DEFENSIBLE LOCKMASTER'S HOUSE

DAVIS LOCK, RIDEAU CANAL:

A COMPARATIVE STRUCTURAL HISTORY

Margaret Carter

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CONTENTS

Introduction ........................................................................................................... p. 1

Chapter 1: Construction of the Defensible Lockmasters' Houses .......... p. 3
Chapter 2: Original Form, Structure and Composition ......................... p. 36
Chapter 3: From British to Canadian .............................................................. p. 83
Chapter 4: Renewal: 1874-1897 ................................................................. p. 96
Chapter 5: A Lockmaster's House in the Twentieth Century .............. p. 118
Chapter 6: Private Rental and Beyond ..................................................... p. 174

Endnotes: Chapter 1 ......................................................................................... p. 166
Chapter 2 ........................................................................................................ p. 175
Chapter 3 ........................................................................................................ p. 183
Chapter 4 ........................................................................................................ p. 187
Chapter 5 ........................................................................................................ p. 194
Chapter 6 ........................................................................................................ p. 203

Figures ............................................................................................................... p. 208

Appendix A: Circular to Foreign Stations No. 239 ......................... p. 268
Appendix B: Comparison of Exterior Wall Facades and Roofs of Defensible Lockmasters' Houses on the Rideau ............. p. 272
Appendix C: Royal Engineers' Aides Memoires on the Construction of Loopholes ........................................ p. 276

Appendix D: Triennial Contracts for the Construction Trades on the Rideau and Ottawa Canals ........................................ p. 288

Appendix E: Empire Steel and Shingle ........................................ p. 311

Appendix F: Pedlar's Iron V Crimp Roofing ........................................ p. 313

Bibliography ........................................................................ p. 314
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The defensible lockmaster's house at Davis Lock was built in 1842. It was one of sixteen similar buildings constructed by the British Ordnance Department on the Rideau Canal between 1837 and 1849 for use as lockmasters' residences. Thirteen of these buildings contained gun slits, and three did not. Located at Ottawa, Hartwells, Hogsback, Nicholson's, Clowes, Old Sly's, Kilmarnoch, Edmonds, Smiths Falls attached, Smiths Falls detached, Poonamalie, Chaffeys, Jones Falls, Upper Brewers and Lower Brewers Locks, defensible houses comprised the majority of lockmasters' residences on the Rideau Canal.

Since the late 1960s when Parks Canada first became interested in the Rideau Canal, work on defensible lockmasters' houses has been a persistent canal activity. Several have been restored, while others have been adapted for modern use. Individual buildings have been examined, planned and researched. In no case, however, has a successful explanation of the origins of this building form been made, or a comparison of its evolution examined.

This manuscript endeavours, in a limited way, to provide the missing historical and architectural context for defensible lockmasters' houses on the Rideau Canal while examining in detail the example at Davis Lock. In many ways this combination of activities is appropriate, for the defensible lockmaster's house
at Davis was built during the 1840-42 period in which the majority of these buildings were constructed. Later, as time and progress brought destruction and major alteration to many defensible lockmasters' houses, Davis remained relatively unchanged. The rarity of the Davis lockhouse emerges clearly from a comparative examination of these buildings in their later form. So too does the common picture of defensible lockmasters' houses on the Rideau Canal in the late nineteenth century -- the historical period best represented by the surviving architectural form of the Davis Lock example.
Chapter 1. CONSTRUCTION OF THE DEFENSIBLE LOCKMasters' HOUSES

i) Perpsective

The origin of the defensible lockmasters houses so common along the Rideau canal have long presented historians with an annoying puzzle. In the first preliminary examination of the canal, Georgina Wyman accurately identified what are still the persisting aspects of the problem:

Though it is extremely difficult to date each structure precisely, it is evident that the lockhouses in general were built during an approximate fifteen-year period (ca. 1832-1847), and that they doubled as residences and as posts of defence...

Those defensible buildings on the canal which were not blockhouses seem to have had certain features in common. They were "generally 27 x 27 feet, one storey high, built with rubble stone; cottage roof covered with tin". The size and design of those houses which were built of masonry but not loopholed are also apparently similar.

... Although plans of the block houses and guard houses have been discovered, there seem to be none extant for the defensible lockmaster's houses.

The following year, Judith Tulloch's intensive examination of canal history further refined the time period concerned:
The rebellions in Upper and Lower Canada in 1837 and the subsequent threat of invasion from the United States led military officials to embark upon a second period of construction of small fortifications along the Rideau.... Buildings of this type seem to have been erected between 1838, when work was begun at Nicholsons, Clowes and Old Sly's, and 1849 when permission was requested to tender for the lockhouse at Ottawa. Although accurate dating is often impossible because of the lack of unequivocal evidence, all the lockhouses of this design were in existence...[by] 1852.

In 1986, James De Jonge wrote a paper entitled "A Second Line of Defence: Defensible Lockmasters' Houses on the Rideau Canal" which examined the lockmasters' houses in the more precise historical contexts of earlier structures on the Rideau canal using comparative physical evidence obtained from early photographs as the basis for examining the lockmasters' houses themselves. De Jonge's manuscript provides an excellent early context from which to view these buildings. It also identifies both the existence or lack of loopholes and a variation in roof line as possible indicators of the history of the building type. Like Wyman and Tulloch before him, however, De Jonge was hampered by the lack of documentary evidence concerning the construction of these buildings.

Since the defensible lockmasters' houses were government buildings, designed by the Ordnance Office of the British Army and constructed under Ordnance supervision, they were probably documented extensively at the time they were constructed. The normal procedure for other types of construction
on the canal suggests that estimates and plans would have been prepared and submitted for approval before any activity took place: in most cases, such estimates would also have been followed up by detailed correspondence on construction activities and expenses. Unfortunately, the only official papers referring to the construction of the defensible lockmasters' houses which have survived and been identified appear to be restricted to one set of papers in the Public Archives of Canada, MG 13 WO 44, Vol.16, p.244-309 which contain canal repair and maintenance estimates for the years 1840-41, 1841-42, 1842-43, and 1843-44. Enclosures on these pages were prepared during the period December 1839 to December 1842 respectively. Contrary to most annual Estimates, the documents that remain for these years consist of summary pages with partial supporting detail only.

Despite a concerted attempt to locate such additional material as specifications, plans, approvals, discussions and accounts concerning the construction of these buildings, little new documentation has been uncovered in the course of this project. The time period in which the defensible lockmasters' houses were constructed is an extremely confusing one, and its documentation is voluminous. Under such circumstances, it is always possible that material has been overlooked. What has emerged from this search, however, is a context within which to view the construction of these buildings. This will be outlined below in the hope that it will provide both a better understanding and a more advantageous starting point for further research.
ii) The Background to Early Lockmasters' Accommodation

As both James De Jonge and Judith Tulloch have described at length, the early lockmasters' accommodation built along the Rideau by Colonel By consisted of blockhouses. The largest of these was constructed at Merrickville (1832-3), with smaller versions at Kingston Mills, Newboro and the Narrows (1832-3). There is evidence to suggest that when By built at least the largest blockhouse at Merrick's Mills, he was acting on approval to build a lockmaster's house instead. He wrote: "Lock Master's House provided for in the Estimate given to the committee and will be completed by the 31st August next". Shortly after approval to proceed was received, By changed his mind on the type of structure required: "I have taken upon myself the responsibility of deviating from the original plan by substituting a Block House for a Lock Masters House" for defensive reasons. In doing this, By was acting within the limits of his authority, for his orders left him free to amend his instructions in accordance with local requirements and report on these amendments afterwards.

The plans for the completion of the canal submitted by By to the Inspector General of Fortifications in May of 1832 do in fact show that By intended to substitute a combination of large and small blockhouses for lockmasters' houses along its entire length. This plan is interesting because it identifies all of the locations at which defensible lockmasters' houses were eventually built except Smiths Falls detached and Ottawa. It proposed the construction of large blockhouses at Smiths Falls (attached), Jones Falls, and Merricks Mills (noted on the plan as "in progress"). It also proposed the
construction of small block houses at Hartwell's, Hogsback, Nicholson's, Clowes, Maitlands, Edmunds, Old Sly, Smith's Falls First Rapids (i.e. Poonamalie), the Narrows, Isthmus (noting "small block house in progress), Chaffey's, Davis' Mills, Brewers Upper Mills, Brewers Lower Mills, and Kingston Mills (also noting "small blockhouse in progress").

Estimates for construction of the lockhouses originally intended for the 7 canal had been L 150 per building. At the time of the Parliamentary inquiry into By's activities, the cost of constructing blockhouses instead of lockmasters' houses as By proposed was not clear. The blockhouses at Merrickville, Kingston Mills, and Isthmus were still under construction, and work on another at Burritt's Rapids (not mentioned on By's May 1832 list) had been begun. British officials inquiring into By's expenditures found it difficult to assess the accuracy of By's estimates for the proposed blockhouses, or indeed the availability of funds for building them.

In the papers presented to the House of Commons & reported upon in 1832 the Estimated expenditure was stated at L 803774 including therein L 41.750 for the erection of Block Houses, purchase of land, compensation for damages & c....

It does not appear however from the papers now [February 4 1833] transmitted whether any larger sum than L 10151.12.8 has been expended of the sum of L 89230 estimated for the purchase of land, Block Houses &c [in the areas already approved -- i.e. Merrickville,
Newboro, Kingston Mills and Burritt's Rapids] nor whether any larger sum than L 10151.12.8 will be required on that account.

Before My Lords give any sanctions upon the subject [of building further blockhouses] they request to receive information on this point.

By's reply to this request was evasive. On February 14 1833 he wrote that to that date canal expenses included

L 3500 on Blockhouses and Bridges & L 241.6.8 [would be] required to complete the contracts, leaving a balance of L 26628.3.6 on the estimate of L 80374.5.6 marked Feb 7 1832; but of this sum L 11139.11.5 3/4 has been expended on repairs; consequently the actual sum unexpended on the said Estimate is L 15,488.11.11 1/2 leaving the sum of L 22761.8 1/2 which may be required for the following ... [A list of items is given which includes] L 4,250 for Block Houses & Bridges not immediately required.

The Treasury countered in a Minute dated 2 July 1833 stating that the blockhouse construction to which By was already committed would require half of the money available for these purposes. The Treasury refused to sanction the expense of further funds until the half already committed had been fully spent. This edict effectively halted the construction of any new blockhouses or lockmasters' houses, for it stopped payment on the main canal construction grant until both cost estimates and expenditures to date were better understood.
Meanwhile, By was dismissed and officials, both in Canada and in Britain, fought hard to obtain control over the situation. Even though the money for canal activities continued to come through a special Rideau Canal Vote that was submitted to Parliament as part of the Miscellaneous Expenses and administered by the Colonial Office, the actual operation of the canal was placed under the administrative control of the Ordnance. This meant that canal operations were no longer directed by an officer in charge with authority to respond immediately to local circumstances, but instead that all decisions and actions affecting the canal were subject to normal Ordnance procedures.

Practically speaking, this change brought not only much greater central control but also the use of well established military procedures for accomplishing canal objectives. Even before he assumed responsibility for the canal the Commanding Royal Engineer was cautionned that "all matters connected therewith will have to pass through, and be reported on by you". This meant that all canal expenses had to be submitted and approved through normal military channels before they were made. As the Commanding Royal Engineer was instructed,

you will give very particular Instructions to Captain Bolton [By's successor] ... that he is on no account whatever to incur any expense for Works or Repairs on the Canal, without receiving authority for the same previously obtained from the Master General and Board in the usual manner, on Estimates to be transmitted for Approval.

Canal plans would no longer be drawn up by engineers in the field or by the
Canal Storekeeper. After this time "the Engineer Office shall be held responsible not only for the plan but for the construction of the work by whatever mode performed". Succeeding Rideau plans, therefore, were drawn up by the Ordnance Engineer's Office in Montreal, and superintended by its representative in the field.

Financial arrangements became much more complex too. Within the Ordnance operation of the canal itself a division was made between on-going operational costs and those for construction, maintenance and repair. The Canal Storekeeper who reported to the Commissariat Office retained authority for on-going operational expenses only. The other expenses became the responsibility of the Ordnance Clerk of Works in Quebec. Under normal Ordnance procedure, the Clerk of Works set the terms of contracts, confirmed the selection of contractors, and submitted his decisions to the Board for approval. An employee from the Quebec office then travelled to the building site to review and approve the works constructed before any payment to the contractor was made. From the beginning, the Rideau was recognized to be a special situation, and the Clerk of Works appointed not one but two representatives especially assigned to canal activities: one in Bytown and the other in Kingston. Although these men had the authority to contract for the completion of discreet individual projects, they also seem to have been empowered to contract directly for goods and services required by the canal as a whole. In practice, this meant that at any time there could be (and usually was) a group of craftsmen whose labours were individually contracted to the Clerk of Works for canal services.
On the larger scale, the change to Ordnance administration meant increased financial complication. From the time the Ordnance took control, the Commissariat was ordered to keep a separate account for Rideau expenses and send a quarterly account to the Master General and Board of Ordnance. This group (who managed the Ordnance) would then submit the account to the Colonial Office (which had received the original and supplementary Parliamentary grants for Rideau construction) and be reimbursed for the expenses that had been incurred. In addition to this money, Parliament decided in 1835 to vote an annual sum to provide for the regular maintenance and administration of the Canal. This too was to go to the Colonial Office which, in turn, would forward it to the Ordnance as required.

From the outset this system was riddled with problems. By 1834 Parliament had still not approved the 1833 budget for the Rideau as the Treasury was still reviewing expenses made to 1832. To cover this gap, the Ordnance loaned money acquired by a warrant on the Military Chest to the Commissariat department to use as funds to continue Rideau operations in 1833, but could not continue this practice in 1834 as the Treasury refused to reimburse the Ordnance itself for any Rideau expenses except those expended by the Commissariat directly on Ordnance services. Ordnance officials read this situation as an indication that future funds for Rideau operations would not only be heavily monitored, but also that they would be difficult to obtain.

In this environment, the Ordnance set about obtaining the necessary information to complete the canal while trimming every possible expense. One
of the first items on the agenda was completion of the blockhouse By had begun at Burritts Rapids. Not only was this justifiably an Ordnance expense which qualified for immediate return of the cash expended, but its completion would also provide an indication of the cost of completing the blockhouses along the canal recommended by Col. By in an Ordnance monitored situation. In September of 1834 the Commanding Royal Engineer wrote to the Inspector General of Fortifications that "Captain Bolton estimates the expense of completing the Block-house at Burritts Rapids deducting materials in Stone and available at L 208.10.4 1/2." Since the first storey had already been completed, Bolton suggested adding a roof and adapting the existing walls to finish the building as a one storey structure. This objective could be accomplished for L 80, and was accepted as the best solution.

Once the lockhouse/blockhouse at Burritt's Rapids had been completed, no further lockmasters' accommodation was constructed until 1838. There at least two reasons for this. The first is that in 1833 Parliament had refused to sanction further moneys for the construction of blockhouses from the 1832 Rideau canal grant until outstanding expenses to be paid from the same portion of the canal grant were clear. These included the purchase of land, the payment of damages caused by canal construction, the costs of bridge construction, and the payments for contracts already committed. As a result, during the first few years in which it was responsible for the canal the Ordnance did its best to resolve these expenses, leaving the matter of lockmasters' accommodation until a later date.
The second reason is that after 1830 Great Britain was much less willing to finance either military defence or colonial expenditure. The year 1830 marked the end of twenty-five years of Tory domination of the British Parliament, years in which defence spending had had a free hand both in the construction of works at home and in the undertaking of vast colonial projects which, like the Rideau Canal, began with defence objectives but contained considerable economic benefits as well. This era ended in 1830 to be replaced by a series of weak governments, all dominated by the Economical Reform Movement which was committed to reduce the costs of government. Under this new regime, both military and colonial expenditures began to be scrutinized much more closely and Col. By, through his activities in constructing the Rideau canal, was one of the first victims of that scrutiny. In the mid 1830s the British government began a campaign to convince Upper Canada to pay for the on-going maintenance and future development of its own canals. As the first step, it adopted the stance that the role of all canals in Upper Canada was primarily economic, not defensive, in character.

In view of this attitude, it was by no means certain whether lockmasters' houses along the Rideau canal should continue to follow the original guidelines of the Kempt Committee for "such a Construction of the Lock Houses (which will serve as a rendez-vous for Militia) as will secure protection against small numbers". In 1832, Senior Royal Engineer officers had recommended purchase of the wooden dwellings built by the contractors during work on the lock stations. This ... course was
followed at Black Rapids, Long Island and Kingston Mills where the contractors shared the expense of constructing the house and later transferred the building to canal use.

Clearly, these buildings were not defensible. Two years later the Rideau's chief officer, Captain Bolton, also indicated that defensibility was not a high priority. During correspondence on the Burritts Rapids blockhouse he stated "that a very comfortable log-house could be erected for L 40 which would answer every purpose and last many years." Senior Engineer officers, on the other hand, decided to opt for the doubled but still moderate cost of placing a roof on the existing half completed blockhouse. It should be pointed out that while this course could be justified by the fact that the walls had already been built with government funds, the resulting building was neither defensible nor non-defensible. It was a compromise -- less defensible than the intended blockhouse which could always be completed if required, but certainly more defensible than the cheaper log alternative Bolton provided. In fact, the decision on the Burritts Rapids blockhouse suggests that Ordnance officers wished to avoid confronting the issue of whether or not lockmasters' houses should be defensible, and they could safely do so as long as they did not actually have to build one. During the mid 1830s, Parliament's refusal to sanction further blockhouse construction on the Rideau until commitments were clarified provided a convenient reason to avoid the issue entirely. In the meantime, Ordnance officers busied themselves clarifying the costs of the canal lands, damages and bridges that were to be paid from the same funds.
They also directed their construction ambitions to other potentially more successful areas like the Ottawa canals. There Ordnance officers considered building a lockmasters' house at Carillon in 1835. Specifications have survived:

The lock master's house is proposed to be built of stone in a substantial, permanent manner as the others along the Ottawa Canals have been. -- and being detached at a distance from any Market or Stores, 3 Rooms seem requisite for the accommodation of a lock Master and his Family in a creditable Manner.

A small Musquet proof Block House 23'6" square, the same as those on the Rideau, might be suited, some pounds under L 218 2 8 1/2 Sterling, the sum Estimated therefore, which I should think favourable to [lockmaster's quarters already constructed at] the Station Houde, but it is an increase of expense -- either however might be borne upon the Balance on the monies granted for the Construction of the Ottawa Canals."

The dimensions given for this building are identical to those of the small blockhouses By commissioned at Newboro and the Narrows, suggesting that these earlier small blockhouses on the Rideau served as models for the lockmaster's house proposed at Carillon. The Carillon lockmaster's residence was never approved for construction, however, indicating that it too fell victim to reductions in defence spending. Its design does, nevertheless, serve as a measure of Ordnance ideas concerning acceptable defensible lockmasters' accommodation by 1835: they had not changed.
iii) **Construction of the First Defensible Lockmasters' Houses**

In 1838 construction of the first group of square stone lockmasters' houses was built on the Rideau at Nicholson's, Clowes, and Old Sly's. The general construction of these buildings was defensible, as was the construction of lockmasters' houses built later along the canal -- all had thick stone walls, tin roofs, protective porches and heavy central fireplace constructions. They did not, however, have the loopholes of the later buildings. In exterior appearance, they resembled normal stone cottages, albeit stone cottages characterized by a distinctive hip roof rarely seen in Canada except in Ordnance buildings.

Since no direct evidence has been uncovered regarding the approval and planning of these buildings, a discussion of why they were constructed as they were can only be conjectural. There is, however, one indication that serves as a beginning point. It is the fact that when construction of these buildings began early in the spring of 1838, it was entirely unanticipated. The lockmasters' journals at Nicholson's lock, where the first of these buildings was undertaken, show that in September of 1837 labourers at the station were employed sinking a cellar for the old lockmaster's quarters, indicating they were to be improved for long term use. Yet in March of 1838 the same journal records "Rec'd R.C.O. ordering the Cellar and Foundation of the New Lock House to be dug Immediately", and the same men with additional assistance from lock labourers from nearby locks began to sink a second cellar in a different location. Such an abrupt change in plans surely shows that construction of a new lockhouse was not anticipated, an interpretation...
supported by the fact that there is no provision for funding or plans for
Rideau Canal lockmasters' houses in either Canal Estimates or Barrack Estimates
during the time period 1834-1837.

The impetus for change seems to have come from the Upper Canadian Rebellion
which occurred in November of 1837. Clearly, the decision that permitted
construction of the lockmasters' quarters occurred during the months immediately
following. This raises the questions "Who made the decision?" and "Why was it
made?" There are three possible explanations for this -- all of them
extraordinary.

The first and most commonly assumed is that the lockmasters' houses were
built as defensive works to protect Canada against American attack during the
Rebellion. If so, Sir John Colborne, Commander in Chief of Her Majesty's Forces
in British North America, is the most likely person to have commanded their
construction. There is, however, nothing in Colborne's papers to support this
contention. Instead, his papers show that from the earliest days of the
Rebellion Colborne's strategies for defending Upper Canada against an American
attack focused on the border area. The Rideau Canal did not play a
part in his schemes. In fact, the new defensive works and troops that appeared
on the canal in the aftermath of the Rebellion were not introduced until
intelligence reports written during the early summer of 1838 indicated it might
be attacked. Even then, two additional blockhouses at Jones Falls and
the Whitefish Dam were considered adequate to protect the canal from plundering
raiding parties, the only form of attack anticipated.
A second person who might have approved construction of the lockmasters' houses was Sir Francis Bond Head, the Lieutenant Governor of Upper Canada. Head was only in Upper Canada until March of 1838, but Colborne's papers indicate a conflict between Colborne and Head over the authority to approve defence expenditures. "I find many expenses have been incurred partly by the authority of Sir Francis and partly by the authority of Colonel Forster", wrote T.J. Sutherland to Colborne when he queried the use of special defence funding. Forster was Commander of the Militia in Upper Canada, and Head was its nominal Commander in Chief. While it is unlikely that Head alone would have had the authority to intrude in the Ordnance chain of command and make this decision, the fact remains that that the Kempt Commission had identified the lockmasters' houses as "a rendez-vous for Militia", small centres of local defence. Head may have been able to influence the Colonial Office in Britain to approve construction of the lockhouses as barracks for the militia in the period just after the Rebellion. Under the circumstances, the Ordnance was unlikely to refuse funds for canal construction.

