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WEST CURTAIN WALL AND SALLY PORTS
THREE AND FOUR, HALIFAX CITADEL

by Richard J. Young

1976

(revised 1979)

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West Curtain Wall and Sally Ports
Three and Four, Halifax Citadel
by Richard J. Young

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Preface

The primary intent of this report is to provide a working paper of essential historical documentation for the design team responsible for the restoration planned this year for the Halifax Citadel. The basic reference text for Fort George is now John Joseph Greenough's The Halifax Citadel, 1825-60: A Narrative and Structural History, 3 Vols., Parks Canada, 1974. That monograph gives both a comprehensive analysis of the political and bureaucratic background to the building of the Citadel, and a valuable outline of the main structural features. However, the demands on research staff for restoration services are rigorously specific. It was necessary, therefore, to go back to the original documents, the correspondence of the Royal Engineers, the maps and plans, with this new emphasis on structural details.

The report is divided into three chapters. In the first chapter I have written a brief introduction on the decision to build the Citadel and the early errors in judgements by the principals involved. This subject is treated elaborately in Mr. Greenough's work. Next is a history of the building of the west curtain wall, 1829-31. This is an attempt to describe, as closely as the available documents would permit, the original plan for the escarp, the construction timetable, and the design changes made during the three building seasons. Chapter 2 consists of a structural analysis of the curtain wall components, which will form the basis of the deliberations of the design team. Chapter 3 is a history of the building of sally ports 3 and 4, followed by an analysis of their structural features.

The main task has been to describe how the west curtain wall and sally ports 3 and 4 were built, and to document any alterations which have been made since their original completion date. The archival sources for the early years are scarce, but yield sufficient information to plan a restoration program. We are severely limited by the lack of structural studies for the periods 1870-1906 and 1906-13, especially in reference to the sally ports.

I would like to thank Bruce MacDonald and Greg Corkum for their excellent drawings, and for their time and patience in guiding me through the as-found records in the Atlantic Regional Office.

Chapter 1 West Curtain Wall Narrative

General Background

Colonel Gustavas Nicolls, R.E., in consultation with Sir James Carmichael Smyth, proposed the design which forms the basis of the present Fort George. Smyth and his fellow commissioners, in their report to The Duke of Wellington, Master General of the Ordnance, expressed their satisfaction and agreement with Colonel Nicolls' ideas on a permanent fortification for Citadel Hill. They informed Wellington that they had invited Colonel Nicolls to submit detailed plans and estimates as soon as possible to the Inspector General of Fortifications; which Nicolls did on the 20th December, 1825.¹ These plans and estimates were considered by Parliament as part of a £1.6 million package which the Smyth Commission had recommended for fortifying the North American Colonies.²

Sir James C. Smyth, either from a basic ignorance of construction costs in the Colonies, or from a sense of British Parliamentary political feeling towards the expenditure of vast sums of money in North America, had underestimated the cost of all the projects submitted by the 1825 Commission. The detailed plans and estimates submitted by the majority of the local engineers for these proposals were well above Smyth's estimates.³ Colonel Nicolls, out of deference to Smyth's judgement, sent in an estimate which agreed with the Commission's proposed cost. In doing so, Nicolls designed escarp profiles which were both inadequate to effectively withstand an artillery assault and not solid enough to withstand the more immediate problem of the Halifax climate. These were the central background facts which accounted for the problems encountered by Nicolls in building the escarp walls and by other engineers in subsequent attempts to redesign the Citadel.

Nicolls sent his plan and estimate to London under the title of "Reconstructing Fort George in Masonry, altering and adding to Fort George",

emphasizing, for the sake of easier Parliamentary approval, that the project was a sensible, permanent, and, in the long run, more economical alteration to existing works on the hill.⁴ The resemblance implied between Nicolls' design and what remained of Straton's 1796 earthworks was not unjustified. Nicolls' trace left the old curtains intact, changed the full bastions to demi-bastions, and added a ravelin on each face. He also proposed an arched, loopholed counterscarp to surround the entire fort, with casemates of reverse fire opposite each bastion salient. Finally, he proposed casemates of defence under the ramparts to enfilade the ditches of the ravelins, and two casemated cavaliers with heavy ordnance mounted on top, to cover the north and west fronts with artillery fire.⁵ The whole was to be framed in permanent masonry. What was proposed was an enormous shifting of earth from the interior of the fort and the ditches to form the counterscarp and glacis; and the quarrying, shipping, and setting in place of an immense amount of stone. (See Figures 1 and 2)

Nicolls considered the west front the most important in the fort,⁶ and this was reflected in his design. Windmill hill was a short 666 yards distant and only 43 feet below the level of the crest of the rampart. Given the unfortified state of the isthmus, a land attack on the town was likely to be undertaken from that direction, since Windmill hill was the most favourable spot for breaking ground against the new fort.

The ditch of the west front was designed to be defended more completely than any of the other three. Guns in the four casemates of defence could fire along the ditches of the ravelins; four guns on the flanks of the bastions covered the glacis, ravelin, and ditch in front of the curtain wall; the entire counterscarp gallery was to be loopholed for musketry; and the casemates of reverse fire were to cover the faces of the bastions and direct a fire into the ditch of the curtain wall. In addition, Nicolls planned a loopholed caponiere to connect with the defensible guardhouse of the west ravelin. He also designed two sally ports through the curtain wall to provide access to the ditch and to the two place d'armes which were to flank the west ravelin. Finally,

seven heavy traversing guns were to be placed atop the cavalier to cover the whole western front.⁷

The resemblance between Straton's 1796 earthwork and Nicolls' design, and the translation of aspects of that earlier work into a permanent masonry fort is nowhere better illustrated than in the west curtain wall. The terms bastion, flank, ditch, counterscarp and curtain wall describe the same defensive arrangements in an earthwork as in a permanent work. However, there is a substantial difference in appearance and defensive capabilities. Nicolls used the crest of the parapet of Straton's fort as the reference point for his own proposals. The height of the parapet and the length of the west curtain wall were to remain the same in the new Citadel. Nothing was lost in the height of the hill for those portions of the work intended to mount artillery. Nicolls simply dug into the hill to form his masonry walls, ditch, and counterscarp. In the case of the west curtain wall, he excavated from 15 to 25 feet and replaced Straton's sloping earth escarp and fraise with a vertical masonry wall 25 feet high. A ditch, 80 feet wide, with an 18 foot vertical counterscarp and ravelin replaced the shallow picketed ditch and counterscarp of Straton's day.⁸ (See Figure 3)

Superficially, the plan looked good and certainly inexpensive. Had no money been spared and the estimates properly explained and detailed, all might have gone better than it did. However, there was a fundamental flaw in the conception of the plan and estimate which disastrously affected the execution of the work. Nicolls, in an obvious attempt not to contradict Carmichael Smyth's estimate, had designed escarp walls much too thin for their purpose and locale. He planned escarps 7 feet at the base and 4 feet at the top - a full 3 feet at the base and 1 foot at the top thinner than the leading fortification theorist, Vauban, prescribed.⁹ According to the best authority on the subject, the walls were too thin to withstand the artillery of the age. Part of the blame for the later problems has to be put on the Ordnance hierarchy in London for not demanding detailed estimates, and for not properly scrutinizing the plans.

This defect may have gone unnoticed and without comment had the

Figure 1

"Plan No. 1", Nicolls, 20 December 1825

This was Nicolls' original plan for the Citadel. The trace of Straton's fort is faintly visible underneath. Point "O" on the west curtain wall designates the crest of the rampart for both Nicolls' and Straton's work. Nicolls retained the length and height of the earlier curtain. As can be seen, the trace of the interior body of the two works are very similar. Nicolls planned to widen the ditches and add ravelins on all four sides. An enormous re-shifting of earth was necessary to accomplish this.

Source: Public Record Office, London (WO 78, No. 1786, MR 947)

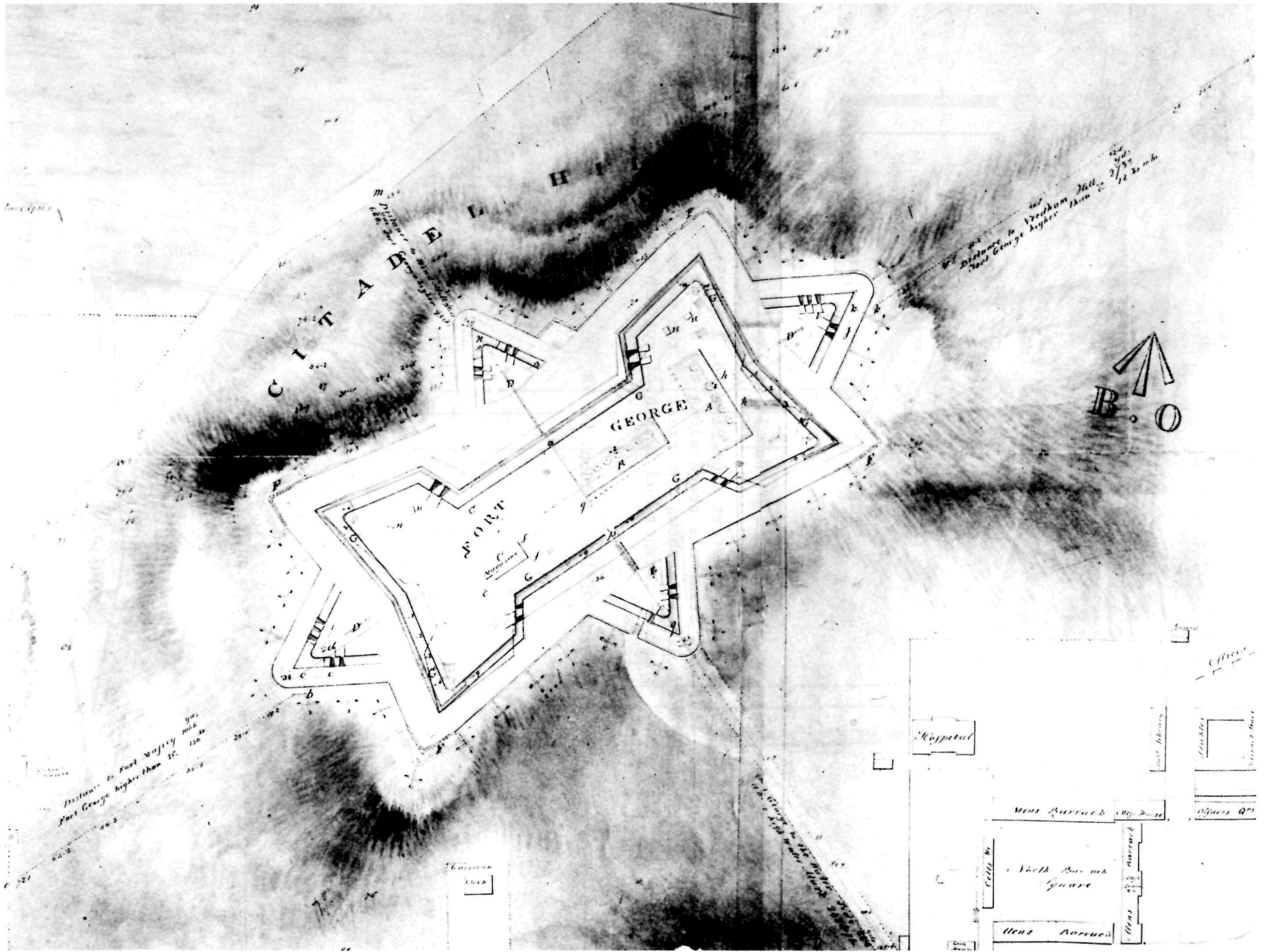


Figure 2

Drawing by Greg Corkum and Bruce MacDonald, Atlantic Regional Office

A tracing of the body of the fort from Plan No. 1 (1825). The shaded line indicates Straton's trace along the bottom of a sloped escarp wall, the solid line shows the crest of the parapet of Nicolls' plan. Crest of parapet and length of curtain wall were identical in both forts.

Source: Public Records Office, London, WO 78, No. 1786, MR 947

EXISTING
NICOLL'S PROPOSAL

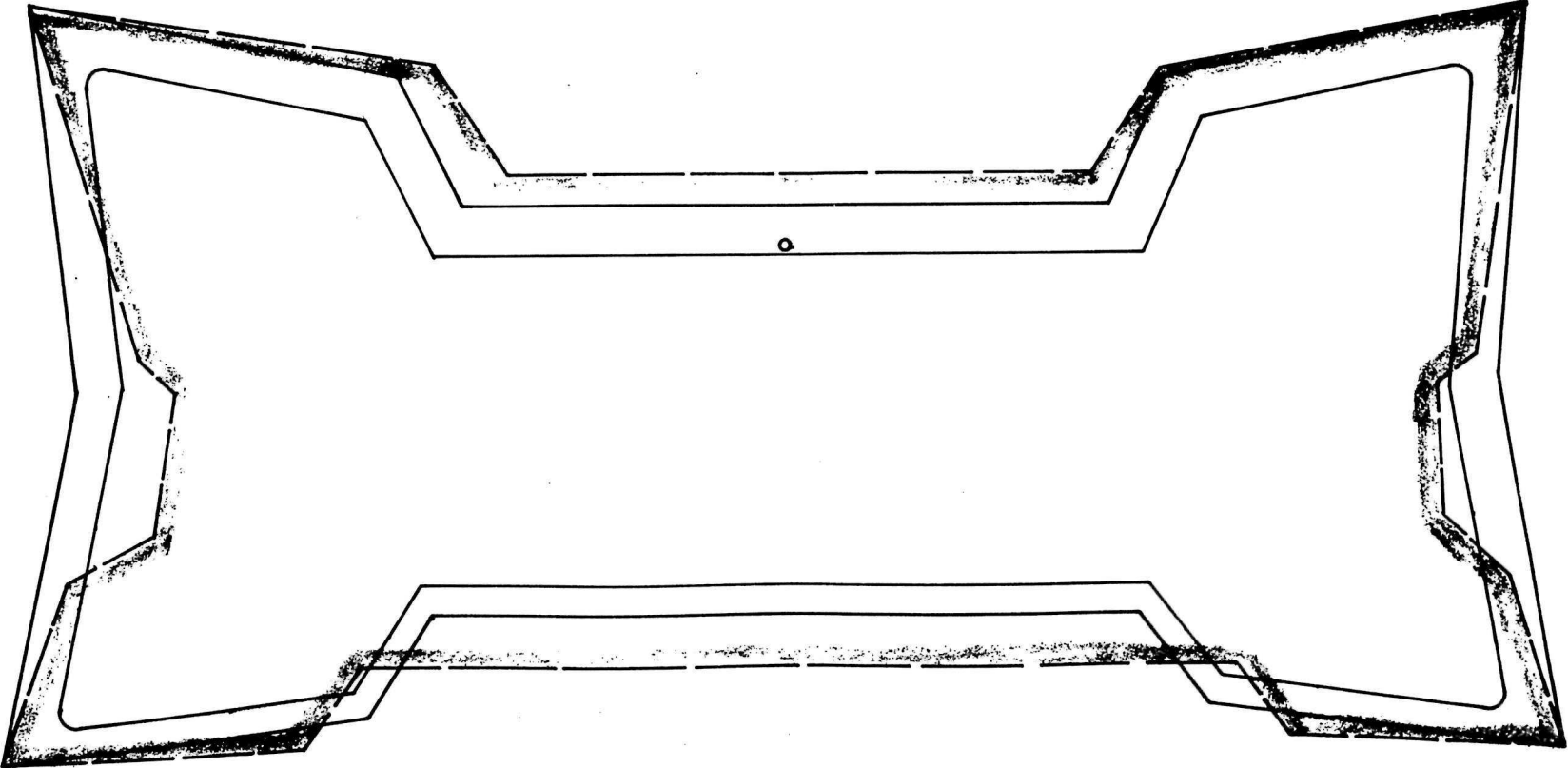


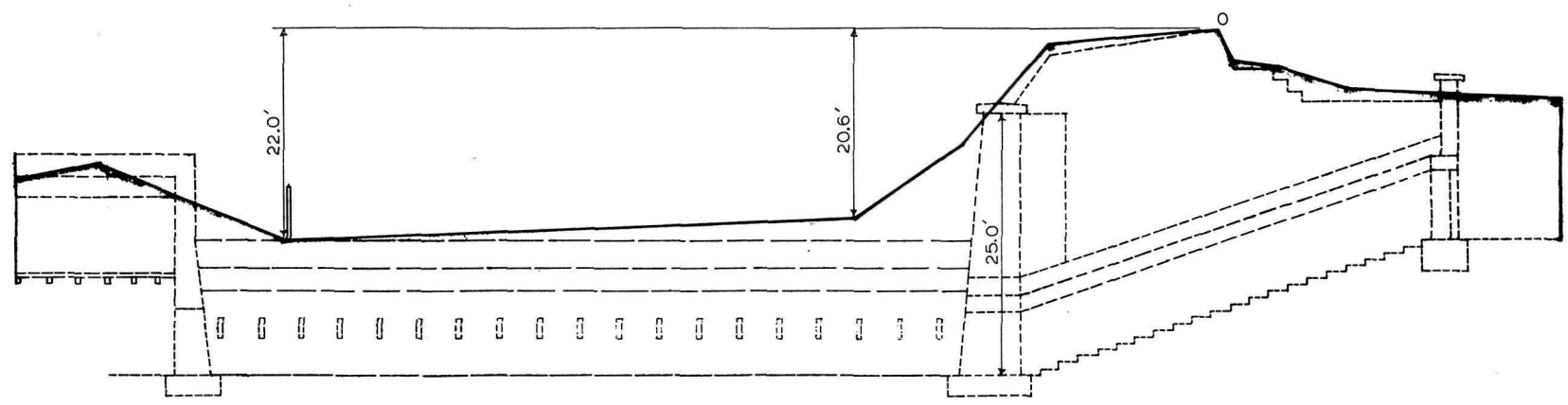
Figure 3

Drawing by Bruce MacDonald

This is a modern re-drawn enlargement of Nicolls' original plan giving an east-west section through the fort. The shaded line indicates the profile of Straton's fort, the solid line and dotted line, Nicolls' proposal. This figure again shows Point "O", the reference point relating the two forts. This figure dramatically illustrates the amount of excavation which was necessary and the translation of the old earthwork into a permanent masonry fort. The middle sally port and caponiere were cancelled in 1835 as an economy measure.

Source: Public Records Office, London, WO 78, No. 1786,
"Plan No. 2", Nicolls, 20 December 1825

EXISTING 1825
PROPOSED BY
COLONEL NICOLLS



walls stood as built. By making these massive stone walls so thin Nicolls had not properly taken into account the effect of the Halifax climate. By the time he made the necessary adjustments, the accounts were rapidly going into the red, the Citadel project was thrown into confusion, and the main participants were involved in mutual recrimination over responsibility. Eventually, Fort George was redesigned and refinanced.

Building the West Curtain Wall

The West Curtain Wall was built piecemeal over a period of three years, 1829-31. It was not constructed to Nicolls' original drawings because as early as the end of the first building season, the Commanding Royal Engineer realized that changes would have to be instituted to keep the escarp walls from further collapse. The alterations made during the next two building seasons included increasing the thickness of the walls, positioning the buttresses closer together, experimenting with the mortar mix, installing drains behind the escarp, and enlarging the size of the stones. Moreover, the curtain wall was built partly by the Sappers and Miners, a company in the Royal Engineer establishment at Halifax, and partly by civilian contract. The wall was completed by late October 1831. Except for the filling in of the opening intended for the middle sally port, and the repointing of the masonry in 1856, the structure remained unchanged until the department began restoration in 1963.

Parliament approved the Citadel project in July of 1828 and granted £15,000 towards it for that year.¹⁰ Nicolls was given the opportunity to build the fort he designed and when news of the approval arrived in August, 1828, the Colonel immediately set about the preliminary work. He considered the west front the most important, and there started the excavation of the ditch. The digging began at the salient of the proposed west ravelin, the lowest part of the west front, where only 5 feet had to be excavated. A drain was installed to carry away the water.¹¹ The soldiers doing the trenchwork continued along both faces of the ravelin and excavated the ditch of the southwest demi-bastion and the escarp

wall area of the northwest demi-bastion.¹² The excavated earth was carted up behind the line of the proposed counterscarp. (See Figures 3 and 4)

Nicolls' most pressing concern was the procuring of adequate building materials and skilled labour for the following year. For three years the Engineers Department had been quarrying stone on a lot in the Northwest Arm, where the village of Purcell's Cove now lies. As early as March 1826, Nicolls was applying to the Provincial Secretary, Rupert George, to have the land excheated for government use.¹³ However, a Mr. Trider had been using the quarry, making improvements, and had a claim to the land. An arrangement was finally worked out in late 1828, whereby the land was put in the trust of the government, while Mr. Trider was granted a right of way and paid \$50 for his improvements.¹⁴

The problem of depending on expensive stone quarried by civilians eliminated, Nicolls applied to the Board of Ordnance for funds to build a proper wharf and road at the quarry site because he felt that the trestle system used by Trider was inadequate for the quantities of stone needed for the Citadel.¹⁵ He also applied for horses and carts to transport the stone from quarry site to wharf.¹⁶ In the early spring of 1829 he sent men to begin work quarrying the stone, and ordered the repair of the Schooner Trial which was to be used to ship the stone to the Lumber Yard.¹⁷

More than stone was needed to construct the Citadel. Nicolls urged the Commissary General, George Damerun, to issue specifications for the supply of bricks, sand, building stone, lumber, coping stone, carters, and lime. He also ordered from London those items which were either too expensive or not available locally: 53,000 large bricks, 104,500 small bricks, 55,950 plain tiles, 305 bushels of cement, nails, glass, locks, hinges and a supply of iron, sheer and blister steel.¹⁸ Nicolls complained that the bricks manufactured locally were inferior and too expensive. The tiles were needed for waterproofing the arches of the casemates and sally ports, and were unavailable locally.¹⁹

Nicolls anticipated no shortage of common labourers, either from the soldiers garrisoned at Halifax or civilians hired on a daily basis.

