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MISCELLANEOUS SALVAGE ARCHAEOLOGY REPORTS

by

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(1975-1976)

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Miscellaneous Salvage Archaeology Reports (1975-1976)

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Salvage Archaeology on Grassy Island,
Canso, N.S.
1975
by M. Elizabeth Snow

Salvage Archaeology at Fort Beauséjour National
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Introduction

Historically Grassy Island must be considered an integral part of the string of islands, known collectively as Canso, which form the northeast side of the harbour of the present day town of Canso. Canso was the site of a valuable fishing industry both as a base for the fishermen and as a place for processing their catch prior to its being shipped to market in Europe or the West Indies. The site was known to European fishermen at least as early as the beginning of the 16th century (Bedwell 1972); by 1604 it was well enough known to be used as a landmark and Basque fishermen were fishing and trading there regularly (Hornby 1966). It remained under French control until 1713 when the British argued that it had been surrendered under the Treaty of Utrecht along with the rest of mainland Acadia. The French disputed Britain's claims to sovereignty over Canso, going as far as to argue that it was located midway between mainland Nova Scotia and Cape Breton Island in support of their claim. The real outcome of the dispute, however, was not settled by conferences in Europe but by the commercial enterprise of the New England fishermen who eagerly appropriated the fishery and its profits for themselves and who forced a reluctant colonial administration to support them:

> The history of activity at Canso between Utrecht and 1745 is the story of New England agression in the face of French opposition and British somnolence (Hornby 1966: 25).

The relationship between the New Englanders and the French at Canso was sometimes friendly and sometimes hostile as both sides engaged in skirmishes and raids; because of the power vacuum in the area, both sides were forced to fall back upon self-help, a process notorious for providing no final answer in disputes of this nature. When war broke out in Europe between Britain and France in 1744, the French seized the opportunity to attack and burn the settlement at Canso. They did not, however, garrison Canso themselves so the New Englanders had no difficulty in recapturing it in the spring of 1745 to use it as a mustering place for their successful seige of Louisbourg. The question of the ownership of Canso was settled finally in 1763 when the British control was confirmed. When settlement was revived, it was for the first time located on the mainland in Wilmot town.

Settlement on the islands of Canso was usually seasonal; it was a fishng and fish processing station in the annual migratory cycle of European, French and New England fishermen in turn. A 1760 survey, confirming what fishermen had known for generations, found that Canso was not suitable for agricultural settlement (Hornby 1966). The settlement pattern was impermanent and discontinuous, epitomized by the custom that fishing stations were occupied annually on a first-come, first-serve basis. During the 1720s some continuity developed when some of the New England fishermen left behind servants to winter in Canso to protect their investment in buildings and flakes. By the end of the decade there were 20 permanent inhabitants and up to 100 fishermen wintered over at Canso; there was a military garrison and a form of local government. After this peak, while the institutional structure was maintained, settlement declined because of the unstable political situation and a loss of some of the European markets.

The Canso fishery was of sufficient commercial importance for the fishermen to demand military protection. The first fortifications appear to have been erected by de Razilly in the second quarter of the 17th century but the fort does not appear to have been maintained for long and its remains have not been located. After 1713 there was more need for permanent protection of the fishery and the historical record is more complete. At this time the strategic importance of Grassy Island, its situation commanding the southern entrance to the harbour and its greater elevation, was recognized as it became the site of a series of forts and the focus of the permanent settlement.

Buildings at Canso seem to fall into two general categories:

> those connected with the permanent establishment, and those connected with the seasonal fishery. Apparently this classification also determined location, for a 1734 report on the Canso fishery noted that the inhabitants who remained over the winter (very few) "have all of them Houses on the Hill of Canso, where no Fish is made the Flakes &c being all round the Waterside upon the other parts of the Harbour Where the Fishermen, Shoarmen, & their Owners &c have Houses amongst their Flakes, for themselves and Shorehands who Cure the Fish." In terms of occupation and structures erected, it is probably correct to say that Canso Island was the centre of the Canso fishing station from about 1720 to about 1750...(Hornby 1966: 43).

The earliest English fort on Grassy Island was built at the western end of the island "...on the beach of Canso Island..." (Hornby 1966: 44) by fishermen in 1720 and

garrisoned over the winter of 1720-21 by a small detachment from Annapolis Royal. This first fort was apparently unsatisfactory with regard to its construction, its fortification (ordnance being borrowed from the fishing fleet each summer) and its situation. A second fort was built on the western promontory before 1735 but the historical documents relating to the fortification of Grassy Island are so ambiguous that it is difficult to tell when it was constructed, what it was like or when the first fort was abandoned. (Hornby [1966] treats this problem in considerable detail.) The fort on the western promontory was the one captured by the French in 1744; the following spring the New Englanders brought with them a prefabricated blockhouse and refurbished the fortifications. If the contemporary descriptions of the fortifications are difficult to interpret, contemporary descriptions of the permanent housing for the small resident population are equally difficult; the most complete are the most suspicious, being claims for damages incurred when the French razed the settlement in 1744 (Hornby 1966).

In 1857 Grassy Island was given a physiographic description in The American Coast Pilot:

> Grassy Island...is a Hill of Drift-Sand, clay and boulders, half a mile long and 66 feet high. It is covered with grass, and displays the only other clay cliff besides that of Petit-pas on this side of the channel. It is no longer insulated, now being united to George Island by a bar of shingle which is never covered. The remains of an extensive redoubt gives the name of Fort Point to the high Western extremity of the steep grassy bank of this island...(quoted in Bedwell 1972: 10).

The island is wasp-waisted in shape with both the western

and eastern ends rising higher than the narrow centre, the eastern promontory being the higher of the two. All along the clay cliff on the southern side of the island, heavy erosion has been taking place in recent years as the action of the waves first undermines the cliff which then collapses. According to local informants, strips of the island's surface up to 30 ft. wide can be lost in a single storm. The amount of erosion and its speed are difficult to estimate for two reasons; first, once a portion of the cliff has collapsed, the resulting mound of clay and boulders protects the base of the cliff from the waves for an undetermined length of time and, second, untrained eyewitness accounts of erosion to a ground surface undistinguished by prominent features could easily err and must be treated with caution. Maps from the 18th century (Canada. Public Archives [hereafter cited as PAC], H 3/240, Canso 1732; H 1/240, Canso 1735; H 2/240, Canso 1764), obvious inaccuracies in the shapes of some of the landforms notwithstanding, are suggestive in that they do show Grassy Island to be larger and to have a more angular profile along its south coast than it has today. Without exaggeration it can be said that erosion is undoubtedly a threat to the archaeological remains on Grassy Island, especially along the southern side of the western promontory where the remains of house foundations are very close to and eroding out from the edge of the cliff. An assessment of the magnitude of this threat would require analyses of both the physiographic and historical factors.

Salvage archaeology on Grassy Island arose from the need to investigate reports that burials had been eroding out of the cliff along the southern or southeastern side of the eastern promontory (Fig. 1). It appeared that testing parallel to the edge of the cliff would indicate whether there was an extensive burial ground there in danger of

eroding away. On arrival at Canso, I heard several second and third hand reports of these burials. While varying in detail, these accounts crystalized around a few central themes: the burials eroded out about two years ago; they consisted of two coffins described as "old," "made of metal, not wood," "not like the ones we see today;" the coffins were reputed to contain nothing but "some hair and some pieces of bone;" and, finally, there have been no grave markers on the eastern promontory in living memory. The presence of metal coffins which had to be imported would make it likely that these burials would pertain to a period of some permanence and prosperity. Burials on Grassy Island from the period of British occupation would be somewhat surprising in view of the fact that, amongst the confusion of changing place names on 18th century maps, there is near unanimous agreement in calling a small island located between Grassy Island and the mainland Burial or Burying Island (PAC, H 3/240, 1732; PAC, H 3/240, 1735). On the other hand, the placing of graveyards on high ground appears to be a local culture trait; all the burial grounds in present day Canso are situated on hilltops and none of the members of the crew who were all from Canso could think of any graveyards in the vicinity which did not have hilltop locations.

The salvage archaeology at Grassy Island also included an attempt to identify a line of large boulders eroding out of the edge of the cliff on the southern face of the western promontory (Fig. 1).

Excavation

Operation 12B1

For the search for burials, operation 12B1, a 200 ft. base line oriented 80 degrees east of north was laid down and marked off in 10 ft. intervals but no permanent bench mark was established nor were elevations taken. The test programme was conducted in seven sub-operations consisting of a series of 10 ft. by 5 ft. pits with the long axis running east-west, parallel to the edge of the cliff (Fig. 2 A). The suboperations were 20 ft. apart and approximately 20 ft. back from the edge of the cliff; 12B1A, 12B1B and 12B1C covered the eastern slope of the promontory and 12B1D, 12B1E, 12B1F and 12B1G covered the crest of the hill and the western slope.

The dense ground cover of Grassy Island suggests an extremely acid soil: various grasses, mosses and clubmosses, bunchberries, blueberries, strawberries, cranberries, dwarfed alders, etc. The surface of the ground is rough; hummocks and depressions seem to be the result of frost action.

The natural stratigraphy in 12B1 consisted of four layers (Fig. 2B, 2C). The uppermost layer was the humus layer, characterized by dense root tangles and moist dark brown soil; its average depth was 0.5 ft. Beneath the humus was a layer of reddish-brown, occasionally yellowish-brown, sandy soil with small streaks of iron oxide. The thickness of this layer varied because of the irregular ground surface from a minimum of 0.5 ft. to a maximum of 1.7 ft. Within

and beneath the sandy soil were lenses of various clays, pinkish, pale grey and dark grey. The fourth layer was a deposit of heavy reddish clay; in all seven suboperations this layer was unbroken, indicating no cultural intrusions and no graves. In all layers, stones from small pebbles to large boulders were abundant (Fig. 4).

Artifacts were rare. They were found in the humus layer of suboperations 12B1D1, 12B1E1 and 12B1F1 and just above the reddish clay subsoil in 12B1D2.

Operation 12B2

The line of stones eroding out of the edge of the cliff on the western promontory was only one of a number of features visible in the area. Immediately to the north was a roughly rectangular hole, the remains of a cellar excavation; its southwestern side had been breached by a pothunter's excavation (Fig. 3A, 5). To the east was a smaller round hole, identified by local informants as a well, and another cellar depression. These features are probably remnants of buildings from the permanent settlement on Grassy Island in the first half of the 18th century. Excavations in the form of two 10 ft. by 5 ft. pits, suboperations 12B2A and 12B2B, were located immediately behind the eroding boulders. When it became evident that the excavation was involving not the feature in question but the considerable and complex remains associated with the cellar depression to the north, excavation was halted and backfilled; such an extensive project fell outside the terms of reference of this project.

Excavation did not reach an adequate depth for the stratigraphy in this part of Grassy Island to be compared with that found in 12B1. Ground cover was predominantly grass; under the sod was a light brown sandy soil which contained brick rubble, large quantities of charcoal and

charred wood and some artifacts associated with the structural debris.

The excavation of lot 12B2B1 included the removal of the sod and sandy soil to a depth of approximately 0.5 ft. where the brick rubble and charred wood became plentiful (Fig. 7). This lot was not completed when the excavation was halted. Suboperation 12B2A had been located so that it extended across a large boulder that was partially visible through the sod on the southwestern side of the pit. The sod and the light brown sandy soil were removed as lot 12B2A1; at a depth of approximately 0.6 ft. structural rubble appeared in the southeastern two-thirds of the pit. In the northwestern third a second boulder was found; to the northwest of the two boulders the soil was very dark in colour and contained a heavy admixture of small flecks of charcoal, brick rubble, fragments of bone and shell and a variety of artifacts (Figs. 3, 6). This layer was excavated as lot 12B2A2. Southeast of the boulders was the stub of a charred post.

The two boulders in 12B2A were seen to align with a third boulder between the excavation and the cellar depression and with a fourth on the southeast side of the cellar. These boulders may have been supports for the wooden superstructure of the building associated with the cellar.

> Because a house was built on block or piers, it does not necessarily follow that it had no cellar. Root cellars were often dug down into the dirt beneath the kitchen and were reached by a trap door and ladder through the floor (Noel Hume 1974: 132).

The brick found in the rubble, much of it heat scarred on one side, probably came from a fireplace. The black soil in lot 12B2A2 is probably midden debris from refuse being

chucked out of the way under the house between the boulder supports.

The relationship of these features to the boulders eroding out of the cliff edge was not determined; it is possible that the eroding boulders are the remains of the supports of different structure which has disappeared.

Artifacts

Ceramics

Three sherds of coarse earthenware were recovered from 12B2A. There was a fragment of a tankard base and a small sherd from the body of a large bowl in lot 12B2A1 and a pale brown fragment, possibly also from the body of a large bowl, in lot 12B2A2. All three sherds come from pottery probably manufactured in North America and all three are definitely within the range of coarse earthenwares found at other Maritime sites in Canada.

Glass

Pane glass from 12B1F1 and one non-diagnostic bottle fragment from 12B1D1 constitute the glass from operation 12B1. A total of ten fragments of bottle glass were found in the three lots of operation 12B2; unfortunately the glass all consisted of very small non-diagnostic fragments.

Metal

Two metal artifacts, both cut nails or spikes with square heads came from operation 12B1, one from 12B1D1 and one from 12B1E1. Both spikes would have been used in heavy construction.

The majority of metal artifacts from operation 12B2 were hand wrought nails with rose heads and fine drawn points. Since these nails clustered in three length

categories, their distribution has been presented in tabular form:

Table 1. Distribution of hand wrought nails in 12B2 by length (in cm)

Lot	less than 3	4 to 7	greater than 8	broken nails
12B2A1	-	2	1	4
12B2A2	11	13	2	6
12B2B1	6	14	1	12

Other construction materials included a pintle from a door hinge in 12B2A2 and one cut nail from 12B2B1. With the possible exception of the cut nail, the construction hardware was probably all associated with the house whose support stones were found at the northwestern end of the excavation.

There were two metal artifacts found that were not associated with house building. One was a piece of lead shot from 12B2B1 and one was a brass button from 12B2A2. The brass button is hollow with both the crown and the back cast separately and joined by brazing; there is a separate eye element and two holes in the back of the button. Typologically it can be equated with Class II, Series D, Type 1, Variety a in the button classification developed to describe the buttons from Fort Michilimackinac where it was stated:

> [Distributional] information suggests a civilian use between ca. 1760 and 1780, although Calver and Bolton suggest that similar types were used by the French military.

> Feature contexts support the suggested date range of 1760 to 1780 (Stone 1974: 54).

It also approximates Type 2 in the less rigorously defined button typology proposed by South (1964); this would place the button contemporary with the first component of Brunswick Town, N.C., in a date range of 1726-76. Since the British occupied Fort Michilimackinac between 1760-80, the fact that the Fort Michilimackinac date for the button corresponds with only the later end of the date range from Brunswick Town is explained and the longer time period for the use of this type of button suggested by the Brunswick Town dates is reasonable. The civilian context for the brass button from Grassy Island is supported by the contextual associations of this type of button at Fort Michilimackinac. Thus a button which has a date range of 1726-80 and which is of a type known to have been used by civilians was found within midden debris from a house in an area of Grassy Island that the historical records suggest was occupied by members of the more or less permanent settlement of New England fishermen in the period between 1720-44.

Miscellaneous

One small fragment of wood that appeared to have been cut square across one end was found in 12B1D2 and one fragment of a clay tobacco pipe stem which from the bore diameter probably had an 18th century date was found in 12B2B1.

Summary and Conclusions

Grassy Island is one of a number of islands which formed the Canso fishing station from early in the 16th century until 1764. First controlled by France, it was ceded to Britain in 1713 after which date the fishery was taken over by New England fishermen. After 1720 the hostility between the French and the British made it necessary to give the fishing station military protection. Grassy Island became the site of two forts in the years 1720-45 and it also became the focus for the small permanent settlement at Canso during that period.

Reports of burials eroding out of the clay and boulder cliff along the southern side of the eastern promontory prompted the salvage archaeology programme. Testing parallel to the edge of the cliff failed to reveal any burials in that area. While it is always possible that scattered graves could have been missed, it is unlikely that there is an extensive burial ground along the edge of the cliff on the eastern promontory. Corroboration for this conclusion is found in the fact that another island in the harbour was identified as Burial Island on a number of 18th century British maps.

Excavation to investigate a line of boulders eroding out of the southern face of the western promontory yielded a little information about the structure and artifacts associated with what has been interpreted to be a civilian house which was occupied by members of the small permanent settlement on Grassy Island sometime between 1720-44. The

house used boulders for the support of the frame structure, probably had a brick fireplace and had a cellar which was under only a part of the building. The artifact assemblage was meagre but can be said to support this interpretation. The line of boulders eroding out of the edge of the cliff probably formed the foundation for a structure the rest of whose remains have already eroded away.

Erosion along the south coast of Grassy Island is posing a very real threat to the archaeological remains associated with the civilian occupation of the island. While the ruins of the fort appear relatively safe for the forseeable future, artifacts and structures are disappearing along the southern side of the western promontory. It seems to me that the primary historical value of this site lies in the fishery. The site has a long history and, although much of its earliest semi-permanent settlement will have left the most ephemeral archaeological traces, the fishing settlement after the British gained control of the island is unique and archaeologically accessible. It was the value of the fishery that caused the settlement to be founded there in the first place, which caused the French to press their claims to ownership after 1713, which caused the New England fishermen to demand military protection and which formed the economic base of the small permanent settlement there. Any future archaeological programme on Grassy Island which does not recognize the very real danger of irreparable loss to the historical record if more of this settlement is allowed to erode away will have missed the opportunity to make a unique contribution to our understanding of the history of Canso and the Nova Scotia fishing industry.

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H3/240 - Canso - 1732. A Draught of the Harbour and Ids. of Canso in the Governt. of Nova Scotia in the Lattd. of 45° 0" 25' North, Survey'd in Anno 1732 by Capt. Thos. Durett.
H1/240 - Canso - 1735. The Harbour of Canso in Nova Scotia.
H2/240 - Canso - 1764. A Draught of the Harbour of Canso with the Islands circumjacent, Shoals, Soundings etc, taken by Order of his Excellency Montague Wilmot, Esq., Governor of the Province of Nova Scotia, 1764, by Charles Morris, Chp., Surveyor.

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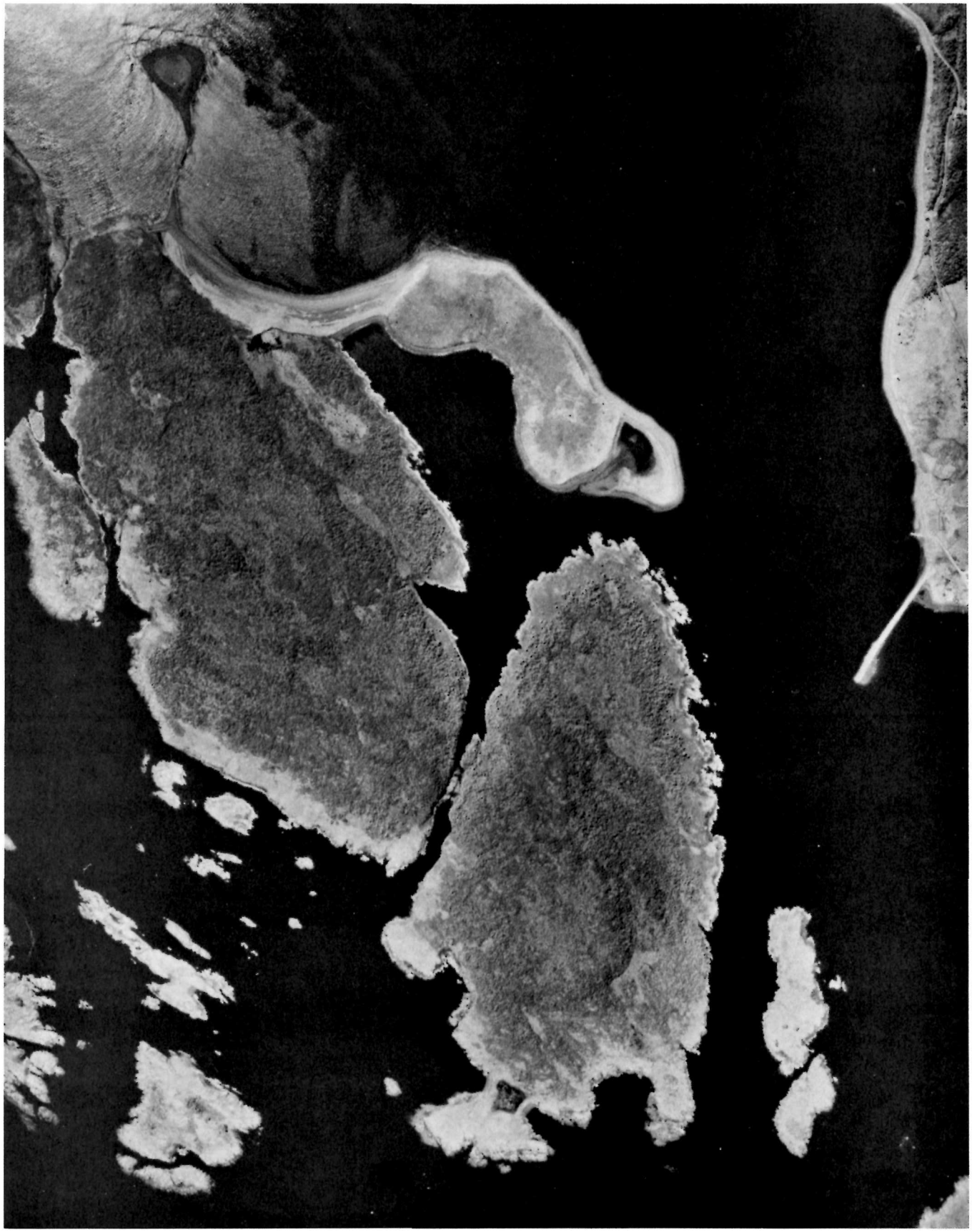
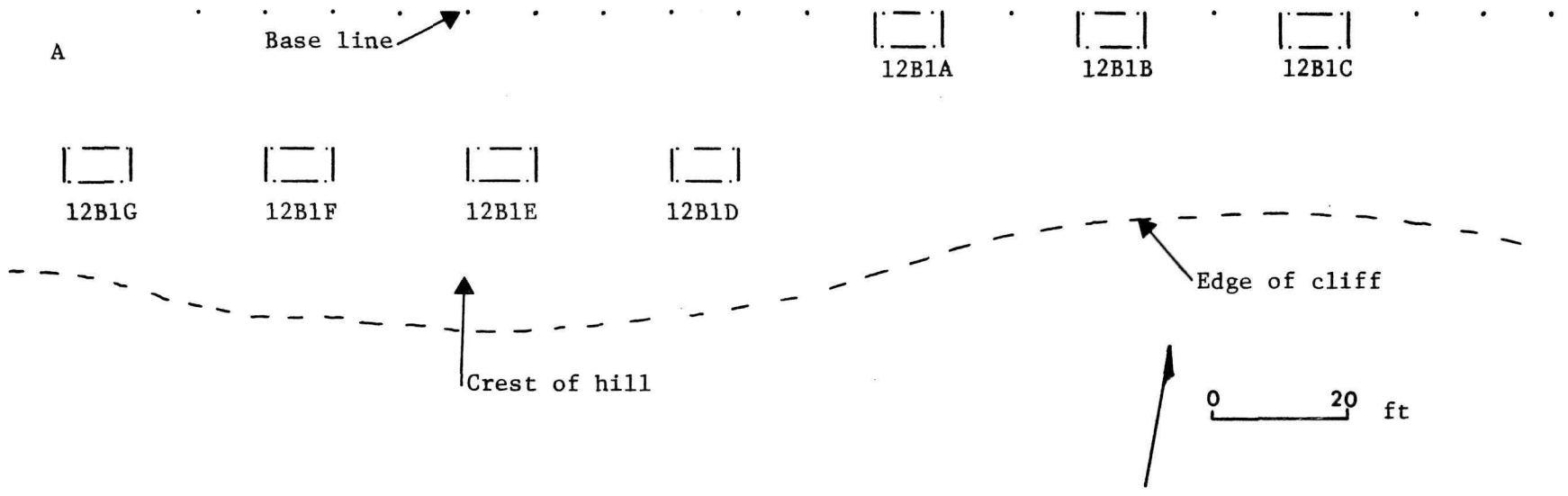
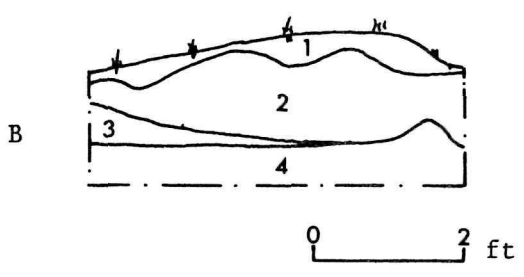
1 Aerial Photograph of Grassy Island showing relative locations of operations 12B1 and 12B2. Burial Island is under the end of the breakwater (Energy, Mines and Resources).



2 A Plan of excavations for burials on the southern side of the eastern promontory of Grassy Island (12B1). B Profile of west end of 12B1C; layer 1, humus, layer 2, reddish-brown soil with small pebbles and frost-cracked rock, layer 3, grey clay, layer 4, hard reddish clay. C Profile of east end of 12B1D; layers as Fig. 2B.


A
Base line
12B1A
12B1B
12B1C
12B1G
12B1F
12B1E
12B1D
Edge of cliff
Crest of hill
0
20
ft


B
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4
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2
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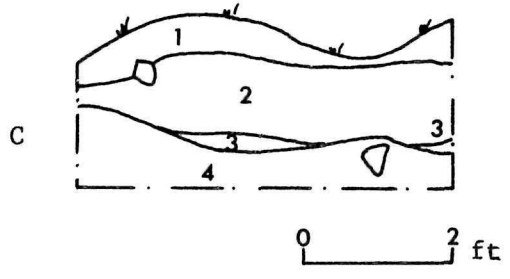
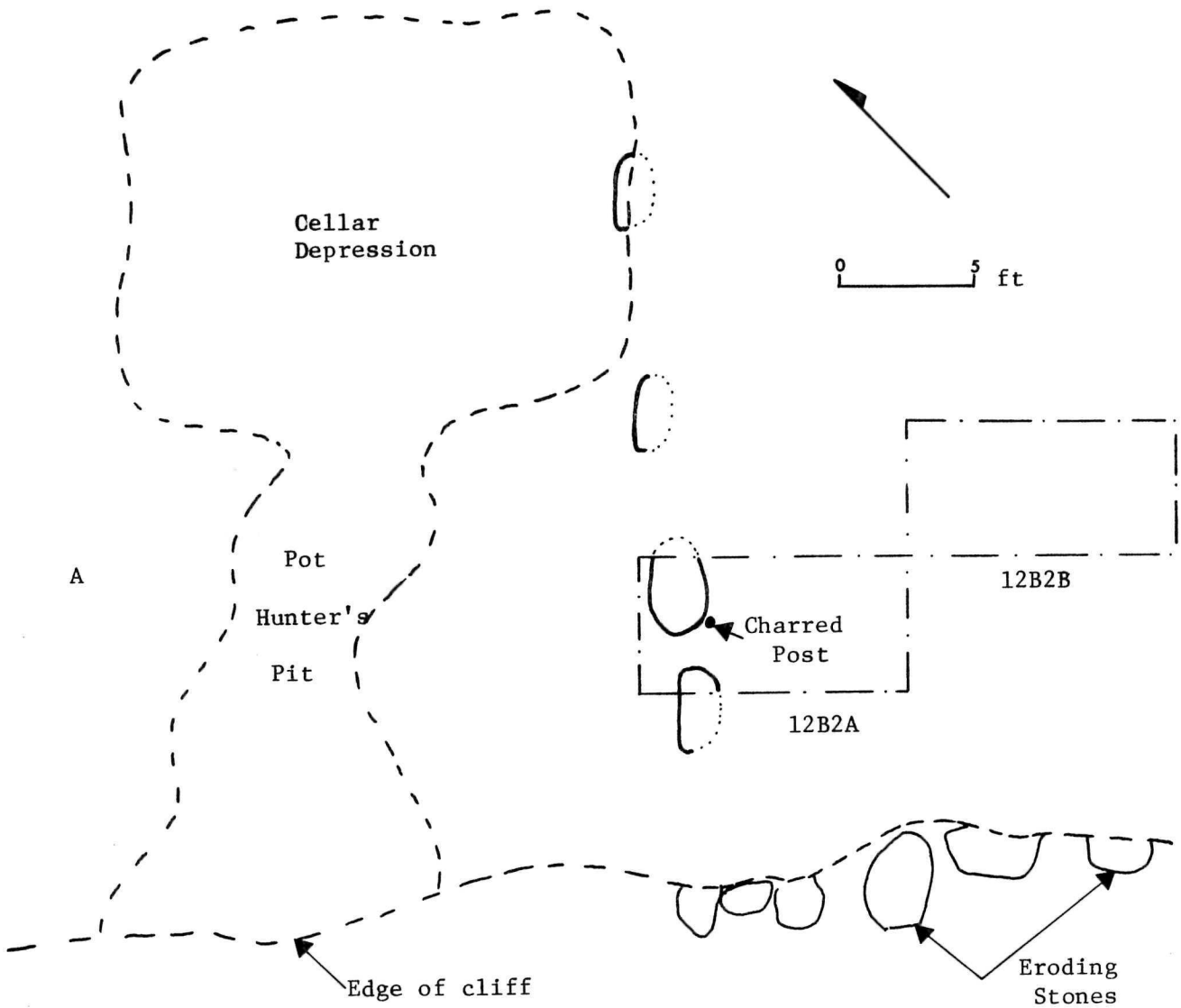
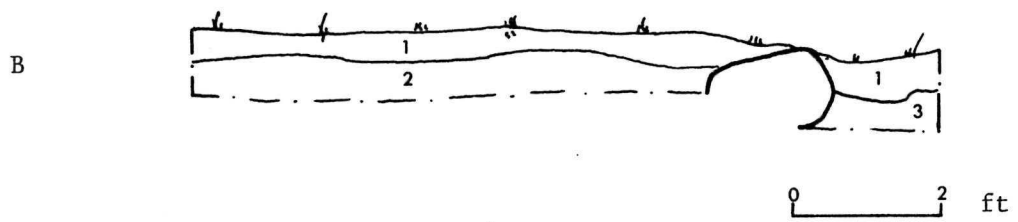

C
1
2
3
3
4
0
2
ft

3 Relationship between 12B2A and 12B2B and unexcavated features. B Profile of southwest side of 12B2A; layer 1, light brown humus, light brown sandy soil containing brick rubble and charcoal, layer 3, black soil of midden deposit.


