaining wall had leaned out "perhaps half an inch to an inch", which was "another very serious cause ....which probably has led to the admission of water."[24]

Reporting on the Citadel casemates generally the two investigators also noted that they had "vallies between each arch formed into a gutter lined with cement and lead, the gutters are led through the interior retaining wall of the rampart, having gargoyles (or stone sprouts) projecting about 8 inches beyond the face of the wall."[25] There is such a sprout between the arches of casemates 51 and 52, but there is no evidence as to exactly when it was put in. None is shown on the early plans, and it may be, as Richard Young speculates in his report on the casemates in the west curtain, that, as these casemates were intended purely for defensive purposes, Nicolls did not concern himself with their drainage.[26] The gargoyle that is there may have been put in by Lieutenant Colonel Calder in 1846-47, at the same time that he installed a number of others between the arches of the casemates of defence in the west curtain.[27] There is no evidence to back this conclusion up, however, and it must rest as pure speculation. If the gargoyle was put in at this time, for some reason the gutter, which was supposed to carry the water along the valley between the arches to the gargoyle, was not built, as Savages's Special Estimate of April, 1849 makes clear.

Burmester and Hawken included casemates 51 and 52 amongst a group which they thought "... should be entirely uncovered and either flagged and counter-flagged and hipped, having stock pipes etc. [by which they meant pipes running down the exterior face of the retaining wall from a hopper head connected with the gargoyle],... or that the remedy pointed out by Colonel Halloway, R.E. to have succeeded at Fort Henry, Kingston, ... be adopted."[28] The staunching methods used at Fort Henry involved hipped dos d'anes, covered with asphalte, and a down pipe <u>inside</u> the casemate connecting with an underground drainage system. In fact, Burmester and Hawken argued against the application of these methods in their entirety at the Citadel. At Fort Henry, they pointed out, the water percolated through the whole length of the arches, whereas at the Citadel it came through only at the ends. This presumably required a different approach. Also, they thought that the building of down pipes inside the pier walls, as, presumably, had been done at Fort Henry, "Would be attended with a considerable expense, the piers being built of ironstone rubble masonry coursed...."[29] Through the two

investigators apparently preferred flagging and counterflagging as a means of covering the casemates, they did suggest that, should it be decided to adopt the methods used at Fort Henry at the Citadel, "data must be furnished from England or Montreal as to the price of the asphalte and the methods of applying it."[30]

On the basis of the above report Lieutenant Colonel Savage was impressed by by the fact that the six casemates in the Citadel which were flagged, hipped, and piped (Nos. 5, 6, 7, 8, 13, 14) were "in every respect dry as regards leakage", and those which were flagged and hipped (Nos. 57 and 58, 15 to 23, and 6A), were "found completely staunch". He therefore concluded, in a letter to the Inspector General of December 1848, that the most expedient solution to the Citadel leakage problems was to uncover "the whole of the casemates that leak and to flag, counterflag, & hip all those that are not so constructed ...".[31] As an added precaution, he also showed himself prepared to experiment with a system of internal down pipes. Instead, however, of cutting a hole for the pipe through the hard ironstones in the casemate walls, he suggested that it would be "... more advisable to avoid this great expenditure of labour, ... to jump a hole through the haunch of the brick arch and carry the pipe cased with 9" brick work down in the angle of each room, and building up the present gargoyle."[32] (See figure 5). The building up of the gargoyles was suggested, presumably, to prevent the water freezing round the tops of the down pipes in winter, as it had in the mouths of the gargoyles.

It is not clear, from the wording of his letter, how far Savage was prepared at this point to extend the system of internal down pipes. A plan which accompanied his letter to the Inspector General of December, however, shows that he was at least prepared to comtemplate three such pipes in casemates 51 and 52, all located in the north end of the casemates.[33] They were to be connected, evidently, with an underground drain, which led from under the steps area of the casemates out under the escarp of the left face of the southern front, presumably through a gargoyle located about 10 feet to the east of the casemates of defence.

Savage was reluctant to adopt the use of asphalte, as had been done at Fort Henry for covering the Citadel casemates. He considered that the

removal of the flagging and counterflagging, with which 48 of the Citadel casemates were covered, for the purpose of putting in asphalte, would be prohibitively expensive. Instead, he considered that the flagging and counterflagging together with hipped dos d'anes, and possibly, internal down pipes, would serve perfectly well for keeping the Citadel casemates dry. As will be seen, however, this was by no means the last that was heard of the use of asphalte for staunching the Citadel casemates.

On April 30, 1849, Savage completed his Special Estimate "for staunching casemates in the Citadel at Halifax ...." It, and a series of five drawings submitted along with it, show that by then Savage planned to flag, hip and pipe casemates 51 and 52.[34] Drawing No. 3 contains a section of casemate 52, showing its pier wall. It portrays a down pipe in place in its northern corner, immediately behind the retaining wall. It leads down underneath the flooring and exits through the foundation of the retaining wall. Thereupon, it connects with an underground drain. The gutter in the valley of the two arches, along which the water was supposed to flow towards the down pipe, is shown as sloping downwards from the southern to the northern end of the casemate, where the down pipe was located. The exit through the retaining wall, however, has an X drawn throuth it, indicating, presumably, that it was to be closed up.[35] The hipping, sloping down from the top of both ends of the dos d'ane to the gutter, can be seen drawn in, in dotted lines. On the subject of hipping, the Estimate provided for the ends of these casemates "to be constructed to the angles indicated by the dotted lines in the sections (drawing Nos. 3 & 4 [See figure 5]), of rubble masonry in mortar for receiving the flagging and counterflagging which together with the sides and edges ... to be of ironstone averaging from 4 to 6 inches thick jointed and bedded flush ½ cement and ½ mortar and jointed with cement as before described with dry flagging and counterflagging of a like description over the gutters...."[36]

The foregoing then, represents the staunching and drainage system envisioned by Savage for casemates 51 and 52 as of April 1849. Over the next number of years, however, a number of changes were made. These included the relocation of the down pipes from the end to the centre of the casemate walls, the abandonment of their proposed brick casings in favour of exposing them directly to the interior warmth of the casemate, and the adoption of

seyssel asphalte as a covering for the dos d'anes.

The precise details of the asphalting plan, especially as it relates specifically to casemates 51 and 52, is unknown. According to Lieutenant R. M. Parsons, R.E., writing in February 1854, between 1851 and 1854, 54 casemates had been uncovered and coated with "3/4 inch asphalte, fine quality, laid in two coats breaking joint, each coat being 3/8" thick, ..." Also, according to Parsons, since two of the first casemates so covered were found to leak, thereafter, asphalted brick was built upon the 3/4 inch coating "until a joint in the ashlar masonry was reached, when the upper stones being removed, a coat of asphalte ... was carried well into the thickness of the wall." Then, earth was loaded on ranging from three and one half, to six feet in depth to form the terreplein of the rampart.[37]

A plan which accompanied a missing report by the CRE, dated 12 June, 1854, provides some interesting details concerning the final asphalting plan adopted for the Citadel casemates. It shows that the valleys between the dos d'anes were filled with rubble masonry, and then it and the tops of the dos d'anes were in turn covered with successive layers of concrete, coarse shingle, more asphalte, and asphalte brick. The down pipes, instead of sloping through the haunch of the arches towards a hopper head located in the valley, rise vertically through the arch and connect with a hopper head set amidst the layer of concrete. The entire covering slopes downwards from all four sides towards a square hole in the middle, leading down, presumably, to the hopper head, and the down pipe.[38] (See figure 5)

It is impossible to say precisely to what extent, if any, the staunching system discussed above was applied to casemates 51 and 52. There appears to have been some variation throughout the fortress.[39] From external appearances, it certainly seems that the downpipes in casemates 51 and 52 rise vertically through the arch as they are described as doing in the staunching system discussed above. Also, if Savage's hipping and flagging system was adopted, it is impossible to say whether it was retained beneath the asphalte. Since upon uncovering this was found to be the case with casemates 9 and 10, however, it may be safe to assume that it holds true for numbers 51 and 52 as well.[40] In the end, however, only excavation will show the exact nature of the staunching system adopted for these casemates.

The origins of the underground drain to which the downpipes were connected is unknown. This drain runs under the alley-way behind the casemates of defence, and then slants outwards to the east of casemate 51, exiting, presumably, through a gargoyle located at the foot of the escarp about 10 feet to the east of this casemate. Casemates 57 and 58 in the northwest demi-bastion have a similar underground drain, exiting under the northern front, about 10 feet to the east of casemate 57. These two sets of casemates are the only ones in the Citadel with independent drainage systems exiting into the ditch. The first occasion upon which the underground drain of casemates 51 and 52 was mentioned was in December, 1848, when Savage completed his plan showing the location of proposed down pipes in the Citadel.[41] Since Savage's Estimate of April 1849, providing for the installation of the down pipes appears to presume the existence of such an underground drain, one can only assume - since it is unlikely that Savage himself could have built it during the winter of 1848-49 - that it was installed sometime before this. Since even someone as indifferent to drainage as Nicolls could hardly expect a huge cavity in the ramparts such as the steps area of casemates 51 and 52, not to fill up with water without some kind of drainage system, it seems most likely that he built the drain. Such a conclusion is pure supposition, however, and there is no documentary evidence to support it.

With the asphalting process completed it appears that for a time casemates 51 and 52 were dry. A report by Captain H. Grain, of the Royal Engineers, and T. Hanlon, the Clerk of Works, in November 1854, reported that there was "no appearance of dampness" in these two casemates. Indeed, by that time, recording to Grain and Hanlon, they were already occupied by two Privates of the Royal Sappers and Miners - Casemate 51 by Private Williams, a miner, and casemate 52, by Private Stevens, a bricklayer.[42] Also, for a time at least, it seems that their families shared the casemates with them.[43] Despite this, however, the requisite fitments for such occupation seem not to have been installed.[44]

The period of dryness for these casemates was quite short-lived. As early as January, 1855, Lieutenant Colonel Richard Stotherd, who had succeeded Savage as CRE in Halifax the previous June, reported to London, that "notwithstanding the hopes of my predecesor" that seyssel asphalte would render the

casemates secure from leakage, some of them had "recently become damp from the percolation of water through the arches." Stotherd then noted that "these defects will require early attention in the spring, otherwise the casemates may become too damp to habitate."[45] Whether casemates 51 and 52 were among those which began to leak at this time is unknown. If they were, however, the work Stotherd had recommended in order to remedy the leakage either was not carried out or was ineffective, for by late May or early June 1856, these casemates had become so damp that Privates Williams and Stevens and their families were evacuated.[46]

Yet another Report on the state of the Citadel casemates, of June 1856, described casemates 51 and 52 as "Very damp at down pipe and near escarp wall." These two casemates, the report elaborated, "have hitherto been dry and serviceable:- their present state, it is believed, arises from defective surface drainage, and perhaps partially from neglect of pointing the external escarp wall now in course of execution in cement under the present years annl. estimate ...." The author[s] of the report hoped the leakage might be cured by the aforementioned pointing, by improved external drainage, and by "laying the terreplein over these casemates in concrete 6 or 8 inches covered with pitch tar and sand."[47] The latter proposal does not seem to have been carried out.

Later in the same month Stotherd had some of the arches of the Citadel casemates uncovered, and observed that the asphalte coating appeared "quite perfect and satisfactory: no cracks are observable <u>on its surface.</u>"[48] But, at the same time he noted that a separation of about 3/16 of an inch had occurred between the arches and the retaining wall. This he attributed to the expansion of the mass of earth behind it when frozen. Stotherd thought this defect "difficult to rectify, as every successive opening disturbs the earth and leaves room for increased action every succeeding frost." He was therefore reluctant to open the ramparts over more arches than was "absolutely necessary." Rather, "the measures now taken I have every hope will be effective, ..." The latter probably involved, for the most part, a repointing of the masonry. In another paragraph, Stotherd clearly summarized the staunching problems faced by the Engineering staff in Halifax. "In this variable climate", he wrote, "... the smallest neglect is productive of very serious evils:- Winter thaws or rains are frequently and quickly

followed by very severe frosts - water percolates through the smallest fissures, which by expansion in freezing, disturbs the masonry leaving room for increased action at every successive frost."[49]

In a letter to the Inspector General of October 1857, Stotherd observed that: "The pointing which has been done to the masonry during the last two years under specific Items of the Annl. Estimates 1856-57 & 1857-58 has greatly improved the work both in outward appearance and general efficiency, by rendering the casemates perfectly dry."[50] Since detailed documentation on casemates 51 and 52 all but disappears after 1856, it is impossible to say whether this state of grace continued for them. Probably it did not. Indeed dampness, and, perhaps some leakage, remain a problem with these casemates to the present day. This may to some extent be due to faulty staunching. It is almost certainly attributable as well to a phenomenon discussed by Stotherd in his letter to the Inspector General of June 1856:- ie., that on occasions of "close warm weather, the moisture condenses within the casemates on their cold walls, and streams down their arches and sides:- Complaints are then made and boards assemble, but the evil is solely attributable to the above cause, and not to any defect of construction:- at such times the same effect is observable, more or less, in almost every house in town."[51]

Despite their empty state, measures went ahead between 1856 and 1858 for the replacement of the wooden Stairs leading down to casemates 51 and 52 with granite ones. The wooden stairs had been put in by Nicolls, and, at least according to plans submitted by Lieutenant Colonel Savage in 1849, appear to have descended to the casemates in two separate sections. A buttress rising part way up the retaining wall may have acted as a landing.[52] At the beginning of May 1856, Stotherd, under pressure to supply space at the Citadel for the accommodation of troops arriving from the Crimea, submitted an abstract to the War Department "of the cost of Services which will become necessary in carrying out the proposed arrangements." This included £79:8:3 for equipping the casemates with fitments such as shelves, Pin rails, and arm bands, and another £101:7:5 for "Building stone steps leading to the South demi-bastion, to replace wooden steps, considered in a dangerous state."[53] Stotherd, also ensured that the necessity of replacing the wooden steps with stone ones was touched upon in the report of the "Committee

on the Citadel and Harbour Defence of Halifax", which was completed about the same time.[54] By June 1856, in a letter to the Inspector General, he noted: "With respect to building the Stone Steps leading to the two gun rooms in the Southwest Demi-bastion, which will accommodate 26 men it was found on inspection that the old wooden steps were in so delapidated a state as to be unsafe - fortunately I had the granite ashlar and steps ready cut on the ground having been prepared by the Sappers during bad weather in the past winter". The cost, he again estimated at £ 101:7:5.[55] Despite the apparently advanced state of preparation, however, authorization for the construction of the steps did not come through until October, 1857.[56] They were probably built during the remainder of that Fall, or early in the building season of 1858.

Documentation on these casemates is so scarce for the years following 1856-57, that it is impossible to say whether thereafter they were ever utilized for barrack accommodation. The next specific reference to their use is not until 1891, when a number of ground plans of that year identify them as Garrison Cells. One plan shows a partition running down the middle of each casemate from the escarp wall, parallel to the pier and party walls, and ending approximately where the casemates begin to bend. These, presumably, formed two cells at the end of each casemate.[57] It is not known when, during the previous 35 years, the appropriation of these casemates was changed. The available documentation, especially "C" Series, contains a number of references to "Garrison Cells" in the Citadel in the 1860's, but it is impossible to say whether or not they meant casemates 51 and 52. It may be reasonable to conclude, however, that the partitions forming the cells were put in sometime after the 24-pounder cannon had been removed, which was probably done in the early 1880's.[58] Probably, the door of casemate 52 was blocked up with masonry to a height equal to the window ledges at the same time that these casemates were converted into cells. Entrance to this casemate was then obtained through the doorway of casemate 51 and hence through the passage way in the party wall. These casemates were still used as Garrison Cells in 1908 and 1922,[59] and the partitions were still in place in 1932.[60] By 1950, however, they were gone.[61]

In 1956-57 restoration work was carried out on the area wall behind these casemates, as well as on the stairway leading to them. A new iron

railing was fitted to the stairs, and iron bars put in the windows. Also, at this time a concrete floor was poured inside the casemates. The present brick parquet floor was put in in 1958-59.[62] When the cement parging was applied to the brick arch, and the walls stuccoed, is unknown.

Structural Details and Analysis:

Foundations

As described in the above report, the dimensions of the foundations are probably something approximating the following:

Casemate 51 (north wall) - 35½ feet by 3½ feet by 4 feet

Casemate 51 and 52 (party wall) - 35½ feet by 3½ feet by 4 feet

Casemate 52 (south wall) - 35½ feet by 3½ feet by 4 feet

Pier Walls

The pier walls measure about 35½ feet by 6½ feet by 5 feet.

Party Walls

The party wall measures about 35½ feet by 6½ feet by 3½ feet.

Casemate 51

East Wall - There are two openings in this wall: the fireplace in the centre of the wall, and the lamp recess near the escarp wall. They were both part of Nicolls' original design.

The fireplace is situated about 10 feet in from the back or retaining wall of the casemate. It measures four feet high by three feet wide. Its depth is one foot three inches. The fire box is capped by a gently sloping brick arch. This is probably the original fireplace built by Nicolls in 1829-31. The present granite hearth, however, may be of as recent a vintage as 1956-57 when a concrete floor was poured in these casemates. The original hearth was probably of granite. There is a small opening above the brick arch which extends back into the flue. This probably dates from the period when stoves were installed in these casemates.[63]

The lamp recess is situated about six feet back from the front, or escarp wall of the casemate. It represents an essential part of the casemate's original design as a casemate of defence. In this recess a lantern was kept from which a flame would be obtained to set off the casemate's cannon. Its dimensions are the same as those of similar recesses in the west curtain casemates of defence, as described by Richard Young.[64] The part of the recess opening into the casemate is one foot six inches wide, by one foot, three inches high, and extends into the wall four inches. There it narrows to a passage way which is one foot wide, and 9 inches deep. The recess then widens into a small chamber about three feet wide, and one foot three inches deep. It is here that the lamp was kept. Probably, access to the chamber was obtained through some sort of door which rested on the four inch sill at the front of the recess. The recess was so designed, presumably, to prevent flames escaping and touching off powder which, in times of siege, might be lying about the casemate.

The West Wall - There are no observable openings on this wall, except for the passage way discussed in the narrative section of this report. The iron door in this passage way with its vertical and horizontal bars, may be a remnant of the days when these casemates served as garrison cells. The door opens from the south where there is a lock hook, while the pintles protrude into the brickwork on the north side of the passage.

North Wall - There are three openings in this wall - two windows on either side of a doorway. Looking out from the interior, the windows measure about three feet in width for a depth of three inches; they then narrow to a width of two feet six inches for a depth of one foot six inches; and then to a width of two feet for a depth of about a foot and a half before opening into the area way. They are about three feet in height throughout. The three foot by six inch portion evidently formed a recess for some sort of shutter or screen. The iron pintles on which it hung are still in place - on the western jamb of the western window, and on the eastern jamb of the eastern. Since no plans of the Citadel show these recesses, it is impossible to tell whether or not they were part of the original construction. Since Calder's detailed plan of 1846 of casemate 57 and 58 does not show one, however, it may well be a later alteration. Probably the windows sat immediately behind the section

which measured two feet in width. (See figure 7).

Going outwards from the interior of the casemate, the doorway measures three feet four inches in width for a depth of six inches; then two feet six inches in width for a depth of one foot eleven inches; and then two feet two inches in width for a depth of nine inches before opening into the area way. It is eight feet nine inches high. As with the windows, the section measuring three feet four inches by six inches evidently formed a recess for a door. The iron pintles are still in place on the eastern jamb. Again it is impossible to tell whether or not it was part of the original construction. Calder's 1846 plan of casemates 57 and 58 does not show one however.

Since nearly nine feet is exceedingly high for a doorway, it is possible that the door was originally structured differently. The original door may have measured about six feet six inches in height, topped by a granite lintel measuring about one foot in thickness. Above this there may have been a window measuring one foot three inches in height. This is the design of the doorway on Calder's 1846 plan of casemates 57 and 58. If the structure of the upper window of casemate 51 was similar to that shown on Calder's plan, it measured about two feet in height on the inside of the casemate. The sill would have splayed upwards for a distance of about two feet into the wall. THe height of the opening at this point would have measured about one foot six inches. It was here that the window stood. Then the opening narrowed to a width of about one foot. The sill then splayed downwards for a distance of about one foot, with the opening on the face of the area wall measuring about one foot three inches in height. (See figure 7).

South Wall - There are three openings on this wall, all an integral part of the original defensive function of this casemate - ie. a large gun port, through which the cannon was to fire, and two musketry loop-holes. They all, of course, extend through the full thickness of the escarp, which at this point is about five feet, six inches. They all slant slightly eastwards, bringing them more in line with the ravelin ditch which they flanked.

The gun port is two feet two inches wide by two feet in height. The eastern jamb of this port runs straight out to the face of the escarp, while the eastern jamb slants, in steps, towards the east, making the opening on the face of the escarp measure four feet six inches in width. The granite steps on the eastern jamb were installed, presumably, to increase the number of ricoheting angles for enemy musket balls attempting to find their way into the casemate. The musketry loop-holes measure about a foot in width by about one foot seven inches in height. They narrow to a width of about four inches on the face of the escarp. By 1832 all of these openings were filled with sashed windows.

The iron ring bolts for the tackle of the casemate's cannon are still in place, though considerably rusted, beneath the gun port. Precisly when they were installed is not known. Perhaps this, along with their specific function, will be clarified by a more specialized study which is to follow.

Casemate 52

The structural attributes of this casemate, except for some minor discrepancies in measurement, are mostly the same as casemate 51. The major differences are noted below.

West Wall - The fireplace here is built quite differently than that in casemate 51. This fireplace like that in casemate 51 is situated about 10 feet in from the area wall, but is much smaller. The brickwork in it appears to be of much more recent vintage and there is no gently sloping brick arch over the fire box as in the fireplace in casemate 51. The hole in the wall above the fireplace probably has been used for some modern heating unit. Probably the original fireplace in this casemate was similar to that in casemate 51. When the alteration was made is not known.

North Wall - This was originally the same as that in casemate 51. The height of what was once the door seems to have been altered in the same fashion. However, sometime after this, presumably, the doorway was built up with granite masonry from the bottom to a height of two feet, two inches, so that it is on the same level as the two window ledges on either side. This was done, presumably, when the casemates were converted to garrison

cells. The bars in the windows, however, like those in casemate 51, were put in in 1956-57.

General

Flooring - Although Peak's estimate for the casemates of defence to be built on the northeast front called for brick or edge flooring (See above), that in casemate 51 and 52 may have been of wood. This is suggested by as found photographs of the interior of casemate 57 and 58 in the northwest demi-bastion, which were built at the same time as, and similarly to, those in the southwest demi-bastion. The former were closed up in the 1930's due to structural failures, probably when much of the original flooring system was still intact. Photographs taken in 1975 show a series of dwarf walls, built of rubble ironstone set in mortar, running crosswise in the casemate. Upon these joists were laid, upon which in turn floor boards were placed.[65]

The floor drain inside casemates 51 and 52 probably were put in during restoration works in 1951-52.

The Area Way

The Steps - The steps here were originally of wood. The surviving plans are inconsistent as to the number of these steps, but they all agree that they were about four feet wide and that they descended to the flooring of the area way in two separate stages. They were separated by a landing of about five feet in length. It is tempting to speculate that this landing was in fact an interior buttress of the area wall, similar to that shown on Calder's plan of the area wall which he planned to rebuild for the casemates of defence in the northwest demi-bastion in 1846. If it was an interior buttress, and if it was similar to that on Calder's plan, it rose about ten feet above the area way's flooring. This buttress may have since been removed, or it may be covered by the present granite staircase.

By 1856 these steps had become rotted and dangerous, and in 1857 or 1858, they were replaced by granite ones. Again the plans are inconsistent as to the number of steps in the new stairway. They all agree, however, that this time they ran straight down to the flooring of the area way and were not interrupted by a landing or buttress. According to Brenda Dunn, in 1950 these steps needed to be replaced and the area wall demolished and reconstructed.[66] In 1956-57 a new iron railing was installed, and in the process the configuration of the bottom three steps was altered to conform to its shape.[67] The bottom three steps on the original staircase jutted out into the area way at a straight angle instead of curving as they do now.

The Area Wall - There are no surviving sections of the area wall which surrounds the area way outside casemates 51 and 52. However, plans submitted by Calder in 1843 for rebuilding the area wall of the casemates of defence in the northwest demi-bastion may offer some clues as to the structure of that in the southwest demi-bastion. Calder's plan shows a retaining wall approximately 20 feet in height and three feet in thickness from the top to the bottom. The foundation is marginally thicker and three feet deep. There are two buttresses on the external side of the southern face of this wall, approximately 16 feet apart, 14 feet high and three feet wide. There is one interior buttress protruding into the area way. It is 10 feet high, four feet thick, and approximately six feet in width.[69] (See figure 7). Allowing for some variation in measurement, perhaps the structure of the area wall in the southwest demi-bastion is similar.

The eastern portion of this area wall runs straight out from the eastern corner of the casemate retaining wall for a distance of about 14½ feet. The wall then turns westward at a ninety degree angle for a distance of about 39½ feet. Then it turns slightly southwards at an angle of 142 degrees for a distance of about ten feet three inches. Then it runs directly southwards for a distance of eight feet before joining the western end of the casemate retaining wall.

The portion of the area wall which extends above the rampart does not conform to this pattern in its entirety, however. The western portion instead of running straight back eight feet to join the end of the casemate retaining wall, as does the area wall below, instead angles sharply southeastwards a further 42 degrees and runs back 11 feet four inches before joining the casemate retaining wall. The intervening space between this wall and the southwest corner of the area way has been filled in by an arch, with earth piled on top of that. This means that looking downwards at this area wall, its west end appears pointed. (See figure 8).

All pre-1891 plans of the Citadel, however, do not show the western end of this wall as pointed. Rather, the western portion of the wall is shown as running back straight to join the western end of the casemate retaining wall. The first plans to show the end of this wall as pointed, with the western wall angling southeastwards, is dated 1891.[70] The plans are inconsistent, however, and one dated as late as 1922 shows the top of the area wall as shaped in the old manner.[71] Copyists, evidently were none too meticulous on this point. The fact that some 1891 plans show the western end of the area wall as pointed, however, probably indicates that this alteration had been carried out sometime before then, though precisely when or why is unknown. One possibility, however, is that it was occassioned by the construction of the new Armstrong gun emplacement just to the east of the southwest salient in the late 1860's. (See above, Ramparts III: Chimnies) If the top of the area wall had been left at its old shape, there would have been precious little room to work the new gun. This is only a theory, however, and may, or may not, be correct. If it is correct, however, a probable corollary is that the arch which rises above the southwest corner of the area way is also a product of this alteration.