This interpretation may not be too far-fetched, for there is evidence to suggest that during late 1837 the Colonial Office might well have been receptive to such a request from Head. An index of the correspondence between the Colonial Office and the Governor General of British North America's office strongly suggests that both Head and Colonial Secretary Glenelg expected the Upper Canadian militia to be both willing and able to defend the Province. On November 30, 1837 Glenelg wrote:
Acknowledging despatches No. 117 and 119 of October 25 and November 3 enclosing two letters from Head to Colborne explanatory of the motives which induced him to urge the withdrawal of troops from Upper Canada. Glenelg expresses his conviction that the Lieutenant Governor would not have urged the withdrawal without a full consideration of all the consequences which it might involve, and gives his full approbation.

Even immediately after the rebellion had occurred, both Glenelg and Head continued to look with favour upon the idea of the Canadian militia defending the province. Approval of the Rideau Canal lockmasters' houses may have appeared to be a step in strengthening the militia's ability to deal with this responsibility.

The third possibility is that a high official in the military in Britain, recognizing that the rebellion would mean the availability of some short term additional funds for military purposes, sanctioned construction of the lockmasters' houses. In this, he may have been acting with the approval of Glenelg (for the purposes stated above), or he may have expected to be able to bury the expenses in other military costs. The stated purpose of these houses as a gathering point for the militia would have provided a sufficient justification for this decision in the late months of 1837. Certainly military officials, frustrated with Parliament's 1835 decision to cut back on military spending, were anxious not only to complete the canal but also to prove they
could perform a useful function responsibly. If a high military official gambled that the Rebellion would provide a golden opportunity to further these objectives and approved construction of the lockhouses, his gamble appears to have been justified. In 1838 Parliament panicked under pressure of the combined threat of American invasion and the fear that such an invasion would be supported by the Upper Canadians once they realized they had been abandoned. It approved the release of all previously requested funds for the Rideau and other Canadian military projects, hoping to provide sufficient money to permit officers in Canada to face any contingency that arose. Moneys from the 1836-37 Estimate arrived in the middle of the year. As well, in December

the Lords of the Treasury have stated that they have directed the sum of L 8,675.5.1 being the remains of the Grant for 1832 for the Rideau and Ottawa Canals; and the sum of L 14,000 of the Grant of 1837-38 to be paid to the account of the Paymaster General ... on account of Ordnance Services ....

By 1838 Rideau coffers contained funds for the first time in many years.

It would be useful to know who approved construction of the lockmasters' houses and why they were sanctionned. These questions are important for an understanding of why the first three buildings were built in a rush in early 1838 and no others were constructed until mid 1840. In terms of physical design this information would provide a clear explanation of why the
first group of buildings do not have the loopholes so evident on the second. Circumstantial evidence does, nevertheless, provide an explanation for this as well.

Regardless of who officially approved the construction of the first lockmasters' houses in 1838, their construction was obviously undertaken immediately as the result of an emergency decision. No matter who assumed the responsibility for that decision, it was clear that funding for the construction of these buildings would eventually have to be approved by Parliament. This was not likely to be an easy road. Not only were Rideau Canal expenses under particularly close scrutiny in Parliament at the time, but since 1835 Parliament had been devoted to a course of reducing all military expenditure. Moreover, the British government had adopted the official view that all of the British North American canals were commercial rather than defence enterprises, and with this justification was seeking to transfer responsibility for their maintenance to the colonial legislatures. Under these circumstances, the climate for approval of extensive military construction along the canal once the contemporary crisis of the Rebellion had passed was not ideal.

Military officials did, nevertheless, wish to use some of the extra funds available in the wake of the Rebellion to further the canal's completion. As a result, they tried a new approach to cost effective military construction. Earlier they had been forced to adapt previously proven military forms such as blockhouses to serve essentially a residential function while reducing their
cost and consequently their effectiveness through the use of cheaper materials. The new approach reversed these priorities. It provided a well built residence that was, if required, strong enough to serve as a defence. The building that was constructed resembled the tollhouse built by the Royal Staff Corps on the Royal Military Canal at Iden in 1834 (Figure 1) in the hope that its familiarity would make it acceptable.

The second group of defensible lockmasters' houses was built under quite different circumstances. On May 20, 1840, control of the entire operation of the Rideau and Ottawa Canals was transferred to the Ordnance. Since the background to this change is important to an understanding of the lockmasters' residences constructed during and after 1840, it will be briefly explored here. Late in 1838, the British government received confirmation of earlier intelligence reports "of extensive preparations alleged to have been made on the American Frontier for an attack on the possessions of Her Majesty in Canada". The effect of this report was further complicated by Colonial Secretary Glenelg's belief "of an organization of the disaffected in Lower Canada which might lend a most pernicious aid to any attack from without". Together, these perceived threats substantially altered Britain's attitude towards the need to defend Canada.

For the first time, Britain began to consider what would be required to defend the colony. The British Parliament, still unwilling to commit long-term funds towards colonial development and expenses, took a long and careful look
at the estimates submitted for the year 1839-40 which included large sums for Canadian defence. (These estimates were not passed until February of 1840, and in the meantime Ordnance officials on the Rideau complained that they had missed the entire construction season. ) While British politicians were not willing to abandon their public insistence upon the reduction of colonial expenditure, they came to fear that unless they showed some active support they would lose Canada entirely. By the end of 1838 Colonial Secretary Glenelg, who had been prepared to withdraw the British Army the year before, forcefully stated it was necessary to allay "the impression which appears to have ... prevailed in Canada that the Loyal Inhabitants of the Province were to look for no support from this Country." The result was a decision by the British Parliament to publicly hold to their principles by keeping normal yearly expenses very low, but to provide special funds to shore up their Canadian position.

These funds, officially entitled "Extraordinary Expenses in Consequence of the Revolt in Canada", were initially intended to cover expenses "incurred for barrack accommodation for military engaged in protection of frontiers or in suppression of insurrectionary movements". In practice they were used to complete many large capital defence projects in Canada, including some on the Rideau Canal. Three groups of funds were granted under this heading: one in 1841 which covered expenses from the years 1837-41, one in 1843 which covered moneys spent in 1840-43, and a final one in 1844 covering all remaining expenses. The existence of this fund is the source of the problems in tracing information on the defensible lockmasters' houses on the Rideau Canal. During the years 1840-43 at least, items entered in Rideau Canal Maintenance
and Repair estimates were red circled and removed to be included in the paperwork on special votes for this fund. Once they had been removed, no indication generally remains of their content. That Rideau lockmasters' houses were involved in this process is indicated by a notation on the 1842-43 Estimates. It reads:

Item 26. provides L280.9.1 1/2 for the renewal of the Lock Masters and Laborers House at Upper Brewers' Mills. -- This service stands for approval, agreeably to the revision of a similar service, under Item 24 which has been deducted in red ink in Canada, as well as Items 29, 30 & 31, but such a course should not be repeated because red ink, according to the usual practice, should only be used for alterations made in this [British Ordnance] Office. The Commanding Engineer should send home his Estimates perfect or with a special covering report where he could suggest alterations.

There are many problems in tracing information on the lockmasters' houses contained in this special fund. The material from only the first grant appears to have been grouped and copied as a discreet volume. It contains information on the blockhouses constructed at Jones' Falls and the Whitefish Dam, but does not appear to hold any information on lockmasters' houses. In all likelihood these were grouped as a single estimate and included in either the 1843 or the 1844 vote. Unfortunately, the location of the papers to cover these specific votes has not yet been determined.
Before continuing with the effects the existence of this fund had on the design of Rideau Canal lockmasters' houses, it is necessary to establish one more point. This is the fact that the lockmasters' houses were considered military buildings. In 1838 the British government was successful in transferring the responsibility for the operation and maintenance of all Canadian canals except the Rideau and the Ottawa to the colonial governments. Under the influence of Cornwall merchants who wanted a local canal to by-pass rapids on the St. Lawrence, the Legislature of Upper Canada refused to accept the Rideau Canal because it was not commercially viable. The content of their argument is fully recorded in a report by Lieutenant George Phillpotts on the Inland Navigation of the Canadas. Briefly, Phillpotts concluded

although the Ottawa and Rideau Canals are most useful in a military point of view, and in the event of a war with the United States they would be invaluable, yet they are so circuitous, and so much impeded by lockage, that they will not answer for commercial purposes...

While this statement was hotly contested by Colonel Oldfield, the Chief Royal Engineer in Canada, a further report by J. MacAuley argued that economically, the Rideau was of greater value to Britain as a corridor for the shipment and settlement of immigrants than it was to the Upper Canadian merchants. The result of all these reports was that the British Parliament agreed to accept responsibility for the Rideau and Ottawa Canals because of their defensive value to Great Britain. From May of 1840, the Ordnance was given full responsibility for both canals and they were treated as
part of the defense works of the Canadas.

The fact that 20 May 1840, the date of the transfer of the canal to full Ordnance operation, preceded the calling of tenders for the second group of lockmasters' houses is significant. Tenders for the completion of lockmasters' houses at Maitlands, Edmonds, Smiths Falls (attached) and Jones Falls to be completed by 31 May 1841 appeared in the Bytown Gazette on 20 August 1840. On the 12 November of the same year, these were followed by a call for tenders for additional buildings at Smith's Falls Detached Lock and First Rapids (Poonamalie) "to be completed by the 31st of August 1841". While it is likely that provision for the construction of these buildings was made in the 1839-40 Estimates approved by Parliament in February of 1840, these were nevertheless the first lockmasters' houses to be built after Britain had agreed to accept continued responsibility for the Rideau and Ottawa canals as military canals. It is important to note that the lockmasters' houses built after May of 1840 were the first on which loopholes or musket slits appeared, for there is every likelihood that the addition of loopholes to these buildings was as much a public design statement as a defensive necessity -- a statement that they were military buildings on a military canal.

During late 1840 and early 1841 British military forces were in the process of deciding what strategy for the defence of Canada they would put in place with the funds made available through the "Extraordinary Expenses in Consequence of the Revolt in Canada". The Rideau and Ottawa Canals were of necessity included in this planning although intitially their role seems to have been
somewhat unclear. One of the major problems the British faced in their planning was the provision of adequate barrack accommodation, since a lack of accommodation for troops had been a major problem during 1837-38. In a memo dated December 1840, Lord Sydenham instructed the Master General of Fortifications:

... the Inspector General will be pleased to notice the existing state of the Barracks, distinguishing the permanent from the temporary, and consider how far it may be advisable in the event of determining to fortify, to combine the two objects of Defence and Accommodation for Troops by erecting Barracks capable of resisting a Coup de Main, on points where works capable of standing a siege may not be required.

In a bid to include the Rideau and the Ottawa in these plans, Col. Oldfield is recorded as having suggested that

The Block Houses and other buildings occupied by the Lockmasters and their Assistants would furnish Barrack accommodation for the Troops on the Rideau Canal.

It is doubtful, however, whether this occurred since the lockmasters' buildings appear in Maintenance and Repair rather than Barracks estimates for 1840-43.

In a further proposal for the defence of the Canadas prepared by Sir R.D. Jackson, Commander of the Forces in British North America in February of 1841 the defensive purpose of the Rideau and Ottawa Canals is for the first time stated:
As the frontier line of the St. Lawrence cannot be used as a communication in time of War, We must depend upon that by the Ottawa and Rideau.

Jackson divided the defences in Canada into four districts, and allied the Ottawa and Rideau Canals to the Montreal District. His plans for a defence system on the canals was, however, not ambitious enough to include the lockmasters' houses:

For the protection of the Rideau and Ottawa Canals we should strengthen our posts at Carillon and Kingston Mills and at the White Fish dam, whatever may be required at Bytown for the accommodation of Troops or stores should be in reference to the expense of that important post, the site of which is admirably calculated for a Fortress or depot, and which may, at some period, perhaps not very remote, become a place of the first consideration in Canada.

In Jackson's proposal as in those that preceded it, the outline of both the defensive role of the Rideau Canal and the structures required to protect it were very limited. It is doubtful whether at the time the first loopholed lockmasters' houses were built they were expected to serve any but the most remote defensive purpose.

During mid 1841 a series of organizational steps occurred that effected
both the means of construction and the means of accounting (and therefore the
location of supporting paperwork) for additional lockmasters' houses. On March
8, 1841 the Inspector General of Fortifications was instructed

that, for the present, such assistance as may be required by the
Engineer Department at certain Stations in Canada should be
sanctionned, and the necessary funds provided, by the Warrant of
the Commander of the Forces, as a charge against the Canada
Extraordinaries.

That this sanction to incur construction expenses included the Rideau was
endorsed by a memo the following week:

In reference to the third paragraph of your letter wherein you
suggest that the charge of the Rideau and Ottawa Canals should
be vested in the Commanding Royal Engineer in Canada, the Master
General and Board direct me to observe that they conceive your
opinion may be fully acted upon in this respect ... [except
in the matters of revenue and trade which are handled through
a different set of authorities].... The Master General and
Board request you will make a communication to this effect to
the Commanding Royal Engineer in Canada, so that the question
may be duly undertaken and any impression of a contrary nature
which it is believed formerly existed, and may possibly yet in
some degree prevail, may be altogether removed.
Immediately following this confirmation, provision was made for Rideau officials to deal directly with the Board of Ordnance in London by-passing the Respective Officers in Montreal, but whether permission for this unusual chain of authority extended to the Repair and Maintenance activities under which construction of the lockhouses was included or merely to matters of revenue and trade is not certain. This permission was given until property rights along the canal were settled. If this chain of communication was followed with respect to engineer activities (i.e. construction), it provides one possible explanation for the location of papers relating to the lockhouses.

In May of 1841 British authorities granted what amounted to carte blanche in the expenditure of military funds to "Governors or Commanders of the Forces in the Colonies in cases of emergency and pressing necessity which prevent previous reference to the Authorities at home." The specific procedures under which this provision was to operate are outlined in Appendix A as they may be of assistance to historians in future attempts to locate papers concerned with these lockmasters' houses. There is little doubt that this is the provision under which the remaining lockmasters' houses were sanctionned, and expenses on all of the lockmasters' houses were removed from annual Rideau Canal Maintenance and Repair Estimates and paid. Expenses incurred under this authority were paid by special Parliamentary votes on "Extraordinary Expenses incurred in Canada in Consequence of the Revolt" or Canada Extraordinaries. Moreover, there is every indication that expenses made under this heading were subject to neither the standard provisions for the construction of public works nor the usual administrative checks and balances.
of public expenditure. When Ordnance officials protested against the irregularities of administration under this provision, complaining that whatever Engineer Establishment may be authorized in Canada should be provided for in the Engineer Annual Estimate notwithstanding the expense may have been incurred under the approval of the Commander of the Forces by which these expenses will be brought under the scouting by Professional officers with the view of establishing every proper check upon the Expenditure, consistently with the efficiency of the Service they were informed

This is not understood. No scrutiny, professional or otherwise, can be applied to an Expenditure so authorised. The Commander of the Forces, is taking on himself the responsibility of ordering an expence, no check on that expence can take place, because it has been decided by competent authority to incur it, and the only proper way to provide for such expence is according to the Regulations of 12 May 1841 S/71, viz. by the Clerk of the Ordnance under the Canada Extraordinaries.

Clearly, the British government was making use of this provision to clear away all the loose ends of Canadian defence expenditure with the least possible expense and public scrutiny.
There is some indication that the price of securing this money may have been an order that the Royal Engineers make the Rideau and Ottawa Canals a profitable venture. In his history of The British Ordnance Department and the Canadian Canals 1815-1855, George Raudenz comments that for the first time during the 1842-45 period the Rideau Canal made a profit. Certainly evidence exists to prove that every attempt was made to make this possible.

One action undertaken under this new authority was permission granted on 7 July 1841 to increase the Temporary Civil Establishment of the Royal Engineers in Canada for a limited period. What this meant in practice is that new construction was no longer undertaken by publicly advertised contract. Presumably work on contracts that were already agreed upon, such as the five lockmasters' houses on which tenders were let in 1840, was completed. But new construction was performed "as much as possible by Measure and Agreement, as was the case when the Canal itself was constructed." There is a possibility that the traditional Royal Engineers' practice of employing military labour force may also have been followed to some extent, and that lockmasters and lock labourers were made part of the Temporary Royal Engineer Establishment for this purpose. Certainly the participation of these men is confirmed by a memo to Lockmasters written in 1843 which referred to "the Practice of detaching them [lockmasters and lock labourers] from their Stations to superintend and effect works at others." That lock personell was capable of performing this work is indicated by a list of men employed at the time. All work undertaken during time period, was heavily monitored by the Ordnance. Col. Oldfield, the Commanding Royal Engineer visited
the Canal in 1841, '42 and '43, and Major Bolton, the Senior Royal Engineer, was a constant traveller.

During this time period, the regulations effecting the supply of building materials were also simplified. Articles required ...[were] authorised to be purchased so far as may be necessary upon the spot" to save time and costs. What exactly this meant is outlined in a letter from the Inspector General of Fortifications to the Ordnance on December 9 1842:

I have therefore not recommended sending any Stores from England, but that the supply of those in the Demands, in cases where the performance of the Work by Agreement and Measure, cannot be resorted to, be procured in Canada, so as to avoid the inconvenience of sending Stores from this country and the creation of Establishments for the repair of Works, for the construction of which no such course was necessary.

A later letter from Col. Oldfield to the Inspector General of Fortifications confirms that all materials were purchased in Canada except the "Howick cement".

The application of these special provisions ended along the Rideau Canal on the 13 September of 1843. On that day, S. Thomas, Ordnance Storekeeper wrote a memo to lockmasters stating

The Master General and Board of Ordnance have desired that the
Lockmasters and Locklaborers should be considered part of the Storekeepers Department, and that the Practice of detaching them from there [sic] Stations to superintend and effect works at others, may be discontinued.

A few weeks later, this memo was followed by an order from Francis Ringler Thomson, Major & Captain Royal Engineers, stating

All work now in progress [is] to be compleated [sic] as soon as possible and for the Future all Work is to be done by the Contractor avoiding day work in all possible cases.

His memo continues to outline a system for requisitioning and monitoring work to be performed by contract in the future. These documents signal the end of the exceptional circumstances under which defensible lockmasters houses were most likely built at Hartwells, Hogsback, Maitlands, Davis, Upper Brewers' and Lower Brewers' Locks during the time period 1841-1843 since no individual approvals or contract tenders to support the construction of these buildings appear to exist at any other time. It is important to note, however, that the temporary provisions under which these buildings appear to have been built lasted for an additional year in Canada. A letter informing the Inspector General of Fortifications of "conditions to be observed in future contracts for Engineer works in Canada" was not written until September of 1844.
Two more defensible lockmasters' houses were built after this time. The first, at Chaffey's Mills was constructed in 1844. The second, at Bytown, was built in 1849. Tenders and presumably contracts for the construction of these buildings were issued according to normal Ordnance procedure. With construction of these buildings, the group of sixteen defensible lockmasters' houses built by the British Ordnance Department on the Rideau Canal was complete.
Chapter 2. ORIGINAL FORM, STRUCTURE AND COMPOSITION

The perspective on the construction of the defensible lockmasters' houses on the Rideau Canal provided by the previous chapter suggests that for analytical purposes they can be subdivided into four separate groups, each with distinct characteristics.

The first group consists of the lockmasters' houses at Nicholson's, Clowes and Old Sly's. These buildings were built in an emergency in 1838 by contractors under the supervision of lockmasters. Construction of the first began at Nicholson's with the digging of the cellar in February 1838, and required six months in all. A daily account of the progress and many details of the work survives in the Nicholson lockmasters' journal. This group of lockmasters' houses is physically most readily distinguished from the others by their lack of gun slits or loopholes.

The second group is made up of the lockmasters' houses at Maitlands, Edmunds, Smiths Falls attached and detached, Poonamalie and Jones Falls. These are the buildings for which tenders were published in the Bytown Gazette in August and November of 1840. Presumably most of these buildings were built by contractors, like the first group, with daily inspection by the lockmasters to ensure work was progressing with the agreed upon materials and
construction practice. At Jones Falls, which was "finished by Mr. W. Miller" on August 19 1841, the lockmaster appears to have spent very little time overseeing this activity. In his "Memorandum upon the nature and value of Labour as of Materials in Canada", Col. Oldfield comments that

The Contract system ... had been tried ... and there is every reason to hope that the attempt will be ultimately successful although it cannot be expected to work well at its first commencement. Much of the work on the frontier performed in consequence of the revolt was contracted by Americans.

Clearly there were some difficulties with the contract system. Oldfield hints at one of them when he states that "Much of the work ... was contracted by Americans". Local contractors did not always understand what the Royal Engineers had in mind when they let contracts, and built to a local standard instead. Oldfield's term "American" did not mean "from the United States", but rather "North American," and suggests there may well have been difficulties in ensuring that construction practices followed were ones the Ordnance approved. As a consequence, buildings in this group may well contain evidence of "American" practice that are not seen in Group Three lockmasters' houses. It is likely that all of these Group Two works were completed by the fall of 1841. Clegg's drawings made in early 1842 (Figures 2-12) depict most of them on location.