Cellar
Depression
0
5
ft
A
Pot
Hunter's
Pit
12B2B
Charred
Post
12B2A
Edge of cliff
Eroding
Stones


B
1
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3
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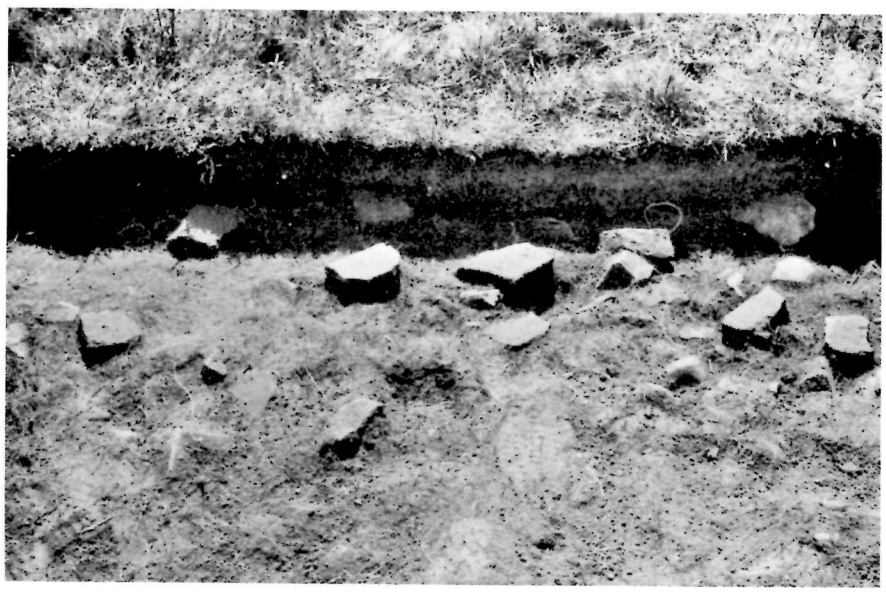
4 12B1F1 after excavation. (Photo by E. Snow; 12B-66M.)

5 12B2 before excavation; stones eroding from cliff edge on left, shovel handle in cellar depression on right. (Photo by E. Snow; 12B-72M.)

6 12B2A; foundation stones in northwestern end of pit. (Photo by E. Snow; 12B-77 M.)

7 12B2B; brick rubble at southeastern end of pit. (Photo by E. Snow; 12B-74M.)



Salvage Archaeology at Fort Beausejour
National Historic Park, N.B., in 1975
by M. Elizabeth Snow

Salvage Archaeology at Fort Beauséjour National Historic Park, N.B., in 1975
by Elizabeth Snow

Illustrations

Introduction

Salvage archaeology at Fort Beauséjour National Historic Park involved the testing of five 100 ft. square locations outside the fort itself in order to assess the requirements, if any, for further archaeological exploration when sites are chosen for the development of proposed park facilities. Only two of the locations tested revealed evidence of former habitation or utilization beyond agricultural cultivation.

Field Methods

Recent publications on archaeological research design have pointed out that archaeology would benefit from a review of its methods. Field work must be conducted according to strict methodological guidelines; probability sampling, a statistical technique, was the method advocated in order that results would be unbiased, broadly comparable and reanalysable. Since the first advocacy of probability sampling as a necessary archaeological technique (Binford 1964, Rootenberg 1964, Vescelius 1960), various field applications of this method have been experimented with and evaluated (e.g., Hill 1967, Redman and Watson 1970) and more flexible uses of various sampling strategies within a more sophisticated research design have been proposed (Redman 1973, 1974). Choice of research strategy has to be made "...with reference to the objectives of the project, the nature of the material to be investigated, the resources available for the study, and the required precision and reliability of the results" (Redman 1974: 19).

At Fort Beauséjour the research objective was twofold: to determine if any of the five locations contained cultural remains; if so, to determine their class (artifacts or structures), extent and period, the data on which to base future research strategy. The nature of the material to be investigated comprised five square tracts located in fields where the heavy turf covering the sites meant that, while the presence of gross structural features

might indeed be discovered by careful surface examination of each site, the presence of artifacts would only be revealed by excavation. Since it was known that the sites had been under cultivation, it was decided that excavation of less than five per cent of the surface area of each tract would be adequate to indicate the presence of cultural remains. Excavations could always be enlarged, if necessary, to solve specific interpretive problems. Manpower resources available were adequate to conduct excavations on the scale planned and the exact location of each tract was to be surveyed in by personnel from regional headquarters in Halifax after the field work was concluded. Since neither of the objectives of this investigation required the collection of data for statistical manipulation, it was not necessary that probability sampling be employed. On the other hand, this seemed an ideal opportunity to compare random sampling, one method of probability sampling, with the traditional long narrow exploratory trench, in terms of the time and labour involved in excavating the different test patterns and the ease with which results may be interpreted in the field.

Field work was conducted in two stages. First, each tract and its immediately surrounding area was examined carefully to see if there were surface indications of cultural features. In two cases, suboperations 2E28C and 2E28E, structural features were visible. Second, each tract was staked out according to the prearranged plan of random squares or test trenches; suboperation 2E28D was tested by random sampling (Redman and Watson, 1970, or Redman, 1974, give detailed descriptions of this method); suboperation 2E28A was tested by four long narrow trenches which bisected each quadrant of the tract; and suboperations 2E28B, 2E28C and 2E28E were tested by four long narrow interrupted trenches bisecting each quadrant of

the site. This last pattern gave the advantage of the long profile, the strong point of the trench system, with considerably less excavation. Excavation was conducted to depths of 1.0 ft. to 1.5 ft. The natural stratigraphy of the sites made it clear that by this depth cultural intrusion, if present, would be clearly manifest.

Excavation

Suboperation 2E28A

This location (planning area V2) is being considered for development as a visitor centre (Fig. 1). It is situated approximately 200 ft. north of the northwest corner of the defence works which the British built in 1755 around their temporary encampment (Nadon 1968). The 100 ft. square test tract was oriented to magnetic north. Four per cent of the surface area of the site was excavated in a pattern of four trenches measuring 50 ft. by 2 ft. (Fig. 2). The trenches were excavated to depths of 0.8 ft. to 1.0 ft. with tests to a depth of 1.5 ft. at intervals of approximately 10 ft. The natural stratigraphy consisted of sod growing in a layer of dark brown loam which had a thickness of 0.6 ft. to 0.75 ft. Beneath the loam was a layer of reddish-brown clay which had a depth of greater than 1.5 ft. beneath the surface; the bottom of this layer was not reached during this excavation.

This site was located in a field. Other than agricultural usage, there was no evidence of cultural alterations to the site, nor were any artifacts found.

Suboperation 2E28B

This location (planning area V4) is being considered for development as a visitor centre (Fig. 1). It is situated approximately 600 ft. east of the Prince Frederick Bastion on the steep slope of the eastern side of the road leading

into the fort. The 100 ft. square test tract was oriented 36 degrees east of magnetic north. The extent of the area excavated amounted to 2.4 per cent of the surface area of the site; individual test pits measured 10 ft. by 2 ft. and they were aligned in four interrupted trenches (Fig. 2). The natural stratigraphy of the site consisted of four layers. Uppermost was a layer of light grey sand which had a thickness of 0.1 ft. to 0.15 ft. and which was not present over the entire site. Beneath the sand, or uppermost where the sand was not present, was a layer of reddish-browh sandy loam which reached depths of 0.5 ft. to 0.75 ft. beneath the surface where it graded into the third layer which was characterized by the presence of pebbles and stones. At a depth of 1.25 ft. or more the reddish clay subsoil was reached. On the downhill side of the site a humus layer of approximately 0.25 ft. thickness replaced the light grey sand.

The site was located in a field. Other than agricultural usage, there was no evidence of cultural alterations to the site, nor were any artifacts found.

Suboperation 2E28C

This location (planning area M1) is being considered for development as a maintenance compound (Fig. 1). It is situated approximately half a mile northeast of the fort next to a square hole in the ground which is likely the remains of a house cellar. The 100 ft. square test tract was oriented 41 degrees west of magnetic north. The extent of the area excavated amounted to 2.4 per cent of the surface area of the site; individual test pits measured 10 ft. by 2 ft. and they were aligned in four interrupted trenches (Fig. 2). The northeast trench was located further to the east than it should have been in order to

avoid some trees. The test tract sloped from the northwest (grid north) to the southeast where it was situated on the edge of a marshy depression. The natural stratigraphy consisted of three layers. First was the humus whose thickness ranged from 0.05 ft. on the drier northwestern side of the site to 0.2 ft. on the wetter southeastern side of the site. Beneath the humus was a layer of sandy reddish-brown loam whose depth reached 0.65 ft. to 0.85 ft. beneath the surface. Underlying the loam was the reddish clay subsoil.

Eight of the 12 test pits yielded artifacts from the upper two layers. The greatest concentration was in the northern corner of the site, closest to the house foundation (Fig. 1). Artifacts included a horseshoe, a harness buckle, some pieces of metal, some non-diagnostic pieces of pale green bottle glass and some sherds of vitrified white earthenware with various patterns, all consistent with a late 19th or early 20th century date.

If the maintenance yard were to be located here, the value of the house foundation and its associated artifacts would have to be assessed in the light of the fact that these remains postdate the military occupation of Fort Beauséjour.

Suboperation 2E28D

This location (planning area M2) is being considered for development as a maintenance compound. It is situated approximately 850 ft. north of the northwest corner of the defence works around the British camp of 1755 (Fig. 1). The 100 ft. square test tract was oriented 23 degrees east of magnetic north. The extent of the area excavated amounted to 2.5 per cent of the surface area of the site. A random sampling technique was used to locate ten 5 ft.

square test pits (Fig. 2). Natural stratigraphy consisted of three layers. Uppermost beneath the sod there was a layer of brown loam which reached a depth of 0.6 ft. to 0.7 ft. beneath the surface; under this there was a layer of reddish-brown soil which contained some stones and pinkish clay. At a depth of approximately 1.25 ft. beneath the surface the reddish clay subsoil was reached.

The site was located in a field. Other than agricultural usage, there was no evidence of cultural alterations to the site, nor were any artifacts found.

Suboperation 2E28E

This location (planning area V3) is being considered for development as a visitor centre (Fig. 1). It is situated on the glacis between the Prince Henry Bastion and the road leading into the fort. The 100 ft. square test tract was oriented 29 degrees west of magnetic north. The extent of the area excavated amounted to 2.4 per cent of the surface area of the site. Individual test pits measured 10 ft. by 2 ft. and they were aligned in four interrupted trenches (Fig. 2). The natural stratigraphy consisted of sod growing in a thin layer of brown soil. At a depth of 0.7 ft. to 0.85 ft. beneath the surface there was a layer of gravel in reddish-brown clay, fill for the exterior earthworks of the glacis. The depth of this fill was not determined.

Artifacts were found in the upper layer in three of the pits on the northern or uphill side of the site (Fig. 2). They consisted of pearlware sherds, corroded metal and dark green bottle glass.

In this site cultural materials relating to the occupation of the fort were found and the site itself is situated on the glacis, an integral part of the fort

itself. If the visitor centre were to be located here, salvage archaeology would have to be undertaken.

Summary and Conclusions

The five 100 ft. square test tracts were tested in various patterns in order to evaluate different research strategies in the field. The meagre cultural remains found, however, greatly reduced the usefulness of this programme. Although it was expected that the long profiles of the test trenches would facilitate stratigraphic interpretations, the lack of complexity in the stratigraphy of the tested tracts obviated this benefit. Also as expected, the test trenches could be laid out much more rapidly than randomly scattered test squares. But if the benefits of a rigorous, explicit sampling procedure were desired, the extra time involved in laying out the test squares would not be a deterrent. Because so little was found, the merits of the two methods being compared cannot be realistically assessed.

Only two of the five tracts tested revealed evidence of any cultural activity other than cultivation. Of these, one site half a mile northeast of the fort had artifacts associated with a late 19th or early 20th century house foundation and the other site on the glacis of the Prince Henry Bastion yielded a thin scatter of artifacts on top of the clay and gravel fill of the glacis. If the former site were developed, there would be little loss to the history of Fort Beauséjour. If the latter site were to be developed, further archaeology would have to be undertaken; the site is, after all, located on the earthworks of the fort. Because of the nature of these cultural remains,

scattered artifacts and earthworks, it is possible that a salvage archaeology programme could be associated with the excavation undertaken during construction.

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1 Fort Beauséjour National Historic Park: Proposed visitor and compound sites (attached foldout).

CANADIAN NATIONAL RAILWAYS

SITE V3

SITE V4

SITE M2

SITE V2

SITE M1

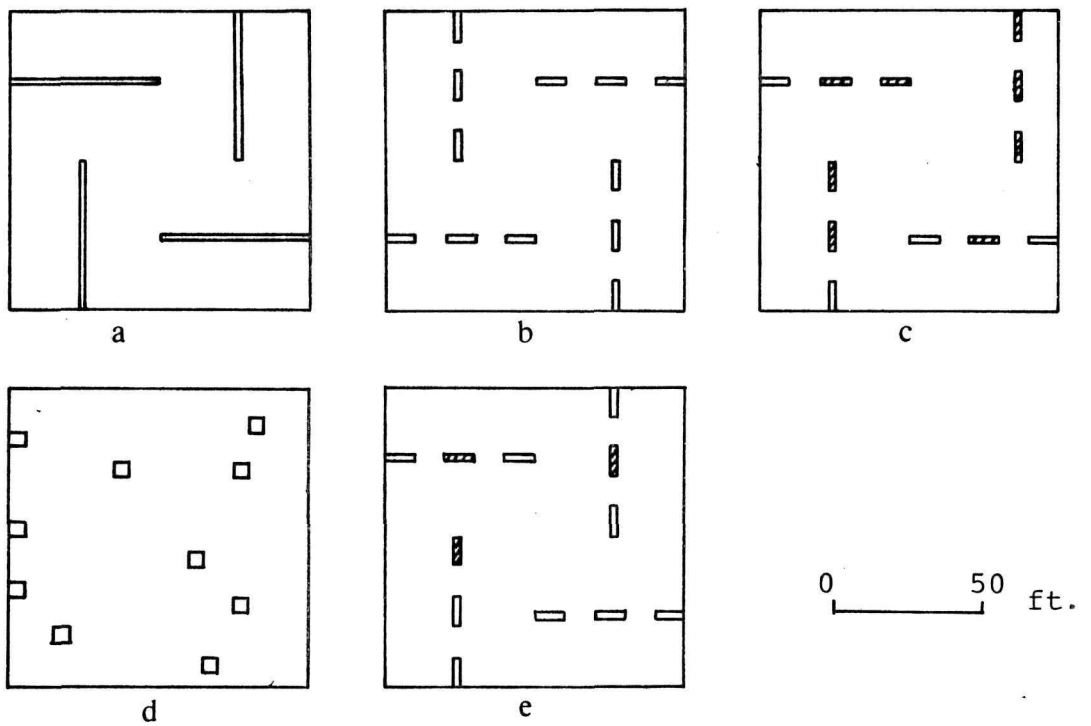
AULAC

To Sackville N.B.

To Amherst

To P.E.I.

2 Sampling patterns for excavations in operation 2E28.



a. 2E28A

b. 2E28B

c. 2E28C Hatching denotes pits where artifacts found.

d. 2E28D

e. 2E28E Hatching denotes pits where artifacts found.

Salvage Archaeology at the Redan Battery,
Queenston Heights, Ontario, 1975
by M. Elizabeth Snow

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Illustrations

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Introduction

In 1975 salvage archaeology was undertaken at the Redan Battery on Queenston Heights in order to determine, if possible, what type of gun platform had been built there, before the site was further disturbed by the installation of a display cannon. Already located within the Redan Battery was a Parks Canada interpretive monument, Marker No. 5 on the Queenston Heights Battlefield Walking Tour, and a Niagara Parks Commission bench mark. Excavation revealed that the interior face of the redan earthworks was revetted in stone and that the gun platform had originally been constructed of wood resting on a clay and gravel base. Among the artifacts found were buttons used by the 41st Regiment and the Royal Scots, both regiments on garrison duty at Fort George during the War of 1812. While the archaeological findings at the Redan Battery are straightforward enough, the paucity of historical data on the redan in the standard secondary sources, apart from general statements on its strategic position in the defence of Upper Canada or its tactical value in the Battle of Queenston Heights, means that many important questions about the history of the Redan Battery are not in this report.

Historical Background

In the early part of the 19th century, Britain's hold on Upper Canada depended on maintaining the long line of communications from Montreal west through the Great Lakes. One vital but vulnerable link in the chain centered on the Niagara River which joined Lake Ontario to Lake Erie and the Western frontier. Because of the importance of the Lakes for transportation and defence, it was necessary to control both the head and the mouth of the river and this is where the most extensive defences were constructed and the bulk of the artillery concentrated. Along the course of the river, the Niagara Gorge is the most significant geographical feature because it constitutes a stretch of border safe against an invasion of troops. Counterbalancing this, however, is the fact that goods must be portaged around the gorge and the falls, the embarkation points at either end of the portage being especially vulnerable to attack. The position of Queenston, the northern terminus of the portage, was worsened by its being situated at the base of the escarpment, overlooked by the guns of Fort Grey on the American side. Consequently, Queenston Heights became the location of commanding gun batteries both by logic and by necessity.

The initial British response to the tactical problem of defending Queenston included a garrison stationed in the village and two gun emplacements:

> Half-way up the side of the mountain, in a natural fold of the ground, a small redan

> battery had been built, with its angle fronting the river and armed with an eighteen-pounder, and at Vrooman's, or Scott's Point, nearly a mile below, a twenty-four pound gun had been mounted en barbette...(Cruikshank 1964: 29).

But exactly when the Redan Battery was built is not clear. Because of the importance of its geographical situation, it may have been constructed sometime after 1800 to act in concert with Fort George, the military headquarters for the Niagara Frontier, and its system of outlying fortifications from Mississauga Point to Queenston. On the other hand, during the time immediately after the outbreak of war in June 1812, the design of Fort George was radically altered and new defensive works were constructed in the Niagara area; "batteries were built and mounted with cannon taken from the fortifications of Detroit" (Cruikshank 1964: 24). There appears to be nothing in the archaeological evidence to resolve this question. It could be argued that the solidity of the construction of the earthworks, which include a dry stone revetment, indicates something more than a hastily constructed field work; and, conversely, it could be argued that, given the obvious military advantage of arming the heights, a defensive work planned and built before the outbreak of war in June 1812 would have been both more substantial and less vulnerable to infantry attack from the rear.

But whenever the Redan Battery was built, its pivotal role in the Battle of Queenston Heights, fought on 13 October 1812, is well known (Cruikshank 1964, Whitfield 1974). The Americans attacked before dawn but, although they were successful in effecting a landing, British fire from the village of Queenston and the Redan Battery kept them pinned down by the river (Fig. 1). Their discovery of an unguarded path up the escarpment somewhere to the right

of the Redan Battery enabled them to gain the heights. From this position they charged downhill, attacking the Redan Battery from the rear; the British barely had time to spike the gun before they were forced to flee downhill. Realizing the tremendous advantage the Americans had just gained, Major General Isaac Brock, the energetic commander-in-chief of the British forces in Upper Canada, organized an immediate counterattack. Conspicuous in his distinctive uniform, he was shot and killed by a sniper. A second counterattack, led by Lieutenant Colonel John Macdonell, Brock's provincial aide-de-camp, was nearly successful when the Americans in the redan were reinforced and Macdonell was mortally wounded. The Americans were able to drill the gun in the Redan Battery and turn it on the village of Queenston. While at this time they held the commanding position, fire from the village prevented reinforcements from crossing the river. General Stephen Van Rensselaer, the commander of the American forces, ordered the American position at Queenston fortified but "there is no evidence that any fortifications were erected either in the redan battery or on the mountain top" (Whitfield 1974: 16). The stalemate was broken when Major General Roger Hale Sheaffe led British reinforcements from Fort George and Chippawa in a counterattack and drove the Americans from Queenston Heights in their turn.

The British victory in the Battle of Queenston Heights was far reaching in its conseqeunces, despite the death of Brock. It served to unify the divided and demoralized citizens of Upper Canada solidly behind the British war effort (Stacey 1964, Whitfield 1974).

After 1812 the Redan Battery fades from the historic accounts although it was undoubtedly kept active for the protection of Queenston (McConnell 1974: pers. com.). It was probably manned both before and after the capture of

Fort George in May 1813 and it was unlikely to have been abandoned until October 1813 when the British were forced to withdraw troops from their seige of Fort George for the defence of Kingston and the Niagara Peninsula was thrown open to the Americans (Allen 1974). It is possible that during this period the Redan Battery was armed and manned by American forces, although it would have been of marginal value to them because Queenston was already commanded by their guns in Fort Grey and Lewiston. In 1814 the struggle for control of the Niagara Peninsula continued with the British in possession after the Americans withdrew from Fort George in December 1813 until July 1814 when the Americans captured Fort Erie and Chippawa and advanced as far north as Queenston. The Redan Battery was now in American control for the third time. Before the end of the month, however, the Americans had retreated south to Fort Erie and the Redan Battery remained in British controlled territory until the end of the war in December 1814.

Two British regiments, the 41st Regiment and the Royal Scots, are represented by buttons found at the Redan Battery. The 41st was on garrison duty at Fort George from August 1811 to March 1813 (Desloges 1975) and figured prominently in the Battle of Queenston Heights (Whitfield 1974). According to American records, members of both the 41st and the Royal Scots were amongst those taken prisoner when Fort George fell in May 1813 (Desloges 1975) so presumably troops from either regiment could have served at the Redan Battery in the spring of 1813. In the summer of 1813 the Royal Scots continued in the area and participated in the investment of Fort George (Desloges 1975: Fig. 18). In 1814, after the British regained possession of Fort George, the Royal Scots were the principal regiment on duty there and, presumably, at the Redan Battery as well:

Il devient toutefois difficile de préciser le

> nombre exact de soldats [at Fort George], car les retours spécifient que les troupes sont installées au fort George et dans les environs (Misissauga, Chippawa et Queenston) (Desloges 1975: 72-3).

The Royal Scots were replaced at Fort George in September 1814. The 41st were back in the Niagara area in 1814 also, serving as part of the garrison at Fort Niagara and the Light Company of the 41st passed through Queenston in July on its way to the Battle of Lundy's Lane (Allen 1974). Thus the 41st Regiment is known to have been present at the Redan Battery in 1812, could easily have been there until March or even May of 1813 and could possibly have been there in the summer of 1814 and the Royal Scots could have been there in the spring or summer of 1813 and were quite likely to have been at the Redan Battery during the spring and summer of 1814.

Armament in the Redan Battery prior to and during the Battle of Queenston Heights is known to have consisted of a single 18-pounder cannon, although its carriage and mount are not specified (Cruikshank 1964, Whitfield 1975). Presumably, when the British withdrew from the Niagara area in 1813, they took their ordnance with them, including the 18-pounder from the Redan Battery. Consequently, the position may have been differently armed if it was reactivated in 1814.

Because the single gun in the Redan Battery had to command a field of fire which ranged over an arc of considerably more than 90 degrees, the gun was likely mounted <u>en barbette</u>, probably on a common garrison carriage, a type that could be found both in permanent fortifications and in more hastily constructed seige positions (Gooding 1965, Wilkinson-Latham 1973). The carriage probably sat on a wooden platform:

> In garrisons and forts after 1800, and during seiges, ordnance was fired from platforms. This prevented the piece sinking into the ground and provided a flat surface to run back on (Wilkinson-Latham 1973: 60).

While at the time the Redan Battery was in use garrison and field platforms were differently shaped, the configuration of the earthworks at the Redan Battery probably dictated the shape of the platform constructed there. Ideally the platform should be made "with a rise to the rear of one half inch per foot to slow the recoil and to facilitate returning the gun" (Gooding 1965: 33) to its firing position.

Excavations

At present the Redan Battery is situated in parkland maintained by the Niagara Parks Commission. Growing on the earthworks themselves are cedar and various deciduous trees, including a dense stand of sumac. A path leading down the steep slope of the escarpment to an abandoned roadway crosses its left flank near the junction of the two arms of the redan. The earthworks of the Redan Battery are still clearly visible; the right arm, oriented roughly northwest to southeast, runs slightly uphill for a distance of something over 50 ft. to a point where it meets the sharp upward rise of the escarpment and the left arm extends on an east-west line that slopes downhill, especially at its western end, for a similar distance. The western end of the left flank is somewhat eroded. Approximately 50 ft. to the southwest of where the two arms join there is a small crescent-shaped earthwork which is oriented in the same direction as the Redan Battery itself (Fig. 6). Because of its orientation, this earthwork cannot be interpreted as an attempt to fortify the unprotected rear of the redan. It has been suggested that, in view of the isolated nature of this gun placement, it would be necessary to store ammunition there and that this earthwork could be interpreted as a field magazine (Ferguson 1975: pers. com.). Located further west, slightly down the sloping shelf of land where the redan is built, are two parallel ridges of earth which may be earthworks built to protect the redan from attack up the slope. Neither the crescent-shaped

earthwork immediately to the rear of the redan nor the other two possible earthworks on the slope to the west were excavated and care should be exercised that these earthworks are not disturbed during any subsequent construction in the Redan Battery or its vicinity.

Located in the middle of the Redan Battery and within the area excavated is a bench mark established by the Niagara Parks Commission. Beneath the surface layer, the area of disturbance created by setting the bench mark into the ground was clearly discernible; this layer was left as a column of dirt and gravel surrounding the cement post. Vertical measurements were all calculated on the basis of the top of the N.P.C. bench mark equalling an arbitrary 100.00 ft. above sea level. Horizontal measurements were based on a grid and tied into the bench mark (Figs. 2, 3). Also within the Redan Battery is a Parks Canada interpretive monument, Marker No. 5 on the Queenston Heights Battlefield Walking Tour, composed of four upright metal modules set in a cement base. Excavations for the cement base and its gravel foundation naturally disturbed an area greater than its 7 ft. by 4.5 ft. dimensions, although it is fortunate that this disturbance was worst on the south and west sides which were further from the central portion of the site.

The purpose of the archaeology at the Redan Battery was to discover if anything remained of the original gun platform structure before a display cannon is placed within the redan. Excavations were carried out in a series of five contiguous suboperations along the interior face of the left flank of the redan and in a single unconnected suboperation on the interior of the right flank (Fig. 2). The area excavated was designed to explore features while remaining within the conditions imposed by the N.P.C. against harming any trees.

In undisturbed areas three layers represented the

natural stratigraphy at the site: uppermost was a layer of black humus (except in pathways where this layer was absent) which lay on top of a layer of yellow-brown soil which contained scattered small stones and some boulders; finally at a depth of 0.8 ft. to 1.0 ft. a layer of fine-grained bright yellow soil containing few stones was reached. This third layer can be considered the culturally sterile subsoil at the site. Around the earthworks themselves, the stratigraphy was more complex. There were two clear areas of modern intrusion represented by the disturbances around the Parks Canada monument and the N.P.C. bench mark (Fig. 3). There is also a complex interlacing of layers resulting from the silting in of the Redan Battery after its abandonment and the eroding of fill from the earthworks to overlie the silt (Fig. 4). This gradually accumulated deposit covers the layers which constitute the remains of the Redan Battery, the fill of the earthworks and the gun platform.

Features include the monument and bench mark already mentioned, the remains of six posts or post molds from the period between the abandonment of the Redan Battery as a military installation and its commemoration as an historic site, and remains of the Redan Battery itself. It is clear that the posts and post molds postdate the Redan Battery because one post found to the south of the earthworks in 22H2E was situated above and unconnected with any of the features of the 1812-14 gun emplacement. Three of the six post holes had the remains of cedar posts still standing and the larger post hole dug to seat the post was evident in two cases (Fig. 7). Although the posts were not aligned in a clear pattern, it seems reasonable to interpret them as fence posts. The single artifact found in any of the post molds was a metal bottlecap of 20th century type.

The Redan Battery consists of two parts, the gun

platform and the protective earthworks of the two arms of the redan. It was found that the interior face of the earthworks was revetted with dry stone masonry for a distance of 37 ft. on the left flank and 33.5 ft. on the right (Figs. 3, 12). The wall was built on a clay and gravel base and nowhere exceeded two feet in height. The majority of the stones used in the construction of the revetment had been quarried and roughly squared although some rounded cobbles were used as well (Fig. 8). Quantities of sharp irregular stones that were found chinking the interstices between the big blocks and that were also found loose on the old living surface of 22H2D and 22H2F suggest that the final shaping was done on the site. The fill of the earthwork consisted of a distictive yellow silty clay packed around irregular sharp stones. The fill at the western end of the left flank was, however, much stonier than that to the east and at the apex of the redan; if, as has been suggested, the final shaping of the masonry for the revetment was done where the stone chips were found near the west end of the left flank, then the stonier fill near there would be the natural result of the excess stone being used in the fill. The earth fill behind the masonry revetment is now somewhat eroded; considering the relative heights of the top of the revetment and the present surface of the redan along with the evidence of erosion that can be seen in the section drawings (Fig. 4), I think that it is safe to say that the original earthworks sloping back from the revetment rose to a height of at least two feet above the top of the stone wall.

The gun platform in its turn consists of two parts, the clay and gravel base and the wooden platform that it supported. The former consisted of gravel and fragments of brick contained in a matrix of compacted clay so that it formed a very solid base for the wooden platform. Although

part of this layer underlay the masonry revetment, it also rose up the stone face of the revetment, especially towards the western side of 22H2B, partially compensating for the fact that the natural ground surface slopes down to the west. Situated on this layer were the fragmentary remains of five wooden sleepers running north-south, perpendicular to the left arm of the redan (Fig. 3). The sleepers are found either approximately 4 ft. apart or approximately 8 ft. apart; this suggests that intermediate sleepers are completely missing for, if replaced, all sleepers would be situated at regular intervals of approximately 4 ft. The northern ends of the two western sleepers are supported on flat slabs, no doubt for levelling purposes (Figs. 9, 10). No traces of the boards of the gun platform itself were found nor were there in situ pieces of hardware that might have joined the boards to the sleepers; from this it is presumed that the gun platform was dismantled after the war and the reusable materials salvaged.

It has been possible to infer the extent of the original wooden gun platform (Fig. 5) using three lines of archaeological evidence. The most important of these is the location of the westernmost sleeper which suggests that the platform had a length of 15 ft. running parallel to each arm of the redan. Second the stratigraphy visible in the profile along the east side of suboperation 22H2A (Fig. 4B) indicates the southern extent of the gravel and clay platform base and shows how the platform base is set into the yellow subsoil, thereby adjusting the original configuration of the ground. If the back of the platform is placed in the position thus indicated, the sides of the platform will measure 10 ft. and a perpendicular drawn from the back of the platform through the apex will measure 16 ft. This platform would appear to be adequate for an 18-pounder which would have less recoil than the 18 ft.

expected of a 32-pounder with full service load (Gooding 1965). Contrary to the expectation that the platform would slope from back to front, it appears that it sloped slightly from east to west, indicting that the platform base constructed did not compensate fully for the natural slope of the terrain. Corroborative evidence for this hypothetical reconstruction comes from the disposition of artifacts. The clay and gravel platform base was, with one exception, sterile in the area covered by platform as it has been reconstructed; artifacts were found, however, immediately next to the revetment, which shows that the platform did not butt directly against the stone wall, and to the west of the western sleeper.

There was one puzzling feature found in the area covered by the wooden gun platform. It consisted of three stones set in a shallow depression in the clay and gravel platform base and it was centered approximately 10 ft. south of the revetment on the left flank (Fig. 11). The soil surrounding the stones was dark in colour and seemed to have a high organic content. Artifacts from this layer (lot 22H2A4) included a variety of early 19th century materials and 20th century bottle glass. It seems that this layer was disturbed, possibly during the construction of either the N.P.C. bench mark or the Parks Canada monument, both of which are very close. Whether the position of the stones was also altered was not determined. From this unsatisfactory information, little can be concluded about the feature; the stones may originally have supported part of the rear of the platform, they may have served some other function or they may have been disturbed during recent construction activities.