Figure 4

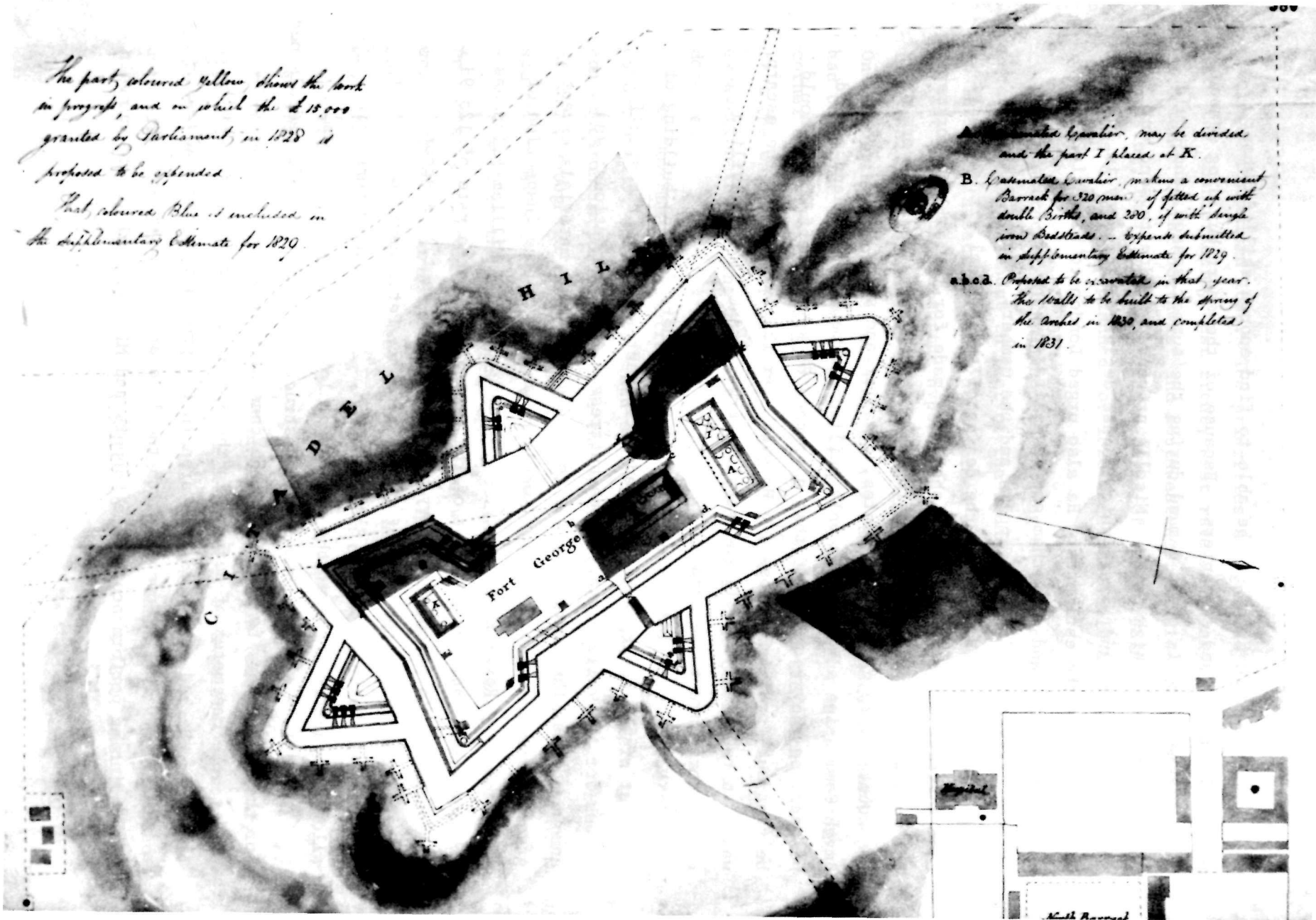
"Plan of Fort George, Citadel Hill....the part coloured yellow shows the Work in Progress, and which the £ 15,000 granted by Parliament in 1828 is supposed to be expended. That coloured blue is included in the Supplementary Estimate for 1829", Nicolls, 7 October 1828.

This plan shows the excavation undertaken by Nicolls in late summer and fall of 1828 along the western front (lightly shaded). The dark areas of the northwest and southwest demi-bastions were the escarps proposed to be built by contractors the following year.

Source: Public Archives of Canada, MG12, WO 44, Vol. 203, fol. 296

The part, coloured yellow shows the work
in progress, and on which the £15,000
granted by Parliament, in 1728 is
proposed to be expended.

That, coloured Blue is included in
the Supplementary Estimate for 1730.



A. Estimated Cavalier, may be divided
and the part I placed at K.

B. Estimated Cavalier, makes a convenient
Barrack for 320 men, if fitted up with
double Berths, and 200, if with single
iron Bedsteads. — Expense submitted
in Supplementary Estimate for 1729.

a.b.o. Proposed to be executed in that year.
The Walls to be built to the spring of
the Arch in 1730, and completed
in 1731.

He did fear that he might not be able to find enough skilled labour, especially masons and carpenters. Because of the short building season, these workmen were in great demand during the summer season, and could only be hired at a high price. Nicolls pressured London to send out a company of Sappers and Miners which he had declared necessary in 1825 when submitting the estimates. He also urged London to hire civilian masons in England and send them out to Halifax.²⁰

As early as 1825, when Nicolls and the members of the Smyth Commission had been discussing the design of the Citadel, it was felt that a strict division of duties should be made for the skilled workmen. For work which demanded fine craftsmanship, especially the arch work of the counterscarp gallery, casemates, cavalier and sally ports, the Smyth Commission advised that only skilled workmen from England should be used, so they recommended that a company of Royal Staff Corps should be sent out for this purpose.²¹ However, for the building of the escarp walls, a relatively simple and straightforward task, local civilian contractors were to be used.

In November of 1828 Nicolls called for tenders for the building of 800 feet of the escarp wall. The advertisement set forth the specifications for the wall, mortar, stone buttresses, and foundations; and announced that the contractor was to find all his own materials except granite stone, and that the work would be subject to the inspection of the Commanding Royal Engineer.²² On December 16, Mr. William Flinn was awarded a contract for 400 feet of the escarp wall, at a rate of 12s 9d per perch.²³ (A perch of masonry was 24.75 cubic feet.) A second contract was let on the 22nd of December to Mr. Peter Hays for another 400 feet of the wall, at 13s 8½d per perch.²⁴ Both contractors were allowed to quarry stone at the government lot on the Northwest Arm.

In early May 1829, the actual construction began. Nicolls had planned for the contractors to build from the casemates of defence in the curtain wall to the casemates of defence in the Southwest and northwest demi-bastions. He had excavated this area in the previous summer and fall - a total of 800 feet. However, with the late arrival (June 24) and disappointing performance of the Sappers and Miners, work on the curtain

wall was minimal in 1828. The priorities assigned to the Staff Corps were the counterscarp, west front, west ravelin escarp, and the casemates of defence in the northwest and southwest demi-bastions. It is not surprising, therefore, that those parts of the curtain wall and the casemates of defence planned for 1828 were not built that year. (See Figure 5)

The contractor Flinn, who was working on the southwest demi-bastion escarps did build about 20 feet of the foundation and wall of the curtain in 1829. This section would have formed a triangular piece of masonry, 20 feet at the base with the hypotenuse running to the top corner of the flank wall, work necessary to keep the granite quoin corner in place.²⁵ On the north end of the curtain, nothing was done. The contractor Hays had built the flank of the northwest demi-bastion as far as the bottom corner of the curtain wall.²⁶ The line of masonry leaned north, away from the wall. (See Figure 6) Other work done in 1829 included the excavation through the existing ramparts for the four casemates of defence.

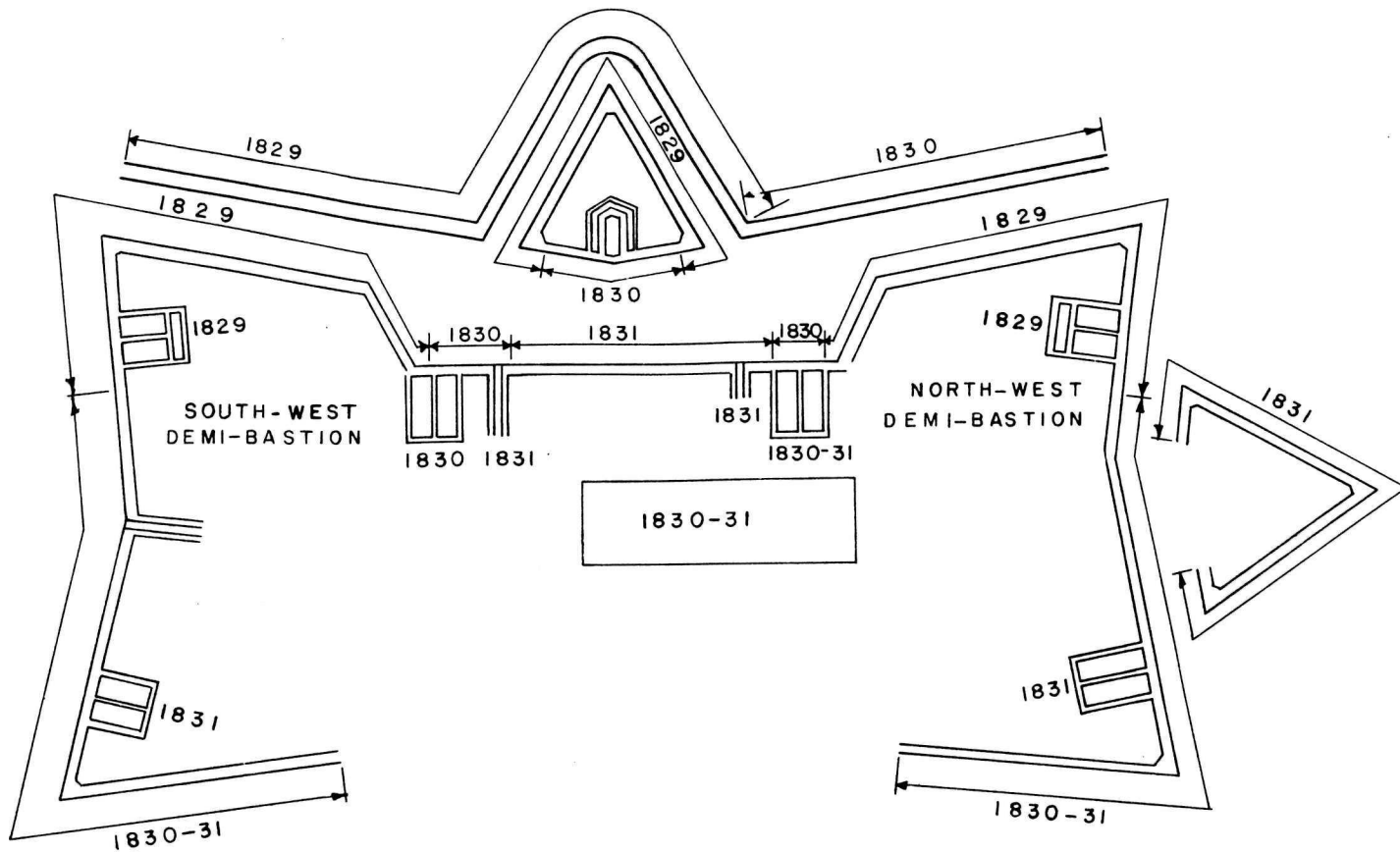
By November the contractors had finished the 800 feet of escarp. On October 15, 1829, Nicolls had again called for public tenders for wall construction in 1830. This time the specifications were for 1,000 feet of wall, enough to carry the escarps to the flanks of the northeast and southeast demi-bastions. However, by November it became obvious that Flinn's work on the right face of the southwest demi-bastion was winding and bulging. Nicolls claimed that Flinn was using stones too small and mortar too weak, so Flinn's contract was not renewed.²⁷ Hays' work was satisfactory to the Engineering staff and his bid for the 1830 season was accepted.²⁸ John Metzler was awarded a contract for the remaining 500 feet, but he was given 12s 7½d per perch, a full 1s 1½d per perch less than Hays.²⁹

Because of the bulging of Flinn's wall, Nicolls felt it necessary to hire a civilian master-mason, Mr. William Cooke, as a general foreman to superintend all the masons on the site.³⁰ Although not specified in the contracts, Nicolls was concerned enough about Flinn's work that he added 4 inches to the thickness of the walls to be built in 1830. He later

Figure 5

Drawing by Greg Corkum

This is a drawing of the work done on Citadel Hill, 1828-1831. It is based on my reading of the correspondence of the Royal Engineers and various maps and plans. It is included as a key plan to make the text more intelligible.



CITADEL CONSTRUCTION
1828-1831

claimed that he also began experimenting in the 1830 season with a mixture of Harwich cement and fine sand to point sections of the masonry.³¹ How much and where Nicolls used this pointing is not known, and just how much the walls were thickened is also a matter of some confusion. A section of the escarps drawn by Colonel Boteler in 1832 shows the 1829 walls $4\frac{1}{2}$ feet thick at top, a full 6 inches beyond the specifications. For the 1830 escarp sections, Boteler shows a top of wall thickness of 5.2 feet, a full 14 inches beyond what Nicolls claimed to have added.³² The basis for Boteler's drawings is unknown. If Nicolls had made such large adjustments in the thickness, however, he most certainly would have claimed credit for it.

In May 1830 the two contractors, Hays and Metzler, resumed work on the left face of the northeast salient and the right face of the southeast salient, progressing from the west front towards the east. The Sappers and Miners continued their work on the west front counterscarp, began building the cavalier, and worked on the wall and casemates of defence in the west curtain. The excavation proceeded along the curtain wall and along the gorge of the west ravelin. The sally ports were included in the estimates for 1830, but only the excavation and the construction of the opening in the curtain wall for sally port 3 was completed.

Work on the curtain wall was again piecemeal in this season. The Sappers and Miners, while working on the casemates of defence in the south end of the curtain, completed the wall to just north of sally port 3. On the north end, the corner was built and the casemates of defence finished to the spring of the arches. Work on the foundation and wall was carried to just south of casemate 11.³³ (See Figures 5 and 6)

The 1830 building season was one of the busiest in the construction history of the Citadel. The men were becoming familiar with the routines, and the labour problems experienced in the preceding year had been ironed out. As many as 380 men were working on the site at one time: 43 Sappers and Miners, 150 military labourers, 150 civilian labourers and about 40 civilian masons and carpenters.³⁴ Approximately 30 loads of stone a day were being hauled up the hill, as well as numerous horse-drawn carts filled with lime, sand, timber and other supplies.³⁵

Nicolls was pleased with the progress of the work in 1830, especially with the work of Metzler and Hays. Their contracts were renewed for the following year without calling for public tenders. The Engineering staff justified this procedure to London by arguing that the men had performed well, and that it would be a measure of economy to retain contractors who were familiar with the work.³⁶ Metzler promised to use stones as large as Hays had been using in 1830, and for this he was awarded a rate of 13s 9d - equal to Hays. Metzler signed a contract agreeing to finish what was left of the 500 feet in the 1830 contract, and to build 186 feet of the west curtain wall.³⁷ Hays was to finish the right face of the northeast demi-bastion and to build 320 feet of the north ravelin escarp.³⁸ Nicolls had decided to shift the contractors to the north and west fronts because he was probably already worried about the cramped interior of the fort, and was considering the redan as a solution to the problem. He did not want to build walls which would rule out this change.

On the 9th December 1830, the right face of the southwest demi-bastion, built by Flinn in 1829, collapsed. Two weeks later, two days before Christmas, the left face of the northwest bastion, built by Hays in 1829, also collapsed. The compromises made by Nicolls in his original design were beginning to be felt. Considering the tightness of the budget which had been insisted on all along, this was a serious situation. It did not reflect well on the Colonel's competence. Nicolls began an unsuccessful attempt to bring legal action against Flinn, and spent January preparing a letter to inform London of the disaster.

In his letter to the Master General, Nicolls did his best to explain the failures, citing that Flinn's contract had not been renewed in 1830 because he was using inadequate materials, and emphasizing the devastating effects of the Halifax climate on massive walls of this nature. He outlined the improvements ordered in 1830, especially Hays' use of larger stones, and the experimental pointing with cement. The Colonel then went on to indicate what alterations he planned for the 1831 season. These were fourfold: the thickening of the escarp walls, the closer positioning of the buttresses, the use of larger stones in the wall, and the pointing of the new masonry to a depth of 6 inches with cement. He was optimistic

Figure 6

Drawing by Greg Corkum

Composite drawing showing the timetable of the curtain wall construction 1829-31. This drawing is based on an 1832 plan by Boteler reporting on the state of the masonry; also on other contemporary sources and the as-found rectified photography of the wall.

Source: Public Records Office, London, WO 78, No. 1679, MPH 205

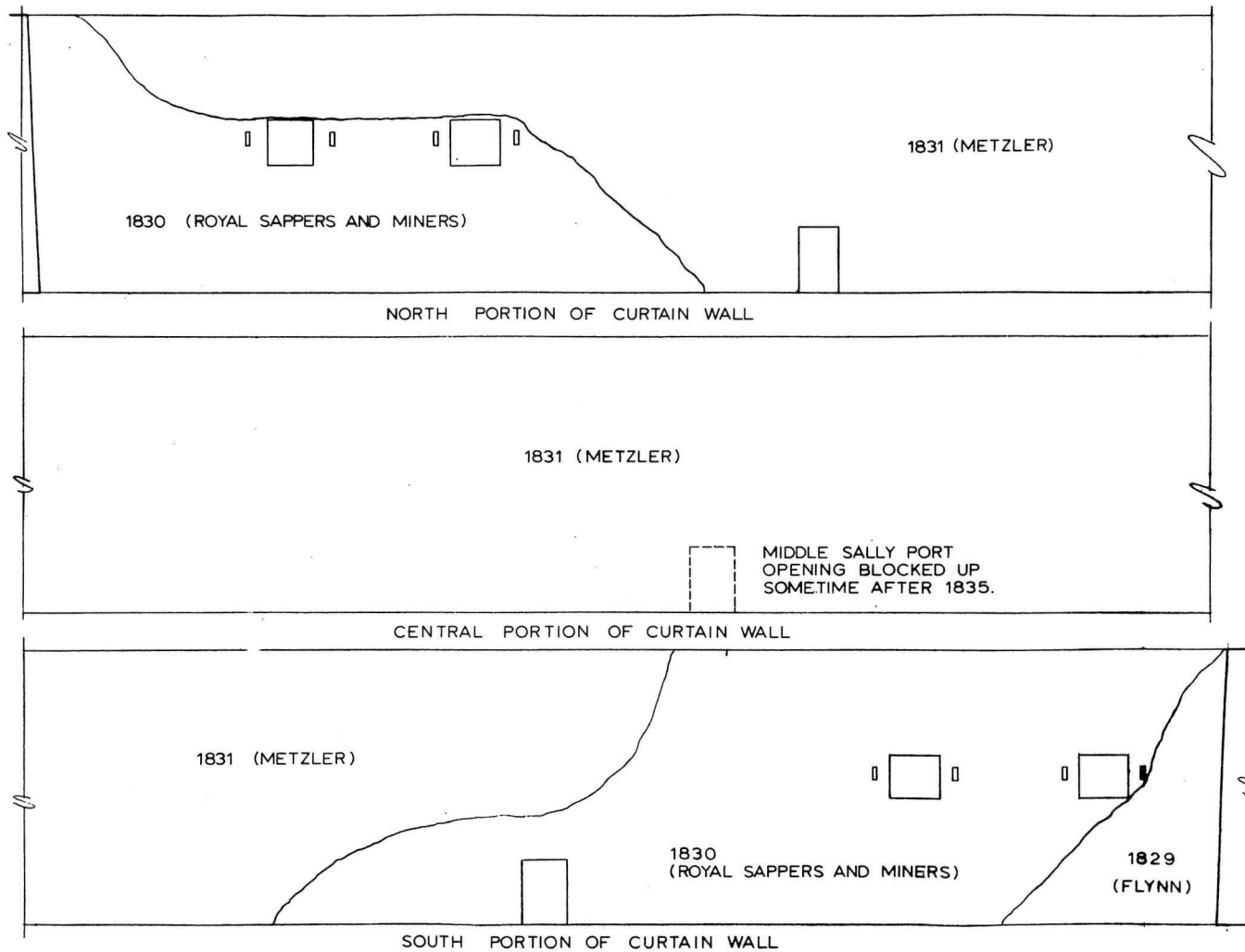


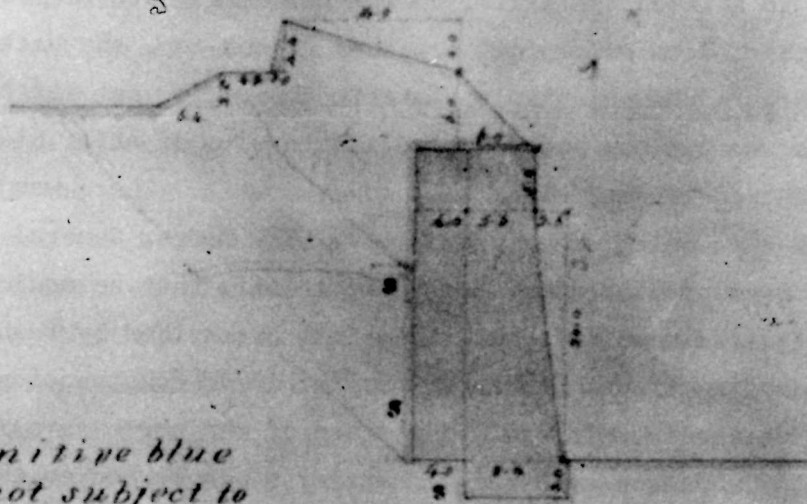
Figure 7

"For the West Curtain, Fort George"

This was the escarp profile plan sent to London with Nicolls' supplementary estimate of 2 May 1831. It shows the profile of the work done by Metzler in 1831 on the west curtain wall. The wall was thickened 1 ft. 6 in. at top and 1 ft. at bottom from Nicolls' original plan (Figure 3). He also mentions the stiff blue clay encountered in excavating for the wall.