The third group of defensible lockmasters' houses is located at Hartwell's,
Hogsback, Davis, Upper Brewer's and Lower Brewer's. Since there are five of these structures, they are probably the items mentioned in the 1842-43 Estimates which identifies L 280.9.1 1/2 "for the renewal of the Lock Masters and Laborers House at Upper Brewers' Mills" as Item 26, and comments on "a similar service, under Item 24 ... as well as Items 29, 30 and 31". These buildings were constructed during 1842, and Clegg's drawings, made in the spring of 1842 show the buildings at Upper and Lower Brewer's and Hartwell's as completed. At Hogsback and Jones' Falls they do not illustrate the area of the lockmaster's house, while at Davis they show the same log lockmaster's dwelling depicted by Burrows earlier (Figures 13 and 14). There is, however, evidence to confirm that Davis had at least been begun by mid 1842. The 1842 census, which was taken in May records lockmaster Purcell's house at Davis in the category of "houses building" (as opposed to "houses inhabited" and "houses vacant") providing indisputable evidence of its date of construction. This third group of buildings was constructed by measure and agreement, by private workmen supervised directly by Ordnance officials. Just before undertaking construction of these lockmasters' houses, Oldfield commented that "On the Rideau Canal it is often difficult to obtain labour at any price", suggesting the probability that Purcell, the lockmaster at Davis who was a qualified mason, built the house himself.

The fourth group of buildings consists of the two remaining lockmasters' houses at Chaffey's and Ottawa. In 1844, the Ordnance released tenders for a Lockmasters house at Chaffey's Mills which were printed in the Bytown Gazette on 8 August 1844 requesting completion of the building by 1 November of that
year. There may be some doubt as to the actual date of construction of this building. Clegg's sketches, which appear to date from the spring of 1842, show a completed lockmaster's house at Chaffeys. (Figure 9). There is a possibility that Chaffey's was constructed under the measure and agreement system in 1842 before the contract system was reinstated and a contract later let for its construction as a means of covering the cost of completion of the 11 lockmasters' houses in Groups One and Two. In any case, the last defensible lockmaster's house was constructed at Ottawa in 1849, for a request to tender for the construction of building was made in that year. On the surface at least, both of these buildings were built by private contractors after the other defensible lockmasters' houses had been completed.

There is some merit to considering these buildings as a comparative group to attempt to learn more about their original construction in both its physical form and surrounding circumstances. Certainly all of them were built to serve the same purpose -- to function as lockmasters' houses on the Rideau Canal. All of them were also described by the Ordnance in roughly the same terms, as "Lockhouse 27'6' square, built of rough masonry covered with tin" while all but the Group One buildings also included the description "& loopholed". Eleven of these buildings, with the possible exception of Ottawa, also appear to have been built within the same relatively short, fairly continuous 1838-1844 time period.

For many years, these similarities led to the assumption that they were built from one standard plan. As Appendix B shows, this is most unlikely,
for there is considerable variation in the exterior composition of the elements on the facades of the individual buildings, even amongst the buildings of a particular group. In addition to their square form and stone construction, what the buildings do share is a common front facade, with a central door fronted by a porch and flanked by two balanced windows. A perusal of other Ordnance designed plans for the period, as represented by Figure 15 showing the plan for a Cook House to be built at Sorrel also the photographs of the tollhouse at Iden (Figure 1), and the "lodge" built as a barracks at Kingston Mills (Figure 16) reveals that this front facade composition was a relatively common feature of Ordnance design.

Further examination of the composition of the other facades used on the various lockmasters' houses as indicated in Appendix B, shows that the same distribution of elements on individual facades is often repeated. One form, for example, consists of an off centre window and an off centre door. A second consists of two off centre windows. A third consists of an off centre window and a loophole, while a fourth contains only loopholes -- two small ones on one side, and one large one on the other. A possible fifth is a facade containing two large loopholes. A sixth has only one central door, and a seventh may consist of only a central window. These facade forms are repeatedly used on different buildings, but they do not always appear in the same sequence or orientation. Moreover, since there are seven possible forms available for use on the three remaining facades of any building, all of them are never used at one time.
This variation in facade forms together with other small physical differences among the buildings despite their basic similarity suggests that they were probably built to a standard set of Ordnance specifications or construction practices, but varied according to the circumstances surrounding the construction of each individual building. With this in mind, an examination of the various features of the lockmasters' houses in the context of known Ordnance construction practices, contemporary circumstances surrounding construction of the buildings, and detailed information known about the construction of individual buildings is extremely informative about the structural roots of the general building type "defensible lockmasters' houses".

A comparison of the physical characteristics of the exteriors of these buildings reveals that all are built of stone, with stone walls, foundations, and porches. The nature of the stone does nevertheless vary, both in colour and size and in sophistication of workmanship. The stone on the building at Davis, for example is light grey and cut in large blocks of regular height, while that used at Kilmarnock is a darker grey with a strong buff component, cut at smaller, random heights. That at Jones Falls is pinkish in colour, and of a much rougher surface than the stonework on any of the other buildings (Figures 17, 18, 19). All of the buildings appear to have a vertical band of longer single depth stones that form a sill between the first storey and the basement. Window and door headers on all the buildings appear to be a consistent flat while the material used for window lintels varies from stone to wood, depending upon the building. Those at Nicholson's and Poonamalie (Figures 20, 21), for example, are of stone, while those at Davis, and Smith's Falls attached
(Figures 17, 22) are made of wood. Originally, every one of these buildings had a fire ladder, casement windows, and a tin roof. The roofs on the majority of the buildings were steeply sloped to a flat ridge (Figures 19, 23-27) whereas those on Ottawa, Chaffey's and Davis (28, 29, 17) were peaked. Chimneys of those buildings that have not been altered appear without exception to be brick. Let us look more closely at these features.

The variation in the types of stone evident on the different buildings, and the potential for their workmanship, is explained by Colonel Oldfield in his Memorandum upon the nature and value of Materials as also on Labour in Canada. According to Oldfield, stone for lockmasters' houses was obtained as close as possible to the site of each building. As a result, various types of stone were used. Oldfield elaborates upon what was available for construction along the canal:

Bytown, Hartwell, the Hogback ... The Country in the neighbourhood of these stations is formed of gray calcareous stone in beds from one to five feet deep. It splits well with plug and feather, cuts well for ashler work and produces lime of a good quality, with the exception of the upper courses which should be laid by for backing the stone as well as adapted for masonry of all kinds. The stone found at all the other Stations on the Canal is of the same description but harder....

Brewers Mills. Granite and other primitives are found here
and also a shaky sand stone at the upper mills. The stones are not good for building. Those used in the Canal locks were brought from distances varying from three to Six miles, but are very difficult to work and much discoloured by the Oxide of iron.

Jone's Falls. Sandstone is abundant here but it is too shacy to work. The ashlers for the locks which are cream coloured sand stones were brought from a distance of six miles from the first concession of South Crosby. The quarries where this stone is got are a trifling elevations, have little covering and required scantlings of sound ashlers can be procured from them. The stone when first quarried is very soft and easily worked, but soon on exposure to the atmosphere becomes hard. Granite is found at Jone's Falls on the west side of the Canal but no lime stone. That required for the Canal locks was brought from Ansleys Mills a distance of 2 1/2 miles.

Davis Mills, Chaffeys Mills ... The rocks at these stations are of the primitive kinds, but the ashler used in building the locks of the canal had to be procurred from quarries in the vicinity of those where the Ashlers were got for Jone's Falls: the stones had to be drawn to these stations distances varying from 7 to 14 Miles.
With these sources of stone in mind, it is possible to see why types of stone seem to be repeated at some stations and differ from the stone used at others. In the case of Jones Falls, it is also likely that the "shaky sandstone" available on the site may have been used to build the lockhouse, and that is the reason why it appears to be both pink and less finely cut than the stone on the other lockmasters' houses. In addition, it would appear that stone window sills may have been used on lockmasters' houses that were near quarries where ashlers were readily available, but it cases where they had to be transported for any distance wood was used.

As the description of the use of stone on these buildings above shows, they had few decorative features. The stone was roughly cut as was convenient for each type of stone used, not crafted into blocks. In cases like Davis and Chaffeys, where the stonework appears to be of a finer quality than elsewhere, this appearance is due to the type of stone used. The rougher appearance of Jones Falls is also due to the same source. There are really only two decorative features on these buildings. The first is the sill that surrounds the building at the division between the basement and first floor level. This is largely a structural detail, in which large slabs of stone act as sills to provide a ledge to support the floor above. The second deliberate detailing exists above the windows and doors (Figure 30) where the stone is laid on end in a fan-like pattern. This pattern is described in C.W.Pasley's Outline of a Course of Practical Architecture, which was used as a text for training Royal Engineers in Britain, as a straight arch "such as is always used for the windows and frequently for the doors of dwelling houses."
In the case of the defensible lockmasters' houses, the simple nature of the stonework is extremely important, for it indicates that these were to be solid houses for normal working men. They were not intended to project a fine image, and little time was taken with providing the careful detail that might have been used if, for example the stone had been hammered and dressed, or if it had had to be carefully selected for quoining or window and door surrounds. The stonework of these buildings indicates they were planned for quick relatively cheap construction and modest occupation.

The mortar used for constructing the stonework on the defensible lockmasters' houses also varied. As in the case of the stone, the reason for this appears to be that the mortar too came from different places in the locality of each building. Oldfield also wrote detailed descriptions of the materials available for use as mortar:

Rideau Canal from By town to the first Rapids. The lime produced from the calcareous stone in the neighbourhood of these Stations is considered of a good quality. The quarries opened for the work of the Canal produced stone easily burnt: the mortar made from this lime takes a long time to harden, and is a very bad water cement. An excellent river sand is found about 4 miles from By-town in the bed of the river Gattineau a little below the rapids and first falls, a good quality of pit sand is also found near By-town. Generally speaking the land is of a sandy nature in the neighbourhood of the Canal stations and a tolerably good building sand can be
obtained at these places.

**Kingston Mills and Brewers Mills.** The stone at Kingston Mills makes excellent lime. The lime required at Brewers Mills must be brought from Ansleys Mills from the lower portion of the eastern edge distance varying from 3 1/2 to 5 miles. A chrystaline lime stone is found at the upper mills but it is difficult to burn. It, however, produces quite a good lime.

**Jones Falls.** No lime stone is to be found in the vicinity. Such as was required for the Canal lock was brought from Ansleys mills a distance of 2 1/2 miles land carriage and 18 miles water carriage.

**Davis Mills, Chaffeys Mills, Isthmus and Narrows.** The lime used in the construction of the works at these stations was made from a chrystalin lime stone which abounds at Chaffeys Mills. Davis Mills and on the shore of the the Mud Lake about half a mile west of the lock at the Isthmus.

The above description deals with only the lime used in the last three locations. Sand is treated in a separate listing:

**Brewers Lower Mills.** At Brewers Lower Mills, the sand bank is in the wilderness about half a mile from the lock, it is of very
indifferent quality being too fine and rather loamy: there is no sand of good quality at Brewers Upper Mills. The sand required for the locks had to be brought from the shores of Doghalee a distance of from 7 to 10 miles.

Jones Falls. The sand at Jones Falls is too fine for Masons work, that required in the construction of the canal was procured from the east shore of sand lake. The latter being of an excellent quality.

Davis's Lock. The sand for Davis's lock was also procured from this place. Sand is found in abundance at Cahffeys near the lock and is of various qualities. ... Without doubt, the materials and mortars used were collected by the masons, processed and mixed on the spot.

One interesting feature of all of the defensible lockmasters' houses is that, although they all have stone porches, none of the porch stone work appears to have been integrated into the stone work of the house wall upon which it was built. In all likelihood, they were simply joined by mortar. This lack of structural integration (i.e. stone linkage) is indicated by the absence of disturbance on the surfaces of the present buildings where porches have been removed. Historically it is also indicated by the Nicholson's lockmaster's house where in June of 1839, a year after the building had been completed, the
lockmaster and lock labourers had to "rise the Porches of the New Lock House. They having been Detached from the building by the sinking of the foundation." In all likelihood this is because the stone porches were added just after the lockhouses were built, not being considered to be a necessary integral part of the initial structures. Clegg's drawings indicate that porches were missing from lockmasters' houses at Lower Brewer's, Upper Brewer's, and one of the doors at Poonamalie (Figures 8, 11, 12), indicating they may have been built as the last stage of construction of these buildings. One of the porches from Poonamalie has survived to indicate the nature of the stonework on these porches, and perhaps on the buildings in general. Upon examination, the Poonamalie porch was found to contain brick fill, indicating that its walls were constructed of two separate facade courses, tied by a solid layer of brick infill. Undoubtedly Oldfield's comment that "the upper courses" of the stone in the By-Town, Hartwell's, Hogsback, Black Rapids, Long Island area "should be laid by for backing the stone" was meant to provide a source of inferior stone for similar infill on the other lockmasters' houses.

Brick was probably used as an infill on the porch at Poonamalie because it could be obtained in the local area. "... bricks have been made at By-town, Long Island and Smiths falls but they do not stand well the effects of the frost" wrote Oldfield in 1841. This would have made little difference to the use of the brick as a cheap source of masonry infill. It would, however, have exerted an influence against its selection as a structural material, and this may well be the reason that although all of the lockmasters' houses have brick chimneys, those chimneys are not only enclosed as much as
possible by the house, but also do not form a part of its structural support. In the case of Davis, the chimney "is a hanging chimney, i.e., its weight is not carried directly to foundations, but is taken up by the ceiling beams."

Stonework also formed the basement walls of the various lockmasters' houses, although without better information, it is difficult to determine the exact nature of its construction. Since, as the diary of the Nicholson's lockmaster appears to indicate, the basements were dug by labour comprised of canal staff, it is likely that a standard set of dimensions were given for the initial excavation. All of the houses appear to have basements made of stone. Pasley's Outline of a Course of Practical Architecture provides two methods of constructing basements, one known as "gravel grouting" for use on wet land, and a second called "piling" for use on dry land. In all likelihood, the latter was used at Davis. Pasley describes the method for constructing footings for buildings in brick, for as he states "The buildings about London Buildings, he may easily make himself master of the method of building with stone":

The Footings of Brick Walls

The base of a brick wall is technically called the footing -- and it should always exceed the thickness above ground. The custom is to diminish the base of the wall, from the bottom upwards by small steps or offsets of a mortar or brick on each side, making half a
brick in all, pared upon each projecting course. Sometimes smaller off-sets have been used; but recently it has been very unusual to employ greater, in the footings of brick walls.

The off-sets that have been described, are sometimes laid out in every successive course, which in brick work does not exceed three inches in height for each step, until the diminution proposed is obtained. Sometimes they are all laid out in every second or third course, which latter arrangement appears to me to be the best.

Just how closely this was followed in constructing the defensible lockmasters' houses would have to be determined through excavation.

At the moment, it seems unlikely that the basements of the various houses had floors made of stone, brick, cement, asphalt or any other compound available for construction use at the time. Since the basements of many defensible lockmasters' houses received applications of concrete in the basement during the 1910s and 1920s, it is difficult to determine the nature of the original basement floor material, if indeed there was one. A survey of departmental buildings taken in 1930 indicates that most of the defensible lockmasters houses had concrete floors, although Kilmarnock is listed as having only an earth floor. That, in all probability, this was the case on most of the buildings when they were constructed is argued by the fact that the cement used on the canal was "Howick cement" imported from England, and therefore expensive. It was unlikely to have been used for
such a purpose even if it was suitable, which is also unlikely given the time period. One other indication may be that the Royal Engineers chose not to surface a basement floor of the Merrickville blockhouse as a way of cutting construction costs. In 1846 it was described as "unfinished", indicating that to leave a basement floor in that state was not the normal practice. To have done so in the case of the lockmasters' houses would, however, have been consistent with the basic utilitarian approach to their construction that is indicated by other aspects of their design.

Other characteristics of the basements of the defensible lockmasters' houses that should be mentioned are the facts that they were known to have drains. At Nicholson's, lock labourers were engaged in "Collecting Stone and making a drain at new lock house" at the same time as the masons were there, just after they had filled "in Clay at Back Walls" and just before they were employed "filling in drain". All of this suggests the drain was built while the walls were under construction, and led from the lower walls of the basement. The original drain also seems to have been made of stone but whether or not it was mortared is not clear: certainly since masons were available this may have been the case.

One other question associated with basements is whether or not they originally contained stone cisterns. This seems to be unlikely. Concrete cisterns are mentioned as later additions to some of the buildings in the 1930s, but others (Davis for one) seem to have had stone ones in the early twentieth century. These were probably added to facilitate the use of pumps.
from wells once they were drilled at each of the respective lockmasters'
houses. One indicator that this was the case is found at Kilmarnock
where there is no cistern in the cellar because the well itself is located
there. Another indication is that at Newboro in 1930 "a concrete
cistern was constructed in the cellar of the old blockhouse to replace the
former wooden tank" Although this was not a lockmaster's house, the
existence of a wooden tank rather than a stone cistern in its basement may
answer the question of what was used for a water supply in the lockmasters'
houses if they were ever completely defensible.

Before continuing, it should be pointed out that according to broadly
interpreted contemporary definitions the lockmasters' houses could have been
called "blockhouses" at the time they were built. A military dictionary
written in 1816 provides the usual definition, then adds "This definition is
sometimes given to a brick or stone building on a bridge, or the brink of a
river, serving not only for its defense, but for the command of the river,
both above and below." The Royal Engineers' Aide Memoire on
blockhouses written in 1845 no longer permits this loose definition.
The Aides Memoires were works on military and civil engineering subjects
written by the Royal Engineers for their own use between the years 1845 and
1851. Since they were produced from the engineers' collective experience
during the period which preceded their composition, their contents may be
considered relevant to a study of the features of the lockmasters' houses.

By the time the third volume in this work which discusses military position
was written in 1851, opinions on military strategy may well have changed; however, by 1851 officers planning to defend a retrenched position such as these lockmasters' houses were warned

it may be observed, that the better the troops composing the defensive army, the fewer should be the [field]works, for it can seldom be advisable to confine any considerable body of a manoeuvring and steady force in an enclosed work, unless it be the key or main support of a position; but when an army is composed in great part of ill-disciplined and unsteady troops, artificial defences can scarcely be too numerous.

If they were truly intended as defensive works, these lockmasters' houses must have been designed for seasoned British troops and not for the local militia, for they did not have any field works. Their defensive attributes were limited to a few very basic physical features installed when the buildings were built. Even the nature of these suggest that the lockmasters' houses were intended as assets should a battle occur (i.e. as buildings capable of defence), but not primarily as defensive buildings.

When they were considered in military planning, it is likely that the lockmasters' houses were defined in a group rather than individually as a retrenchment "formed of enclosed and isolated works, each capable of a good resistance". Such works were designed to link and
support other major defensive fortifications, in this case at Montreal, Kingston and perhaps Bytown, and provide a series of retreat positions if required. The Aides Memoires recommend the location of individual sites be selected with a clear field in front, a potential course for retreat from the rear, and be chosen to otherwise effectively occupy their position."

All of these criteria appear to have been borne in mind in the selection of sites for lockmasters' houses at Davis and other locations along the canal. Indeed, the need for a retreat route may well have been used as the justification for building the first bridge and road behind the lockmasters' house at Davis. The Aides Memoires continue, stating that it is not important that such sites be fully manned and indicating "the most trifling efforts of labour, such as loopholing buildings, ... destroying bridges or roads, ... forming ... the slightest cover from cannonade" "could not fail to add materially to the powers and movements of a defensive force".

In 1845 after the period of extraordinary construction associated with the rebellion had passed in Canada, the Inspector General of Fortifications in London issued a circular on the design of defensible buildings for all Royal Engineers. Since it was not issued until all of the defensible lockmasters' houses had been completed, there is no guarantee that its provisions were followed in their construction. It must be remembered, however, that the defensible lockmasters' houses were among the first ordinary buildings to be adapted for construction as military fortifications, and these guidelines are primarily intended for such adaptations:
Such Public Buildings and Premises, as Barracks, Dock Yard Walls, Prisons, etc. should invariably be constructed for defence against any force, unaccompanied by Artillery that can be brought to breach them, provided there is any open space around them that will admit of it.

This may be effected at little or no extra expense not by erecting buildings exclusively for defence as is usual, but by merely adapting to that effect, the form of those which are necessary to the establishment.

37

It is probable that, far from following the stipulations of Circular 303, the design of the defensible lockmasters' houses helped to establish them.

One of the requisites of a defensible building according to this circular is "That every part of it be flanked." It recommends

If the Building is too small, or any Line of it too short to make it convenient to give it a flank at the angle, the effect may be obtained by a projecting Porch in the middle.

Should the Building have no upper storey, this Porch must be enclosed from the ground and in that case the entrance should not be through it, but at some short distance from it, the front of the Porch itself if square, will be unflanked but may have
loopholes for direct fire from it.

This instruction quite accurately describes the porches constructed on two surfaces of each defensible lockmaster's house. They are square, built of stone to the ground (i.e. not on raised supports), and contain loopholes. Moreover, each is a separate space with a heavy exterior door divided from the main building by a second heavy door. It is likely the original strong interior doors at Davis are still in the building, but whether the six panel doors currently on the interior of the front entrance and on the former porch door from the main building to the kitchen are those doors in their original location is uncertain.

From a point of view of defence, it is likely that these porches were intended to protect the sides of the houses that did not have complementary flanking from other canal buildings on their sites. Circular No. 303 which outlines the requirements for defensible buildings above also states:

The enclosure Walls which are universally considered to all such Establishments should have some of their covered buildings made to project, and with their outer angle in a slight degree acute, in the bastioned form, and be so disposed as to flank each other and every part of the enclosure.