Artifacts

Artifact proveniences can be summarized as follows: undisturbed clay and gravel platform base is found in lots 22H2A3, 22H2B2 and 22H2E2; one post mold dating to the period after redan had silted in was excavated as lot 22H2A2; all other artifacts come from surface layers or disturbed contexts. It should be noted that the majority of the artifacts come from lot 22H2D2 which was associated with debris from the shaping of the revetment masonry and which lies to the west of the reconstructed platform; this early 19th century assemblage was disturbed at its eastern end by the admixture of modern glass which was probably deposited when the Parks Canada monument was built.

Ceramics

From a surface layer there were five sherds of refined white earthenware with a green transfer print which would date to ca. 1830, a period after the Redan Battery had been used as a gun emplacement. The other sherds which include two pieces of a pearlware cup (22H2D2) and two pieces of creamware and a piece of coarse earthenware (22H2A4) date from the period 1780-1820 and, therefore, were probably deposited while the Redan Battery was in use during the War of 1812.

Glass

One small fragment of a tumbler base (22H2D2) is the only piece of glass possibly coeval with the use of the Redan Battery during the War of 1812. Other glass includes pane glass (22H2D2) and a variety of bottle fragments which span a period from the late 19th century to the present. These bottles include fragments from fully modern pop bottles, beer bottles and liquor bottles, including a Seagram's whiskey bottle, fragments of pop bottles from the second quarter of the 20th century, fragments from a wide-mouthed food-containing bottle and fragments of a square medicine bottle (or bottles). The majority of these bottles seem to reflect recent use of the site as a picnic and recreation area.

Metal

Metal artifacts included construction materials and a variety of other objects. Numerically the most significant of the construction materials were the 126 nails recovered. Of these, 6 were wire nails found in surface layers close to the Parks Canada monument, 5 were hand-forged spikes whose length exceeded 10 cm, and 115 were rose-headed hand-forged nails of remarkably similar size. Except for two slightly longer examples, they clustered in a group measuring approximately 6 cm to 7 cm in length. While three of the nails and one of the spikes came from the clay and gravel platform base, an overwhelming majority of 102 nails came from the area immediately to the west of the platform (22H2D2). The only other metal artifacts associated with construction are an inconclusive piece from a hand-latch rim lock (22H2D2) and a key with a round loop which was found between two stones of the revetment near the boundary between suboperations 22H2A and 22H2E below the level of the

top of the original platform, obviously shoved into the crack for safe-keeping. It is of a type which was in use for a long time during the 18th and the first half of the 19th centuries.

While the key poses no problem in the interpretation of the construction materials found in the Redan Battery because its provenience suggests that, as it could have been placed in the context where it was found by a soldier on duty there, it need not pertain to any building at or near the site itself, the other artifacts are less easily explained. Except for the five spikes, the nails were all too small to have joined the heavy timbers of a gun platform to their sleepers, so the question of what they were used for arises. No structural evidence of the presence of a shack for storage or the protection of the men on duty was found in the area excavated nor does Major Dennis show one in his drawing of the Battle of Queenston Heights executed sometime after the war (Whitfield 1974: Fig. 2). It is, however, possible that the nails and the fragment of lock pertain to a shack built there later in the war or to some other structure. The finding of most of the nails together in 22H2D2 suggests that they were accumulated there when some structure was dismantled. The fact that no spikes or other hardware were found in association with the in situ sleeper fragments supports the interpretation already advanced that the gun platform in the Redan Battery was dismantled and reusable materials salvaged after the war.

Other metal artifacts include modern objects such as the aluminum pop-top from a beverage can, a small aluminum foil packet and the metal screw cap from the whiskey bottle, all from surface layers; a modern metal bottle cap from one of the post molds; eight unidentifiable scraps of metal from surface layers and one from the clay and gravel platform base; a piece of metal strapping and a part of a wire-edged

pot of a style being used in the first half of the 19th century from 22H2A4; and a fragment of a small brass ring and part of a buckle from 22H2D2. From the surface there was a spent bullet from a post-War of 1812 breech-loading percussion weapon, two pieces of cast iron cannister shot from the clay and gravel platform base and two lead musket balls from 22H2D2. There were also three buttons from 22H2D2.

Of the buttons, one is plain and two bear embossed military insignia. The plain button is a flat disc cast around a separate eye which is anchored in a prominent boss and it has a pronounced mold seam on the back. It is similar to Type 8 in the South (1964) typology, except that it is made of white metal, not brass. Of this type of button, Noel Hume says:

> It may also be added that the regulation white metal buttons worn by "other ranks" of the British army in the Revolutionary period were flat-faced with a very pronounced boss on the backs, into which an iron eye was anchored (1970: 92).

Being a British army button, its terminal date on American sites would clearly be the American Revolution, although it could be expected to be found on British military sites in Canada long after that time. The two regimental buttons, one from the 41st Regiment and one from the Royal Scots, both consisted of a single disc cast around an iron eye; the faces of both buttons were probably convex, although that of the 41st is too bent to be certain. The style of button of the 41st found at the Redan Battery was in use until 1813 and is described as follows: "The early officers' silver buttons of the 41st had the design in relief of an eight-pointed star, in the centre of which was the number '41' (Parkyn 1956: 207; Fig. 340). The button of the Royal

Scots was of a style that probably was not received in Canada until 1813 after the change of regimental name which took place in 1812 (Emilio 1911, Parkyn 1956); the button is described as follows: "...solid; convex; pewter.... At the top, a crown, in centre a script monogram of letters "GR", figure "1" below, under the words "Royal Scots"; with circle of poignards and thistles" (Emilio 1911: 113). The known movement of the two regiments within the Niagara area and the dating of the buttons coincide. The presence of the Royal Scots at the Redan Battery in 1813 or later supports the presumption that the Redan Battery was active in the defence of the Niagara peninsula after 1812.

Miscellaneous·

Four clay tobacco pipe stem fragments were found, three from the surface layers and one from the clay and gravel platform base; this sample is unfortunately too small for the application of statistical dating techniques. One small fragment of a grey gunflint was recovered; it was so incomplete that a formal description could not be derived from the remains. Some animal bone was also recovered from all layers; the bone is very fragmentary in nature and no doubt represents the remains of soldiers' meals. It has not been identified as to species.

Wood used as sleepers in the construction of the gun platform has been identified as white pine (Pinus strobus).

Summary and Conclusions

While the archaeology undertaken at the Redan Battery did not resolve the historical questions surrounding the dates of its construction and eventual dismantling, it did reveal considerable structural evidence. The Redan Battery consists of an earthwork and gun platform; the former is revetted in stone on its interior face to a height lower than the top of the earthworks but higher than the wooden gun platform and the latter consisted of a wooden platform placed on a compacted clay and gravel base which did not fully compensate for the natural slope of the land. The dimensions of the gun platform can be inferred from the position of the wooden sleeper remains, the stratigraphy, and the disposition of artifacts around the edges of the platform. Nothing was found to upset the historians' conclusion that the American forces had not undertaken field works when they were in possession of the Redan Battery during the Battle of Queenston Heights. Artifacts were few but there was nothing found that was inconsistent with the character of the site and buttons identified two of the regiments serving there. The presence of small nails, a lock part and pane glass suggest that there may have been a small shack or other structure built near the Redan Battery and a semi-circular earthwork to the rear of the gun position may have served as a field magazine. There is evidence of what was probably a fence running across the earthworks (in the form of decaying posts and post molds), set both in the earthworks and in the Redan Battery after it

had silted up. A small quantity of mid-19th century pottery does not appear to have any structural associations and quantities of 20th century bottle glass are in keeping with the site's recent use as a park, a function indicated by the presence of a Parks Canada monument and a Niagara Parks Commission bench mark.

The archaeology was occasioned by the intention of setting up a display cannon within the Redan Battery. If the site is to be reconstructed, the masonry revetment will have to be consolidated and the earthworks restored to their original height. If reconstruction is not undertaken, I would recommend that the masonry revetment be left undisturbed, the cannon set at present ground level and the earthworks raised to a reasonable height by the addition of extra fill. This would allow a future reconstruction of the site if priorities should change. Whatever course is followed, the Parks Canada monument and the N.P.C. bench mark will have to be moved and care must be exercised not to disturb the crescent-shaped earthworks to the rear of the gun position. Present day tree cover on the site obscures a ready appreciation of the strategic significance of the Redan Battery and the removal of trees from the earthworks should be considered essential to whatever reconstruction or display is finally erected there.

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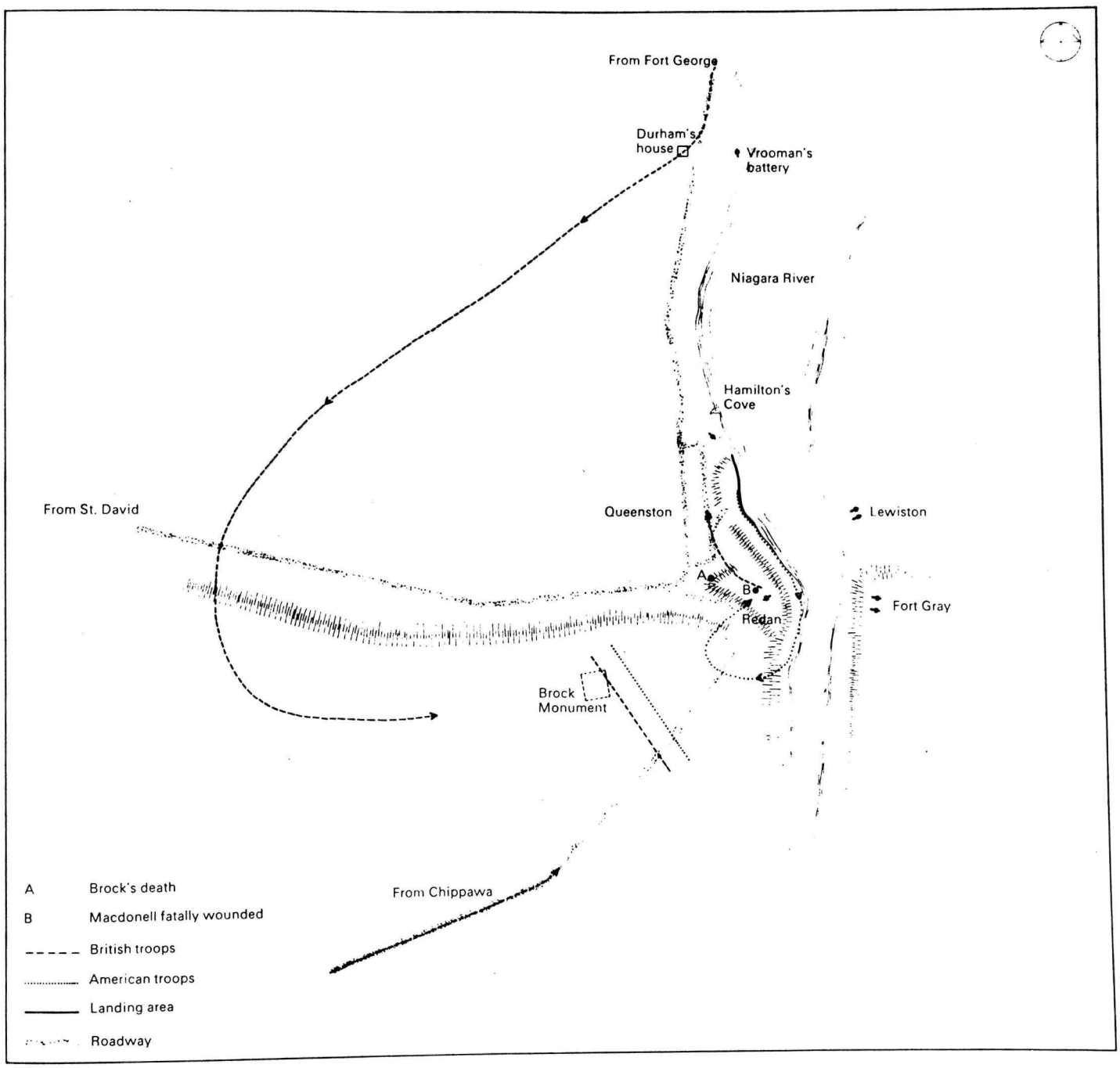
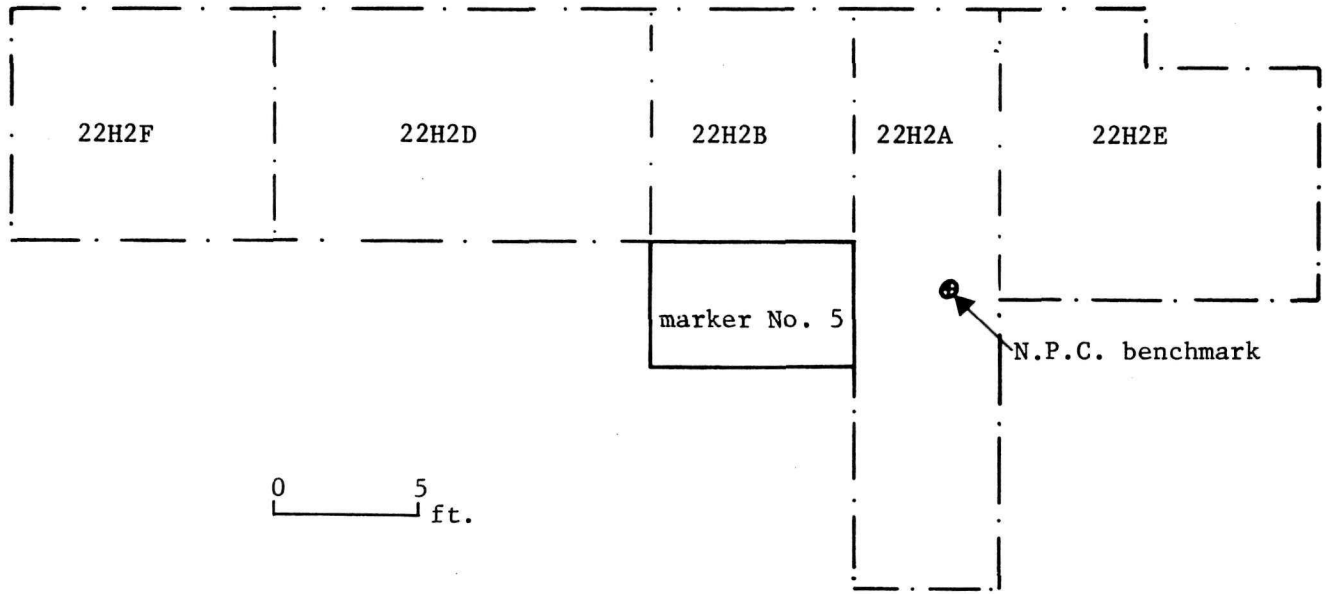
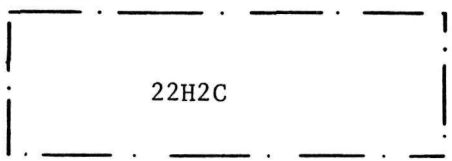
1 Redan Battery: its location on Queenston Heights and its tactical position in the battle of Queenston Heights (Whitfield 1974: Fig. 1).

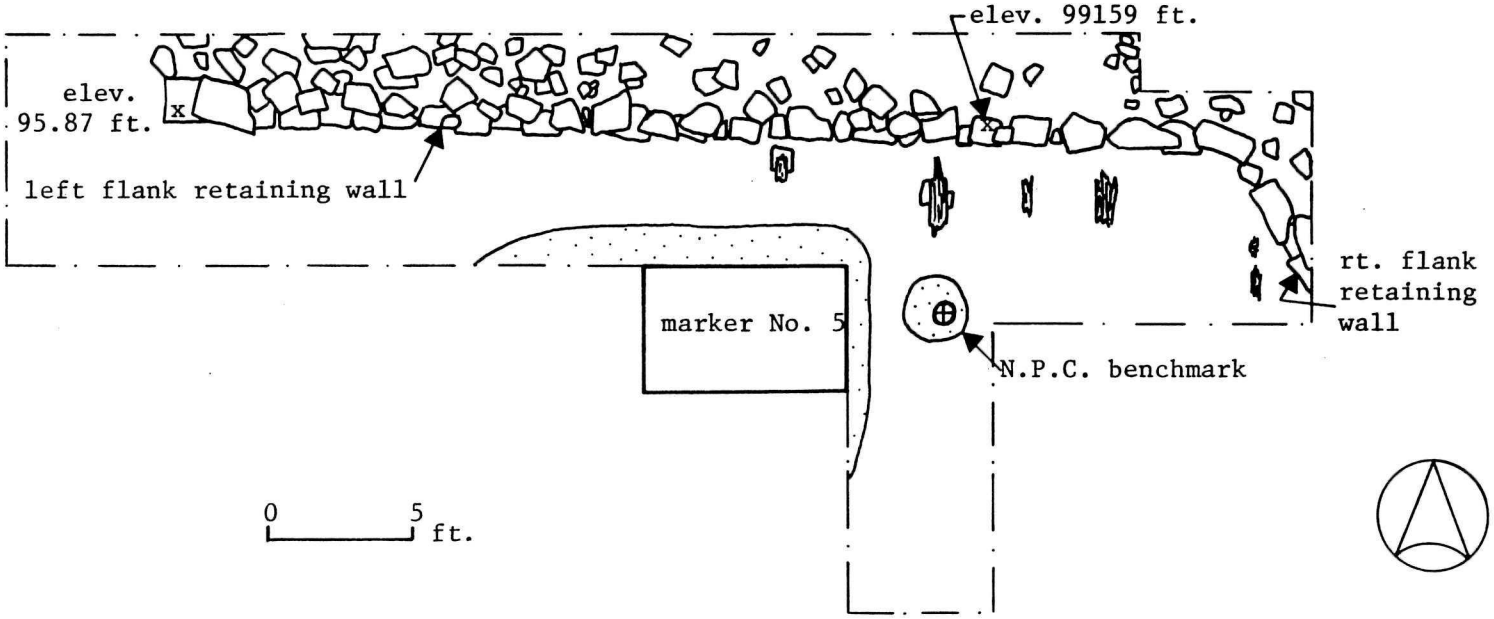

From Fort George
Durham's house
Vrooman's battery
Niagara River
Hamilton's Cove
From St. David
Queenston
Lewiston
A
B
Redan
Fort Gray
Brock Monument
From Chippawa
A Brock's death
B Macdonell fatally wounded
British troops
American troops
Landing area
Roadway

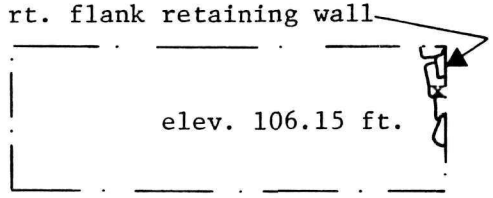
2 Redan Battery: locations of suboperations within excavation.


22H2F
22H2D
22H2B
22H2A
22H2E
marker No. 5
N.P.C. benchmark
0
5
ft.

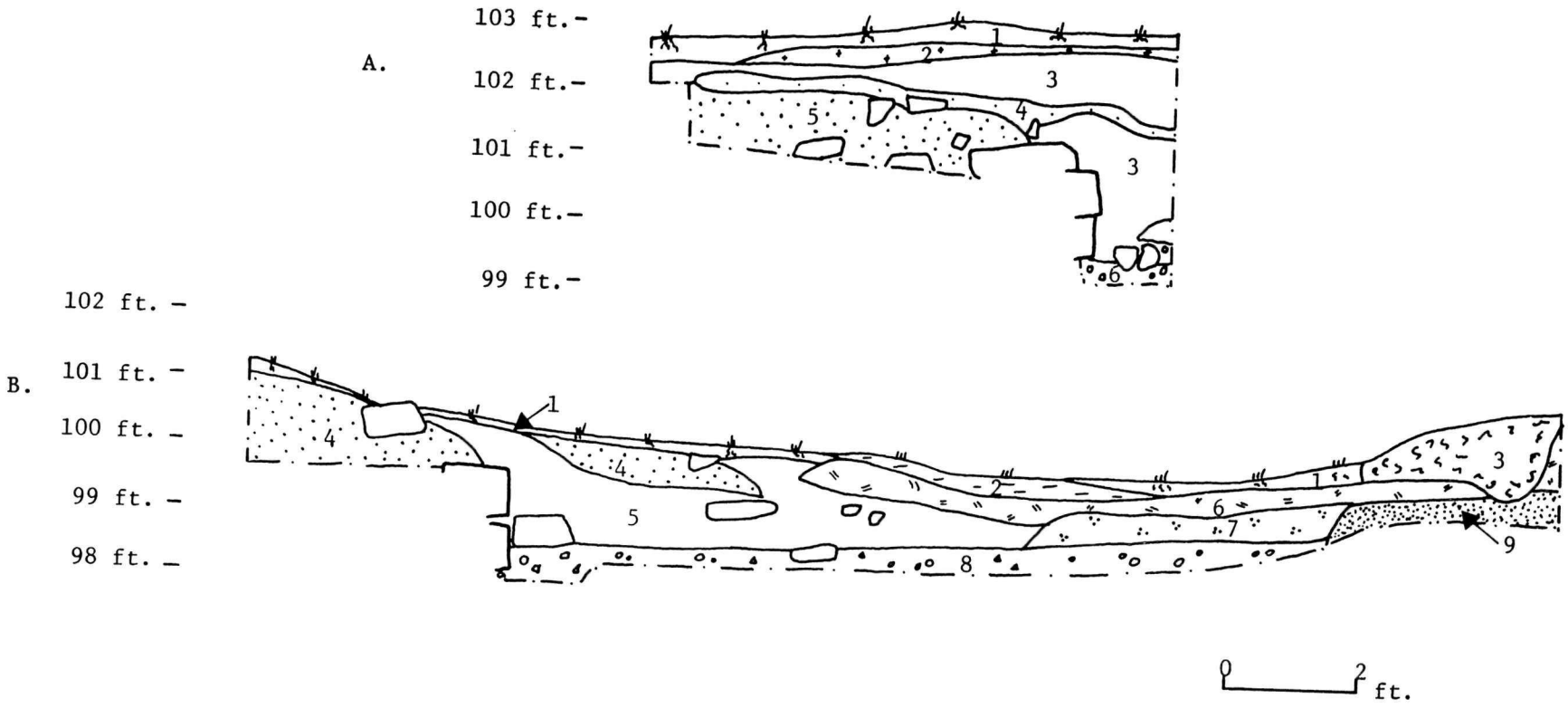

22H2C

3 Redan Battery: excavated features.

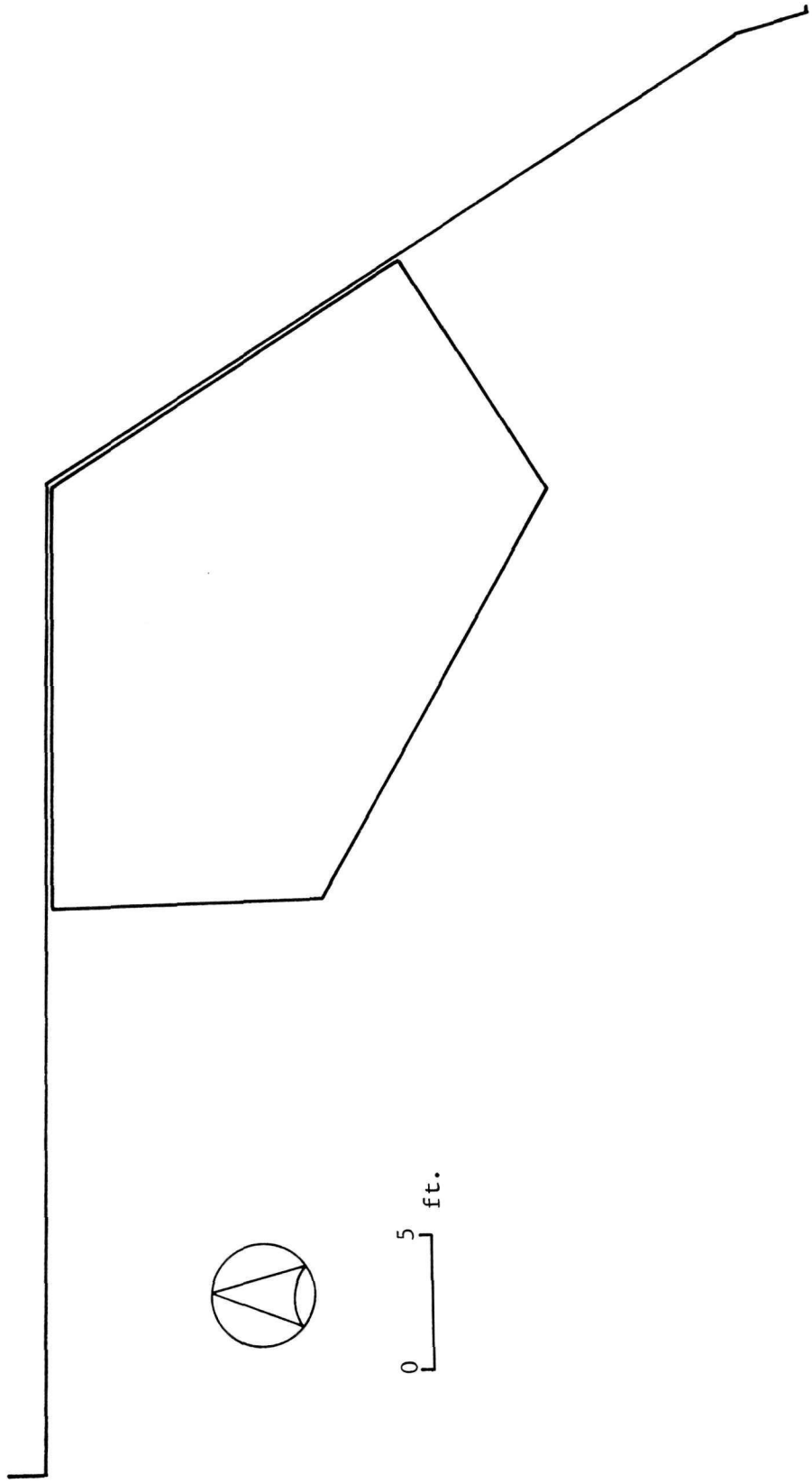

elev. 99159 ft.
elev.
95.87 ft.
left flank retaining wall
rt. flank
retaining
wall
marker No. 5
N.P.C. benchmark
0
5
ft.


rt. flank retaining wall
elev. 106.15 ft.

4 Redan Battery section drawings: A. East wall 22H2H: 1, black humus; 2, grey pebbles; 3, brown clay loam; 4, very pale yellow silty clay, eroded earthwork fill; 5, yellow silty clay earthwork fill; 6, clay and stone base for platform. B. East wall 22H2A2; 1, black humus; 2, light-brown water-laid sand; 3, tree roots; 4, yellow silty clay earthwork fill; 5, brown clay loam; 6, gravel in grey sandy loam; 7, brown clay loam containing gravel; 8, clay and stone base for platform; 9, bright yellow culturally sterile subsoil.


A.
103 ft.
102 ft.
101 ft.
100 ft.
99 ft.
1
2
3
4
5
6
B.
102 ft.
101 ft.
100 ft.
99 ft.
98 ft.
1
2
3
4
5
6
7
8
9
0
2
ft.

5 Redan Battery: hypothetical reconstruction of the area covered by wooden gun platform constructed within the earthworks.


0
5
ft.

6 Redan Battery before excavation. Foreground, western half of crescent shaped earthworks behind the Redan Battery; middle, Parks Canada interpretive marker located within the Redan Battery. The earthwork of the left flank of the redan is visible behind the Parks Canada monument. (Photo by E. Snow; 22H-8 X.)

7 Looking north at fill of earthworks in 22H2A at remains of post in unexcavated post hole in background and excavated remains of post hole and post mold in foreground. (Photo by E. Snow; 22H-16 X.)

8 Detail of the stone work in the revetment on the interior of the left flank of the redan. (Photo by E. Snow; 22H-66 X.)

9 Remains of sleeper supported on stone slab in 22H2B. Note height of sleeper relative to base of masonry revetment. (Photo by E. Snow; 22H-29 X.)

10 Remains of sleeper supported on stone slabs in 22H2A. Note position of sleeper relative to top of masonry revetment. (Photo by E. Snow; 22H-28 X.)

11 Large blocks of stone set in shallow depression in clay and gravel platform base (22H2A4). N.P.C. bench mark and revetment visible behind feature; Parks Canada monument to left. (Photo by E. Snow; 22H-38 X.)

12 Post-excavation view of masonry revetment and earthwork fill of left flank of Redan Battery. (Photo by E. Snow; 22H-94 X.)

Salvage Archaeology at
Halifax Citadel, Nova Scotia
September to November, 1976
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Illustrations

Abstract

A nine-week excavation programme was undertaken at the Halifax Citadel during the fall of 1976 to provide structural information for the West Curtain Wall restoration programme. In the courtyard area behind the cavalier building, trenches were excavated with the aim of establishing historic courtyard levels. The degree of recent disturbance, however, prevented this. A structure known only on mid-nineteenth century plans was unearthed. This was a stairway leading to the privy in casemate 54. The upper 3.0 ft. had been destroyed by recent construction. The privies in Casemates 54 and 55 were to be excavated to investigate the nature of the drainage improvements shown on the 1856 plans. Casemate 54 was found to be completely filled in with rubble masonry and brickwork so this structure was not excavated. In casemate 55, ironstone flagstones had been laid in the soil pit to form a trough for drainage into sallyport 4. The remains of the 1891 latrine were also uncovered. Very little remained of the drains in the sallyport as they appear to have been previously excavated and filled in. On the ramparts above casemates 11 to 14, trenches were excavated to explore the waterproofing techniques in use on the west curtain wall. Rubble masonry, ironstone flagging, lead-lined troughs and finally asphalt were all used to prevent leaking in this wet maritime climate. An attempt to find any traces of an 1830 chimney over casemates 12 and 13 was prevented due to problems caused by water seepage once the flagstones were removed.

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Introduction

In the fall of 1976, a nine-week project was initiated at the Halifax Citadel to supplement and verify the historical information on the area of the west curtain wall restoration programme. Despite the expected recent disturbances, it was hoped that the results of this project would provide structural information to verify, or illustrate more clearly, some of the alterations and improvements mentioned in the historical records. Work was concentrated in four areas: in the courtyard between the cavalier building and the west curtain wall; in the privies in casemates 54 and 55; in sallyport 4 between these casemates; and on the ramparts above casemates 11 to 14 (Fig. 1). A structural history of the features excavated, the aims and results of the excavations, and problems encountered will be presented in the following chapters of this report.

Historical Background

Halifax was founded in 1749 to serve as an administrative centre for Nova Scotia and, more importantly, to provide a base for the British army and navy for their attacks on Louisbourg and Quebec. The first Citadel overlooking the Halifax harbour was begun the same year. By 1750 the city was protected on all sides by a line of palisades and forts extending from Citadel Hill to the harbour. The wet Nova Scotian climate soon destroyed these wooden structures, necessitating their replacement during the American Revolution and the French Wars of 1793-1802. The fourth citadel, Fort George, begun in 1828, was designed to replace these timber structures by a permanent masonry one. As with any establishment of this nature, it was (and still is) continually being repaired and renovated and new structures were added as the needs arose. However, the main outerworks of this final fort were finished during the 1840s. Almost as soon as the fort was completed, it was termed obsolete. It continued to serve as a military establishment, however, until the end of World War II. It became a National Historic Park in 1956 (Anonymous 1974).