Coping - The present coping round the top of the area wall is of formed concrete, put in during restoration work in 1956-57. That which it replaced was of granite. The dimensions of the original granite coping are unknown but they may have been the same as that round the area wall of the casemates in the northwest demi-bastion, which, according to Calder, was 6 inch "chisled granite 2' 8" wide throated both projections."[72]

Drain - There seems always to have been a catchment basin in the flooring of the area way leading to the underground drain which exited under the escarp to the East of casemate 51. All the earlier plans of the Citadel show it as situated hard up against the footing of the Eastern portion of the area wall. The first plans which show it in its present position, about three feet out from this wall, are dated 1891.[73] (See figure 8).

Endnotes:

Casemates of Defence - Southwest Demi-bastion

1. PAC, MG 12, W.O. 44, Vol. 227, p. 103, "General Estimate of the expense of reconstructing in Masonry altering and adding to Fort George on Citadel Hill ... Halifax, Nova Scotia ...", 20 December 1825.
2. PANS MG 12, R.E. 54, p. 97, Nicolls to the Inspector General of Fortifications, 2 September, 1825.
3. Cf. P.R.O. S/N 649 MR947, Sheets 16-17, "Fort George, Citadel Hill...",G. Nicolls, 20 Dec. 1825.
4. Ibid., sheets 16-17.
5. PAC, MG 12, W.O. 55, Vol. 865, f. 580.
6. Young, West Front: Halifax Citadel , p. 86.
7. See PAC, MG 12, W.O. 55, Vol. 872, p. 330, "Plan of Fort George, Citadel Hill showing the works in progress, approved, and those estimated for the year 1832", G. Nicolls, 3 Sept. 1831. Although this plan is faded, it seems to show the steps and retaining wall areas of the casemates of defence in the southwest and northwest demi-bastions as included amongst work that was "in progress and expected to be finished this season".
8. As found drawings, Set C, Casemate 51 and 52, Project Office, Halifax Defence Complex.
9. Young, West Front - Halifax Citadel , p. 89.
10. As found drawings, Interior elevation, South Dungeon Casemate Nos. 1 and 2, Project Office, Halifax Defence Complex.
11. Young, p. 88.
12. Ibid., p. 88.
13. PAC, Mg 12, W.O. 44, p. 381, "Estimate No. 3 ... for the Completion of Fort George at Halifax, N.S.", Capt. L. Peake, 12 June 1833. Underlining not in original.
14. As found drawing, Set C, casemates 51 and 52, Project Office, Halifax Defence Complex.

15. See, for example, the 1831 plan in: PAC, MG 12, W.O. 55, Vol. 872, f. 330, "Plan of Fort George, Citadel Hill, shewing the works in progress, approved and those estimated for the year 1832", G. Nicolls, 3 Sept. 1831.
16. PAC, MG 12, W.O. 55, Vol. 878, "Sketch of the North East and the North Fronts of the Citadel ...", P.D. Calder, 22 May 1842.
17. Ibid., Vol. 883, f. 781, "Citadel, Halifax, N.S. ...", H.J. Savage, 9 Jan., 1849.
18. See, for example Ibid. Vol. 880, f. 994, "Supplementary report and Estimate of Work for completing the Citadel at Halifax ...", P.D. Calder, 31 March 1843; and PANS, MG 12, R.E. 11, p. 99, Calder to the Inspector-General of Fortifications, 20 July, 1845.
19. Greenough, I, p. 175.
20. See Ibid., pp 186-187.
21. PAC, MG 12, W.O. 55, Vol. 883, p. 826, Savage to Burgoyne, "... reporting upon the state of the Casemates in the Citadel at Halifax", 28 Dec. 1848.
22. PAC, RG 8, "C" Series, Vol. 1825, f. 110, Burmester to Savage, 30 November, 1848.
23. Ibid., f. 113.
24. Ibid., f. 115.
25. PAC, MG 12, W.O. 55, Vol. 883, f. 829, Savage "to the Inspector General of Fortifications reporting upon the state of the Casemates in the Citadel at Halifax", 28 Dec. 1848.
26. Young, p. 95.
27. Ibid., p. 95.
28. PAC, RG 8, "C" Series, Vol. 1825, p. 117, Burmester to Savage, 30 Nov. 1849.
29. Ibid., p. 117.
30. Ibid., p. 118.
31. PAC, MG 12, W.O. 55, Vol. 883, Savage to the Inspector General of Fortifications ".... reporting upon the state of the Casemates in the Citadel at Halifax", 28 Dec. 1848.
32. Ibid., f. 832.

33. Ibid., f. 835, "Halifax Citadel shewing the Casemates Numbered 1 to 54 and the Situation of Proposed Down Pipes and Drainage to carry off Water from the Vallies between the dos d'anes", H. Savage, 28 Dec. 1848.
34. Ibid., fols. 843 - 880, "Special Estimate for Staunching Casemates in the Citadel at Halifax ...", H. J. Savage, 30 April, 1849. See especially Drawing No. 2, f. 857, and No. 3, f. 858.
35. Ibid., f. 858. The written Estimate contained the following: "... the gargoyle openings to be filled up & made good with brick work in Roman Cement." Ibid., f. 846.
36. Ibid., fols. 847 - 848.
37. PAC, MG 12, W.O. 55, Vol. 887, fols. 495-- 496, "Report on the Seyssel Asphalte used at Fort George, Halifax, Nova Scotia", Lieut. R. M. Parsons, 13 Feb. 1854.
38. PAC, MG 12, W.O. 55, Vol. 887, f. 498, "Fort George, Halifax, N.S. A Sketch of the covering of the Casemates with Asphalte," 12 June, 1856.
39. See, for example, Young, pp. 94-95.
40. PAC, MG 12, W.O. 55, Vol. 882, "Special Estimate for Staunching Casemates in the Citadel Halifax ...," H. J. Savage, 30 April 1849.
41. PAC, MG 12, W.O. 55, Vol. 883, f. 835, "Halifax Citadel shewing the Casemates numbered 1 to 54 and the Situation of Proposed down Pipes and Drainage to carry off Water from the Vallies between the Dos d'anes", H. Savage, 28 Dec. 1848.
42. PANS, MG 12, R.E. 33, P. 95 "Tabular Statement shewing the number, appropriation and general state of the Casemates in the Citadel at Halifax, Nova Scotia...", H. Grain, Capt. R.E., T. Hanlon, C.W.R.E.D., 28 Nov. 1854.
43. PAC, RG 8, "C" Series, Vol. 1429, p. 77. Lt. Col. Stotherd to Lt. Col. Le Marchant, 28 July 1856.
44. PANS, MG 12, R.E. 33, p. 95, Report by Grain and Hanlon, 28 Nov., 1854; and PANS, MG 12, R.E. 43, p. 271½, Lt. Col. Stotherd to Respective Officers War Dept., 3 May 1856.
45. PAC, MG 12, W.O. 55, fols. 508 - 508A, Lt. Col. Stotherd to the Inspector General of Fortifications, 17 Jan., 1855.
46. PAC, RG 8, "C" Series, Vol. 1429, p. 77, Stotherd to LeMarchant, 28 July 1856.

47. PANS, MG 12, R.E. 13, "Tabular Statement showing the Situation, Nature and Condition of the casemates in the Citadel at Halifax, Nova Scotia...", 17 June 1856.
48. PANS, MG 12, R.E. 13, p. 184, Stotherd to the Inspector General of Fortifications, 20 June 1856, emphasis in original.
49. Ibid., p. 185.
50. Ibid., pp. 313-314, Lt. Col. Stotherd to the Inspector General of Fortifications, 21 Oct. 1857.
51. Ibid., p. 186, Stotherd to the Inspector General of Fortifications, 28 June 1856.
52. See, for example, PAC, MG 12, W.O. 55, Vol. 883, f. 781, "Citadel Halifax, N.S. ...", H.J. Savage, 9 Jan. 1849.
53. PANS, MG 12, R.E. 43, Lt. Col. Stotherd to the Respective Officers, War Dept., 3 Aug. 1856.
54. PAC, RG 8, "C" Series, Vol. 1558(7), f. 31, "Report of the Committee on the State of the Citadel and Harbour Defences of Halifax, Nova Scotia," 5 May 1856.
55. PANS, MG 12, R.E. 13, p. 179, Stotherd to the Inspector General of Fortifications, 18 June, 1856.
56. PAC, RG 8, "C" Series, pp. 298 - 299, J. R. Godley, War Office, to the Major General Commanding Halifax, 29 Sept., 1857.
57. PAC, H4/250, "Halifax, the Citadel, Fort George".
58. According to John Johnston, by January 1886, "the 20 24-pounder cannon from the defence casemates were described as being in the fort but dismounted", "Defending Halifax: Ordnance, 1825 - 1906", 1977, p. 126, Manuscript on file, Halifax Defence Complex.
59. Dunn, "The Halifax Citadel, 1906-51," pp. 181-182.
60. PAC, RG 24, C9, Vol. 3052, File Ha-1376-11-1, Vol. 1. "The Citadel or Fort George."
61. Department of National Defence. The Citadel or Fort George, 21.7.50.
62. T.D. MacLean, "Construction and Restoration of the Halifax Citadel, 1950-1970", pp. 7-9, Manuscript on File, Halifax Defence Complex.
63. Halifax Citadel as found recording, South Dungeon details, Project Office, Halifax Defence Complex.

64. Young, p. 90
65. As founds, Set C, Vol. C4, Photographs CC13 and CJ37. Volume on file, Project Office, Halifax Defence Complex.
66. Dunn, "The Canadian Period", p. 134.
67. T.D. MacLean, "Halifax Citadel Survey", November, 1975, p. 10.
68. Set, for example, PAC, HL/250- Halifax - 1891, "The Citadel, Fort George. Block Plan", Lieut. Col. Hill, November, 1891.
69. PAC, MG12, W.O.55, Vol. 879, of 519, "Plan and Section of the Proposed retaining wall of the casemate of defence N.W. Bastion ...", Lt. Col.P.D. Calder, 22 May, 1843.

Calder Casemates: Nos. 5 and 6

Lieutenant Colonel Patrick Calder replaced Rice Jones as Commanding Royal Engineer in Nova Scotia in March 1842. Over the course of the next year, as he contemplated the kinds of measures which were necessary to complete the Citadel, he came to the conclusion that it needed more bomb proof accommodation and storage space.[1] Consequently, an Estimate (which he submitted to London in May 1843) for "Alterations and Renewals" at the Citadel contained provisions for no less than 17 additional casemates - four on the west front, two on the north front, seven on the east front, two on the south front, and two in the re-entrant angles of the redan.[2] Those projected for the south front became casemates 5 and 6.

After receiving this estimate, the Inspector-General of Fortifications, argued in a note to the Board of Ordnance in July 1843, that although the existing bomb proof accommodation at the Citadel was as much "as a work of this character generally has", he was disposed to support Calder's scheme "as eventually more economical than the reconstruction or thorough repairs from time to time of so much of the Store and Barrack accommodation which the garrison of Halifax had hitherto occupied".[3] The Board of Ordnance approved the proposal on July 12, 1843,[4] and news of the approval was sent to Calder on July 18, 1843.[5]

Over the next couple of years portions of the items provided for in the estimate were brought forward.[6] On March 31, 1846, for reasons which will not be gone into here, Calder submitted to London another estimate for completing the Citadel which, though providing for the same services as the 1843 estimate, included more detail concerning those items yet to be brought forward.[7] It shows that the four casemates on the west front and the two on the south, were authorized in 1846-47. In a letter to the Inspector General of July 21, 1846, Calder noted that they were "Included in the vote for the present year". In the margin beside Calder's words someone, presumably in the Fortifications department in London, had written: "This service has

been authorized & the money provided therefore so much of the Supplementary Estimate of 21 March, 1846 has been acted upon and got rid of."[8] Probably most of the work was carried out during the 1847 and 1848 building seasons. At any rate, Burmester and Hawken's report of November, 1848, seems to describe these casemates as complete, except for the installation of their flooring.[9]

The various structural aspects of casemates 5 and 6 with the exception of staunching will be discussed under Structural Details and Analysis.

These casemates, along with casemates 7, 8, 13, and 14 on the west front were the first in the Citadel to have down pipes installed to carry off water from the valleys of the dos d'anes. This was an innovation introduced by Calder, who expressed dissatisfaction with the staunching methods which had been used up to then. Thus, in July 1843, he wrote to the Inspector General that the considerable quantities of plain tiles and Dutchesses slates included in the 1842-43 estimate for covering the casemates' dos d'anes were not "well calculated" for this purpose - "the tiles because they are at best a porous material and when covered with earth liable to decay, - the slates because they are likely to be broken by the weight of the earth over them as well as liable to be affected by the intense frosts in this country".[10] Calder then went on to state his belief that a better staunching material would be "large hard stone flags from 1½ to 2 inches thick [which] can be procurred from our quarries to cover all the arches ...".[11]

In its reply on August 11, 1842, the Fortifications department, though stating that the supply of tiles and slates would not be postponed, left it to Calder to decide whether "to make a small experiment of each mode of covering the Dos d'anes, so as to insure their perfect security against fracture or leakage from any cause ...".[12] This Calder proceeded to carry out, and by June of the next year was able to report to London that the flagging had been a decided success.[13] The Fortifications department seems not to have been completely convinced, but wrote sanctioning Calder's "making further experiments of the Flag stones from 1½ to 2 inches thick, from the Ordnance Quarries properly bedded in cement ..., provided the flags are carefully selected, quite impervious, and free from shakes and flaws."[14] It also referred him to a "a practice which has very much obtained of using asphalte or other bituminous ingredients as being less fragile than even the best rendering of cement".[15]

Calder ignored the reference to asphalte, and stuck with his own pet staunching scheme involving stone flagging. His work over the next five years was to show, however, that while sticking with the basic flag stone covering, he was quite prepared to experiment with additional staunching means which might assist in keeping the casemates dry. Thus, those built on the west and south fronts (7, 8, 13, 14, 5, and 6) under the Annual Estimates of 1846-47 were both flagged and hipped, and had down pipes built into the pier and party walls to carry off water from the valleys of the dos d'anes.[16] The section dealing with these casemates in the 1846-47 Annual Estimate for Halifax, (submitted, probably, in October 1845) stated that "no down pipes are herein provided for, [but] the estimate for these as well as pipes for the whole of the Citadel is in progress".[17] By the time the casemates came to be built, however, the down pipes had evidently been provided for and authorized, for Burmester and Hawken's report of November 1848 refers unambiguously to their being "flagged, hipped, and piped".[18] (See figure 9).

The down pipes in casemates 5 and 6 are positioned in the centre of the pier and party walls, amidst the inner layer of rubble masonry into which the brick facings are bonded. They are clearly visible today through holes that have been cut through at the foot of the walls. Sectional drawings submitted by Lieutenant Colonel Savage in December 1848, portray the gutters in the valleys of the dos d'anes of those casemates which were flagged, hipped and piped as sloping downwards from both ends of the dos d'ane towards the down pipe, located in the middle of the wall.[19] The pipe was to connect evidently, with an underground drain - probably yet to be built - leading to the main drain that ran out under the Redan.[20]

Some time between 1851 and 1854 these casemates, along with 54 other Citadel casemates, were covered with a coating of seyssel asphalte. Probably, however, since these casemates were two of the dryest in the fort, the asphalting process was not as elaborate as that described for casemates 51 and 52 (See Chapter II, above). Rather, here, the original flagging was probably simply covered with a 3/8 inch layer of asphalte, as this seems to have been what was done over their sister casemates on the west front.[21]

As has been seen, Burmester's and Hawken's Report on the Citadel casemates of November 1848, described numbers 5 and 6 as "dry", and though

intended for stores, as "fit for troops when the flooring is completed."[22] By January 9, 1849, Savage probably referred to these casemates when he wrote that the flooring "is nearly completed, and will be all laid next month".[23] The floor that was put in, however, was not brick on edge paving, as originally intended, but instead was of wood. On the same day Savage submitted a return which showed the appropriation of casemate 5 as a "Qr. Master Store", and casemate 6 as an "Engineers Store".[24]

By November, 1854, Grain and Hanlon observed that casemate 5, though designated as a Quarter Master Store, was presently occupied by a "Provost Prison Wood Store". Casemate 6 was designated as a "Rl. Engineers Store", and was presently occupied by "Engineers Store Tools, etc." The investigators' comments on these two casemates were: "No appearance of dampness. Chimney smokes occasionally."

The report on the Citadel casemates of June 1856 cited casemate 5 as a Quarter Master Store, but listed its "Present Occupation" as a "Soldier's Quarters". It was described as "Slightly damp near escarp wall". Casemate 6 was cited as a Royal Engineers' Store, and its present occupation listed as "Rl. Eng.'s Tool house and Store". It was termed "In a serviceable state". The investigator[s] noted that: "These casemates have no thorough ventilation and require a constant fire to keep them dry: - It is expected that the careful pointing of the Escarp wall, which has been too long neglected will improve No. [5] casemate; if not the removal of the entire mass of Parapet & Rampart will be a serious & expensive Service. - And will be delayed until there is no other remedy".[25]

Whether the last mentioned operation was ever carried out, is not known, as thereafter detailed documentation on the history of these casemates disappears. The "Casemate Use" study provides the following information as to their function at specific times during the next century:

Year	Casemate 5	Casemate 6
1891	Q.M.'s Office	Q.M.'s Store
1906	Store	Engine House
1908(1)	condemned	Q.M.'s Office
1908(2)	Q.M.'s Office	Q.M.'s Store
1922	Wood Shed	Fire Hose
1924	Wood Shed	Fire Hose
1924	Wood Shed	Fire Hose
1928	Court Martial Room	QRM Store[26]

Throughout these years the basic structural attributes of these casemates remained the same, except for some minor changes. These shall be discussed in the next section.

Structural Details and Analysis

Calder's Estimate for 1846-47 stated that casemates 5 and 6 were to be "executed in every respect" as casemates 7, 8, 13, and 14 on the west front,[27] which have been thoroughly discussed by Richard Young.[28] The present report is meant to be a reference source for the restoration of the southwest front, however, and many of the structural features which are similar will be discussed in detail here.

Foundations

Calder's Estimate of May 1843, for the new casemates projected for the west and southern fronts, called for the foundations of the pier walls to be forty-five feet long, five feet deep, and four feet thick.[29] However, by the time he submitted his Estimate for 1846-47, according to which the work was actually done, he deepened them to ten feet, and increased their width to five.[30] The party walls are not mentioned in either estimate, but presumably the dimensions of their foundations were no greater than those for the foundation of the pier walls. The masonry was to be of rubble ironstone with horizontal beds.[31] There were, presumably, only two completely new foundations put in for casemates 5 and 6. An extra foot may have been added to the foundation of the western pier wall of sallyport 2 which also served as the pier wall of casemate 5, since an extra foot seems to have been added to the wall itself.

Pier Walls

Casemate 6 - Neither of Calder's Estimates contain any information as to the dimensions of the pier walls. There was, however, only one entirely new pier wall built for the two new casemates on the south front - ie., the west wall

of casemate 6. A portion of the north end of this wall also forms the east wall of demi-casemate 20 in the south magazine area. As found drawings show the thickness of the wall at this point to be about four and half feet. If one allows for a facing of about six inches on the wall of the demi-casemate, the overall thickness of the pier wall would be about four feet.[32] This is also the thickness estimated by Richard Young for the pier walls of the casemates built by Calder on the west front.[33]

The interior face of this wall is six feet from the footing to the spring of the arch. It is lined with "4½ inch brickwork in Mortar" with every fourth course being "headers bonded into the wall".[34] The wall is topped by a granite skewback six inches thick.

Calder's "Supplementary Estimate" of March, 1846, contained a provision for affixing certain fitments, such as shelves, pin rails, and arm bands, to the walls of the kitchens in the Officers Quarters in the redan, in the Guard Rooms, and in the casemates of defence (which, at least in the latter, appears not to have been carried out). "The walls to which it is proposed to affix these fitments" the Estimate noted "are built with large blocks of iron stone masonry and no provision was made by leaving openings for the insertion of wood bricks necessary to fix them". Since cutting into the walls in order to install the wooden bricks would have been prohibitively expensive, Calder provided in this Estimate for an alternative method of affixing the fitments.[35] By the time he came to building his own casemates, however, Calder was able to insure that this problem did not arise. The interior face of the pier wall of casemate 6, for example, contains a course of wood brick running the full length of the casemate, located three courses down from the granite skewback. Five courses further down every fifth or sixth brick is of wood.

In the centre of the wall the masonry is cut away revealing the down pipe, which is eight inches in diameter.

Casemate 5 - The already extant western pier of sallyport 2 served as the basis for the pier wall of casemate 5, As found recordings show the thickness of the wall to be about four feet, which means that about one foot was added to the thickness of the original sallyport pier as built by Nicolls. (See below, Chapter 4 on Sally Port 2). Also, since the sally port slopes

downwards under the parapet from the interior level of the fort to exit at the base of the escarp, the wall must, persumably, have been built higher as the sally port descended, reaching a height of about 13 feet at the escarp end.[36]

At some point the interior brick facing of this pier wall has either fallen, or been torn away. The inner portion of the wall appears to have been built of coursed blocks of ironstone set in mortar. Each course is separated from the one below by slots or grooves four inches wide and five inches deep. These were meant, presumably, to receive the courses of brick headers, which served to bind the brick facing into the wall. When still intact the interior face of this wall resembled that of the pier wall in casemate 6.

Party Wall

According to as found information the party wall between casemates 5 and 6 is about four feet thick.[37]

Casemate 5 - The interior face of the party wall in this casemate is like that of the pier walls, built of red brick set in mortar, with every fourth course consisting of headers, presumably bonded into the wall. The wall is topped, also like the pier walls, by a six inch granite skewback. The third course down from the skewback is of wood which, except for where it is broken by the fireplace, runs the full length of the casemate. Five courses below that every fifth brick or so is of wood. These again, of course, are broken by the fireplace.

The fireplace, located about 28 to 29 feet in from the front of the casemate, is certainly the dominating structural feature of its pier wall. It is about five feet across and stands four feet eight inches high from what would have been the level of the flooring. Unfortunately Calder's estimate for the construction of casemates 5 and 6 does not mention fireplaces. But some structural data can be obtained from the Ordnance Annual Estimate of 1844-45, which provides for similar fireplaces to be built in the seven casemates therein projected for the northeast salient. It shows that the foundation below the hearths measured six feet in length, two feet in width, and one

foot two inches in depth. Both the back and the front hearths were to be of four inch chiseled granite - that in front measuring five feet by two feet, and that in back four feet by one foot nine inches. The jambs and head of this fireplace were to be of chiseled granite - the former measuring three feet six inches in height, by one foot nine inches in width, and one foot in depth;the latter six feet in length, by one foot in width, by one foot in depth. Except for the width of the jambs, which according to as found information is about one foot instead of the one foot nine inches mentioned here, all these measurements seem to be accurate for the fireplace in casemate 5. There is an arch above the fireplace's head formed of red brick standing on end. The fire box is four feet wide by one foot deep. Its back wall is built of brick. Also, the chimney opening and the flue are lined with brick set in mortar. Presumably the brick in these areas is some sort of firebrick. The flue, presumably, connects at some point with that of the fireplace of casemate 6, and then they both rise to a chimney located directly above the party wall on the ramparts.[38]

Casemate 6 - The inner face of the party wall here is in almost all respects exactly the same as that in casemate 5. The third course of bricks down from the granite skewback is of wood as in casemate 5; but unlike casemate 5, there are no wood bricks spaced at intervals five courses further down. The fireplace appears to be built similarly to that in casemate 5. It is , however, located further south along the wall so that its fire box begins approximately where that in casemate 5 ends. The brick arch above this fireplace's head has a hole punched through it, with a rusted stove pipe protruding from it. When the hole was cut is uncertain.

Flooring

Calder's original estimate of May 1843, called for brick on edge flooring for the new casemates to be built on the south front.[39] The 1846-47 estimate, stated that the floors in these casemates were "to be laid with 4 inch chiselled [sic] granite and grouted". By the time the casemates came to be built, however, something, possibly the pressure he was under to have

them ready for use, induced Calder to substitute wood. Calder's Estimate for these floors, if there was one, has not survived. Probably, however, a fairly accurate picture of their structural details can be obtained from the 1844-45 ordnance annual estimate, which provided for similar floors in the seven casemates to be built in the northeast salient,[40] and from as-found information. Since most of the flooring is missing from casemate 5, a series of stone and brick pads can be seen stretching down the middle of the casemate. Each one is about three feet three inches long, by one foot nine inches wide, and is separated from the next by a gap of, on the average, about one foot. These were to support the joists, and were probably built as a substitute for the dwarf walls running the full lengths of the casemates which were proposed for the casemates to be built in the northeast salient. This alteration may have been carried out to improve the circulation of air beneath the flooring. Whether the depth of these pads is one foot, as proposed for the aforementioned dwarf walls, is unknown. The bricks laid in mortar on the top of these pads appear to be of fairly recent vintage. The joists proposed for the casemates in the northeast salient were to be of rough pine measuring eight inches by two and a half inches, and the wall plates were to measure six inches by four inches. The flooring itself was to be two inch wrought and rebated pine. Probably, those in casemate 5 and 6 were of roughly similar dimensions.

There is a six inch granite skirting around the bottom of the wall, just above the flooring.

The North Walls

These walls form a part of the retaining wall of the work, and were provided for in the 1836 Estimate. Presumably their specifications conform to those enumerated in this Estimate - ie., a height of twenty feet, and a thickness of three feet, with foundations three and a half feet thick, by five feet deep.[41] Their exterior face is composed of squared granite blocks. The 1846-47 Estimate, which provided for the construction of casemates 5 and 6, noted that there was no provision for their front or north walls, "either in foundation or superstructure as the wall originally estimated is adequate to cover the cost of the proposed alteration of the work".[42]

Casemate 5 - Using the 1846-47 Estimate, which provided for the new casemates on the west and south fronts, and the Supplementary report and Estimates of 1846, which provided for rebuilding the retaining wall of the casemates of defence on the west front, a fairly detailed picture can be constructed of the structural features of this wall.

The wall has six openings - two air vents, two lower windows, a doorway and an upper window. The second lower window, ie., that closest the door, was not part of the original construction. It was put in sometime after the 1870's, and was done by knocking out the masonry to the east of the original window to a width of about three feet, and building a brick jamb down the middle.