Although there never were any walls around the defensible lockmasters' houses, it is quite possible that other buildings on the site performed this function.
It is extremely difficult to see this in any of the early sketches. Clegg, for example, shows the existence of such outbuildings only at Smiths Falls combined (Figure 7) and Hartwell's (Figure 2). At Davis, the defensible lockmaster's house never appears in any early drawings of the site, although a Burrows sketch (Figure 14) dated 1840 depicts the house's predecessor on approximately the same location. It was a pitched roof log building with chimneys at either end. It appears to have been oriented with its front facade in the same direction as the kitchen addition to the present building although it may, have been closer to the hillside given the seemingly greater distance between the house and the shed roofed building to the rear seen in both the 1840 drawing (Figure 14) and the earliest illustration available of the Davis lockmaster's house which dates from 1875 or earlier (Figure 32). The shed roofed building itself was located off north west corner of the present lockmaster's house. Although it appears to have been clad in vertical board indicating it was a roughly constructed service structure, its actual function has not been identified. Both Figure 14 and Figure 32 also show a log building to the rear of houses they respectively illustrate. This is probably the stable identified in an 1851 map of the site (Figure 33). If flanking was truly a consideration, the position of these buildings may well have been considered adequate for the rear of the lockhouse.

Both Circular 303 and contemporary military practice seem to require that loopholes be present in a defensible building. It is not surprising that they were added to the design of the standard lockmaster's house Group One buildings to make all of the other lockmasters' houses defensible. They
appear in both the porches and the walls of each of the Groups Two, Three and Four buildings. On the porches they seem to have been consistently placed with one on each side of the porch structure. On the front facade of each building, just beside the front porch were two small loopholes, one on each side. At Davis and Jones' Falls each of these loopholes measures approximately two feet in length: Upper Brewer's (Figure 23), Lower Brewers (Figure 34) and Poonamalie (Figure 21) still show a location for loopholes in this position. At Davis (Figure 17), Smiths Falls attached (Figure 22), Jones Falls (Figure 19), and Upper Brewers (Figure 23), the position of a second small loophole is still visible between the window and the corner of the building on both balanced sides of the front facade. Although the facade forms varied on the other surfaces of the buildings, the position of loopholes curiously indicates a consistency in their design indicates that there were originally a set of standard facades prepared, with instructions for variation of the door placement according to the individual requirements for the defensive addition of the porch (see below) on each site. Other facades may have been situated according to the need for visibility or similar factors on each site.

The position of loopholes seems to indicate that there were three basic facade designs prepared for variable application. One of these which can be seen on the east facade at Davis (Figure 35) is that of two parallel windows separated by a long internally subdivided loophole. This form appears to have been used in lockmasters' houses at Smiths Falls detached, Poonamalie, Jones Falls, Upper Brewers, Hogsback, Hartwells and Ottawa as well (see Appendix B),
although in some of these cases, one of the windows was, instead, a door. The same facade appears on the Group One lockhouses and Nicholson's, Old Sly and Clowes although, of course with no loopholes. It is interesting to note that on the Old Sly's building it seems to have appeared twice, once as two windows, and once as two doors.

This suggests that the first facade design was abandoned (or adapted) on one building facade when loopholes were added to the original base design, for the second basic facade form used on the loopholed buildings consisted of two loopholes and a door or window. At Davis this appears on the original south surface of the building, as Figure 32 shows two loopholes of approximately six feet each in length and an offset door. As Appendix B shows, this form was also used at Hartwell's, Kilmarnock, Edmunds, Chaffey's, Jones Falls, Lower Brewers, although in several of these cases the door was instead a window.

The final facade which appears on the north surface of the building at Davis (Figure 36) contained one large loophole and two smaller ones of slightly differing sizes. Remnants of the same facade can be seen at Lower Brewers (Figure 34) and Ottawa (Figure 29): it apparently also existed on the Jones Falls building. Although little is known about the facade variations which appear at Ottawa as a central window, and at Poonamalie as a central door, they may in fact be a variation of this loopholed facade in which the more central of the two small loopholes is replaced by either a window or a door.
The loopholes in all of the defensible lockmasters' houses were constructed of wood imbedded in the masonry of the buildings. All of them diminish in proportion as they approach the exterior of the building. According to loophole definitions provided by the Aides Memoires they can be classified as horizontal loopholes "most effective and most convenient" in all situations except those which require great vertical range in firing as, "with great lateral extent, it combines sufficient vertical range to include the height of a man". The construction guidelines for horizontal loopholes are subsequently described:

Horizontal loops ... can be constructed to contain two or even three men, the interior opening having an increase of not less than 2 feet per man.

The extent of the exterior opening depends upon the range required, but its width should not exceed 3 inches, and the hole at the exterior should be at least 7 or 8 feet above the level of the ground at the outside to prevent the loop being marked or fired into.

The length of a barrel of a musket in our Service is about 3 feet 3 inches. As it is necessary that the muzzle should extend 3 inches outside of the loop, to prevent inconvenience from the explosion, it is evident that the ordinary form of the loop is inapplicable to a wall of a greater thickness than 2 feet 6 inches, or at most 3 feet.

Circular 303 also requires "That these loopholes be not less than 7 feet from the external ground." While excavation of the Davis lockmaster's
house site indicates that the height of the loopholes is, in fact, seven feet above the level of the original log house on the site, it cannot be assumed that the entire Davis site remained at the original level once construction of the stone lockmaster's house was complete. Indeed, a comparison between Figures 14 and 32 seems to indicate that the site around the lockmaster's house was higher: most of this fill was probably provided at its construction. Furthermore, the sites of many of the other lockmasters' houses -- Upper Brewers, Lower Brewer's, and Poonamalie to name a few -- do not appear to be high enough to permit this provision to have been followed. Since low loopholes would allow an enemy to stand beside the buildings and fire inside, the presence of such loopholes has been puzzling as they would destroy the buildings' defensive potential.

The Aides Memoires provide a probable explanation for this situation:
"Loopholes should always be higher or lower than a man's height from the level of the ground immediately in front of them," they state. "When this cannot be effected, there should be a drop or ditch in front." In all likelihood most defensible lockmasters' houses were immediately surrounded by ditches during the British period. At Davis the height of land around the building was probably raised in all places except the area directly around the building, which was left at the original height as a ditch. In some cases, the depth of the ditch may have been the depth of the foundation of the building, for Pasley's instructions on the construction of "Foundations of Buildings in Good Soil" state that if the ground on which the building is to be built "proves to be good throughout, such as Rock, Gravel, or soil of a sound,
uniform quality, not liable to be altered from time to time, entirely or in part by the effects of water acting below the surface, a trench is cut all round, and carefully levelled, on which the walls are commenced".

If the ground is very irregular, Pasley indicates the trench should be cut in steps away from the building wall, but never on an inclined plane. Unfortunately no description of the width of either the trench cut for the foundation or the ditch in front of a loophole is provided by Pasley, the Aides Memoires or Circular 303.

Appendix C contains a lengthly dissertation on the construction of loopholes as provided by the Aides Memoires. Its second page is made up of recommendations for the construction of loopholes by Lieut.-Colonel Alderson, R.E. which suggest that six feet should be the maximum length of a single loophole opening. Alderson recommends horizontal loopholes for use in defensible barracks and guard houses, adding that in these cases "the larger opening should be inside as "it will afford ... more light, and provide shelves for the occupants."

Alderson continues to state that loopholes should be framed with cast iron, slate or hard stone. This sentiment seems to be echoed throughout the appendix, and instructions are also given on the variation of loophole construction when the loopholes are not lined with cast iron, but made of a weaker stone construction. On the defensible lockmasters' houses on the Rideau Canal, however, they were made of wood. The form Rideau loopholes followed is that recommended for cast iron framed loopholes, suggesting that
the Royal Engineers considered Canadian hardwood sufficiently strong to serve the same function. The only possible hazard from the use of this material was fire which may not have been considered too serious since the lockmasters' houses were not expected to undergo extensive defensive use. The wood used was probably white oak, considered by Oldfield as suitable for "purposes where strength and durability are required."

Wood also seems to have been used to provide fireboards, or moveable coverings for the windows of the defensible lockmasters' houses. These are visible in an early sketch of the Poonamalie lockmaster's house (Figure 37). The need for their presence is explained by the Aides Memoires which contends that when the interval between loopholes "exceeds 7 or 8 feet, the fire becomes weak and futile". Windows and probably also doors in the buildings had to be rendered firing areas to maintain a firing capacity of less than seven or eight feet. Circular 303 also suggests some capability for the conversion of windows is necessary. It requires "That there be no openings by which defenders will be exposed to shot, except the small loopholes constructed for their own fire." Moreover, it requires "That the ... Doors and all Windows be strong enough not to be forced open without very powerful means". Since both the doors and windows of the defensible lockmasters' houses contained glass, it is evident some further additions were necessary. The military solution to all of these problems was a loopholed cover for the window. In discussing the "Defence of Buildings and Villages" the Aides Memoires describe the basic requirements of adapting a window to a safe firing position. "The principal object is to screen and protect the defenders
whilst giving their fire; any thing, therefore, that will fill up the window to a height of 6 feet from the floor, and that is musket-proof, will answer the purpose." Wooden window covers served this purpose very adequately.

Wooden window covers would also have served as protection against the winter cold. In her *Military Construction Techniques in the Use of Building Materials in the Nineteenth Century*, Elizabeth Vincent discusses the increased concern for light and ventilation in the mid nineteenth century, and includes the information that window shutters were a common expedient. It is likely that the window covers used on the defensible lockmasters' houses were primarily to fulfil this objective, with the space planned for use in firing continuing to admit some light during winter months. Initially the windows in the defensible lockmasters' were casement windows, each containing a six over two arrangement of panes (Figure 32). The doors to the porches also contained windows with four over four panes. It is important to note that throughout the *Aides Memoirs* glass is considered a standard element of buildings, and is in no way regarded as an impediment to military activity. Not only the windows and doors, but also the loopholes on the defensible lockmasters' houses were glassed in at an early stage, and the *Aides Memoires* merely warn soldiers to knock the glass out of the way before a battle begins in case it is knocked inwards and harms the inhabitants. Since the Engineers considered the light and fresh air admitted by windows to be essential, glass was a necessary commodity in temperate climates.

The origin of the glass used on the defensible lockmasters' houses is
described by Oldfield:

Glass is imported from Great Britain cut into different sizes and packed in cases it is very seldom brought into this country in crates. -- that mostly used in the country is the C-glass. A box of glass contains 50 superficial feet but sometimes the box has 100 feet in it and is sold according to the size of the pane; the price per pane varying from two pence to one shilling and two pence. -- it can be procured at all large towns no glass is imported from the United States.

"C-glass" was crown glass, a type commonly used in military buildings during this time period. For more information on its manufacture and processing see Vincent's chapters on "The English Glass Industry" and "The Military Use of Window Glass in 19th Century British North America". This text includes a list of the sizes of panes available, although Wylie's report on the defensible lockmaster's house at Jones Falls includes the information that the twenty-four panes contained in the Jones' Falls windows each measured 8.5 inches by 7.5 inches.

The other British material used on the defensible lockmasters' houses were the tin shingles on the roofs. According to Oldfield

Tin - Is the usual covering for roof in the lower part of the Province, it is imported from England and procured at Quebec,
Montreal, and the other principal towns in Canada, it lasts for many years, forms an excellent covering and is seldom in want of repair; it is sold by the box, the price of a box of tin averages about 50p per box the quality is that called I.C. one box will cover 100 superficial feet of roofing. the nailing costs 5p per box in laying 5 1/2 lbs of tinned nails the skeet. have a lap or cover of three inches.

There are probably two reasons why tin was selected as a roof covering for the defensible lockmasters' houses. In its general comments on the construction of blockhouses, the Aides Memoires comment that "the roofs should be covered with zinc, sheet iron, or (as in Canada) with tin", confirming that tin, as a non combustible material, was considered preferable in a military structure. This military use alone may not, however, be sufficient to explain the use of tin in the Rideau lockmasters' houses, for it must be remembered that Colonel By opted for shingles as an adequate but cheaper material on the blockhouse/lockmasters' houses he built in the early 1830s. By preferred tin which "will render these buildings very durable and difficult to destroy by fire, as tin remains free from rust in this climate upwards of sixty years."

Tin was also light weight and did not require a heavy support structure. It is still possible to examine some of these original shingles, for at Davis they were used as a covering under the eaves once they had been removed from the roof of the building.

One structural puzzle presented by the Rideau defensible lockmasters' houses
is the difference in roof style between the examples at Davis, Chaffey's and Ottawa and those on all of the other buildings. The roofs on Davis / Chaffey's / Ottawa group are pitched, resolving in a single central point. Those on the other lockmasters' houses are hipped, and have a ridged centre. The reason for these distinctions is not certain. Both forms are common in military architecture at the time, and if the specifications were sufficiently vague, either form would have been permissible. Since the wood for framing the roofs of both Chaffeys and Davis was probably obtained at the saw mill at Davis and this may account for the similarity between these two buildings. Oldfield comments that red or white pine is

the timber most generally used for building both internally and externally ... it is easily wrought, and if kept painted is durable; the red is the strongest, but not so generally used as the white, as it is found to warp, and the gum exuded from it when exposed to summer or stove heat.

To some extent, the construction of these roofs may have depended on the length, strength and other qualities of the wood available locally. Other possibilities that may account for the similarity in roof form between Davis and Chaffeys is a difference in the superintending engineer and/or roof design guidelines under which they were constructed.

The use of the same pitched roof form on the Ottawa building reduces the likelihood that local factors were the only consideration. It is probable the
change in design reflects that the defensible lockmasters' houses were built during a period when the Royal Engineers' general ideas about roof design were undergoing a shift. The ridged roof reflects earlier attitudes: the peaked roof the new idea. Since all of the earlier defensible lockmasters' houses were built under the supervision of the same Superintending Engineer, Daniel Bolton, they had the same design. Bolton was temporarily absent from his canal duties during late 1842 and early 1843. His replacement was announced by a circular dated October 4 1842: "Lieutenant White Royal Engineer having joined the Rideau Canal district will take charge of that work as Executive Officer and the General superintendence and to Office Duties". Between October 1842 and February 1843 White, not Bolton, was patrolling the canal to give instructions and approval on construction matters. During this period White probably initiated the first changed roofline. Undoubtedly by 1849 when Ottawa was built the peaked roofline had become a standard design.

One other characteristic of the roofs of defensible lockmasters' houses is that they all contained fire ladders. An abstract of Ordnance Estimates for 1843-4 orders fire ladders for the buildings of the second group. Undoubtedly they appeared on the other buildings as well, for a letter discussing another project in Lower Canada written to Col. Oldfield in 1839 comments on "fixing 5 Roof & 4 Standing Ladders, which are absolutely necessary in case of fire, & which the Law in this Country insists upon". While such a law may well have existed in urban Quebec at the time, no such law was in place in rural Ontario. The Royal Engineers must have recognized the sense
in such an arrangement and incorporated it in the design of all Canadian military buildings. Figure 38 shows the placement of a roof fire ladder on the lockmaster's house at Hogsback. Similar ladders were probably also used on the other buildings.

When the Royal Engineers considered the design of a building, they were taught to think of its placement in terms of the military implications of its site. Some of the factors they kept in mind when choosing the site and placing the building included hills, rock, ravines, lakes and rivers, and are discussed above under the construction of basements and the placement of loopholes. Once the building had been constructed, its design was not complete. The Royal Engineers planned the site itself to enhance its defensibility. At Davis, for example, the building was sited to make use of the existing outbuildings as defensive flanking. The bridge behind the building was also a defensive element, for it allowed a retreat while blocking pursuers. The road to the lockhouse was another such element, and Oldfield discusses the materials available for road grading and surfacing of Canadian supplies.

One other landscape element the Royal Engineers were encouraged to mold was the vegetation. While the Aide Memoire on this subject is extensive and contains considerable information on tropical sites, it also provides general guidelines for the selection and dispersal of vegetation in temperate climes. "The qualities of trees and plants best adapted for the formation of living, or at least vegetating ramparts are necessarily, -- 1st, those which will flourish best in the closest practicable linear juxtaposition; 2nd, those that grow straightest; 3rd, those that have the hardest wood; and 4th, those
that strike the deepest roots." Whether any of the sites of the defensible lockmasters' houses were designed using vegetation is not known. The subject might prove a useful one for interpretive investigation.

Since Ordnance estimates for 1843-4 also include similar sums for painting the lock houses at Nicholson's, Old Sly's and Hogs Back in 1843, paint was evidently considered a necessary feature of both the exterior and the interior of the defensible lockmasters' houses. Fortunately, information about the initial painting of Nicholson's lockmasters' house has survived, and it can undoubtedly be generally applied to all of the other buildings. The material that was sent on the government scow to paint the building consisted of:

<table>
<thead>
<tr>
<th>Material</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Paint</td>
<td>56 lbs</td>
</tr>
<tr>
<td>Black</td>
<td>12</td>
</tr>
<tr>
<td>White</td>
<td>20</td>
</tr>
<tr>
<td>Boiled Linseed Oil</td>
<td>6 gal</td>
</tr>
<tr>
<td>Paint Brushes</td>
<td>2 pounds</td>
</tr>
<tr>
<td>White wash &amp; c</td>
<td>1</td>
</tr>
<tr>
<td>Barrels of Lime</td>
<td>1</td>
</tr>
</tbody>
</table>

With these materials, the exterior of the building was painted, the interior woodwork was finished, and the plaster was whitewashed. The paint consisted of a powdered colour which was mixed with oil on the site to render it liquid. Oldfield reveals that "Paint, Oils and all the requisites for painters' work are imported from Great Britain and may be procured at all the principal places
In his report on the defensible lockmaster's house at Jones Falls, Wylie includes information from painting specifications for the building in 1849. Since it is most likely that a similar distribution of colour was used earlier, these are described here. Doors, Wylie reports, were to be given "two coats of white oil paint ... to be applied to the splines and muntins between the panes": windows were treated the same way, in the same colour. "The angle-staff trim around the door frames was to be given two coats of black oil paint," as was the angle-staff trim around the windows. The main part of the door "was to be painted in lead-coloured paint similar to that on the porch walls". Since the porch at Jones Falls was clapboarded by this time, this distribution of lead coloured paint was presumably to make all defensible portions of the building the same colour, and less easily distinguishable as a target. Loophole frames, and presumably loophole plugs were to be painted this lead colour as well. These specifications account reasonably well for the black and white paint and linseed oil in the list of supplies above, but they do not deal at all with the largest quantity of colour, the red paint. In all likelihood this red paint was used to cover the tin shingles to protect them from rust. Research on contemporary metal roofing reveals that red was a colour often used at the time.

Hardware on the doors and windows was another exterior and interior element of all defensible lockmasters' houses. Oldfield indicates that the locks, latches and hinges used were obtained in Canada:
Ironmongery Can be procured at Quebec, Montreal, Kingston, Toronto and at all the towns in Canada but generally of an inferior description. -- particularly locks, hinges and latches, -- There are very good iron foundries at Quebec, Three Rivers, Montreal, Kingston, Toronto, Niagara, Long Point .... at most of those places castings of any kind can be procured.

73

His statements about the "inferior description" of articles available needs some elaboration in the light of the latter half of his statement. In all probability he meant that hardware made in Britain is available for sale in most Canadian towns, but that he preferred to purchase articles that were made in the Canadian foundries. Considerable enlightenment on Oldfield's words is provided by an earlier statement by Colonel By:

Experience has shown that the Iron of this Country is much Superior to the English which makes me anxious that the Iron required for the various services of the Canal should be procured in Canada, my preference arises from the Metal in this Country being melted with Charcoal, and absorbing a portion of Carbon, renders it tough and more malleable than the English Iron which is melted with Sea Coal.

74

Elizabeth Vincent's work on Military Construction Techniques discusses the selection of locks for military buildings at length. She indicates that two types of locks were commonly in use for modest contemporary exterior doors. These were "stock locks" and "iron rim dead locks". Stock locks
were used in stables, sheds, cookhouses and similar situations, while iron rim dead shot locks were used for barracks, and guard houses. Such locks may well have found application on the defensible lockmasters' houses: indeed one of them may still exist on the door between the main building and the kitchen at Davis. Vincent's work shows samples of such locks on pages 179, 181 and 183; however the origins of the locks illustrated are American and possibly British and they may not be comparable to those manufactured in Canada. Vincent also refers to "mortice locks for interior doors", stating that these were only to be used in special situations. She also indicates that "iron rim drawback locks" were used for hall doors and interior doors. Such a lock may still exist on the front north bedroom door at Davis.

The interiors of the defensible lockmasters' houses present another series of concerns that also merit discussion in a structural review. In all probability the original specifications called for a four-room structure, as the floor plan of the surviving one storey lockmasters' houses at Davis, Upper Brewers and Jones Falls appear to indicate that all of these buildings once had four rooms. Initially, all of these rooms must have been grouped around a central fireplace, as the arrangement of the supporting joists at Davis indicates extra support in the area where the fireplace once stood. The Aides Memoires seem to prefer fireplaces to stoves, stating while the latter are more efficient in fuel consumption, they create air that is extremely dry and "injurious to respiration". In Canada, where fuel was abundant, fireplaces were the logical option.
In this system, heating and ventilation are combined, as the smoke-flue continually draws away a large quantity of air which must be replaced by the external air entering either by doors, windows, or apertures specially contrived for the purpose. As much of the air drawn off has been heated, but not dispersed through the rooms or buildings, there is a great loss of heat in every apparatus of this kind, which increases in proportion to the force of draught and the size of the throat of the flue. To obtain the greatest effect from an open fire-place, the throat of the flue should be no larger than is absolutely necessary to maintain an efficient draught, and should be so placed as to keep the radiating flame as long as possible in view... as otherwise the loss of heat must be very great.