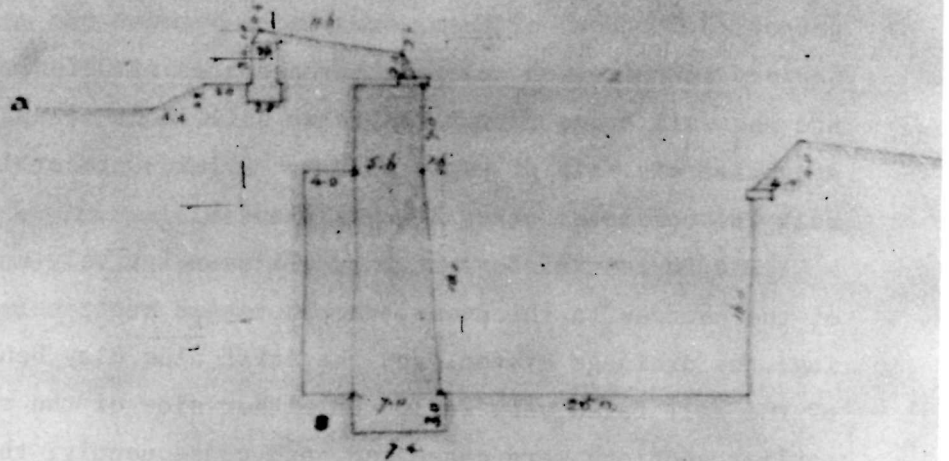
Source: Public Archives of Canada, MG12 W0 55, Vol. 868, fol. 496

Section thro' the West Curtain Fort George, as proposed to be built.



are of the primitive blue ll, which, when not subject to the weather, is as substantial as any.

Section thro' the line a.b.



Capt. Nicolas Bouché
Comd' Engineer

that with these improvements, no trouble would be experienced with the 1830 or 1831 walls.³⁹

In early May 1831, Nicolls sent a plan to London showing how he intended to thicken the walls.⁴⁰ The new escarp profile was to be 8 feet at the bottom and 5 feet 6 inches at the top, the batter 20 feet. (See Figure 7) He was also optimistic about the west curtain wall because the excavations had revealed that a vein of stiff blue clay ran to a height of 18 feet along the proposed wall. There was very little chance of this being damaged by frost. The Master General did not approve these plans, and stated categorically that he would not tolerate a wall of "less mean thickness than that prescribed by Vauban".⁴¹ However, by the time this letter was received, construction was well underway on the curtain wall and escarp of the north ravelin.

The 1831 season went well. Metzler's men worked on the west curtain wall incorporating the changes made by Nicolls. They built the wall from just north of sally port 3 to just north of sally port 4. One further alteration was introduced that year by Nicolls - the introduction of square wooden drains behind the wall emptying through the wall to granite gargoyles.⁴² Four of them were placed between the sally ports. The Sappers and Miners completed the casemates of defence, numbers 11 and 12, and the wall above them. They also built most of sally port 3 and approximately half of sally port 4. By mid-October 1831, the west curtain wall was complete. (See Figures 5 and 8)

The further history of the wall is relatively uneventful. Because of the changes in thickness, the increased buttressing, the cement pointing, the drainage system, and the stiff blue clay behind, the 1831 section of the wall fared very well. On either side of the sally ports, the earlier sections were casemated, and consequently, there was never any great strain on the wall. The middle sally port opening was blocked up with ironstone sometime after the Master General had cancelled plans for the caponiere in 1835.

By 1844, the wall was in need of repair. Captains Barry and Grain, reporting to the CRE on the state of the cavalier after an earthquake, reported that the curtain wall was fast approaching a "state of

dilapidation".⁴³ They suggested that the functions of cavalier and curtain wall be combined by rebuilding the curtain wall with casemates, and building a tower above to mount three or four guns. However, no action was taken on this suggestion.

The curtain wall received some disparaging comment in 1856 from General Gaspard LeMarchant. His opinion was that the "chief part of the Western Curtain is perfectly rotten, supported only by the casemates and arches, while the stone work is held together with mud and earth".⁴⁴ Because of this and other comments, a Committee was set up by London to investigate all aspects of Citadel construction, especially the contract escarps. However, the 1856 Committee, after making an opening in the curtain wall, taking measurements and analysing the mortar, vindicated Nicolls for his adjustments in escarp profiles after 1830. The walls and counterforts were found to be "if anything, of greater dimension than specified by the plan and contract".⁴⁵ Admittedly, the walls were a bit thin, but the committee decided that since repointing could be done at a trifling expense, rebuilding was not necessary. The repointing was estimated and carried out in that year.

There is no documentation suggesting that anything further was done to the curtain wall until Parks Canada began restoration in 1963. In that year the rear wall of casemate 10 was torn down to allow a rear access to the Citadel for construction vehicles. In 1973 the facing stones of the portion of the wall between the sally ports were numbered, taken down, and replaced. The ramparts were excavated for the West Curtain Wall Museum and the buttresses removed.

Figure 8

"Plan of Fort George, Citadel Hill, shewing the work in progress, approved and those estimated for the year 1832", Nicolls, 3 September 1832.

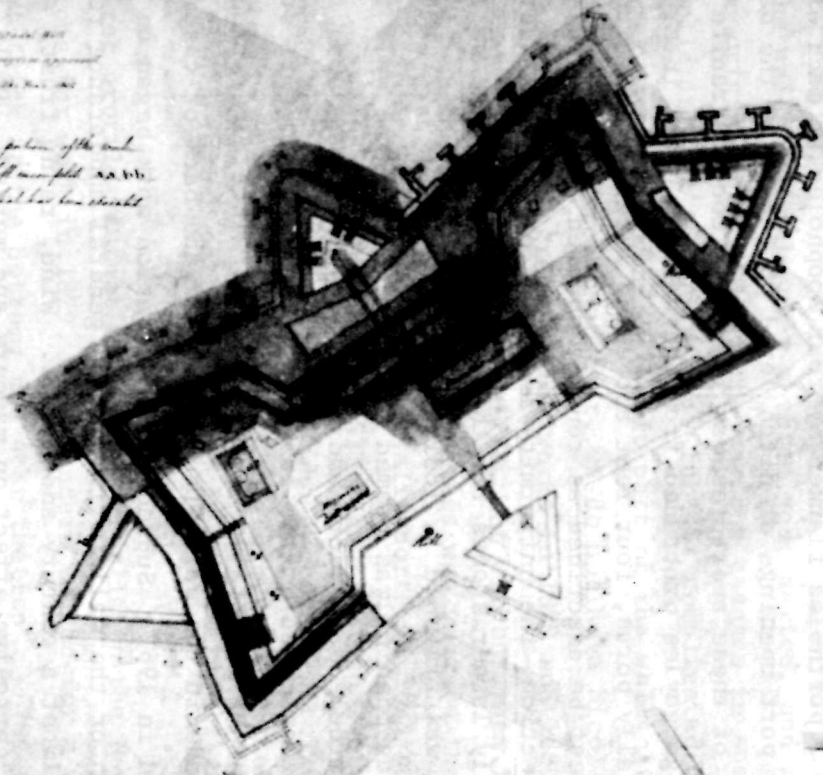
This plan shows the progress of the works until late 1831 and those proposed for the following year. Although the plan was colour coded, we only have a black and white print, which makes identification of the portions completed in 1831 difficult. See also Figure 5.

Source: Public Archives of Canada, MG12, WO 55, Vol. 862, fol. 330

Plan of Fort George (Great Hill)
Showing the Works in progress in 1782
and their extension in 1783. See p. 182

The light ramp has been taken off the work
but was done in 1782 but left uncompleted.
The dark ramp shows that has been started
since the spring of 1782.

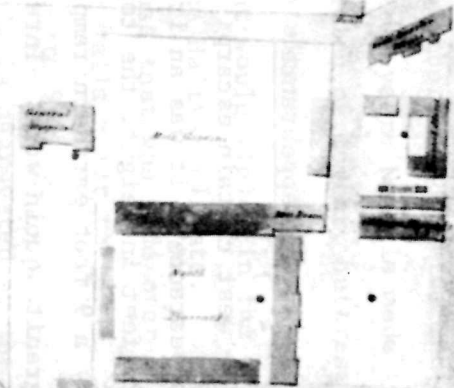
□ Fire-works
■ Magazine
○ Barracks
□ Hospital
□ Store-house
□ Gun-ammunition
□ Gun-ammunition
□ Gun-ammunition



Reference
The Fort, Plans &c. in the possession of the
War Office, London.
The Light Ramp, the present one, was
constructed by the late General Sir
John Mordaunt, and completed
in 1782.
The dark Ramp, the present one, was
constructed by the late General Sir
John Mordaunt, and completed
in 1782.



Plan of Bastion W. Bastion
built April 1782, finished in 1784.



W.O. 55/872

Chapter II Structural Analysis

Superficial Appearance

The west curtain escarp, in its finished state, had a formidable appearance. It was an ironstone masonry wall, 325 feet in length, 25 feet in height, the top accentuated by a sandstone coping surmounted by a 9 foot earthen rampart. The wall was framed at each end by granite quoin work. Interrupting the plain ironstone facade were ten openings: 2 portholes flanked by four loopholes at each extremity, and two sally port openings at ditch level 60 feet from the bastion flanks. Each of these apertures was framed by tooled granite stonework. Four granite gargoyles protruded from the wall at equal intervals between the sally ports, four feet above the level of the ditch. The masonry can best be described as roughly squared random rubble ironstone. On close inspection, the uniformity is broken only by the use of proportionately larger stones for the 1831 section of the wall.

The wall was finished in 1831 to Colonel Nicolls' original design. At that time an opening was framed in the centre of the wall to connect the proposed middle sally port and caponiere. When the plan for the caponiere was cancelled by the Inspector General of Fortifications in 1835, this opening was filled with ironstone. That alteration was the only change made in the wall structure until the back of casemate 10 was demolished in 1963. Subsequent restoration work began on the middle section of the wall in 1973. The general appearance remained unchanged for almost a century and a half. Wind, rain, frost, and ice had their natural corrosive effect on masonry and mortar. By 1973 the wall was standing, but on the verge of collapse.

Profiles

The profiles of the escarp walls pose some of the most difficult and obscure structural questions in the Citadel research. Colonel Nicolls' original design and his specifications for civilian contract work on the escarps proved very clearly inadequate by November of 1829, the end of the first building season. In the following two years Nicolls made minor adjustments in wall thickness, the composition of mortar, buttress placement, and size of stones. He thought these alterations might marginally increase the expense of the walls, but would yield, in the end, walls that could withstand the effect of the Halifax climate. These changes proved successful. For all the fuss that was made over his escarp profiles in the next decade, only the walls built to the 1828 specifications proved troublesome. (See Figure 9)

The research problem on the West Curtain Wall is aggravated by the fact that the wall was built over a three year period, and incorporates not only the original design, but the various changes in specifications made by Nicolls in that period. It is further complicated by the fact that the Royal Sappers and Miners built part of the wall; it is not entirely a contract escarp. Moreover, we do not have Nicolls' estimates and plans showing the progress of the works in 1829 and 1830. These documents probably were not too specific, but without them it is difficult to ascertain exactly what progress was made on the wall, casemates of defence, excavation, and sally ports in 1829 and 1830. We are left with Nicolls' September 1831 plan, the reports and proposals for change made by the three engineers who succeeded Nicolls at Halifax, Colonels Boteler, Peake, and Jones, and the drawings of the current as-found team. This report on the profiles is an interpolation of these elements.

The first profile is that defined by Nicolls in the November 1828 specifications for work in 1829. The tenders called for a wall "25 feet high, 7 feet thick at the bottom, and 4 at the top".¹ (See Figure 3) The fact is that we have no profiles to these dimensions in the curtain wall. But the base of the wall directly under casemate 9 measures 6 feet 6 inches, six inches less than what was specified. This part of

Figure 9

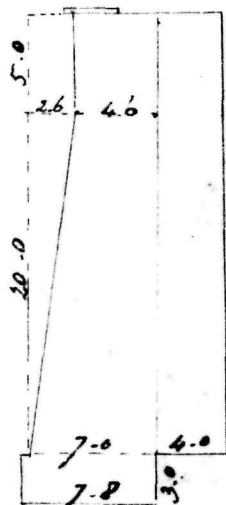
"Plan No. 8, Elevation of the West Ravelin", Boteler, 14 February 1832

This plan shows profiles of the escarps built in the period 1828-31, as described by Boteler in his report to London 14 February 1832. Some of these dimensions differ with Nicolls' statements, and it is difficult to determine who was telling the truth. The West Curtain escarp built by Metzler in 1831 is accurately measured.

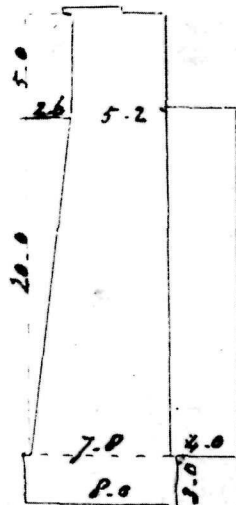
Source: Public Records Office, London, WO 78, No. 1679, MPHH 205

Esplanade

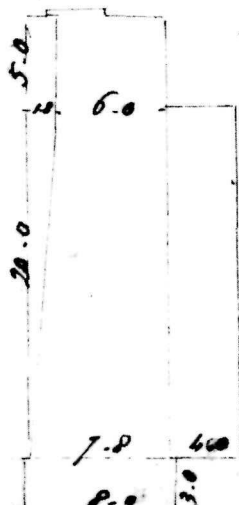
Esplanade



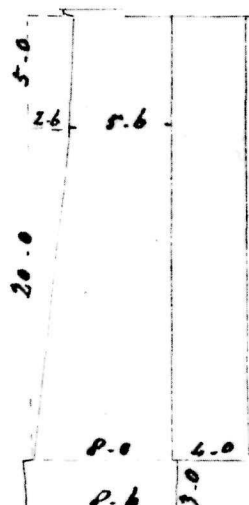
NW & SE Bastions
built in 1829 -



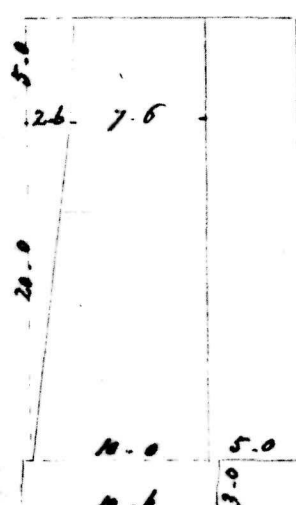
Left face N.E. &
right d. S.E. Bastion
1830



Right face N.E. &
left d. S.E. Bastion
1831



West Curtain
built in 1831.



Left face N.W. Bastion
rebuilt in 1831.



West C.
built

Counterforts, Work	ft	ft
West Bastion	5	4
N.W. Bastion	4	4
N.W. Bastion - breach rebuilding	5	5

the wall was built in 1829 by the contractor Flinn. The top of the same wall was built a year later. Nicolls having increased the general wall thickness by four inches for that year, we find the top of the wall measured as-found at 4 feet 6 inches.²

Colonel Nicolls had included the four casemates of defence in the west curtain wall in the estimates for 1829.³ However, because of the late arrival of the Corps of Sappers and Miners, and because of the priority given the counterscarp, west front, west ravelin, casemates of defence, northwest and southwest demi-bastion, and the work intended for the foundation of the cavalier building, it is unlikely that any work was done by the Sappers and Miners on the four casemates in 1829.

Colonel Boteler indicated in 1832 that the only work done on the curtain wall in 1829 was 20 feet of foundation at the south end.⁴ This, with the line of masonry to the top corner of the flank, would give a triangular section to support the corner quoin work. (See Figure 20) This work was done by the contractor, Flinn, not the Sappers and Miners, because it involved no archworks or casemate work. According to Boteler's plan, no work was done on the north end of the wall, not even the corner quoin work. The line of masonry slanted up the flank and away from the corner of the curtain wall.

At the beginning of the 1830 building season, the civilian contractors, Hay and Metzler, shifted to the construction of the escarp of the southeast and northeast salients. The Sappers and Miners continued to work on the counterscarp of the west front, casemates of defence in the curtain wall, cavalier, and casemates of defence, northeast and southeast salient. Casemates 9 and 10 were completed in that year and the wall itself carried over sally port 3. On the north end of the curtain wall, the Sappers and Miners carried construction of casemates 11 and 12 to the spring of the arches, and built the wall from the top of the flank over the port-holes of the casemates almost to sally port 4.

In November 1829 it became clear that contractor Flinn's southwest demi-bastion escarp wall was inadequate. It had begun to wind and crack between the masonry joints. Nicolls gave the escarp contract for 1830 to William Metzler, making sure this time that the liabilities for

inadequate work were more clearly stated. At the same time he decided to increase the thickness of the escarps by four inches, although this was not specified in the contracts, which again called for a wall 25 feet high, 7 feet at the base and 4 feet at the top.⁵ However, with the addition of the four inches which Nicolls later claimed to add to the thickness, the profile would have 7 feet 4 inches at the base, 4 feet 4 inches at the top.

It does not appear that Nicolls increased the thickness of the lower portions of the curtain wall at the north and south ends, which were built by the Sappers and Miners in 1830. The base of these walls remained seven feet thick, probably because the earth behind the wall was a solid blue clay not likely to bulge from frost heaves.⁶ Also, since the upper parts were to be casemated there was even less reason to add to the thickness. He did, however, increase the thickness at the top of the wall over the casemates of defence in the south end from 4 feet to 4 feet 6 inches.⁷ This portion of the wall was intended to be backfilled and, consequently, would be more threatened by the action of the frost.

The third and thickest profile in the curtain wall is that built by the contractor, William Metzler in 1831. Metzler's contract called for the building of the curtain wall 186 feet in length, the distance between the sally ports. Metzler had already signed the contract for 1831 when the disastrous collapse of both Flinn's and Hays' 1829 escarp walls in the northwest and southwest demi-bastions took place in December 1830. Nicolls spent the winter trying to explain to London the embarrassing failure of these walls and, at the same time, working on a proposal for the curtain wall and north ravelin escarp. He faced a difficult dilemma. On the one hand he was forced to admit that his original design was inadequate for the climatic conditions. On the other, he could not increase the profile of the escarp walls to the proportions suggested by Vauban without greatly increasing the expense, and thereby embarrassing himself, the ordnance hierarchy in London, and perhaps jeopardizing the completion of the Citadel. He sent his plan and the estimates for the increased expense to London on the second of May 1831, as the building season began.

The profile designed by Nicolls and built by Metzler in 1831 was 8 feet at the base, 5 feet 6 inches at the top, with a batter of 20 feet.⁸ (See Figure 7) Metzler's contract called for the building of the curtain wall 186 feet in length. This is the distance between the sally ports. However, he probably began slightly to the north of sally port 3 which had been constructed the year before, and continued a little to the north of sally port 4 which was being constructed by the Sappers and Miners the same year. The walls above the casemates of defence, north end, remained 4 feet 6 inches because Nicolls apparently felt they needed no further thickness. The wall was finished in October 1831 and the profiles proved adequate for over a century.

Foundations

The tender specifications made by Nicolls for the foundations of escarp walls did not change over the three year period 1829-1831. The 1828 contract specifications stated: "the foundation of the wall to be 3 feet deep and 7 feet 8 inches thick, of good sound blue or ironstone. The excavation will be performed by the Government".⁹ (See Figure 3) Presumably, these are the dimensions of the foundation put in by Flinn in 1829 for the 20 feet at the south end which he built in that year. Although Nicolls decided to increase the thickness of the escarp in 1830 in other parts of the fort, he appears not to have done so for the lower portions of the curtain wall built in 1830 (see above, "Profiles"). The foundations built in 1830 by the Royal Sappers and Miners probably conformed to the 1828 specifications. By the time Metzler was contracted to finish the curtain wall in 1831, this foundation, 3 feet deep by 7 feet 8 inches wide, extended from the south corner to 20 feet north of sally port 3, and from the north corner to within a few feet of sally port 4. (See Figure 6)

The drawings sent to London by Nicolls in May 1831 show the increased thickness of wall and foundation planned for that year. Since the base of the wall was to be increased by a full foot, the foundation had to be widened an equal amount. This gives a dimension of 8 feet 8 inches

wide and 3 feet deep for the foundation built by Metzler. (See Figure 7)

We have some further information supplied by Nicolls in 1831 on the composition of the foundation. In a letter to the Inspector General of Fortifications he commented on Colonel Jones' 1834 estimates for completing the Citadel. Nicolls thought the cost estimates for the foundation were too high.