Current restoration of the Citadel is being concentrated on the West Curtain Wall area (Fig. 1). Colonel Gustavus Nicolls, the Engineer responsible for the design of the Citadel, considered the west front the most important in the fort, as Windmill Hill, a mere 666 yards distance, and 43 feet lower than the new fort, was a likely spot for an enemy to mount siege batteries. Work on the curtain walls was begun in the spring of 1829 and completed

in the autumn of 1831.

The wall and associated casemates were built of roughly squared ramdom ironstone quarried from the Northwest Arm. The construction was done by both the Royal Corps of Engineers and by civilian contractors. Casemates of defence 11 and 12 and the west half of sallyport 4 were also completed by 1831. The privies in casemates 54 and 55 were built by 1840 and 1842 respectively. Sallyport 4 was completed by 1842 although its original floor had to be altered to provide drains from the privies. Casemates 13 and 14 were constructed in 1847. Renovations to the privies were made in 1856 and 1891 and these in turn affected the sallyport floor. Temporary renovations on the wall were undertaken in the 1950s as it was in danger of collapse. Since that time, the wall and demi-casemates have been restored (Greenough 1974; Young 1976: pers. comm.).

Previous Excavations

Previous archaeological work at the Halifax Citadel has encountered the major problem of destruction of features by recent renovation and reconstruction. Even while this project was under way, uncontrolled excavation by backhoe was going on in the moat area. In 1965 an emergency salvage excavation took place to record what was left of the drainage system in the redan uncovered by the restoration crew (Lane 1965). Later that year, archaeological work was done in the moat to gather information about its "role...in the structure, defence and habitation of the 19th Century fortress" (Coleman 1965), and also to serve as a test excavation to determine the degree of disturbance to be found at the citadel. On the glacis, a tunnel opposite the salient angle of the west ravelin was uncovered by Wilson in a 1967 salvage project. Excavations have also been undertaken on the gun emplacements on the roof of the cavalier building but no information on this project is available.

1976 Excavations

As mentioned in the introduction, excavations were concentrated in four areas of the west curtain wall. The first took place in the courtyard and involved the establishment of courtyard levels and a search for a possible structure outside casemate 54. Excavation of the privies in casemates 54 and 55 followed by investigations in sallyport 4 was to provide information on the 1856 renovations and illustrate more thoroughly the drainage system in use at that time. Finally, excavation on the ramparts was to uncover the methods of waterproofing in use and also any remains of an 1830 chimney.

The system of numbering casemates used in this report is that currently in use by the Halifax Defence Complex extant recording team and not that of the earlier historic plans. All measurements were taken using the Imperial system to conform with the master grid at present in use at the Citadel.

Courtyard

Excavation in the courtyard area of the west curtain wall was designed to investigate the footing and foundations of the demi-casemates and the cavalier building and to establish original grade levels in the courtyard. Several trenches were planned so that a comparison of soil profiles and artifact content might be made. An initial 3.0 ft. wide trench between the cavalier building on the east and demi-casemate 34 on the west, a distance of 30.7 feet

(Figs. 2, 3), revealed only the degree of recent disturbance that exists in this area of the Citadel. The soil was so hard packed that the first 1.2 ft. had to be loosened with a jackhammer. Beneath this first layer to a depth of 4.2 ft. excavation was by pick and shovel. The soil was uniformly disturbed, composed of a mixture of clay, sand and road gravel. Even at 4 ft. below surface, slabs of modern asphalt and wood were found. The footing of all the demi-casemates was found to have been recently replaced during the restoration programme now in effect. A plastic-covered power line was found 5.0 ft. from the footing at a depth of 2.25 ft. At the east end of the trench, near the footing of the cavalier building, two recently constructed features were uncovered. A concrete electrical conduit running north-south was located 4.17 ft. west of the foundation, at a depth of 2.25 ft. below surface. Consultation with restoration crew members revealed that a large trench had been excavated for this conduit and that it had been enlarged several times during construction due to problems with cave-ins. Only 1.0 ft. from the footing of the cavalier building, at a depth of 4.1 ft., a wooden frame was found. This was to have been used as a frame for the setting of a pre-formed concrete pillar in a project that was never completed. Frames were apparently placed in several locations along the back of the cavalier building. The few inches remaining directly adjacent to the cavalier footing was comprised of a homogeneous layer of sticky blue-grey clay. It contained no artifacts. The cavalier footing extends 0.5 ft. out from the wall of the building and consists of large blocks of rough-cut ironstone in varying sizes. The top of the foundation is covered by a 1.5 in. thick concrete capping. The footing continues to the bottom of the excavated layer, a depth of 4.17 ft. below the surface, and appears to continue below that. However, the disturbance caused by

construction of the wooden frame made further excavation pointless.

In an attempt to find a less disturbed area of the courtyard near the west curtain wall, another 3.0 ft.-wide test trench was placed in front of casemate 7 (Fig. 2). This casemate, built in 1847, was used until 1908 as a Royal Artillery Storage area for side-arms (Young, pers. com.). After 1908 it is simply referred to as a storeroom. The test trench extended through the drainage system in front of this casemate which was probably built ca. 1891, although a system for collecting water from the ramparts and directing it to the underground storage tanks was in use from 1858 (Young, pers. com.).

As this area had not been used as a driveway, excavation with shovel and trowel was possible. The trench was extended 15 ft. east from casemate 7, cutting through a granite drain and a cast iron pipe of 0.5 ft. in outer diameter, the base of a drain once connected to the ramparts. The debris found within the granite drain appeared to be modern refuse. It consisted of coal, stove fragments, burned debris and ash and a great deal of window glass. It appears to have served as a garbage dump once its use as a drain had ended. It was excavated to the water table, a depth of 2.5 ft.; excavation was not continued because the purpose of this test trench was to determine courtyard levels. If future historical research can determine the date of these granite drains, further excavation for artifact content may be fruitful.

In the remainder of the trench, lots were excavated in 0.2 ft. layers. This seemed a satisfactory control given the inexperienced crew. Three datable artifacts were found 0.6 to 0.8 ft. below the surface. These included an 1890 Canadian nickel, perforated as though used as a charm; a Royal Artillery button dating to the late 19th century; and a Royal Sappers and Miners button dating to the mid-19th

century. Other artifacts including ceramic, glass and pipe fragments, all date to the late 19th century. Below the 1.0 ft. level the water table was encountered; once the clay became saturated it was very difficult to extract artifacts from it. As soon as a hole was dug in the ground it filled with water and the trenches did not drain during the entire nine weeks of the project.

As had been discovered in previous archaeological excavations at the Citadel, a great deal of the fortress has been too badly disturbed to make extensive archaeological work worthwhile. The courtyard excavations would appear to be another case in point. It seems to be impossible to accurately date courtyard levels using stratification and artifact analysis. Without comparable test trenches, however, it is not possible to state that the courtyard level of the citadel was 0.6 ft. to 0.8 ft. below the present level during the late 19th century, though the artifacts of this period found at this depth may hint at this.

The foundations of the demi-casemates had been recently reconstructed so that information on past construction techniques is no longer available there. The foundation of the cavalier building is composed of rough-cut ironstone, extends 0.5 ft. beyond the walls, and continues to at least a depth of 4.2 ft. below surface. A concrete cap covers the 0.5 ft.-wide foundation (Fig. 4).

Privy Stairs

Both the 1849 Citadel plan (Fig. 5) and the 1856 privy renovation plan (Fig. 6) indicate a feature in front of the privy in casemate 54. No later plans show any structure here. The 1849 plan gives no indication as to its nature while the 1856 plan suggests that it may have been a stairway providing entry into casemate 54.

A certain amount of disturbance was expected because, until recently, this site had been the location of a wooden storage shed and part of its footing, a 0.5 ft. thick beam, still lay in place beside casemate 54. Several trenches were opened over the area where the feature was expected to lie. First a number of modern intrusions were found. A 2.0 ft. below surface an electrical line running parallel to casemate 54 was encountered; it was set on a bed of sand and protected by creosote-covered planks. Above this feature the soil was uniformly disturbed and contained few artifacts. At 2.5 ft. below surface, a 0.58 ft.-diameter cast iron pipe, also running parallel to casemate 54, was encountered. This was found to be resting on top of granite and ironstone blocks set in mortar. At the south end of the excavation the cast iron pipe had been broken off to permit laying of a 0.5 ft. diameter red clay pipe running northeast from casemate 54. At 0.58 ft. east and running parallel to the casemate, a 2.5 in.-cast iron pipe was discovered beneath the clay drain.

Thus the site was badly disturbed by successive installations of pipes and wires. Once the soil was removed these pipes drained water into the excavation so that a pump had to be used continually as work progressed deeper.

The granite and ironstone under the pipes was found to be the remains of a stairway originally containing eight steps (Figs. 2, 7). It led to a below-ground doorway into casemate 54 (Fig. 8). The doorway was filled in with cut ironstone leaving an opening of only 1.5 ft. deep. Measuring 5.0 ft. high by 3.0 ft. wide, the doorway was part of the original wall construction, the lintel stone and the steps were set into the stonework of the casemate wall. The stairwell itself originally measured 14.0 ft. long (north-south) and 5.6 ft. wide (east-west). The east wall was approximately 2.2 ft. thick and the south wall 2.0 ft. thick. A 1.0 in.-deep tooled section was cut out from the

ironstone lintel and extends eastward to the first step. It may have been designed so that a wooden cover could be placed over the entire stairwell. An 1847 plan of the Citadel may in fact show the stairwell with the hatch doors covering it.

On the northeast side of the stairwell another feature was discovered; it consisted of the remains of a french drain constructed of random-sized ironstone slabs. Beneath the dry-laid capstones which covered its trough, it was approximately 0.55 ft. deep and 0.3 ft. wide. Approximately 9 ft. of the drain remained after having been broken at the south end by the red clay pipe and at the north end by recent renovations to the door sill of sallyport 4 (Figs. 2, 7).

Although it may have been possible to determine if the stairwell had been filled in with garbage and rocks over a period of time or if it had been deliberately filled in when the doorway at the bottom was blocked, the continual flooding of the excavation obscured traces of any stratification. The stairwell did contain a large number of artifacts, mainly stoneware bottles smashed in situ. Near the bottom there was also a distinct layer of large beach rocks mixed in with the artifacts. Preliminary examination of the stoneware shows material from two different periods within the latter half of the 19th century (Gusset, pers. com.). As stoneware bottles were reusable, this could account for the presence of earlier and later material in the same context.

Despite the fact that the upper 3.0 ft. of the structure had been destroyed, enough remained of the stairway to determine its size and construction. This stairway would have been used, prior to the 1856 construction of drains, as access to the privies for emptying and cleaning them (Young, pers. com.). The doorway at the foot of the stairs may have been filled in as part of

either the 1856 or the 1891 renovations. Both the late date of the artifacts found and the fact that the privy pits were only filled in when changed to latrines in 1891 suggest that the stairway was still in use until this date. It would certainly have facilitated cleaning of the soil pits even after drains were installed. In such a confined area as the Citadel, keeping the privies clean would have been a problem.

Casemates 54, 55 and Sallyport 4

Privies in Casemates 54 and 55

As would be expected, there is not a great deal of historical documentation on the privies in casemates 54 and 55. Casemate 54 was constructed in 1839-40 and casemate 55 during 1841-42 and were projects contained in the 1836 revised estimates for building the retaining wall and privies (Young, pers. com.). No further documentation exists until the 1856 plan and estimate for improvements to the privies (Fig. 6). The "Non Com$^{d.}$ Off^{rs}, [54] Privates and Womens Privies[55]," had the "shape of the bottoms of the Pits under the floors" improved and a "reconstructing [of] the floor and seats in the Mens Privy" was ordered (Greenough 1974, 2: 316-18). Originally flat, the pit bottoms were altered by adding hipped stones to improve drainage (Fig. 6).

An 1891 plan shows casemates 54 and 55 labelled as latrines with a 2-in. pipe (Young, pers. com.). Thus the filling in of the soil pits may have been undertaken around this period as part of the change in function from privy to latrine. Also around 1891, concrete flooring was added (Young, pers. com.).

There is no known information or ground plans for these

privies. The 1847 plan may indicate seats and stalls. Presumably casemate 55 was once partitioned as it is listed in the 1856 renovations as "Privates and Womens Privies" (Greenough 1974, 2: 316). In the 1950s casemate 54 was sealed up, possibly in connection with the rebuilding and stabilization of the west curtain wall and demi-casemates (Young, pers. com.).

Excavation of the privies was, therefore, needed to supplement the documentary information. Exploration of the drainage system would be continued into the sallyport once its point of origin had been uncovered. Besides providing structural details, it was hoped a comparison of the artifacts from the officer's privy in casemate 54 with those from the one for women and enlisted men in casemate 55 would indicate differences in economic and social status of the two groups.

It was impossible, however, to enter casemate 54. After several days of drilling with the jackhammer, it was evident that the doorways had not simply been filled in but rather the entire room was filled. Solid rubble masonry filled the east half of the casemate and laid brickwork filled the west. The time involved in removing this was beyond the limits of the project.

In casemate 55 the removal of the concrete flooring, rubble masonry and 5.1 ft. of mud fill was done by jackhammer, pick and shovel. As the 1856 plans gave some indication of what the pit bottom should look like, two bisecting trenches were excavated across the casemate. This was to allow investigation of the slope of the pit lining on all four walls, while at the same time necessitating only partial removal of the fill. The confined space of the casemate and sallyport plus the depth of excavation made removal of fill a serious problem. Although the trenches were originally three feet wide, they had to be widened to

over five feet due to the danger of cave-ins caused by the presence of continually-running water below the 3-ft. level.

Table 1. Summary of Layers Found in Privy Fill in Casemate 55.

Layer Number	Material	Description
1	Concrete	There appeared to be two layers. Together they were approximately 3 in. thick although in the northeast corner they were only 1 in. thick.
2	Rubble Masonry	This layer was approximately 7 in. thick and was composed of large rocks and gravel cemented together.
3	Large rocks and Gravel	This layer was composed of large beach rocks, fragments of ironstone building stone and sandy, grey/brown soil. It was approximately 2 ft. deep and contained no artifacts.
4	Rocks and Clay	This layer of sticky, blue/grey clay and small rocks was saturated with water. It contained artifacts such as clay pipe, bottle and ceramic fragments plus coal and ash. With the exception of the south end, this layer continued to the bottom of the pit.

Following removal of the fill, several features were

uncovered. Two rows of joist holes are set along the west wall of the privy (Fig. 10). The upper row of five holes is set in the concrete footing and is approximately 0.3 ft. square. The lower row of six holes is cut into the stone wall about 0.4 ft. below the first. The base of these lower joist holes is only 0.1 in. below that of a ledge formed as part of the wall construction on the east side of the room (Fig. 11). Thus timbers running across the room from the joist holes to the ledge could have supported a level floor. The holes are large enough to accommodate timbers 4.0 in. by 6.0 in.

A second feature was a tooled sandstone trough (Figs. 12, 13). Located on the west side of the door opening into sallyport 4, it measures 2.21 ft. east-west and 2.29 ft. north-south. It is set in place on 0.5 ft. of cement or mortar which itself is on top of a brick column at the south end of casemate 55. The brick column is nine courses high, and measures 2.0 ft. east-west and 2.2 ft. north-south. The centre of the brick column is hollow and a clay tile at the base empties into the sallyport (Figs. 10, 13). Artifacts found within the column included an ivory tooth-brush handle, clay pipe fragments and a stoneware ink well, all dating to the late 19th century. The brickwork rests on a pile of rubble masonry 3.0 ft. high which filled the south end of the privy pit.

At the bottom of the privy, the soil pit is lined on three sides with ironstone flagging 1.0 in. thick, square cut, flat-surfaced and in a variety of sizes (see chart on Fig. 10). The flagstones rest on an earth base and are butted together to form a V-shaped trough 3.7 ft. deep. The pit lining at the north end slopes inward to meet the east and west walls. The trough slopes towards the south doorway with a drop of 0.29 ft. from the north end to the front of the rubble masonry filling the south end. The placement of the flagstones at the V of the trough was not visible as the

water maintained a depth of at least 1 ft. despite constant pumping. The V of the trough is not located in the centre of the room but rather lines up with the centre of the doorway to sallyport 4. Some flagstones are missing along the southeast wall. From those that are still in situ it appears that there never was any lining along the south wall. It is possible that the missing flagstones were smashed by huge building stones found in this area as part of the fill. Covered with the same kind of whitewash or lime deposit that is found on the casemate walls of the room they were probably shoved into the pit during a renovation to the west wall when additional windows or doors were cut out.

The brick column at the south end is probably part of the 1891 latrine system. The south end of the pit was partly filled in with rubble masonry and the column was placed on top of this base (Fig. 16). Above the column was placed the sandstone drain trough (described in detail in Figure 13) which was held in place by two inches of cement. A clay tile at the base of the column drains into the sallyport.

The lack of stratification of the soil filling the privy suggests that it was thoroughly cleaned out before being filled in. Although the layers were difficult to see since the lowest levels were constantly under water, there was no obvious change in the soil. Artifacts from the fill all date to the late 19th centuy and were sparsely scattered throughout. A section of wood found in the fill at the foot of the brick column appears to be part of a stall, possibly from the privy. It is described in detail in Figure 17. Fragmentary tenons, 2.54 ft. apart, fit exactly into the last two joist holes at the south end of the upper row described earlier.

Sallyport

Excavations in the sallyport were laid out using the 1856 historical plan as a guide. The first test trench, 5.0 ft. long, was placed across the 6.0 ft. wide sallyport to intersect both the remains of a stone foundation 11.0 ft. from the east door of sallyport 4 and the collection cistern, part of the Y-shaped drain shown on the 1856 plan (Fig. 6). In addition to revealing the drains, it was hoped that historical floor levels in the sallyport might be determined.

A live powerline was uncovered during excavation, indicating that the south 0.7 ft. of the trench was disturbed to a depth of at least 3 ft. On the north side, below the door of the ante-room of casemate 56 the remains of a step or wooden platform were found. This was constructed of planks and two-by-fours and contained wire nails. Below this, from 0.5 ft. to 5.8 ft. below surface, nothing was found except hard sticky clay, scattered brick and drain tile fragments, and three sherds of cream-glazed red earthenware. Excavation ceased at 5.8 ft. below surface, well below the depth of the privy pits. At some time after the 1891 construction of latrines, the sallyport must have been excavated and refilled, leaving no trace of any drains except for a few tile fragments.

When it was learned that recent renovations had been made to the sill at the west end of sallyport 4, plans for excavations in this older section were abandoned and work was limited to the area immediately in front of the doors to casemates 54 and 55. This trench extended 6.0 ft. west from the door sill at the east end of the sallyport. From the 1856 plans (Fig. 6) it was expected that the remains of a Y-shaped drain would be encountered although some damage caused by the 1891 latrine construction was expected. Once again, the powerline had disturbed the south half of the

trench to a depth of 3.0 ft. Removal of a 6.0 ft. deep layer of clay containing brick and drain tile fragments and very few artifacts revealed some remains of the 1856 drain and the extensive alterations undertaken during the latrine construction. Originally an arched entranceway located below the doors of both casemates would have provided access to the privy pits from the stairway in front of casemate 54 (Fig. 16). The doors are 3.0 ft. wide and approximately 5 ft. high. They were still in use after the 1856 alterations as two pieces of ironstone flagging (one in situ) were found near the base of the casemate 55 doorway (Figs. 10, 11). The stone walls that had formed the Y-shaped drain were so smashed away that only areas of broken rock along the sallyport walls remained. In 1891 when the latrines were installed, the doorways were filled in with rough-cut ironstone. The doorways of casemates 54 and 55 have been blocked in different manners. The ironstone blocks in the latter are set into the opening, leaving a 1.5 ft. recess on the sallyport side. A clay drain-pipe with a diameter of 0.41 ft. is set into the stonework. In the former, the stone and brickwork extends 1.7 ft. north into the sallyport and 5.5 ft. west where the edge of the excavation is found. The top of this masonry feature has been destroyed by the powerline. A clay drain-pipe 0.3 ft. in diameter is set into this feature leading from the casemate 54 privy. This pipe must have permitted water to flow freely into the sallyport. The presence of fragments of broken clay tiles provides the only evidence that a drainage system connected to the pipes from casemates 54 and 55 once continued in the sallyport.

At the east doorway of sallyport 4, the original stone footing below the west side of the sill contains bricks and stone blocks mortared in place which may be the remains of steps or part of a base for a floor covering the sallyport drain system.

Summary

As expected from the historical documentation, the soil pit of the privy was altered by the formation of a trough built of ironstone slabs on a clay base which sloped to a drain in the sallyport. Around 1891, the below-floor doorway into sallyport 4 was sealed up with ironstone blocks and the south end of the pit was filled in with approximately 3.0 ft. of rubble masonry. Large granite blocks cut from the east wall in the formation of a window or door were pushed into the pit as part of the fill. A red brick column nine courses high was set on top of the rubble masonry. The rest of the pit was filled in with rock and soil possibly at the same time. Once filled in, the pit was covered with a concrete floor which probably sloped towards the sandstone trough which drained the latrine. The sandstone drain probably contained a grate covering as the tooling on the upper surface suggests. A clay drain-pipe led from the base of the brick column into the sallyport. Once the latrine was no longer in use, a second layer of concrete was poured, covering the floor of the entire room and filling in the sandstone trough.

The remaining pieces of ironstone trough leading from the privy to the sallyport indicate that the 1856 renovations included alterations to the sallyport. This trough and any earlier drains were destroyed during the construction of the latrines in the 1890s. Since that date the clay tiles which led from the latrines have been destroyed during some alteration to the sallyport floor. It is, therefore, now impossible to determine original grade levels at least in the east end of the sallyport, and this information must be sought in the west end.

Ramparts

The typical Nova Scotian winter with its continual thawing and freezing causes frost-heaving in all structures where

moisture was allowed to gather. Thus waterproofing of structures was a serious problem at the Citadel and over the years numerous attempts, described in detail by Greenough (1974, 2), have been made to find a satisfactory solution.

The latest historical plan showing waterproofing detail is dated 1856 (Fig. 19) but there is no record of all the changes recommended in this report having been implemented. An archaeological excavation on the ramparts at the undisturbed north end of the west curtain wall would both settle this point and provide detailed information on the nature of the deposits that were used for waterproofing.

This information would be used in the 1977 programme to restore the ramparts at the south end of wall over casemates 7 to 10 (Fig. 1). The ramparts there had been destroyed by bulldozer during stabilization of the south flank. As casmates 7 to 10 are contemporary with casemates 11 to 14 at the north end, it was assumed they would have been waterproofed in a similar fashion.

While investigation of waterproofing techniques was the primary aim of archaeological excavation on the ramparts it was also hoped that some traces might be found of a chimney dating to the 1830 period which was located between casemates 12 and 13. The north wall of casemate 12 had originally been an outside wall prior to the 1847 addition of casemates 13 and 14. This outside wall contained an external chimney. Similarly the north wall of casemate 10 also contained an external chimney; now that part of the rampart is destroyed, the remains of the flue of this chimney are exposed (Fig. 20). This detail was used in determining placement of one of the trenches, excavated over casemates 12 and 13.

The first trench was designed to investigate waterproofing material and drainage and was excavated between the present chimneys over casemates 11 and 12, a distance of 12.5 ft. The historical data indicated the

deposit could have a possible thickness of 7.5 ft. (Fig. 19). To minimize the amount of excavation, the trench was only 3.0 ft. wide. Stratigraphic control was difficult as the deposit had to be loosened by jackhammer.

Table 2 summarizes the layers that were delineated by combining wall profiles and on-site observations:

Table 2. Summary of Layers from the Rampart Excavation

Layer Number	Material	Description
1	Asphalt	2 layers each 0.25 in. thick
2	Gravel and Mortar	Layer 0.25 ft. to 0.3 ft. thick
3	Yellow-brown Sand	Thin lens (less than 0.50 in. thick)
4	Dark Brown Clay and Sand	Thin lens (less than 0.50 in. thick)
5	Rubble Masonry	Layer composed of mortar plus granite and ironstone slabs, boulders, roofing tiles, bricks and yellow sand. The depth varies with the slope of the dos d'ane* from 1.0 to 2.7 ft.
6	Mortar and Rock	A thin lens (less than 0.50 in.) of cream-coloured mortar and rock
7	Brown Clay	A thin lens (less than 0.50 in.)

8	Ironstone	Flagstones 0.16 ft. thick. These hip the dos d'anes by flagging and counter-flagging and can be seen in detail in Figures 21 and 22.

* Dos d'ane: a peaked construction shaped like a gable roof, built up over an arch in order to shed water (Greenough 1974, 1: 4).

It appears that huge ironstone flagging was laid over the arches. This was then covered with rubble masonry. Layers 6 and 7 are likely the results of leaching and the breakdown of mortar. Layers 2, 3 and 4 are either the results of the breakdown of the upper surface of the rubble masonry layer or possibly another attempt at waterproofing by the addition of more material. Finally, the entire rampart was covered with two coats of asphalt. Analysis of the asphalt by the Conservation Division, National Historic Parks and Sites Branch confirms that it is the Seyssel Asphalte which was in use at the Citadel in 1847-56 and which is described in detail in Appendix A. The second layer of asphalt may be the result of repairs made in 1854 when the first layer was found to be ineffective (Greenough 1974, 2: 146-7).

Two lead-lined gutters were located in the trough between the casemates and these sloped eastward towards the courtyard. The drains are approximately 0.9 ft. deep, 0.7 ft. wide and were covered with dry-laid ironstone capstones so that any water that did penetrate the masonry would filter into the trough.

In order to determine where the water drained and to expose one edge of the 1846 chimney, the trench was extended at right angles so that it ran parallel to the chimney. The gutter found in the first half of the trench continues along

the spring of the arch and abutted the vertical portion of the chimney. At this junction an extra sheet of lead was laid into the chimney brickwork to prevent the overflow of the drain leaking through the masonry (Fig. 23). No evidence of a central drain pipe such as was described in the 1856 plan was found (Fig. 19). The gutter found during excavation apparently empties out into the courtyard through a gargoyle in the retaining wall directly below. The hipped flagstones are laid in an overlapping manner so as to direct the water both down to the drain and towards the courtyard.

A third trench was excavated on the ramparts over casemates 12 and 13 to compare waterproofing techniques between the older and newer casemates and to search for any traces of the 1830 chimney. Since excavation below the flagstones was planned, this trench was five feet wide to allow removal of the flagstones. The trench was placed directly over the wall between the casemates as the chimney would originally have been located on the outside wall of casemate 12. There were few differences in waterproofing materials used between the 1830 and the 1847 casemates except for the presence of a larger percentage of granite in the rubble masonry above the 1847 casemate and the fact that this area of the ramparts still retains the one to five feet of mud and gravel above the asphalt layers that was used for bombproofing. This fill has been removed from above several of the casemates during restoration programmes. Another lead-lined gutter was found in this trench also leading eastward between the casemates to the courtyard (Figs. 24, 25, 26).

The final aim of this excavation, the investigation of the 1830 chimney, was not completed. The expense of cutting through the flagstones and the leakage to be caused by their destruction made it impossible to continue the search for the chimney below the flagstone layer. At a depth of

approximately 4.0 ft. the only remains would have been situated beneath the existing 1870 chimney so that this also would have had to be destroyed.

The historical documents state that by November 1848 casemates 13 and 14 were flagged and hipped over the dos d'anes while casemates 11 and 12 were only flagged (Greenough 1974, 2: 144). Very little of the flagging of casemate 13 was exposed (Fig. 25) as time did not permit the extension of the excavation to include an east-west trench over these casemates. However, the different waterproofing techniques in use between casemates 12 and 13 could explain why the composition of the rubble masonry deposit differed from that of casemates 11 and 12. Without further excavation in this area of the ramparts it is difficult to make observations about the evolution of waterproofing techniques in use here. It is probable that changes were made to the original waterproofing material used over casemates 11 and 12 as slate was in use at the time of their construction in 1830 (Greenough 1974, 2: 143).

From the preliminary archaeological investigation, attempts to waterproof the casemates apparently consisted of the use of large slabs of ironstone, placed so that they flagged and counterflagged the hip over the dos d'anes. Lead-lined gutters were placed in the troughs between the casemates so that water ran down the flagging, into the gutter, and then eastward to a gargoyle in the retaining wall. The gutters were covered by dry laid capstones so that water could seep through from above. Several feet of rubble masonry was placed over this to discourage build-up of water on the ramparts. Then two layers of asphalt were placed over this. The second layer of asphalt, placed there in 1854, was obviously effective as it is still in place.

Salvage at Flank Wall of Southwest Demi-Bastion

Salvage at Flank Wall of Southwest Demi-Bastion

Several sites along the flank wall of the southwest demi-bastion were uncovered by backhoe operations in connection with the excavation of a drainage ditch for the ongoing wall restoration programme. The sites were seriously damaged before archaeological inspection could take place. These sites appear to contain deposits of garbage that had been tossed over the flank wall into the ditch. Artifacts were found scattered along the flank and were located 0.5 ft. to 1.5 ft. below present surface. They generally dated to the latter half of the 19th century and included stoneware bottles, assorted earthenwares, bottle glass, clay pipe fragments and a copper keyhole plate marked with the broad arrow.

It is fortunate that the restoration crew members recognized the significance of the material that was recovered. However, had archaeological testing been undertaken before the backhoe excavation, it is possible that a sizeable collection of late 19th-century artifacts could have been recovered. Although it is not likely that many features exist in the ditch area, the original drain and sewage system from the privies in casemates 54 and 55 did cross the ditch, so that excavation under archaeological supervision will be required.

Conclusions

While a number of problems arose during excavation as a result of recent disturbance and the high water table, considerable information was recovered on the mid-19th century Halifax Citadel. Test excavations in the courtyard indicate at least localized major disturbances to a depth of three feet; features below this level, such as the stairway in front of casemate 54, should be intact. The privy in casemate 55 was well enough preserved to provide details both on the 1856 drainage renovations and on the 1891 latrine. If casemate 54 is excavated in the future, more efficient means must be used to remove soil and water, thus decreasing the time needed for excavation. While the test excavations done in sallyport 4 indicate a high degree of disturbance, excavations should be undertaken in the older west half of the feature. Further archaeological work on the ramparts should be undertaken by utilizing mechanized equipment. Since destruction of the roof area will cause considerable leakage problems, there is a need to combine archaeological excavation with restoration work.

Prior to initiation of further archaeological work in the courtyard or ditch areas of the Citadel, a detailed plan should be made showing all known drainage systems, electrical installations, construction forms and recent renovations or reconstructions. Consultation of these maps will allow more efficient siting of archaeological tests.

Appendix A.

Part one of this appendix is a report prepared by the Conservation Division of Parks Canada following analysis of the asphalt sample taken from the excavation over casemates 11 and 12. Part two is a quotation from Greenough giving the composition of Claridge's Patent Asphalte (Greenough 1974, 2: 262-265).

Part 1

"Seyssel Asphalte"

Request: Three pieces of asphalt, totalling 0.19 kg in mass, were submitted for analysis to see if they are made of an asphalte type called "Seyssel Asphalte". A brief description of the latter substance was included with the request, and is attached to this report as the Appendix.