Provision for conducting the hot air from the area of the fireplace or stove to other rooms through flues is also discussed. Whether this arrangement was available in the early 1840s, or indeed considered applicable to modest buildings like the defensible lockmasters' houses in Canada is not known. Pipe from the fireplace area is interred in the walls at Davis although it is likely it was added later. At Jones' Falls the fireplace has back to back outlets in two rooms to serve both living and cooking areas. Such an arrangement would appear to have been more usual in Canada at the time.

If Davis also contained back to back fireplaces, it is likely that the two rooms on the west side of the building were used as the main living rooms of the house, with those on the east side serving as bedrooms that were entered
off the main living rooms. The interior of each defensible lockmasters' house must have contained four rooms, but the shape and location of these would inevitably have varied with the placement of individual facades on the buildings' exteriors. Given the contemporary concern for light and ventilation, it is reasonable to assume that each room would have been allotted a window. It is likely that the placement of original interior walls in the midst of loopholes would have been avoided if possible. Presumably, if this were unavoidable, a plug would have been placed in the loophole over the interior wall space, and as long as two feet of firing space remained the provision for defence would have been considered adequate.

The nature of the trim and finishing of the original interiors of the lockmasters' houses underlines the impression created by their exteriors, i.e. that they were intended to be modest structures. In military terms, they were designed for the equivalent of petty officers and their families, not for common troops or for senior officers. Baseboard material throughout the building is comprised of simple planks topped by small separate mouldings and butted by quarter round and both, if regular and machine shaped, were certainly later additions. In all probability most of the original trim was replaced early in the twentieth century when the building was plastered. The Davis lockmaster's house contains several six panel doors with small panels on the top divisions that may well have been original to the building. These were well within the capability of contemporary carpenters. Such interior woodwork was probably made of either pine or oak. Oldfield states
the timber most generally used for building both internally and externally is the red and white pine, it is easily wrought, and if kept painted is durable ....

Oak is of three varieties white, red and black; -- the white is of good quality and used ... for door jambs, lintels and other purposes where strength and durability are required. -- The red oak is little used for building purposes [nor is the black]...

Birch is little used except for hand rails and balusters of stair cases. [Beech, hemlock and tamarack are not used for buildings.]

80

Ash, which appears below in a specification for timber to be purchased at Kingston for use in military buildings, is not even discussed. The original doors, mouldings and and floors of the lockmasters' houses were probably made of white pine plank, while the structural framing of the door and window openings was of oak. The cuts of the wood may be similar to those indicated by the following specification for wood to be purchased by the Commissariat office in Kingston in May 1842:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td><strong>Oak feet</strong></td>
<td><strong>4 inch</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td></td>
<td><strong>3 1/2 inch</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td></td>
<td><strong>1 1/2 inch</strong></td>
<td><strong>1000</strong></td>
</tr>
<tr>
<td><strong>Ash feet</strong></td>
<td><strong>3 inch</strong></td>
<td><strong>250</strong></td>
</tr>
<tr>
<td></td>
<td><strong>2 inch</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>Pine feet</td>
<td>3 inch</td>
<td>500</td>
</tr>
<tr>
<td>-----------</td>
<td>--------</td>
<td>-----</td>
</tr>
<tr>
<td>2 1/2 inch</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>1 inch</td>
<td>2500</td>
<td></td>
</tr>
<tr>
<td>3/4 inch</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>1/2 inch</td>
<td>1000</td>
<td></td>
</tr>
</tbody>
</table>

The whole of the timber to be twelve feet long, and the plank and boards no less than 12 inches broad, and of the best quality [the heart cut out of the tree not admissible] to be delivered at the Ordnance Wharf ...

With similar material obtained from local sawmills, the carpenters finishing the lockmasters' houses fashioned the original accoutrements of the buildings.

The interiors of the lockmasters' houses were, without exception, finished with plaster. The original plaster at Davis as in the other lockmasters' houses is known to have been laid directly on the stone walls of the interior of the building. In her work on Military Construction Techniques, Elizabeth Vincent quotes from William Millar's Plastering Plain and Decorative. A Practical Treatise on the Art & Craft of Plastering and Modelling, published in 1905. She states that Millar had studied earlier applications of plastering techniques and was writing a comprehensive text on the craft. The following excerpt applicable to the defensible lockmasters' houses is quoted from Vincent as she paraphrases Millar's discussion on the use of plaster:
For internal work the first coat of plaster generally contained a mixture of lime, sand, hair and water. Hair was used in order to bind the plaster together. Ox or cow hair was commonly used, though for various reasons other types of hair might be substituted and fibres such as hemp could also be used. Sand was needed in the mixture to prevent irregular shrinkage and cracking and to form channels for crystallization. It was necessary that the sand used in plaster be sharp and hard. The finer the quality of the plaster desired the finer must be the sand which was used...

On brick, stone or concrete walls the plaster was generally laid directly on the walls. The first coat in this case was called rendering. Before putting on the plaster the superfluous mortar in the joints had to be cleaned off, the walls well swept and the surface thoroughly wetted. In some cases ... the face of stone walls [was] roughened. In order to provide a suitable surface for plastering ... on ceilings, laths or narrow strips of wood had to be nailed to the ... ceilings. Laths were of various thicknesses, with the strongest being used for ceilings, and were usually nailed about 3/8 in. apart. The importance of lathing was to provide sufficient interstices for the plaster to obtain a proper key so that it would not fall off.

Ordinary plaster work on interior walls or on ceilings was classified as one, two or three coat work. According to Millar
one coat work was usually described as 'lath and lay' or on brick walls as 'render'. 'Laying' was simply spreading one coat of coarse stuff on lathing leaving a fairly smooth surface with a trowel. This was the cheapest kind of plaster, generally used as an infill for partitions or roofs. Two coat work was usually described as 'lath, plaster and set', or 'lay and set'.

... The best quality of plastering was three coat work...

Vincent goes on to state that one and two coat work are both found in military buildings during this time period, then discusses the nature and combinations of the various materials employed.

It is worth noting here that plaster was not always used as an interior finishing for buildings in Canada. A lime wash or white wash was frequently employed on a rough interior surface. According to an Ordnance Property Inventory prepared for military buildings in Kingston in 1841, the only building in the compound that was lathed and plastered was the hospital. Even the better houses were "whitewashed or coloured" with a paint mixed lime wash.

In planning for construction of the defensible lockmasters' houses, Oldfield did however assess the potential presence of plasterers' materials. In general, he stated:

**Plasterer's Materials**

*Laths* can be easily procured in all parts of the country.

They are made of Cedar or Pine. The former is preferable, they
are sold in bundles of 120 each from nine pence to fifteen pence per bundle.

Lath nails are to be purchased at almost all country stores.

Hair, is to be had at any of the tan yards, which are to be met with in all parts of the Country. it is sold at the rate at from three to four half pence per pound.

Oldfield continues to assess the potential for plaster compositions in all locations along the canal. At Davis he states "a chrystaline lime stone ... abounds" that is perfectly suitable for use. The sand required could also be obtained at the lock. Since the composition of rough plaster does not seem to vary substantially from the mortar used in building the lockmasters' houses, it was probably mixed and applied as a rough wash by masons. This must certainly have been applied to the ceilings of the interior of the lockhouse upon construction, for lath and some plaster would have been required as interior finishing. Perhaps the initial coat was also extended to the walls, although these may have required some seasoning before being coated further. Sweeney's journal indicates that Purcell, Davis' mason lockmaster, came to whitewash the Jones Falls lockmaster's house a year after it had been completed on May 10 1842. He may have been originally applying the coating to the walls that is today considered its first coat of plaster -- a rough coat of rendering made of locally available materials covered by a lime or whitewash.
This review of the components of the original lockmasters' houses reveals the basic intentions behind their construction. They were made with materials that required little transportation -- wherever possible with those that could be obtained near the building site. The manufactured goods used in their construction were purchased either by the Canal office or the contractor locally from the source providing the most durable option. Tin shingles, paint and glass came from England. Locks were made in Canada because Canadian made locks were more durable. The lockmasters' houses were built of strong, materials: they were built as economically as possible, but they were built to military standards and intended to survive any attack either an enemy or the weather could provide.

The intention of their design was a combination of moderate defensibility and modest accommodation. Defensible lockmasters' houses were to provide comfortable housing for lockmasters and their families in remote locations while serving a military purpose if required. Those on the Rideau Canal may have been among the first civilian designs adapted to serve a military purpose, for the practice seems to have begun with the restraint imposed by the Economical Reformists in the British Parliament, and continued as a common one in British military architecture in the period which followed. The defensible lockmasters' houses incorporate all of the essential attributes of a secondary military building with the attributes of a modest contemporary dwelling. Unlike the blockhouses which preceded them, they did not incorporate additional space for military purposes, yet they were adequately defensible. Their modest practicality as dwelling houses is attested by the basic nature of the finishing
on the materials used in their construction.

As a group of buildings, the defensible lockmasters' were constructed in the most efficient and effective way possible. Standard general specifications seem to have been issued, specifications which provided detailed dimensions for basement excavation and wall thickness as well as wall and roofing materials for all buildings, but left design specifics to Royal Engineers working on the sites. Alternative facade possibilities must have been given, but these seem to have been allocated at the discretion of the Superintending Engineer (usually Bolton in this case) who adjusted the facades to suit the natural requirements of each site. Roof form does not appear to have been detailed, but rather assumed to be "standard". The existence of such specifications must certainly have saved considerable time in the construction of a group of buildings like the defensible lockmasters' houses. Not only would they have served the purpose of a standard design in providing common quantity and quality material requirements for each structure, but they also assured sufficient similarity among the structures that they projected a common image. While maintaining the advantages of a standard plan, the engineer could still approach the site of each new building with sufficient flexibility to adjust to its special characteristics.

This chapter provides a description of the defensible lockmasters' houses as they were constructed. As such, it supplies a contextual base for the discussion and assessment of their evolution over time.
Chapter 3. FROM BRITISH TO CANADIAN: 1845 - 1873

a) Under Ordnance Administration

In the period immediately following its construction, the lockmaster's house at Davis, like other lockmasters buildings along the canal, was administered by the Ordnance under the direction of the Royal Engineers. Although it emphasized cost efficiency, the Ordnance paid careful attention to the living requirements of the lockmasters, ensuring that required maintenance received attention and that any structural problems were corrected.

Under the Ordnance the lockmasters' houses were treated as military buildings. 1 Lockmasters had been issued arms in 1841, and these continued to be stored at each station until the Ordnance requested them returned in 1856.

Repairs and works during this time period were performed by a series of general contractors hired to maintain all canal property. The Rideau Canal participated in the triennial contract system under which most military projects of the time seem to have been managed. Under this system, the Ordnance hired a general contractor or individual contractors for specific types of jobs and issued standard specifications for all types of the work they were to perform. These specifications were extremely detailed and centrally prepared.
Appendix C contains an example of the contracts issued on the Rideau and Ottawa Canals for 1844. Similar contracts were also issued in 1847 and 1850. Contractors merely formed an agreement with the Ordnance upon the prices to be charged for each type of work. Once a contractor was engaged, he seems to have operated in conjunction with the Clerk of Works as a central co-ordinating office to ensure work on the canal was accomplished at minimum cost to the Ordnance.

From October 3, 1843 forward, lockmasters were instructed to prepare work orders for work required, then forward them to the Clerk of Works who would obtain the approval of the senior Royal Engineer and requisition the work from the contractor. Lockmasters were expected to inspect both the materials and the work as it was performed, and report on the workmen employed and the project progress weekly. They were also instructed to keep a contractor journal which recorded the work order, the date of work and particulars of the Order. The names of at least two contractors responsible for Rideau Canal repairs under this arrangement are known. The first, a Mr. H. Blasdell, began this work in 1843. Another, a Mr. Dufton "ceased to be Ordnance Contractor for executing the works and Repairs on the Rideau Canal" in 1856. These contractors evidently employed qualified lockmasters and lock labourers to perform many of their projects, for one of the first actions of John J. Killaly when he assumed responsibility for the canal under the Board of Works of the Canadas was to write a memo informing lockmasters "Not to send any bills for work done for Contracter [sic] to this office." Certainly Davis lockmaster, John Purcell, appears to have been involved in this activity. His
name is listed as "head mason" in the "Weekly Progress Report of Works and Repairs ... At Brewers, Upper Mills, Between the 14th and 19th January 1850."

A comprehensive list of the maintenance and repairs to lockmasters' houses performed under the contract system is not known to exist. Such information as has survived is listed in lockmasters' records. Of these, the journals of Lockmaster Sweeney of Jones Falls are the most informative before 1849. They are complemented by sporadic entries in the Davis lockmasters' journals after 1850. During the 1840s the Sweeney records contain several types of work applicable to the maintenance of all lockmasters' houses. The first of these was the glassing of the loopholes which occurred at Jones Falls in 1842, a year after the building's construction, and was in fact performed before a contractor was responsible for canal maintenance. The second is consistent painting activity. Sweeney confirms that the lockmaster's house at Jones Falls was painted in 1844, 1845, 1846 and 1849. All parts of the building including the interior floor seem to have been covered by this work: known specifications for the exterior are discussed in Chapter 2. It is likely that painting at similar intervals and under similar specifications occurred at all lockmasters' houses during the period. Another generally applied improvement would have been the addition of fireboards to the buildings in compliance with an 1845 order requiring all defensible buildings to be fortified. The porches on the buildings may also have needed attention. At Nicholson's these separated from the main building during the settling that occurred just after construction.
During the 1850s, the Davis lockmaster's journal records the floor of the house was repaired. In March of 1852, labourers James Naigle and John Curry were employed for two and four days respectively "spreading and levelling the gravel" while carpenters John Thomas and John Sly were also employed for two and four days respectively "repairing the floor of the Lockmasters House". This information is noted on a reply to a work order which also includes the notations "Weight of Wrot Iron 257 lbs. Weight of Cast Iron 84 lbs." directly beside the times worked by the carpenters, suggesting the nature of the floor repair may have involved both the first storey and the basement and concerned heat or possibly fire damage from a stove. Since a stove probably existed at Davis at this time (see below), it is possible this work constituted repair of the floor after the fireplace had been removed. Whether it involved laying the finished coat of wood on the floor that exists today is not known.

Under the Royal Engineers canal possessions were rigorously inventoried to ensure the protection of Crown property. Since buildings constructed and maintained by the Canal were considered among these assets, they were inventoried in an Ordnance survey of buildings conducted in 1852. In 1851 the lockmaster at Davis responded to a Canal Order requesting details of the buildings at his station:

<table>
<thead>
<tr>
<th>Designation</th>
<th>Length</th>
<th>Breadth</th>
<th>Height</th>
<th>The construction</th>
<th>For what purpose</th>
<th>Remarks applied [sic]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stone house</td>
<td>27'6&quot;</td>
<td>27'6&quot;</td>
<td>9'6&quot;</td>
<td>four Divisions</td>
<td>Lock Master</td>
<td>Tin Roof with Cellar</td>
</tr>
</tbody>
</table>
The location of all but one of these buildings can be seen on a map prepared on September 17, 1851 by F.W. Whinyates, R.E. (Figure 39). When this plan is viewed together with the contents of the Ordnance's list of buildings, some discrepancies emerge. The Whinyates map does not show the watch house described in the Ordnance inventory. Instead it depicts three structures on Ordnance land which are not recorded in Davis lockmaster Purcell's list of buildings.

These include a stable, a barn and a second lock labourer's house. The stable appears to have been made of log construction and to have existed on the Davis property as an adjunct to the earlier log lockmaster's house on the site (Figure 14). The nature and construction of the barn is not known. Its presence is not surprising for census data confirms that Purcell took full advantage of the provisions which allowed lockmasters to garden and pasture animals on canal lands. In 1848 he is recorded as owning 7 cattle, 9 sheep and 2 hogs and having raised twenty bushels of wheat, twelve bushels of Indian corn and eighty bushels of potatoes. Although the Ordnance issued an order requiring all old buildings on Ordnance land be demolished in 1851, it is unlikely this provides an explanation for these discrepancies. In all probability all of the buildings in doubt were on the site throughout the 1840s.
and 1850s because the reason for the existence of each was a continuous one. Several of them may not have been included on the Ordnance list because they were not Ordnance buildings. This is probably true of the second lock labourer's house. Purcell himself probably owned the barn and stable, for he had been lockmaster at Davis since the canal was completed.

Purcell was a protestant born in Ireland in 1795. He came to Canada as a small boy and attended the same school as Sir John A. Macdonald in Kingston. As a youth he apprenticed as a stone cutter and mason and went to work on the canal during its construction. Purcell claimed to have laid the first stone at Davis lock, then when the canal was completed he was named Davis lockmaster. He and his Scottish wife Mary raised six children in this lockmasters' house.

By twentieth century standards the Purcells' accommodations seem crowded, but evidence indicates that, like Davis, other lockmasters' houses were frequently inhabited by large families during the nineteenth century (Figure 40). The facilities available to them also seem to us relatively primitive, but by contemporary standards they were sound and up-to-date although not luxurious. The location of the family's outhouse is not known. It may have been on the east side of the lockmaster's house where archaeologists have located a midden, or it may have been in the wood slab shed roofed building that appears in Burrows 1840 sketch (Figure 14) and still seems to exist in the 1870s (Figure 32) as no other explanation of this building has been found.

As for other facilities, it is likely the lock station was heated during
the early part of this period by fireplace then later by stove. The lockmaster's 19
journal reveals there were two stoves at Davis by 1856. This seems to
have been the case in other lockmasters' houses as well, for W. Wylies history
of the lockmaster's house at Jones Falls, indicates that a cast iron stove
weighing 120 pounds was supplied at that station in 1849. He also notes that
that there were two stoves at Jones Falls which appear to have moved 20
seasonally from the cook house to the lock house. It is likely the same
pattern was followed at Davis. Light in the lock house may have been provided
either by candle or by seal oil lamps, as seal oil lamps are known to have been
used later along the canal, and oil for canal activities was provided 21
during this period by the Ordnance Storekeeper.

This oil was purchased by the Storekeeper in bulk at Bytown and transported
to the lock by boat. Most manufactured goods like paint and bulk goods
(i.e. lumber) were purchased and supplied in this manner as well. Building
materials appear to have been bought and shipped by both the Ordnance
Storekeeper and the the canal contractor, presumably depending upon which
situation offered the most advantageous price. Lockmasters were instructed 23
to receive and verify the quality of both. During the time it
administered the canal, the Ordnance not only bought and sent supplies to lock
stations, but also kept a careful check on the materials and equipment at each
station. Inventories of stores were kept, surplus goods were collected and
sold at public auction, and serviceable used materials were reused in other 24
canal projects. The Ordnance did all in its power to ensure careful,
cost-effective management of what it regarded as essential canal activities.
b) **A Canadian Canal**

When the Board of Works of the Canadas assumed reluctant control of the Rideau and Ottawa Canals on April 1, 1857, this situation changed completely.

Nothing has been expended on the canal for some time except what has been absolutely necessary to maintain navigation. Its appearance would be much improved by a little paint and repairs ... and general trimming up

wrote J.D. Slater, Superintendent of the Rideau Canal, in 1864. Lacking the organized manpower and administrative practices the Ordnance had used to make the canal cost effective, the Canadian Board of Works had simply cut its operating costs to the bone.

As Confederation approached, however, the Canadian Board of Works began a review of its properties in preparation for the establishment of a Department of Public Works. Rideau Canal lockmasters' houses were among those on the list of buildings needing repair. As early as 1863 four of the defensible lockmasters' houses were identified as requiring plaster and flooring repairs: these were located at Davis, Kilmarnock, Edmonds, and Chaffey's Mills. The repair at Davis was not done until 1867 when it was included in annual "Schedule of Works and Repairs Required" as requiring $30 to perform.

The exact nature and location of the repairs performed at Davis or elsewhere during this period is not known. All requests for the 1860-1870 period address
repairs to plaster, flooring and porches. In all probability this is the time at which the loopholes of the defensible lockmasters' houses were sealed and plaster patched on the interior. Porch interiors too were probably repaired after their loopholes were sealed, either with plaster or, as in the case of Davis, with wood. The diamond pattern used in finishing the porch interior at Davis is one that was often used to make a wall material of short mill ends and may indicate that, at Davis, cost effective use was made of materials from the nearby sawmill. Both the materials used in finishing the Davis porch interior and the fact that loopholes were filled with both timber (Figure 30) and stone (Figure 34) suggests that the lockmasters were responsible for locating materials and perhaps some of the lockhouse repair themselves.

The nature of floor repairs made during this period is unclear. Possibly a layer of finished flooring was installed throughout the lockhouses to cover the patches or other special fire-proof covering left by the Ordnance when fireplaces were removed. Possibly the Ordnance finished only the rooms affected when the fireplaces were removed, leaving flooring in the rest of the house to be completed. Alternatively water damaged areas near the loopholes, or charred areas near the stoves may have required replacement.

Porch, plaster and flooring repairs also seem to have been involved when Annual Reports list further small repairs to the lockmasters' houses at Davis, Hartwell's, Clowes, and Smith's Falls detached. At the latter, the porch was painted, although it is possible that the work performed at
Smith's Falls was the same identified several years earlier in the "Schedule of Works and Repairs Required for the Season of 1867" which requested $10 30 for porch repair. During these years, repairs seem to have been repeatedly requested before a few were selected for action. Under these circumstances, it is likely that the repairs undertaken at Davis in 1867, 1870 and 1871 were both urgently required and performed in a stop-gap manner.

In fact, there is evidence to suggest the Department of Public Works wanted to rid itself of all costs associated with the lockhouses during these years. It appears to have leased lockhouses to the lockmasters and to have sold at least one of them outright. In 1870 Superintendent J.D. Slater wrote:

I am informed that at Kilmarnock the lockmaster at that place has purchased to within 200 feet of the canal his purchase includes the stone Lock House and out buildings, which will all have to be repurchased, when any change is made, of the Lock Master at that Station.