There is no provision for frames for the original lower window in Calder's Estimate. But presumably they were the same as those for the upper window and door - ie., six inches by four inches, rabetted, and chamfered, prepared fir. The sunk sills were of oak. The window was single hung, with patent lines, brass cased pully boxes, and iron weights. It was to be secured with spring sash fasteners. There would have been six frames of glass in the upper half of the window, and six in the lower half, each pane measuring nine inches by seven inches.

The upper window was located immediately above the door and lower window, about midway between them. As has been mentioned, it was framed with six inch by four inch rabetted and chamfered fir. Its two inch beveled bar sashes were three feet by eight inches. It, like the lower window, was situated nine inches in from the face of the retaining wall. Its inner sill, measuring about a foot and a half, was splayed downwards towards the floor of the casemate.

The six inch by four inch door frames were held with wrought iron T hold fasts which were run with lead and secured to the frame with two inch screws. The door itself was of two inch fir, with inch thick wrought and rabetted sheeting on the front, and a wrought and rabetted herringbone back. It was hung with 24 inch wrought iron hook and eye hinges, opened by a thumb latch,

and secured by a ten inch iron rimmed dead lock.

The door and lower window were lined with chisel dressed granite with one inch chamfers. Only the upper jamb of the upper window is of granite, however. The rest of the masonry in this wall is of brick.

The two air vents, which opened beneath the floor, connected with vents on the face of the retaining wall, located about a foot and a half above the level of the parade. The ventilating plates on the face of the retaining wall were twelve inches long, by nine inches wide, by ½ an inch thick. Each was to be perforated with 154 holes. The air was intended to flow through these plates, underneath the floors, and then up through similar ventilating holes cut in the rear wall. (See figure 10).

Casemate 6 - Originally this wall was like that of casemate 5,[43] but subsequently a number of changes were introduced. Sometime before 1891, probably around the same time that the alterations discussed above were carried out in the north wall of casemate 5, the door was widened to twice its original width. Also, the window was widened, but to somewhat less an extent than that in casemate 5. There was no brick and granite jamb built down the middle as in the enlarged window of casemate 5. The door and window still stood at these dimensions, and the upper window was still intact in 1950. Sometime after that a further alteration was carried out - the size of the door was considerably increased to measure eight feet two inches in height, by eight feet one inch in width. This was done by knocking out the masonry to the east of the door to the required depth. In the process the width of the window was reduced so that it now measures two feet nine inches, with a height of three feet nine inches. In raising the height of the door the upper window was also cut into. The remainder was bricked in. Presumably, the iron I beam lintel over the door was put in at the same time. Precisely when, or for what reason, this alteration was carried out is unknown. (See figures 11 and 12).

The South Walls

Casemate 5 - There are presently five openings in this wall, all having to do with ventilation.

None of the earlier plans show the ventilating shaft which has been cut through to the face of the escarp. This may have been cut through in the 1850's, when ventilation was identified as a problem with these casemates. (See above). The two air shafts higher up on the wall were definitely a part of the original construction, however. There are granite frames around these shafts measuring about one foot nine inches in length by one foot six inches in height. They are five inches wide. The openings are covered by ventilating plates measuring the same as those in the retaining wall - ie., twelve inches, by nine inches, with a thickness of one half an inch. They are perforated presumably with 154 holes each. They were connected with openings under the floor by shafts or flues running down behind the brick facing. These were meant to dispense the air into the casemate which the vent in the retaining wall let in under the floor of the casemate.

Casemate 6 - The south or back wall of this casemate is, with minor variations in measurement, exactly the same as that in casemate 5.

Arches and Waterproofing

The arches were vaulted three bricks thick set in lime mortar. They rested on granite skewback abutments. When finished they were grouted with hot lime. The dos d'anes were formed of rubble masonry and iron stone flagging, set in mortar and pointed with roman cement.

The staunching and waterproofing system for these casemates has been discussed in the narrative section of this paper.

Endnotes

Calder Casemates: Nos. 5 and 6

1. See PANS, MG 12, R.E. 54, pp. 157-60, Calder to Sir Frederick Mulcaster, 6 Jan. 1843.
2. PAC, MG 12, W.O. 55, Vol. 878, fols. 516, and 519, "Estimate for Alterations and Renewals for the Citadel at Halifax ...," Lt. Col. P.D. Calder, 22 May 1843.
3. PANS, MG 12, R.E. 56, unpaginated, Sir Frederick Mulcaster to R. Byham, 1 July, 1846.
4. Ibid., unpag., R. Byham to Sir Frederick Mulcaster, 12 July 1843.
5. Ibid., unpag., Matson to Calder, 18 July 1843.
6. See PAC, MG 12, W.O. 55, Vol. 880, f. 976, Memorandum by Calder, 15 October 1845.
7. Ibid., f. 936, "Supplementary Report and Estimate of Works for completing the Citadel at Halifax ...," Lt. Col. Calder, 31 March, 1846.
8. Ibid., f. 1024, "Replies to the Inspector General's Remarks on the Supplementary Estimate for the Citadel at Halifax ...," Lt. Col. Calder, 21 July 1846.
9. Ibid., Vol. 883, f. 841, "A Return Shewing the State of Every Casemate in the Citadel", 22 Nov., 1848.
10. PANS, MG 12, R.E. 10, p. 139, Calder to Sir Frederick Mulcaster, 12 July 1842.
11. Ibid., p. 140.
12. Ibid., R.E. 56, unpaginated, Fanshaw to Calder, 11 Aug. 1842.
13. Ibid., R.E. 10, p. 220, Calder to IGF, 10 June 1843.
14. Ibid., R.E. 56, unpaginated, Fanshaw to Calder, 26 Aug. 1843.
15. Ibid., unpaginated, Fanshaw to Calder, 26 August 1843.
16. Ibid., f. 841, and f. 835, "Halifax Citadel Shewing the Casemates numbered 1 to 54 and the Situation of Proposed Down Pipes and Drainage to carry off the Water from the Vallies between the Dos d'anes", 28 December, 1848.
17. P.A.N.S., MG 12, R.E. 56, unpaginated, "Report and Estimate of Works to be carried on at the Citadel Halifax Nova Scotia for the year 1846-47".

18. P.A.C., W.O. 55, Vol. 883, f. 841, "Return Shewing the State of Every Casemate in the Citadel", Burmester and Hawken, 21 November 1848.
19. Ibid., f. 837, "Longitudinal Section ... Shewing casemates Flagged, Hipped and Piped, Flagged and Hipped, and Flagged only", Lt. Col. Savage, 28 Dec., 1848.
20. Ibid., f. 835, "Halifax Citadel Shewing ... the situation of the Proposed Down Pipes and Drainage to carry off the water from the Vallies between the Dos d'anes", Lt. Col. Savage, 28 December 1848.
21. See Young, West Front , p. 120.
22. PAC, RG 8, "C" Series, Vol. 1825, f. 110, Burmester to Savage, 30 November 1848.
23. PAC, MG 12, W.O. 55, Vol. 883, Savage to Burgoyne, 9 Jan. 1849.
24. Ibid., f. 883, "Return Shewing the appropriation of each of the Casemates in the Citadel at Halifax ...," Lt. Col. Savage, 9 Jan. 1849.
25. PANS, MG 12, R.E. 13, "Tabular Statement Shewing the Situation, Nature and Condition of the Casemates in the Citadel at Halifax ...". 17 June 1856.
26. B. Dunn, J. Johnston, and R. Young, "Casemate Use: Halifax Citadel", 1977, Manuscript on File, Halifax Defence Complex.
27. PANS, MG 12, R.E. 50, unpaginated, "Report and Estimate of works to be carried on at the Citadel, Halifax, Nova Scotia for the year 1846-47".
28. See Young, pp. 112-124.
29. PANS, MG 12, R.E. 56, unpaginated, "Estimate for Alterations and Renewals for the Citadel at Halifax, ...", Lt. Col. Calder, 22 May 1843.
30. Ibid., unpaginated, "Report and Estimate of Works to be carried on at the Citadel ..." for 1846-47.
31. Ibid., unpag..
32. As found drawings, Set C, Casemates 5 and 6, Project Office, Halifax Defence Complex.
33. Young, pp. 114-115.
34. PANS, MG 12, R.E. 56, unpaginated, "Report and Estimate of works to be carried on at the Citadel, Halifax, Nova Scotia, for the year 1846-47.
35. PAC, MG 12, W.O. 55, Vol. 880, f. 994, "Supplementary Report and Estimate of Works for completing the Citadel at Halifax ..." Lt. Col. Calder, 31 March 1846.

36. These calculations are based in part upon PRO S/N 549 MR 947, "Section through a, b, c, d, e, f, g, h, i, j, k, l. Plan No. 1", G. Nicolls, 20 Dec., 1825.
37. As Found Record, Set C, Casemates 5 and 6, Project Office, Halifax Defence Complex.
38. The information in this paragraph is derived from PANS, MG 12, R.E. 56, unpaginated, "Report and Estimate of Works and Repairs proposed to be carried on in the Royal Engineer Department in Nova Scotia, New Brunswick, and their dependencies in the year 1844-45," Lt. Col. Calder, 20 Oct. 1843; and As Found Record, Set C, Casemate 5, Project Office, Halifax Defence Complex.
39. PANS, MG 12, R.E. 56, unpaginated, "Estimate of the Alterations and Renewals for the Citadel at Halifax ...," Lt. Col. Calder, 22 May 1843.
40. Ibid., unpaginated, "Report and Estimate of the Work and Repairs to be carried on in the Royal Engineer Department in Nova Scotia ... in the year 1844-45." Lt. Col. Calder, 20 October, 1843.
41. See Greenough, III, pp. 184-185.
42. PAN, MG 12, R.G. 56, unpaginated, "Report and Estimate of the Work to be carried on at the Citadel ... 1846-47".
43. See, for example, PAC, MG 12, W.O. 55, Vol. 883, f. 835, "Halifax Citadel... Ground Plan shewing ... the situation of Proposed Down Pipes and Drains ...," H. J. Savage, 28 Dec., 1848.

The South Sallyport (No. 2)

The south sallyport was part of Nicolls original design for the Citadel. It was intended to provide access to the south ditch and hence to the south ravelin and musketry gallery. According to Nicolls, commenting in 1836, it was "built arch turned and steps made in 1831 except for a very small part of the face of the inner front".[1] It was completed, presumably, when the retaining wall was built in the 1840's.

The south sallyport, like those in the west curtain,[2] was built somewhat differently than as indicated in Nicolls' original plan of 1825. A profile submitted then shows that Nicolls first intended the sallyport to slope down under the rampart directly from the rear of the retaining wall to the rear of the escarp wall.[3] A profile submitted by Lieutenant Colonel Boteler in February 1832, however, is quite different - it shows level sections of flooring extending into the sallyport about ten feet at both the retaining wall and escarp ends, with a forty foot sloping steps section in the middle.[4] In fact, the sallyport was built differently than as shown in either of these plans. As found recordings show that the steps may have begun directly inside the retaining wall, while there is a level section of flooring stretching in about twenty-one feet at the escarp end. The sloping steps section measures about thirty feet.[5]

Since, according to Nicolls' observation quoted above, the sallyport had already been mostly built by the time that Boteler submitted his profile, the inaccuracy of the latter's recording is difficult to explain. There is no evidence that the sallyport was ever rebuilt after Boteler made his report. Perhaps his misrepresentation is due to a copyist's error, or perhaps he mistakenly made use of a revised plan for the sallyport which had been drawn up by Nicolls, but which had been discarded by the time that work actually began.

Even by Boteler's time the ditch of the south front had not been fully excavated. In a letter to the Inspector-General of April, 1832 he observed that the north and south sallyports had been constructed "two feet below the

level of the ditch". This, together with the fact that no work had been undertaken on the guard house of the north ravelin, while no work at all had been begun on the south ravelin, led him to conclude that "it was intended ultimately to introduce Caponniers to the North and South fronts, and perhaps to omit the Guard houses in these small works".[6]

There is no evidence that Nicolls intended to introduce caponniers to the north and south fronts. Perhaps, though, Boteler's suggestion influenced Captain Peake when he sumitted his Estimate in June, 1833, to recommend the construction of a caponnier on the south front while dispensing with the ravelin. Peake considered the south front the one least likely to be attacked, and he evidently considered a caponnier would provide sufficient flanking fire. It also would have been cheaper.[7] Rice Jones adopted Peake's proposal for a caponnier on the south front in his first estimate of March, 1834, but at the same time, since he saw the threat to the south front as greater than estimated by Peake, advised going ahead with the ravelin as well.[8] In the end, the Fortifications department decided that a ravelin, as originally planned by Nicolls, was desirable on the south front while a caponnier was a luxury which the already inflated Citadel account could not afford. Hence the caponnier was omitted from Rice Jones's revised estimate of February, 1836.[9]

This was the last that was heard of a caponnier connecting up with the ditch exit of the south sallyport. When the ditch was excavated to a level even with the threshold of the sallyport is unknown. It was still being excavated as late as August, 1856.[10]

With the building of the retaining wall entrance in the 1840's, the basic structure of this sallyport was completed. It appears to have remained essentially unaltered down to the present. When the structural deterioration began, which today makes entry hazardous, is unknown.

Structural Details and Analysis

Unfortunately, there is very little specific documentary evidence for compiling a structural history of this sallyport. One is compelled, therefore, to rely on a few surviving early profiles, which are inaccurate, upon as found recordings, and upon extrapolation from what is known of other sallyports within the fortress. Also, Rice Jones' estimate of February, 1836, contains provisions

for sallyports on the north west and south fronts. Since that on the south front was nearly complete by the time that this estimate was drawn up, it doubtlessly refers mostly to sallyports on the west and north fronts; still it probably can be relied upon for some structural information on sallyport 2.

Foundations

Nicolls' profile of 1825 does not show the foundations of the pier walls. Boteler's of 1832 shows something protruding beneath the flooring by about two feet which may, or may not be a pier wall foundation, but as has been seen this profile is unreliable. (See above). Rice Jones in his estimate of February, 1836 provided for pier wall foundations of three and a half feet wide by three feet deep which may be the dimensions of those in sallyport 2. Only excavation will tell for sure. The foundations here were probably built of rubble iron and blue building stone, as were all the other foundations built at this time.

Piers

Both Nicolls and Boteler's profiles show the walls of the south sallyport to be seven feet in height. This was also to be the height of the pier walls in the sallyports provided for in Rice Jones estimate of 1836. The walls of the latter were to be three feet thick. Since they were to be the same height as the piers in sallyport 2 it is perhaps legitimate to assume that they were built to the same thickness as well. About a foot was probably added to the thickness of the western pier of sallyport 2 in 1847-48, when the eastern pier wall of casemate 5 was built. (See above, Chapter III). The inner faces of the pier walls are composed, in the wording of the as found recordings, of "square cut, rough face, broken coursed iron stone".[11] They are topped by three inch ironstone skewbacks. The as found drawings do not show the full height of the walls since there is a considerable accumulation of earth and debris on the flooring.

Arches and Waterproofing

The portions which have fallen away from the arch of in sallyport 2 show it to have a thickness of about two feet. This is the thickness indicated in Nicolls' and Boteler's profiles as well. As found drawings show that the arch rises about one foot three inches over a six foot span, leaving a clearance of about eight feet three inches for troops moving through the sallyport. The arch is built of red brick laid, for the most part, in Flemmish bond. A section near the courtyard, which is of more recent vintage, is of common bond, however. This may date from the time when the sallyport was completed in the 1840's.

Above the sections of arch which have fallen out about two or three inch thick ironstone shingles can be discerned on top of which rubble stone appears to have been piled. Nicolls' original waterproofing plan called for tiling laid in cement. Jones revised estimate of 1836 called for a two foot layer of tiling laid in cement for covering the arches of the north, west, and south sallyports. Whether the ironstone shingles and rubble stone which can be seen above sallyport 2 constitutes a part of the aforementioned tiling schemes, or whether they are part of a later innovation is unknown. One is tempted to speculate that Calder, who was an inveterate experimenter with waterproofing methods, when installing the ironstone flagging over casemates 5 and 6, may have put in something similar above sallyport 2 as well; but there is no documentary evidence of his having done so. It should be noted that the tiling was exposed over the sallyports on the western front when they were uncovered during excavation work in 1973.[12]

The arch profiles of sallyports 2, submitted by Nicolls in 1825 and by Boteler in 1832 differ markedly from one another, and both differ from what was actually built. As found drawings show a flat section in the arch stretching in about two feet from the inside of the retaining wall, followed by a sloping section of twenty-nine feet, and another flat section stretching twenty-one feet to the retaining wall.

Flooring

As noted above, Nicolls stated on one occasion that the steps for sallyport 2 were "made in 1831", but he did not provide any specifications for them. Rice Jones' 1836 estimate, however, called for 20 granite steps, six feet

across, by one foot, six inches thick, for the sallyports on the north, west, and south fronts, which probably conformed to Nicolls' specifications. The level sections were probably meant to be brick on edge paving. The steps section of sallyport 2 would have measured about thirty feet in length. It is not clear whether the steps were ever installed in this sallyport - Nicolls, after all, referred to the steps being "made", not "laid". If they were, however, they are located about two feet beneath the level of earth and debris. The original pier walls were seven feet in height from the flooring to the spring of the arches; whereas as found drawings show the distance from the earth and debris to the spring of the arches to be on the average, about five feet.

Excavations in sallyport 3, which was probably built mostly by Nicolls, show that the granite steps had been installed, but that intermediate brick steps had at some point been built onto them. Whether this had also been done in sallyport 2 remains to be seen.

Openings - retaining wall

As has been noted, Nicolls wrote in January 1836, that the south sallyport was built in 1831 except for "a very small part of the face of the inner front". (See above). Rice Jones, in commenting upon Nicolls statements in April 1836, wrote that it remained "as left in 1831".[13] It was completed, probably when the retaining wall was built in the 1840's.

The entrance to sallyport 2 measures six feet in height by three feet nine inches in width. The door was set back nine inches from the face of the retaining wall at the top, and six inches at the bottom. Rice Jones' estimate provided for door frames eight inches by six inches, and for doors of three inch oak plank.

Openings - Escarp wall

The exit from sallyport 2 into the south ditch is six feet three inches high by four feet six inches wide. It expands to a width of five feet at the rear of the escarp wall. It was built, presumably, by the local Halifax contractor, John Metzler, in 1830.

It is not clear what kind of door, or gate, it was originally intended to install in this opening. It is unlikely that a door of three inch oak

plank, as provided for in Rice Jones' 1836 estimate would have been affixed here, given the relative ease with which it would have been breached.

A detailed plan of gates for the Citadel sallyports survives from the years 1859-60, however. It shows two oak gate doors, each about two feet wide, by five inches thick, which swung backwards into the sallyport. Presumably, those in sallyport 2 were somewhat wider than this. The exterior face was covered by metal sheathing about one inch thick. Each door contained a loop hole, also made of metal, measuring six inches by seven inches. The doors were held in place by hinges measuring approximately two feet long by two inches wide. The pintles were bedded into the stone masonry of the walls. The doors were further secured by an oak bar measuring four inches by three inches, held in place by three brackets, those on the walls probably being of stone.[14] (See figure 14) Boarding which has been erected over this opening makes it impossible to observe whether the pintles or stone brackets are still in place. There are pintles in place at the sides of the exit at the rear of the escarp, however, which indicates that there were doors in place here at some time, as well.

The lintel over the exit on the face of the escarp is of granite. An ironstone slab which has fallen out of place and cracked immediately behind it makes working in this area extremely hazardous.

Located about three feet in from the rear of the escarp, separated from one another by about three feet six inches are the rusted remains of an iron bar holder.

Endnotes

The South Sallyport (No. 2)

1. PANS, MG 12, R.E. 54, p. 109, "Remarks of Col. Nicolls... on addition proposed in Lieut. Col. Jones' Estimate...," 13 Jan. 1836.
2. R. Young, "West Curtain Wall, and Sallyports 3 and 4", p. 71, 1976, Manuscript on File, Halifax Defence Complex.
3. PRO, S/N 699 MR 947, "Halifax Citadel, Sections", G. Nicolls, 20 December, 1825.
4. PRO, W.O. 78, MPH 205 "#3 Section through Fort George, Halifax, N.S. as supposed to be when finished agreeably to documents on the spot", Lt. Col. R. Boteler, 14 February, 1832.
5. As found drawings, Set C, Postern No. 2, Project Office, Halifax Defence Complex.
6. PANS, MG 12, R.E. 9, p. 5, Boteler to Bryce, 12 April, 1832.
7. Ibid., R.E. 54, p. 54, Peake to Pilkington, 12 June, 1833.
8. Ibid., pp. 63-64, Rice Jones to Pilkington, 15 March, 1834.
9. Ibid., p. 142, Mulcaster to Rice Jones, 24 August, 1835; Ibid. pp. 93-94, Rice Jones to Mulcaster, 1 Feb. 1836.
10. PANS, MG 12, HQ 49, unpagenated, "General Orders", 15 August, 1856.
11. As found drawings, Set C, Postern No. 2, Project Office, Halifax Defence Complex.
12. Young, "West Curtain Wall", p. 80.
13. PANS, MG 12, R.E. 54, p. 109, "Explanatory Statements upon Colonel Nicolls observations...", Rice Jones, 20 April, 1836.
14. PAC, RG 8, "C" Series, Vol. 1653; p. 130-134, "Fortifications, Report and Estimate of Works and Repairs proposed to be carried on in the Royal Engineer Dept. in Nova Scotia, ... in the year, 1859-60". p. 136.

The Ramp

It is clear from plans which Colonel Nicolls submitted to London in 1825, 1828, and 1831 that he intended communication between the parade area of the Citadel and the terrepleins of the two western demi-bastions to be by means of flights of stairs. He made no provision for a ramp anywhere in the Citadel.[1]

This omission was rectified by Lieutenant Colonel Boteler who provided for a ramp in his estimate for the retaining wall of the west front. Since his estimate for the ramp provided for twelve "perches of brickwork in arch" and two "squares of tiling laid in cement", it is possible that it was intended to open into the parade through the retaining wall.[2] Precisely where on this front it was intended to be located is unknown, however. Apparently a ramp was one of those features which Captain Peake, doubtlessly in the interest of keeping expenditures down, felt could be dispensed with. At any rate his estimate for completing the fortress did not provide for one.[3] The idea was reactivated by Rice Jones, however, who provided for a ramp in his estimate of February 1836, for the retaining wall of the north, south, and west fronts. Its walls were to have measured 25 feet by 4 feet by 9 feet.[4] Unfortunately, Rice Jones did not make clear on which of these fronts he proposed to build his ramp. Evidently he planned a flight of stairs for the site of the present ramp leading to the southwest demi-bastion, as well as for the site of the present staircase leading to the north-west demi-bastion.

In January, 1843, Lieutenant Colonel Calder wrote to the Inspector General of Fortifications recommending that ramps be substituted for Rice Jones's flights of stairs. The Brigade Major replied in March:

> As regard the ramps which you propose to substitute for steps of communication on the western front the Inspector General has no objection but he requests your attention to what Lt. Colonel Rice Jones observes upon the subject.[5]

Rice Jones had written in March 1 that:

> The substitution of broad ramps ... for the steps provided for on

> the west front would give more ready access for guns etc. to the rampart but yet seems objectionable from interfering with and curtailing the breadth of the rampart at the flanks.[6]

In the light of Rice Jones' critisms, Calder wrote to the Inspector General on May 22, 1843:

> As regards the ramps proposed in my letter ... I beg to state after a more minute examination of the Western front, I find it practicable to form one of communication with the South West Bastion ... without interfering with the communication along the rampart but to secure the same advantage at the North West Bastion it will be necessary to construct a flight of steps.[7]

Why this should have been so is not made clear. Also, as a result of Rice Jones' observations, Calder probably was induced to round the corners of the area wall of the magazine next the bastion "so as to facilitate the communication along the ramparts by increasing the distance between its parapet and that of the area of the casemates of defence to 20 feet"[8]

Calder's "Estimate for Alteration and Renewals" at the Citadel, which also was submitted on May 22, 1843, contained no specific proposals for, or plans of, the ramp which he proposed to build leading to the southwest demi-bastion. The only clue is provided by a plan of the south magazine which accompanied this estimate. It shows a ramp of about thirteen feet in width, by about fifty feet in length, bounded on its south side by the area wall of the magazine and on its north by an independent retaining wall measuring about fifty feet in length by about two feet in width. This wall was to have run parallel to the area wall of the magazine and was to have extended into the parade area of the fort the same distance. Its rear portion was to have been separated from the projected south wall of casemate 7 by a gap of about four feet.[9] This was not how it was constructed, however. (See figure 15).

The ramp was built in 1847 or 1848, after casemates 7 and 8 had been completed. These two casemates were built somewhat wider than originally designed. Whether this alteration was introduced so that the south wall of casemate 7 could serve as the upper portion of the ramp's retaining wall, or whether the decision to utilize it for this purpose was made after the casemate was completed, is not known. Whatever the case, the wall was so utilized.

The independent ramp retaining wall was never built, though the small granite ramp retaining wall which protrudes into the parade from the southeast corner of casemate 7 may be a remnant of this original design. The latter wall is about twenty feet long, and slopes upwards from a height of two feet five inches at the parade end to a height of nine feet six inches at the point where it joins the corner of casemate 7. The elimination of the independent ramp retaining wall meant that the width of the ramp could be increased from about thirteen feet to about fifteen feet.

Recent excavations on the lower end of the ramp have shown that the inner face of the small granite retaining wall was carefully tooled just like the outer face. This may indicate (since it is unlikely that the Royal Engineers would have gone to the trouble of tooling any stone which would not have been visible) that initially the ground level of the ramp was not intended to rise above the level of the tooled stonework. If this was so, the ramp would have risen quite gently for the first twenty feet or so inwards from the parade, then it would have risen very steeply to the ramparts. There is no documentary evidence to suggest that this was the case, however.

Most plans show two buttresses on the ramp side of the magazines' area wall. If they were built, the first is located about twenty feet in from the parade, the second about twenty feet beyond that. They each measured about four feet square. Since there is no surviving elevation of this wall their height is unknown but obviously they could not have risen above the level of the ramp. Probably the second is somewhat higher than the first.[10]

Whether or not the ground level of the ramp rose to the top of the small granite retaining wall, or did not extend above the level of the tooled stonework, all the available plans agree that the basic design of the ramp was not altered over the next fifteen years.[11] By the late 1850's, however, problems had developed with the ramp's drainage. Water had begun to penetrate from it through the south wall of casemate 7, which at that time was being used as an artillery store. According to the Fortifications Annual Estimates of 1860-61, this was "the case to such an extent as to render the casemate wholly unfitted for its purpose".[12] Consequently, this Estimate contained a proposal to stop the leakage.