They should not be equal to the walling above ground, as they can be done at a cheaper rate. The Contractors were always rejoiced at getting to a part where the foundations were deep; no face work and the facility of using the largest stone (several trucks were broken in bringing such up the hill in 1830-1831) and the economy therefrom in the mason's and labourers' work and mortar... but the existing contracts could not be altered; for building by the Department, foundation mortar not equal in quality to the other was used...."¹⁰

The foundation under sally port 4 may have been altered somewhat when the drain from the privies to the ditch was installed in 1839. A plan of the alteration proposed in the privies in 1856 shows the drain passing directly through the foundation, 2 feet 6 inches below the level of the ditch. The foundation shown in this plan measures 8 feet 8 inches wide, by a full 6 feet deep.¹¹ (See Figure 17) The foundation was probably deepened and strengthened to support this drain.

Buttresses

Nicolls' specifications for buttresses in 1828 called for "...the Buttresses to be of good sound iron or blue building stone. The Buttresses to be 14 feet apart, 4 x 5 feet each, and the height of the wall".¹² The specifications for the following year, 1830, were the same. For the 1831 season, Nicolls had decided to narrow the buttresses to 4 feet by 4 feet, but to move them a foot closer together (13 feet). However, these specifications were drawn up before the

collapse of the 1829 walls, and by the spring of 1831 Nicolls decided to go back to the 4 feet by 5 feet dimension. (See Figure 7)

The excavation of the ramparts and earth fill behind the curtain wall for the proposed museum has enabled the as-found team to accurately number and measure the buttresses. Their findings echo the conclusion of the 1856 committee members who, after making an opening in the West Curtain Wall, stated that the "Counterfort partially laid open, rather exceeded the dimensions specified in the Contract and Plan".¹³ The buttresses are not only slightly larger than 4 feet by 5 feet but are spread an average of 12 feet apart rather than 13.¹⁴ Nicolls was determined to ensure that this wall did not collapse. (See Figure 10)

In the following descriptions, I have numbered the buttresses south to north in the order in which they were built to facilitate reference.¹⁴

- No. 1 Eight feet north of the wall of casemate 10. 4 feet by 5 feet to the height of the wall. This buttress was probably built to half its height in 1830 by the Sappers and Miners, and finished to top of wall by Metzler in 1831. It marks the southern extremity of Metzler's work. South of this buttress, the wall is fully one foot thinner than the 1831 wall to the north.
- No. 2 One foot six inches north of sally port 3. 4 feet 6 inches by 5 feet. This buttress was only 5 feet 6 inches high. It was probably begun by the Sappers and Miners in 1830 as they worked on the sally port exit. The next year Metzler began work on buttress no. 3 and probably decided this small buttress was placed too close to the wall of the sally port for the regular spacing planned.
- No. 3 Eleven feet nine inches from the wall of sally port 3. 4 feet 9 inches by 5 feet. The first full buttress built by Metzler in 1831.
- No. 4 Twelve feet six inches from no. 3. 4 feet 6 inches by 5 feet. Metzler, 1831.
- No. 5 Eleven feet from no. 4. 5 feet by 5 feet. Metzler, 1831.

No. 6 Twelve feet from no. 5. 5 feet by 5 feet. Metzler, 1831.

No. 7 Twenty-four feet from no. 6. 5 feet by 5 feet. Metzler, 1831. This buttress is double the usual distance from its neighbours because the middle sally port was planned for the area between them.

No. 8 Eleven feet from no. 7. 5 feet by 5 feet. Metzler, 1831.

No. 9 Eleven feet from no. 8. 5 feet by 5 feet. Metzler, 1831.

No. 10 Eleven feet nine inches from no. 9. 5 feet by 5 feet.
Metzler, 1831.

No. 11 Ten feet nine inches from no. 10. 5 feet by 5 feet.
Metzler, 1831.

It is unknown whether there was a buttress placed between sally port 4 and casemate 11. The 1847 plan shows one. Sometime after 1870 casemate 7B was built, so the buttress, if it existed, must have been torn down. Since the distance between sally port 4 and casemate 11 is only 14 feet, it is conceivable that the buttress was never built.

The buttresses were formed into a continuous mass and bond with the masonry of the wall.

Masonry and Mortar

The wall was composed of roughly square ironstone, laid in irregular courses, and bonded by a mixture of lime and fine sand. The ironstone was quarried on the government lot on the Northwest Arm, some by the Corps of Sappers and Miners, the rest by Metzler's own men. It was then shipped around the peninsula by boat, unloaded at the Ordnance Wharf, hauled up the hill by horse and wagon, and finally laid by the masons. The lime and sand were provided by civilian contractors.

The 1828 contract specifications spell out in some detail the masonry requirements.

...the three front feet of the Wall to be of good sound iron building stone, and the remainder of the Wall also the Buttresses to be of good sound iron or blue building stone. Not any stone to be used in the front of the

Figure 10

Photograph of the interior of the escarp wall taken by as-found team during the excavation of the ramparts for the museum. These buttresses have now been completely removed. The photo also shows the middle sally port opening in the wall.



Walls whose length may be less than its height. No stone to run into the Wall less than 9 inches and every fourth stone not less than 18 inches.

In courses above 9 inches, the base of each stone to be at least equal to its height and not any course in the front to be less than five inches. If the courses be of 5 or 6 inches high, it [sic] must be formed of only one stone, but if it be 7 inches and upwards, one half of the stones used in it must be of the height of the course - the other half may be of two stones provided neither be less than 3 inches in height...the bottom course next the offset not to be less than 8 inches high, formed of one stone in height. Care must be taken to break the joints as shewn on the plan. The whole of the work to be performed in a workmanlike manner, to be properly bonded and well bedded in mortar. There will be granite stone Quoins for each corner of the wall, which will be found and prepared by Government, and set by the Contractor, they will be measured in the Wall to pay for the setting. The mortar to be composed of one third of the best white lime to two thirds of fresh water sharp sand. The Contractor to find his own scaffolding and all materials except the granite stone.¹⁶

There were only two minor changes made in the specifications in the following years. The 15 October 1829 specification added: "...no part of the Wall, to be built more than 1 foot 3 inches high in a course... the top and bottom course next the offset not to be less than 8 inches high, formed of one stone in height..."¹⁷

Although there were no changes in the specification for the masonry built over the three year period, some alterations were ordered by Nicolls. In the first instance, Flinn's contract was not renewed because he had used faulty materials. Nicolls had tried mixing coal

ash with the lime and sand in 1830 for facing the walls, but that the result had been the same: "...the front of the joint was washed in December".¹⁸ Another improvement was made in 1830 when the contractor Hays began to use a much greater proportion of large stones. For the 1831 season, Nicolls insisted that Metzler use stones as large as those being quarried for Hays. By examining the rectified photography of the curtain wall, it is very easy to distinguish this change to larger stones. (See Figures 11 and 12)

Nicolls also informed London that he considered a freer use of cement necessary. For the 1831 building season, he proposed to face all the walls with an equal mixture of Harwich cement and fine sand "for six inches deep". Nicolls declared that he had never seen this done to a thick wall but he intended to give it a fair trial and expected the change to "suit the humidity of this climate".¹⁹

An analysis of the mortar of the west curtain wall was undertaken by Colonel Stotherd, the Commanding Royal Engineer in Halifax, in 1856 in an angry reaction to Sir Gaspard LeMarchant's comments that the stones of the wall seemed to be held together "with mud and earth". Samples were taken from the interior backing of the wall and forwarded to London. Colonel Stotherd's letter and specimens were forwarded by Colonel Matson, Deputy Adjutant General of the Corps, to Mr. Munnir, a surveyor in London.²⁰ Munnir's opinion was that the mortar

...is composed of the very best material, but that the proportion of lime might have been less, and that a little more labour in making up would have been advantageous. I am not aware whether a coarser sand could have been procured, if so, it would have been desirable and better adapted for rubble masonry walls than the fine sand, which has been used, though it is a clear first rate specimen and of good grit.²¹

The masonry was repointed in 1856, presumably with cement. Thereafter, we know of no changes to the stonework until the department reconstructed the central portion of the wall in 1973.

Figure 11

Rectified photography of south portion of west curtain wall, showing sally port 3 opening. It is very easy to identify the ragged line dividing the 1830 and 1831 sections of the wall. The 1831 section above and to the left of sally port 3 was built by Metzler, who used much larger stones than the Sappers and Miners were using the previous year. This line agrees with the line described in Boteler's 1832 plan of the wall. See also Figure 6.

Source: Atlantic Regional Office.

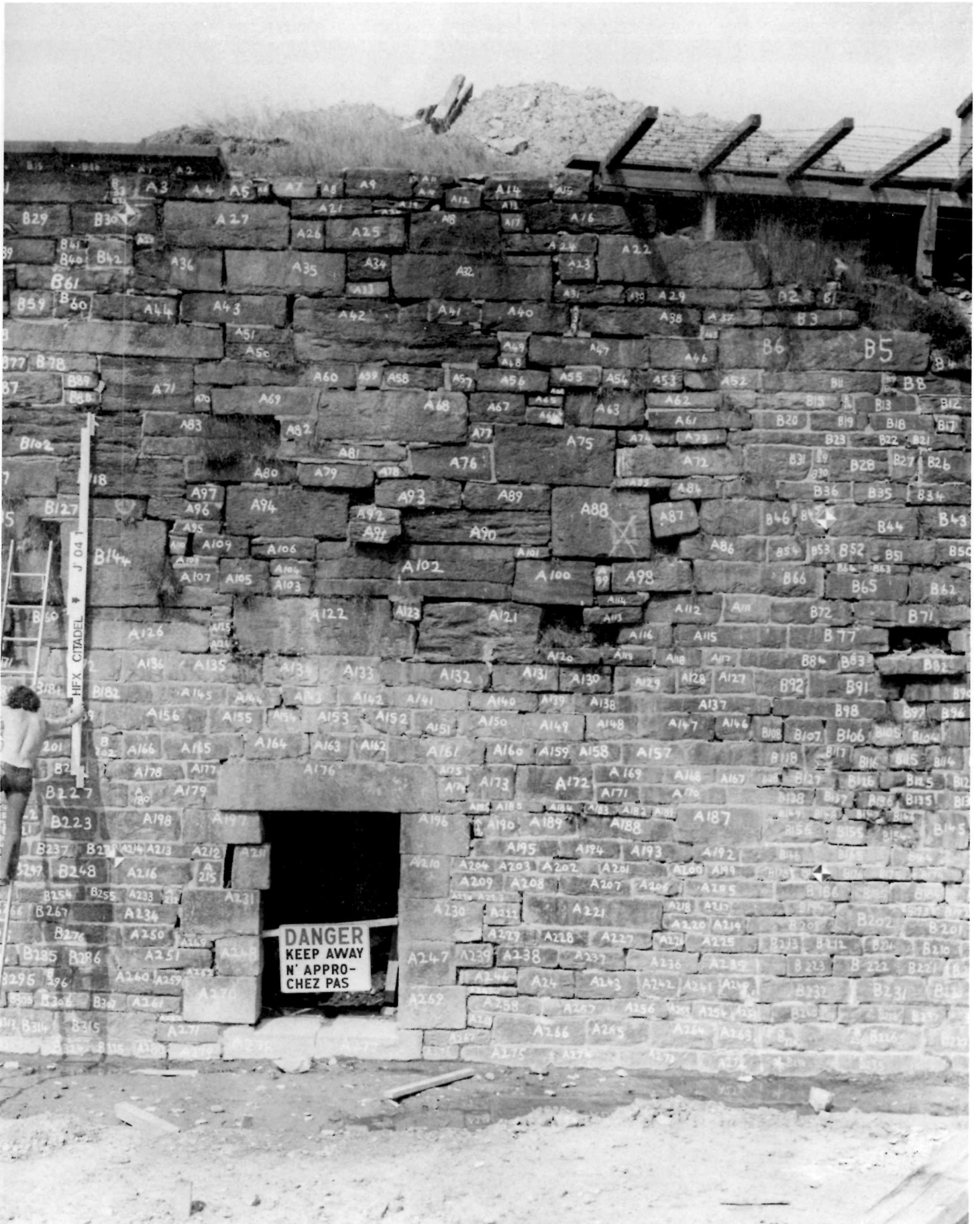
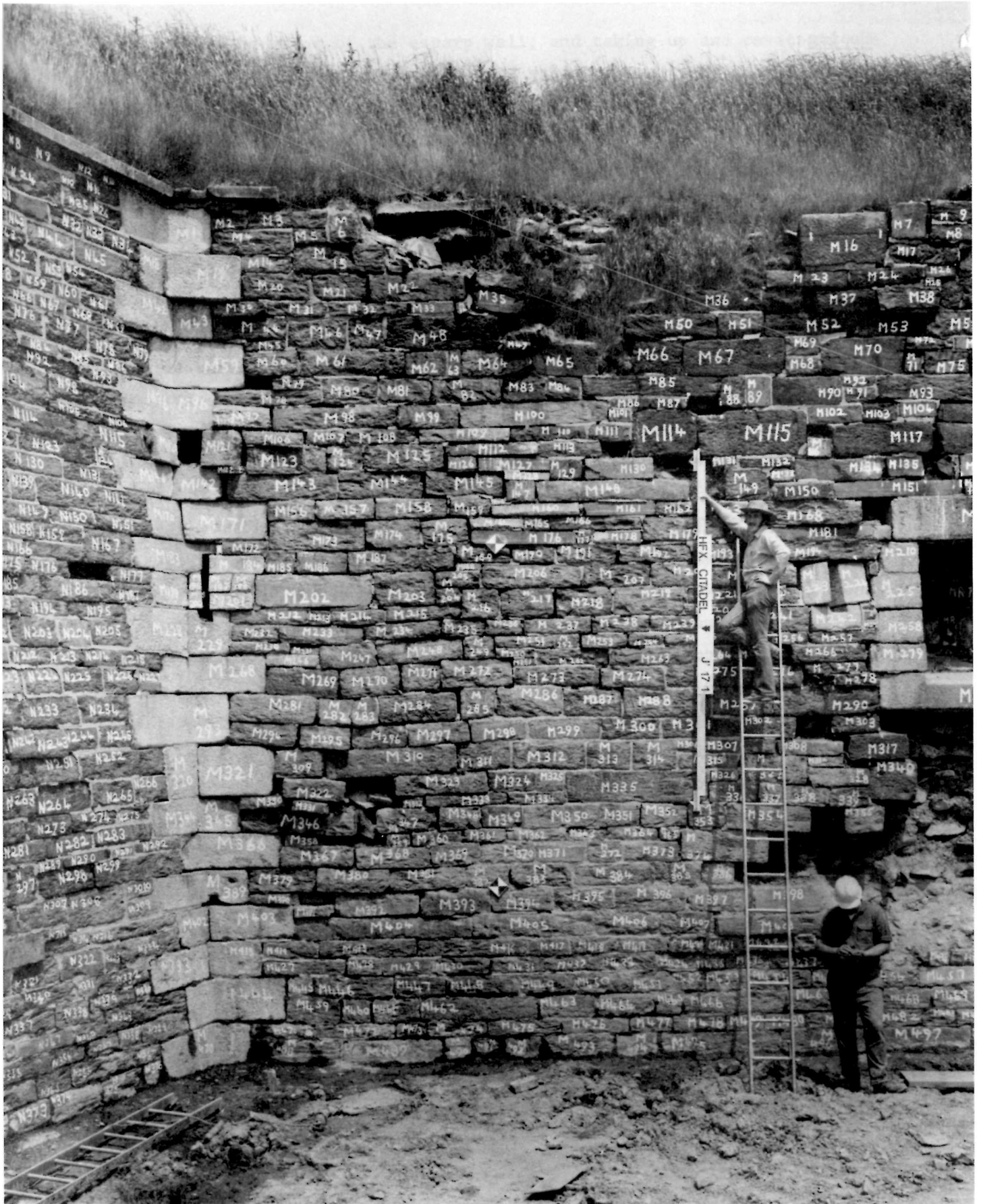


Figure 12

Rectified photography of north portion of curtain wall showing portholes and loopholes of casemate 12. Again the line between the smaller stones of the 1830 building season and those larger stones used in 1831 is clearly visible. See also Figure 6.

Source: Atlantic Regional Office



Coping

Nicolls' original plans indicate that a freestone coping was intended to run along the entire length of the top of the wall.²² (See Figure 3) This capstone kept the surface water from collecting behind the wall and by projecting six inches, prevented the same water from washing the masonry of the face. The contractor for the supply of the coping stone in 1829 and 1830 was Richard Scott; the stone to be "freestone...3 feet wide and four inches thick...no stone to be less than 3 feet long..."²³ George Smith was the contractor for capstone in 1831.²⁴ We do not have a copy of his contract, but presumably the materials were similar or identical to Scott's.

Although the contracts are not specific on the tooling of the freestone, it appears from examination of the 1830 coping on the flank of the northwest bastion, and from old photos of the curtain wall, that a gutter was chiselled into the freestone about two inches from the outside edge. This gutter collected the surface water and allowed it to pass to spouts which projected out a further six inches. It is not known how many were located along the wall. The spouts were part of the capstone, and being a brittle rock in an exposed situation, they had a tendency to break off. There is only a third of one spout extant, and this on the left face of the northwest demi-bastion. The coping stone was also tooled in such a way that the rear edge was higher than the front to facilitate drainage. (See Figure 13)

The coping of the casemated portions of the wall is a more difficult matter. After completion of the wall in 1831, it seems probable that the capstone described above would have run along the entire length of the wall. When the problem of the leakage in the casemates arose in the 1840s, various proposals were put forward as remedies, two of which involved altering the coping.

The first proposal for stanching the casemates which included altering the coping came from Colonel Calder in 1848.²⁵ He proposed to hip and flag the top of all the casemates so that the water would run to the centre of the valleys between the dos d'anes, then down drain pipes inside the casemates. It involved setting a continuous water

table into the rear of the escarp wall, and taking up and resetting the flagged coping. This resetting would have involved raising the coping in the mid-point of the wall so that the water off the ramparts flowed back into the casemate catchment. The water table was intended to keep the water well away from the arches where they tailed into the wall. Whether the "flagged coping" referred to the capstone on the curtain wall is uncertain. In any case, this proposal does not seem to have been implemented on the casemates of defence of the curtain wall.

The second proposal involved the use of asphalt and was inserted in the annual estimate for 1851, and the work was carried on over the next three years. It was similar in concept to the previous proposal, but made extensive use of asphalt, brick, concrete and course shingle. Asphalted bricks were laid up to and slightly over the rear of the escarp wall and a layer of asphalt was poured over this brickwork.²⁶ Chimnies and vents were sealed in a similar manner and, ideally, the water had an unobstructed flow to the down pipes of the casemates. (See Figure 14)

An inspection of the top of the casemates on the north end of the wall suggests that perhaps a modified method was used in the 1850 period or later. From the small portion of the top of wall exposed, it appears that concrete was carried over the bricks to mid-point of the capstone and the asphalt substance poured over this. Archaeological research may shed further light on the subject.

Gargoyles

After the failure of the escarp walls in 1830, Colonel Nicolls considered a number of alterations to help alleviate the frost pressure on the walls. One of his experiments involved the installation behind the wall of square wooden tubes. These wooden drains were connected by an ironstone tunnel through the wall to granite scuppers on the face. He tried this innovation on the portion of the left face of the northwest demi-bastion which he partially rebuilt in 1831.²⁷ He also incorporated

Figure 13

Photo from Massey Report 1950. This photo shows the coping stone above the curtain wall, on a casemated portion of the wall. The spout is visible in the middle ground of the photo.

Source: Public Archives of Canada



Figure 14

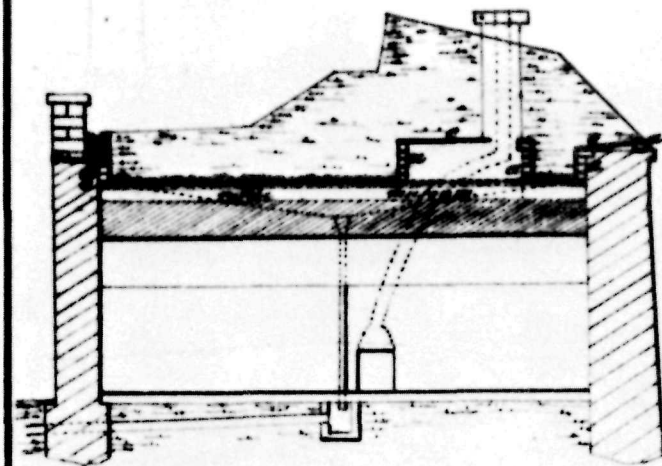
"Fort George, Halifax, N.S. A Sketch of the Covering of Casemates with Asphalte", ...R.M.P., 12 June 1854

This plan and two sections show the method adopted in 1851-53 for waterproofing the casemates. Section on AB shows how the coping and rear of escarp wall were altered to drain to the valleys between the casemates. The plan gives a top view of the escarp wall, showing the bricks and asphalt built over the coping.