Under these circumstances, the responsibility for initiating, performing and paying for any building repairs required reverted to the lockmasters.

Most repairs at lockmasters' houses which like Davis remained the property of the Department of Public Works, appear to have been performed by the lockmasters themselves. Although the "Schedule of Works and Repairs
"Required" for the 1860s and early 1870s separate the costs of labour and materials, labour costs are not included for any but skilled labour. Some indication of the administrative attitude under which this work was done is indicated in the following memo enclosed in the Davis lockmasters' journal:

I am directed to state that the several Lock Masters are to be employed during the winter months at making Ladders or such other small repairs as may be required about their stations.

Since lockmasters were traditionally the only canal employees obliged and paid to remain at their posts during the winter, this order was tantamount to an instruction to take on an additional workload for the same pay. One wonders how many lockmasters, frustrated with waiting for the Department to grant them materials money for necessary repairs, simply performed minor jobs at their own cost. If this occurred frequently, it may prove impossible to ever document the structural evolution of lockmasters' houses during this period.

During the Public Works period, such materials as the Department bought for repairs to lockmasters' houses appears to have been purchased by the lockmasters in local stores. Nicholson's lockmasters' diary includes an entry for materials purchased to repair the lockhouse in 1873. It reads as follows:
Received from B&T Cook ten m. shingles

" from John Hoey 20 bush lime

" " J.A. Kidd 111 lbs nails & 2 gals oil and 16 lbs paint

" 4 lbs putty

" " Francis Wickwire 600 bricks

In a later journal entry J.A.Kidd is revealed as a private merchant in Burritt's Rapids. Under the Ordnance many of the supplies purchased on the list above would have been bought in bulk and supplied through the Ordnance Storekeeper. No similar provision for bulk purchase and supply seems to have been made by Public Works, at least insofar as the purchase of materials extended to the repair of lockmasters' houses. In fact under Public Works, lockmasters appear to have been left to fend for themselves as best they could.

In this vacuum the individual lockmaster played a crucial role. The lockmaster at Davis during this period was John Johnston, former lock labourer at Smiths Falls. He was appointed to Davis when Purcell retired in 1857 along with the Ordnance administration. When he became lockmaster at Davis, Johnston was forty years old. Like Purcell he was an Irish protestant with six children. He too raised potatoes, horses, cows and sheep while he was lockmaster at Davis. He also sold butter, wool and muskrat pelts to obtain extra funds. Unlike Purcell, however, Johnston does not appear to have been particularly well educated: Neither does he seem to have any previous experience of observing the duties of lockmaster at close hand. Together with the unsympathetic political climate, these factors probably explain why Johnston did not petition for more than one major repair to the lockhouse even if others were required.
Indeed, it is likely that the lockmaster's house at Davis became quite run down during the 1857-1871 period. Johnston does not appear to have had the access to capital for improving the building available to his predecessor Purcell through his extra activities as a mason. At the same time, Johnston had approximately the same responsibilities. While Johnston was probably permitted free access to discarded canal materials during this time (because such details were no longer monitored), it is unlikely even these were plentiful enough to permit either large construction or extensive repair. Aside from the one major repair to plaster and flooring in 1867, it is likely the lockmaster's house remained essentially the same during these years, patched here and there to alleviate leaks or cracks that caused discomfort.

Unless their lockmasters were particularly well off or ambitious, it is likely most the other defensible lockmasters' houses were in a state of decline similar to Davis during this period. Fortunately for the survival of Davis lockmaster's house, this situation was soon to change. After Johnston exchanged places with Alfred Foster, Lockmaster at the Isthmus in 1871, the tempo of change increased. Undoubtedly this was assisted by two other circumstances. The first was the appointment of fresh administration in 1872 when F.A. Wise replaced the battle scarred J.D. Slater as Superintendent of the Rideau Canal. The second was the cancellation of leases to lockmasters' houses on August 22 1873. This action should not be underestimated in the histories of the defensible lockmasters' houses along the Rideau Canal, for it finally signalled Canadian government recognition that the lockmasters' houses were essential canal buildings entitled to reasonable maintenance support.
4. RENEWAL: 1874 - 1897

The lockmaster at Davis lock during this period was Alfred Foster, son of David Forster, former lockmaster at Long Island (1857-62) and the Isthmus (1862-64). Foster was well educated, extremely efficient, and a go-getter. He seems to have chosen Davis lock as the place he wanted to spend his life, and maneuvered to get it in 1871 by working out an exchange with the established incumbent John Johnston. Foster left Davis lock under protest in 1897. But while he was there he imprinted his personality so strongly on the lock that it was known as "Foster's Lock", a name it retained for many succeeding decades. During his stay at Davis lock, Alfred Foster used every means in his power to improve his life style. In doing so he renovated the lockmaster's house to almost its present configuration.

Alfred Foster is an interesting character. He was born in England and must have immigrated to Canada before he was eight. When his father died in 1864, he was appointed lockmaster at the Isthmus at the age of fifteen. He exchanged posts with Lockmaster Johnston to become lockmaster at Davis at the age of twenty-two. Whether he was married at this time is not known. Before 1881 he did marry an Ontario-born woman, but the couple did not have any children, and no one else appears to have permanently shared their occupancy of the Davis lockmaster's house. Nevertheless, the building was expanded considerably during the time Foster was lockmaster.
Foster's applications for repairs must have begun as soon as news reached him that the leases for the lockmasters' houses had reverted to the government in late 1873. In July of 1874, Superintendent Wise's list "of the nature and cost of the repairs necessary to the works under my charge" included

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Brewers Mills</td>
<td>Repairs to lock house</td>
<td>$100</td>
</tr>
<tr>
<td>Davis'</td>
<td>Repairs to lockmaster's house</td>
<td></td>
</tr>
<tr>
<td>Old Slys</td>
<td>Repairs to lockhouse</td>
<td>$100</td>
</tr>
<tr>
<td>Edmonds</td>
<td>Repairs to lockhouse</td>
<td>$100</td>
</tr>
<tr>
<td>Hogsback</td>
<td>Repairs to lockhouse</td>
<td>$40</td>
</tr>
<tr>
<td>Hartwells</td>
<td>Repairs to lockhouse</td>
<td>$40</td>
</tr>
</tbody>
</table>

In all likelihood, this list incorporated the cost of replacing the casement windows in these defensible lockmasters' houses with double hung sashes for an amount of approximately $40. This deduction is based on the fact that the published Annual Report for the year 1874 records "new sashes put in lockhouse" at Hartwells, Hogsback and Ottawa. Combined with information which appears in Wise's estimate for the six months ending June 30, 1878 which reads:

- Jones Falls - new windows for lockmr's house $30.00
- Chaffey's Mills " " " " " 40.00
Poonamalle " " " " 50.00
S.Falls Det " " " " 36.00
S.Falls Comb " " " " 80.00
Edmonds " " " " 40.00

it is possible to draw some conclusions.

The first is the fact that Wise, who was a careful and very professional engineer, had concluded that the casement windows were causing some damage or extra cost to the repair of the defensible lockmasters' houses and should be replaced. Between 1874 and 1878 he ensured such windows were removed from all the defensible lockmasters' houses under his care. Twelve of the sixteen possible buildings are listed above with repair amounts that, if they do not precisely identify new windows as an expense, contain an amount sufficient to provide them. The other four buildings include Clowes which is recorded as having been "plastered and shingled" in 1874 allowing sufficient funds for the job to have been done, Kilmarnock which at the time was owned by the lockmaster, Lower Brewers, and Nicholson's. According to the published Annual Report, doors were also replaced on the lockmaster's house at Black's Rapids in 1874. Although this was not a defensible lockmaster's house, it is probably reasonable to assume that any doors on lockhouses that appear to date from the late middle nineteenth century may also have been replaced at this time. The exterior door to the front porch of the Davis lockmaster's house (Figure 17) appears to be such an example.
Several different pieces of information combine to suggest that window and possibly door replacement were not the only repairs required to the defensible lockmasters' houses by 1873. As previously stated, Clowes required plastering and shingling. Moreover, the amounts stated in the estimates for Upper Brewers, Old Sly's, Edmonds and Davis in 1874 indicate that Wise concurred with the lockmasters wishes to see further work done. During this time period, however, Wise seems to have encountered considerable difficulty in obtaining approval for such work. The contents of his estimates during this period do not align very well with the declarations of work performed in the Annual Reports. Replacement of the sashes on the Ottawa lockmaster's house, for example, never appears in his estimates, yet the 1874 Annual Report confirms it was done. The same report records repair of the plaster and shingles at Clowes, yet the amount requested for the job does not appear until Estimates prepared in 1876. Repair activities on some of the buildings, notably Hartwells, Hogsback, Smiths Falls detached, Chaffeys and Jones Falls, appear in more than one published Annual Report during the years 1874-1878. Others, like Edmonds appear in the Estimates bearing different amounts as is evident from the 1874 and 1878 Estimates cited above. All of this argues that Wise was persistently using every means possible to ensure necessary repairs occurred.

One solution he devised was to undertake full payment of repairs necessary to the maintenance of the existing buildings, which were in most cases windows, while encouraging lockmasters to proceed with other repairs with promises of future support. This provides an explanation for the
reduction of repair costs at Edmunds from $100 in 1874 to $40 (the cost of windows) in 1878. There is every likelihood that the same cutback was made at Davis. Many years later when he retired from the Public Service, Lockmaster Foster was to claim compensation for, among other things

... a frame kitchen with upstairs bedroom, which he states he built on to the lock house ...

He states the kitchen, which he rebuilt, was to re-place the old one which was, at that time (in the year 1875), falling into ruin; and that he received permission from the then Suptg. Engineer, (the late F.A. Wise Esq.) to build it.

... [Mr Forster] merely states that he always understood from Mr. Wise that he would at some time or other be repaid for his outlay.

The engineer sent out to investigate this claim in 1901 commented:

With regard to the item of $50.00 for building an addition to the lock house itself, I would refer you to photo No.3 which partly shows the frame addition built on to the stone lock house.

This addition was clapboarded outside, and sheeted inside by the Dept. many years ago, so that it is impossible to see the work that Mr. Forster claims payment for.

Exactly who built this addition or what materials were originally used
remains open to question. The lockmaster's record for July 5 1875 reads "John Mason Carpenter" in the comments columns opposite the listing for "boat Messrs Arghus from City of Kingston, travelling to Ottawa from Kingston", and Foster often wrote personal comments in that column. Mason may have provided carpentry work for the kitchen if Foster did not do it himself.

There was also a saw mill at Davis which seems to have produced considerable quantities of fuel, railway ties, cedar posts and squared timber (pine) and may have supplied some rough lumber. The lumber Foster used may have come from a combination of used materials from the former kitchen and new lumber. Certainly the porch surrounding the door on that surface of the building would have had to be removed. Figure 32 which shows what might have been a platform foundation for the kitchen at the top of the cliff in front of the south west corner of the lockmaster's house. This suggests that the old summer kitchen was demolished and not moved closer to the house and revived on a new foundation as occurred at Hogsback. When the Hogsback lockmaster sought compensation the evaluating engineer described his work as follows:

porch to kitchen and connecting door in wall of lock house into
a window and building up masonry at footing ...
moving up summer kitchen, flooring same, clapboarding one side
and building chimney ...

The practice of encouraging lockmasters to add shed roofed, wooden shingled kitchen additions to their dwellings perhaps reusing the old separate summer kitchens on the lock stations seems to have been a common one
during the time period (see Figures 24, 26, 27). In more than one case Wise approved of the procedure and permitted the lockmasters to go ahead with promises of future compensation.

In 1880 administrative responsibility for the lockmasters' houses was transferred to the newly established Department of Railways and Canals. Although this change may have ensured a somewhat more sympathetic ear to required changes to the lockmasters' houses over the long term, over the short term it does not appear to have made much difference to the frequency and size of repairs. Canal personnel did not change: Wise continued as superintendent, and in that role continued his initial priority of ensuring the original lockmasters' houses were well secured before financing additions. As a result Edmonds, Old Sly's, and Smiths Falls attached were resinished in the 1879-82 period, and small repairs such as painting were undertaken. In 1877, just before the transfer of canal properties to the Railways and Canals, the defensible lockmasters house at Ottawa was demolished to make way for more extensive accommodation. Once the remaining group of lockmasters' houses had been secured as a well maintained, solid core of canal structures, Wise began to consider paying for further alterations.

The first type of alteration he supported was the addition of shed kitchens similar to those some of the lockmasters had already built. According to the published Annual Report for 1886-87, new kitchens were added to Old Sly's and Jones Falls that year, although unspecified repairs to Hartwell's, Hogsback, Davis, and Lower Brewers in 1884-5 and 1886-7 and possibly to Poonamalie in
1888-89 seem to have involved some kitchen repairs as well. The cost of adding a new kitchen at Jones Falls is given as $150, while $200 was spent at Old Sly's although this may have included money for lumber for a new storehouse which was also built that year. A lesser amount of $100 was spent at Hartwell's and Hogsback where, like Davis, some sort of kitchen seems to have been in place.

At Davis, where more detail is known, the situation was actually much more complex. Estimates for June 1886 include entries for $50 in general repairs and $600 in costs for construction of a new Lock Labourer's house. However, the lockmaster's records for the period include entries that show that carpenters at the lock station for other purposes during the 1884-1890 period actually performed considerable renovations to the kitchen. In 1884 the lockmaster's journal includes an entry under the title "C. McGonigle - Repairing Kitchen at Davis Station Octr 1884" which states that a carpenter was employed from October 6 to November 12, 6 days a week plus a helper for one day. "McGonigle" was probably Charles McGonigal of Newboro who seems to have been a carpenter employed on a number of government projects during the period. The exact nature of his activities in repairing or reconstructing the kitchen at Davis in 1884 is unknown, but they must have been extensive. Indeed, he seems to have undertaken the major activity of up-grading the rough summer kitchen and bedroom to their present finished state. That this is likely is supported by the fact that the lockmaster purchased a coal stove in 1886, suggesting that the woodstove previously used to heat the lockhouse had been moved to the present kitchen rather than to the central part of the house once.
the work had been completed. Whatever work was done on the kitchen in 1884, it does not appear to have included finishing the exterior of the building. This was completed in October of 1890 when Arthur J. McGuigan, the carpenter from Smiths Falls who had been in charge of building the lock labourer's house at Davis the previous two seasons, returned to use what was presumably extra lumber to finish the lockmaster's kitchen. On the 29th of October 1890 Foster's journal contains an entry under the title "Repairs consisting of Clap-boarding kitchen." It reads as follows:

labour - Arthur J. McGuigan, carpenter - 8 days - 21st to 29th Oct. 1890

21st. Coming from Smiths Falls, 22nd preparing corner & base boards
23rd, 24th & 25th putting on corner and base boards and clapboarding
27th preparing window and door casings & cornice boards. 28th fitting on casings & repairing platform & steps in front of door 29th returning to Smiths Falls

Given this description of the work, McGuigan appears to have covered the kitchen with clapboarding and added exterior detailing. Once this work had been completed, the kitchen addition had attained its present form, and the evaluating engineer's 1901 description of this portion of the lockmaster's house is fully explained.

This account of the construction of the kitchen at Davis is interesting because it shows how Wise eventually did provide support to Foster. He supplied
materials and labour to complete the finishing, the expensive part of the kitchen he had encouraged the lockmaster to begin. In 1885 Foster also built a barn with what he perceived to be the same type of encouragement. So apparently did other lockmasters at Hogsback, Jones Falls and possibly Lower Brewers. This barn stood on the Davis site just east of the lockmaster's house until it burned down in 1983 (Figure 41). Its interior configuration was described much later by Jean Rowe, daughter of later lockmaster Elah Alford. The west portion, she claimed, held storage for wood, and for coal as well as an outhouse: it was accessed by a door directly across from the back door to the house. The middle portion contained a storage place for carriages (later a garage) and opened with double doors facing the house. The end portion, which opened from the east contained stalls for cattle and pigs. When Foster attempted to claim compensation for this barn in 1901-02, the government assessor reported "This building could not have been built for much less than $400.00 when new."

Ironically, one of the main reasons Foster was not eventually compensated for building this barn was the fact that he tried to force the government to provide him with assistance to build it in the first place. He wrote to the Minister of Railways and Canals in March of 1885 stating the project had the support of the local Conservative M.P. Mr. Taylor, and outlining his duties as lockmaster. He stated that a horse, buggy and sleigh were essential to the performance of his job.

I furnish a horse and all the necessary equipment to perform those
duties and the stable I have used is decayed and useless to keep a
horse in or protect the feed from the weather and I am compelled to
either sell out the horse or put up a stable this season which I
cannot well afford, as I am serving the Dept at $1.00 per diem.

Through Wise, the Department replied by providing "lumber to assist" in the
job, and the fact that it did prevented payment of the later claim. It
is also worthy of note, however, that the barn was built in 1885 when two
carpenters, five labourers and two teams were performing major lock repairs
and could easily have provided some barn building assistance.

In fact, major lock repairs were underway at Davis consistently from
1885 to 1889 as a new dam was put in above and below the lock and major
portions of the lock were rebuilt. During this time period, "sheds" on the
property were pulled down, and labourers were employed "wheeling earth to fill
up where old buildings stood". At the very least this suggests the possibility
that when the barn containing an outhouse was built, the old outhouse was
demolished. This may have been the building that appears to have been attached
to the side of the house where the present summer kitchen stands in Figure 32.
A list of the sheds that were demolished probably includes the outhouse, stable,
and barn -- all replaced by facilities in the new barn. In addition, the old
lock labourers houses were probably torn down since a new lock labourer's
house was built by D. Sly, one of the carpenters employed in lock repair. At
this time the exterior of the lockmaster's kitchen was also clapboarded.
Additional fill was probably added to the area around the lockmaster's house
as well.
A similar period of activity occurred again in 1895-96 when the upper sill of the lock was rebuilt. On this occasion no less than six stone masons were on the site, two from October to December 1895, two in April and May 1896, and another, Robert Snaith, who arrived in October 1895 and did not leave until May of the following year. Snaith was the chief mason for the project. During the time he was at Davis, he cut stone for the sill from the government owned quarry near Elgin, arranged for it to be hauled to the locks by local men, and supervised its installation. Foster's journal indicates that fill around the lockmaster's house was provided in the fall of 1895. His journal reads "Fleming's team employed drawing clay & gravel to fill in the end of the dam at LM's house". Given Snaith's long presence on the site, it is likely some small masonry repairs such as pointing were performed at this time as well.

Certainly the major portion of this money was used for repairs to the lockmaster's house performed by carpenters in the summer of 1894. At that time six carpenters were on the Davis lock site. They are identified in the lockmaster's journal as "W. Summers, Dd Russell, Jno Mason, Jas Summers, Peter Tapp, Jas Carroll, W.K. Morris". While they were at Davis they "put up [a] W.C." in an unspecified location (perhaps close to the lock). They may also have built storm sashes for the lockmaster's house, for storm sashes were supplied at Hartwell's in 1896, Chaffey's in 1899 and may have been provided as well for Clowes and Edmunds when major carpentry repairs occurred in those locations in 1895 and 1896 respectively. The main activity which occupied the carpenters at Davis in 1894, however, was the
replacement of the old tin shingle roof with a new one of galvanized iron.

When Colonel By initially recommended the use of metal shingles on the Rideau Canal buildings he described them as a durable roofing, "good for up to fifty years in this climate." The roof on Davis lockmaster's house appears to have lived up to By's expectations, as did those on some of the other lockmasters' houses (notably Poonamalie, Clowes, Jones Falls, Hogsback, and Nicholson's). In other cases, however, the original metal roofs were replaced at a much earlier date. Annual reports record that Edmunds was re-roofed in 1867 and again in 1882; that Old Sly's was re-shingled in 1880 and again in 1897; and that Smiths Falls attached and Upper Brewers received a new roofs in 1880-1. Such a variation in the success of the original metal roofs is readily explained by architectural works which discuss the early use of metal as a building material in the North American climate. All agree that the major factor influencing its durability and effectiveness is the care and thoroughness with which it was laid. Since the defensible lockmasters' houses were built by a variety of different individuals, it is not surprising that the original metal roofs were built differently and in consequence seem to have survived a variation of time periods.

Given the austerity of the time in which many of the earliest roofs were replaced, it is also not surprising that they were shingled in wood. In 1867 the estimate for re-shingling the lockmaster's house at Old Sly's calls for
8000 shingles for Lockmaster's quarters, $16
5 days carpenter $1.50  25 lbs nails .05 $ 8.75

The estimates for re-roofing Upper Brewers, Smiths Falls attached and Old Sly in 1880 were also $80, $75, and $60 respectively. These prices argue the use of wood shingle as a roofing material. The replacement of roofs at both Old Sly and Edmunds after approximately a twenty year interval also supports this deduction, for the anticipated durability of wood shingle as a roofing material is approximately twenty years.

When the Department of Railways and Canals re-roofed several lockmasters' houses in the 1890s, however, it replaced at least some of them with metal roofs. The product chosen for Davis lockmaster's house was Empire Steel Shingles, produced by the Metallic Roofing Company of Toronto. This product had been developed by 1885 and was one of the earliest pressed metal products manufactured in Canada. At the time it was selected for use at Davis it had received considerable public acceptance as a cheap, durable, fire-proof roofing material. According to its manufacturer's claims

*Our Metal roofing can be applied in at least one-third to one-quarter the time it takes to apply wood shingles, and only costs about the same when laid on the building, besides looking better and lasting very much longer.*

Designed so they could be securely interlinked, these shingles were pre-painted
and pre-measured by the manufacturer so that, by the time they reached the building site, they could be reliably and simply laid by a carpenter. In fact this was what happened in 1894: the carpenters identified above applied galvanized roofing to the lockhouses at both Davis and Jones Falls consecutively.