It provided for an area wall running parallel to the south wall of casemate 7, with an air space between them measuring one foot six inches. This

wall is six feet high at the end towards the parade, while rising to a height of eleven feet over the next twenty feet or so; then it runs straight back for the remaining thirty feet or so of its length. The wall is topped with a small arch measuring two feet in thickness, which rises to a height of about five feet. A drain was to have run along the bottom of the air space, carrying the leakage to a drain which ran under the parade to the main drain which exited under the redan. The original estimate also provided for three air passage ways to be cut through the pier wall of casemate 7 to the interior of the casemate. According to the original estimate it was planned:

> To excavate for wall and area, and under drain fill in and well ram the same, make good the gravelling on parade, and ramp, and remove the rubbish; to build the wall of area and to build the arch of same on proper centre, on flat bedded ironstone rubble masonry laid dry, and to form drain 9" x 9" in the clear, from area to the existing under drain, at opposite of the parade, (distant 200 feet) with rubble masonry, sides 9" thick, and flagged top and bottom with iron stone flags, the whole to be laid dry, and to have a fall of not less than 1½ inch in 10 feet. The side of the old drain to be opened, and the new properly connected thereto. The wall of the store next the ramp to be perforated with 3 openings 9" x 6" ... for the purpose of ventilation.[13]

Below the above is another hand, someone, probably in the Fortification department in London, wrote: "Suggested that it should be advisable to leave openings in the proposed area for the admission of fresh air."[14] This was probably the origin of the ventilating hole that was cut through at the top of the granite retaining wall where it joins the corner of casemate 7. This hole led to a shaft which ran directly down to the air space that had been formed between the new area wall and the south wall of casemate 7.

The next major alteration in the ramp was an addition to its length so that it protruded into the parade considerably beyond the end of the granite retaining wall. In the process, it probably was built up so that its slope became much more gradual. Whether this alteration was occasioned by the construction of the area wall and ventilating shaft is not known. The first plan which shows an elongated ramp dates from 1879. According to it the ramp at that time extended into the parade about twenty feet beyond the end of the granite retaining wall, angling slightly northwards.[15] By 1891 it had been

extended into the parade a further twenty feet (making forty feet altogether), still curving to the northwards.[16] The reason for this curvature is not clear. Presumably the retaining walls of this elongated ramp consisted of the roughly cut ironstone that is still intact in the portion which remains. Also, at this time, probably additional layers of ironstone were built upon the small granite retaining wall (constructed in the 1840's) so that the ramp could be built higher at this point. The ironstone was laid dry.

The northwards curve of the ramp remained until 1899-1900 when the construction of the brick block necessitated its being shifted southwards. Apparently no further changes were made, and it remained the same width and length. Its walls remained of ironstone laid dry.[17] (See figure 17).

Probably the ramp was shortened to its present length in the early 1940's when a large N.C.O.'s mess was constructed just to the east of the south magazine. This building would have cut into the southwards slopping portion of the ramp.

Endnotes

The Ramp

1. See PRO, S/N 649, MR 957, The Citadel, Fort George, 20 Dec., 1825; PAC, MG 12, W.O. 55, Vol. 863, The Citadel, 7 October, 1828; PRO MPH 486, Plan of Fort George, Citadel Hill, 3 September, 1831; PAC, MG 12, W.O. 44, Vol. 227,"Estimate of the Expense of reconstructing in Masonry and altering and adding to Fort George on Citadel Hill, Halifax," 20 Dec., 1825.
2. Ibid., f. 293, Lieutenant Colonel Boteler, "Estimate No. 1. ... for the completion of Fort George, Item 5. Retaining Wall of Rampart ... Ramp Steps to Rampart and Officers Privy, West Front." End of January, 1833.
3. See Ibid., fols. 354 and 373, Estimates nos. 1 and 2 "for the completion of Fort George ... Item 14. Retaining Walls of Rampart", L. Peake, 12 June, 1833. Peake did include a ramp in his estimate for the retaining wall which he proposed to build round Nicolls' 1812 magazine, however. Ibid., f. 394.
4. PAC, MG 12, W.O. 55, Vol. 863, f. 647, "Revised Estimate for completing the Citadel", Rice Jones, 1 Feb., 1836.
5. PANS, MG 12, R.E. 54, p. 162, E. Matson to Calder, 3 March, 1843.
6. Ibid., p. 163, Rice Jones to Mulcaster, 1 March, 1843.
7. Ibid., p. 168, Calder to Mulcaster, 22 May, 1843.
8. Ibid., p. 168.
9. PAC, MG 12, W.O. 55, Vol. 878, f. 517A, "Estimate of Alterations and Renewals for the Citadel ...", P. D. Calder, 22 May, 1843.
10. Ibid., Vol. 883, f. 856, Ground Plan, Fort George or the Citadel, 30 April, 1849.
11. See, for example, Ibid., f. 856; PAC, At/202 - 1862 Nova Scotia, Plans of Barracks or War Department Propoerty, Fort George or the Citadel, Halifax, N.S., 1862; PAC, H4/250 - Halifax - 1852, Surface Plan of

Fort George the Citadel, 12 April 1852.

12. PAC, RG 8, "C" Series, Vol. 1653A, p. 171, "Fortifications Annual Estimate, 1860-61, Item 3, September, 1859.
13. Ibid., p. 171.
14. Ibid., p. 171.
15. PRO, W.O. 78/2944, "The Citadel, Halifax, Nova Scotia, Plan of Revised Armament," 28 August, 1879.
16. PAC, H4/250 - Halifax - 1891, Halifax, N.S., The Citadel, Fort George, 19 October, 1891.
17. PAC, H4/250 - Halifax, N.S., "Proposed Barrack for 105 men in the Citadel ...", 1 May, 1899.

Ramparts I: Expense Magazine-Narrative

Located in the re-entrant angle of the south front, about 15 feet back from the escarp, is a small building embedded in the ramparts. There is an identical structure in a similar positon on the north front. These were expense magazines, and were built, presumably, in the mid-1860's.

According to an article in the Proceedings of the Royal Artillery Institution of 1860 expense magazines were "much smaller than powder magazines", and were generally meant to contain only made up ammunition, though sometimes "side arms, case shot, etc." were kept there as well. There was supposed to be one expense magazine to a bastion or battery "though this [was] not always the case", and "if possible", they were to be bomb-proof, "but in general they [were] not so."[1]

Probably, the expense magazine in use at the Citadel before the extant permanent structures were built were the moveable variety. For example, one of the questions posed to the 1856 Committee "on the state of the Citadel and Harbour Defences of Halifax" read:

> It having been reported to the Major General Commanding that the Expense Magazines on the Ramparts are a dangerous and cumbersome appendage to a Battery; are there sufficient quantity of water proof rectangular boxes in store to meet the necessary demands of a siege?[2]

The answer read:

> Moveable Expense Magazines were here meant:- expense magazines are, however, very necessary to a fortress, and there should be one to each Bastion or Battery to contain a small supply of made up ammunition - unless constructed of Masonry, they should not be made until a siege is apprehended, as they are usually damp, being excavated under the rampart, if the latter is large enough.[3]

Besides pointing out that the expense magazines in use at the Citadel at that time were portable ones, this answer may perhaps also be taken as evidence

of a dawning recognition amongst the military in Halifax that permanent expense magazines at the Citadel had become necessary.

Nothing further is said by the Committee concerning the type of moveable expense magazine used at the Citadel. They may, however, have been similar to a type of portable magazine described by Major Miller, R.A., in his Equipment of Artillery published in 1864. This type of magazine measured three feet five inches in length, and one foot nine inches in width, with an extreme height of two feet ten inches. It had a sloping lid covered with canvas, and rested on four twelve inch trucks. It weighed 86 pounds.[4]

A letter of May, 1857, from Lieutenant Colonel F. Dick, CRA in Halifax, to Lieutenant Colonel Stotherd, CRE, referred to a proposal for no less than six expense magazines in the Citadel.[5] Since the reference is a brief one, it is not clear what kinds of magazines were intended, however. In his letter Dick argued that the scheme should be postponed, since the recent arrival of artillery stores had made the need for storeroom "much more urgent than for expense magazines."[6] Partially, perhaps, for this reason the scheme seems to have been shelved, and nothing more was heard of it.

The extant expense magazines were first provided for in the Fortifications Estimates for Nova Scotia and New Brunswick of 1861-62, which were submitted to London by Lieutenant Colonel Richard Nelson in October, 1860.[7] Item 3 of the Estimate provided for "two splinter proof Traverse Magazines for the Citadel to contain 52 Barrels each, and is brought forward by the Commanding Royal Engineer as being essentially necessary for the due custody of the ammunition at that fort...".[8] The new magazines were proposed to be "exactly similar" to ones provided for Grand Battery in the Fortifications Estimates of 1860-61. An accompanying plan shows their proposed locations as being the re-entrant angles of the north and south fronts, where the ones now standing are situated.[7] The estimated cost was to be £383 a piece, or a total of £766.

This estimate apparently was approved,[10] but the work was not begun. In November, 1861, Lieutenant Colonel S.P. Westmacott brought the expenditure forward again in the Fortifications Estimates of 1862-63. In doing so he noted that it was "the postponed Item 3 of the Fortifcation annual estimate of 1861-62", and was "again brought forward for authority by order of the Major General Commanding".[11] As before, they were to be built to the same specifications as those brought forward in 1860-61 for Grand Battery, and again they were to cost £766.

The plan that was finally approved for the Citadel expense magazines was somewhat different than that proposed in the 1860-61 Estimate for the expense magazine in Grand Battery. Still, it is clear that it was based upon the earlier plan. Although certain structural features are quite different, the basic configuration of the magazines in the two plans is similar. Also, the actual magazine section in both plans are the exact same length, width, and height.

There is no specific evidence as to precisely when the expense magazines were built at the Citadel, but it may have been in 1863-64, and 1864-65. A detailed plan dated July 7, 1862 still lists them as "proposed", which probably precludes their having been built in that year. Since, however, the plan is an accurate representation of what was actually built, it probably indicates that planning was at an advanced stage by that time.[12] Also, the Army Estimates for 1863-64, and 1864-65, specifically mention sums voted for magazine construction in the Nova Scotia and New Brunswick Command, which may have included sums for the Citadel expense magazines.[13] Nothing more conclusive than this can be said, however.

Structural details and Analysis

The forgoing narrative section dealt generally with both the south and north expense magazines. Although the general statements in the following can, of course, be taken as referring to both, any mention of specific structural features refers only to that in the south. Probably these features are similar in the north expense magazine, but this has not been examined in any detail.

The following information is based upon Corporal Scott's 1862 plan, upon the 1860-61 estimate for the expense magazine in Grand Battery, and upon as found recordings.

Brief Description

The south expense magazine is divided into two separate sections, divided from each other by a partition wall. In front is a relatively narrow porch section , and behind is a much larger magazine section. Originally the whole was fronted by a small courtyard. (See figures 19 and 20).

Foundations

Corporal Scott's plan of 1862 shows the wall foundations as measuring one foot in depth by three feet in width. Since practically all the measurements on this plan correspond with those on the as found drawings, these almost certainly are the dimensions of the foundations of this magazine. Their lengths would be the same as the walls - i.e., 24 feet for the pier wall and about seven feet eight inches for the front, partition, and rear walls.

Walls

The pier walls measured 24 feet in length, by two feet in thickness, and were about six feet in height from the tops of the foundations to the spring of the arches on the inside, and seven feet to the top of the wall on the outside. They were built of bedded rubble iron stone, set in mortar.

The front wall was two feet thick, by seven feet eight inches in length. About three inches in from its western end a doorway was built leading to the porch. It measured two feet six inches in width for a depth of about six inches on the walls' exterior face, and widened to a width of three feet one half inch for a depth of about one foot five and three eights inches on the inner. The exterior face of this wall was lined with chisel draughted granite.

The partition wall between the porch and the magazine measured two feet thick, which together with a brick lining on the magazine side of the wall, made for an overall thickness of two feet six inches. There was a doorway in the middle of this wall measuring two feet seven inches in width for a depth of five and three quarter inches at the porch side, and three feet six inches for a depth of about one foot six inches at the magazine side. To the right of the door as you enter the magazine a small window has been cut through the wall measuring about one foot five inches in width, by about one foot eleven inches in height. It is located about three feet three inches up from the flooring. This opening was not a part of the original construction. It seems to have been built by knocking a hole in the granite and ironstone from the western door jamb to the pier wall, for about two feet in height. Then the window was built and the missing portion of the door jamb filled in with red brick. The window has a double layer of framing on both its porch and magazine sides. That on the porch side is hinged and opens outwards into the porch. This may indicate that the opening was meant to contain a lantern.

There is no evidence indicating when this alteration was carried out.

The rear wall measured one foot six inches in thickness, by seven feet eight inches in length. The brick facing on the interior, however, made the overall thickness measure two feet.

The Courtyard Area

The entrance to the magazine was obtained through a small courtyard outside the porch measuring three feet by eight feet. The courtyard was surrounded by an area wall with the front portion - i.e. that running parallel to the retaining wall - measuring about five feet six inches in height from the bottom of the flooring, by a thickness of one foot six inches. The side walls were of the same thickness and height, and measured four and a half feet in length. They sloped upwards from their northern ends at an angle of about 50 degrees to an additional height of about five feet where they joined a layer of rubble masonry that was built on the top of the pier walls of the porch and magazine sections. These walls were topped by a layer of coping, probably of granite, about six inches thick. Their foundations were one foot six inches thick, and ran one foot deep.

The flooring of this courtyard consisted of a bed of concrete about six inches thick. It was topped probably, by a six inch layer of granite flagging.

Access to the courtyard was via a short flight of five steps. They all measured about nine inches in thickness. The bottom two were three feet in length by about a foot in width. The next three curved outwards towards the area wall. Altogether the steps protruded into the courtyard about four feet, and stood three feet nine inches in height. They were made of granite, resting on a concrete base. Probably these steps were identical to those in the north expense magazine, which are still in place.

The Porch

The porch area measured four feet in length, by seven feet eight inches in width. Most of the masonry in this area is of ironstone.

The present flooring in the porch area is of concrete. This probably is a remnant of the original construction. It may, however, have been covered with a layer of granite about six inches thick, as this was provided for in

the porch area of the expense magazine in the Grand Battery.[14] Also, Corporal Scott's plan shows the flooring in this area as consisting of two layers, with that on top measuring about six inches, and that on the bottom, which would have been the layer of concrete, measuring about nine inches. With the flooring here topped by a six inch layer of granite, the height of the pier walls from it to the springing of the arches would have been about five and a half feet. Since the arch here rises one foot six inches over a seven foot eight inch span, the clearance would have been about seven feet. This corresponds with the measurements on Corporal Scott's plan.

The Magazine

The magazine area measured fourteen feet in length by six feet eight inches in width. The inner faces of the walls here were lined with a facing of red brick, consisting of three courses of stretchers, followed by one of headers. The 1860-61 estimate for Grand Battery called for: "oak wood bricks to be bedded into the walls, at not more than 3 feet apart to receive the wall lining". It also called for: "the walls of magazine and porch including the door jambs to be lined with inch pine wrought one side and edges tongued grooved and beaded [?] and fixed to spruce battens 3" x 1" not more than three feet apart with copper nails to be properly cut and properly trimmed [?] to air plate".[15] Presumably the battens were attached to the oak wood bricks. Probably the Citadel expense magazines were also lined with pine in the manner here described, as the oak wood bricks, to which the battens would have been attached, are still in place. The pine would have been painted "3 coats common colour".[16] Whether or not this covering extended into the porch area, as provided for in Grand Battery, is problematical, since there seems to be wood bricks in place in only one of its walls.

The flooring of the magazine area was built upon a bed of concrete about six inches thick which came up to a level even with the tops of the wall foundations. The wall plates, upon which the floor joists rested, would have measured about six inches by four inches laid broad side down. The joists also would have measured about six inches by four inches, laid standing on end. There would have been twelve such joists, separated from one another by a gap of just under a foot, beneath the flooring of the magazine portions

of the Citadel expense magazines. If similar to those proposed for Grand Battery, these wall plates and joists would have been of oak. Also, the flooring, if similar to that in Grand Battery, would have been one and a half inch oak, laid in six inch widths, "wrought rebated and filletted and laid straight with oak trenails." The estimate for Grand Battery also provided for "skiddings of pine 6" x 3" wrought and chamfered and fixed on floor at each side for barrels."[17]

Concrete

According to the 1860-61 estimate for Grand Battery the concrete used was to be composed of six parts screened gravel and one part cement.

The Doors

There were two doors in the Citadel expense magazines, one leading from the courtyard to the porch, the other from the porch to the magazine.

If similar to Grand Battery the frame for the former was to be of oak measuring four and a half by three inches, "with gun metal tenons to the floor". The door itself was also to be of oak, of two thickness 1¼ inch each, wrought, grooved and put together with copper nails. It was to be hung in stone reveals, by 24 inch hook and eye hinges and fastened with a 22 inch dead shot lock. According to Corporal Scott's plan this was a single panel door made of seven boards standing vertically, each about four inches wide.

The door frame leading to the Magazine was also to be of oak measuring five inches by four inches, wrought, framed, rebated, and chamfered. The door itself was to be of pine, hung with 16 inch HL hinges, and fastened with a 12 inch lock. Corporal Scott's plan shows a door here to be of two panels with five four inch boards standing vertically per panel. Each panel had a cross piece descending diagonally from right to left.

In Grand Battery the outer faces and edges of these doors were to be covered with sheet copper 16 ounces to the foot, and secured with 3/4 inch copper nails.

Ventilation

Originally this expense magazine was to be aired by ventilating passages measuring two feet high by three inches wide cut into the side walls of the courtyard about four feet up from the flooring. These lead back into the walls about five inches where, turning ninety degrees southwards, they ran inside the pier walls for a distance of about four feet. Here they turned another ninety degree angle and exited into the porch area through passages of the same measurements as those in the courtyard. From the porch area ventilating passages were cut through the partition wall on both sides of the door measuring two feet in height by three inches in width. These led to a ventilating chamber measuring about three feet four inches in height by two inches in width which completely circumscribed the magazine behind the red brick facing. The air flowed from here into the magazine through ventilating shafts which were cut into the brick facing at intervals along the wall. These openings measured about three feet four inches in height by three inches in width. There were three of these ventilating holes cut into the facing of the pier walls at intervals of three and a half feet. There was one similar opening cut into the middle of the rear wall. Whether these holes were left open, or whether some kind of perforated ventilating plate was installed is unknown. They were subsequently bricked in. When this was done is unknown, as is the nature of the ventilating system adopted thereafter. Some ventilating holes seem to have been cut through around the windows, however.

Also, there is a further ventilating hole located at the top of the rear wall, which presumably connects with a shaft leading to the roof of the expense magazine. The interior opening of this ventilating shaft is covered with a perforated ventilating plate measuring nine and a quarter inches high by six and a quarter inches wide. Whether this was part of the original construction is unknown, since Corporal Scott's plan does not contain an elevation of this wall. It may possibly, have been cut through when the other ventilating holes in the wall were bricked up.

Arches and Waterproofing

According to Corporal Scott's plan the brick arch was to have been two feet thick. Probably, the mortar in which the bricks were laid was half cement and half sand, as called for in the estimate for Grand Battery,

As found recordings show that the arch over the porch area to rise one foot nine inches over a seven foot eight inch span; that over the magazine one foot six inches over a similar span (not including the brick facings). According to as founds there is about a three inch drop from the top of the former arch, to the top of the latter.

The Estimate for Grand Battery called for the ceilings in these areas to be whitened with two coats of hot lime. There is evidence that this was also done in the Citadel expense magazines.

The roof over the arch was to be formed of rubble masonry, with small flat bedded stones laid in mortar. This was to be coated over with "half cement half sand laid smooth", which in turn was to be covered with a 3/4 inch layer of seyssel asphalte, consisting of two thicknesses, 3/8 of an inch each. The whole of the outer face of the side and end walls as well as the asphalted roof were to be covered with nine inch thick quarry or beach shingle. Corporal Scott's plan shows evidence of this having been planned for the Citadel expense magazines as well. The traverse was then to be finished with sods laid header and stretcher 12 inch and 24 inch alternatively.

Drainage

Drainage represents a problem with this magazine. Corporal Scott's plan shows a drain about six inches square running around the magazine. Presumably a drain cut through the floor of the magazine connected with this. According to Corporal Scott's plan this drain lead out under the front of the magazine to a pipe which sloped down under the terreplein and exited through the retaining wall into a hopper head situated about eleven feet down from the top of the wall. A down pipe was to carry the water to the parade area drainage system. There is, however, no sign of such a hopper head and down pipe on the retaining wall today, nor is there evidence that one ever exited there. There is so sign either of the pipe having been led out through the escarp instead. Therefore, it is unknown where the drain pipe from this expense magazine leads. It is tempting to speculate that the builders in fact connected it with the drainage system of casemates 5 and 6, which lie not very far below. There is no documentary evidence for this having been done, however. Another possibility is that the void which has been discovered behind the retaining wall to the east of sallyport 2 is somehow connected with the drainage from this magazine. This

remains to be explored.

Terreplein and Traverse

According to Corporal Scott's plan the expense magazine were to have been built five feet beneath the level of the terreplein.

For the configuration of the traverse See figure 21.

Ramparts II: Flagstaves

One of the most striking features of Lieutenant Colonel Hicks' sketches of the fort which stood on Citadel Hill in 1781 was a large British ensign flying over it. By 1829 the largest size flag proposed for the Citadel measured, according to Colonel Nicolls, thirty feet by nineteen feet. That which flew over the early Citadel appears to have been at least this large. Its stave stood on the eastern side of the central tower or blockhouse.

A plan sent to London by Nicolls in 1831 identified the location of three staves in the Citadel - a telegraph stave and a signal stave on the parade next the east front, just south of what was to become the north reentrant angle of the redan, and a flagstave in the middle of the west curtain rampart. Whether these staves were survivors from an earlier fort or whether they had been put up when work begun on the present Citadel in 1828 is unknown. Probably the former. Whatever the case the plan noted that they were to be moved - the two signal staves to the southeast front and the flagstave to the southwest front.[18] The signal staves may have been moved shortly thereafter, but the flag stave seems to have remained in the old location until about 1839, as a sketch of the Citadel by William Eager of that date, shows it in place there.[19] Another sketch of the Citadel by Col. Mercer, dated August, 1840, however, shows clearly that it was in place on the southwest front by then. (See figure 22).

In the letter of 1820 referred to above Nicolls proposed three sizes of British ensigns for the Citadel.

Large	-	30 x 16 feet
Medium	-	20 x 10 feet
Small or Jack	-	8 x 4 feet[20]

Whether Nicholls meant all these flags to be flown at once, or whether he meant them to be kept in store and flown at appropriate occasions is unclear. Probably he meant the latter. A number of sketches of the Citadel form the early 1840's show only one flag flying. They appear to have been either the medium (twenty feet by ten feet) or the Jack (eight feet by four feet) varieties.[21]

The flag stave remained in the south-west corner of the fort throughout most of the British period. A photograph dated 1879 clearly shows it in place about ten feet to the north of the stairwell leading down to casemate 51 and 52. (See figure 23). Also, it can be seen rising up above the ramparts in another photograph, dated 1880, looking south along the west curtain wall towards the flanking wall of the south west demi-bastion. The flag in the photograph appears to have been the small size ensign, or Jack. In July, 1889, the Commander of the Troops in Halifax, Colonel J. C. Goldie, wrote to the Inspector General of Fortifications, that there were three flagstaves in the Citadel"... all on the South Front, one [i.e. that on the southwest front] is used simply for hoisting the ensign daily, or, on the prescribed day, the Royal Standard. The other two [i.e. or the southeast front] are used for signalling ships and for hoisting storm signals. They are also landmarks for shipping."[22]

A plan dated 1891 shows the flagstaff in the southwest demi-bastion as still in place. However, an aerial photograph of the Citadel dated 1923 shows that by then it had been removed. Precisely when or why this was done is not known. Perhaps, though, it had simply become rotted and unsafe and the expense of replacing it was not considered worthwhile. The remains of its base could still be seen embedded in the ramparts before the pile of earth which is there now began to accumulate. Probably after the stave's removal the flag was flown from one of the signal masts on the Southeast front.

Ramparts III: Chimnies

There are three chimnies on the southwest rampart: two over the pier walls of casemate 51 and 52, and another above the party wall of casemates 5 and 6.

That over casemate 51 is set back twenty-three feet from the face of the escarp, and that over casemate 52 about nineteen feet. (The latter is actually

farther south, but the escarp here slopes slightly northwards.)[23] These probably were not the original sites of the chimnies over these casemates, however. Plans which accompanied Savage's 1849 staunching estimate, for example, show these chimnies as set back from the escarp a distance of about ten feet.[24] (See figure 5). Plans of the Citadel from 1852 and 1862 also show the chimnies over both casemates 51 and 52 as set back ten feet from the escarp.[25] Yet a photograph dated ca. 1875 clearly shows them in their present position, set further back. (See figure 24). Therefore, sometime over the previous thirteen years they had been moved back from ten to thirteen feet. In the process, they were moved eastwards as well.

There is no documentary evidence showing when or why this alteraiton was carried out. The only answer which occurs to the author is that it was done in the late 1860's (probably about 1868) when the new ironstone embrasure was built just to the east of the southwest salient, and a 7-inch Armstrong gun installed.[26] Probably the chimney over casemate 52, if left in its old position, would have been in the line of fire of this gun. Why the chimney over casemate 51 also was moved remains a mystery; unless it had something to do with some contemplated alteration (evidence of which has not survived) in the 32-pounder gun position which stood next to it.

According to Savage's 1849 staunching plans the original chimnies serving these casemates rose directly over their respective pier walls, to a height of about 10 feet above the tops of the casemates.[27] They emerged over the exterior slope of the rampart by about two feet in front, and about a foot and a half in back. They were capped by a granite chimney block measuring about seven or eight inches in thickness. They may also have had circular chimney pots, as shown in photograph(ca. 1875) of the chimnies over casemates 57 and 58 in the northwest demi-bastion. (See figure 25). The flues would have sloped southwards from the fire places above the pier walls a distance of about sixteen feet (the location of the fireplace in Savage's drawing of casemate 52 is inaccurate) before ascending upwards.