Source: Public Archives of Canada, MG12, WO 55, Vol. 887, fol. 498

To Accompany C.E. Report No 599
dated 12th June 1856

Section on AB.



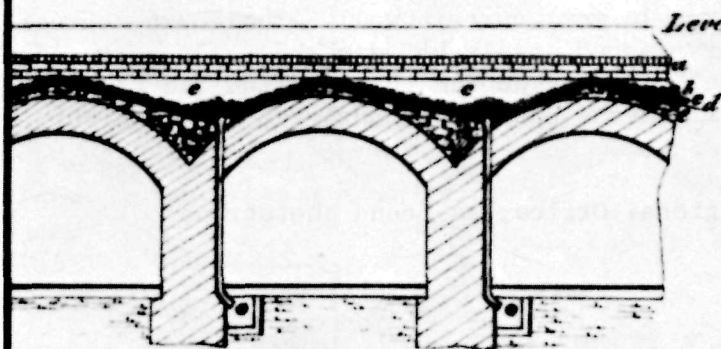
498

FORT GEORGE
HALIFAX, N.S.

A Sketch of the covering
of Casemates
with Asphalt.

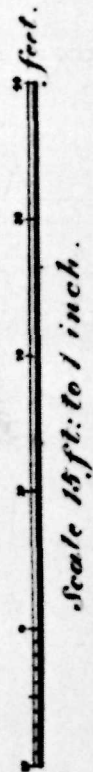
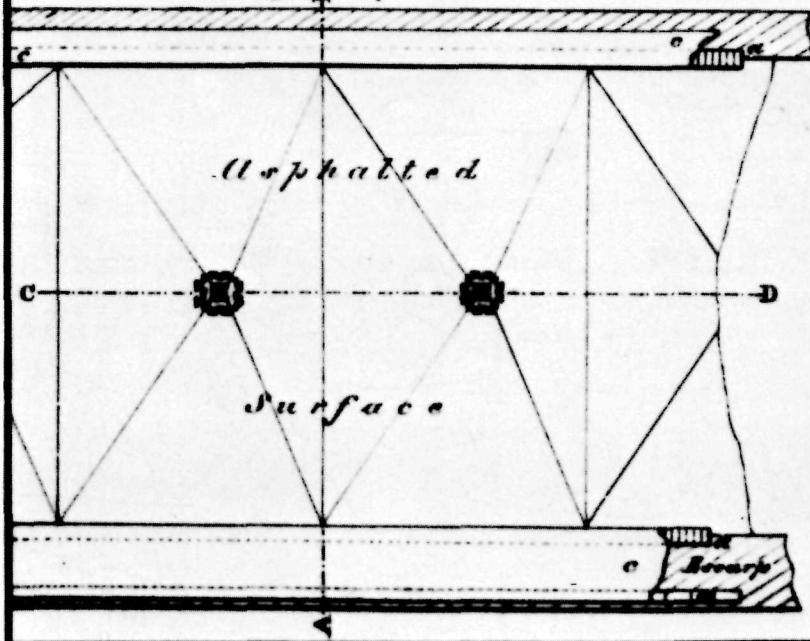
- a. Asphalted Bricks.
- b. Course Shingle.
- c. Asphalt.
- d. Concrete.
- e. Rubble Masonry.

Section on CD.



Level of Rampart.

Plan of Asphalted Arches.



20 22
498

Figure 15

As-found photo of gargoyle west curtain wall. There are four of these granite scuppers spaced evenly between the sally ports, four feet above ditch level. Square wooden tubes behind the escarp wall carried water to an ironstone channel through the wall and out the gargoyles.

Source: Atlantic Regional Office, as-found photograph

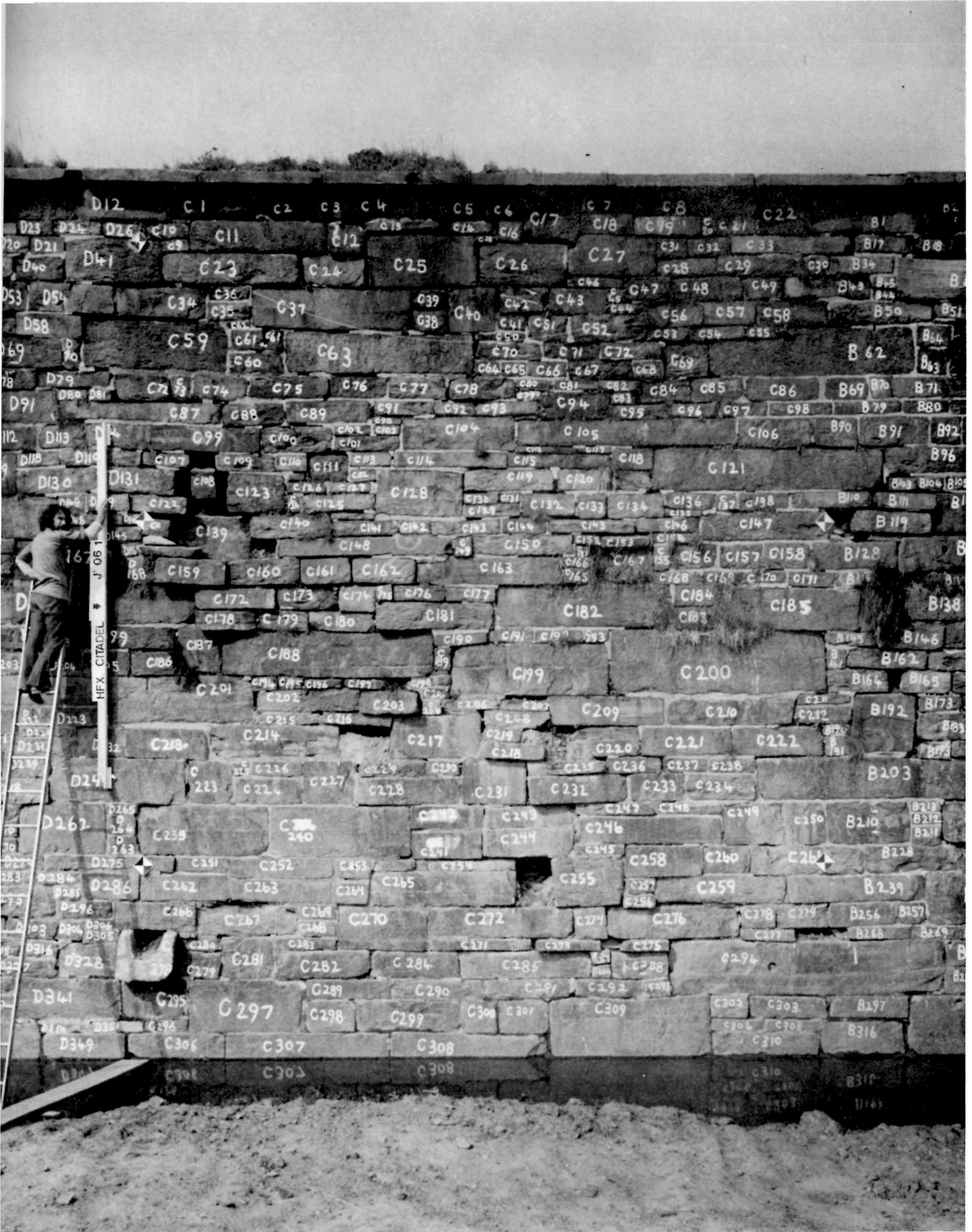
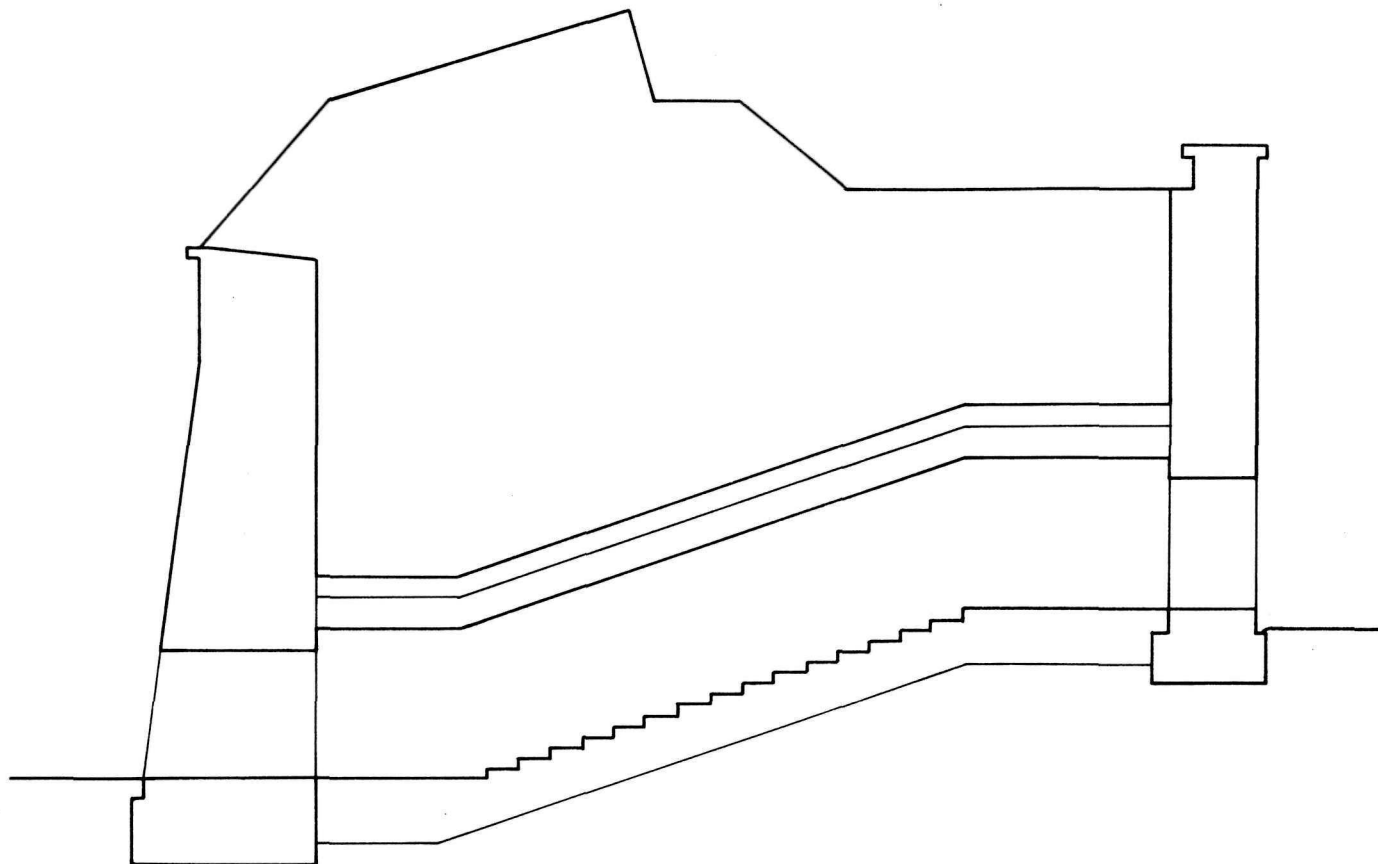


Figure 16

Drawing by Greg Corkum

This modern drawing is an enlargement from Boteler's very small scale. It shows the sally port opening seven feet high with a flat roof.

Source: Public Records Office, London, WO 78, No. 1679, MPHH 205,
"Plan of Fort George, Halifax, N.S., as supposed to be when
finished agreeably to the documents on the spot", Boteler,
14 February 1832



COLONEL BOTELER'S
1832 PLAN OF
PROPOSED MIDDLE SALLYPORT

Figure 17

"Plan and sections showing the work described in improving the soil pits at the Soldiers' Privies...", Stotherd, 1 January 1856.

Figure 3 gives a section through the length of the sally port. The opening through the wall has a flat roof seven feet above floor level. The section indicates that the lintel was tooled to provide a door abuttment.

Source: Public Archives of Canada, MG12, WO 55, Vol. 887, fol. 659

Plan and section showing the arrangement
in improving the air lift by the
"Subsidiary Process"
at the
"Station"
connecting the air lift system with the "Main" air lift
and "Main" shaft

*W. J. Fisher & Co.
Contractors
St. John's N.S.*

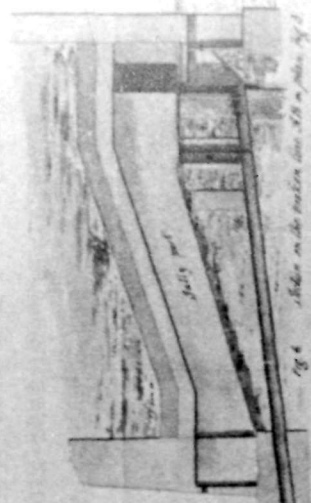


Fig. 4. Section on the main air lift shaft.

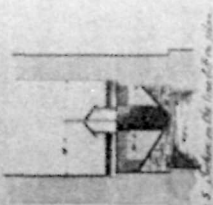


Fig. 5. Section on the main air lift shaft.

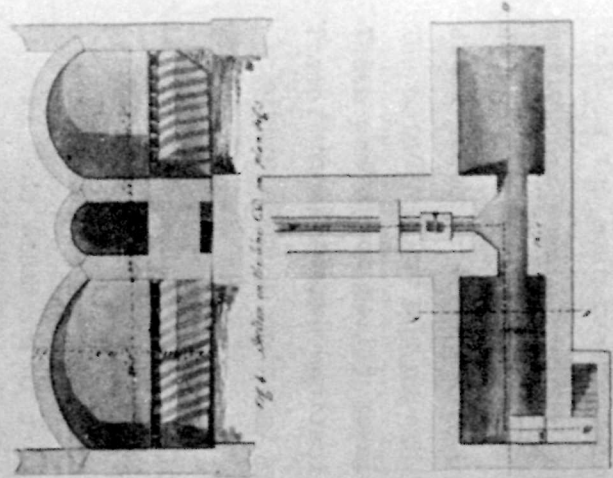


Fig. 6. Section on the main air lift shaft.

Fig. 6. Section on the main air lift shaft.

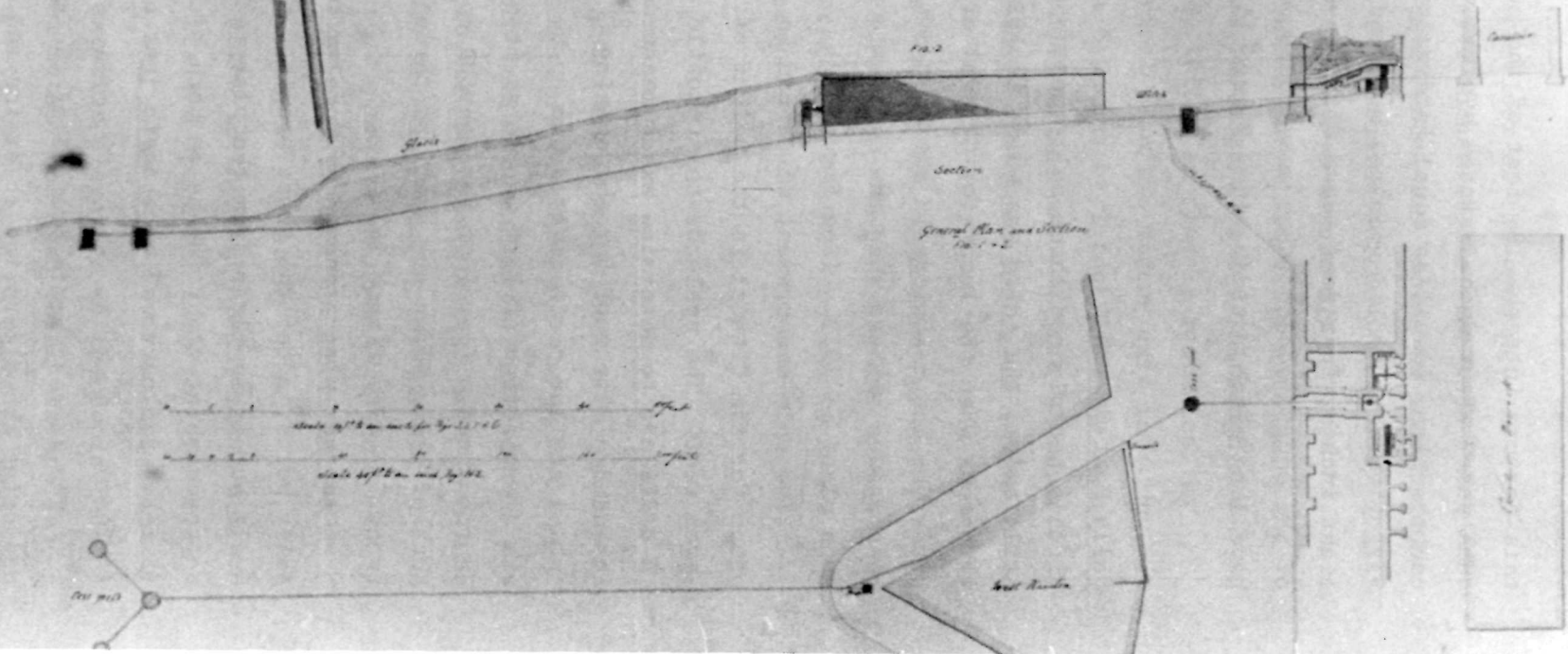


Fig. 2

Section

General Plan and Section
Fig. 1 & 2

Scale of 1/4" = 10' and for Fig. 1 & 2
Scale of 1/8" = 10' and for Fig. 3 & 4



this feature into the 186 feet of the curtain wall built by Metzler that same year. Four such drainage systems were included in the curtain wall construction, spaced at equal intervals between the sally ports. The gargoyles were tooled granite, mortared into the wall, projecting out eight inches, four feet above ditch level. Understandably, no evidence of the square wooden tubes were found during excavation. They must have long since rotted. (See Figure 15)

Sally Port Openings

Nicolls had planned three sally port openings through the wall. Two still exist, the third was built in 1831, but later filled in with ironstone when the Inspector General of Fortifications cancelled the plans for the caponiere in the west ditch. The interior of this middle opening was exposed when the excavation for the curtain wall museum took place in 1973. (See Figure 10)

The only measurement which can be extracted from Nicolls' original plans for the Citadel is the height of the sally port through the wall - seven feet. The scale of this profile of the fort is so small that it is difficult to determine exact measurements. It appears also that he intended a flat roof for the opening.²⁸ (See Figure 3)

A similar profile was drawn up by Colonel Boteler in 1832. This was a projection of Fort George as it should have looked when complete. He too shows a flat roof through the opening and a height of seven feet. Both of these plans are sections through the middle sally port, west front.²⁹ (See Figure 16)

Another plan prepared by Boteler in 1832 shows a top view of the sally ports, after the three openings had been built. The scale is small but it is clear from the plan that the sally port (6 feet 6 inches) narrowed about eight inches on both sides as it entered the escarp wall (5 feet) and narrowed once again just before the exit to the ditch (4 feet).³⁰

The largest scale profile of the sally port openings is a plan depicting the alteration to drains and privies in 1856. This profile

shows a flat roof seven feet above the floor of the opening. Also indicated is an abutment of 9 inches by 9 inches at the exit into the ditch. This would seem to indicate the lintel was tooled to accommodate a door casing. No similar abutment is indicated on the interior opening to the main chamber of the sally port.³¹ (See Figure 17)

A plan made to accompany an estimate for eight sally port gates in 1858 is the most recent document that has been located. Although the sally port opening is not identified, this plan closely resembles the as-found measurement. On the historical plan the narrow exit into the ditch measures 4 feet wide by 6 feet 6 inches by 1 foot 6 inches deep. The main chamber opening measured 6 feet 10 inches by 4 feet 8 inches.³² There was a 4 inch sill on top and along both sides acting as a door frame. (See Figure 18)

The entrance into the ditch was framed with carefully squared granite ashlar. The inside walls and roof were ironstone. The floor is now composed of earth, although originally it was intended to have brick on edge paving at the entranceways.