Since the Metallic Roofing Company is known to have marketed its material both through local agents and by mail order directly from the factory, evidence of the company name was sought in canal records for the period in the hope a direct bulk purchase of galvanized metal shingles for lockmasters' houses might have been made. While this search was in itself unsuccessful, it highlights the variety of purchasing patterns employed by the Department of Railways and Canals for buying building materials during the period.

The government policy for purchasing materials is generally outlined by the following Estimate for Staple Materials found in the 1893-4 Superintendent's records:

- **oak timber** - Tenders have heretofore been asked from a few responsible dealers
- **cement** - bought from Messrs C.B.Wright & Sons, Hull, Que. at current market prices
- **paint (oxide iron)** - bought from Thos Birkett, Ottawa, wholesale & distributed along canal during navigation
spikes - bought either in Ottawa or Kingston which ever is nearest to the work, delivered by boat in summer & by stage in winter

... paint oil - bought at current prices at the nearest store to the work

coal oil - bought at current prices at the nearest store to the work

dimension timber - usually purchased at Ottawa at the Mills at which it is manufactured. If large bill for a special work tenders are called

flatted timber - usually bought at Ottawa after enquiry to price, quality, &c &c

iron - bought at either Ottawa or Kingston whichever is nearest to work

In 1890, Wise sent a memo to the lockmasters which outlined the procedure to be followed when they bought local goods:

Lockmasters who order and receive goods required for their respective stations from local or town shops, will in future be governed by the following regulations.

1st No account is to run over two months, Lockmasters will notify store-keepers to that effect and insist that this is done.
2nd Where a store-keeper is dealing with several stations, he will keep each station separate [sic] and leave a sufficient space between each station for the Lockmasters to make a declaration that he has received the goods at his particular station. You will notify the storekeepers to that effect also.

These instructions for local purchase were amplified upon in 1893, when Wise instructed that "Lockmasters must see that prices charged are not more than a private individual would pay for the same article."

It is no accident that all of these documents relating to the purchase of materials come from the early 1890s. As the information on construction at the defensible lockmaster's house at Davis during the 1870s and 1880s shows, as little material as possible was actually purchased by the Department in earlier years. In many cases lockmasters bought the materials themselves as appears to have been the case in building some of the barn and kitchen at Davis. In others they had a free hand to re-use discarded materials around the station. In 1891 another memo was circulated stating "In future no timber from broken up gates, cribwork & c is to be taken by the lockmasters for their own private use until ... the foreman of works has picked out what portion of it can be used again for canal purposes." By implication, lockmasters had had a free hand to use such timber in earlier years. They also seem to have transported used material to other stations where it was required. In 1874 the lockmaster's journal at Davis states "shipped 21 pcs 2 in plank ash and Hemk to Burritts" opposite the entry for H. Harris & Co., steamer Gatineau.
One other, possibly major, way in which building materials were provided for use in various building projects during these years was by contractors. Just as it seems to have been no accident that various unrecorded repairs were performed to lockmasters' houses by skilled craftsmen engaged in canal repairs at the lock during these years, it seems likely that some materials used were probably overpurchased under the guise of the canal project. The lockmaster's journal contains some interesting entries that may confirm this. In 1886 it states "Lumber W.B.D. received" opposite the entry for the Steamer Nile, and in 1895-96 it contains three separate items -- two for shingles, one for lath -- identified as "for W.W.B.". These might be the initials of the major contractors who performed repairs to the canal at Davis during these years.

Construction projects undertaken during these years seem to have involved three types of labourers. In a few rare cases works on lockmasters' houses were performed by a direct contract for the job. This was the case when the Newboro lockhouse was painted in 1880, and again when it was altered in 1888. In the latter case the contractor involved was Charles McGonigal of Newboro who performed work at Davis in 1884, 1885, 1886 and 1887 including repair to the lockmaster's kitchen in 1884. Robert Snaith, the stone mason who lived at Davis in the winter 1895-96 while he quarried and supervised installation of the new lock sill also seems to have performed the job on contract. In 1895 the Superintendent's correspondence includes the following instructions to Foster:
Yes you can get the coffer dam built as formerly, only you had better write out an agreement & get the contractor to sign it and witness it yourself and send it to me.

Neither of these entries is included in Department of Railway and Canals' list of Rideau Contracts up to 1899. This suggests a different system operated for small contracts because in both situations the men were hired to perform specific jobs.

Two other distinct forms of employment also existed. The first was the contract employment of skilled labourers to perform work for the Department along the canal for the season. Men employed in this way were often referred to as "the government carpenters" or "our own masons", and the capacity to hire such men along the canal had existed since 1866. Under Wise (who died in 1894), the number of seasonally employed craftsmen appears to have been very limited. That some did exist is attested by the following letter:

I wrote a few days back to send two carpenters to Chaffeys (men who are accustomed to the work).

As soon as the state of your work permits of it, you will reduce the carpenters by letting the local men go, who were taken on for the Jones Falls work.

Indeed, Sommers to whom this letter is addressed appears as a carpenter at Davis in 1884, 1889, 1891 and 1894 when major canal construction is undertaken.
Snaith, too, may have worked in this capacity during the summers, for he seems to have been in charge of the lock repairs at Davis during the construction seasons of 1895 and 1896 and may only have performed contract work during the winter.

For the most part, however, Wise seems to have preferred to hire local craftsmen to work on projects in their own areas. The names C. McGonigal, Arthur J. McGuigan, D. Sly and Peter Tapp all appear frequently in connection with repairs at Davis during the 1880s and early 1890s. Whether these men were hired for a short term as they were during later years, or hired by the day is not certain. The latter was probably the case, for in 1892 lockmasters were asked to attest that all work was paid for at the same rates as everyone else. This suggests that lockmasters, who were after all knowledgeable about local labour supply, were involved in hiring or at least nominating local contractors. A close co-operation between lockmasters and local contractors is further implied by an 1893 memo which states "if it has been customary to lend the Gov't tools &c to private parties....the practice must be at once discontinued."

All in all, there is sufficient evidence to suggest that during the time Foster was lockmaster at Davis and Wise was Superintendent of the Rideau Canal the lockmasters had considerable influence over which local merchants and tradesmen received the benefit of canal moneys. Undoubtedly this resulted in co-operative assistance on projects at the lockmaster's house in the form of both labour and materials. For much of this period formal requests for
repairs and additions to the lockmasters' houses would have been refused, and this system accomplished the same ends with far less fuss. It is interesting to note, however, that Wise insisted on some decorum:

When permission was given you to take on an extra hand ... it was supposed you would employ an able bodied man, and not a person who is staying at your house as an invalid -- it is open talk through the Canal, and I cannot justify it -- I am also informed you are building a boarding house for tourists and employing lock labour to build it, is this correct?

While this was undoubtedly gossip, it probably contains some grains of truth. In all likelihood the construction referred to was the stable Foster built in 1885, but it is also quite possible that Foster was taking in boarders to live in the lockmaster's house. This at least provides an explanation for why he was anxious to increase the size of what was already a two bedroom house for the accommodation of what, according to census data, were two people (Foster and his wife).

The Fosters lived at Davis lock in considerably more comfort than had their predecessors. Not only did they have more space for fewer people, but the lockmaster's house was better heated by a coal stove in the winter. At some time in the 1870s coal oil was introduced as a light source along the canal, and it was undoubtedly used in lamps in the lockmaster's residence. Wood, and coal were conveniently stored next to a new privy in the
barn Foster built. Water, unfortunately, was still hauled from the lake by bucket.

Some indications of the style in which the Fosters lived in the Davis lockmaster's house do remain. The most enlightening is the reply to a letter Foster wrote demanding changes in the Jones' Falls lockhouse before he would agree to accept a transfer there in 1897.

I have no objection to your having the partitions taken down in the [Jones Falls] lock house ... and you may tell Summers to put a couple of carpenters to work. The painting cannot be done at present, and as to papering that must be done at your own expense. I do not however think it is at all necessary as I was in the [Jones Falls] house 10 days ago & the paper is sound and good.

Since Foster lived close to the Jones Falls lockmaster's house, it is reasonable to assume he was aware of its condition when he made these requests. Undoubtedly the changes he required were intended to make the Jones Falls house more like the one at Davis which he and his wife had spent almost thirty years adapting and decorating for themselves. Indeed, a wallpaper scrap discovered beneath a scrap of 1898 newspaper on the pantry wall at Davis much later (Figures 43 and 44) may illustrate Mrs. Foster's taste.

The departure of the Fosters from Davis lock on April 1 1897 marked the end of an era.
Chapter 5. **A LOCKMASTER'S HOUSE IN THE TWENTIETH CENTURY: 1897-1962**

a) Transition

When Foster left Davis on April 1, 1897 he was replaced by Philander Smith Alford, a forty-nine year old farmer from Harlem Ontario. Alford brought with him his wife and his youngest son Elah, who was then sixteen. He had three other children all of whom had grown up and left home.

According to local tradition Alford had worked on Halliday's farm in Elgin at some time, but whether he came from there or Harlem to occupy the lockmaster's position is not known. He does not appear to have had any experience as either a lockmaster or locklabourer beforehand.

Both Alford's inexperience and the fact that Foster (who had been at Davis for twenty-seven years) was ordered to move, argue there was some irregularity about Alford's appointment. This may have come from one of two sources. The first is Arthur T. Phillips, Superintendent of the Rideau Canal, for in 1897 Phillips was confirmed in this position after filling it in an acting capacity since Wise's death in 1894. If Phillips had wanted to make any major changes he would have made them in 1897. The second was Mr. Fredenburgh, newly elected Liberal representative for the federal district of Leeds and Grenville. General historical evidence argues that Fredenburgh claimed the right to name a new lockmaster at Davis as a patronage appointment. Surviving documentation from the 1894-97 period in which Phillips served as acting Superintendent of the Rideau does not in any way suggest that he was
unhappy with Foster. The only time in which he addressed Foster curtly was in reply to Foster's demands for compensation if he was to be forced to move. "Your letter received & before I proceed to answer it, I would point out that we are not in the habit of giving orders to Lockmasters, subject to conditions proposed by them before being carried out." The behaviour of both Phillips and Foster in this instance suggests neither man has any choice in the matter; both are acting under outside compulsion.

On the other hand after 1896, Phillips was careful to consult Fredenburgh about any activity involving the expenditure of funds in his district. That Fredenburgh's interest extended to the appointment of lockmasters as government employees is confirmed by a letter Phillips wrote in 1898 stating he was looking for a lockmaster to replace Alford, who was on temporary leave, "in conjunction with the local Member of Parliament". It also extended to the appointment of short term labour. "As we are now about ready to have the stone drawn from the quarry," wrote Phillips to Fredenburgh in January 1898, "I should be glad if you would name the parties whom you wish to do the teaming." In addition, Fredenburgh identified suppliers for locally purchased canal needs, for after he had moved to Jones Falls, Phillips instructed Foster:

Any blacksmith work is to be done by C. E. Johnson of Elgin, so get shekels there. Any other supplies are to be purchased in Elgin from W.W. Brown and H.S. Harrison.... the above are recommended by Mr. Fredenburgh for patronage.
Until Fredenburgh’s election, local distribution of canal funds had effectively been controlled by the lockmasters. The Liberal victory of 1896 changed that.

But it brought other changes as well, changes that supported lockmasters in their need for up-graded accommodation. As early 1895 with the re-shingling of Jones Falls, Davis and Nicholson’s and the construction of a second storey on the lockmaster’s house at Chaffey’s, it became clear that Phillips intended to improve the condition of the lockmasters’ houses. Perhaps his careful attention to the patronage requirements of the new Liberal government paid off, for during the next few years he was able to obtain approval for improvements to many of the lockmasters’ houses. He moved carefully at first, securing obvious improvements like shingling, the construction of winter sashes, and the drilling of wells. When Alford the new lockmaster at Davis made a more ambitious request early in 1898, he replied "Your letter re lock house received. I am afraid what you ask cannot be done." Unfortunately there is no record of what Alford requested. Alford’s request may, however, have had repercussions, for by the time he prepared the estimates for 1899 Phillips had decided upon a much bolder course. That year he proposed the government pay for new construction of lockmaster-related quarters at selected locks where he had played the patronage game. Edmonds, where the lockmaster had been replaced in 1897, received a new barn. At Lower Brewers, where the lockmaster’s resignation had been demanded for political reasons in 1896, the kitchen and stable were renovated, and a second storey was added to the house. At Davis, where Alford had been appointed at Fredenburgh’s instigation, a new summer kitchen was added.
While the promotional value of the summer kitchen at Davis was relatively high because it permitted the Annual Report to acknowledge new government construction on a lockmaster's house, the summer kitchen actually built at Davis in 1899 was really a very small room with windows on both the east and west surfaces. It remains today as a separate room behind the side entrance to the lockhouse (Figure 44). When it was built, this structure was sheathed in tongue and grooved siding and adjoined to a small porch, partially covered and accessed from a door in the kitchen addition just beside the main house. From evidence visible in Figure 44 this addition appears to have been placed on a foundation of loosely piled stone.

During the summer of 1899, an attempt was also made to drill a well at Davis to remove the necessity of hauling water from the lake. An estimate is enclosed in the lockmaster's papers of the time:

I here with submit my tender to drill a well at Davis station for $3.00 per foot and if I do not strike water we expect no pay for same. But in the event of a good flow of water I am to get 3.00 per foot for every hole drilled. O.P.

Permission was also given to drill a well at Jones Falls in 1897 under the same terms, and so it is likely that earlier drilling had been unsuccessful at any stations which did not have well water by this time.

In April of 1901, Lockmaster Philander Alford (Figure 45) died.
The pace of change at Davis lock established by Alfred Foster in the 1880s and '90s had continued during Philander Alford's short occupancy. By 1901, the lockmaster's house at Davis was one of the best equipped and maintained on the canal.

b) Marking Time

Time, and with it "progress", seem to have stopped at Davis early in the twentieth century. While change inevitably occurred, the changes to the lockmaster's house during the next fifty years were minimal in comparison to what had come before. As the following pages will show, two factors seem to have played a part in this: the first is requirements, the second is location.

Philander Alford was replaced as lockmaster at Davis by his youngest son Elah. "Ely" as he was called, was twenty when he was named lockmaster in May of 1901; he had been appointed lock labourer in 1899 and had been effectively performing the job of lockmaster during his father's illness since that time. Elah Alford was to remain lockmaster at Davis for the next forty-six years, until his retirement on December 1, 1946.

When Elah Alford (Figure 46) became lockmaster, he was a bachelor. His mother remained to keep house for him until he married Edith Whipple of Malone New York in 1907. The couple eventually had two children, but even by mid twentieth century standards, Davis lockmaster's house always
provided sufficient accommodation for their needs. By turn of the century standards, when Ely Alford became lockmaster at Davis, his accommodation was very comfortable. The station boasted a relatively new barn and kitchen and a brand new summer kitchen. The lockmaster's house was warm and sound and had recently been re-roofed. Fortune had smiled on Davis during the previous decades. During the time lockmasters had been the initiators of change in their own lockhouses, Davis had had an aggressive lockmaster. During the time lockhouse improvement had been a political game, the Davis lockmaster had had a strong patron. As a result the Davis lockmaster's house had received every repair advantage.

Other lockmasters' houses were not as fortunate. During the late nineteenth century the canal had acquired a new importance as a highway for the transportation of raw materials required for the new growth and manufacturing industries in the small towns and urban centres it touched. Since some of these raw materials were obtained in the area surrounding the canal, the canal became a vital link in stimulating the economy of southeastern Ontario. As its importance as a link developed, pressure to improve canal facilities translated into the expenditure of available funds on the canal works themselves. Initially, the repair and improvement of lockmasters' houses had been assigned a secondary importance.

Information contained in the published Annual Reports of the Department of Railway and Canals suggests this changed in the first decade of the twentieth century. Early in the 1900s all lockmasters' houses were reviewed
and their condition assessed. "These cottages are all of the same pattern...", stated Superintendent Phillips in the Annual Report of 1904, "repairs to them only seem to be a waste of money, as they are over 70 years old." In the surrounding years, the defensible lockmasters houses at Edmonds, Hartwell's, Hogsback, and Smiths Falls attached were all described as "in bad condition." Indeed, Phillips believed the latter to be "so far decayed that I consider the only thing to do is to build a new house as the present one is not worth repairing." In 1905 "the old stone lock house [at Edmonds] was taken down on account of the back wall partially collapsing," undoubtedly strengthening Phillips' argument that immediate and extensive attention was required.

The Liberals responded to the challenge. During the period which preceded the First World War, the lockmasters' houses received extensive funds for maintenance, expansion and repair. While the activities undertaken at each station varied according to its individual needs, some patterns are evident in the type of work performed. The first of these is new construction. Many lockmasters' houses were expanded to better suit the needs of their occupants. Second storeys were added to the houses at Lower Brewers (1899), Hartwell's and Hogsback (1907), Nicholson's (1916) and Poonamalie (Figure 47) during this period. Kitchens and small additions were also made at Davis (1899), Upper Brewer's (1899), Poonamalie (1899 and/or 1903), Smiths Falls attached (1910), Jones Falls (1910) and Nicholson's (1916), and new stables were built at Edmonds and Upper Brewer's (1899) and Lower Brewer's (1911).
The second type of work done during this period was masonry repair. Many of the buildings were pointed and grouted at this time. Annual Reports specifically list this activity at Jones Falls (1900, and 1914), Old Slys (1902), Smiths Falls attached (1902), Poonamalie (1913). Basements also received new tile drains, concrete floors, and miscellaneous concrete repairs. These are noted in detail at Hogsback and Edmonds (1900), Old Slys (1898 and 1909), Jones Falls (1914), and Hartwells (1914). Hartwell's too was lathed and plastered in 1907, and new chimneys were built at Upper Brewers in 1912. Such repairs were undoubtedly carried on at other stations as well and reported as either "small repairs" or "small masonry repairs". One of these was Davis which lists unspecified "small repairs" in 1911 and 1913, and "small repairs to lockhouse and lock masonry" in 1916. It is probable that the early ground level basement doorway (Figure 62) and windows were added in 1916, and the basement floor concreted. This is all the more likely because lockmaster Alford's brother, Fred Alford was one of the masons hired seasonally by the government to do canal work at this time. He would have been aware of the possibilities for remodelling the basement, and may in fact have performed it as private labour with the government providing the materials.

Other general patterns consisted of activities to bring houses to a consistently good state of repair. Storm sash was added at Chaffey's (1896), Hartwells (1901), Hogsback (1901). New roofing was applied at Hogsback (1903), Smiths Falls attached, (1910) and Chaffey's (1911). In 1913 a tender was also accepted to lay galvanized iron roofing on the kitchen of the lockmaster's house at Hartwells. During this period Hartwells was
clapboarded and sheeted on the outside (1902), and the majority of lockmasters' 
houses were painted several times. The colour of the paint was undoubtedly 
what Jean Rowe remembers as never changing "lockmaster grey", for during this 
period, canal paint was bought in quantity and shipped to the locks. 
In 1916, all of the lockhouses received flagpoles and Union Jacks to underline 
that they were government buildings in a time of war. 

Further attempts were made to dig wells at Davis (1905), Hartwells (1906) 
and Poonamalie (1915). The well at Davis was dug by Mr. M.L. Wilson of Athens 
with the same "no water, no pay" condition under which the earlier attempt was 
made. Apparently, the price paid was higher than at most stations because the 
working conditions were more difficult: 

The nature of the rock which is very much distorted, makes it a 
very difficult matter to put down a hole straight without rimming 
it out after every six or eight inches, otherwise the bit drifts 
sideways with the seams and binds in the hole. 

Alford's daughter, Jean Rowe, comments that the water from this well was always 
full of iron; nevertheless, her parents must have found it much preferable 
to hauling water from the lake which had been the previous practice. Once 
the well had been successfully sunk, a pump with an iron cylinder was installed 
attached to a small sink in the lockhouse kitchen. In 1915 Lockmaster 
Alford had the sink replaced by a new one because the old one was so stained 
by iron deposits. This occasioned considerable tension with Superintendent

126
Phillips who thought Alford had had an additional second sink installed on his own initiative.

I certainly would not have given you permission to gain such an article, and you will please remember that Lockmasters are not permitted to order things for our houses unless they first obtain permission to do so.

37

Times had changed. Since the turn of the century the government had reclaimed the lockmasters' houses with a vengeance. Not only had the government made a considerable number of repairs on the lockmasters' houses in the intervening years, but most of them had been made using government labour -- the skilled workmen the government hired either seasonally or on short 30 day work terms to perform canal labour. Certainly, the government had paid for any contracts and all materials concerned. Moreover, it had also adopted the policy of re-paying lockmasters upon retirement for the repairs they had personally made to the buildings during earlier periods. As a result, in 1911 the Department of Canals and Railways felt perfectly justified in introducing a rental fee to be charged to lockmasters for use of lockmasters' houses. The fee was a blanket $4.00 per month per building. Lockmasters were responsible for supplying their own heat and light: in return, the Department maintained the buildings, performing all necessary repairs. Lockmasters do, however, appear to have been permitted to improve the buildings further at their own expense provided they had prior approval for changes; moreover, until 1937 they were reimbursed for approved changes -- albeit depreciated
by use -- when they vacated the buildings.