Reply: This material is of the same chemical composition as the Seyssel Asphalte described in Appendix. It is 12% bitumen, 82% calcium carbonate (limestone), and 6% grit (acid and benzene insolubles).

There is no evidence of mineral tar having been applied underneath the asphalte. However, if the asphalte was applied hot it may have mixed with any such tar so that the tar is no longer detectable as a separate layer.

Analysis: About 33 grams of sample, with both surfaces included (with a few pieces of wall remains still attached) were placed in a Soxhlet extraction apparatus and extracted with benzene until no colour was detectable in the benzene flowing from the Soxhlet cup. This took about 5 days. The extracted sample was dried at room temperature for one day, then its weight compared with that of the unextracted sample; a 12% weight loss is found. This is assumed to be the bitumen content of the sample.

The remaining substance, light gray powder, was further analyzed. A sample of this gray powder is included with this report. X-ray diffraction shows it to be chiefly calcium carbonate. Dissolution of the powder in 10% hydrochloric acid left a residue which was 7% by weight of the initial powder sample. This residue may be mainly from wall particles attached to one side of the sample. If it is assumed that the acid soluble portion of the sample is entirely calcium carbonate then this test shows that 93% of the gray powder, or 82% of the initial sample, is calcium carbonate. The absence of a large number of grit particles in the gray powder shows that this is fine or fine-gritted Seyssel Asphalte.

A cross section of a piece of asphalte was made by cutting on a diamond saw and polishing with fine-grit sandpaper. This was examined under a low-power (20X) microscope. No evidence of a separate mineral tar layer could be seen.

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Part 2

There are no surviving detailed estimates for the staunching method finally adopted at the Citadel, but there are several indications of the materials employed and the manner in which they were used. The most important material used was "Claridge's Patent Seyssel Asphalte," and the following section describes its composition and application.

There are several accounts of casemate staunching using asphalt, both in the primary and secondary literature, and these should be consulted for comparative purposes. None, unfortunately, is very accessible. The easiest to come by is the account of the staunching operations carried out at the citadel at Plymouth contained in Colonel John Oldfield's on the article of asphalt in the Professional Papers of the Royal Engineers.

> ....Seyssel Asphalte, known also as Claridge's Patent Asphalte, is made from a bituminous rock found at Pyrimont Seyssel, in the Jura Mountains.
>
> It is a limestone saturated with bitumen, and contains about 90 to 92 per cent carbonate of lime and 10 to 8 per cent of bitumen.
>
> This material is ground, mixed with grit and with heated mineral tar until the mass has thoroughly amalgamated and become reduced to a mastic. It is then run into moulds to form blocks.
>
> These blocks are 18 inches square, 6 inches deep, and weigh about 125 lbs. each; countersunk on two sides with the words PYRIMONT and SEYSSEL as the trade mark.
>
> The asphalte is imported in this form by the Pyrimont Seyssel Asphalte Company, from whose circular most of the following information is obtained:-
>
> QUALITIES. - There are three qualities in the market -
>
> 1. Fine, without grit, used for magazine floors and as a cement for very close joints in brickwork.

2. Fine-gritted, for covering roofs and arches, lining tanks, as a cement for brickwork, and for running the joints of stones.

3. Coarse-gritted, containing more and larger grit; used for pavements and floorings where great strength is required, as gun-shed floor, tun-room floors, margins of stall floors, etc. In gateways for heavy carriage traffic small pieces of granite chippings, etc., are introduced.

MIXING. - The blocks of asphalte are broken up into pieces of not more than 1 lb. weight each, and melted in iron caldrons heated by wood or peat.

Coal is objectionable on account of the smoke it creates; coke injures the material and destroys the caldron.

The following directions are from the circular of the company: -

"The fire having been lighted in the caldron, put into the boiler 2 lbs. of mineral tar, to which add 56 lbs. of asphalte, broken into pieces of not more than 1 lb. each. Mix the asphalte and tar together with the stirrer, till the former becomes soft, and then place the lid on the caldron, keeping up a good fire. In a quarter of an hour repeat the stirring, and add 56 lbs. more asphalte, in similar sized pieces, distributed over the surface of that in the caldron. Again cover the caldron for ten minutes, after which keep the contents constantly stirred, adding by degrees asphalte in the proportion of 112 lbs. to 1 lb. of tar, until the caldron is full and the whole is thoroughly melted.[1] When fit for use the asphalte will emit jets of light smoke and freely drop from the stirrer".

The asphalte is removed from the cauldron in ladles, poured over the concrete fundation, or other place where it is to be applied, brought to a smooth surface with

wooden rubbers, and finished, either with a mixture of slate-dust and silver sand in equal parts, or roughened by grit stamped in while the asphalte is soft....

---

[1][Footnote in text] Practice, however, best regulates the quantity of tar to properly flux the asphalte. In exposed situations, particularly on the coast during cold and other unfavourable weather, a strong fire is necessary to be kept up, and at such times the asphalte work is longer in execution. On this account the tar is more quickly consumed, and a small quantity will have to be added. A somewhat larger proportion of tar is also necessary in the application of asphalte to brickwork, and also in running the joints of stones. In warm climates an excess of tar must be avoided. From the first lighting of a caldron about 3 1/2 hours will be occupied before the entire mass with which it is to be filled will become melted. The subsequent operation will occupy about half an hour less time....

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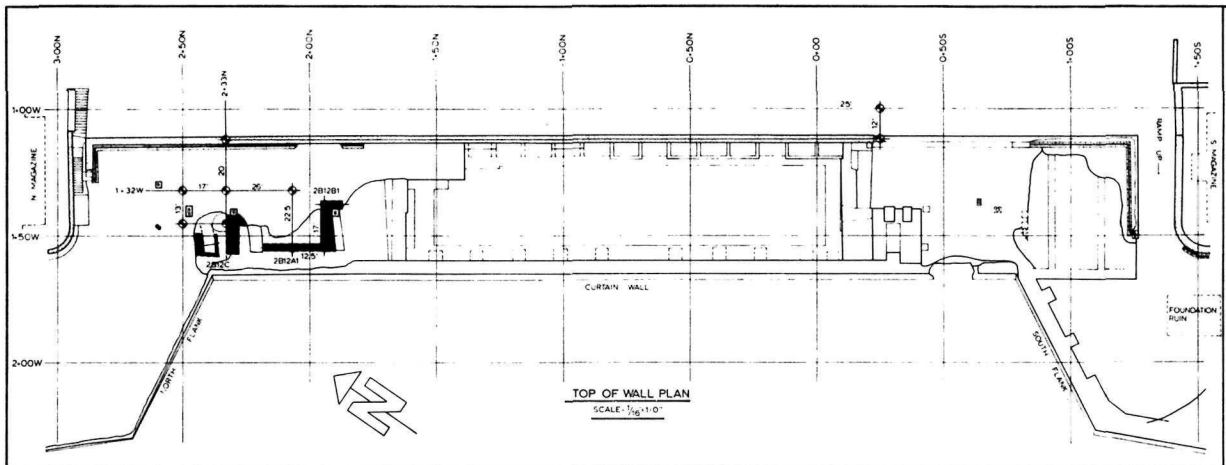
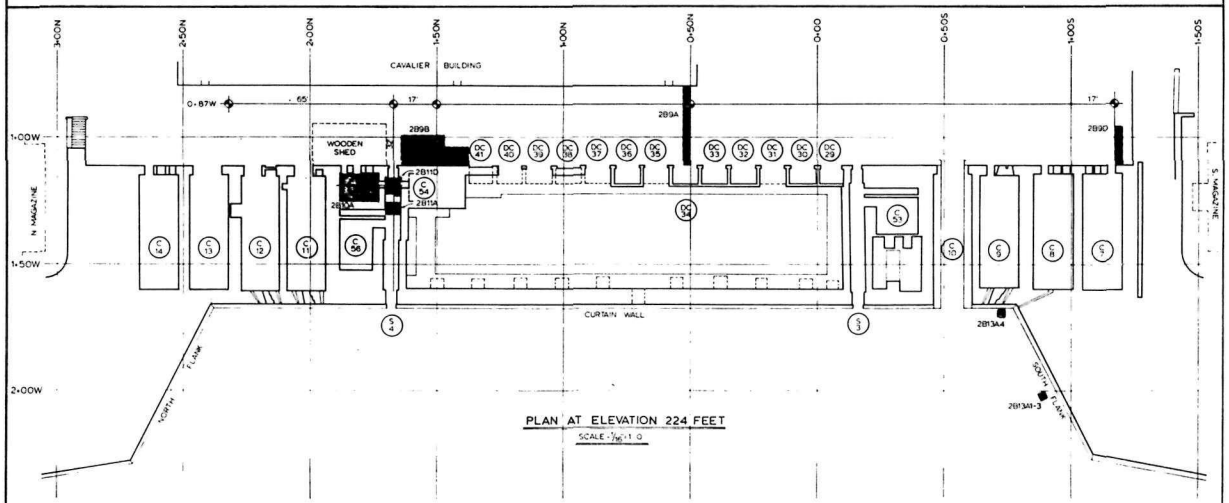
1 General plan of the west curtain wall area of the Halifax Citadel showing casemate numbering system and outlining excavation areas. (Drawing by Brian Gallant.)



TOP OF WALL PLAN

SCALE - 1/16 = 1·0"



PLAN AT ELEVATION 224 FEET

SCALE - 1/16 = 1·0

NOTES

AREAS OUTLINED IN ■ REPRESENT REGIONS AROUND THE WEST CURTAIN WALL WHICH WERE EXCAVATED BETWEEN THE MONTHS OF SEPT. THRU NOV. 1976. SUB OPERATION AND LOT DESIGNATIONS, ARE SHOWN ADJACENT TO THESE POSITIONS.

GENERAL NOTES

SUB OPERATIONS 2899C, 2810B AND 2811C WERE NOT USED.
2813A AND 2811B ARE SURFACE COLLECTIONS.

FOR INFORMATION CONCERNING COMPLETE DIMENSIONS TO FEATURES REPRESENTED THROUGHOUT THIS SET PLEASE OBTAIN FIELD NOTES ON FILE WITH EXTANT RECORDING TEAM, HALIFAX DEFENCE COMPLEX, HALIFAX CITADEL.

ALL DRAWINGS WITH THE EXCEPTION OF DETAILS ON DWGS. 13,14 & 15 ARE ORIENTATED ACCORDING TO CONVENTION ESTABLISHED FOR THIS SET. THE CONVENTION ADOPTED IS THAT EAST IS ALWAYS THE DIRECTION TO THE TOP OF THE DRAWING SHEET AND WEST TO THE BOTTOM.

ALL 3/4" PLANS HAVE A FIELD RECORDED ACCURACY OF 1/8 OF A INCH.

ALL DETAILS HAVE A FIELD RECORDED ACCURACY OF 1/16 OF AN INCH UNLESS OTHERWISE NOTED.

ALL SPOT ELEVATIONS SHOWN THROUGHOUT THE SET ARE REDUCED FROM FRACTIONS TO DECIMAL FORM AND FOR CONVENIENCE ARE RECORDED IN - FEET ABOVE 200.00 GEODETIC - I.e 30.51 IS ACTUALLY 230.51 FT. THEIR ACCURACY IS STATED TO THE NEAREST 1 0.05 OF A FOOT.

DATES GIVEN IN NOTE COLUMNS HAVE BEEN OBTAINED FROM HISTORICAL DOCUMENTS FILED IN THE RESEARCH SECTION, HALIFAX DEFENCE COMPLEX.

2812C1 WAS THE MUD AROUND THE CHIMNEYS AND 2812C2 WAS THE EXCAVATION

SCALE:
10 FEET
DECAMETERS

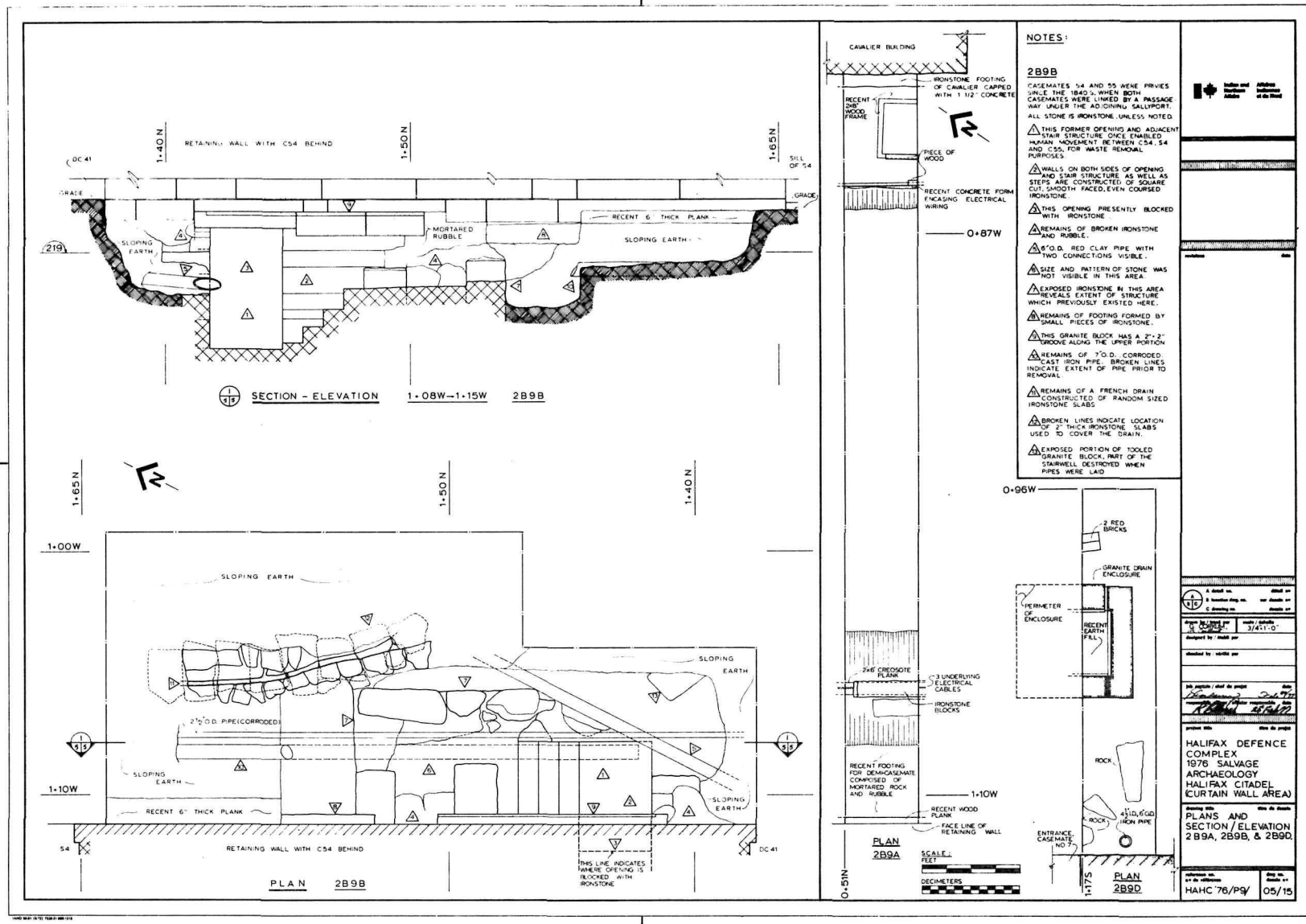
Indian and Northern Affairs / Affaires indiennes et du Nord

HALIFAX DEFENCE COMPLEX
1976 SALVAGE ARCHAEOLOGY
HALIFAX CITADEL
(CURTAIN WALL AREA)

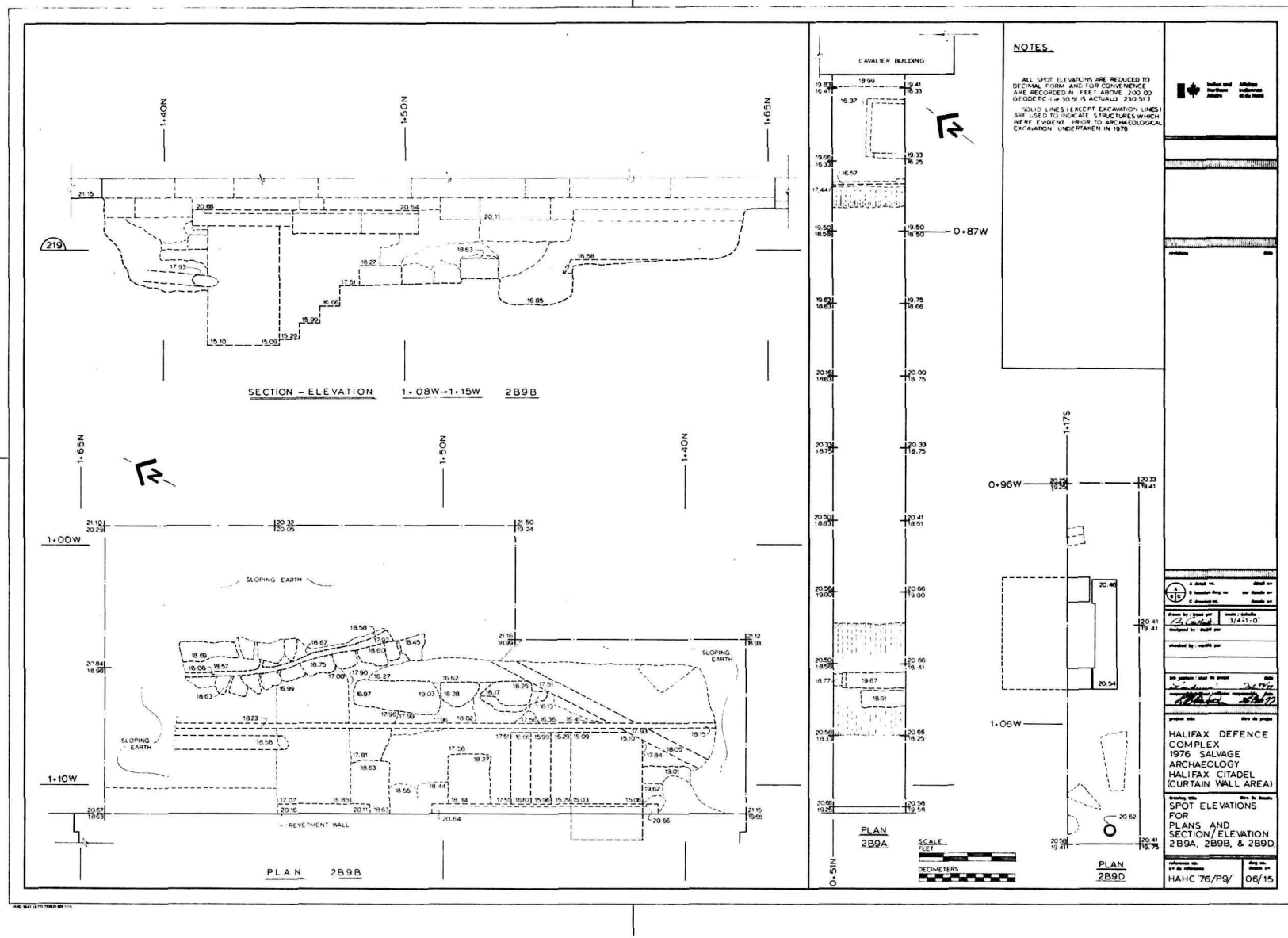
OPERATIONS KEY PLAN

HAHC 76/P9/ 04/15

2 Plans and section/elevation of stairwell in front of Casemate 54 (2B9B) and of courtyard test trenches. (Drawing by Brian Gallant.)


1·40 N
RETAINING WALL WITH C54 BEHIND
1·50 N
1·65 N
DC 41
SILL OF 54
GRADE
GRADE
RECENT 6" THICK PLANK
MORTARED RUBBLE
SLOPING EARTH
SLOPING EARTH
219
SECTION - ELEVATION 1·08W–1·15W 2B9B
1·65 N
1·50 N
1·40 N
1·00W
SLOPING EARTH
SLOPING EARTH
2½" O.D. PIPE (CORRODED)
SLOPING EARTH
SLOPING EARTH
1·10W
RECENT 6" THICK PLANK
54
RETAINING WALL WITH C54 BEHIND
DC 41
THIS LINE INDICATES WHERE OPENING IS BLOCKED WITH IRONSTONE
PLAN 2B9B
CAVALIER BUILDING
IRONSTONE FOOTING OF CAVALIER CAPPED WITH 1 1/2" CONCRETE
RECENT 2x8 WOOD FRAME
PIECE OF WOOD
RECENT CONCRETE FORM ENCASING ELECTRICAL WIRING
0·87W
2x6 CREOSOTE PLANK
3 UNDERLYING ELECTRICAL CABLES
IRONSTONE BLOCKS
RECENT FOOTING FOR DEMI-CASEMATE COMPOSED OF MORTARED ROCK AND RUBBLE
1·10W
RECENT WOOD PLANK
FACE LINE OF RETAINING WALL
0·51N
PLAN 2B9A
SCALE: FEET
DECIMETERS
0·96W
2 RED BRICKS
GRANITE DRAIN ENCLOSURE
PERIMETER OF ENCLOSURE
RECENT EARTH FILL
ROCK
4½ O.D. 6GD IRON PIPE
ROCK
ENTRANCE CASEMATE NO 7
1·17S
PLAN 2B9D
NOTES:
2B9B
CASEMATES 54 AND 55 WERE PRIVIES SINCE THE 1840's WHEN BOTH CASEMATES WERE LINKED BY A PASSAGE WAY UNDER THE ADJOINING SALLYPORT.
ALL STONE IS IRONSTONE, UNLESS NOTED.
1 THIS FORMER OPENING AND ADJACENT STAIR STRUCTURE ONCE ENABLED HUMAN MOVEMENT BETWEEN C54, 54 AND C55, FOR WASTE REMOVAL PURPOSES.
2 WALLS ON BOTH SIDES OF OPENING AND STAIR STRUCTURE AS WELL AS STEPS ARE CONSTRUCTED OF SQUARE CUT, SMOOTH FACED, EVEN COURSED IRONSTONE.
3 THIS OPENING PRESENTLY BLOCKED WITH IRONSTONE.
4 REMAINS OF BROKEN IRONSTONE AND RUBBLE.
5 6" O.D. RED CLAY PIPE WITH TWO CONNECTIONS VISIBLE.
6 SIZE AND PATTERN OF STONE WAS NOT VISIBLE IN THIS AREA.
7 EXPOSED IRONSTONE IN THIS AREA REVEALS EXTENT OF STRUCTURE WHICH PREVIOUSLY EXISTED HERE.
8 REMAINS OF FOOTING FORMED BY SMALL PIECES OF IRONSTONE.
9 THIS GRANITE BLOCK HAS A 2"-2" GROOVE ALONG THE UPPER PORTION.
10 REMAINS OF 7" O.D. CORRODED CAST IRON PIPE. BROKEN LINES INDICATE EXTENT OF PIPE PRIOR TO REMOVAL.
11 REMAINS OF A FRENCH DRAIN CONSTRUCTED OF RANDOM SIZED IRONSTONE SLABS.
12 BROKEN LINES INDICATE LOCATION OF 2" THICK IRONSTONE SLABS USED TO COVER THE DRAIN.
13 EXPOSED PORTION OF TOOLED GRANITE BLOCK, PART OF THE STAIRWELL DESTROYED WHEN PIPES WERE LAID
Indian and Northern Affairs Canada / Affaires indiennes et du Nord
3/4"=1'-0"
HALIFAX DEFENCE COMPLEX
1976 SALVAGE ARCHAEOLOGY
HALIFAX CITADEL
(CURTAIN WALL AREA)
PLANS AND SECTION / ELEVATION
2B9A, 2B9B, & 2B9D.
HAHC '76/P9
05/15

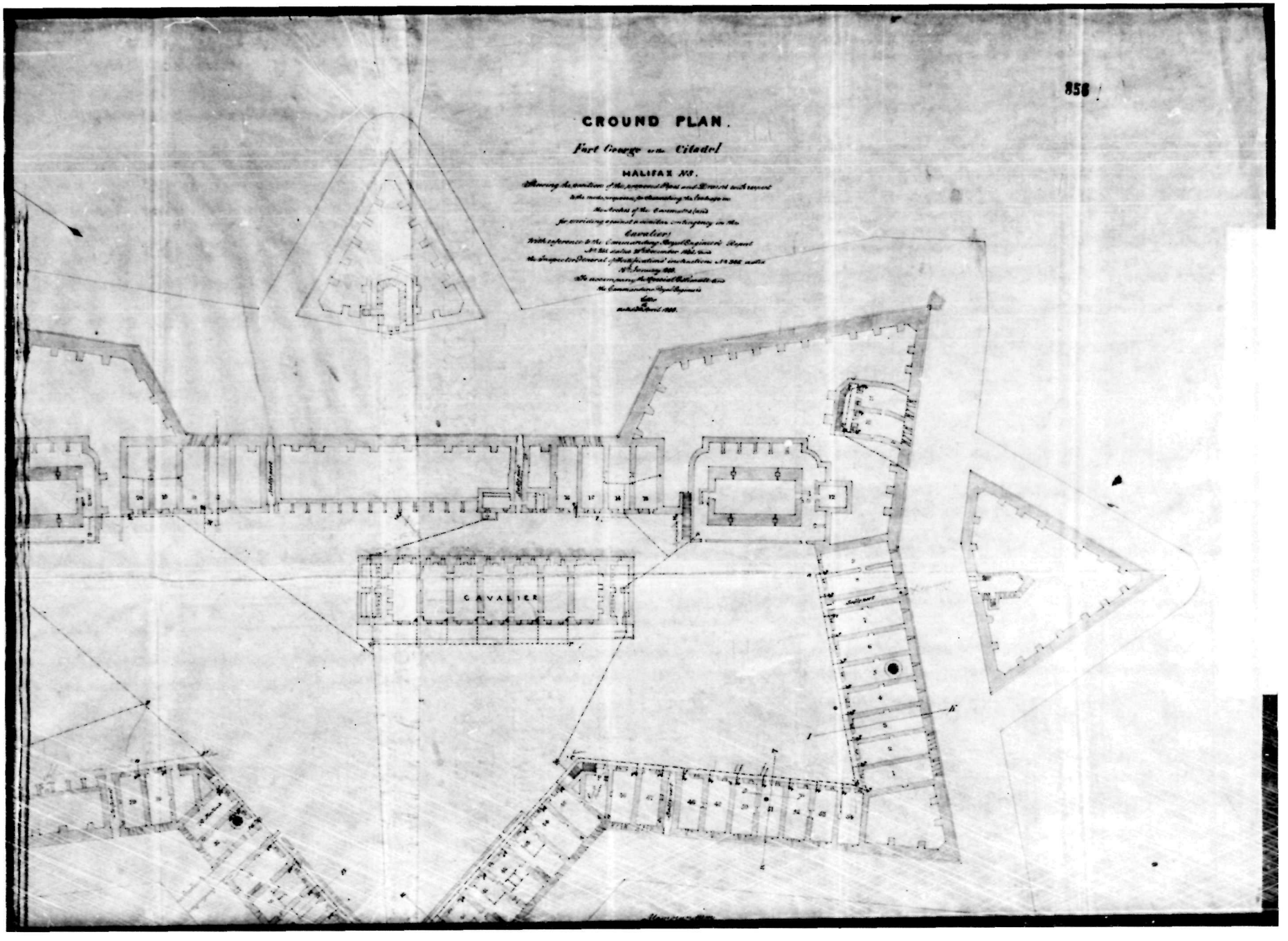
3 Spot elevation for privy stairwell and courtyard excavations. (Drawing by Brian Gallant.)


1+40N
1+50N
1+65N
219
SECTION - ELEVATION 1+08W→1+15W 2B9B
1+65N
1+50N
1+40N
1+00W
1+10W
SLOPING EARTH
REVETMENT WALL
PLAN 2B9B
CAVALIER BUILDING
0+87W
0+51N
PLAN 2B9A
1+17S
0+96W
1+06W
PLAN 2B9D
NOTES.
ALL SPOT ELEVATIONS ARE REDUCED TO DECIMAL FORM AND FOR CONVENIENCE ARE RECORDED IN FEET ABOVE 200.00 GEODETIC (i.e 30.5' IS ACTUALLY 230.5')
SOLID LINES (EXCEPT EXCAVATION LINES) ARE USED TO INDICATE STRUCTURES WHICH WERE EVIDENT PRIOR TO ARCHAEOLOGICAL EXCAVATION UNDERTAKEN IN 1976
SCALE
FEET
DECIMETERS
HALIFAX DEFENCE COMPLEX
1976 SALVAGE ARCHAEOLOGY
HALIFAX CITADEL
(CURTAIN WALL AREA)
SPOT ELEVATIONS FOR PLANS AND SECTION/ELEVATION 2B9A, 2B9B, & 2B9D
HAHC '76/P9/
06/15

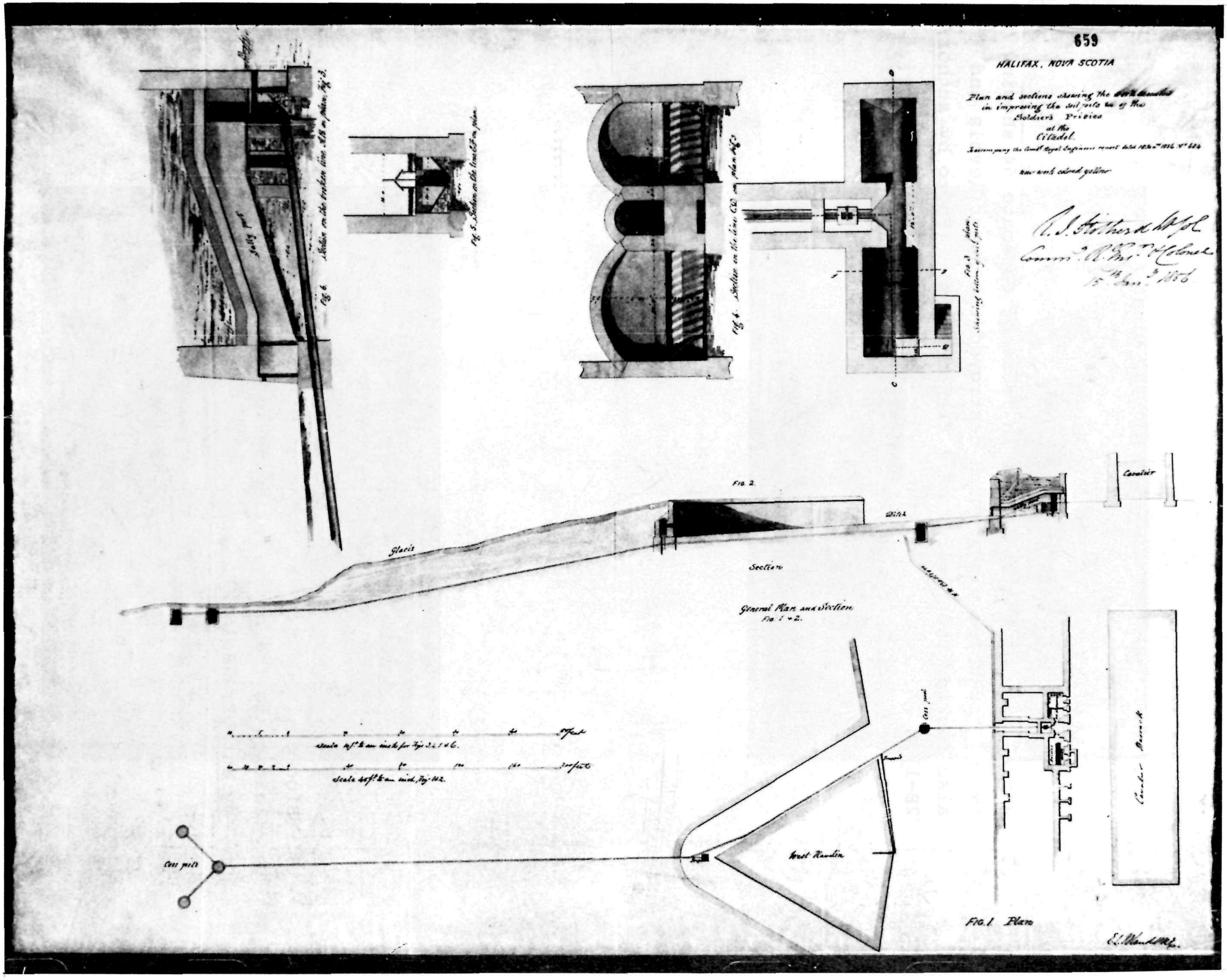
4 Test trench in the courtyard between the Cavalier Building and Demi-Casemates showing footing of the Cavalier Building and the wooden frame in front. (Photo by author; 2B-69M.)