Sally Port Gates

Nicolls' original estimates were so generally formulated that it is impossible to know whether he included doors or gates for the sally ports. Colonel Boteler and Colonel Jones both included estimates for doors in sally ports in their revised estimates for the completion of Fort George. However, these estimates are also very general - simply an item for three inch oak plank for the doors and a quantity of cast iron for hinges and bolts. Neither engineer indicated whether the doors were to hang on the exterior or interior opening of the sally port.³³

In 1858 a plan and estimate for gates to the eight sally ports was sent to London. We do not have the detailed specifications for the doors but we do have a plan indicating that the gates were to be of oak, five inches thick. (See Figure 18) The exterior elevation of the doors suggests that a metal sheathing approximately one inch thick was applied to cover the outside face. The doors were to be held in place by four

Figure 18

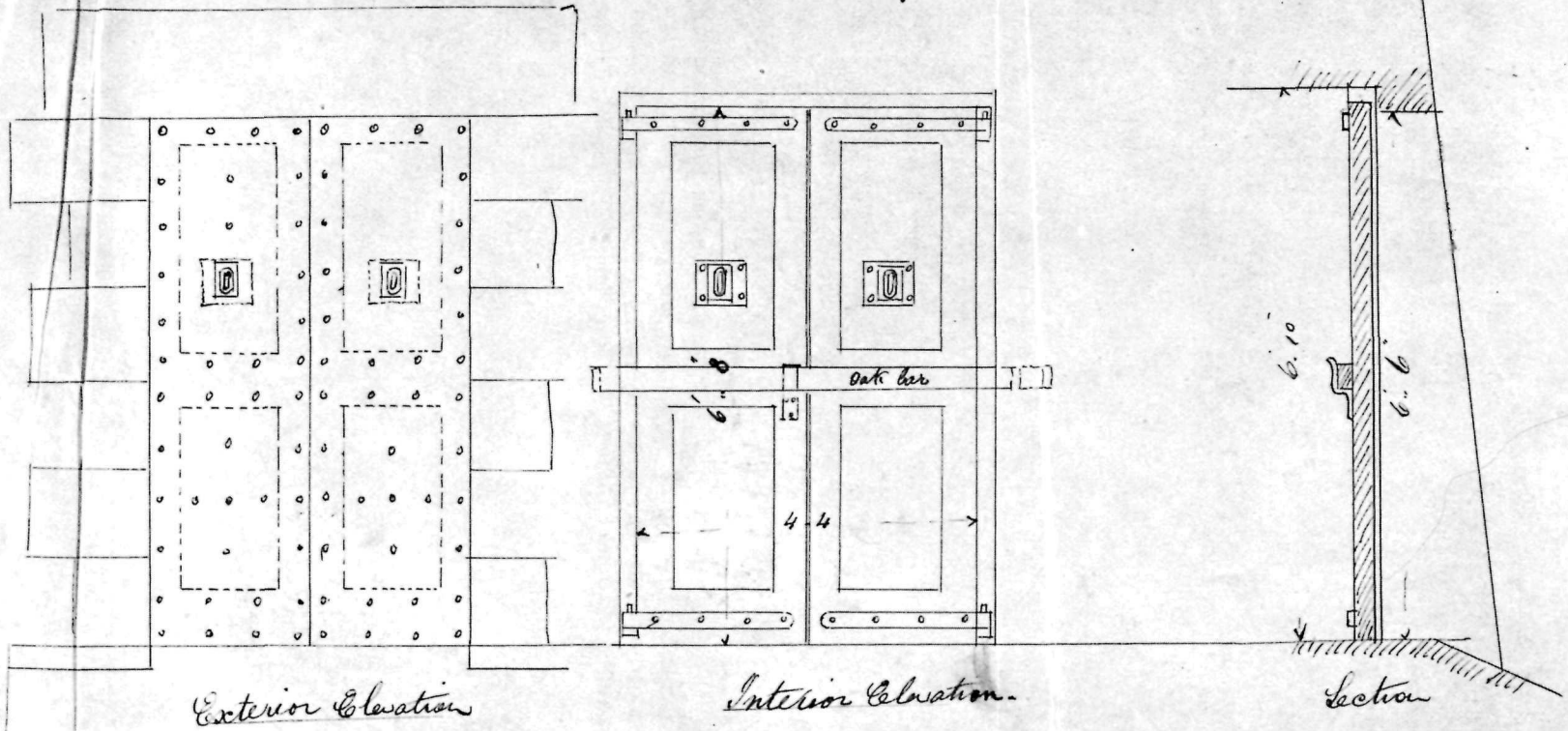
"Halifax, Nova Scotia, OAE 59.60, Item 2"

This is a plan, section and two elevations of the sally port gates intended for all six of the sally ports. Plan is self-explanatory. It appears that a metal sheathing was intended to cover the exterior of the door. The pintels are still in place in sally ports 3 and 4.

Source: Public Archives of Canada, RG8, C series, Vol. 1653A, p. 136

Halifax, Nova Scotia
O.A.C. 59.60. Item 2.

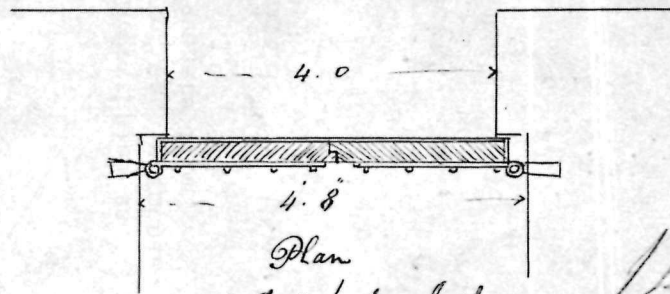
136



Exterior Elevation

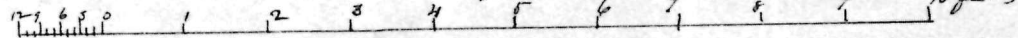
Interior Elevation

Section



Plan

scale 2 feet = inch



[Handwritten signature]

Figure 19

Photo of curtain wall from Massey report. Photo shows portholes as they existed in 1950. Notice steps on the south side of each porthole. These were chiselled into the granite to protect the gunners from ricocheting musket fire.

Source: Public Archives of Canada (Box #4683, HS-12495)



Figure 20

1973 as-found photo of south corner of curtain wall. Porthole of casemate 9 in a precarious state. Note step chiselled into north side of porthole and the granite sill chiselled to provide splay. The portion of the masonry still standing is that built by Hays in 1829.



hinges, the shanks of the pintels bedded into the granite walls. An oak bar, 4 inches by 3 inches, secured the inside of the doors and was held in place by three brackets, two of them open at the top. Two loopholes were included, one in the centre of each door, 4 feet 4 inches above the floor level. These loopholes measured 6 inches by 7 inches and they, too, appear to have been made of metal.³⁴ Colonel Nelson wrote to London in December 1858 requesting delivery of the loopholes ordered.³⁵ This would seem to suggest that they were manufactured in England and probably made of steel.

The pintels of the door hinges are still in place, imbedded in the granite. Pintels are also evident in the interior opening into the sally ports which suggest doors were in place there at some period in time.

Portholes in the Casemates of Defence

There is little useful historical documentation on the portholes. Nicolls had intended mounting 24-pounder carronades in the casemates so they would have been designed to accommodate this artillery. The portholes were framed by granite to make them as splinterproof as possible. It is clear from his 1831 plan of the north front that steps were chiselled into the granite to protect the gunners from ricocheting musket fire.³⁶

Boteler prepared an elevation of the west curtain wall as part of his 1832 report on the escarps which shows the portholes in place, but not very accurately drawn. The granite steps on the north side of the ports, for example, are not detailed. Not much attempt was made at perspective, so the portholes measure 4 feet by 4 feet throughout. The granite quoins and long lintels are shown accurately. Another interesting fact about the drawing is that the interior of the portholes are obviously covered by sash frame windows.³⁷

None of the later sections of the casemates by the various engineers show any profiles of the portholes, so we have to rely on the as-found drawings to give a sense of their vertical dimensions.

The as-found drawings record the portholes in their present dilapidated state. The interior opening in casemate 11 is 3 feet 2 inches high, by

2 feet 7 inches wide. The porthole is 4 feet from the top of the arch and 2 feet above the present concrete floor. The left side of the porthole is 5 feet 9 inches from the south wall of the casemate; the right side is 6 feet 6 inches from the north wall. The opening is splayed outward and downward; 5 feet 4 inches along the top, 6 feet along the bottom. The downward splay is chiselled out of the granite sill. There is one step in this porthole on the south side of the opening.³⁸ The exterior opening of casemate 12 measures 4 feet 6 inches wide, 4 feet 3 inches high.

The porthole through casemate 12, at present, measures 3 feet high by 3 feet 7 inches wide. Its top is 3 feet 9 inches from the arch; the bottom, 2 feet from the present concrete floor. The left side is 4 feet from the south wall of the casemates; the right side 7 feet 6 inches from the north wall. The opening is splayed outward and downward - 5 feet 4 inches along the top, 6 feet along the bottom. The downward splay is chiselled through the granite sill. There are two steps in the south side of the porthole.³⁹ (See Figures 12 and 19) The exterior opening of casemate 11 measures 4 feet 5 inches high by 4 feet 5 inches wide.

The porthole through casemate 9 measures 2 feet 3 inches wide by 2 feet 9 inches high. It is positioned 6 feet 4 inches from the south side of the casemate, and 6 feet 4 inches from the north side. It stands 4 feet above the present concrete floor, and 2 feet 6 inches from the top of the arch. The downward splay is chiselled through the granite sill. There is one step on the south side. (See Figure 20) The exterior opening of casemate 9 measures 4 feet 6 inches wide by 4 feet 2 inches wide.

Loopholes - Casemates of Defence

Scant as the documentation is for the portholes, there is even less for the loopholes in the casemates of defence. The only early documentation we have is an 1831 plan of the north front by Colonel Nicolls. This merely shows the loopholes as a wedge shape through the walls. The interior opening appears to be about 1 foot 6 inches.⁴⁰

Boteler's 1832 elevation of the curtain wall shows the loopholes, but in no detail. By his plan they are approximately 1 foot 4 inches high through the exterior of the escarp wall. They are positioned too

regularly three feet on either side of the portholes. He does not indicate portholes for casemates 11 and 12, but this must have been an oversight on the drafting table.⁴¹

The as-found team has recorded the exterior openings of all six loopholes. The interior openings have been filled in by brick and stucco and the rear of casemate 10 was demolished before the as-found team began recording. The measurement of the north loophole, casemate 11, is $6\frac{1}{4}$ inches by 1 foot $6\frac{5}{8}$ inches. It is splayed downward, $3\frac{1}{2}$ inches have been chiselled from the sill to accommodate the splay. The south loophole, casemate 11, exterior dimension - 6 inches by 1 foot $6\frac{3}{4}$ inches; $3\frac{1}{2}$ inches chiselled.

Exterior dimension of north loophole, casemate 12, 1 foot $7\frac{3}{4}$ inches high, width 6 inches; 5 inches chiselled from granite sill for downward splay. The exterior measurement of the south loophole, casemate 12, is 1 foot $5\frac{1}{2}$ inches high, width 6 inches; $2\frac{1}{2}$ inches chiselled from granite sill for splay.⁴²

Exterior dimension of south loophole, casemate 9, 1 foot $7\frac{1}{4}$ inches high, $6\frac{1}{2}$ inches wide. The granite framing of the north loophole, casemate 9, is well out of joint because of the restoration work.

Historical Considerations for the Restoration Design Team

Since the curtain wall remained virtually unchanged from its 1831 completion date until 1963, the reconstruction will be to the 1831 period. The documentation on the wall masonry and basic structure is quite specific - a roughly squared, roughly hammerfaced, ironstone masonry wall, 25 feet from foundation to coping stone, with a batter of 20 feet. We have an adequate description of the freestone coping to manufacture new material if the old is lost or broken. The portholes and loopholes of the casemates of defence in the north and south ends of the curtain will prove the most troublesome for design. Since there are no specific details in the early plans, a heavy reliance on the as-found record will be necessary. The loopholes and portholes in the north end are in the best state of preservation, and can be used as a reference for the reconstruction of those in the south end. In addition, there are eight additional casemates of defence built during the same period (1829-31) which can be examined for

details and measurements. The 1858 plan for the sally port gates supplies the most accurate representation of the sally port openings through the wall, and should form the basis for reconstruction drawings. It seems that the rear wall of casemate 10 will continue to provide a rear access to the Citadel parade, so this may be the last item of the reconstruction plan.

Chapter III Sally Ports Three and Four

Narrative

Colonel Nicolls had intended to have three sally ports in the west curtain wall. The middle sally port was to lead into a caponiere connecting the interior of the fort with the guardhouse of the west ravelin and providing additional flank fire along the ditch. Plans for this middle sally port were dropped when the Inspector General cancelled the caponiere in 1835 as an economy measure. Sally ports 3 and 4 were included in the supplementary estimates of 1829 but not built until 1831. The sally port 3 opening through the escarp was constructed in 1830 and the remainder of the tunnel to the retaining wall built the following year. The sally port 4 opening through the wall was built in 1831 and about half of the tunnel was constructed at the same time. The remaining parts of the sally ports were built in 1838-39 under the provisions of the 1836 revised estimates for retaining wall and privies.

There is virtually no documentation on either sally port 3 or 4 as they were originally constructed. Both Nicolls and Boteler provide profiles of the middle sally port through the west front ramparts but this sally port was never built. However, there is no reason to assume that sally ports 3 and 4 were intended to differ from the middle sally port, since there was nothing in the nature of the caponiere which would alter the design.

From Colonel Nicolls' 1825 sections through the fort, it is evident that he planned the sally ports to slope directly from retaining wall to escarp wall, the entire length to be floored with granite steps. Sometime after this plan was conceived and before actual construction began he changed his design by extending the level floor areas well into the sally port.¹ Another small change between 1825 and 1830 was the

positioning of the sally ports in the wall. The 1825 surface plan shows the sally ports approximately 60 feet from either end of the wall, but sally port 4 was built 70 feet from the north corner. This change was made because the west ravelin was not located in the centre of the curtain wall, but a full ten feet south of the centre line. Whether this was a surveyor's error, or whether Nicolls was taking advantage of a geological feature is not clear. Casemates 11 and 12 had to be constructed ten feet south of the north corner to enable the ordnance to properly cover the ditch of the ravelin. Sally port 4 was built ten feet south of its planned position.²

It is difficult to ascertain how much of the sally ports was constructed in 1831. They were left in an unfinished state until 1838-39. When writing to the Inspector General in 1835 and taking issue with Jones' estimates, Nicolls declared that "...the south sally port was brought to the springing of the arches in 1831 and a great part of those to the west and north were completed in that year".³ Jones simply reiterated that the sally ports remained as left in 1831, unfinished and exposed to the weather.

In 1833 Boteler had completed a comparative estimate for the completion of Fort George. This estimate included a provision for "£648 - two sally ports west front".⁴ In an earlier estimate he had provided for £345 for the completion of the sally port to the caponiere, so we can assume that £303 were necessary to complete sally port 4, leaving a great part of it unfinished. It was finally completed under item 4 of the 1836 revised estimate for the building of the retaining wall and privies. Some error was made in the measurements for the retaining wall and privies in 1838-39. As a consequence of this design error, the newer portion of sally port 4 does not align exactly with the older section. The difference is 10½ inches and is identified on the 1847 surface plan.⁵

The foundation, piers and arches of sally port 3 were built to the retaining wall area in 1831, but completion awaited the construction of the retaining wall. This was provided in item 4 of the 1836 estimate and built in 1838-39.

There was one further alteration in sally port 3 which has been identified. This alteration was associated with the building of casemate 53 immediately south of the sally port. The construction of this casemate sometime between 1870 and 1890 involved cutting a door through the south pier wall of the sally port and slightly altering the grade of the floor. Identification of further alterations awaits a structural study of the Citadel 1870-1905.

An alteration to sally port 4 took place during the period 1870-1890, when casemate 56 was constructed. Two doors were cut through the north pier wall of the sally port to provide access to the casemate and its anteroom. The floor grade was changed at the same time to accommodate these doors. Further information on this area also awaits further study.

Individual Features

Sally Port Exits to Ditch

This area was covered in Chapter II - Sally Port Openings.

Foundations

Nicolls' 1825 profile of the middle sally port (Figure 21) did not detail the foundation for the sally port pier walls. However, Boteler's 1832 profile of the same area (Figure 22) does indicate a foundation of 3 feet in the flat portions and 2 feet 6 inches in the stepped sections.⁶ Figure 3 of the 1856 plan for the renewal of the privies and drains indicates that a foundation existed 3 feet 6 inches wide, but no depth is documented. (See Figure 17 & 23) This plan also indicates that lateral foundation connecting the two pier foundations was placed over the drain. It was located 11 feet west of the doors to the privies and measured 3 feet 6 inches by 5 feet 6 inches deep.⁷ Whether this foundation was part of the 1836 construction, or part of the 1856 alterations, has not been determined.

Colonel Jones' revised estimate of 1836 called for foundations measuring 3 feet 6 inches wide by 3 feet deep. These foundations were intended for the sally ports of the south, north and east fronts. It is unlikely that the foundations built by Nicolls in 1831 varied much from these specifications.

Piers

Colonel Nicolls' 1825 profile for the middle sally port specifies a wall height of seven feet. Boteler's profile of 1832 indicates the same height for the walls. Jones' revised estimate for 1836 proposes 7 feet high and 3 feet thick piers for the south, north and east sally ports. It can be assumed that this seven foot height was originally designed by Nicolls and followed by Boteler and Jones. The as-found drawings are recorded to the earthen floor level, so the height of the walls given in the as-found dimensions varies considerably along the length of the sally ports.

Arches

Neither Nicolls nor Boteler provided a cross section of the sally ports. However, Jones' 1836 specifications called for an arch that rose 1 foot 6 inches in a span of 6 feet. Figure 4 of the 1856 plan of sally port 4 also indicates a rise of 1 foot 6 inches in 6 feet. This would have made the head room for the entire length of the sally ports, excluding the exits and entrances, 8 feet 6 inches.

Nicolls', Boteler's, Jones', and the 1856 plans all agree that the brick forming the arch was to be 1 foot 6 inches thick. Boteler had estimated in 1832 that 62 perches of brick would be necessary for the arch of the sally port leading to the caponiere.⁸ The uncertainty surrounding the distribution of the bricks sent from England, those manufactured in Halifax and those shipped from St. John has not been untangled. The best bricks, sent from England, were undoubtedly used for face work. The others were used in purely structural courses.

Figure 21

Drawing by Bruce MacDonald and Greg Corkum

This is a modern enlargement of Nicolls' original plan. The shaded line indicates Straton's fort profile, the dotted lines Colonel Nicolls'. The sally ports were not built to this design but with flat entranceways at each end. In June 1977, steps were discovered in sally port 3, but there is no archaeological evidence that steps were ever built in sally port 4.

Source: Public Records Office, London, WO 78, No. 1786, MR 946,
"Plan No. 2", Nicolls, 20 December 1825

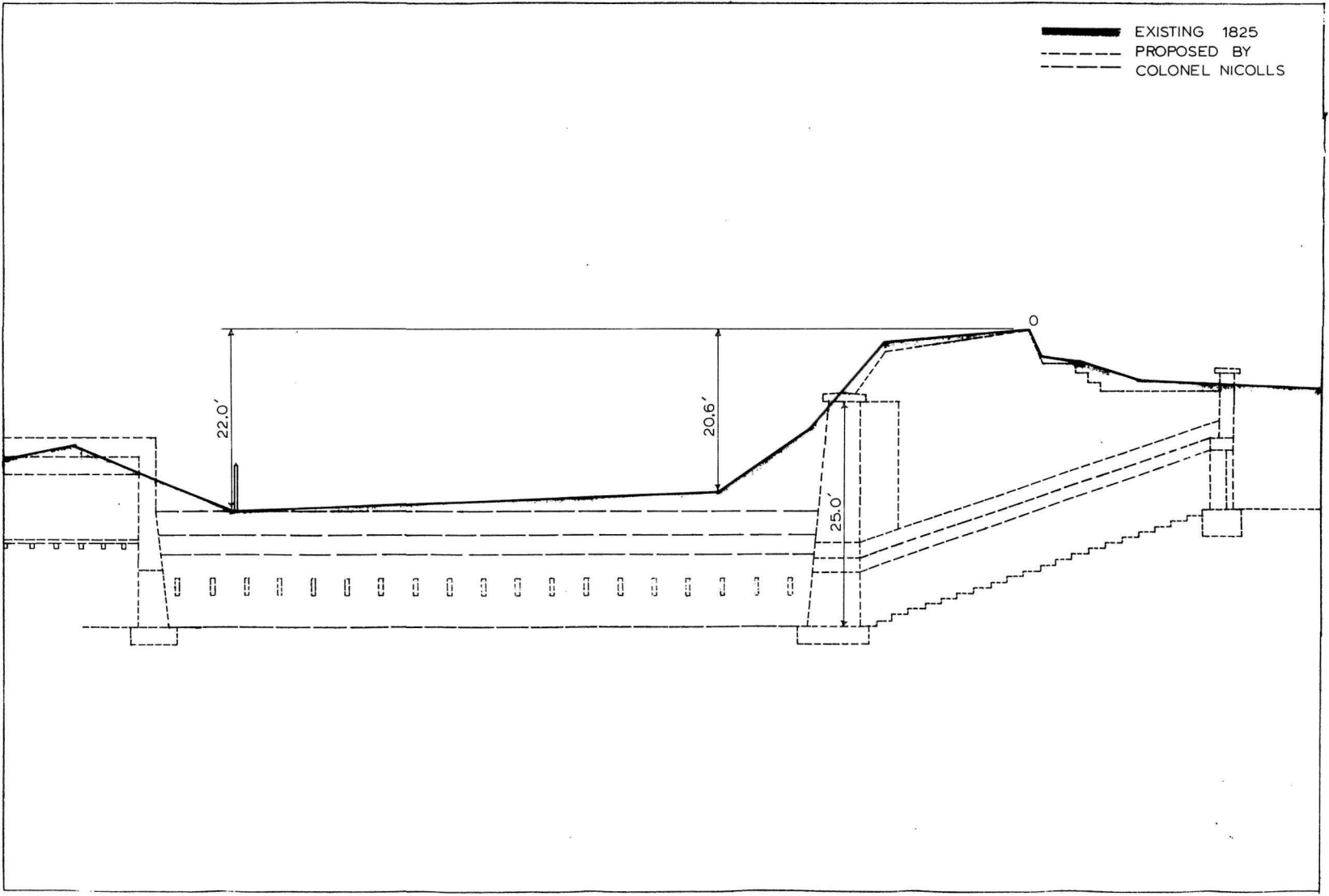
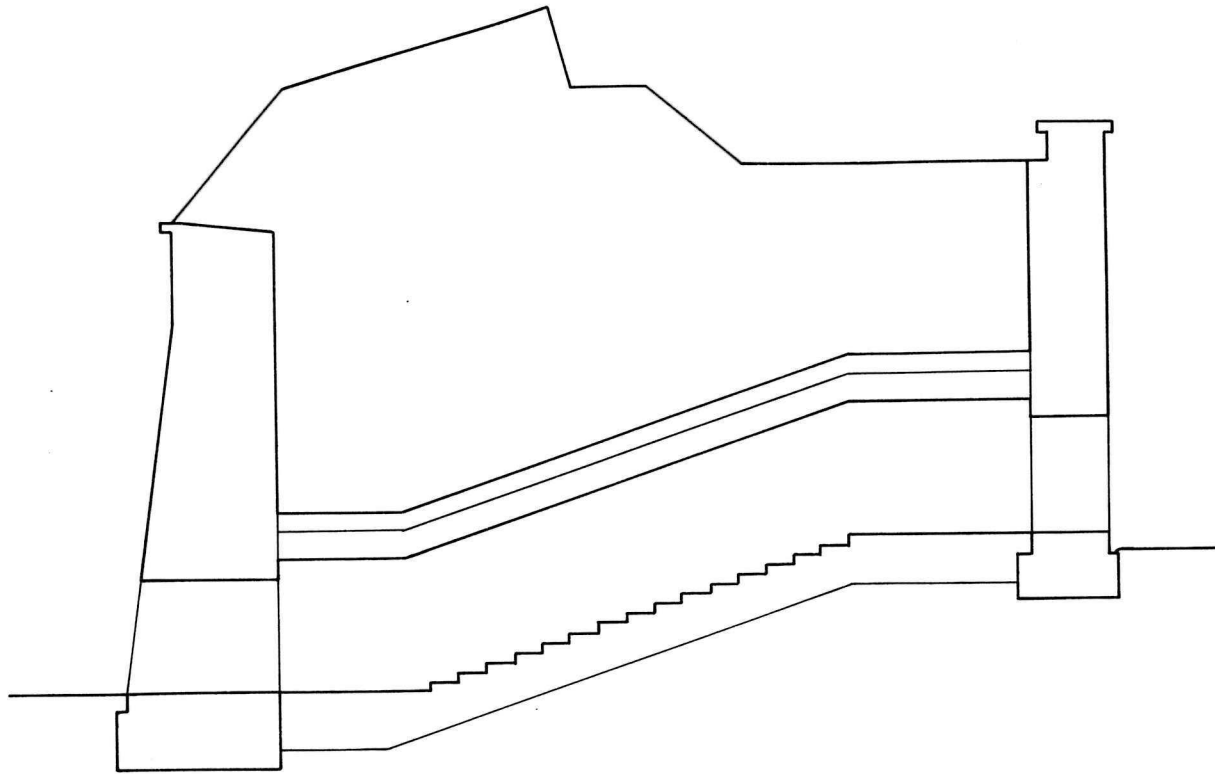