The chimney which now serves casemate 52 emerges above the rampart about two feet eastwards of its pier wall, that serving casemate 51 about six feet eastwards of its pier wall. Their flues, therefore, would slope upwards from the fireplaces in a southeasterly direction - casemate 52's southwards for about

seven feet three inches, and eastwards for about four feet three inches; casemate 51's southwards for about five feet three inches and eastwards for about eight feet three inches. (See figure 8) Their total heights from the tops of the fireplaces is about twenty-eight feet.

The chimney over casemates 5 and 6 is set back twenty-three feet from the face of the escarp. It rises to a height of about twenty feet above the fireplace in casemate 5 and emerges above the ramparts about five feet to the east of this fireplace. The flue, therefore, would slope in an eastward direction. There is no evidence that the position of this chimney was ever changed. The ca. 1875 photograph of the south front, however, shows that originally it was much higher than it is now. It probably rose to the same height above the ramparts as those over casemate 51 and 52. (See figure 24) When or why it was cut down to its present height is not known.

Endnotes

Ramparts

1. Minutes of the Proceedings of the Royal Artillery Institution, 1858-61, p. 98.
2. PAC, MG 12, W.O. 55, Vol. 1558(7), f. 19, "Report of the Committee on the State of the Citadel and Harbour Defences of Halifax ...", 5 May, 1856.
3. Ibid., f. 19.
4. Major Miller, R.A., Equipment of Artillery, (London, Longman's and Co. 1864), p. 415.
5. PAC, RG 8, "C" Series, Vol. 1669, pp. 259-60, Lt. Col. F. Dick to Lt. Col. R. Stotherd, 30 May, 1857.
6. Ibid., p. 210.
7. Ibid., Vol. 1653A, p. 239, "Fortifications, Report and Estimate of Works and Repairs ... in the year 1861-62", Lt. Col. R. Nelson, 24 October, 1860.
8. Ibid., p. 239.
9. Ibid., p. 240.
10. See Ibid., Vol. 1650, p. 267, T. Foster for IGF to the CRE, Nova Scotia, 21 January, 1861; and Ibid., pp. 218-219, Col. A. Benn (CRA) to Asst. Quarter Master General, 16 February, 1861.
11. Ibid., Vol. 1653A, p. 268, "Fortifications, Nova Scotia and New Brunswick in the year 1862-63", Lt. Col. S. P. Westmacott, 22 November, 1861.
12. PAC, National Map Collection, H4/250 - Halifax - 1860, "Citadel, Plan Sections of Proposed New Splinter Proof Magazines in Traverses, 54 barrels", Drawn by J. [?] M. Scott, Corporal, R.E., 7 July, 1860. Doubtlessly, the reference to "54 barrels" is a copyist's error. They were meant to contain 52 barrels each, or a total of 104 barrels.
13. Parliamentary Papers, Gret Britain, Army Estimates, 1863-64, Vote 14, Old War Office Library, Whitehall, Great Britain.

14. PAC, RG 8, "C" Series, Vol. 1653, p. 180, "Fortifications, Estimate for Nova Scotia and New Brunswick, 1860-61", Item 8.
15. Ibid., pp. 180-183, emphasis in original.
16. Ibid., p. 186.
17. Ibid., p. 182.
18. PAC, MG 12, W.O. 55, Vol. 872, f. 330, "Plan of Fort George, Citadel Hill ...", G. Nicolls, 3 September, 1831, Lieutenant Sykes, 15 Dec., 1835 . It should be noted that the copy of this plan actually dates from December, 1835. The notes concerning the flag and signal staves were taken as dating from the earlier year because all the writing on the plan of that date is in the same distinctive print. It was common practice, until the late 1830's, to use Nicolls' earlier plans, with overlays, to show proposed changes in the design of the Citadel. The September, 1831 plan was also used by Boteler in April, 1832, to indicate alterations which he proposed in the fortress. It contained the same note concerning flag and signal staves. PRO, S/N 650, MPH 486, "Plan of Fort George, Citadel Hill ...", 3 September, 1831. [R. Boteler, 19 April, 1832].
19. Toronto Public Library, "Halifax from the Red Mill, Dartmouth", William Eager, ca. 1839.
20. PANS, MG 12, RG 8, p. 112, Nicolls to General Mann, 31 October, 1829.
21. PAC, Photograph Collection, Neg. C - 13722, "Citadel and common from Cogwell's Barn...", Col. Mercer, 21 August, 1840; Neg. C - 13718, "Halifax Citadel and Common from the Road," Col. Mercer, 5 July, 1841.
22. PAC, RG 8, "C" Series, Vol. 1875, Col. J. C. Goldie to IGF, 8 July, 1889.
23. As found drawings, Set C, Top of Wall, Southwest demi-bastion, Project Office, Halifax Defence Complex.
24. PAC, MG 12, W.O. 55, "Halifax, Nova Scotia, Fort George or the Citadel. Plan Shewing the mode proposed for staunching the leakage in the arches of the Casemates", Drawing Nos. 2 and 3, 30 April, 1849, fols. 857, 858.
25. PAC, H4/250- Halifax - 1852, Surface Plan of Fort George or the Citadel, 12 April, 1852; PAC, At/202 - 1862 - Nova Scotia, Plans of Barracks or War Department Property, "Fort George or the Citadel, Halifax, N.S.", 1862. It should be noted that the remains of the chimnies over casemates 57 and 58 in the northwest demi-bastion which, as has been seen, were built similarly to casemates 51 and 52, are both set back about 10 feet

from the face of the escarp.

26. See Johnston, "Ordnance", pp. 114-122.

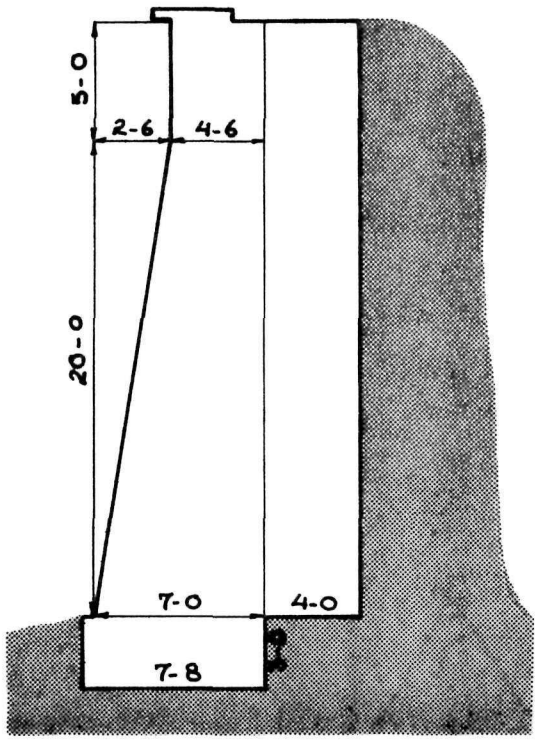
27. "Plan Shewing the mode proposed for staunching the leakage in the arches of the casemates". Drawing No. 2, 30 April, 1849, f. 858.

28. As found drawings, Set C, casemate 5, Project Office, Halifax Defence Complex.

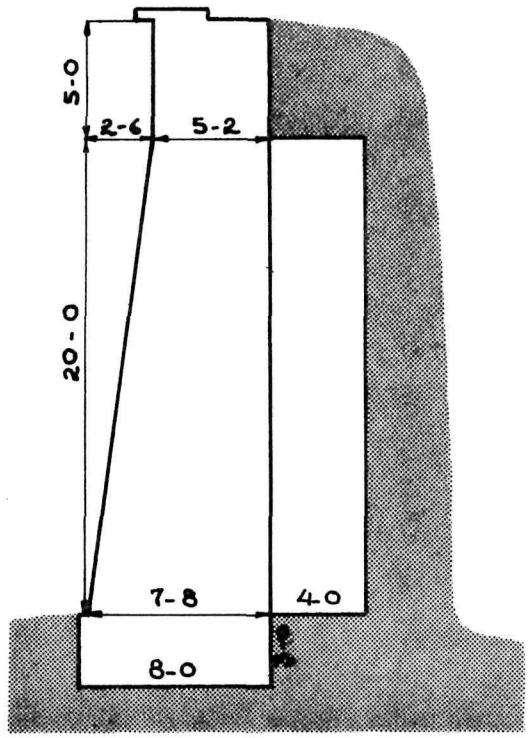
Figure 1

Escarp profile, southwest front, as built by Flinn in 1829 and by Metzler in 1830. Flinn's work extended one hundred and eleven feet, nine inches eastwards from the southwest salient angle; Metzler's from where Flinn's left off to the south sallyport and beyond. In 1833 the first sixty-three feet of Flinn's work was torn down and rebuilt the next year with thicker dimensions (See figure 2). This left forty-eight feet of Flinn's work standing (ie. the escarp in front of casemates 51 and 52).

Source: Halifax Defence Complex.



Dimensions of Escarp
built by Flinn in 1829

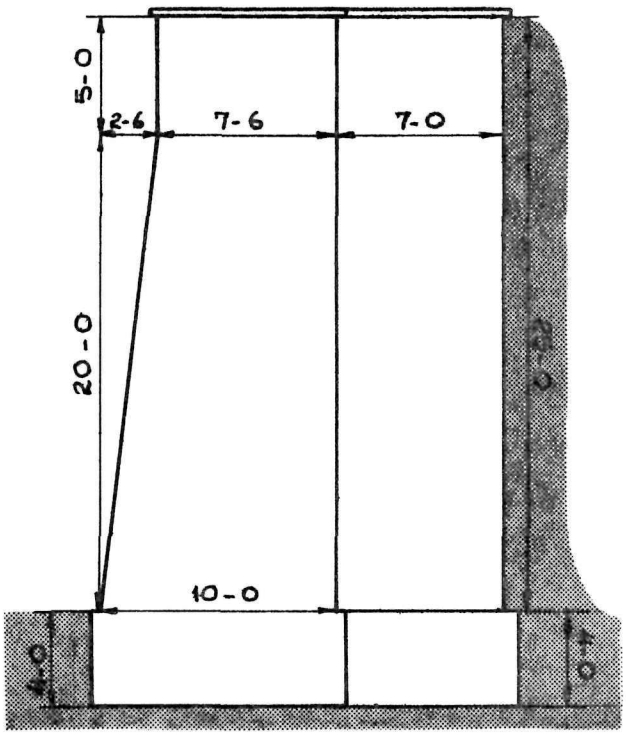


Dimensions of Escarp
built by Metzler in 1830

Figure 2

This shows the dimensions of the escarp, southwest front, which was rebuilt by Rice Jones in 1834 (ie. approximately sixty-three feet eastwards from the salient angle). Note the nature of the coping.

Source: Halifax Defence Complex



Dimensions of Escarp rebuilt by Lieutenant Colonel Rice Jones in 1834

Figure 3

The southwest escarp 1978. This shows clearly the larger stones in the portion of the escarp which was rebuilt by Rice Jones in 1834 (above and to the left of casemate 52's gun port), and the smaller ones in the part built by Flinn in 1829 (below and to the right of the gun port).

Source: Halifax Defence Complex

Figure 4

Ground Plan of Citadel (1828). This shows the design of the Citadel as proposed by Nicolls in October 1821. Note the steps leading to the ramparts of the southwest demi-bastion roughly in the area of the present ramp. Note the position of the casemates of defence under the ramparts, and the design of the steps leading to those in the southwest demi-bastion.

Source: Public Record Office

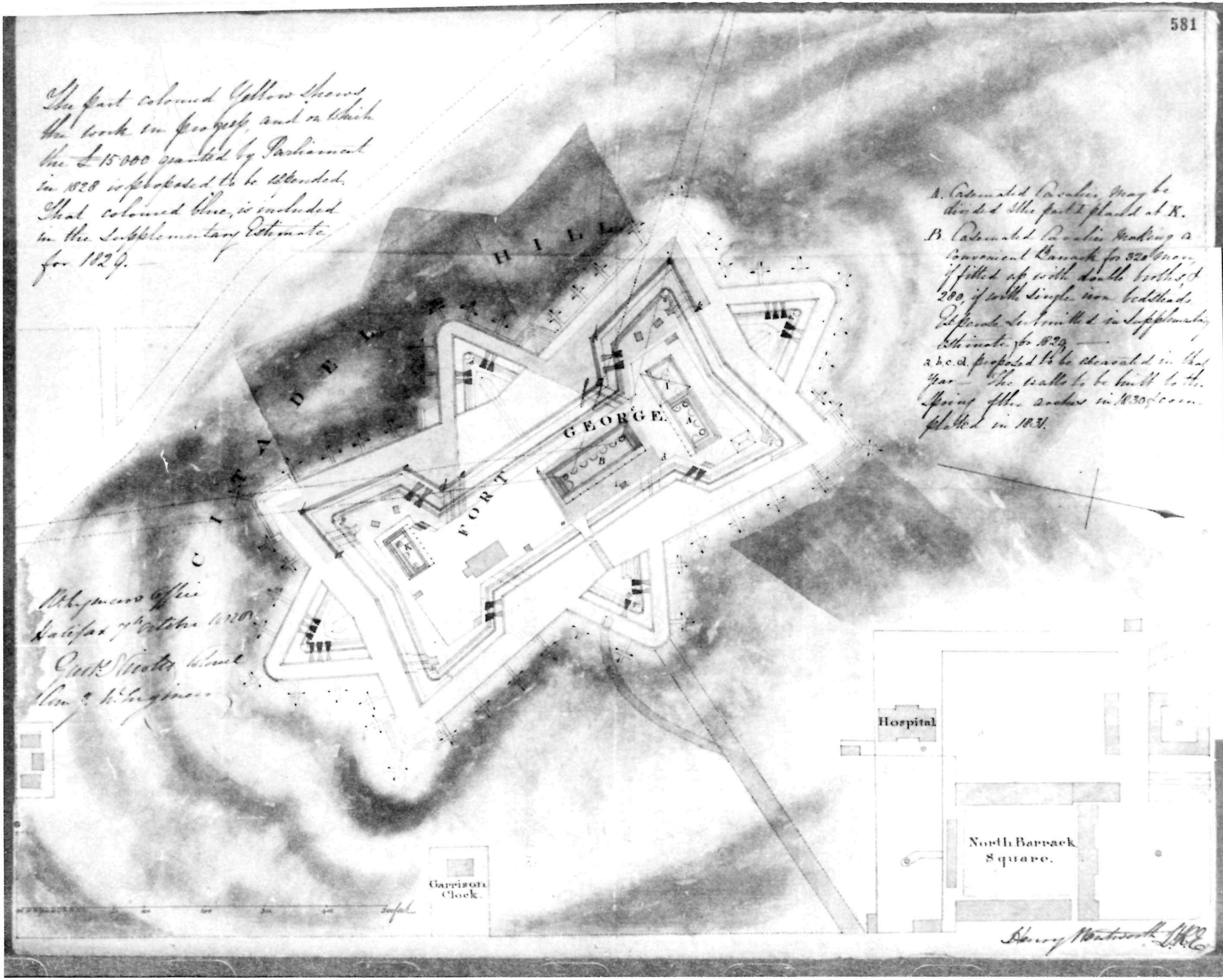

581
The part coloured Yellow shows the work in progress, and on which the £15.000 granted by Parliament in 1828 is proposed to be expended. That coloured blue, is included in the Supplementary Estimate for 1829.
CITADEL HILL
FORT GEORGE
A. Casemated Cavalier may be divided at the part marked at K.
B. Casemated Cavalier making a convenient Barrack for 320 men if fitted up with double berths, & 280, if with single iron bedsteads. Estimate submitted in Supplementary Estimate for 1829.
a.b.c.d. proposed to be excavated in that year. The walls to be built to the spring of the arches in 1830 & completed in 1831.
Hospital
North Barrack Square.
Garrison Clock.

Figure 5

"Sections ... showing the mode proposed for staunching the leakage in the Arches of the casemates ...," No. 4, (1849). This is the only surviving plan containing any detail of either of the casemates of defence, southwest demi-bastion, from the Citadel's early days. It shows the western pier wall of casemate 52. Note the valley between the arches of these two casemates drawn in in dotted lines, leading through the retaining wall to a gargoyle (not shown) on the face. An X is drawn through the exit through the retaining wall showing that Savage proposed to block it up. Note also the hipping which Savage proposed to build drawn in in dotted lines. The down pipe was not built in the position shown; rather it was positioned against the pier wall in the middle of the casemate. This plan also shows the position of the original chimney above the casemate. (The position of the fireplace is inaccurate, however). It also probably provides some clues as to the structure of the original flooring.

Source: Public Record Office

FIG. 4

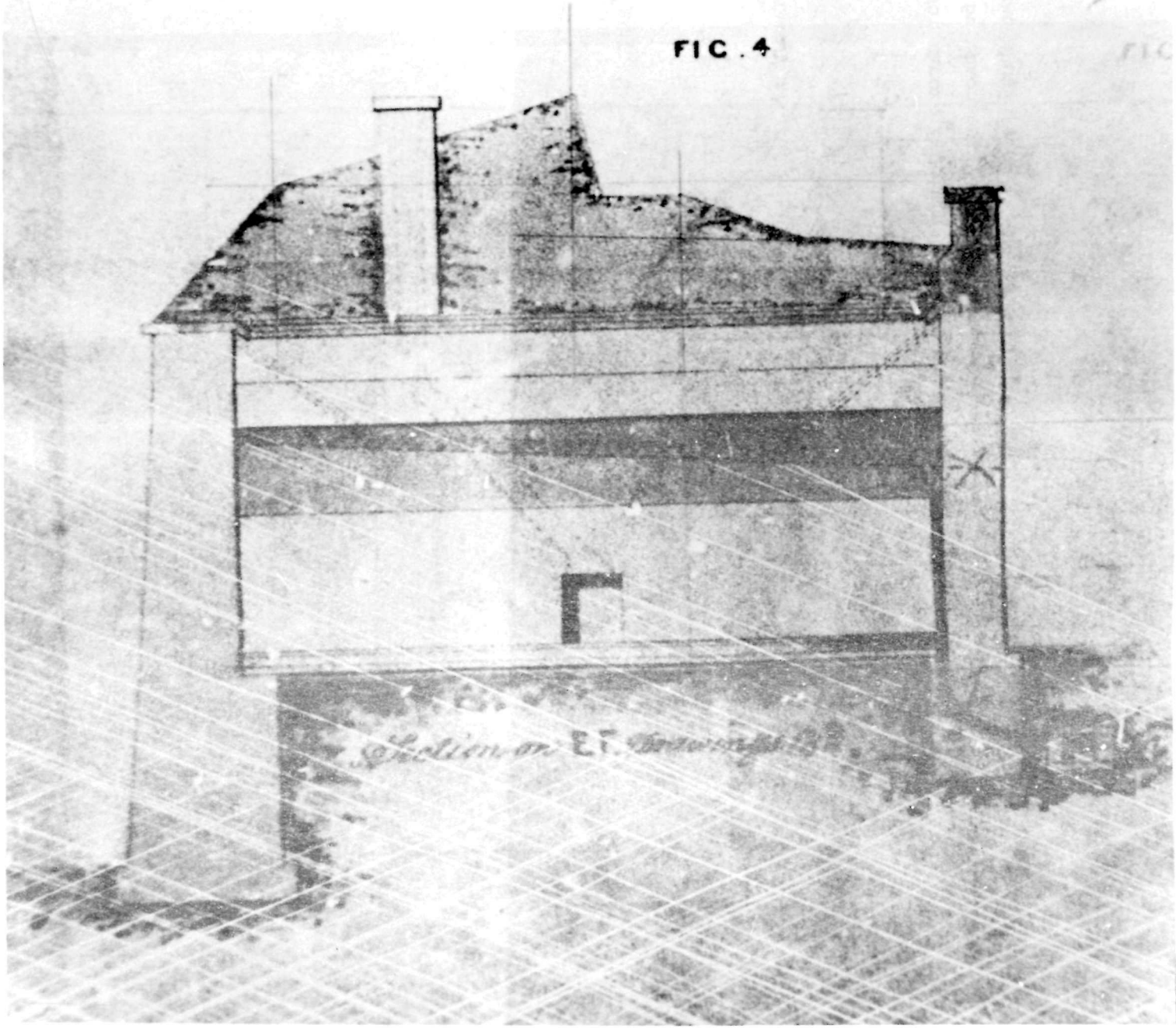


Figure 6

A sketch of the covering of casemates with asphalte (1854). This plan shows the final recorded staunching plan for the Citadel casemates. The covering over casemates 51 and 52 may be like that shown here, though only excavation will tell for sure.

Source: Public Record Office

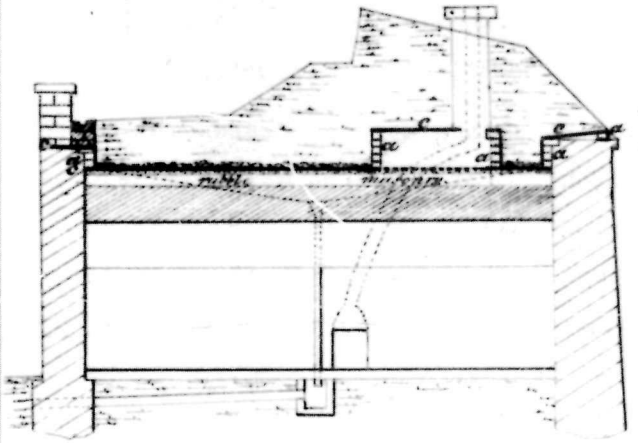
To accompany C.W.D. Report 22 599
dated 12th June 1856

496

FORT GEORGE
HALIFAX. N.S.

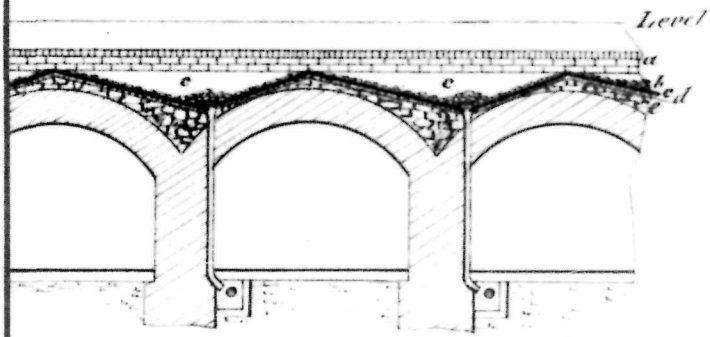
A Sketch of the covering of Casemates with Asphalte.

Section on AB.

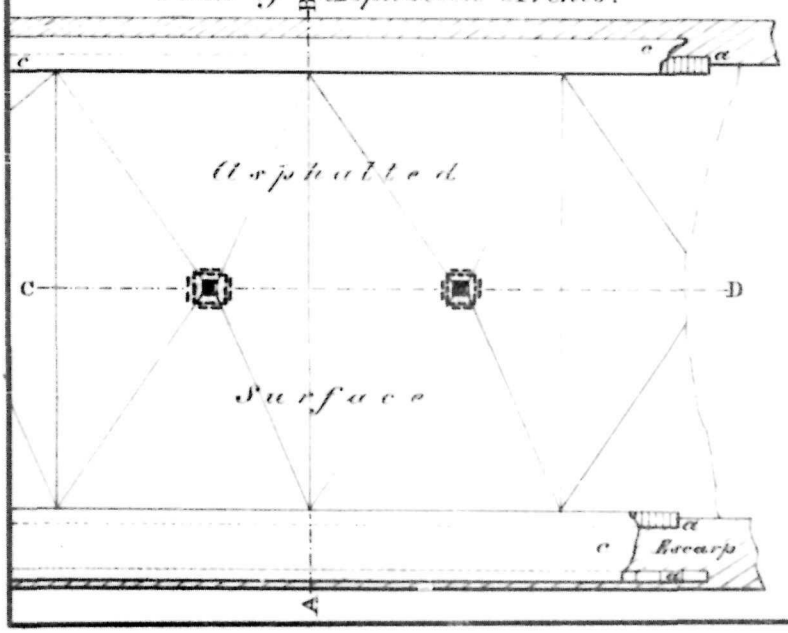


a. Asphalted Bricks.
b. Coarse Shingle.
c. Asphalte.
d. Concrete.
e. Rubble Masonry.

Section on CD.



Plan of Asphalted Arches.



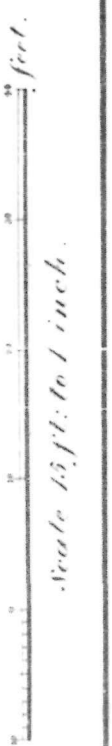


Figure 7

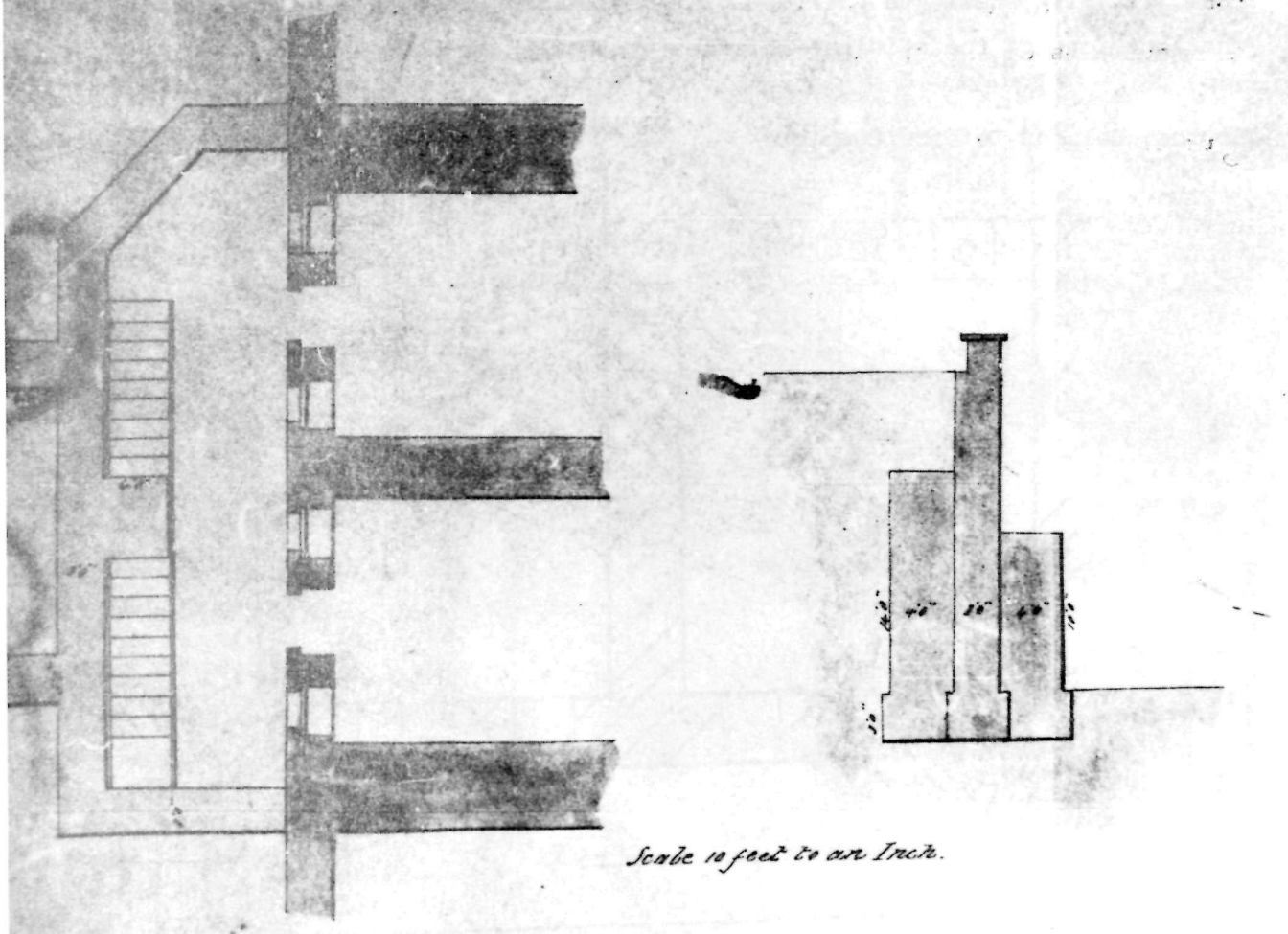
"Plan and Section of Proposed Retaining Wall ... casemates of Defence, N.W. Bastion ...." (1843) The structure of the area wall of the casemates of defence, southwest demi-bastion, may be similar, with some variation in measurement, to that shown here. If there was an interior buttress built for that in the southwest demi-bastion, it may be covered by the granite staircase. Note the structure of the casemates' doors and windows.