2B9D

5 1849 Citadel Plan. (Public Archives of Canada.)


858
GROUND PLAN.
Fort George or the Citadel
HALIFAX N.S.
CAVALIER

6 1856 plan of the privy renovations. (Public Archives of Canada.)

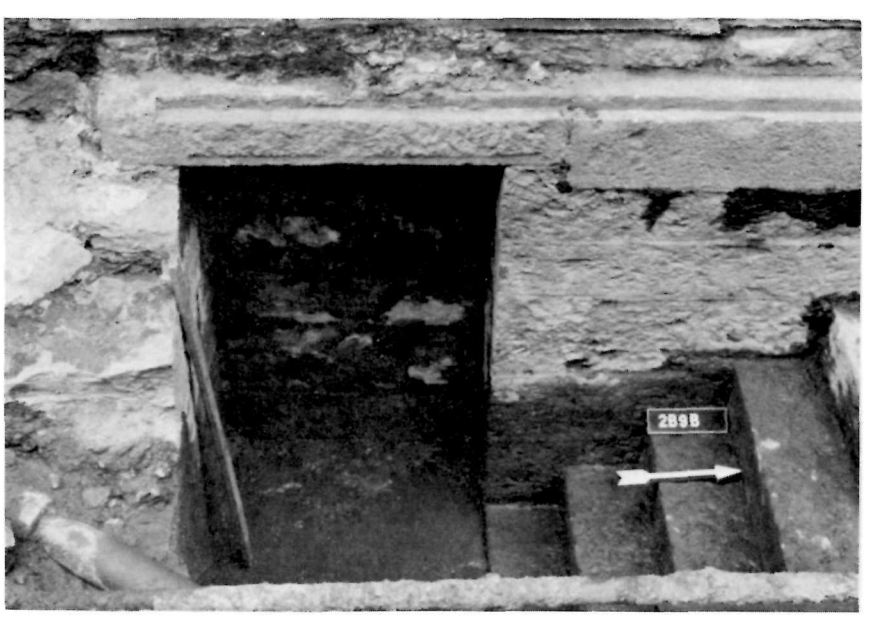


659
HALIFAX, NOVA SCOTIA
Soldier's Privies
at the
Citadel.
new work colored yellow
Glacis
Ditch
Section
Fig. 2.
Cavalier
General Plan and Section
Fig. 1 + 2.
Cess pool
Cess pits
West Ravelin
Fig. 1 Plan
Fig. 3

7 Aerial view of the stairwell in front of Casemate 54 showing two of the three pipes which destroyed the upper levels and also showing the remains of a french drain. (Photo by author; 2B-173M.)

8 Blocked-in doorway at the foot of the stairs once leading to the privy soil pits in Casemate 54. (Photo by author; 2B-163M).


2898


2898

9 1891 Citadel Plan. (Public Archives of Canada.)

HALIFAX, N. S.

The Citadel — Fort George.

BLOCK PLAN

PREPARED BY LIEUT COL. A HILL CRE 19.10.01

Photographed and Printed at the School of Military Engineering, Chatham
under the direction of Capt. J.E.C. Bond, R.E.
Major General R.F. Stevenson Smith R.E. Commandant

No 1 (of 1)

REFERENCE

Lines of War Department Property, including Glacis & Pavilion Barracks
R.E. Boundary shown thus
" " Stones shown thus
Guard Period, Buildings are blocked and marked thus
Fire " " " " "
The Green block denotes the Green Flats
The light Barrack Stanton block denotes the Drill Hall & Surgeon
The light Indigo block denotes the Officer Barracks
The Grey block denotes the Play Ground
The Barrack block symbol with Indigo Ink denotes the Casemate Barracks
The Cypher " " " " " " " Officers Mess
The height of the Rooms are shown thus
The Surface Gutters are represented thus
Gratings to underground drains to Surface Gutters are shown thus
The Foul Drains are shown thus
and were conducted into W.D. Sewer shown into Halifax Harbour
The Manholes to drains are shown thus
The Surface and Roof Water drains are shown thus
Rain Water Pipes from Roofs are shown thus
" " " " with gratings under are shown thus
Ventilating Pipes to drains are shown thus
Water Supply Pipes are shown thus
Stop Cocks are shown thus
Branch Pipes " "
Wash Hydr " "
Water Tanks or Cisterns outside Buildings are shown thus
Flushing Apparatus " " "
Fresh Air " " "
Lightning Conductors " " "
The Citadel is lighted by Oil, Externally and Internally
The Glacis are open, no Rain does flow into Waterlands of Halifax Harbour & shown thus
Female Hydr shown thus
Height of Female Hydr above ground shown thus
Most of the buildings are built of Granite, Rock obtained partly by Contract
All Granite work done by Royal Engineer Workmen
Estimated Cost Not Known
Actual Cost " "
Contractors [illegible]
Date of Authority 1868
" Commencement 1868
" Completion 1874

Wooden Buildings indicated thus

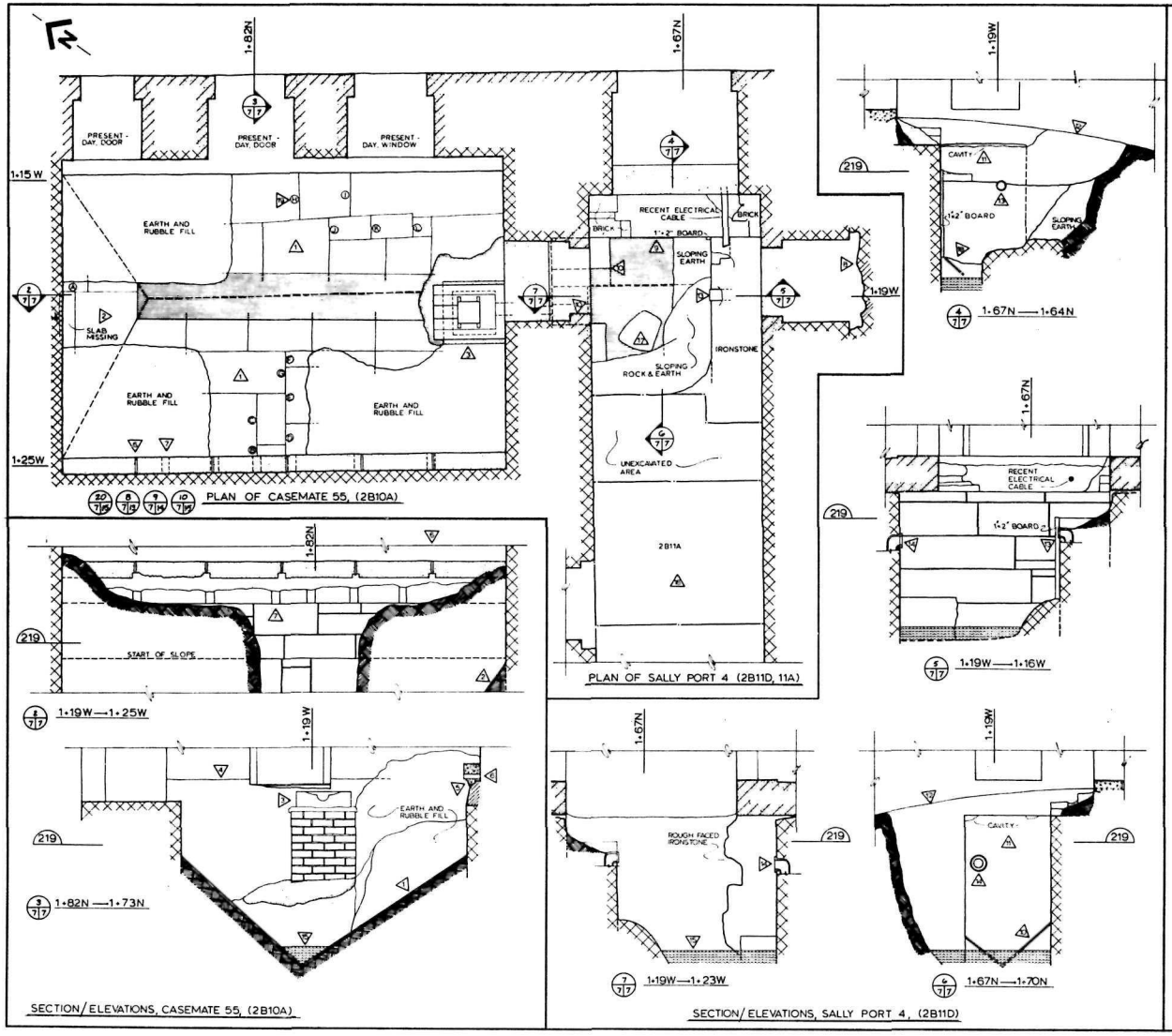
Terms				
Number	Dimensions			of what material constructed
	Length	Breadth	Depth	
North Branch	11-0	11-0	11-0	Brick with Brick
South "	"	"	"	" " "
Centre "	11-0	11-0	11-0	" " "
Hydr for Connection of Engine	Number of Hydrants 1			
" " Ground Boxes	" " "			Plans
Flushing Tanks (Iron) in case of Conflagration, under	11-0	11-0	11-0	Cast Iron
	11-0	11-0	11-0	Rock Island with Sand

Table of Accommodation											
	No. of Rooms	Cubic Contents	Officers	Sergeants	Corporals	Buglers	Privates	Women & Children	Horses	Capacity of Hospital	Other Uses
Artillery			3	1	1	1	7	340			2000	20000
Total			3	1	1	1	7	340			2000	20000

Site Plan, Scale 880

1874-5

10 Plans and sections of Casemate 55 and Sallyport 4 excavations. (Drawing by Brian Gallant.)



NOTES

CASEMATES 55 AND 54 WERE LATRINES SINCE THE 1840's WHEN BOTH CASEMATES WERE LINKED BY A PASSAGEWAY AT A LEVEL BENEATH THAT OF THE ADJOINING SALLY PORT.
THE FUNCTION OF BOTH C55 AND C54 HAVE UNDER GONE DRAMATIC CHANGES SINCE THAT TIME

2B10A -

1. IRONSTONE SLABS - 1 INCH THICK. SQUARE CUT AND SMOOTH FACED - SLOPING TOWARDS BOTTOM OF COLLECTING DRAIN (FLAGGING)
2. LOWER PART OF NORTH WALL MADE OF 1 INCH THICK IRONSTONE SLABS - ANGLES TO INTERCEPT EAST AND WEST SLOPING WALLS OF DRAIN
3. SANDSTONE DRAIN ATOP BRICK SHAFT
4. THIS LINE REPRESENTS THE APPROXIMATE LEVEL OF THE FINISHED FLOOR WHEN IT WAS ORIGINALLY INTACT DURING 1840's.
5. BED OF CONCRETE SEPARATES LATER EDITION CONCRETE FORMS FROM EARLIER CONSTRUCTED BATTER OF BRICK AND MORTAR.
6. NOTE LOCATIONS OF RECESSES IN CONCRETE FORMS. THIS CONSTRUCTION MAY HAVE HAD SOMETHING TO DO WITH THE LOCATION OF DETAILS SIMILAR TO THAT OF THE WOODEN ARTIFACT DESCRIBED ON DRAWING NO.14.
7. NOTE ALSO, RECESSES WHICH ACCEPTED WOODEN JOISTS TO SUPPORT LATRINES ORIGINAL FLOORING.

2B11D -

8. EXTENT OF REMOVAL OF BRICK AND IRONSTONE RUBBLE AT ENTRANCE TO C54.
9. THIS WALL CONSTRUCTED OF SQUARE CUT, EVEN COURSED, SMOOTH FACED IRONSTONE.
10. NOTE REMAINS OF IRONSTONE DRAIN TROUGH, AND THE CENTERLINE FORMED AT INTERSECTION OF FLAGGING STONES.
11. THESE FORMER OPENINGS ONCE ENABLED HUMAN MOVEMENT BETWEEN C54, THE SALLY PORT, AND C55, FOR WASTE REMOVAL PURPOSES. ONLY SMALL CAVITIES NOW EXTEND BACK BEYOND THESE PRESENTLY SEALED PASSAGEWAYS.
12. THIS LINE MARKS GROUND LEVEL, PRIOR TO EXCAVATION OF TRENCH.
13. REMAINS OF CLAY DRAIN PIPE LEADING TOWARDS CASEMATE 54
14. DRAIN OPENING CONNECTED TO OUTLET FROM BRICK SHAFT IN CASEMATE 55
15. WATER LEVELS IN C55 & C54 AT TIME OF RECORDING.
16. THERE WERE NO FEATURES TO BE RECORDED IN SUB OPERATION 2B11A.
17. THIS STONE - ALTHOUGH NOT IN PLACE - IS ASSUMED TO BE ANOTHER OF OF THE ORIGINAL STONES FORMING ONE SIDE OF THE DRAIN 'VEE', SIMILAR TO THAT DESCRIBED IN NOTE 10.
18. NOTE REMAINS OF ONE SIDE OF IRONSTONE FLAGGING, WHICH ORIGINALLY WAS PART OF A DRAIN TROUGH GOING INTO C54

TABLE FOR ACTUAL SLOPING DIMENSIONS OF IRONSTONE SLABS. (FLAGGING)

SLAB NO.	ACTUAL SLOPING DIMEN.	NO.	ACTUAL SLOPING DIMEN.
1	1'-0 1/2"	6	1'-7"
2	4'-1/2"	7	1'-11 1/2"
3	2'-0"	8	1'-10"
4	1'-3"	9	1'-0"
5	2'-1/2"	10	1'-0"
	7'-1/2"		0'-9 1/2"

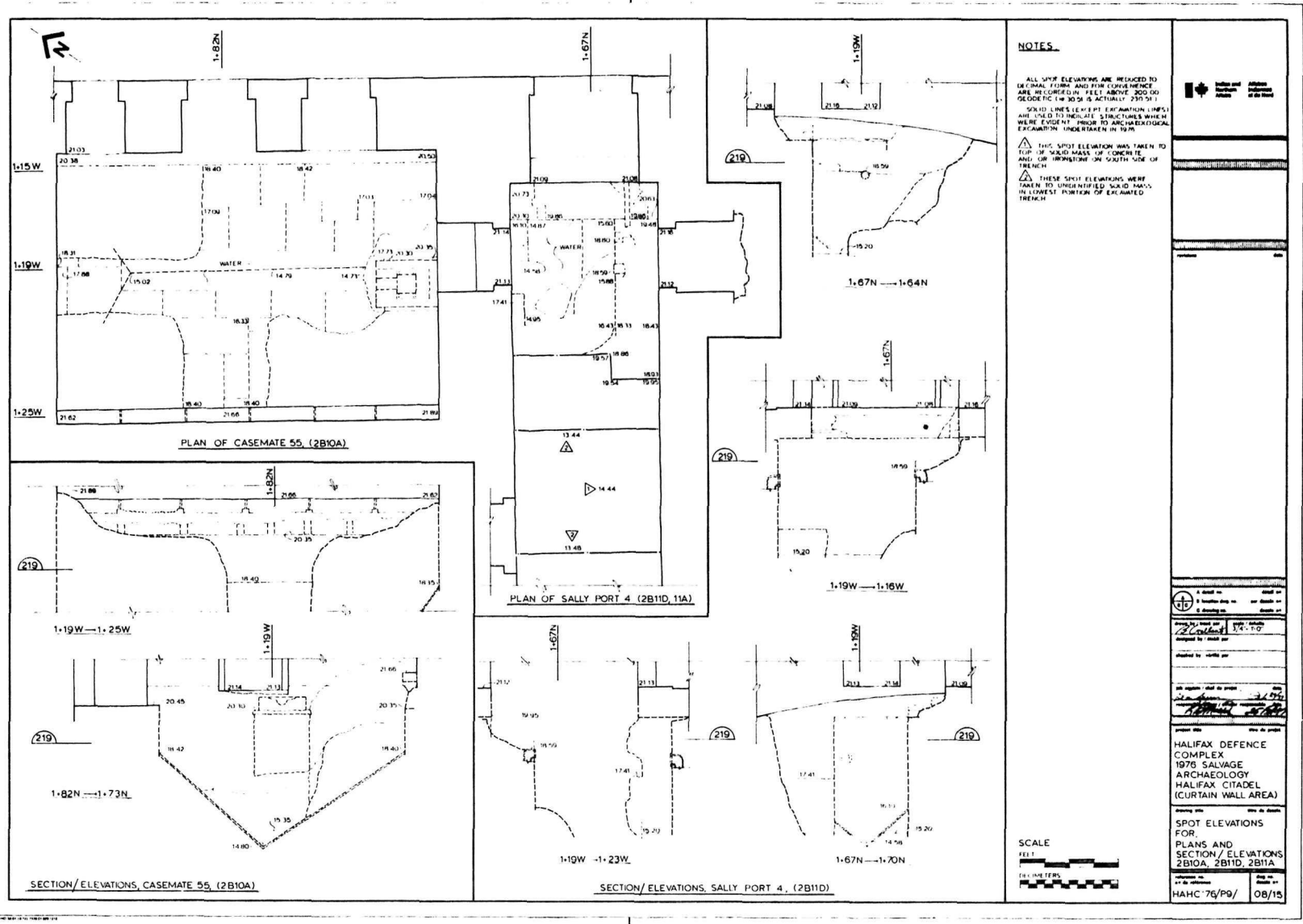
SCALE
FEET
DECIMETERS

HALIFAX DEFENCE COMPLEX
1976 SALVAGE ARCHAEOLOGY
HALIFAX CITADEL
(CURTAIN WALL AREA)

PLANS AND SECTION / ELEVATIONS 2B10A, 2B11D, 2B11A.

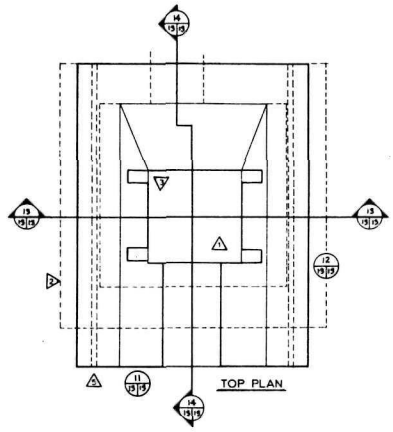
HAHC '76/P9/ 07/15

11 Spot elevations for Casemate 55 and Sallyport 4 excavations. (Drawing by Brian Gallant.)

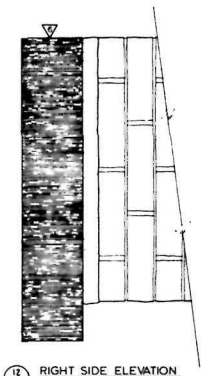

1+82N
1+67N
1+15W
1+19W
1+25W
WATER
PLAN OF CASEMATE 55, (2B10A)
PLAN OF SALLY PORT 4 (2B11D, 11A)
1+19W
219
1+67N —1+64N
1+67N
1+19W—1+16W
1+82N
1+19W—1+25W
1+19W
1+82N —1+73N
SECTION/ ELEVATIONS, CASEMATE 55, (2B10A)
1+67N
1+19W —1+23W
1+19W
1+67N—1+70N
SECTION/ ELEVATIONS, SALLY PORT 4, (2B11D)
NOTES
ALL SPOT ELEVATIONS ARE REDUCED TO DECIMAL FORM AND FOR CONVENIENCE ARE RECORDED IN FEET ABOVE 200.00 GEODETIC (ie 10.51 IS ACTUALLY 210.51)
SOLID LINES (EXCEPT EXCAVATION LINES) ARE USED TO INDICATE STRUCTURES WHICH WERE EXTANT PRIOR TO ARCHAEOLOGICAL EXCAVATION UNDERTAKEN IN 1976.
1 THIS SPOT ELEVATION WAS TAKEN TO TOP OF SOLID MASS OF CONCRETE AND OR IRONSTONE ON SOUTH SIDE OF TRENCH
2 THESE SPOT ELEVATIONS WERE TAKEN TO UNIDENTIFIED SOLID MASS IN LOWEST PORTION OF EXCAVATED TRENCH
SCALE
FEET
METERS
HALIFAX DEFENCE COMPLEX
1976 SALVAGE ARCHAEOLOGY
HALIFAX CITADEL
(CURTAIN WALL AREA)
SPOT ELEVATIONS FOR, PLANS AND SECTION/ ELEVATIONS 2B10A, 2B11D, 2B11A
HAHC 76/P9/
08/15

12 Sandstone drain *in situ* on brick column at south doorway of Casemate 55. Stone was cracked and broken as a result of the use of the jackhammer. Opening into brick column is filled with concrete. (*Photo by author*; 2B-93M.)

13 Details of latrine drain structure in Casemate 55 and Sallyport 4. (Drawing by Brian Gallant.)

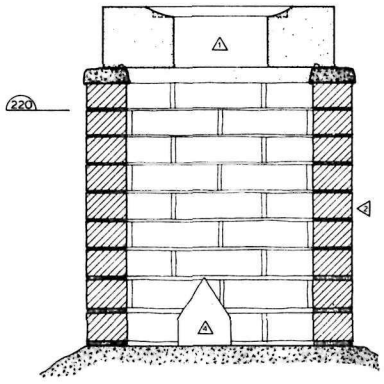


TOP PLAN

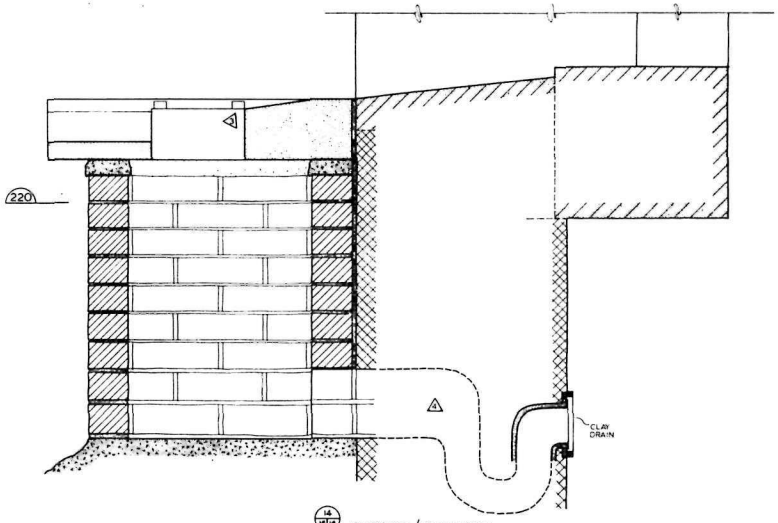


RIGHT SIDE ELEVATION

FRONT ELEVATION



SECTION / ELEVATION



SECTION / ELEVATION

NOTES

SANDSTONE DRAIN WAS FOUND SECURED BY A 2 INCH BED OF MORTAR TO THE TOP OF A BRICK CONSTRUCTED SHAFT NEXT TO THE PASSAGEWAY LEADING TO SALLY PORT 4. THIS STRUCTURE REPRESENTS A LATER FORM OF DRAINAGE, DESIGNED FOR THE LATRINE AROUND 1891.

SANDSTONE DRAIN IS SQUARE CUT WITH REGULAR TOOLED SURFACES SHOWN IN PLAN. FRONT AND SIDE ELEVATIONS SHOW SAW TOOTH MARKS WHERE STONE WAS CUT TO PRESENT SHAPE. BOTTOM SIDE IS SCORED AS WELL.

1. AN OPENING IN THE CENTER ALLOWS WASTES TO FLOW FROM TROUGH INTO BRICK SHAFT. IT IS DISPOSED OF THERE THROUGH A BRICK OPENING WHICH IS BELIEVED LINKED TO A CLAY DRAIN IN THE SALLY PORT.
2. SHAFT IS COMPOSED OF RED BRICK WITH COMMON BOND CONSTRUCTION. IT RESTS ON A CRUDE BASE OF RUBBLE IRONSTONE AND MORTAR.
3. NOTE FOUR RECESSES IN SANDSTONE AROUND OPENING TO SHAFT. THIS INDICATES THERE MAY HAVE BEEN A GRILL OR COVER OF SOME FASHION WHICH CONTROLLED THE FLOW OR SIZE OF WASTES PASSING THROUGH OPENING FROM THE TROUGH.
4. THE MANNER BY WHICH THE WASTES PASSED FROM THE OUTLET OF THE BRICK SHAFT TO REACH THE OPENING OF THE CLAY DRAIN, IS NOT CLEARLY EVIDENT. PERHAPS IT FOLLOWED THE ROUTE OUTLINED IN DASHED LINES AS SHOWN, LIKE AN EARLY TYPE FLUSHING TRAP. THE SYSTEM COULD HAVE BEEN REPLENISHED FROM ABOVE THE SHAFT WITH A BUCKET OF WATER.
5. NOTE 1/2" DIAMETER GROOVE TOOLED ALONG BOTTOM SURFACE OF SANDSTONE DRAIN.
6. SYMBOL REPRESENTS SCORED - LIKE TEXTURE OF CUT SANDSTONE.

SCALE: (1/4 FULL SCALE)

FOOT

DECIMETERS

Indian and Northern Affairs / Affaires indiennes et du Nord

1/4 FULL SCALE

HALIFAX DEFENCE COMPLEX
1976 SALVAGE ARCHAEOLOGY
HALIFAX CITADEL
(CURTAIN WALL AREA)

DETAILS OF DRAIN STRUCTURE SUB OPERATION 2B10A

HAHC·76/P9/ 13/15

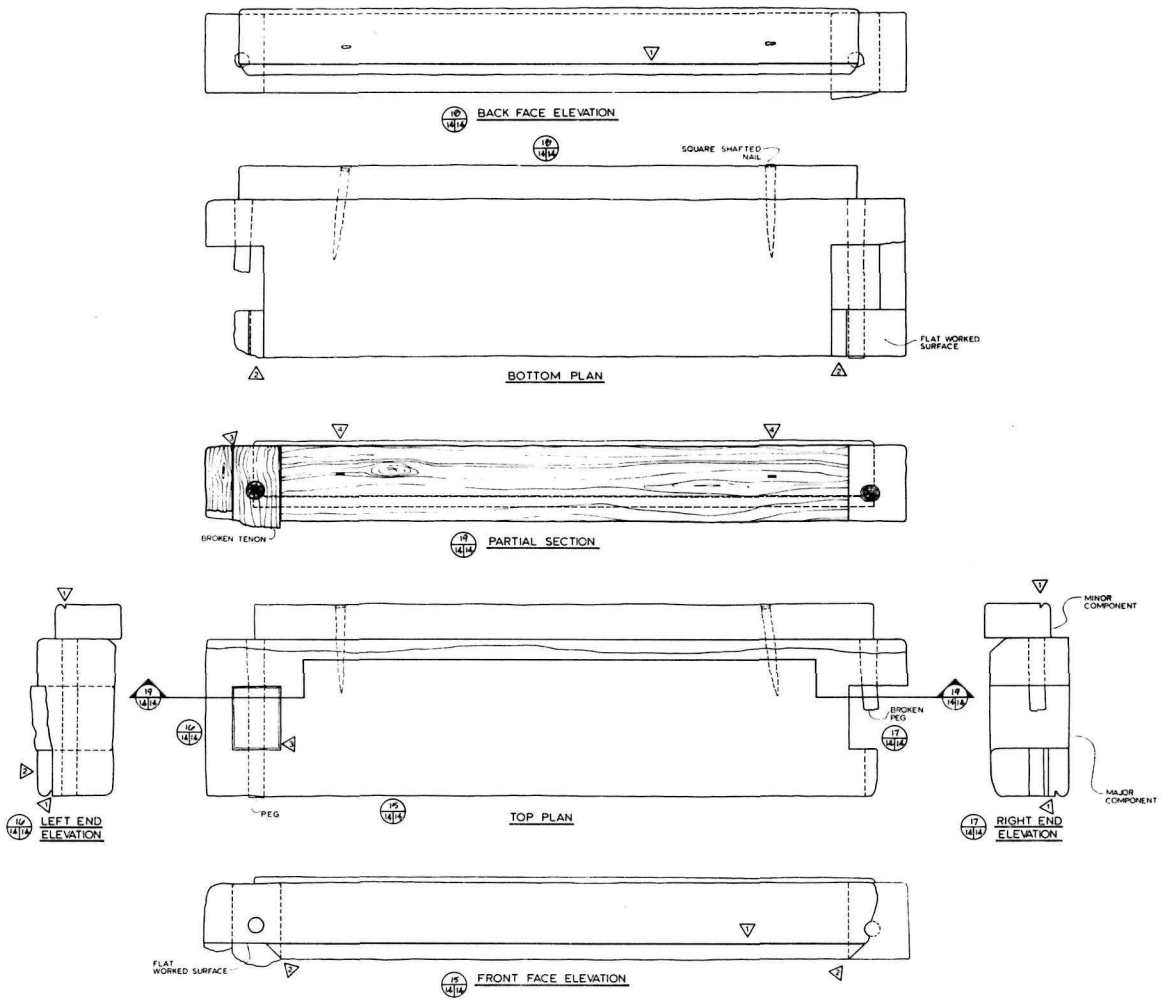
14 Privy soil pits in Casemate 55, facing north, showing trough formed by flagstone. (Photo by author; 2B-148M.)


28 10 A

15 Privy soil pits in Casemate 55, facing north. Brick column in foreground. (Photo by author; 2B-153M.)

16 Brick column with sandstone trough removed. Column resting on rubble masonry base. (Photo by author; 2B-158M.)

17 Details of wooden object recovered from privy pit fill and believed to be part of the stall construction. (Drawing by Brian Gallant.)