Figure 22

Drawing by Greg Corkum

A modern enlargement from Boteler's February 14, 1832 "Plan of Fort George, Halifax, N.S., as supposed to be when finished agreeably to the documents on the spot". This plan shows the middle sally port which was never built. But the plan was drawn up after most of sally port 3 and half a of sally port 4 were constructed. The plan, therefore, would have reflected what was already built, especially roof and floor profile. There were no openings planned in the pier walls. The granite steps in the centre portion were built in sally port 3, but not in sally port 4.

Source: Public Records Office, London, WO 78, No. 1679, MPH 205



COLONEL BOTELER'S
1832 PLAN OF
PROPOSED MIDDLE SALLYPORT

The arches did not tail into the escarp wall.

Tiling

The method adopted by Nicolls for waterproofing the sally ports consisted of plain tiling set in cement. This tiling was shipped from England in 1829 because none was manufactured locally. The thickness of the tiling shown by his 1825 profile is approximately 1 foot 6 inches. Boteler's 1832 profile shows two thicknesses above the arch indicating tiling. The thickness of the two layers was three feet. Jones' 1836 revised estimate called for a two foot layer of tiling laid in cement for covering the arches of the south, north, and east sally ports. Figure 6 of the 1856 plan of sally port 4 shows a two foot layer of tiling over the brick archway.

This tiling was exposed on both sally ports during the 1973 excavation.

Roof Profiles

Nicolls' original design for the sally ports showed a roof profile which sloped directly from the interior of the retaining wall to the interior of the escarp wall. (Figure 21) That design was dispensed with before the construction began. Boteler's 1832 section shows the roof profile as 10 feet flat entrance from interior of retaining wall, a 25 foot slope, and finally a 7 foot flat section to the interior of the escarp wall. (Figure 22) This profile was intended for the middle sally port and did not record what was actually built in sally ports 3 and 4. Figure 6 of the 1856 plan for sally port 4 shows a 12 foot flat entrance, 29 foot slope, and another 6 foot flat section of roof to the interior of the escarp exit. (Figure 23) The as-found records document the profile of the roof of no. 4 as 13 feet flat, then 28 feet of slope, and 4 feet 6 inches flat.⁹ (See Figures 24 and 25) For sally port 3, the as-found drawings show a 13 foot flat section, followed by 29 feet of slope, ending with an 8 foot flat section.¹⁰ (See Figures 26 and 27) It is doubtful that the roof profile, once built, was ever changed, so the as-found recordings show the roof profile as originally built.

Floor Profile and Materials

The floor profile in both sally ports has undergone considerable alteration. Nicolls' original design was for a straight floor profile from retaining wall to escarp wall. He appears to have intended that granite steps be built along the entire length of the sally port. (See Figure 21) This design was changed before the sally ports were constructed.

Boteler's plan profile of 1832 shows the floor paralleling the roof course - 12 feet flat entrance, 25 foot slope (to be formed of 15 granite steps) and a final 7 foot flat area before the exit through the escarp wall. (Figure 22) From Boteler's estimate for completing the middle sally port, it is clear that he had intended brick on edge paving for the flat areas between walls and slope.

Jones produced no profile plan of the sally ports he had built, but his estimates for the north and south sally ports called for 20 granite steps, 6 feet by 1 foot 6 inches, presumably in the centre sloped portion of the floor.

The 1856 plan of sally port 4 indicated a floor profile that sloped directly to the interior of the escarp wall from a flat 14 foot entrance-way at the top. Also shown in this plan is a sluice constructed in 1856, at the interior end of this flat area, to facilitate the washing of the drains. The plan also appears to indicate that the flat 14 foot entranceway was paved with brick on edge. (Figure 23)

As-found floor of sally port 3: a gradual slope of 16 feet to a granite step. This area was originally flat, but altered somewhat to accommodate the door of casemate 53. The remainder of the floor consists of 16 steps uncovered in June 1977. These consist of 7 granite steps full width with an 18 inch tread and a 6 inch rise. Starting from the bottom there are two granite steps and then two brick on edge steps between each granite step with the exception of the top two granite steps which are separated by only one brick step. The final eight feet were originally flat. (Figures 26 and 27)

As-found floor of sally port 4: the floor profile of sally port 4 has come full circle to Nicolls' original plan - a more or less direct slope from retaining wall to escarp. This levelling process happened when the doors were cut through the pier to casemate 56 and its recess room, some

Figure 23

Figure 3 of "Plan and Sections showing the work described in improving soil pits at the Soldiers' privies...", Stotherd, 1 January 1856.

We have no plans of the privies and the half of sally port 4 built under item 3 of the 1836 revised estimates. However, since the changes described in this plan are largely underground, only the floor profile of the sally port would have been changed at this time. Note the doors to the privies through the pier walls, lateral foundation, sluice, and drain. Also the dirt floor sloping directly to opening through escarp wall, and tiling above arch.

Source: Public Archives of Canada, MG12, WO 55, Vol. 887, fol. 659

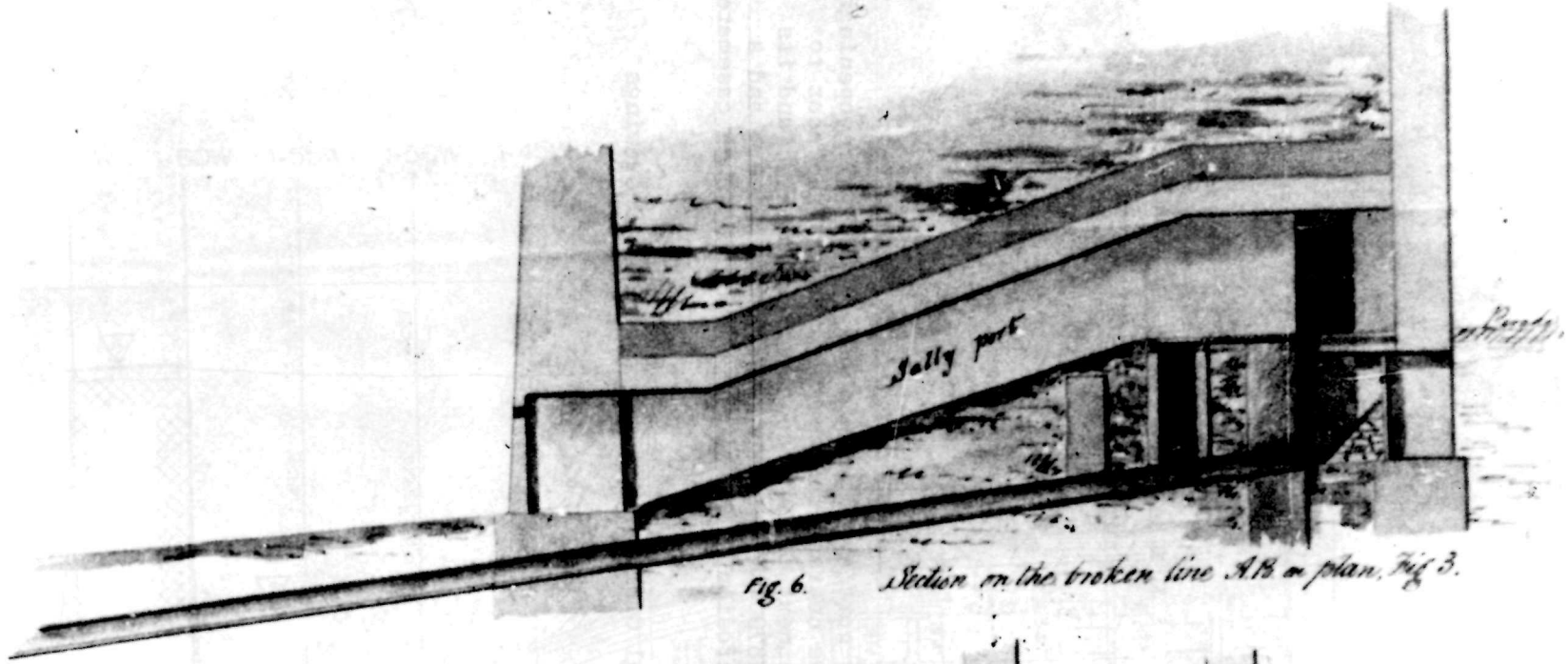


Fig. 6. Section on the broken line A-B on plan, Fig 3.

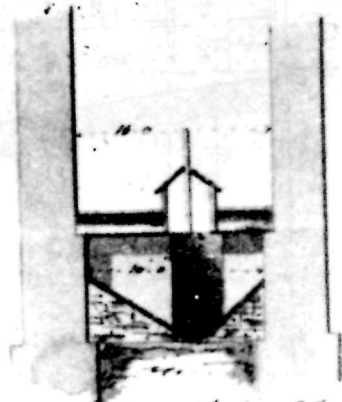
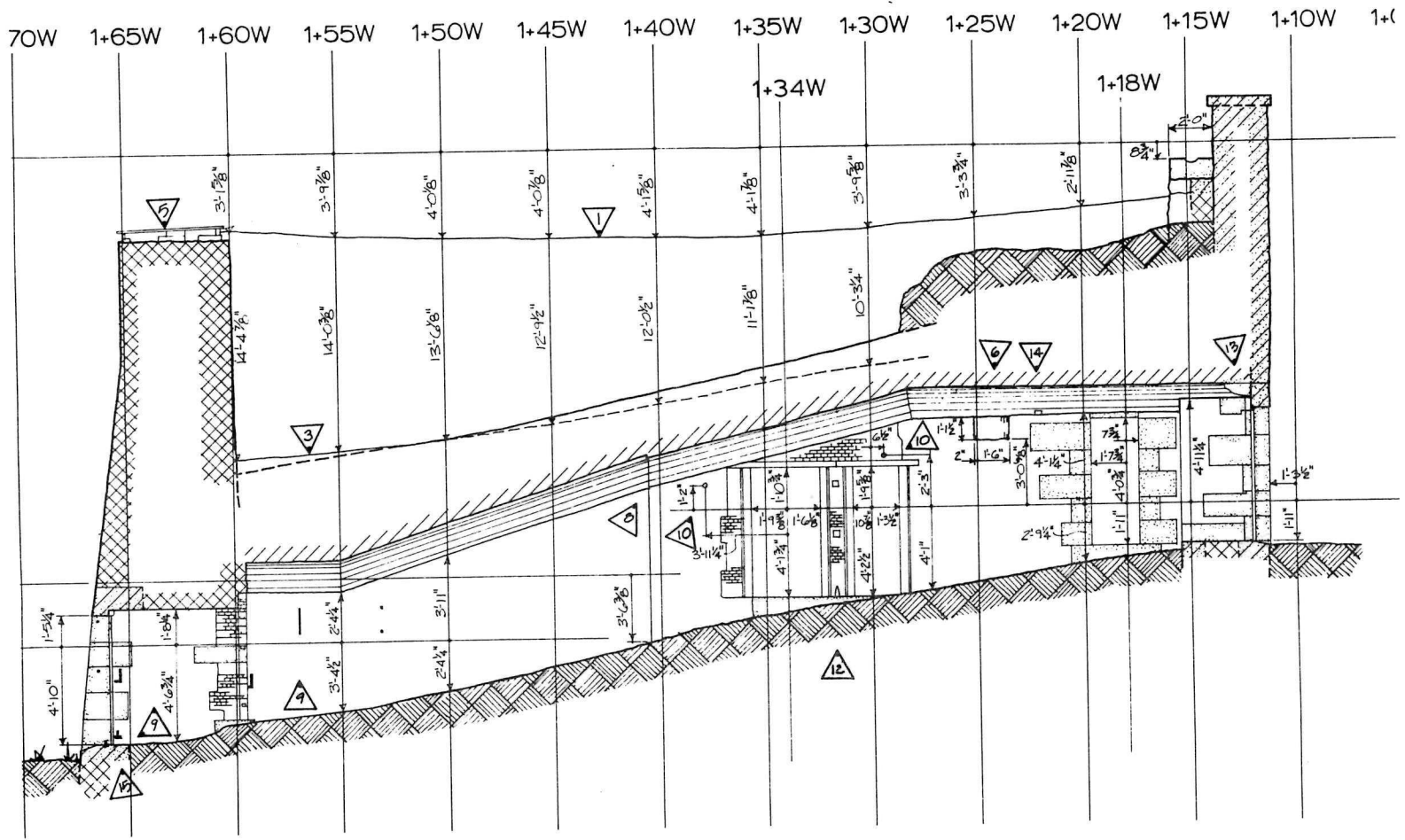


Fig 5. Section on the line C-D on plan

Figure 24

As-found profile of sally port 4, looking north. Note three openings in the pier wall. The one nearest the entranceway was the door to privy built in 1839. The next two are doors to casemate 56 and its recess room built after 1870. Floor profile after a century and a half of alterations and erosion. The sluice was buried when casemate 56 was built.

Source: Atlantic Regional Office, As-found Team, Set C drawings

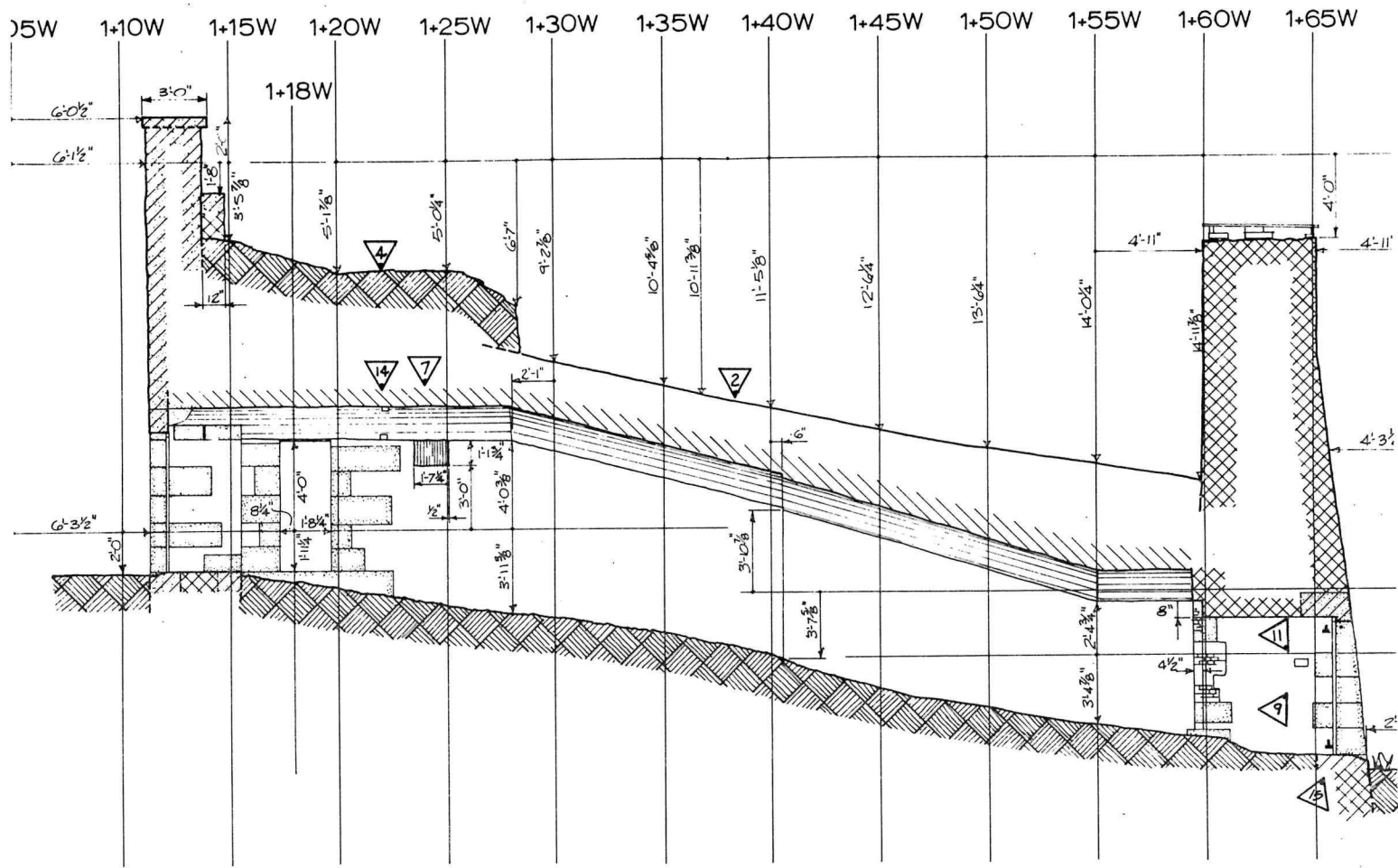


SECTION ELEVATION, 1+67N→1+70N

Figure 25

As-found profile of sally port 4, facing south. Door near entranceway was built in 1839 and filled in some time after 1870.