Source: Public Record Office

Plan and Section of the proposed retaining wall of the Area of the Casemates of Bligh's S.W. Bastion. the Steps to be of wood as in the S.W. Bastion.

Item 18.

To accompany Estimate dated, 22. May



Scale 10 feet to an Inch.

Bern.d Whittingham L.t R.E.

Figure 8

Casemates of Defence, southwest demi-bastion, and area way. This drawing shows the alteration which was carried out in the area wall sometime before 1891. It also shows the position of the original drain in the area way, and the locations of the original chimnies above the casemates.

Source: Halifax Defence Complex

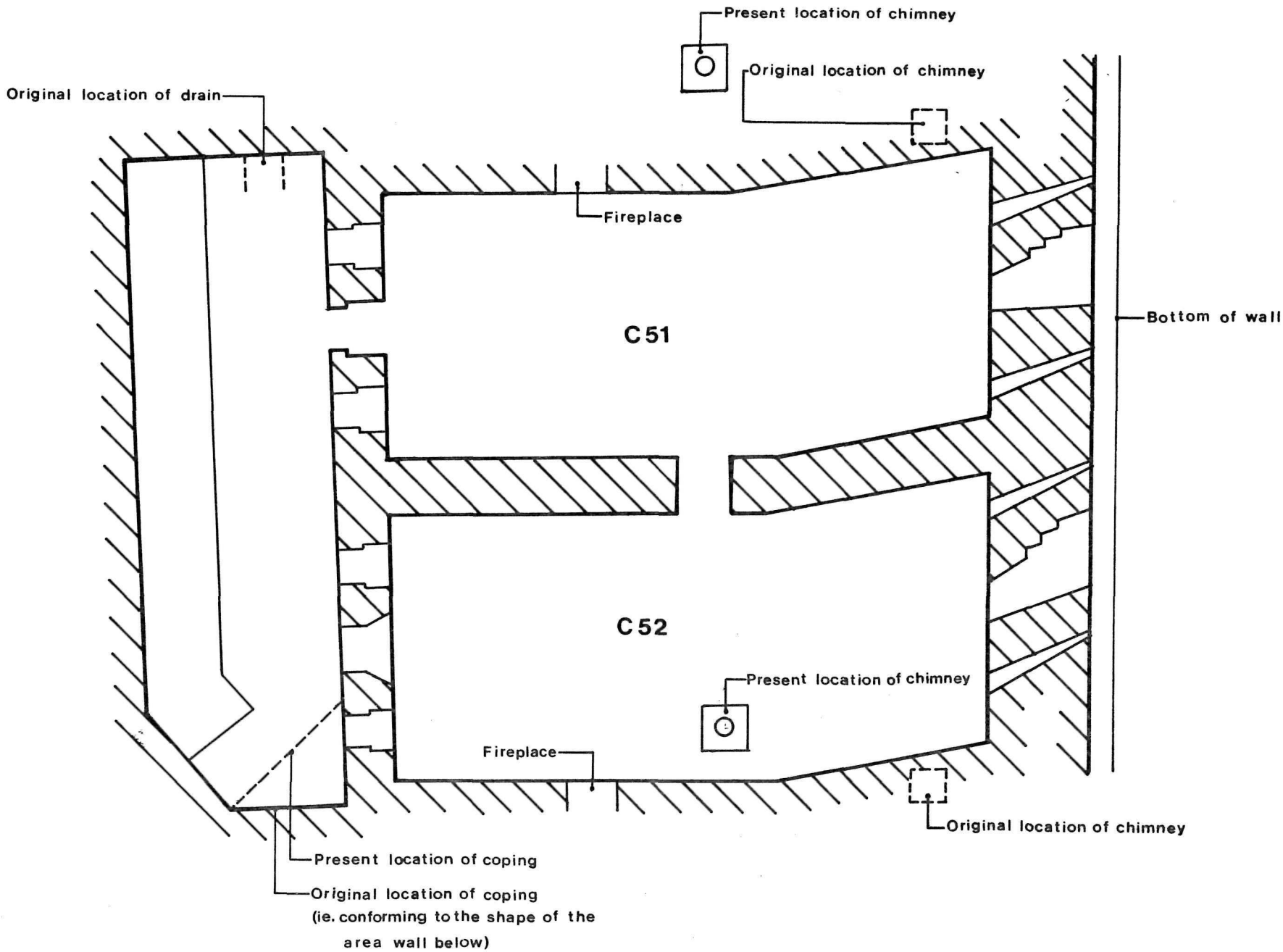

Present location of chimney
Original location of chimney
Original location of drain
Fireplace
Bottom of wall
C51
C52
Present location of chimney
Fireplace
Original location of chimney
Present location of coping
Original location of coping
(ie. conforming to the shape of the
area wall below)

Figure 9

"Sections ... shewing Casemates Flagged Hipped and Piped...." (1848) This was the staunching systems adapted by Lieutenant Colonel Calder for casemates 5 and 6. Note the hipping on either ends of the dos d'anes and the sloping drain leading to the down pipe. The down pipe was built inside the pier and party walls.

Source: Public Record Office

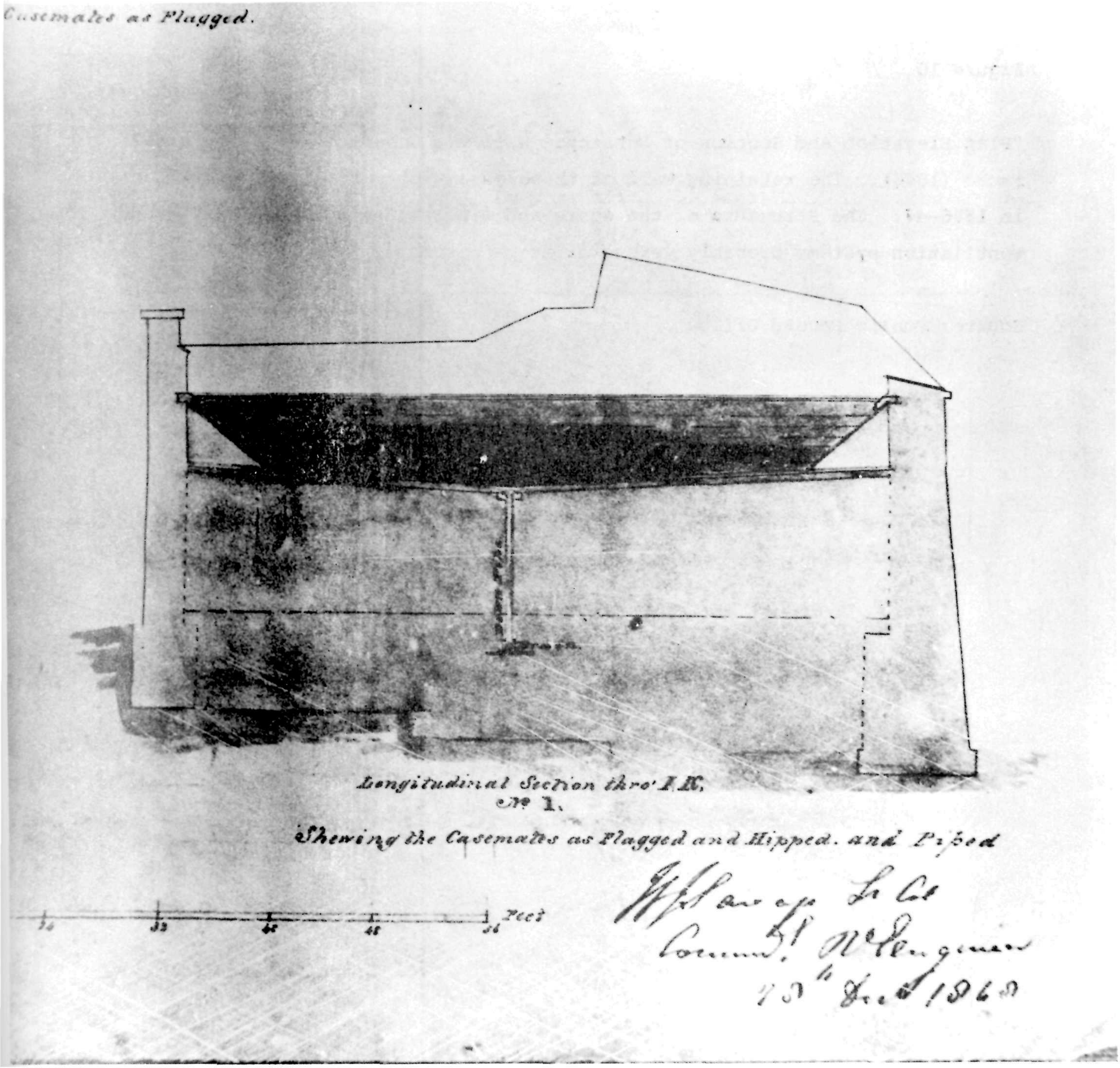

Casemates as Flagged.
Longitudinal Section thro' I K.
No 1.
Shewing the Casemates as Flagged and Hipped. and Piped
32
40
48
56
Feet

Figure 10

"Plan Elevation and Section of Retaining Wall ... Casemates of Defence West Face" (1846). The retaining wall of these casemates was rebuilt by Calder in 1846-47. The structure of the doors and windows and of the flooring and ventilation systems probably were similar in casemates 5 and 6.

Source: Public Record Office

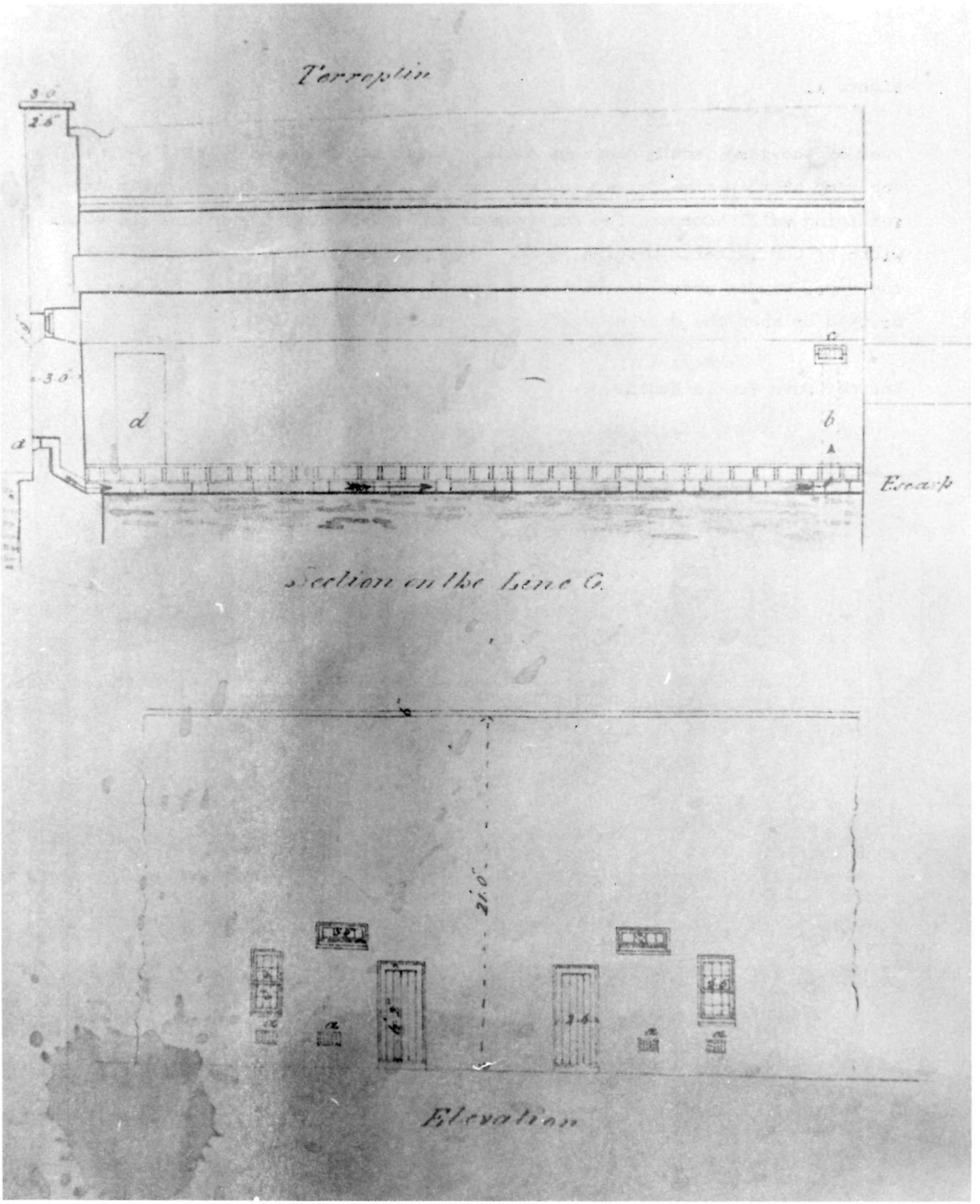

Terraplein
3.0
2.6
3.0
d
c
b
A
a
Escarp
Section on the Line C.
21.6
Elevation

Figure 11

View of the ramp, south magazine and southwest retaining wall (1928). The ramp at this time curved southwards. Note the ironstone masonry in its retaining wall. Compare the doorways of casemates 5 and 6 and note the extra width of the latter. Originally they were the same width. Note also that the upper window above casemate 6 was still intact at this time. It was bricked up when the doorway was further enlarged in the 1950s.

Source: Nova Scotia Museum

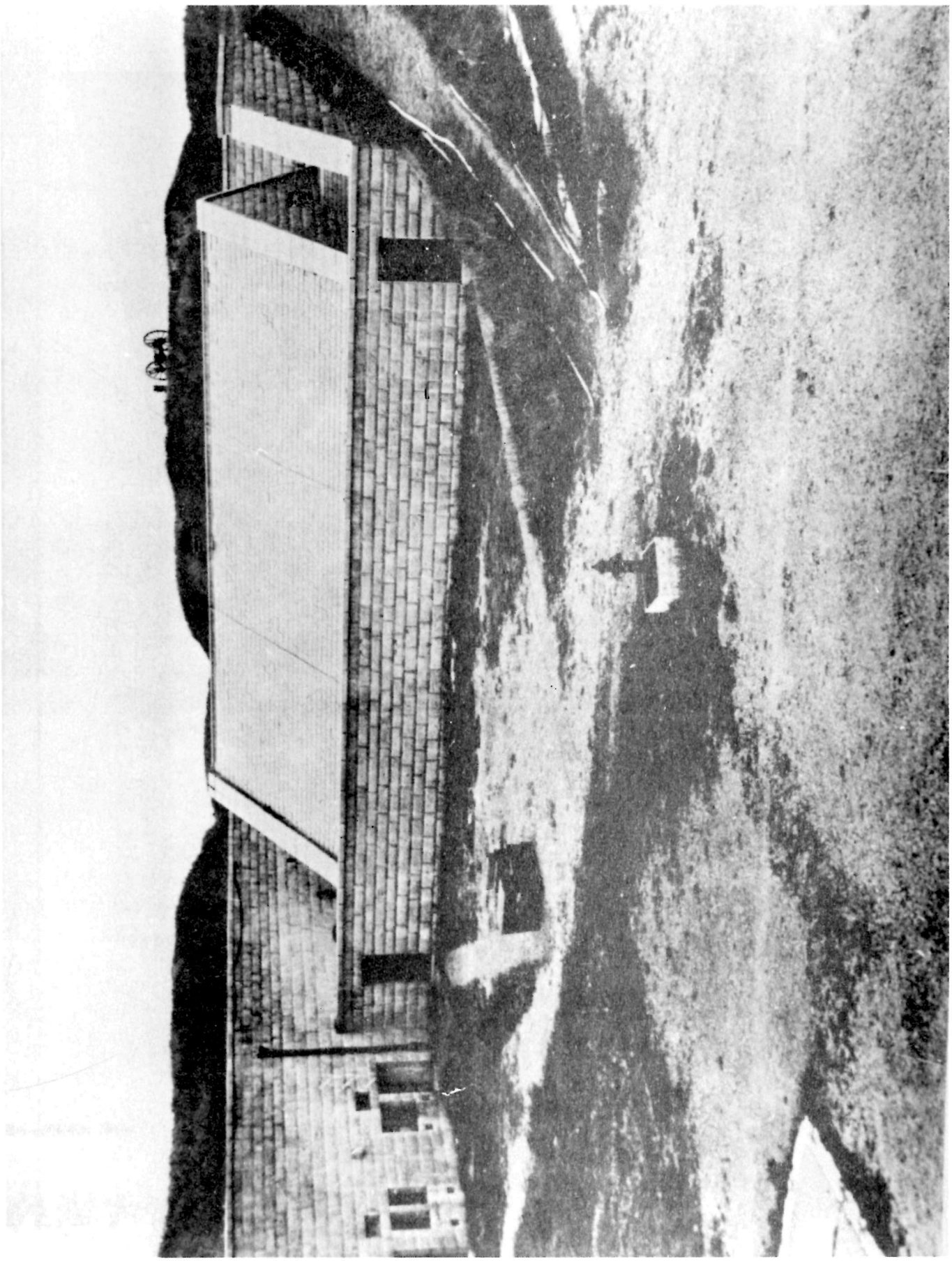


Figure 12

The southwest retaining wall today. (1978). The doorway leading to casemate 6 was enlarged to the extent shown here in the 1950s. In the process the upper window was cut into, and the rest bricked in. This alteration also eliminated about one half the casemate's eastern window, and its western-most ventilating passage.

Source: Halifax Defence Complex

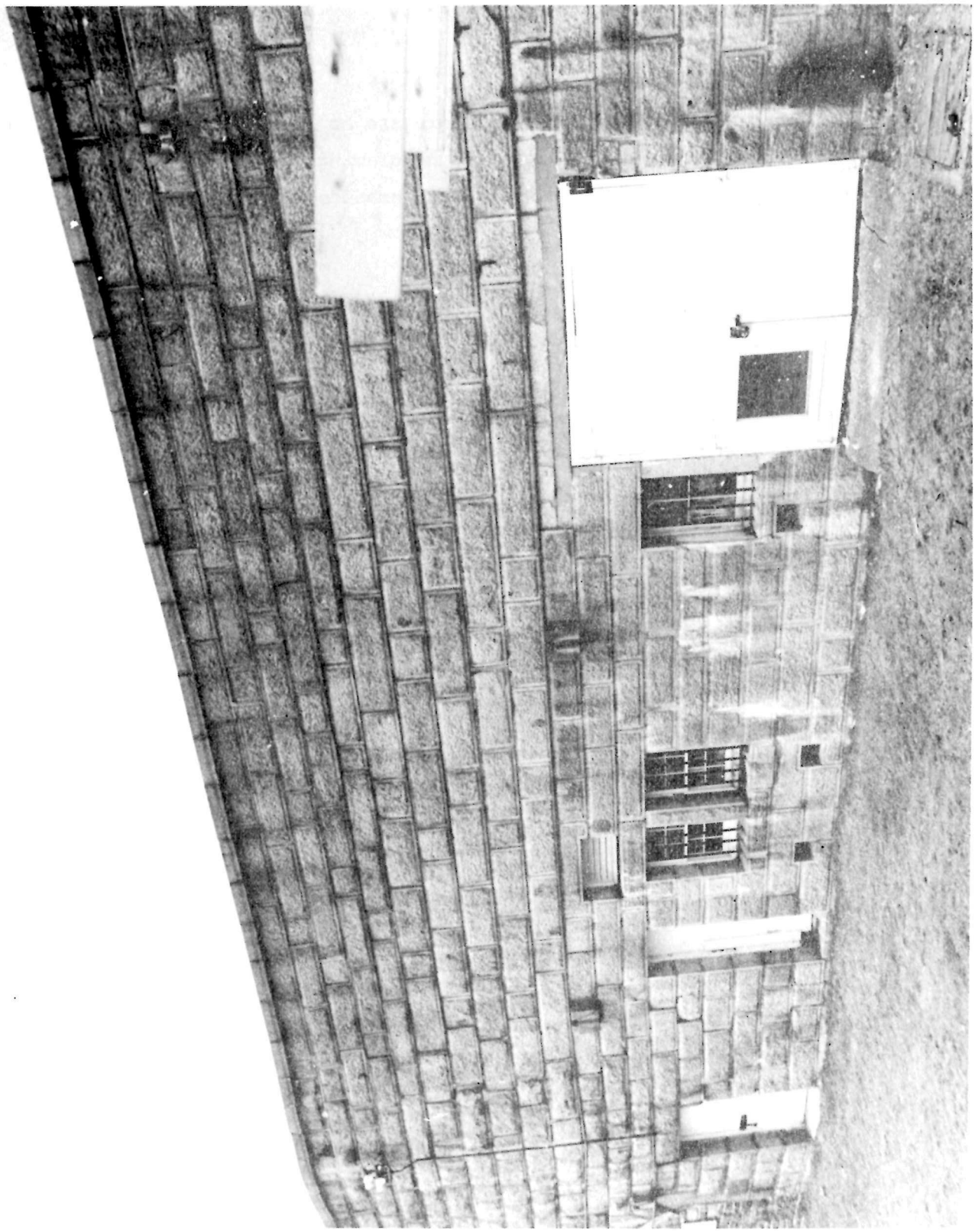
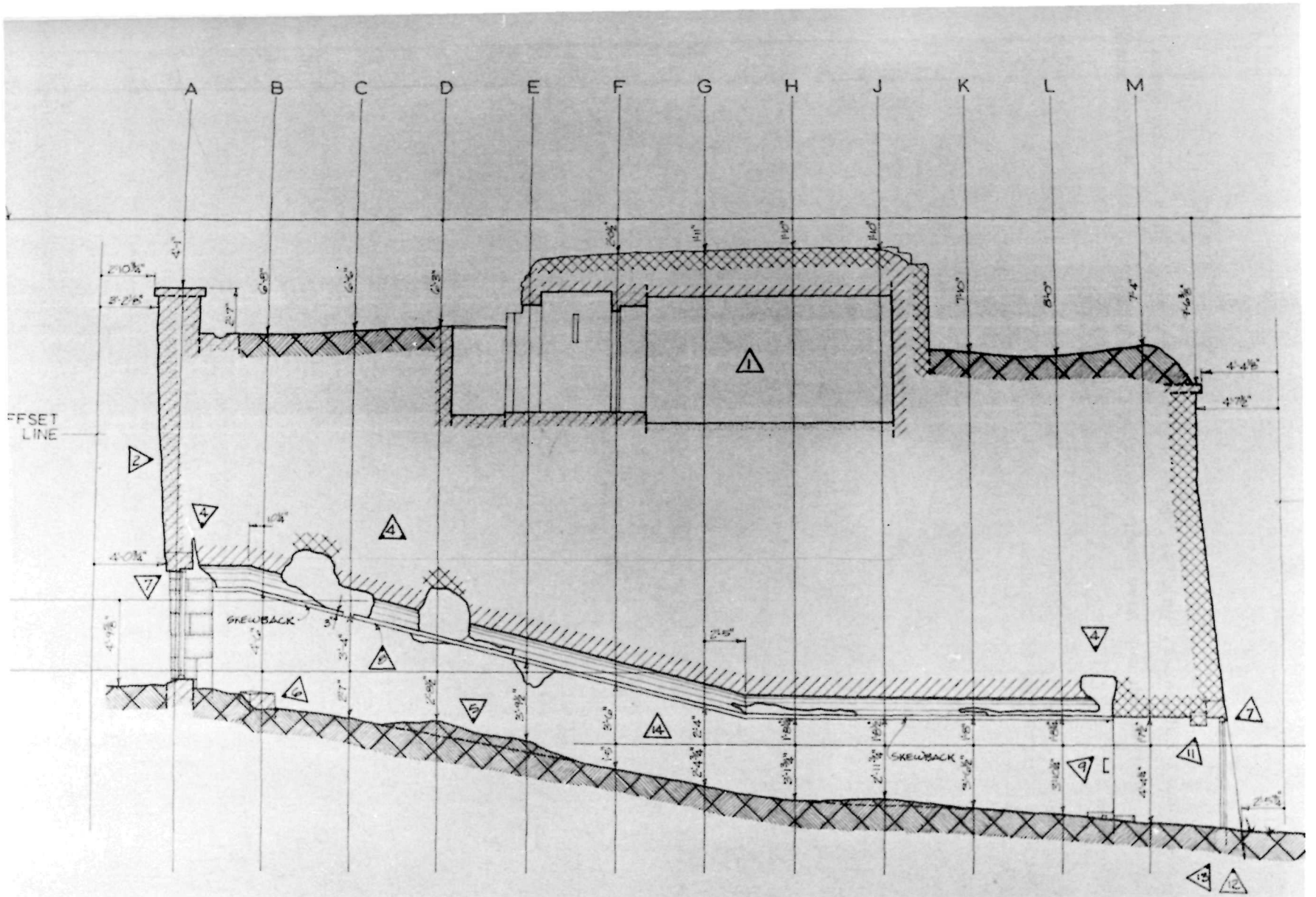


Figure 13

As found record, south sallyport. There are no surviving early plans of the south sallyport as built. This as found drawing shows the sallyport as it stands today. Note the expense magazine embedded in the ramparts above.