NOTES:

WOODEN ARTIFACT WAS FOUND BENEATH EXCAVATED RUBBLE OF CASEMATE 55.
ASSEMBLY OF ARTIFACT CONSISTS OF FIVE SEPARATE WOOD PIECES AND TWO IRON FASTENERS, ALL PRESENTLY IN A STATE OF ADVANCED DETERIORATION.
ARTIFACT CONSISTS OF A MAJOR COMPONENT WITH A MINOR ADDITION SECURED TO THE FORMER BY TWO IRON NAILS. THERE IS A PARTIAL TENON FOUND FASTENED TO THE MAJOR COMPONENT BY A 3/4" Ø PEG. FRAGMENT OF WOODEN PEG REMAINS AT THE OPPOSITE END. EXISTING TENON IS SMOOTH FINISHED ON ONE END AND BROKEN OFF AT THE OTHER

1. NOTE BEADED MOULDING ON FRONT FACE OF MAJOR COMPONENT AND BACK FACE OF MINOR COMPONENT
2. NOTE EXISTING BEVELED SURFACE.
3. A 45° CHAMFER EXISTS AROUND FINISHED END OF TENON.
4. RECTANGULAR SHAFTED IRON NAILS.

THE WOODEN ARTIFACT, MAY HAVE ORIGINATED PRIOR THE 1890'S WHEN THE LATRINE WAS CONVERTED TO ACCOMMODATE INDIVIDUAL STALLS. ITS SIZE CORRESPONDS TO WIDTHS BETWEEN RECESSES OF CONCRETE FORMS WHICH WERE CONSTRUCTED ON THE WEST WALL OF THE CASEMATE.
IT MAY HAVE BEEN FASTENED TO THIS CONCRETE DETAIL BETWEEN INDIVIDUAL PARTITIONS OF A STALL WHILE OTHER SIMILARLY CONSTRUCTED WOOD DETAILS COULD HAVE COMPLEMENTED REMAINING STALLS.

SCALE (1/2 FULL SCALE)
INCHES
CENTIMETERS

Indian and Northern Affairs / Affaires indiennes et du Nord

HALIFAX DEFENCE COMPLEX
1976 SALVAGE ARCHAEOLOGY
HALIFAX CITADEL
(CURTAIN WALL AREA)

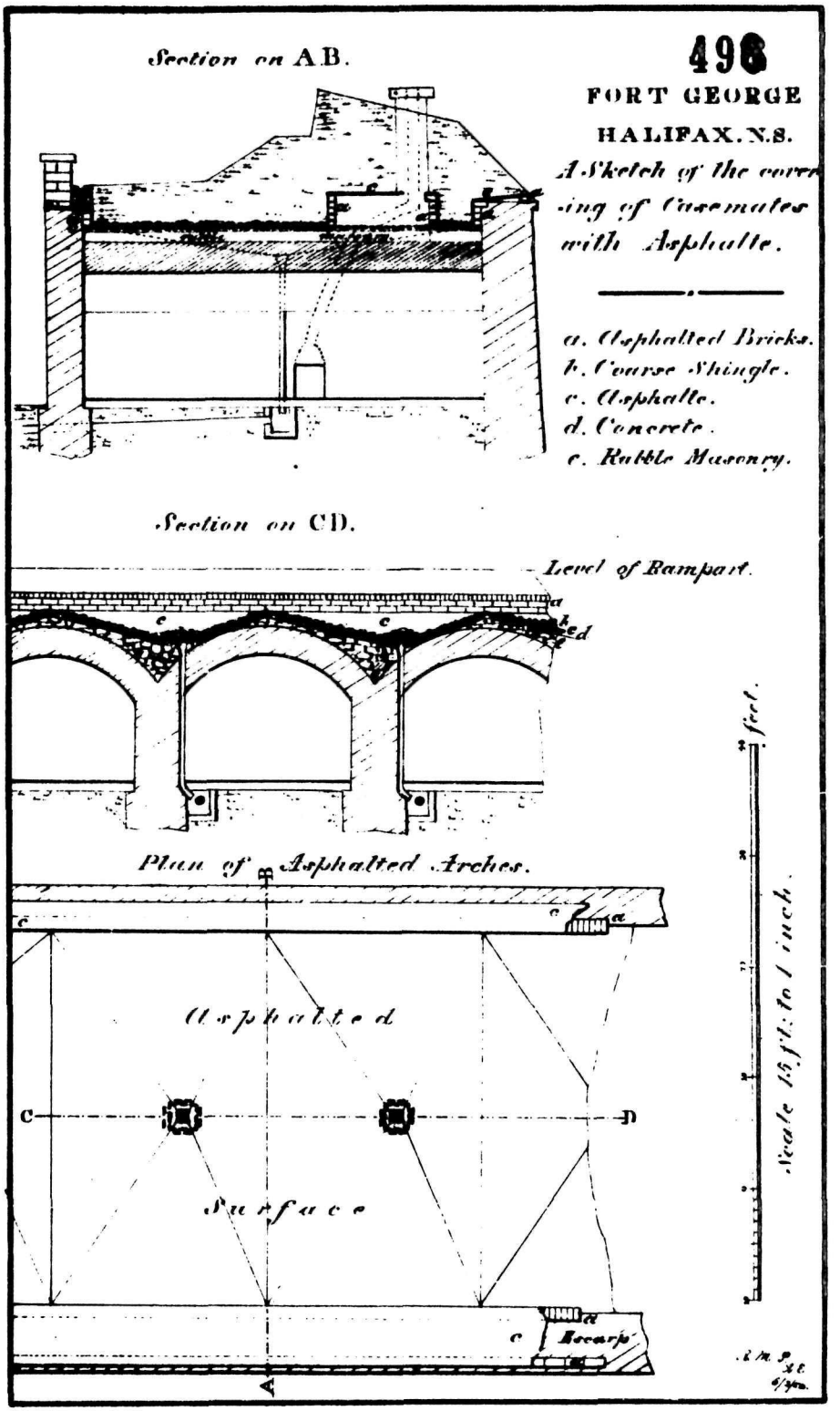
DETAILS OF WOODEN ARTIFACT
SUB OPERATION 2B10A

HAHC 76/P9/ | 14/15

18 East end of Sallyport 4 showing remains of drain and arched doorways into soil pit of the Casemate 55 privy. (Photo by author; 2B-6B.)

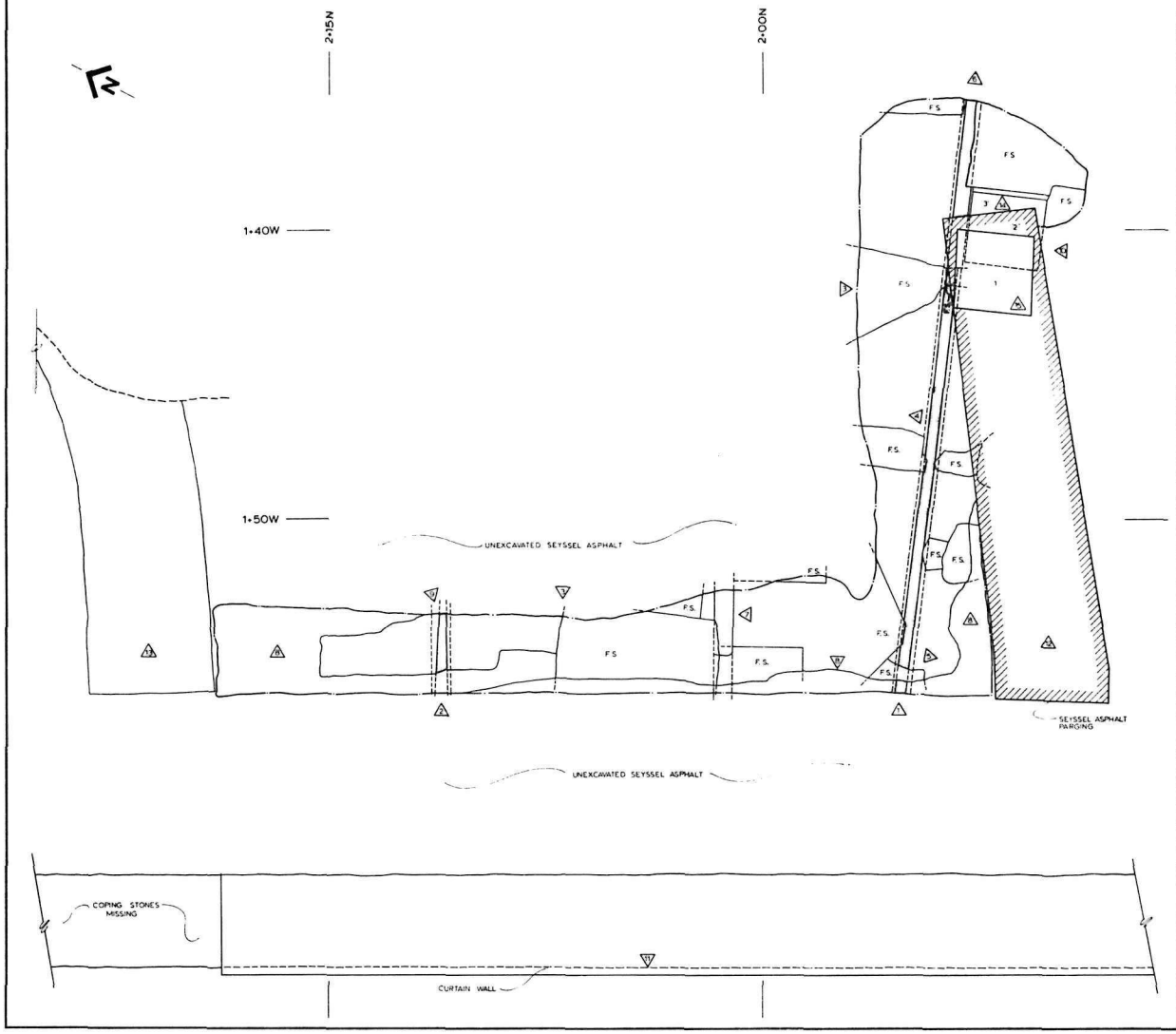
19 1856 plan for rampart waterproofing. (Public Archives of Canada.)

To accompany C.W.D. Report No 599
dated 12th June 1856



20 Remains of 1830 chimney in Casemate 10 at south end of west curtain wall. (Photo by author; 2B-185M.)

21 Plan of rampart excavation over casemates 11 and 12. (Drawing by Brian Gallant.)



NOTES

1. THIS WELL EXPOSED LEAD-LINED DRAIN IS POSITIONED OVER THE SOUTH WALL OF CASEMATE 11
2. THIS PORTION OF LEAD-LINED DRAIN IS POSITIONED OVER THE COMMON SIDE WALL OF C12 & C11
3. LARGE IRONSTONE SLABS (FLAGGING STONES) WERE POSITIONED AND OVERLAPPED ON TOP THE VAULTS OF CASEMATES TO PROVIDE IMPROVED DRAINAGE. FOR IDENTIFICATION OF THE SMALLER FLAGGING STONES, THE ABBREVIATION 'F.S.' APPEARS ON TOP THESE SLABS.
4. FLAGGING STONES ARE SLOPED TOWARDS AND OVERHANG THE DRAINS LEAD CONSTRUCTED SIDE WALLS, BY APPROXIMATELY 1 1/2". THE 'F.S.' APPEAR TO ACT AS FEEDERS, BY DIRECTING WATER OFF THE LARGER SLABS TOWARDS THE DRAIN OPENING.
5. NUMEROUS ROUGH CUT AND FLAT STONES WERE REMOVED FROM TOP OF DRAIN OPENING DURING EXCAVATION. THESE WERE DRY LAID TO ALLOW WATER RUNNING OFF FLAGGING STONES, TO FILTER THROUGH INTO GUTTER.
6. SOUTH GUTTER SYSTEM SLOPES TO DRAIN SPOUT, LOCATED ON FACE OF RETAINING WALL WITHIN WOODEN SHELTER. SEE OPERATIONS KEY PLAN DRAWING, NO 04.
7. PEAK PORTION OF FLAGGING STONES - LOCATED OVER THE CENTERLINE OF C11 - IS FINISHED WITH YELLOW SLAG BRICK. THE WEST END PORTION WAS BROKEN OFF DURING EXCAVATION.
8. UNEXCAVATED MORTARED RUBBLE OVER FLAGGING STONES.
9. FLAGGING STONE ON NORTH SIDE OF THIS DRAIN OPENING IS NOT PARALLEL WITH STONE ON OPPOSITE SIDE. LEAD SIDE WALLS OF DRAIN ARE INDICATED BY DASHED LINES.
10. NOTE THREE DISTINCT PORTIONS OF CHIMNEY, NUMBERED AS SUCH AND IN ORDER OF DESCENDING ELEVATION; TOGETHER THEY OPERATE AS ONE CHIMNEY SYSTEM. THEIR PRESENT STATE IS PROBABLY THE RESULT OF ALTERATIONS AND ADDITIONS MADE DURING DIFFERENT PERIODS OF THEIR CONSTRUCTION.
11. DASHED LINE REPRESENTS NORTH END OF CURTAIN WALL. OVERHANG IS THAT OF THE COPING STONES.
12. CHIMNEY EXTENSION IS IN A STATE OF ACUTE DETERIORATION AND ACCURATE OUTLINE OF FLUE OPENING IS INDETERMINABLE. CONSTRUCTION MATERIAL USED IS RED BRICK.
13. THIS CHIMNEY EXTENSION IS CONNECTED WITH FLUE SYSTEM OVER COMMON SIDE WALL OF CASEMATE 12 & 13. SEE DRAWING 11 FOR MORE DETAIL.
14. THIS PORTION OF CHIMNEY SHAFT, AND THE EXCAVATED PORTION OF THE CHIMNEY EXTENSION VISIBLE IN THE SOUTH WALL OF THE TRENCH, IS CONSTRUCTED OF RED BRICK USING NO FIXED BOND PATTERN.
15. UPPER PORTION OF MAIN CHIMNEY SHAFT IS CONSTRUCTED OF RED BRICK WITH A CEMENT PARGING.

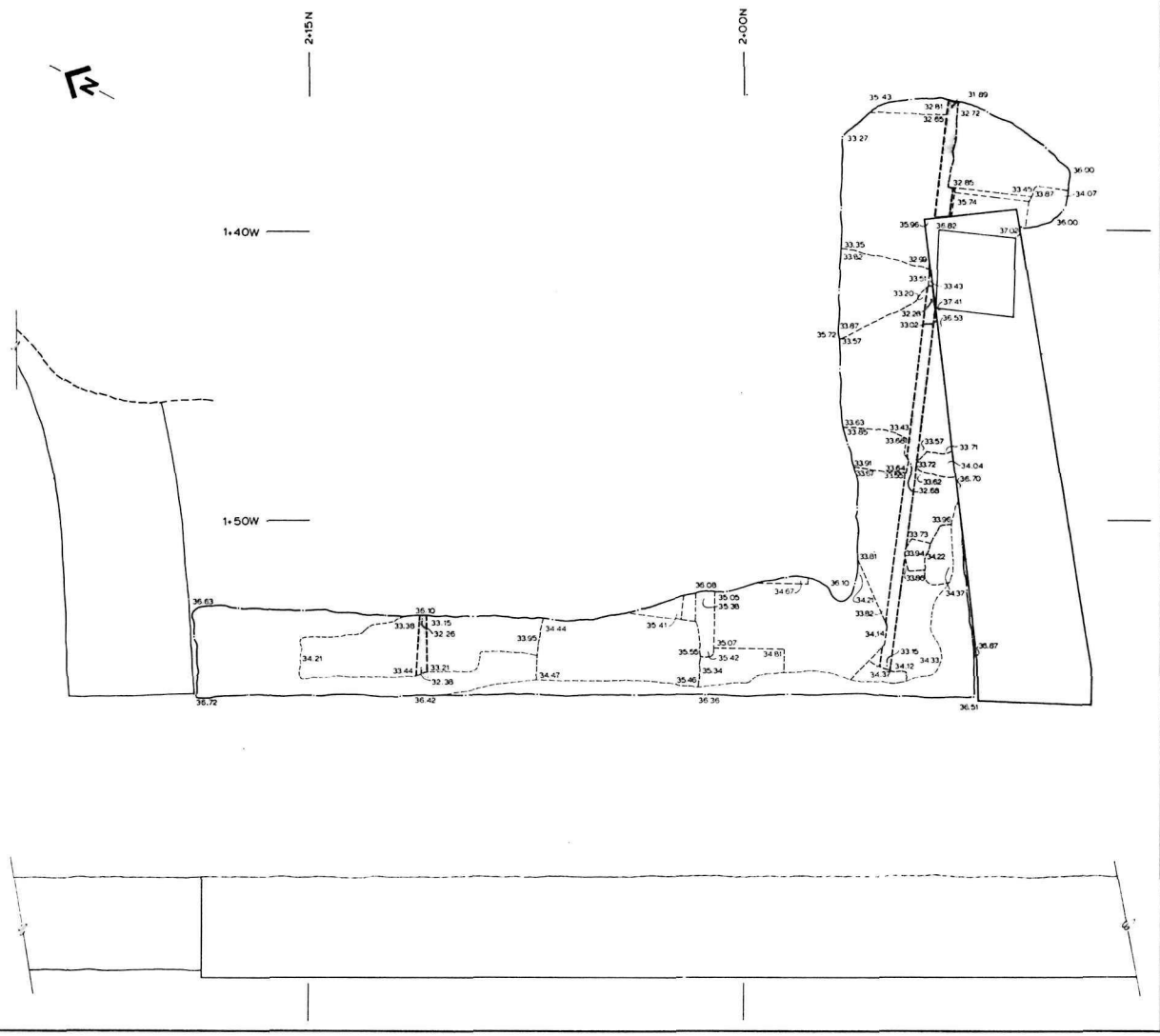
SCALE
FEET
DECIMETERS

HALIFAX DEFENCE COMPLEX
1976 SALVAGE ARCHAEOLOGY
HALIFAX CITADEL
(CURTAIN WALL AREA)

EXCAVATION PLAN
2B12A&B

HAHC 76/P9/ 09/15

22 Spot elevations for rampart excavation over casemates 11 and 12. (Drawing by Brian Gallant.)



NOTES

ALL SPOT ELEVATIONS ARE REDUCED TO DECIMAL FORM, AND FOR CONVENIENCE, ARE RECORDED IN FEET ABOVE 200.00 GEODETIC (i.e 30.51 IS ACTUALLY 230.51').

SOLID LINES (EXCEPT EXCAVATION LINES) ARE USED TO INDICATE STRUCTURES WHICH WERE EVIDENT PRIOR TO ARCHAEOLOGICAL EXCAVATION UNDERTAKEN IN 1976.

SCALE
FEET
DECIMETERS

Indian and Northern Affairs / Affaires indiennes et du Nord

HALIFAX DEFENCE COMPLEX
1976 SALVAGE ARCHAEOLOGY
HALIFAX CITADEL
(CURTAIN WALL AREA)

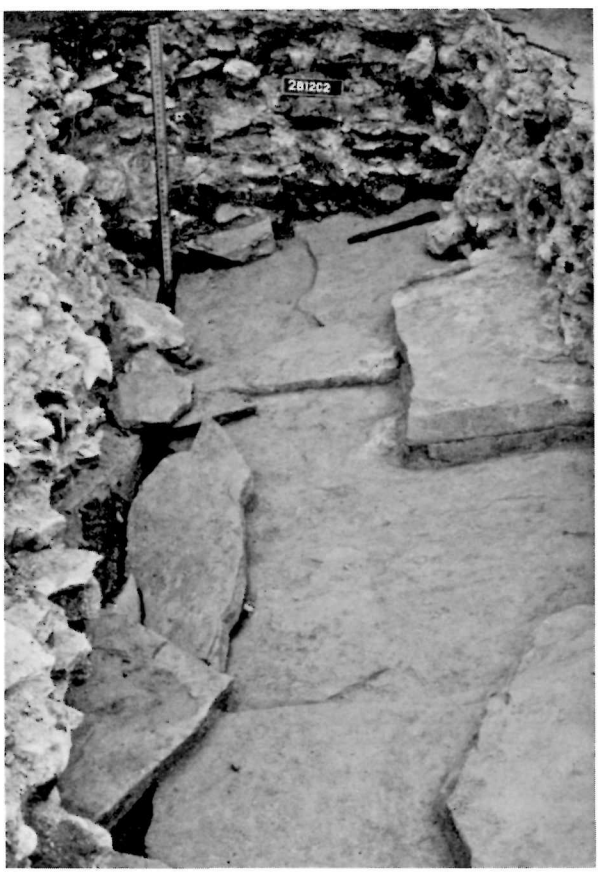
SPOT ELEVATIONS FOR EXCAVATION PLAN 2B12 A & B

HAHC·76/P9/ 10/15

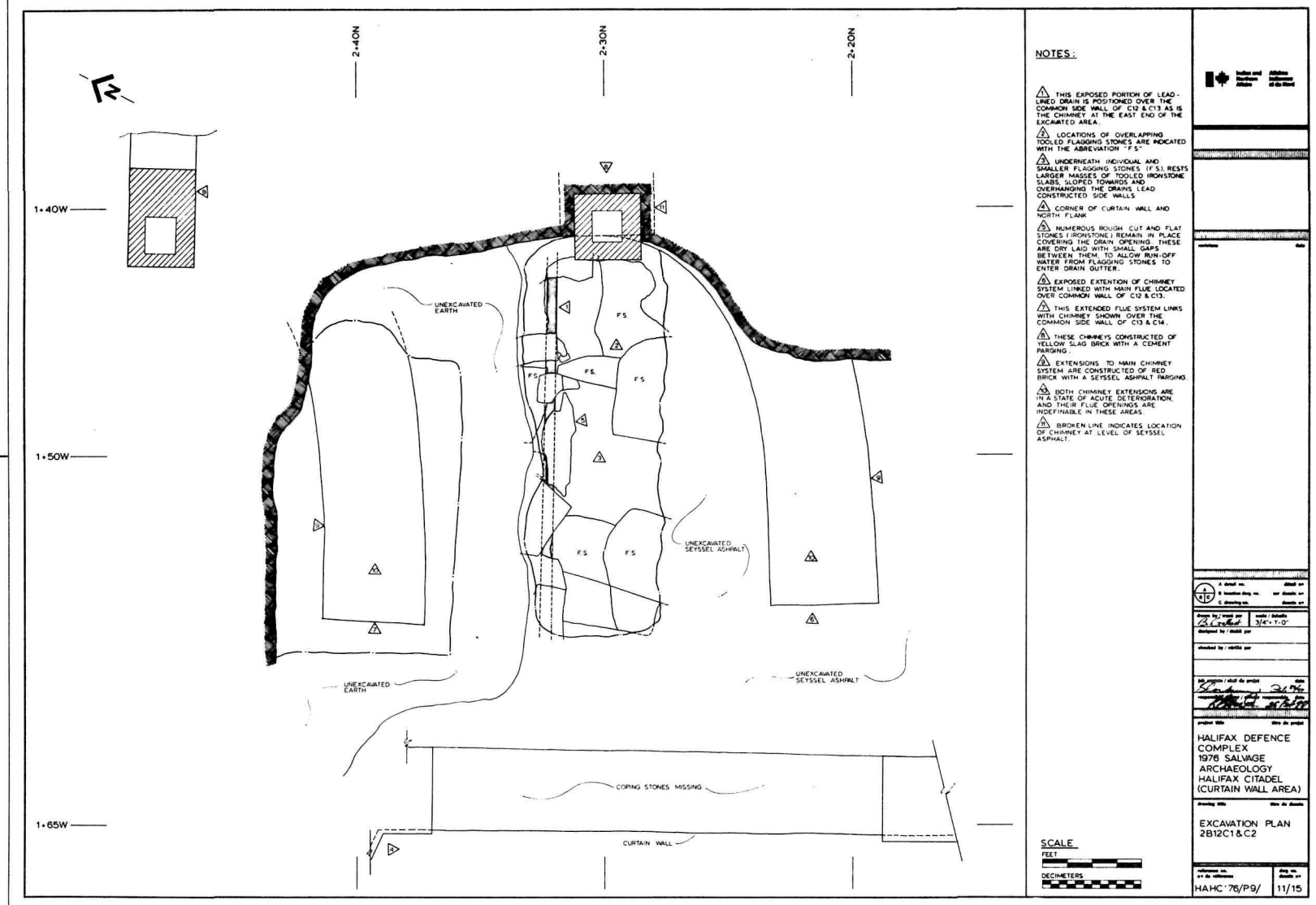
23 Detail of lead sheeting set into brickwork of chimney over casemate 11. (Photo by author; 2B-134M.)

24 Trench over casemates 12 and 13 facing east. Rubble masonry and hipped flagstone sloping to drain are visible. (Photo by author; 2B-81M.)


2B12B1


2B12C2

25 Plan of rampart excavation over Casemates 12 and 13. (Drawing by Brian Gallant.)



NOTES:

1. THIS EXPOSED PORTION OF LEAD-LINED DRAIN IS POSITIONED OVER THE COMMON SIDE WALL OF C12 & C13 AS IS THE CHIMNEY AT THE EAST END OF THE EXCAVATED AREA.
2. LOCATIONS OF OVERLAPPING TOOLED FLAGGING STONES ARE INDICATED WITH THE ABBREVIATION "F.S."
3. UNDERNEATH INDIVIDUAL AND SMALLER FLAGGING STONES (F.S.) RESTS LARGER MASSES OF TOOLED IRONSTONE SLABS, SLOPED TOWARDS AND OVERHANGING THE DRAINS LEAD CONSTRUCTED SIDE WALLS.
4. CORNER OF CURTAIN WALL AND NORTH FLANK.
5. NUMEROUS ROUGH CUT AND FLAT STONES (IRONSTONE) REMAIN IN PLACE COVERING THE DRAIN OPENING. THESE ARE DRY LAID WITH SMALL GAPS BETWEEN THEM, TO ALLOW RUN-OFF WATER FROM FLAGGING STONES TO ENTER DRAIN GUTTER.
6. EXPOSED EXTENTION OF CHIMNEY SYSTEM LINKED WITH MAIN FLUE LOCATED OVER COMMON WALL OF C12 & C13.
7. THIS EXTENDED FLUE SYSTEM LINKS WITH CHIMNEY SHOWN OVER THE COMMON SIDE WALL OF C13 & C14.
8. THESE CHIMNEYS CONSTRUCTED OF YELLOW SLAG BRICK WITH A CEMENT PARGING.
9. EXTENSIONS TO MAIN CHIMNEY SYSTEM ARE CONSTRUCTED OF RED BRICK WITH A SEYSSEL ASHPALT PARGING.
10. BOTH CHIMNEY EXTENSIONS ARE IN A STATE OF ACUTE DETERIORATION, AND THEIR FLUE OPENINGS ARE INDEFINABLE IN THESE AREAS.
11. BROKEN LINE INDICATES LOCATION OF CHIMNEY AT LEVEL OF SEYSSEL ASPHALT.

SCALE

FEET

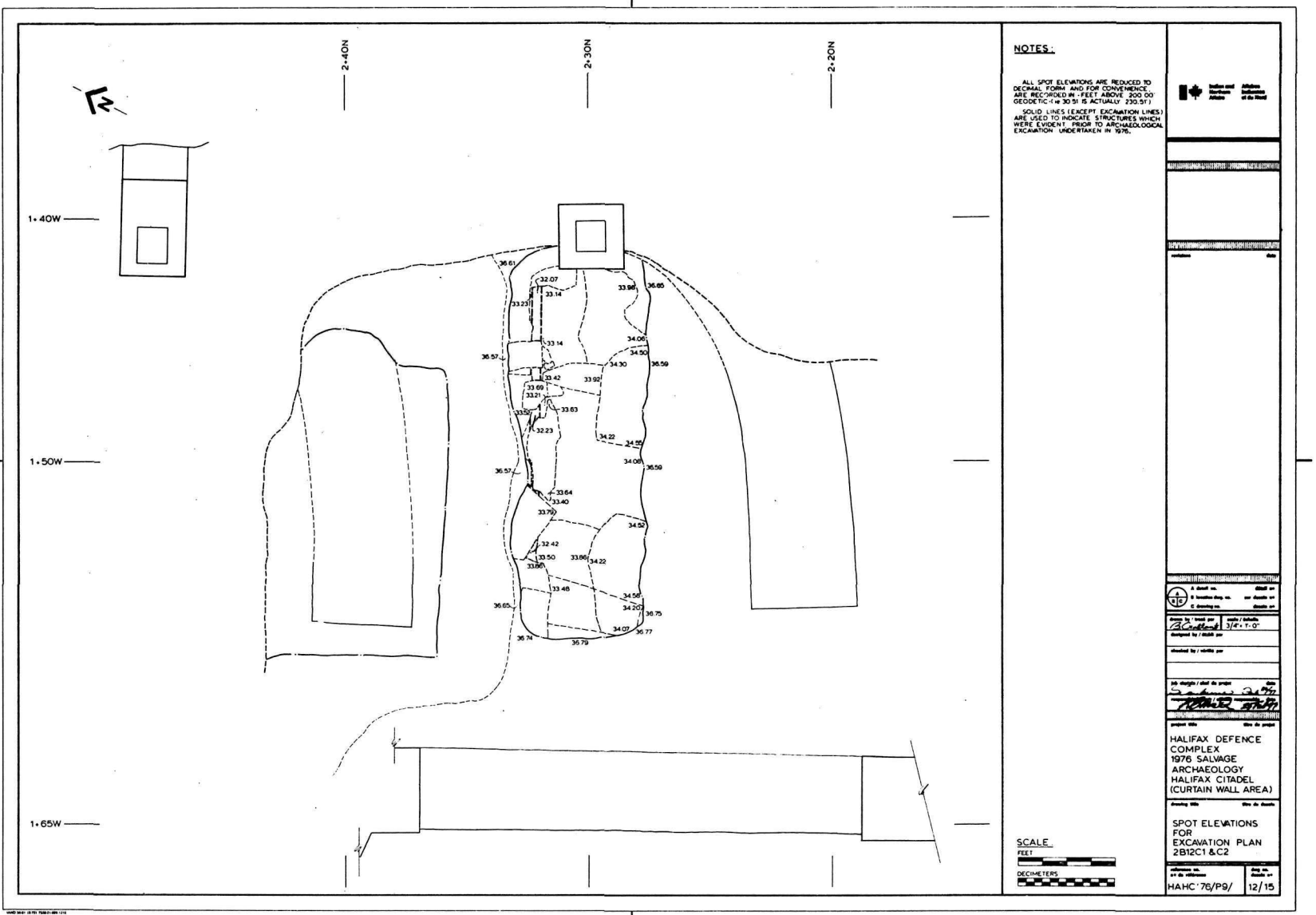
DECIMETERS

HALIFAX DEFENCE COMPLEX
1976 SALVAGE ARCHAEOLOGY
HALIFAX CITADEL
(CURTAIN WALL AREA)

EXCAVATION PLAN
2B12C1&C2

HA:HC:'76/P9/ 11/15

26 Spot elevations for rampart excavations over Casemates 12 and 13. (Drawing by Brian Gallant.)



NOTES:

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SCALE

FEET

DECIMETERS

Indian and Northern Affairs / Affaires indiennes et du Nord

HALIFAX DEFENCE COMPLEX
1976 SALVAGE ARCHAEOLOGY
HALIFAX CITADEL
(CURTAIN WALL AREA)

SPOT ELEVATIONS FOR EXCAVATION PLAN 2B12C1 &C2

HAHC '76/P9/

12/15

Salvage Archaeology at
Cape Spear Lighthouse, Newfoundland
September, 1976
by Caroline Phillips Parmenter
1977

Salvage Archaeology at
Cape Spear Lighthouse, Newfoundland
September, 1976
by Caroline Phillips Parmenter

Illustrations

Abstract

A small archaeological salvage project was undertaken in the fall of 1976 in cooperation with the restoration architect assigned to the Cape Spear Lighthouse Restoration Project. The stone foundation of the original front porch was excavated along with a plank wall and a ring bolt fastened in the bedrock and used to anchor the lighthouse. No definite evidence was found at the site of the original kitchen entrance to indicate what type of steps or porch had existed here. The base of the light tower enclosed by the house was uncovered, showing the tower to be set directly on the underlying bedrock.