Source: Atlantic Regional Office, As-found Team, Set C drawings

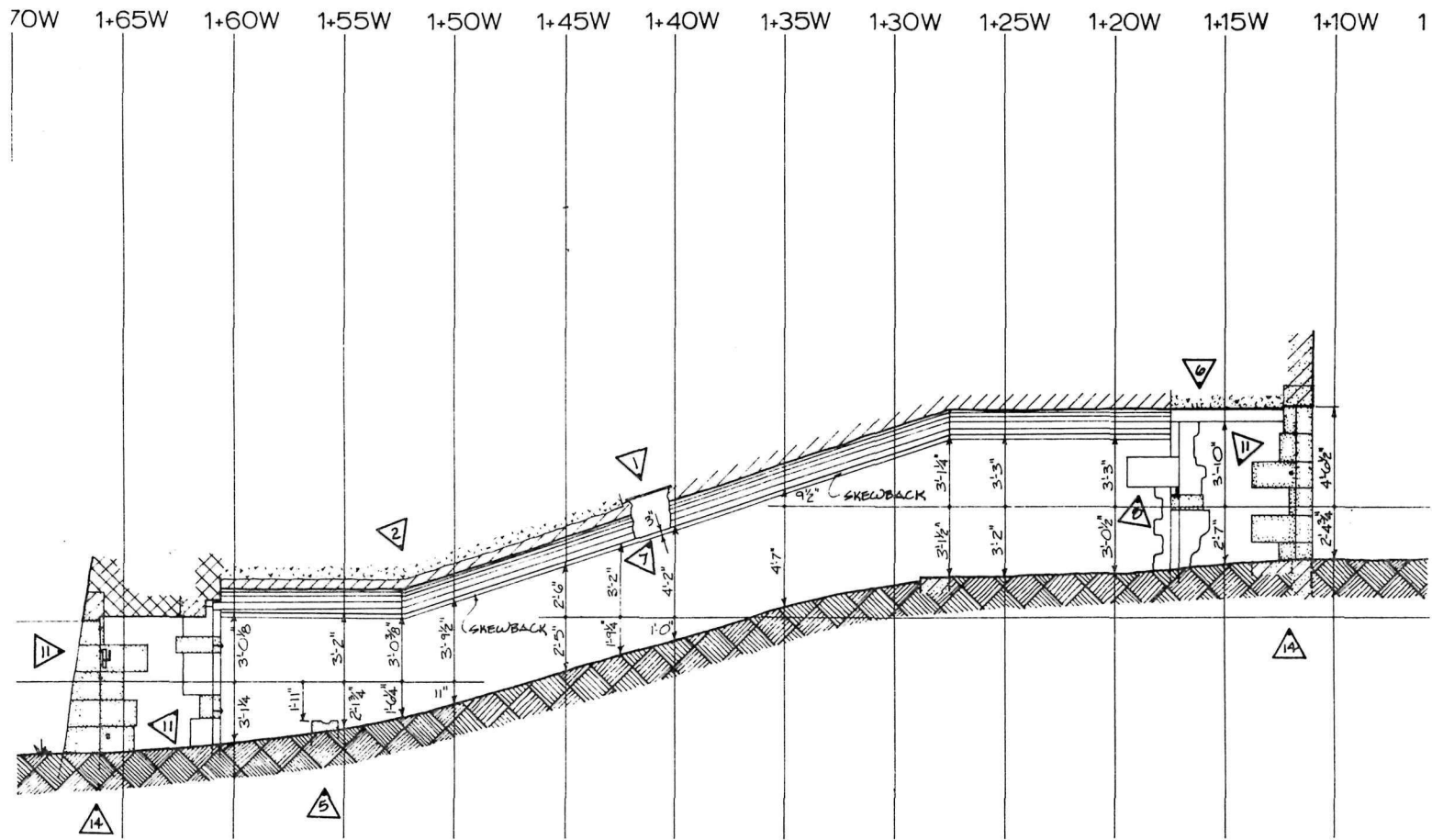


SECTION ELEVATION, 1+67N → 1+65N

Figure 26

As-found profile of sally port 3, facing north. Note granite step at beginning of slope to ditch exit. The roof profile is that built in 1831 and presently being reconstructed.

Source: Atlantic Regional Office, As-found Team, Set C drawings

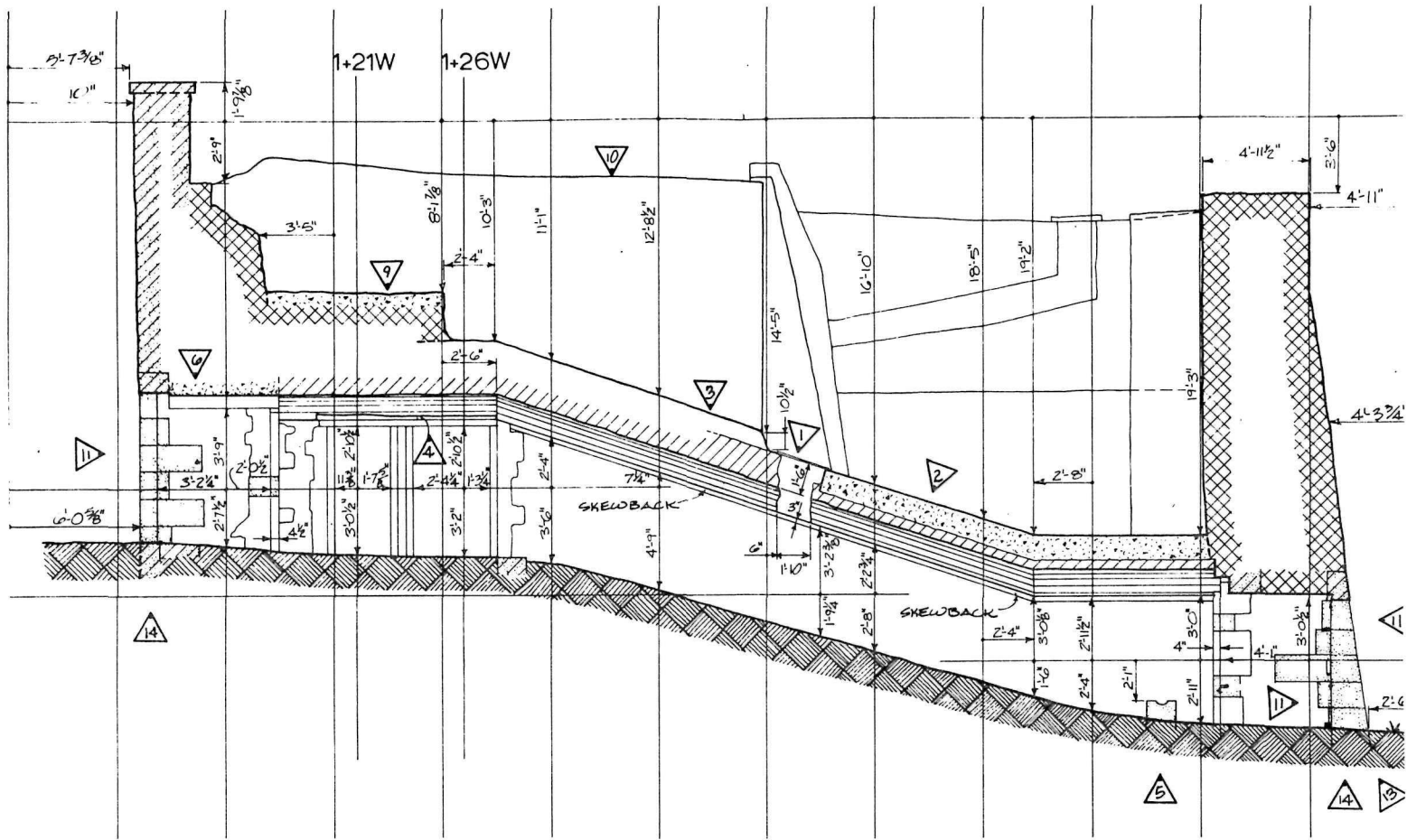


SECTION-ELEVATION, 0+15S → 0+10S

Figure 27

As-found profile of sally port 3, facing south. The two doors were built to provide an entrance to casemate 53 constructed some time between 1870-90.

Source: Atlantic Regional Office, As-found Team, Halifax Citadel, Set C drawings



SECTION-ELEVATION, 0+15S → 0+20S

time between 1870 and 1890. Also the natural erosion and footwear of a century of use has sloped what was originally a five foot flat area behind the escarp wall. In the process of altering the floor to accommodate the door of casemate 56, traces of Jones' floor profile and Stotherd's drain and sluice were eradicated. (Figures 24 and 25) This area needs archaeological investigation.

Openings in Pier Walls

Nicolls designed the sally port pier walls as solid, with no openings. However, in the building of casemates 53, 56, and the privies, adjacent to the sally ports, doors were cut through the walls.

Sally port 3: Two doors, both providing access to casemate 56, were cut through the south wall of the sally port some time between 1870 and 1890. These doors measure 2 feet 6 inches by 6 feet, and 3 feet 6 inches by 6 feet, and are framed in granite.¹¹ (See Figure 27)

Sally port 4: Two doors, one in the north side and one in the south side, were built as entranceways to the privies when this section of the sally port was constructed in 1838-39. They measured, by the 1856 plan, 4 feet by 7 feet and were framed in granite. As-found drawings show them 2 feet 4 inches by 6 feet, and 2 feet 4 inches by 6 feet. The door on the south side has been blocked by ironstone masonry. Two more openings were cut into the north pier wall of the sally port to serve as entrances to casemate 56 and its recess room. These openings measure 3 feet 4 inches by 6 feet, and 2 feet 2 inches by 6 feet.¹² (See Figures 24 and 25)

Entrances through the Retaining Wall

These entrances will be fully described when a study of the retaining wall has been completed.

Historical Considerations for the Restoration Design Team

The deliberations of the design team for sally ports 3 and 4 will have to centre firstly on a restoration date. The sally ports could not be restored to the 1831-39 period without closing up the entrances to casemates 53 and 56 which were built after 1870. The construction of these casemates altered not only the wall appearance but the floor profile. In the case of sally port 4, the sluice and drain for the soldiers' privies were also buried at this time. But the roof profile for both sally ports remains unchanged from the original date and, except for the door openings, the ironstone masonry and arched brickwork remain intact. The granite steps planned for the sloped centre portion of the sally ports were apparently never built, but it may be advisable to install such steps, if the steep dirt slope be considered to dangerous for some park visitors.

EndnotesWest Curtain Wall Narrative

- 1 Canada, Public Archives (hereafter cited as PAC), RG8, II, Vol. 6, Part 1, Smyth Report, Appendix C.
- 2 Greenough, John Joseph, "The Halifax Citadel, 1825-60", Manuscript Report Series 154, Parks Canada, 1974, Part 1, for a general discussion of British Parliamentary politics and their impact on the recommendations of the Smyth report.
- 3 Ibid., Part 1, p. 26. Chart comparing costs estimated by Smyth Commission and those of the local engineers.
- 4 Nova Scotia, Public Archives (hereafter cited as PANS), RE54, pp. 6-11, "General Estimate of the Expense of Reconstructing in Masonry...Fort George on Citadel Hill", 20 December 1825.
- 5 Public Record Office, London, W.O. 78, No. 1786, MR 947, "Plan No. 1", Nicolls, 20 December 1825. This plan shows Nicolls' design superimposed on the trace of Straton's 1796 Fort George.
- 6 PANS, RE54, pp. 17-20, Nicolls to Mann, 7 October 1828.
- 7 Public Records Office, London, W.O. 78, No. 1786, MR 947, "Plan No. 1", Nicolls, 20 December 1825.
- 8 Public Records Office, London, W.O. 78, No. 1786, MR.947, "Plan No. 2", Nicolls, 20 December 1825.
- 9 Muller, John, Elements of Fortifications, London, 1846, p. 50, Museum Restoration Edition, Ottawa, 1968.
- 10 PANS, RE54, p. 16, General Bryce's minute, 26 July 1828.
- 11 PANS, RE54, pp. 17-20, Nicolls to Mann, 7 October 1828.
- 12 PAC, MG12, W.O. 55, Vol. 865, Fol. 580-1, "Plan of Fort George, Citadel Hill, shewing the Work in Progress, and on which the £15,000 granted by Parliament is supposed to be expended", Nicolls, 7 October 1828.
- 13 PANS, RG1, Vol. 146, unpaginated, Letterbook of the Provincial Secretary, Rupert George to Colonel Nicolls, 15 March 1826.

- 14 Ibid., Rupert George to Nicolls, 20 November 1828.
- 15 PANS, RE8, pp. 87-8, Nicolls to Mann, 22 Nov. 1878.
- 16 PAC, MG12, W.O. 55, Vol. 1886, Report from Capt. Peake, 12 June 1833.
- 17 PANS, RE8, p. 100, Incidental Services, 1 August 1829.
- 18 PAC, W.O. 55, Vol. 1886, Ellicombe to Thomas, 24 July 1834.
- 19 PANS, RE54, pp. 17-20, Nicolls to Mann, 7 October 1828.
- 20 Ibid.
- 21 PANS, RE54, p. 4, Citadel estimate 1825.
- 22 PAC, MG12, W.O. 55, Vol. 1558, p. 70, Specifications for building a stone wall on Citadel Hill, 12 November 1828.
- 23 PAC, MG12, W.O. 55, Vol. 887, p. 712, Peter Hays contract for Wall at Citadel Hill, Halifax, 22 December 1828.
- 24 Ibid., p. 711, William Flinn's Contract for Wall at Citadel Hill, 16 December 1828.
- 25 Public Records Office, London, W.O. 78, No. 1679, MPH 205, "Elevation of the South West Bastion No. 7, Elevation of the North West Bastion No. 8," Colonel Boteler, 14 February 1832. These elevations of the curtain wall were part of the report on the condition of the escarp walls which Colonel Boteler sent to London in February 1832.
- 26 Ibid.
- 27 PANS, RE54, pp. 66-71, Nicolls to Bryce, 28 January 1831.
- 28 PAC, MG12, W.O. 55, Vol. 887, p. 714, Peter Hays Contract for a Wall on Citadel Hill, 19 December 1829.
- 29 Ibid., p. 713.
- 30 PANS, RE9, pp. 197-99, Jones to Inspector General of Fortifications, 12 March 1935.
- 31 PANS, RE54, pp. 66-71, Nicolls to Bryce, 28 January 1831.
- 32 Public Records Office, London, W.O. 78, No. 1679, MPH 205, "Plan No. 1", Section 1 and Section 2, Colonel Boteler, 14 February 1832.
- 33 Based on Boteler's elevation of Curtain Wall, 14 February 1832. Also on an examination of the rectified photography done by the as-found team, before the wall was reconstructed in 1973. The line dividing those portions built in 1829-30 and 1831 is clearly visible by the use of much larger stones in 1831. Also, the thickness of the wall increases by a foot in 1831.

- 34 PANS, RE9, pp. 38-40, Boteler, H. Ince, and John Tapp to Board of Ordnance, 28 January 1832.
- 35 PANS, RE29, pp. 82-83, Nicolls to G. Damerun, 22 October 1829.
- 36 PANS, RE8, pp. 168-9, No. 25, Respective Officers to Byham, 11 November 1830.
- 37 PAC, MG12, W.O. 55, Vol. 887, p. 715, Peter Hays Contract for Wall at Citadel Hill, 4 November 1830.
- 38 Ibid., p. 716, Metzler's Contract.
- 39 PANS, RE54, pp. 66-71, Nicolls to Bryce, 28 January 1831.
- 40 PAC, MG12, W.O. 55, Vol. 868, Fol. 469, Plan - "For the West Curtain, Fort George", Nicolls, 2 May 1831.
- 41 PANS, RE54, pp. 26-7, No. 202, Fanshawe to Nicolls, 29 June 1831.
- 42 Plan: "Elevation of the Northwest Bastion, No. 8, Boteler, 14 February 1832.
- 43 PANS, RE33, p. 99, Capt. Barry and Capt. Grain to CRE, 24 February 1844.
- 44 PAC, MG12, W.O. 55, Vol. 887, p. 623, General LeMarchant to Colonel Stotherd, 10 October 1855.
- 45 PAC, MG12, W.O. 55, Vol. 1558, pt. 7, "Observations on the Defense of Nova Scotia", 1856.

EndnotesStructural Analysis

- 1 PAC, MG12, W.O. 55, Vol. 1558, p. 70, Specification for building a stone wall on Citadel Hill, 12 November 1828.
- 2 Atlantic Regional Office (hereafter cited as ARO), As Found drawing, Set C, profile through casemate 9.
- 3 PAC, MG12, W.O. 55, Vol. 865, Fol. 580-1, "Plan of Fort George... shewing the works in Progress, and on which 15,000 granted by Parliament is supposed to be expended", Colonel Nicolls, 7 October 1828.
- 4 PRO, London, W.O. 78, No. 1679, MPH 205, Plan "Elevation of the South West Bastion, No. 7," Colonel Boteler, 12 February 1832.
- 5 PANS, RE54, pp. 66-71, Nicolls to Bryce, 28 January 1831.
- 6 ARO, As Found drawings, Set C, Sections through casemates 11, 12, and 9.
- 7 Ibid.
- 8 PAC, MG12, W.O. 55, Vol. 868, Fol. 469, Plan "For the West Curtain, Fort George", Nicolls, 2 May 1831.
- 9 PAC, MG12, W.O. 55, Vol. 1558, p. 70.
- 10 PANS, RE24, Letter 387, Nicolls to Inspector General of Fortifications, 2 December 1835.
- 11 PAC, MG 12, W.O. 55, Vol. 887, Fol. 659, Plan "Plan and Sections showing the work described in improving the soil pits at the Soldiers Privies...", Stotherd, 1 January 1856.
- 12 PAC, MG12, W.O. 55, Vol. 1558, p. 70, Specifications, 1828.
- 13 PAC, MG12, W.O. 55, Vol. 1558, Pt. 7, "Observations on the Defence of Nova Scotia...", Appendix N.
- 14 ARO, As Found drawings, Set C, top of wall drawing.
- 15 These are taken from the as-found drawings.
- 16 PAC, MG12, W.O. 55, Vol. 1558, p. 70, Specifications, 1828.
- 17 PAC, MG12, W.O. 55, Vol. 1558, Pt. 7, Appendix M.

- 18 PANS, RE54, pp. 66-71, Nicolls to Bryce, 28 January 1831.
- 19 Ibid.
- 20 PAC, MG12, W.O. 55, Vol. 887, p. 700, Stotherd to Colonel Matson, 24 June 1856.
- 21 Ibid., p. 698, P.O. Munnir to Inspector General of Fortifications, Burgoyne, 25 June 1856.
- 22 PRO, London, W.O. 78, No. 1786, MR947, "Plan No. 2, Section through the fort", Colonel Nicolls, 20 December 1825.
- 23 PAC, MG12, W.O. 49, Part 2, p. 1081.
- 24 PAC, MG12, W.O. 55, Vol. 1886, p. 12, Disbursement 31 Dec. 1851, item 16.
- 25 PAC, MG12, W.O. 55, Vol. 883, Fols. 843-54, "Special Estimate...", 30 April 1849.
- 26 PAC, MG12, W. O. 55, Vol. 887, Fol. 498, Plan "A Sketch of the Covering of the Casemates with Asphalte", R.M.P., 12 June 1854.
- 27 PRO, London, W.O. 78, No. 1679, MPH 205, Plan "Elevation of the N.W. Bastion, No. 8", Boteler, 12 February 1832.
- 28 PRO, London, W.O. 78, No. 1786, MR947, "Plan No. 2, Section through the fort", Nicolls, 20 December 1825.
- 29 See Plan: "Plan No. 3, Sections through Fort George...", Colonel Boteler, 14 February 1832.
- 30 See Plan: "Plan of Fort George...as supposed to be when finished agreeably to documents on the spot", Colonel Boteler, 14 February 1832.
- 31 PAC, MG12, W.O. 55, Vol. 887, Fol. 659, "Plan and Sections showing the work described in improving the Soil Pits at the Soldiers Privies", Stotherd, 1 January 1856
- 32 PANS, RG8, C Series, Vol. 1653A, p. 136, Plan "Halifax, Nova Scotia, OAE 59.60, Item 2", Plan, section and two elevations of the sally port doors.
- 33 PAC, MG12, W.O. 44, Vol. 227, p. 327, Boteler's "Comparative estimate #1," January 1833; and
PAC, MG12, W.O. 44, Vol. 873, Fols. 637-77, "Revised estimate for completing Halifax Citadel...", 2 February 1836.

- 34 PAC, RG8, C Series, Vol. 1653A, p. 136, Plan "Halifax, Nova Scotia, OAE 59-60, Item 2".
- 35 PAC, RG8, C Series, Vol. 1435, Nelson to Inspector General of Fortifications, 14 December 1858.
- 36 PAC, MG12, W.O. 55, Vol. 868, Fol. 469, Plan "For the North Ravelin, Fort George", Nicolls, 2 May 1831.
- 37 PRO, London, W.O. 78, No. 1679, MPH 205, Plan "Elevation of the South West Bastion, No. 7", Boteler, 14 February 1832.
- 38 ARO, As Found drawings, Set C, Section elevation through casemate 11.
- 39 ARO, As Found drawings, Set C, Section elevation through casemate 12.
- 40 PAC, MG12, W.O. 55, Vol. 868, Fol. 469, Plan "For the North Ravelin, Fort George", Nicolls, 2 May 1831.
- 41 PRO, London, W.O. 78, No. 1679, MPH 205, Plan "Elevation of the South West Bastion, No. 7", Boteler, 14 February 1832.
- 42 ARO, As Found drawings, field notes.

EndnotesSally Ports 3 and 4

- 1 Compare Nicolls' 1825 sections through the fort and a similar section drawn by Boteler in 1832. Op. Cit.
- 2 Compare Nicolls' 1825 overall plan and Boteler's overall plan. Op. Cit.
- 3 PANS, RE54, p. 25, Nicolls' observations January 13, 1836, with Jones' comments, 30 April 1836.
- 4 PAC, MG12, W.O. 44, Vol. 227, p. 327, Boteler's Comparative Estimate No. 1, January 1833.
- 5 PANS, map collection, Plan "Ground Plan of Fort George...", Colonel Calder, 10 March 1848.
- 6 "Plan of Fort George as supposed to be when completed...", Boteler, 14 February 1832. Op. Cit.
- 7 "Plan and Sections....in improving the Soil Pits...", Stotherd, 1 January 1856. Op. Cit.
- 8 PAC, MG12, W.O. 44, Vol. 227, p. 327.
- 9 ARO, As Found drawings, Set C, Section and elevation of sally port 4.
- 10 Ibid., for sally port 3.
- 11 Ibid.
- 12 Ibid., for sally port 4.