Source: Halifax Defence Complex



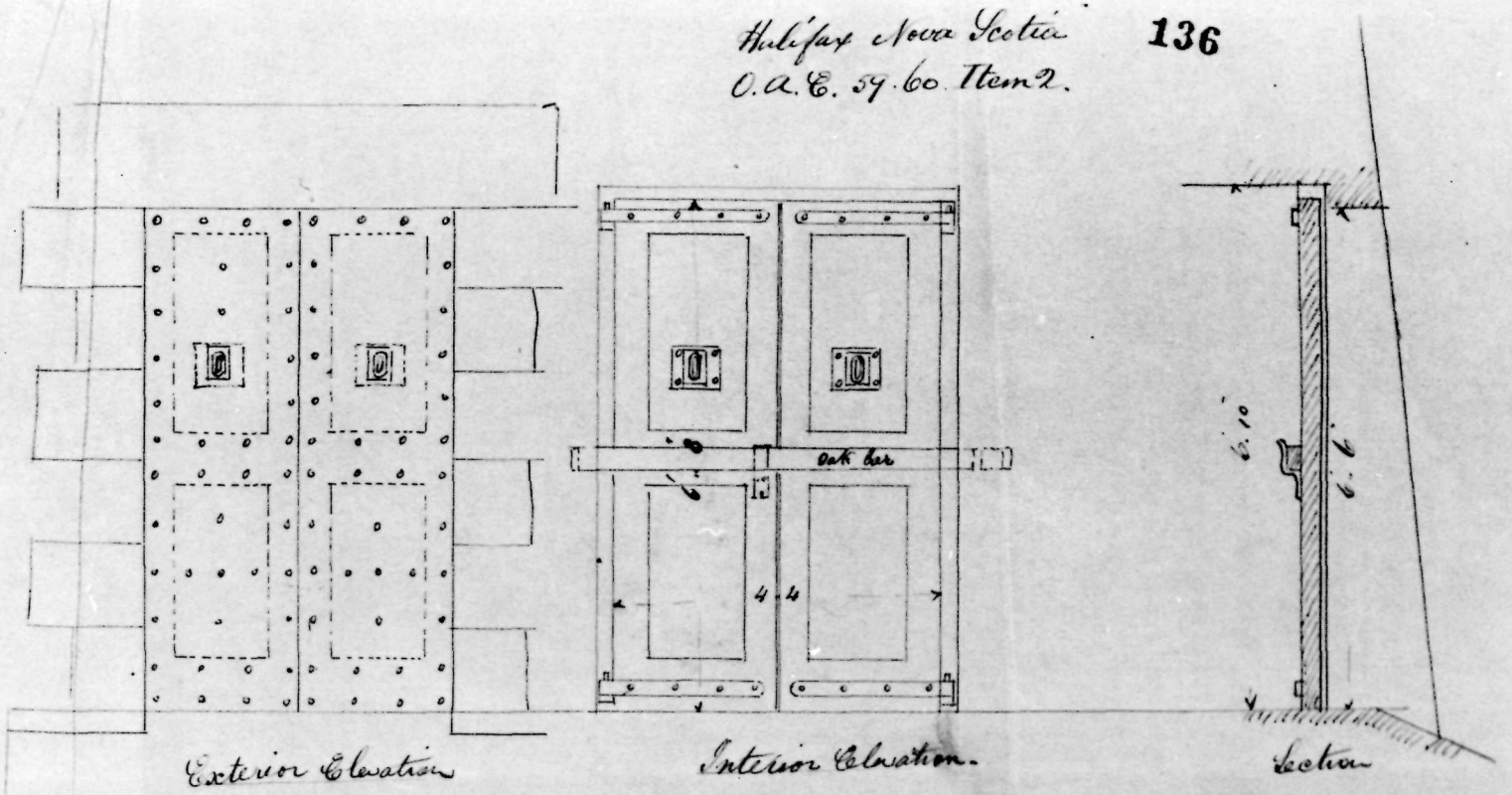
SECTION ELEVATION, 0 → 5E

Figure 14

Ordnance Annual Estimates, Halifax, Nova Scotia, 1859-60. This sketch shows the type of door which may have been installed in the escarp exit of the south sallyport in the early 1860s.

Source: Public Archives of Canada

Halifax Nova Scotia
O.A.E. 59.60. Item 2.



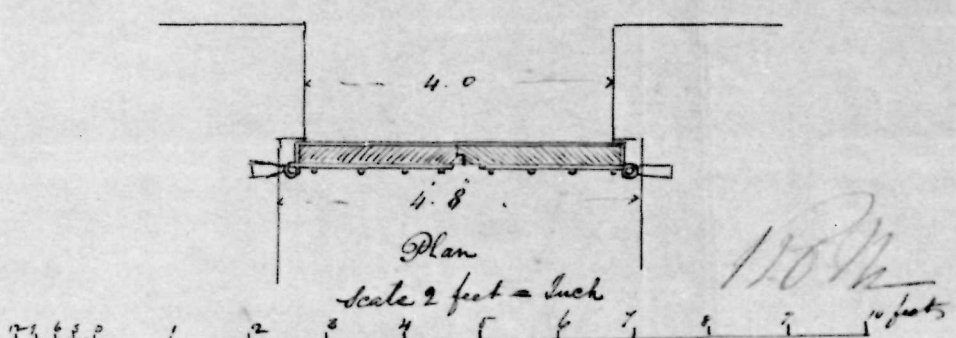


Figure 15

This plan of the south magazine offers the only illustration indicating the nature of the ramp which Lieutenant Colonel Calder proposed to build in 1843. Note the independent wall which he intended to serve as the ramp's northern boundary wall. This was eventually dispensed with, and the south wall of casemate 7 utilized for this purpose, while a small dwarf retaining wall was run out from the southeast corner of this casemate.

Source: Public Records Office

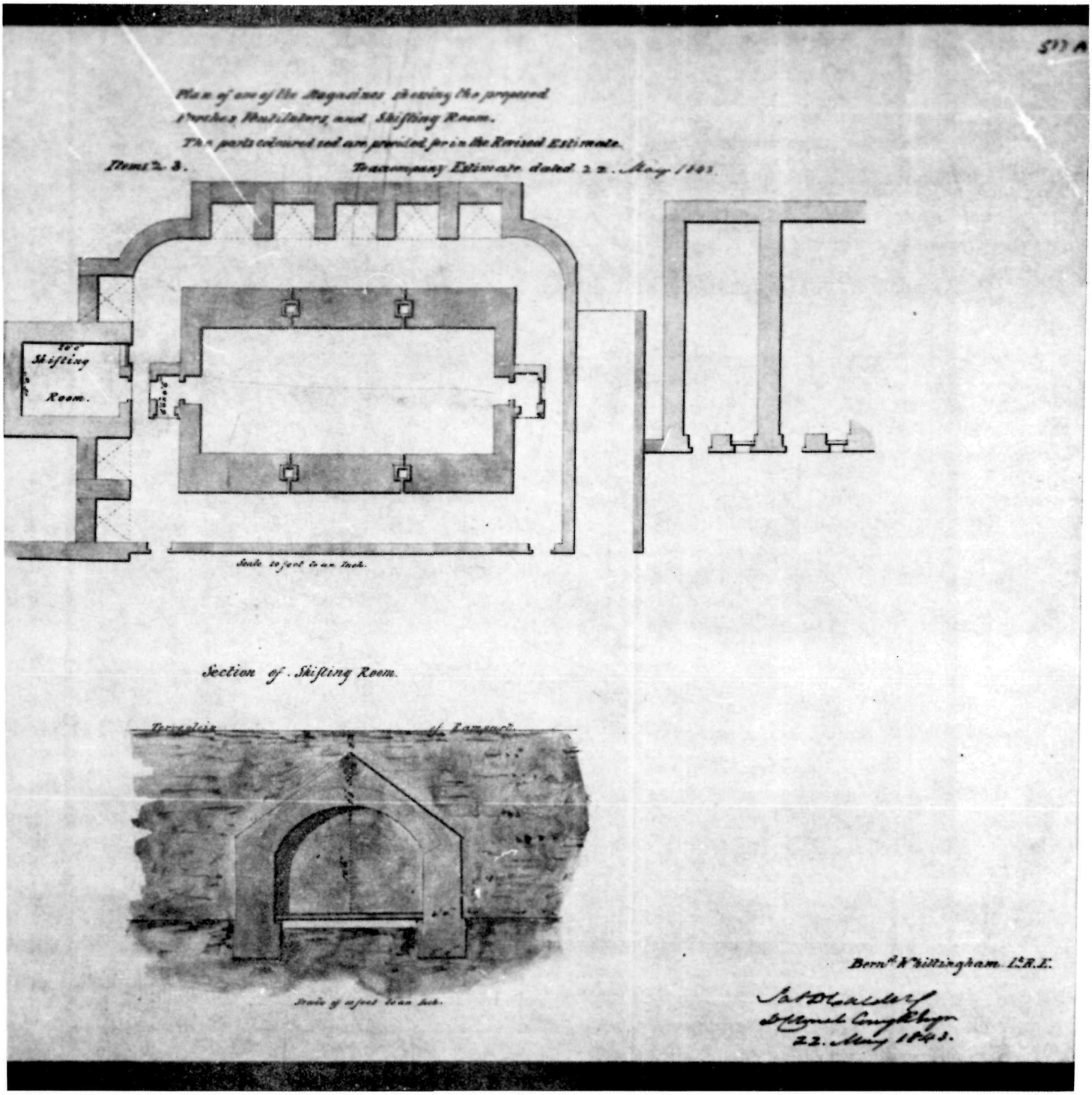

Plan of one of the Magazines showing the proposed
Porches, Ventilators, and Shifting Room.
The parts coloured red are provided for in the Revised Estimate.
Items 2. 3.
To accompany Estimate dated 22. May 1843.
Shifting
Room.
Scale 10 feet to an Inch.
Section of Shifting Room.
Scale of 1 foot to an Inch.
Born.d & Whittingham. Lt.R.E.
22. May 1843.

Figure 16

"Proposed Drainage of the Ramp in the Citadel..." 1860-61. This plan shows the drainage system which was installed on the north side of the ramp in the early 1860s.

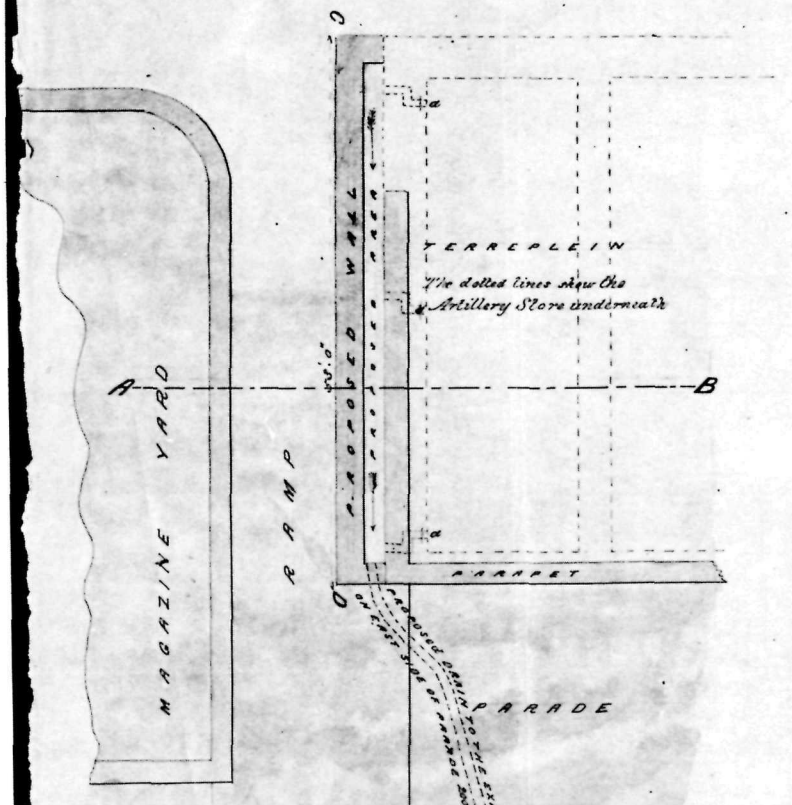
Source: Public Archives of Canada

HALIFAX, N. S.

PLAN AND SECTIONS OF PROPOSED DRAINAGE OF THE RAMP IN THE CITADEL IN ORDER TO THE PREVENTION OF DAMPNESS IN THE ARTILLERY STORE ADJOINING

Fortifications A.2. 1860-61
Store 3.

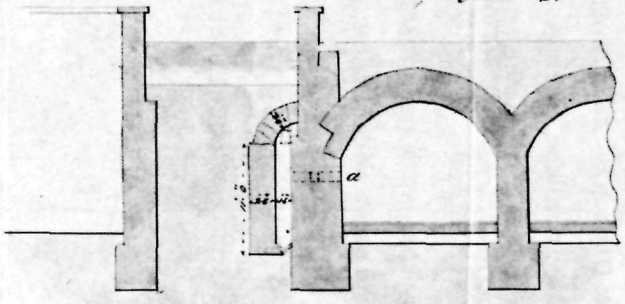
172



PLAN

shewing the proposed Drainage of Ramp by means of a covered Area against side wall of the Artillery Store.

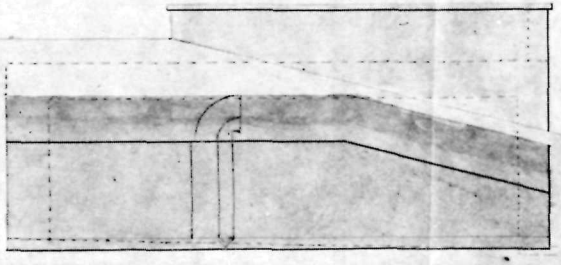
Examined
R.G.
25/10/59



SECTION ON LINE A—B

Copied from a drawing by Mr Gordon C.E.
by J. McLeod
2d Corpl R.E.

REFERENCE
a, a, a. Openings for Ventilation



Scale 10 feet to an inch
0 5 10 20 30 40 50 feet

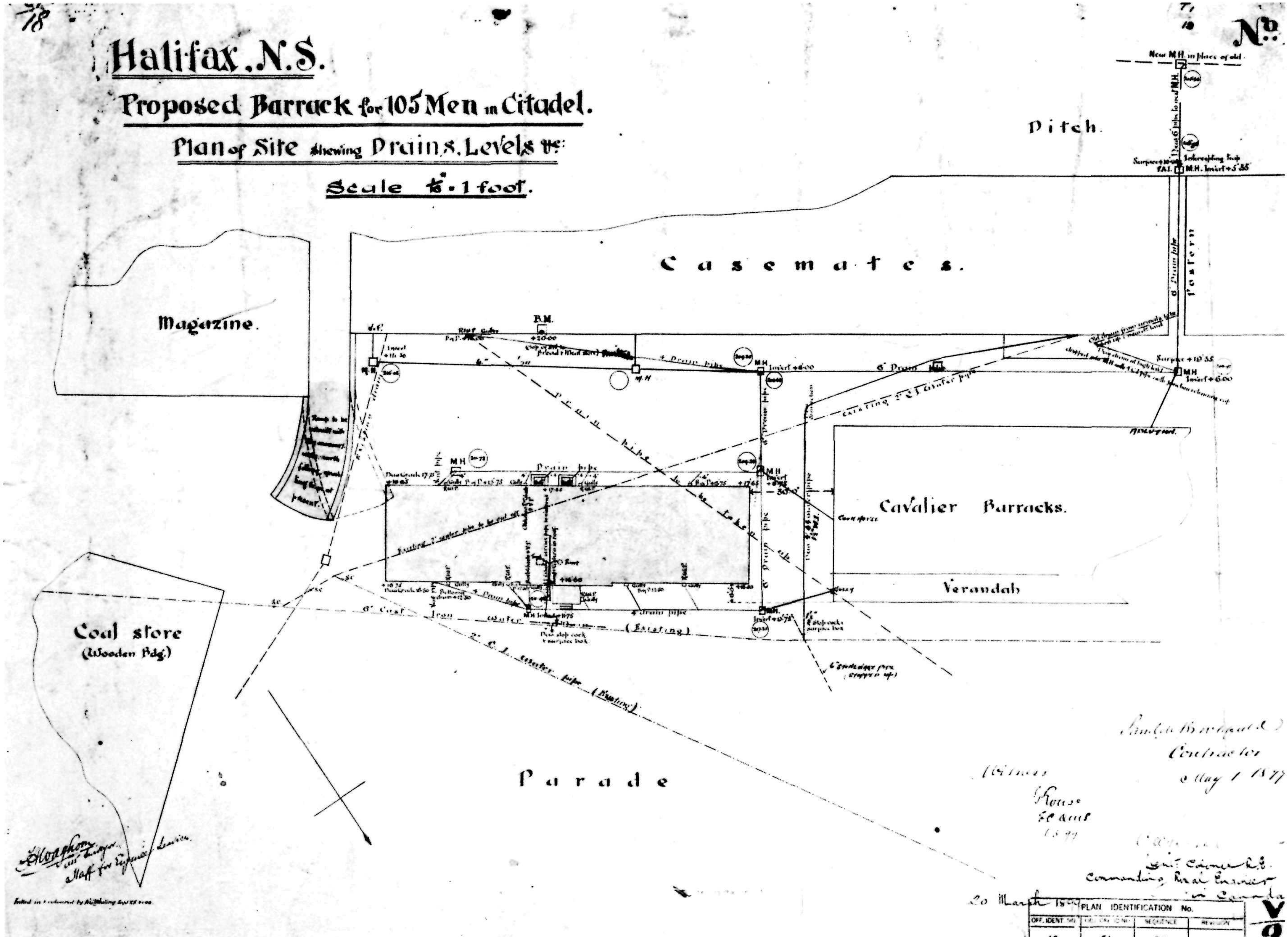
SECTIONAL ELEVATION THROUGH C—D

R Mulvey Sergt
H.S. Clk
29/12/59

Figure 17

"Proposed Barracks for 105 Men in the Citadel" 1899. Sometime in the 1860s or 1870s, the ramp was built out into the parade and angled slightly northwards. In the 1880s it was lengthened further and curved northwards to the extent shown here in dotted lines. The construction of the Brick Block in 1899-1900 necessitated the ramp being shifted southwards, as shown. This southward curving ramp remained intact, probably into the 1940s.

Source: Public Archives of Canada, National Map Collection



Halifax, N.S.
Proposed Barrack for 105 Men in Citadel.
Plan of Site shewing Drains, Levels &c.
Scale 1/16" = 1 foot.
No.
Ditch.
Casemates.
Postern
Magazine.
B.M.
Cavalier Barracks.
Verandah
Coal store
(Wooden Bdg.)
Parade
Contractor
PLAN IDENTIFICATION No.
V
9

123

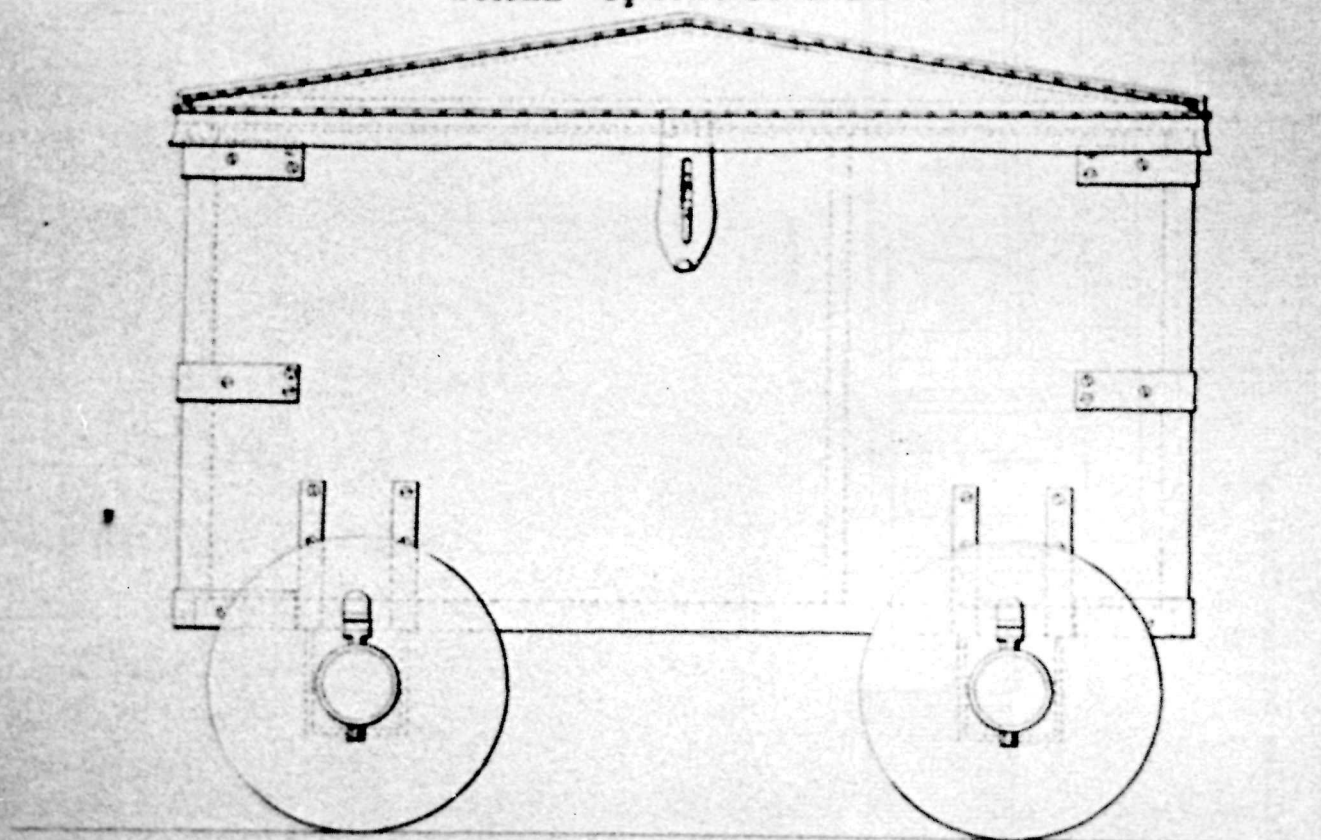
Figure 18

Portable Magazine, 1860. The moveable expense magazine depicted here is not identical to that described by Major Miller but it does provide a clear idea of one type of moveable expense magazine used by the British army in the mid-nineteenth century.

Source: Royal Artillery Institution

PORTABLE MAGAZINE.

SCALE—1¼ INS. TO A FOOT.



SIDE ELEVATION.

Figure 19

Expense Magazine, Top and side view. From Corporal Scott's plan of 7 July 1862.