Acknowledgements

The project was an excellent example of the type of research that can be undertaken with the combined efforts of restoration architect, historian and archaeologist. I would like to thank Robert Peck, restoration architect, and Judith Tulloch, historian, both with the Atlantic Region office of Parks Canada, for providing information from the results of the architectural and historical investigations into the site. I would also like to thank the staff at Signal Hill National Historic Site, St. John's, Newfoundland, particularly my crew members Dave Hickey and Cyril Vokey, for their assistance with this project.

Historical Background

The first lighthouse on Newfoundland's foggy coastline was established in 1810 at the entrance to St. John's harbour at Fort Amherst (Fig. 1). When the need for a second light was established, Cape Spear, four miles southeast of Fort Amherst, was chosen. Construction of this light began in late 1834 or early 1835 and it was in operation by 1 September 1836.

The original building consisted of a stone light tower surrounded by a two-storey frame dwelling. The light itself came from Inchkeith, near Edinburgh, Scotland, where it had been in use since 1815. Over the years numerous changes were made to the light-keeper's dwelling. Additional wings were added around 1850, 1865, and 1903 (Fig. 2). Doorways and chimneys were also altered or replaced as the shape of the dwelling changed (Tulloch, pers. com.).

During World War II, Cape Spear was the site of a Counter Bombardment Battery containing two ten-inch guns, concrete gun-crew shelters, magazines and barracks, most of which have since been torn down.

History of the Park

In 1955 the old light was replaced by a new mechanical beacon 185 metres to the east. The original structure was to be demolished but public interest saved Newfoundland's oldest surviving lighthouse. The site became a National Historic Park in 1962.

Park development is now in the planning stage and the lighthouse is to be restored during the next few years. The objectives are to restore the light and residence to its 1830s appearance and to stabilize the World War II site so that it is not a hazard to visitors (Tulloch, pers. com.).

Archaeological Excavations and Results

As several questions remained following architectural investigations, it was felt that a small-scale archaeological investigation could provide the missing information. Thus in the fall of 1976, archaeological excavations were conducted outside the main doorway, at the original kitchen entrance, and around the base of the light tower (Fig. 2).

Main Doorway

As Cape Spear is in such an isolated location, there is very little historical data on the lighthouse. Renovations are only briefly mentioned; those on the front porch took place in 1868 when new steps were built, and in 1884 when the porch and its surrounding platforms were torn down (Tulloch, pers. com.). The location of the original doorway on the north face of the house (Fig. 3) had been discovered by the restoration architect during his investigations. While searching for evidence of the porch foundation, the architect noticed several large rocks below this window. He then requested that an archaeological excavation be undertaken on this site to determine the size and composition of any porch foundation remains.

Initially a one metre-wide trench was laid out between the two large protruding rocks situated at the base of the window. This trench was extended until the north edge of a foundation was encountered. Once this was established, an

east-west trench was excavated to determine the width of the foundation. With its dimensions known, the entire foundation was then excavated. Seated directly on the bedrock, it consisted of a wall constructed of stones and red and yellow brick with mortar.

The walls were 0.6 m thick and their surviving height varied from 15 cm to 50 cm depending on the slope of the bedrock. The foundation extended 2.24 m north from the house and was 2.59 m wide. The interior space formed by the three walls was filled with rock and brick rubble combined with mortar (Fig. 4). No artifacts were found in the interior.

A wide area around the foundation was excavated in an attempt to locate the steps (Fig. 5). While several large rocks were found on both the east and west sides of the foundation, there was no other evidence to suggest the location of the stairs.

In front of the porch, on the north side, a line of butt-ended planks 30 cm wide and 2.8 cm thick was found running the entire length of the dwelling. These planks were set on piles of stones and logs to form a platform base or retaining wall (Fig. 6). This wall is 1.12 m from the porch and is not parallel to the house, veering slightly to the northeast. Stains in the soil plus traces of wood fibres indicate that boards once connected the base of the wall to the base of the porch foundation where they were set directly into the stonework. The traces of these boards are very faint but it appears that they were originally set 0.26 m apart in front of the porch (Fig. 6). No evidence remained of boards having been placed on top of these sleepers.

A final feature discovered in the area excavated around the porch was located 7.5 m north of the house. A one metre-trench had been extended north to investigate any

landscaping that may have taken place on the hill beside the house. In the 34 cm-deep soil a bolt with a 16 cm ring attached was found set into the bedrock (Fig. 7). Both the ring and bolt were made of iron 3 cm thick. They are located on the centre line of the original 1836 structure and are believed to have served as an anchor for guy wires which extended from the corners of the eaves where remains of bolts are still visible.

In summary, there was no information on the front entranceway prior to excavation. It is now known that the house had a fairly large front porch. Evidence for the location of the steps is scanty; the large rocks on either side of the foundation could have supported the base of the stairs or could simply be rubble which fell there during dismantling of the porch. The logs and planks found north of the porch foundation may have been connected in some way with steps. The brief historical note on the dismantling of the porch in 1884 does mention the porch and its surrounding platforms (Tulloch, pers. com.). Other interpretations suggested for this wall are that it is either the base of a boardwalk or a retaining wall preventing the shallow layer of topsoil from washing downhill.

Unfortunately there is no historical documentation on the appearance of the porch. From the archaeological investigations there is evidence to suggest that there might have been a trapdoor in the floor of the porch. The foundation behind the porch originally contained an opening which has since been filled in with stone (Fig. 8). A later concrete foundation has now hidden any external indication of this opening. A trapdoor from the porch would have allowed access to the crawl space around the light tower. At this time a trapdoor exists in the hall of the dwelling directly behind the window which was originally the front door. Although mortar was found cementing the rubble in the

interior of the foundation, and despite that fact that no artifacts were found which one would expect if the area served as a passageway, the presence of the former opening strongly suggests that the original porch foundation was not rubble filled. The interior could have been filled in during the 1865 renovations thus providing a firmer base. More likely the rubble found during excavation was simply the remains of the upper levels of the foundation which were pushed into the interior along with the old mortar. The wet climate may have caused it to re-cement itself.

1836 Kitchen Entrance

Three mortice holes slightly to the left of the present doorway into the west wing suggested that there had once been another door in this location, possibly the original kitchen entrance (Fig. 9) (Peck, pers. com.). In an attempt to find further information on this doorway, an excavation was conducted beneath the floor of the west wing (Fig. 2). This project was severely hampered by lack of working room - the crawl space being less than one metre high - and by having very poor lighting. However, it was hoped that the remains of steps or a porch might be found beneath the mortice holes.

The space beneath the floor of the west wing appears to have served as a storage area as the floor was covered with coal and grain seeds. Twenty centimetres below this surface, two extremely faint traces of planks were found running west from the wall and located directly below the two northernmost mortice holes. The planks were approximately 15 cm wide and were associated with red and white painted shingle debris. Their depth was approximately one metre below the joists of the west wing floor and they lay on sterile gravel and bedrock. No plank outline was

found beneath the south mortice hole. While this may be due to the extreme wetness of the soil, the evidence for a porch or stairs must really be limited to the presence of the mortice holes. The planks found could easily be rubble associated with the shingling.

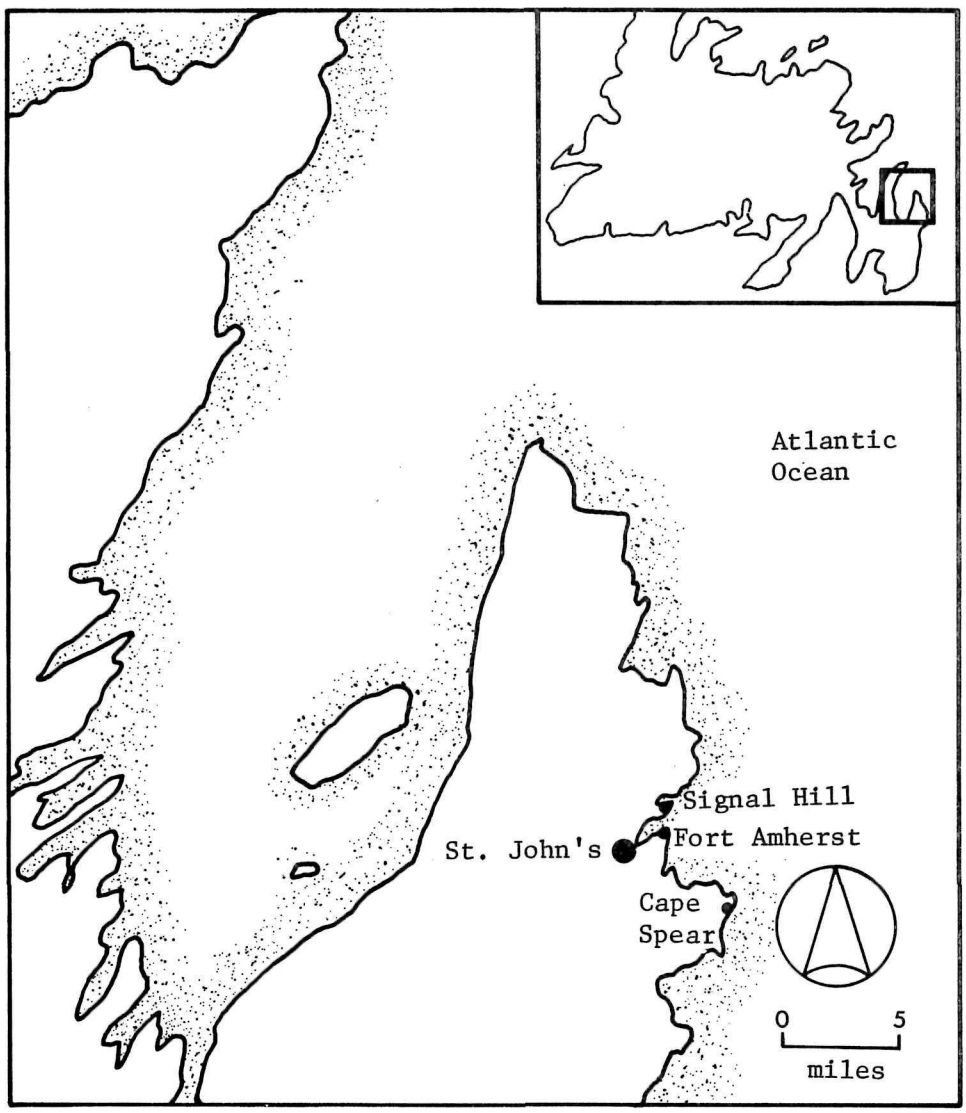
Light Tower

A small area was excavated on the north side of the base of the light tower so that its footing could be investigated. The soil in this location (Fig. 2) was extremely shallow (approximately 2 cm) and was composed of fine dust and coal. The tower is built of random-sized rocks with an occasional brick and is faced with mortar. It is seated directly on the bedrock and the foundation follows the natural contours.

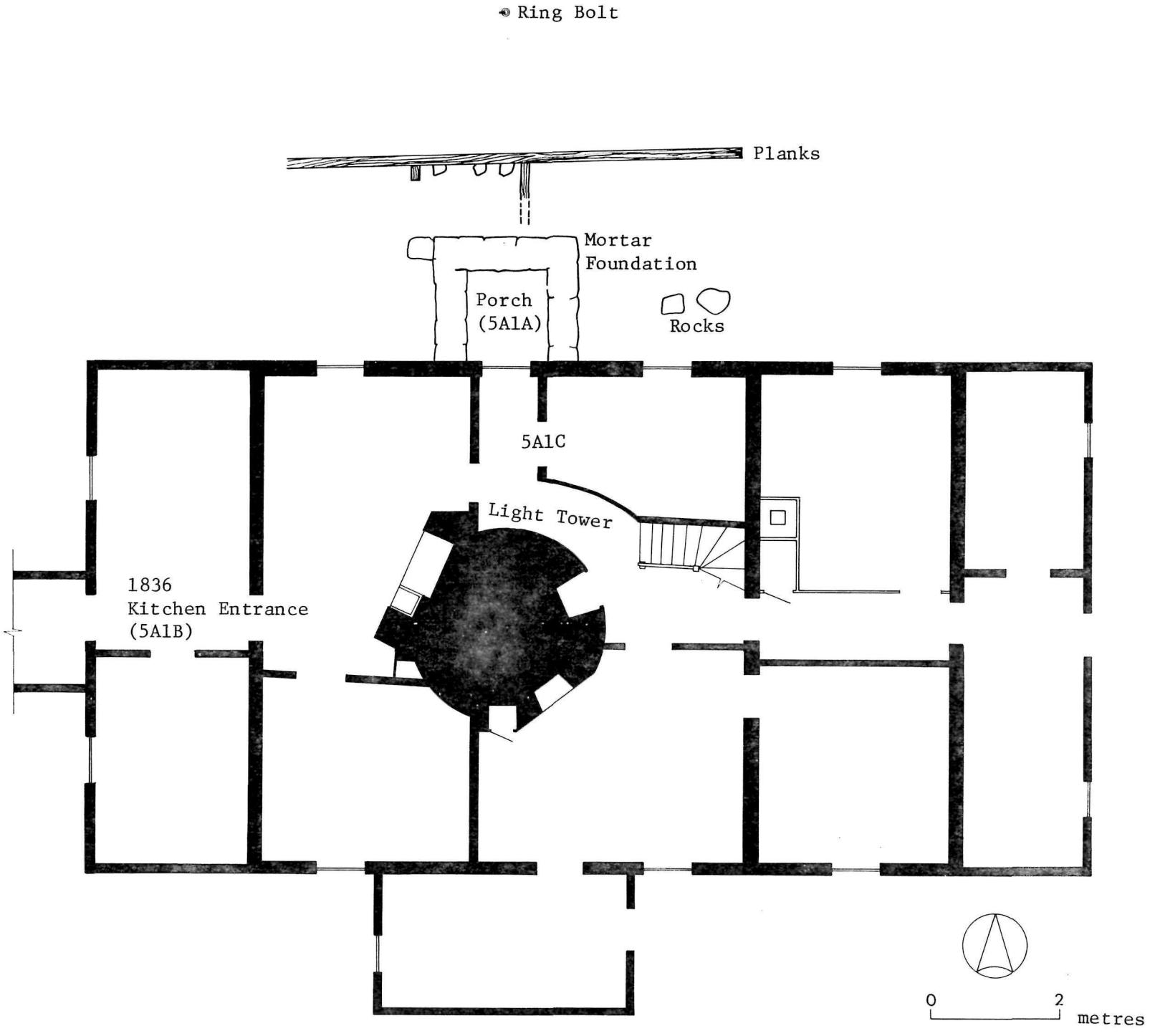
Conclusions

These small-scale excavations successfully provided the restoration architect with the information he required concerning the porch foundation, the light tower foundation, and the kitchen entranceway. Remains of the original 2.24 m by 2.59 m stone porch foundation were uncovered. No further evidence was found concerning the kitchen door steps. The light tower itself was found to be built using the natural bedrock as its base.

1 The Avalon Peninsula of Newfoundland. (Drawing by S. Epps.)


Atlantic
Ocean
Signal Hill
Fort Amherst
St. John's
Cape
Spear
0
5
miles

2 Architect's floor plan of the Cape Spear light and house showing areas excavated and features uncovered. (Drawing by S. Epps.)


Ring Bolt
Planks
Mortar
Foundation
Porch
(5A1A)
Rocks
5A1C
Light Tower
1836
Kitchen Entrance
(5A1B)
0
2
metres

3 Cape Spear Lighthouse, 1976. The window to the left of the pole was the location of the original entranceway. (Photo by author; 5A-2M.)

4 Porch foundation prior to removal of interior rubble fill. (Photo by author; 5A-27M.)

5 The porch foundation set directly on bedrock. (Photo by author; 5A-30M.)


5A1A

6 A section of the plank wall found north of the foundation showing the log base at the east end and the stone bases for the planks once connected to the foundation. (Photo by author; 5A-64M.)

7 The bolt and ring located north of the centre of the original dwelling. (Photo by author; 5A-32M.)


5A1A

8 Original opening in foundation facing north. Photo taken in crawlspace behind porch excavation. (Photo by author; 5A-13M.)

9 The two northernmost mortice holes above the original kitchen doorway visible now that plaster and wallpaper have been removed. (Photo by R. Peck.)


5A1C

Salvage Archaeology at
Lower Brewers Lock, Ontario
1976
by Peter G. Lane
1977

Archaeological Explorations at
Rideau Canal, Ontario, 1976
by Peter G. Lane

Illustrations

Abstract

In the late fall of 1976 archaeological fieldwork was conducted at the Lower Brewers Lock on the Rideau Canal near Kingston, Ontario. This work was undertaken to investigate the structural remains of the lock which had become exposed during its dismantling for reconstruction purposes. The fieldwork provided details of the construction methods and sequence of repairs made to the lock during the last half of the 19th century. Descriptions of the underlying infrastructure of the original lock and the repairs made to it are given along with historical references to these repairs.

Archaeological salvage work was carried out at Lower Brewers Lock on the Rideau Canal (24H3C) in the fall of 1976. The southern end of the lock at Lower Brewers was the location of the salvage archaeology. This area consisted of three major components: the entrance to the lower gate below the sill called the tail bay floor; the sill itself; and the gate recess area above the sill. These areas had been exposed during the preliminary stages of reconstruction of this lock. As opportunities to examine actual lock construction and the architectural features of underlying lock components are not frequent, it was important that an accurate record be made of whatever features were exposed.

The objectives of this salvage project were clearly defined. They were to make a photographic record of all the exposed timbers and architectural features and to make accurate drawings of these features showing their relation to the lock walls. These drawings would show jointing techniques and other construction details which could be observed and would be of use in future lock reconstruction.

Due to the nature of the site and the objectives of this project, no excavation was to be undertaken. Instead, field procedures were oriented towards the recording of the exposed features. This recording was made possible by clearing away the loose mud and debris that covered the lock floors and cross timbers; large chunks of cut stone from the lock walls which were too heavy to move were left in place. Sludge pumps were used to drain the lock recess area and were in continuous use in the area below the sill. A

temporary datum was established after the debris was cleared. The point chosen was the tip of the angle iron at the apex of the sill (Fig. 3). This point was equidistant from the east and west walls of the lock. From this datum a line projected south equidistant from both the east and west walls to the outside edge of timber A, the most southerly timber in the tail bay floor area; it was also projected north to the inner edge of the only cross timber in the gate recess area. All measurements were taken at right angles to this line and distances north and south were measured from the datum point. This enabled a fair degree of accuracy in the recording of these exposed features, and their locations could be tied in with the plans of the lock prepared by the Ontario Region Engineering and Architecture Branch.

There were eight cross timbers found in the tail bay area at the southern end of the lock, and one found at the north end of the gate recess area (Fig. 3). These cross timbers ranged in width from seven inches to thirteen inches. The timbers were hewn flat on the tops but were left rounded on the sides. The thickness of these timbers could not be determined. The central section of timber B was missing (Fig. 3). It had either broken off or rotted off, leaving the end fragments jutting out from the two opposite walls. Timbers B, E, and F proved to be recessed (Fig. 2). The areas between cross timbers D and E and F (Fig. 3) were filled with concrete and the sill to the north of timber H was also constructed of concrete. On both the east and west sides of the lock, at the lower end below the sill, there were boards running on a north south axis. These boards were nailed to the cross timbers which were recessed to take them (Fig. 3). These boards measured between 8 inches and 10 inches in

width and between 3/4 of an inch and 1½ inches in thickness. They were also extremely worn, probably by the action of running water.

On the east side of the lock, 4 feet south of the curved corner of the eastern door recess, a large piece of burlap was found projecting from the eastern wall. It could not be determined whether it was part of a cloth seal to protect the edge of the planking or a rag accidently dropped during the construction of the lock.

In the gate recess area above the sill planking running north and south and one large cross timber were found. These planks form the floor of the gate recess area above the sill. This floor was slanted, with the slope rising towards the center line. Most of these planks were found on the west side of the gate recess area. They extended 3 feet past the center of the lock into the eastern side of the gate recess area. The remainder of the eastern side was covered with concrete. A total of 23 planks were recorded; but because of the amount of rubble in the gate recess area, some of them could only be partially exposed. These planks were two inches thick and their widths ranged from 8½ to 20 inches.

There was a large squared cross timber at the northern edge of these planks. This timber marked the northern limit of the gate recess area and the beginning of the main lock chamber. In the northern section of the gate recess area below this cross timber just described; there were east-west boards on a level with the base of the north-south planks (Fig. 1). These boards appeared to have a coating of pitch or tar on them. At a level 3 inches above these boards and 1¼ inches south of the squared cross timber there was another

east-west board which had concrete between it and the boards below (Fig. 1). A thin layer of concrete was also noted just south of this where it covered some of the planking over an area of approximately 10 feet by 3 feet. This seems to indicate that the whole floor may have been covered with this thin layer of concrete at one time.

The feature referred to as the sill was a triangular concrete form in the central area between the tail bay floor and the gate recess area. The area on both sides of the apex of this sill was protected by an angle iron which extended for 8½ feet from the apex (Fig. 3). The sill held the gates closed when the lock was filled with water.

Interpretation of Features

The features recorded in the Lower Brewers Lock appear to be from three different periods. This particular lock has had a history of trouble since its opening in 1832. The primary fault lay in the fact that the lock was constructed on a foundation of soft clay and mud rather than bedrock.

The large cross timbers below the sill are undoubtedly the original cross timbers on which the 1832 floor rested because they extend underneath both the east and west walls of the lock. They indicate that the lock was constructed in a somewhat different manner than was the usual practice for the lock stations along the canal because they run at right angles to the lock walls instead of parallel to them as the Royal Engineers report on the construction of the locks along the Rideau shows (Weale 1839: Pl. 4-5). The reason for this particular type of construction might have been the fact that the

lock foundation was not bedrock. Probing between some of the cross timbers showed that the bottom was of a soft mud and clay. The broken ends of timber B were water worn indicating that a swift current ran around these timbers at some time.

The lower sill area of the lock appears to be the sill that was reconstructed in 1906. This sill was built with a timber frame of Douglas fir filled with a concrete overlay (Tulloch 1975: 139). Repair work completed on the lower area of the lock since 1914 till the late 1960's consisted of only minor repairs such as grouting and the adding of the angle iron to the lower sill.

The gate recess area above the lower sill could possibly belong to the 1861 reconstruction of the lock floor. In 1861 "the lock floor was renewed with a double sheeting of planking" (Tulloch 1975: 138). The planks found in the area above the lower sill were laid in a double layer, one oriented in a north-south direction and the other in an east-west direction. The concrete layer covering these planks in the gate recess area appears to be that from the 1905-6 repairs carried out under the direction of Phillips. After the sill was repaired and the lock was put back into operation on the 9th of July, "Phillips declared it was in better shape than ever before since the chamber walls and gate recesses had been filled with cement so that no water could perculate through to the sill" (Tulloch 1975: 139).

Conclusion

The objectives of the archaeological salvage project at Lower Brewers were fulfilled. An adequate photograph record and accurate drawings of the exposed timbers and other architectural features were successfully completed. This information will be of use in the future to persons studying the architecture of the lock and will, perhaps, be of value in the present reconstruction of the lock.

Bibliography

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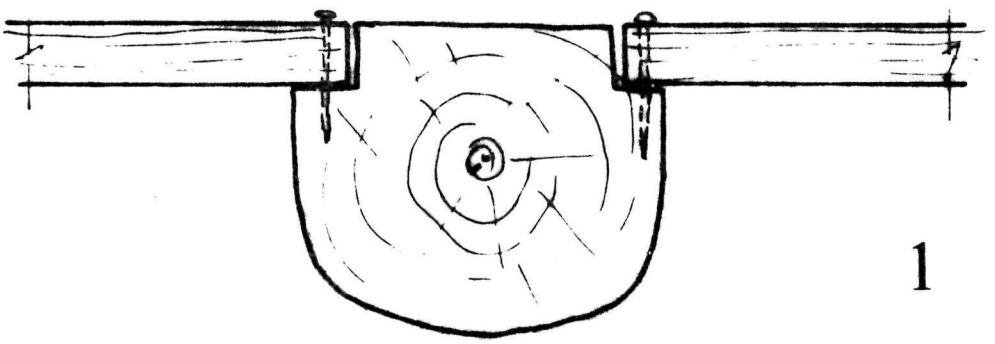
1 Section view of timber and plank in gate recess area.

2 View of recessed timber.



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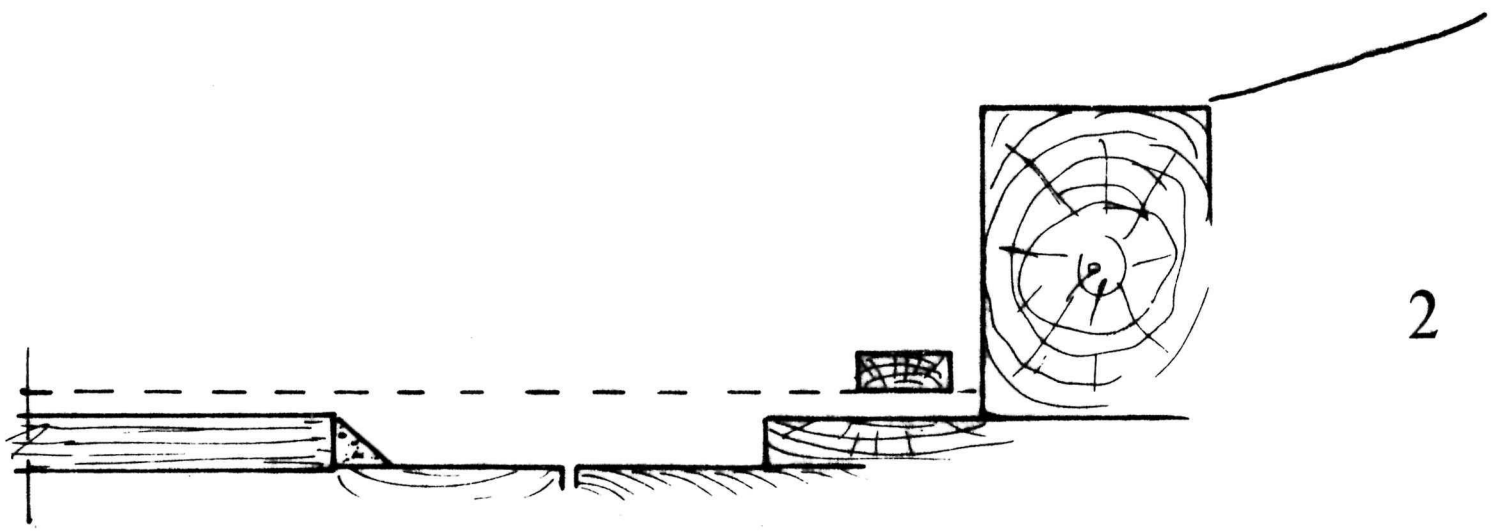

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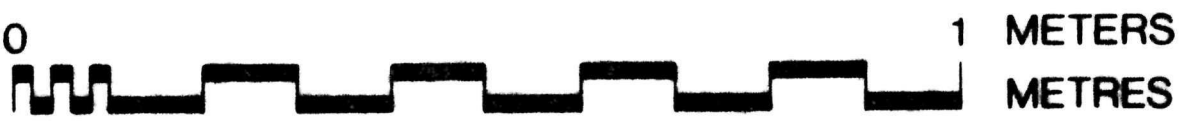
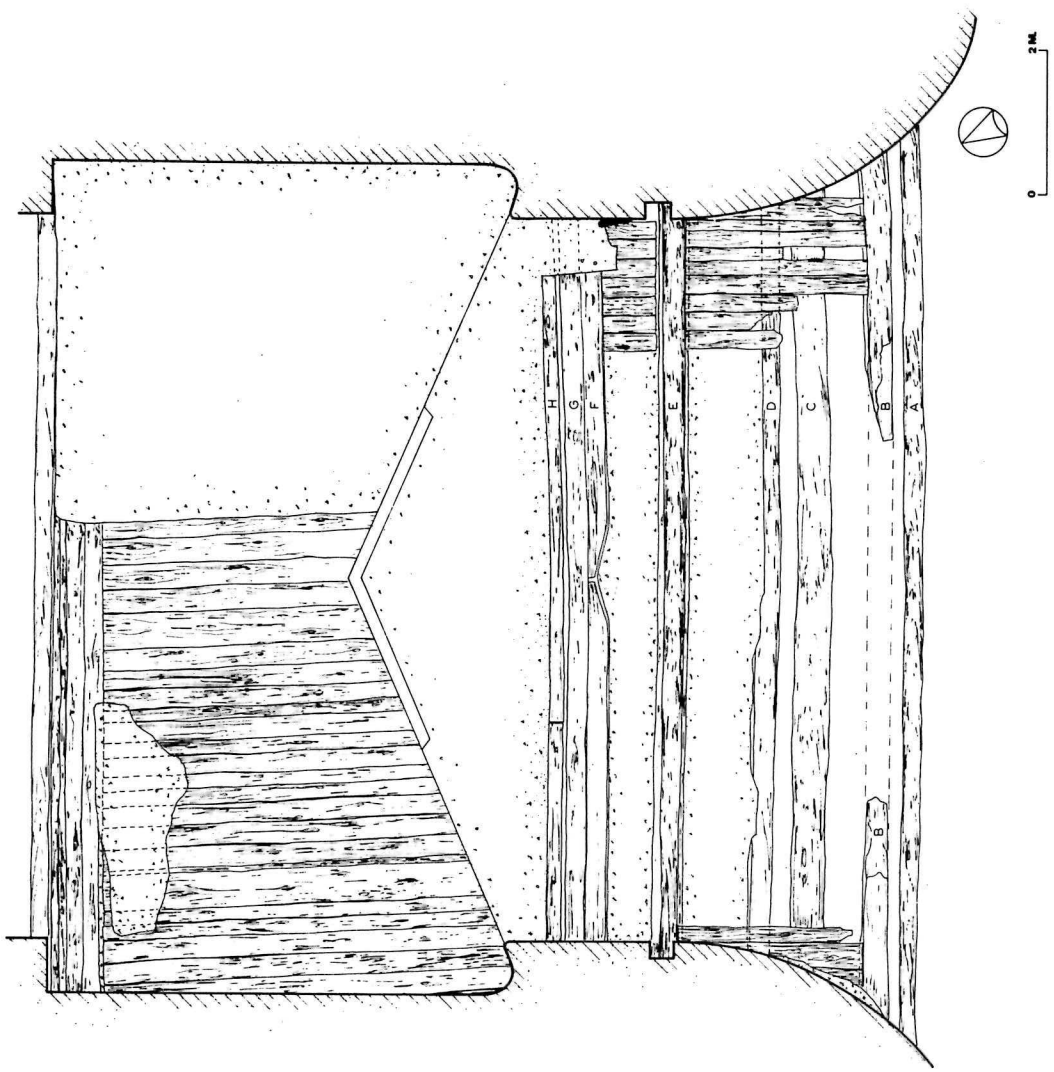


3 Overview of lock showing three main features.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