Source: Halifax Defence Complex

HALIFAX, NOVA SCOTIA

Citadel

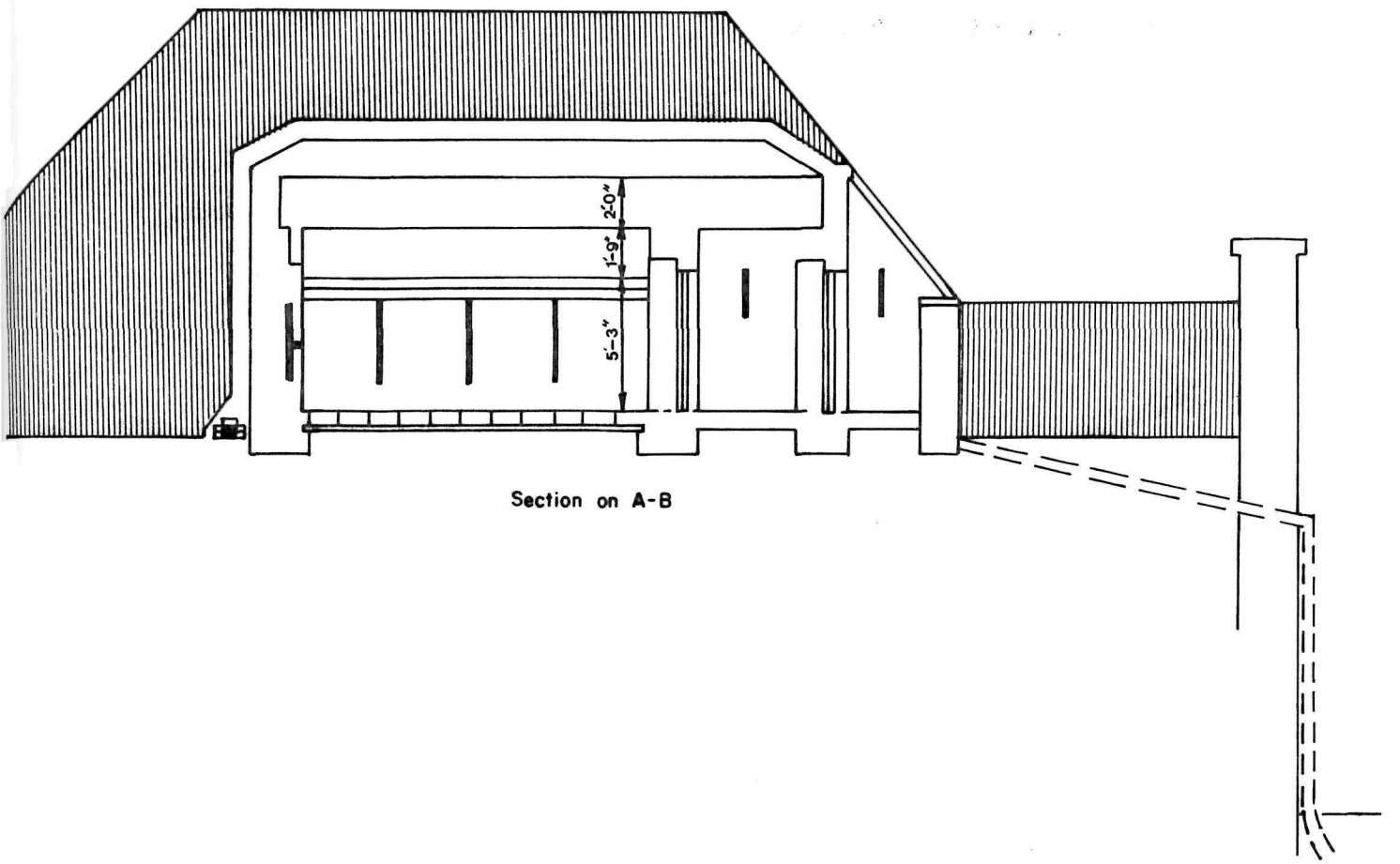
Plan, Sections, and Elevation

of proposed

New Splinterproof Magazine

in Traverses

July 1862



Section on A-B

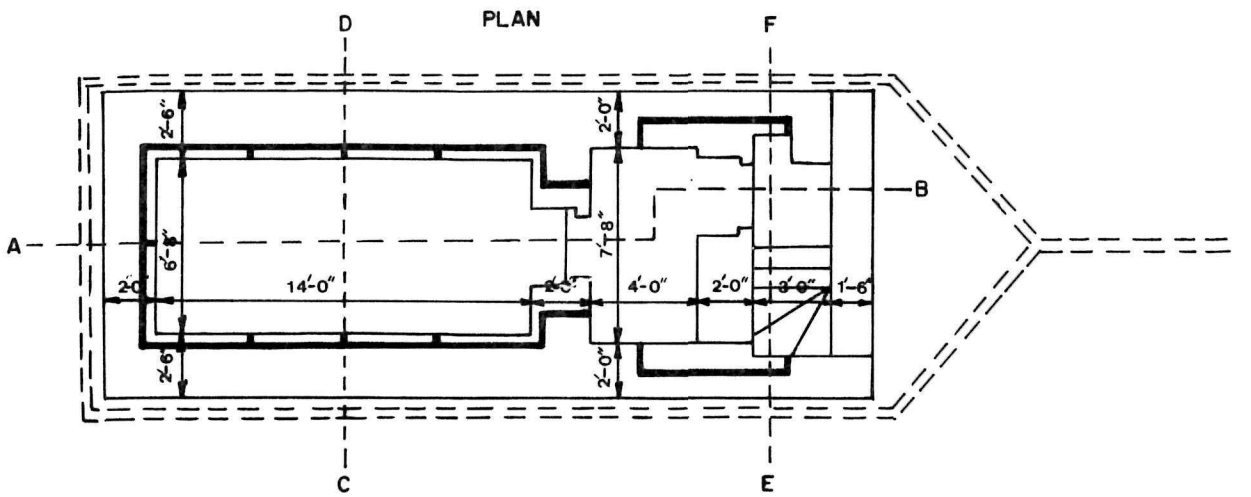
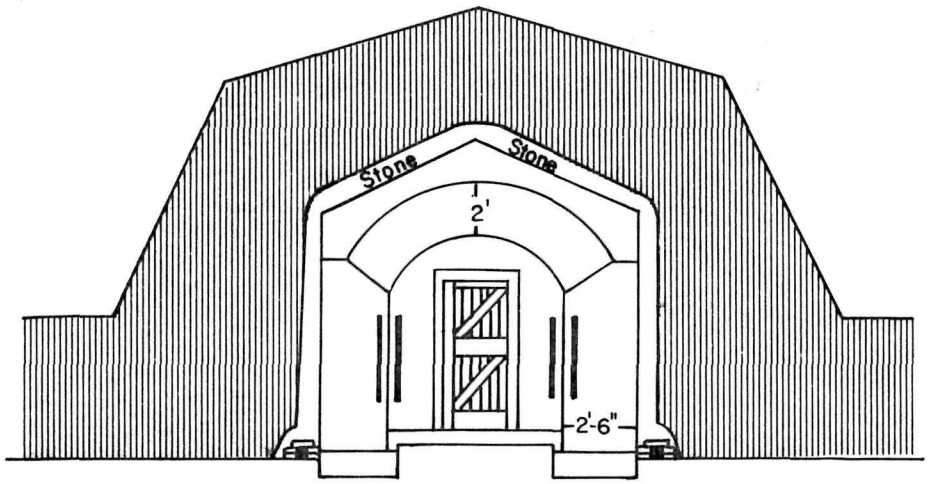


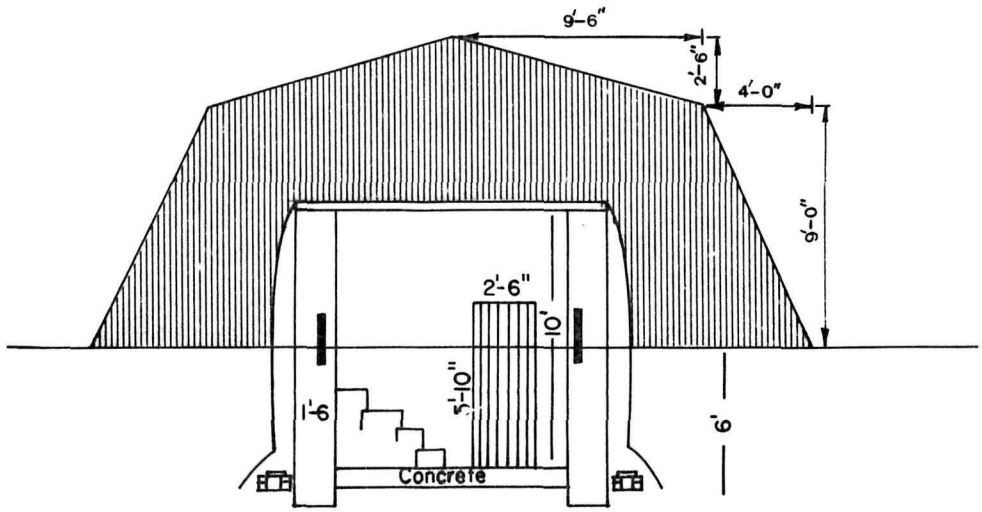
Figure 20

Expense Magazine, front view and section.

Source: Halifax Defence Complex.



Section on C-D



Section and Elevation on E-F

Figure 21

Halifax Citadel and common from Cogswll's Barn near the haunted house. 21 August 1840. Colonel Mercer. This sketch shows clearly that the flag staff was in position on the Citadel's southwest front by 1840.

Source: Public Archives of Canada, Picture Division

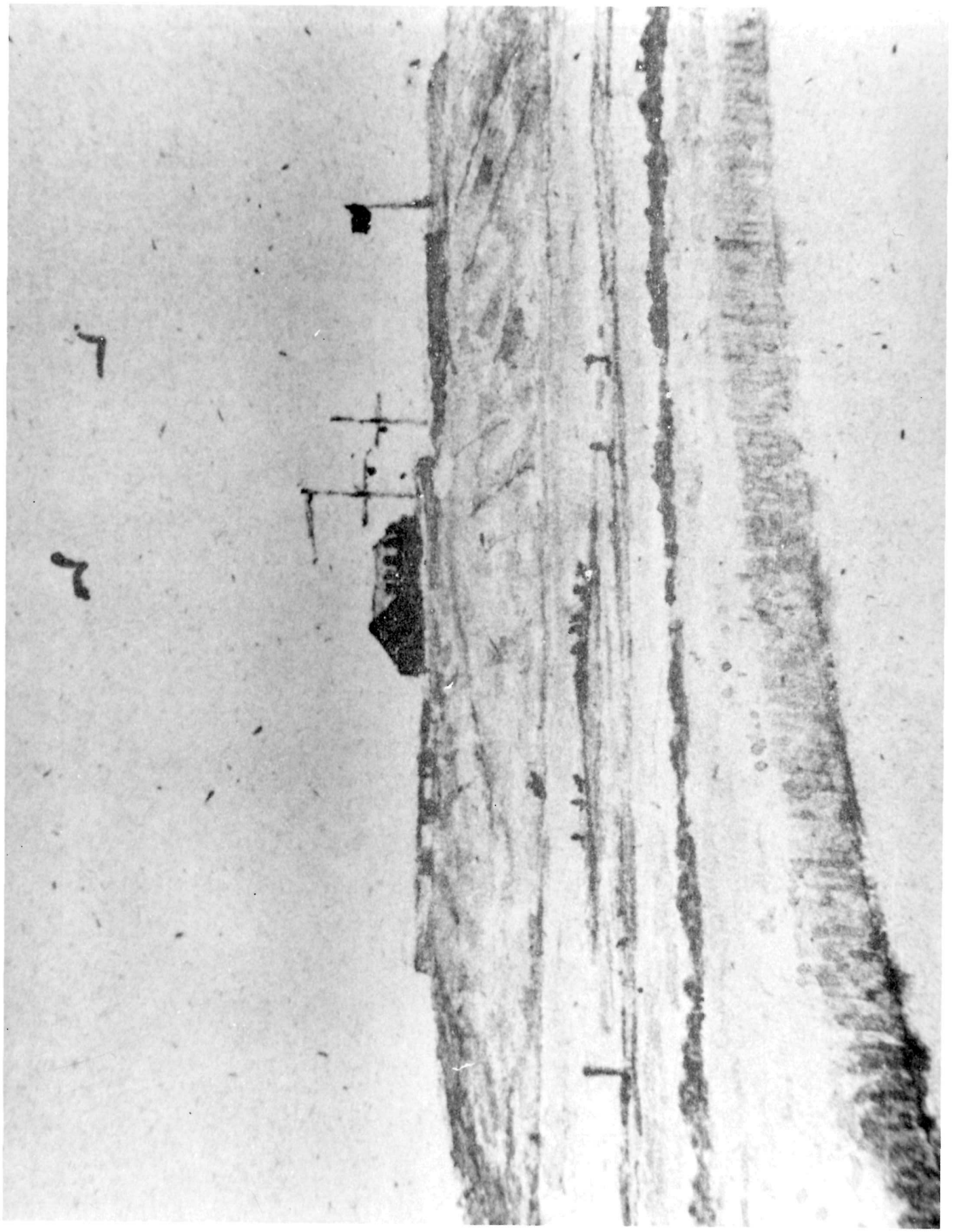


Figure 22

The salient of the southwest demi-bastion (1879). Of particular note for this report is the flag staff to the right of the area wall of the case-mates of defence. This was the location of the Citadel's main flag staff throughout most of the British period. Note also the granite coping on top of the area wall.

Source: Public Record Office.

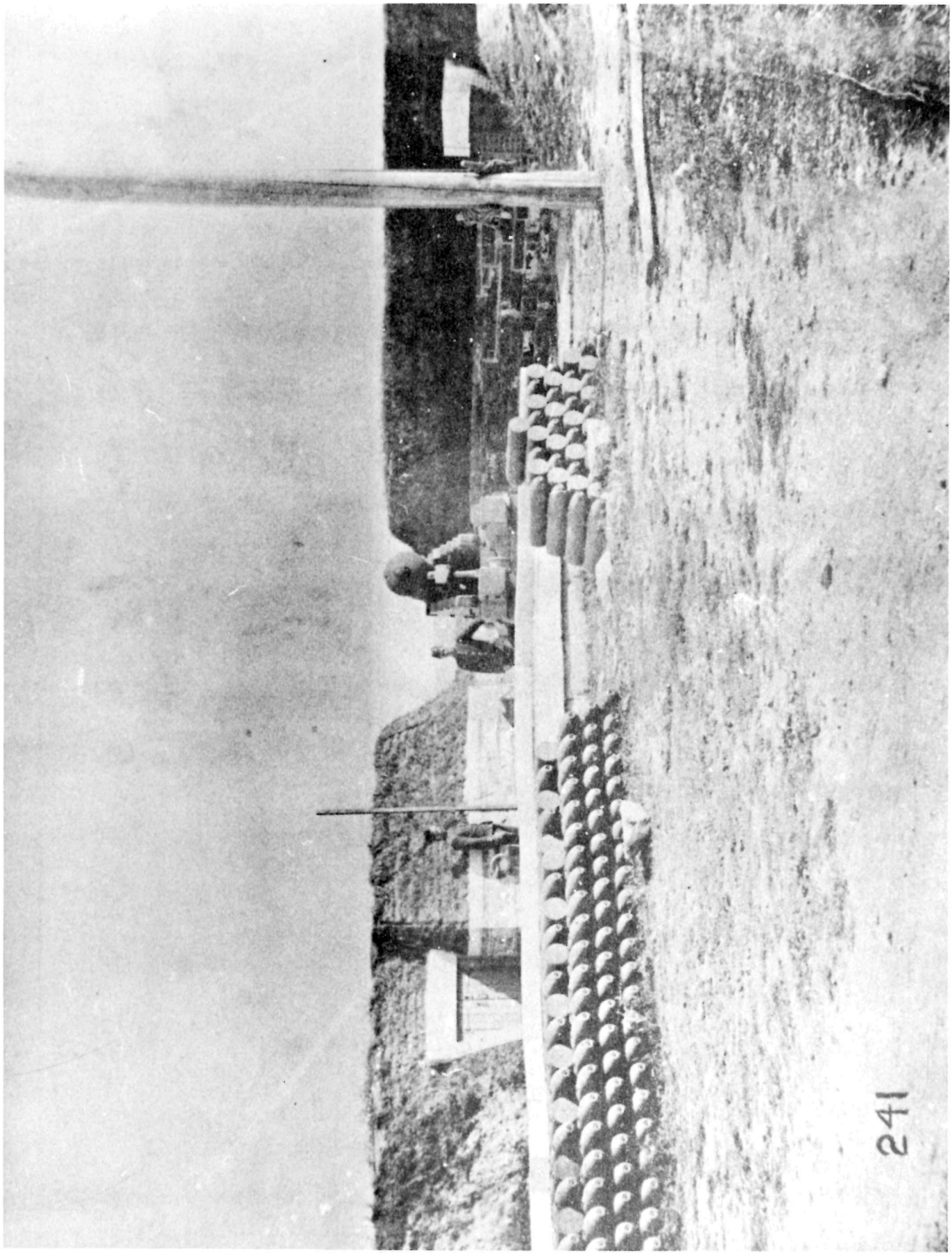

241

Figure 23

The south front, c. 1875. This photograph was taken after the chimnies over casemates 51 and 52 had been moved back to their present position. Note the nature of the chimney pots. Note also the chimney above casemates 5 and 6 (just to the right of the flagpole), which appears to have been built to the same height as those over casemates 51 and 52. The flagstave which is clearly visible, is in the position it occupied throughout most of the British period.

Source:Parks Canada

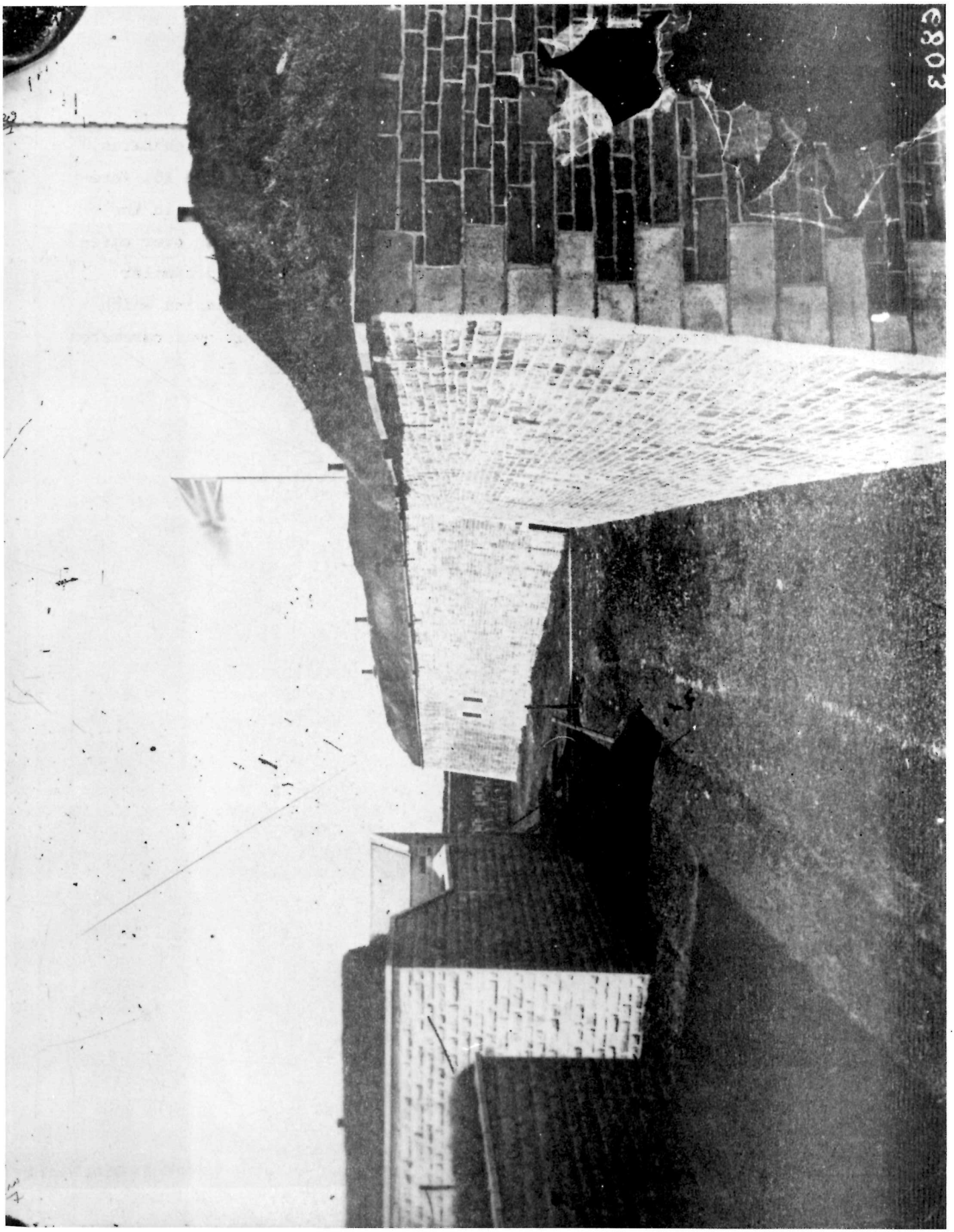

E803

Figure 24

Entrance to the casemates of defence, northwest demi-bastion, chimnies, casemates of defence right middle ground, chimnies of casemate 15, foreground (1879). The chimnies over the casemates of defence are in the same position relative to the escarp as the original chimnies over casemates 51 and 52 (ie. ten feet back). Perhaps the latter had similar chimney pots. As can be seen in Figure 23 however, the chimnies which were built later over casemates 51 and 52, as well as that over casemates 5 and 6, has similar chimney pots to those over casemate 15.

Source: Public Record Office.

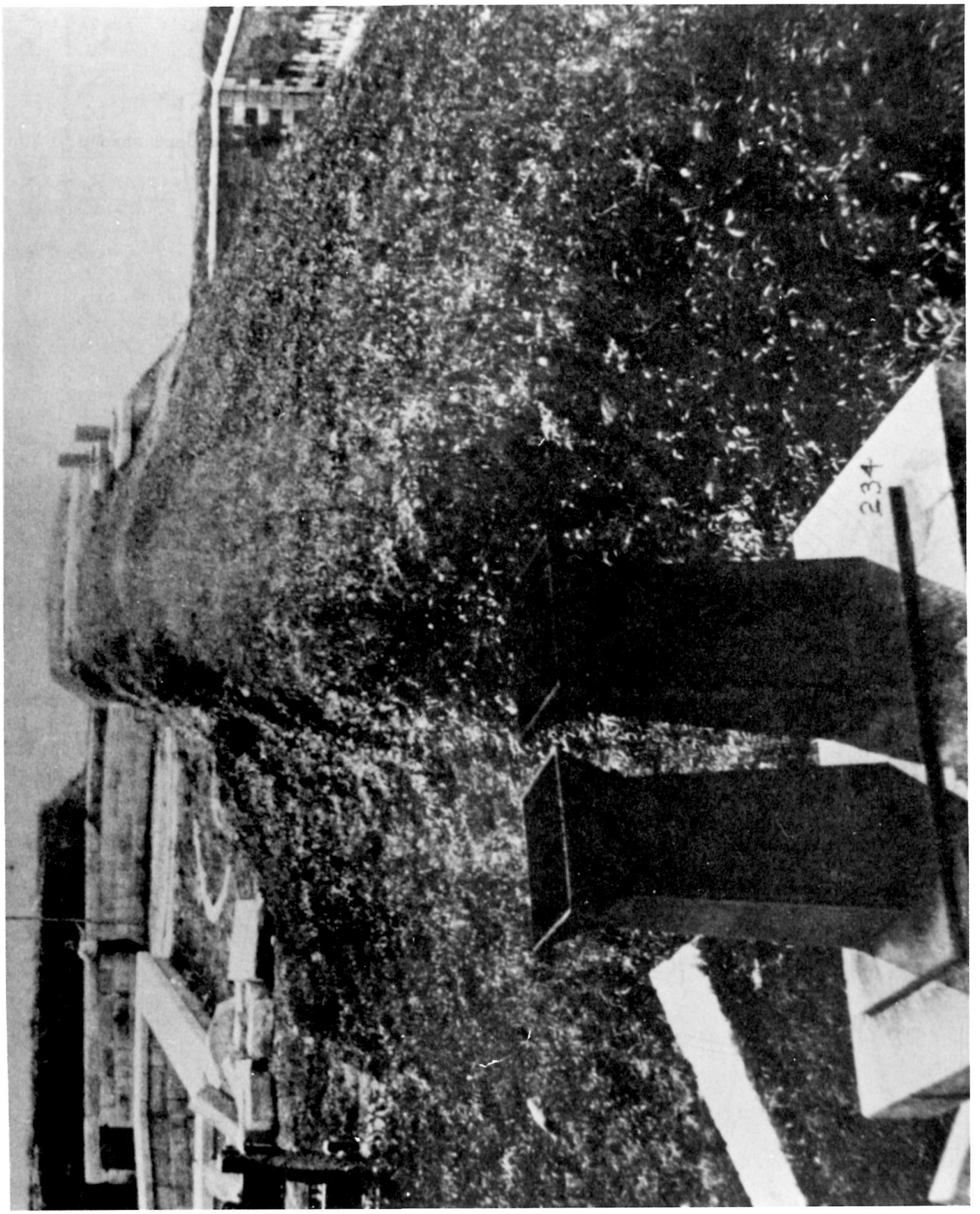
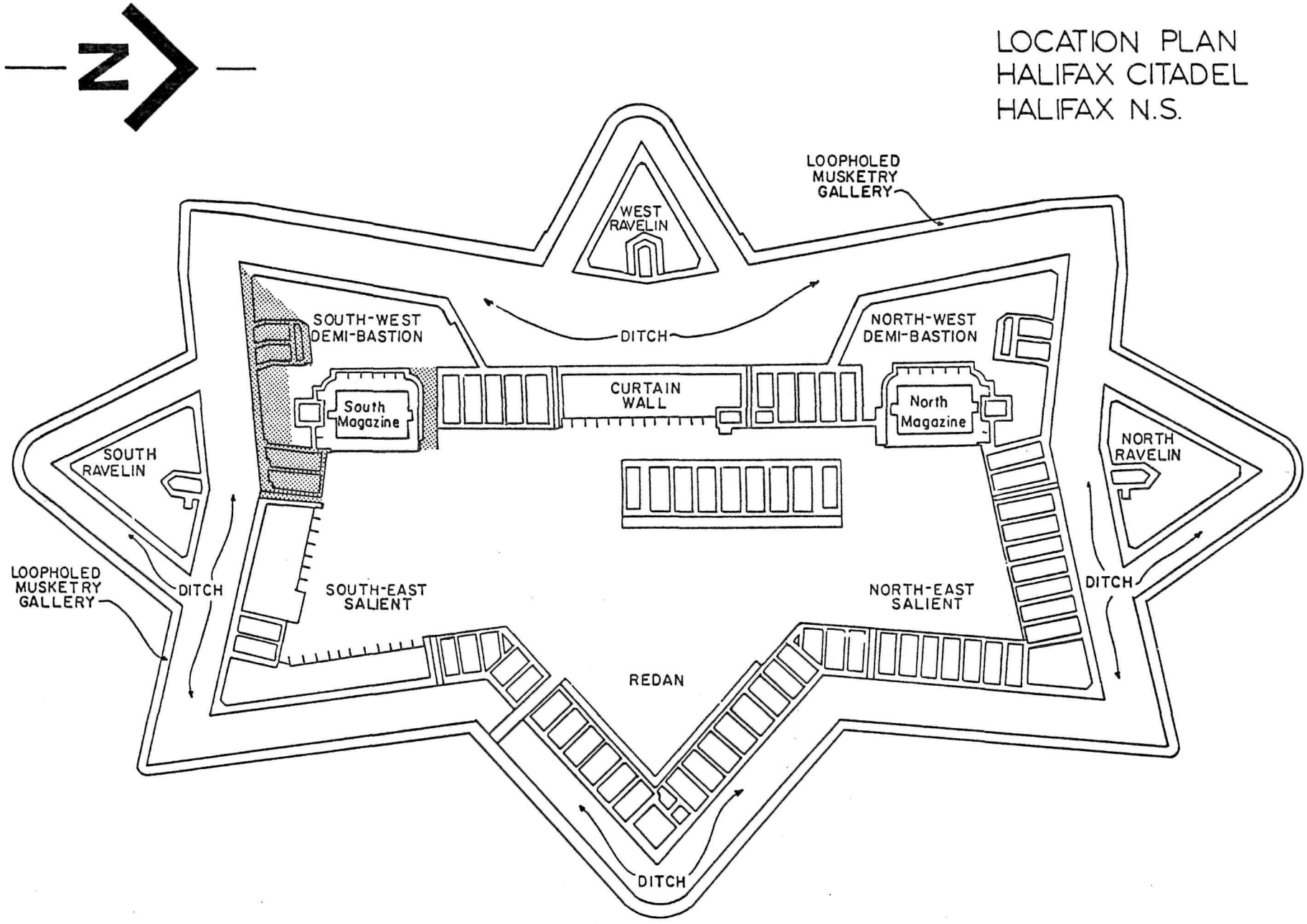

234

Figure 25

Site plan, Halifax Citadel showing the area covered by this report shaded.

Source: Halifax Defence Complex.

LOCATION PLAN
HALIFAX CITADEL
HALIFAX N.S.



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National Map Collection Citadel Plans

Great Britain
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