After the moratorium on improvements imposed by the First World War had ended, the Department continued to support improvements of a similar nature to those that had been made beforehand. At Davis problems with the lockhouse walls had been noted as the war ended in 1918. Mrs. Rowe remembers that when she was a small child frost climbed the bedroom wall (in the bedroom that later became a bathroom) to a height of two feet above the baseboards. Canal workmen lathed and plastered Davis lockhouse in 1922 while the family lived in the top of the watchhouse. Similar problems had been noted and dealt with by the application of lath and plaster in most other canal houses by this time. At Hartwell's in 1904 health officials had condemned the building as unsanitary. Dampness seems to have been a constant problem in the defensible lockmasters' houses and many of the repairs that were performed were made with the objective of relieving it. The addition of lath and plaster was one of these: others probably included such things as the initial removal and blocking of the gun slits, the early change in windows from casement to double hung, various forms of exterior clapboarding, and finally the improvement of ventilation through the addition of basement windows. Lockmaster Alford was ill during the winter of 1915 and the entire 1916 season. The nature of his illness is not known, but if it was related to dampness the department probably considered the house repair a worthwhile investment.

In 1924 a new cistern built in the lockmaster's house to provide an
alternative to the iron-laden water from the well for washing. A new concrete cistern was also added to the lockmaster's house at Hartwell's in 1931. In 1930 the lockmaster's house at Newboro, which was not one of the defensible lockmasters' houses, received a concrete cistern "to replace the former wooden tank". Whether any of the defensible lockmasters' houses originally held wooden tanks, or even stone cisterns is not known. An inventory of government buildings prepared in the early 1930s shows that cisterns certainly did not exist in all of the buildings. Entries for Hartwells and Poonamalie show no cisterns in these buildings. Those for Kilmarnock, Lower Brewers, Upper Brewers, Jones Falls, Old Sly's, Chaffey's, Nicholson's, and Clowes do mark cisterns; however, those for the last three mark "cistern-Dept" indicating that the Department of Canals built the existing cisterns, whether others had previously existed or not. Certainly the cistern at Davis, although it is lined and topped with concrete, is made of stone suggesting it may have originated in an earlier period. Mrs. Rowe, who lived in the house as a child, seems to confirm this as she says there was always a cistern in the basement.

In 1925 the wooden shingles from the kitchen and summer kitchen roofs at Davis were removed and replaced with 26 guage galvanized iron V Crimp roofing made by the Pedlar People, a Canadian pressed metal manufacturing firm located in Galt, Ontario (Appendix F). This work was done on contract by Moriarty of Newboro for a bulk price of $92.00. Moriarty also renewed the eaves trough and conductor pipe on the Davis lockmaster's house in 1934. The details of this work survive in the lockmaster's journal.
Sir

Will require for Lock house #53

136 ft of Evetrough @ 17 1/2c per ft = $23

I may require 8 or 10 ft of conductor pipe which would be
@ same rate 17 1/2c per ft, but could do with some of the
original if Mr Moriarty would make a few necessary repairs;
possibly the work for repairs would amt to more than the
new conductor pipe 10 ft @ 17c per ft would be $1.75,
Total for Evetrough, conductor pipe $25.55.

This is the price Mr. Moriarty of Newboro submitted to
me which includes the cost of erecting etc.

If Moriarty bought his eavestroughing and conductor pipe from Pedlar, or an
agent that retailed Pedlar products, it is likely it was manufactured by E.T.
Wright & Co., Hamilton, since a contemporary E.T. Wright's catalogue contains
the information that it regularly supplied such fixtures to seven major
Canadian roofing companies including Pedlar for marketing.

As the twentieth century progressed, the unofficial terms of the rental
agreement imposed by the Department upon lockmasters became increasingly
more convoluted. The problem was the arrival of modern utilities, supported
as they were by expensive technology. Those lockmasters living in urban areas,
where such technology was readily available, wanted to upgrade their lifestyles
to the standard of their neighbours. The first hint of this change came even
before the First World War, in 1910, when the lockmaster at Hartwell's installed
a telephone in the lockhouse "at his own expense and at his own convenience".
When he asked the government to assist in the cost of maintaining this utility the following year, its value to the Department was assessed as follows:

Since this instrument has been placed in the lock house it has proved to be of great use to the Department; and it has been used fully as much on departmental business as on private business.

I may say that I have found it to be a great convenience to have a telephone at this place; and we have saved a considerable sum in horse hire since it was installed in the lock house; and I would not like to be without it again ....

As a result of this evaluation, the Department decided to support the installation of telephones in lockmasters' houses whenever possible. Telephones were consequently hooked up in the defensible lockmasters' houses at Upper Brewers, Hogsback and Smiths Falls in 1911, and at lockmasters' houses that were not of this design at Long Island, Blacks Rapids, and Newboro (1912). At the same time, applications were made for the newly beginning South Crosby Telephone Company to install telephones at Chaffey's and Jones Falls. Although this company seems to have some difficulty starting, these phones were in place by 1913. Because it was remote, Davis was not included in this new improvement. The lockmasters' house at Davis did not receive a telephone until about 1940.

As electric light became a common feature of urban living, the path the Department had assumed in exchanging rent for the provision of accommodation
became a much more complex one to tread. When the lockmaster at Smiths Falls detached requested electricity be installed in his lockhouse in 1916, the Deputy Minister of Railways and Canals asked Superintendent Phillips to report on the subject. Phillips replied that the Department had not installed electricity in any of the thirty-six houses occupied by Rideau Canal employees, and if we commence to furnish light for one official, all the others will naturally ask for similar consideration.

This means therefore that in places where electric current can be obtained, we shall be confronted with applications for wiring our houses, putting in fixtures and furnishing current; and at places where no electric light can be obtained, the men will have just as much reason to ask us to furnish them with lamps and coal oil for their own use.

By 1921 the Department had evidently decided it could not stem the tides of change. That year wiring was installed in the house at Smiths Falls and an extra one dollar per month rent charged to the lockmaster in perpetuity.

By 1930 this policy had evidently been revised to a position where the Department paid for the installation and the lockmasters paid for the fixtures. When the lockmaster at Hogsback applied for electricity in 1930, Phillips reported:
I informed him that the Department might consider his application providing he paid for the fixtures and also for all current consumed, and this he is perfectly willing to do.

We have in the past had some of our houses so wired for electric light, and added One Dollar per month to the rental.

I would recommend this application to your favourable consideration as, in addition to the convenience afforded, there is less danger from fire than by the use of the old-fashioned coal oil lamps.

This had been changed by the mid 1930s to an increase in the cost of rent only until the wiring had been paid for. When wiring was finally provided for the lockmaster's house at Hogsback, it was installed

... on the condition that there will be an extra dollar a month rental to be paid by the lockmaster until June 1949, which will cover the cost of the installation by the department plus interest charges.

The government may have accepted responsibility for providing fixtures at this time the Chief Engineer of Railways and Canals wrote to the Department of Public Works requesting light fixtures required for the Hogsback house from surplus stores. Unfortunately, none were available, and the lockmaster appears to have bought at least some of his own fixtures and been compensated for them upon
his retirement. The justification for this change appears in another letter in 1934 in which a lockmaster from another canal entirely applied to have new wiring installed for his stove, and was informed he must pay for the installation as it was above the basic wiring the department provided, but that the government would pay for the materials because "The material in question becomes a part of the house and would not be removed." By this point the Chief Engineer of Canals was making expenditure decisions on houses on all canals.

When central heating became an issue in the late 1930s, the same policy was followed. When the lockmaster at Lower Brewers requested that a furnace be installed in 1938, he reported:

I have made inquiries and find that I can purchase a pipeless furnace complete with fittings, shipped to Washburn, freight prepaid for the sum of $130. The installing part would be performed by myself, eliminating the cost of installing.

The response to his letter indicates not only that the Department would purchase the furnace through its purchasing agent, but also that it accepted the lockmaster's offer "to repay the cost to the Department in four years". By the mid 1940s, this policy was changed again. The new rules are outlined by Superintendent Whittier in 1948 when the lockmaster at Merrickville applied for a furnace:
An equitable arrangement would be to increase ... rental by $1.50 per month or $18.00 per year which would represent a return of a little better than 8% on the cost of the installation. The most serious objection to increasing the rental by $3.00 per month is that the present occupant of our house would pay the total cost of the installation in approximately six years, while the life of the furnace to be enjoyed by future occupants would probably be 30 or 40 years. A fair policy to follow would be to permanently increase the rental to provide a normal return on the amount spent on the installation, such increase to be paid by the present and all future occupants of our building.

63

After the late forties, furnace repairs were amortized over a long period of time and the lockmasters' rent remained relatively low.

There is every indication that the same policies were followed in the case of other major repairs like plumbing. When plumbing was installed in the canalmen's houses in Smiths Falls in 1949, for example, it was financed by a similar increase in rent. There is no indication in the 1930s inventory that any of the defensible lockmasters' houses had plumbing, yet as the above request indicates this must have been relatively common in the buildings in urban and semi-urban areas by the late 1940s. Certainly the department had every reason to introduce plumbing into its buildings in these areas. During World War II leakage from the outhouses used on the public beach at Hogsback had drawn public attention to the resulting "unsanitary conditions" in the
canal, and such publicity was undesirable.

During this time Davis and many of the other more remote lockmasters' houses remained isolated from the demands of modernization. Lockmaster Alford and his wife had developed a style of life at Davis that suited them remarkably well despite its lack of up to date facilities. Nothing illustrates this better than their arrangements for the provision and storage of food. Their meat was obtained by fishing, hunting, and raising chickens, cows and pigs at the lock. It was stored in barrels, packed with alternate layers of snow and meat in an ice house located on the other side of the lock bridge. Ducks were hung in the summer kitchen during the winter. Most vegetables from the garden were preserved; others were stored in the front porch of the lockhouse during the winter, along with bulk goods such as flour and sugar that were purchased in Elgin. Milk was kept in a four by five by three and a half foot wooden tank box packed with ice at the bottom of the basement stairs.

During this time, heat was provided to the building by the woodstove in the kitchen and an oil burner located in the area of the old fireplace. The oil stove was probably introduced before the building was plastered, for Jean Rowe indicates that the pipes from the stove formed a circuit around the upper walls of all four rooms before exhausting through the chimney. The kitchen and front bedroom were heated by the wood stove from the kitchen where food was also prepared in the winter. A coal oil fired copper boiler also existed in the summer kitchen and was presumably used for preserving. Soap was made in a kettle outside the house. Water was pumped into the kitchen from
the cistern fed from the well, and supplemented from a rain barrel on
the porch where the downspout terminated.

Since the Alfords remained in the house for a long time, and their use
of its facilities probably did not vary substantially from those of Alford's
father, or in fact the Fosters, it is reasonable to explore it a little more
extensively. According to Jean Rowe, the front bedroom beside the porch was
used as a guest bedroom, while the one at the back belonged to Alford's
daughters. The room to the south west of the living section of the old house
was a parlour which held a fern stand, two chairs, a couch, a piano so that
Mrs. Alford could practise the piano lessons she took by correspondence. It was
separated from the back room near the stove by a curtain on loops. The area on
the south east side was a family room with a radio, a gramaphone, a library
table and a Windsor chair near the stove for daily use.

The present kitchen was subdivided by a pantry which enclosed a three by
five foot area from the chimney to the door. The pantry contained shelving and
a sink with a little green hand pump beside it. The wood stove sat in the
corner of the kitchen, between the wall of the pantry and the front wall of
the building. Robert Pyne, the succeeding lockmaster's son who
lived for many years in the lock labourer's house at Davis while the Alfords
were in the building, recalled that the kitchen was always panelled with
wallboard to about four feet from the floor and wall-papered above. The
Baldwins, who later rented and renovated the house, recall that a piece of this
panelling remains beneath the kitchen sink (installed in 1959), and remembered
it as linen cloth covered beaverboard. According to Jean Rowe the kitchen floor was always painted an ochre colour, and the room was often cleared to hold dances. A large quilt frame was also located in the kitchen, on pulleys so that it could be pulled up to the ceiling over the table.

Mrs. Alford had taken a taxidermy course by correspondence and earned extra money by mounting trophy fish for summer visitors, so undoubtedly there were examples of her work around the house. In the basement was a one cylinder Fairbanks Morse motor which Ely Alford used to charge batteries for his radio. The present vestibule over the doorway to the basement was probably built during the later years the Alfords were in the building, as was the extension of the summer kitchen over the porch area beside the south door. Both were in place by the time the Pynes occupied the lockmaster’s house in 1947.

Although the lockmaster’s house at Davis was not substantially altered during the time it was occupied by the Alfords, many subtle changes had occurred, all indicative of major changes in society and in particular in the administration of lockmasters' houses along the canal. The Alfords left Davis just as it was about to move into the twentieth century. In 1945 as a result of a local public request, Lockmaster Alford applied for electricity to be extended to Davis lock. He later withdrew the request, perhaps because he did not wish to comply with the terms under which the Department was willing to do the job so close to his retirement. In December of 1946 he left Davis to retire in Smiths Falls, having removed the chicken coop and ice house he built to his cottage the previous summer.
c) The Complete Twentieth Century Lockmaster's House

When Alford left Davis he was replaced by James Pyne, who had served as his lock labourer for the previous decade. Pyne was born in Torquay England in 1893 and immigrated to Canada when he was fourteen. He entered the canal service after World War I, and served as the lock labourer at Jones Falls from 1926 to 1936 before coming to Davis. He was officially appointed lockmaster at Davis on September 30, 1947. He and his family of five children moved from the lock labourer's house to the stone lockmaster's house shortly thereafter. At the time he paid $5.00 per month rent, and the building was heated with stoves and lit by coal oil lamps. As soon as he moved in he applied to have electrical wiring installed.

In 1948, the canal administration completed an agreement with the Delta District of the Hydro Electric Power Commission of Ontario to provide electrical service to the lock. Hydro installed an extension in 1950; however, due to a misunderstanding between Hydro and the Department of Transport, only one pole was placed near the locks and a second one which would permit lines to be run to the lockhouse was not completed. Canals Branch sent an electrician to wire the lockmaster's house late in 1951, but all of the problems were not resolved until the spring of 1952, when Hydro completed the line and a departmental electrician finished wiring the lockhouse, the barn and the stable. The fixtures and wiring used were provided by the Canals Branch.
Davis was in fact one of a number of lockmasters' houses included in the last phase of such wiring. An inventory of canal buildings conducted in 1948 identifies the buildings that required wiring in the immediate post war period. They included Hartwell's, Poonamalie, Davis and Jones Falls. Davis was not the last of the defensible lockmasters' houses at which this work was completed. Although the dates for the installation of electrical service at Hartwell's and Poonamalie are not known, the lockmaster's house at Jones Falls was not wired until 1953 and the power was not activated until 1955.

Once the electricians had completed their job at Davis, Mrs. Pyne was able to finish decorating the house. "She has ceilings to paint, also 3 rooms to wallpaper," wrote Pyne to A.R. Whittier on May 1 1952, "and cannot do it til [wiring] the house is finished." One of the rooms to be redecorated was the kitchen, for Robert Pyne recalls his mother putting up new wallpaper there. The materials for this job may have been purchased by the Canals Branch. In 1964 L.W. Clark, Superintendent of the Rideau, described what had been long-term policy on the subject:

In respect to interior painting of canal dwellings, we have had very few requests for interior decorating except when a new tenant occupies a dwelling, then he is permitted to redecorate with materials supplied by the Department but with the tenants doing the work. This practice has proven satisfactory and I feel it should continue.
This memo also outlines long-standing Canal policy on painting the exterior of the buildings. "We have followed a practice of having Canal Operating Staff paint these buildings at four or five year intervals and feel this practice should continue." That this practice had been in effect for some time is confirmed by a memo to the lockmaster at Hogsback in 1953 which states:

It is our policy to paint our buildings once every 5 years. According to our records the following buildings were last painted in 1948 and should therefore be painted again this year.

Kindly check over your supplies of paint and painting materials you may need and you are to paint these buildings during the present summer.

As the memo above confirms, early in the 1950s the lockmasters painted their own houses, while later the job was done by Canal Operations staff. The effects of this change may have been less than desirable. Robert Pyne remembers painting the roof of the lockmaster's house at Davis with special metallic paint, a task that does not appear to have been continued by Canal Operations. The result has been disintegration of the unprotected metal. Paint was centrally supplied in both situations, to keep costs down and to ensure a constant colour and image was presented along the canal.

Shortly long after they occupied the Davis lockmaster's house, the Pynes had problems with the drains. "Have smelt a very bad odor both down cellar
and just outside corner of frame house," wrote James Pyne to Whittier in the
summer of 1952,

and found that the old drain from house was plugged up solid,
by being caved in, and was forming cesspool under ground and
odor from it was very bad, both by following up discharge
pipe through cellar, and forming cesspool.

I have dug drain up and took out the old drain which was
useless, and have it all ready to place tile in. Would like
to get tile in as soon as possible as there is still bad
odor from open drain. The drain I have dug up is 31 feet
from house to end of drain, am sending in requisition to
cover same.

The Superintendent was quick to reply, stating that he would send "thirty
82 feet of new Drain Pipe" immediately. Evidently, Pyne performed the job
himself with materials supplied by the Department. The identity of the "old
drain" in question is somewhat problematical. No plumbing for the building has
been mentioned other than the sink which would have had a drain that,
presumably, was still in use. The drain concerned may well have been the
original basement drain. A quotation for eavestroughing for the Davis
lockmaster's house was received from E.J. Kenney of Elgin the following year,
but whether this was related to the drainage problem or simply regular
83 maintenance is not known.
In 1953 Pyne also installed insulation in the Davis lockmaster's house at the suggestion of the Department. Once again the Department supplied the material and Pyne performed the job: "arrangements will be made to send this [insulating material] up during the Summer so that you can put it in place for next Fall," wrote the Superintendent. The nature of the job is outlined in a letter from Pyne:

The attic flooring is all that is needed, of House No. 53.

<table>
<thead>
<tr>
<th>Frame part (attic)</th>
<th>26' x 13'</th>
<th>338</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Stone part (attic)</td>
<td>26' x 26'</td>
<td>676</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1014</td>
</tr>
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<td></td>
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<td>84</td>
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</table>

A cursory examination of the files of other defensible lockmasters' houses suggests that the Department had instituted a program of insulating its buildings during this period. The Department bought rock wool to insulate the kitchen ceiling at Lower Brewers in 1957; it also sent rock wool to be installed when it repaired the canalman's house in Jones Falls in 1953. Although recent architectural investigation reveals only vermiculite in the attic of the defensible lockmaster's house at Davis today, this must have been installed after the fire. It is more likely that rock wool (rather than vermiculite) was the material Pyne used.

In November of 1956, under the directive of Treasury Board Minute 498812, Canals Branch was forced to change its policy in the rental of canal houses to lockmasters. What had, by that time, become a well established pattern of
informal give and take between lockmasters and canal administration was forced to conform to a general Government of Canada mold for the rental of departmentally owned dwellings to government employees. The most immediate result of this policy was a drastic increase in rent for all canal houses, including the defensible lockmasters' residences. The extent of this change is revealed in the following list of its effects on lockmasters in those residences:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hartwell's</td>
<td>TC-808 - Dale, R. Lockmaster</td>
<td>$45.00</td>
<td>2.00</td>
<td>Not given</td>
<td></td>
</tr>
<tr>
<td>Hogsback</td>
<td>TC 418 - Watt, L.J. Lockmaster</td>
<td>$50.00</td>
<td>20.00</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>Nicholson's</td>
<td>TC-504 - Watt, C. Lockmaster</td>
<td>$35.00</td>
<td>10.00</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>Clowes</td>
<td>TC 506 - Hassall, J., Lockmaster</td>
<td>$20.00</td>
<td>4.00</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>Kilmarnock</td>
<td>TC 508 - Marshall, R., Lockmaster</td>
<td>$25.00</td>
<td>6.00</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td>Old Slys</td>
<td>TC-510 - Wiltsie, E.J., Lockmaster</td>
<td>$35.00</td>
<td>6.00</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td>Smiths Falls</td>
<td>TC-46 - Langley, H. Lockmaster</td>
<td>$20.00</td>
<td>5.00</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td>Poonamalie</td>
<td>TC-512 - Carty, M., Lockmaster</td>
<td>$20.00</td>
<td>10.00</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>Chaffey's</td>
<td>TC-430 - McIntyre, W. - Lockmaster</td>
<td>$30.00</td>
<td>11.50</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td>Davis</td>
<td>TC-554 - Pyne, J. Lockmaster</td>
<td>$23.00</td>
<td>5.00</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>Jones Falls</td>
<td>TC-582 - Sly, G., Lockmaster</td>
<td>$20.00</td>
<td>5.00</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>Upper Brewers</td>
<td>TC-556 - Woods, R. Lockmaster</td>
<td>$28.00</td>
<td>12.00</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td>Lower Brewers</td>
<td>TC-558 - Cooper, H.A., Lockmaster</td>
<td>$45.00</td>
<td>11.00</td>
<td>7.00</td>
<td></td>
</tr>
</tbody>
</table>

*lockmasters are responsible for paying their own utilities*
Canals Branch administrators were not happy with this change. They argued that lockmasters were required to live at their stations, and often to work extra hours. Treasury Board's reply to this was an abrupt statement that compensation for canal employees who were required to be on call twenty-four hours a day was not to be received in the form of low rent, but rather "compensation, if any, for these peculiar conditions should be in the form of extra pay."

The employees' union, too, protested. Such an increase in rental for houses, some of which did not have electrical or sanitary systems, was ridiculous.

One result of this changed policy, was that Canal Operations staff performed all further maintenance to the lockmasters' houses. A second was a flurry of activity to up-grade canal residences to merit the new charges. A third may well have been that James Pyne reassessed the desirability of applying for an extention to his term as lockmaster as had his predecessor. On June 23 1959 he retired and vacated the lockmaster's house at Davis.

d) Short Term Gain

Pyne was replaced as lockmaster at Davis by J.S. Moses, who was to remain
for a short three years. Just after Moses moved into the lockmaster's house, the building received its final major renovation as a government residence -- a plumbing system. In October of 1959 the Rideau Canal Office's file indicates that

E.J. Kenney who has Order R10033 for the installation of sanitary plumbing in the Lockmaster's House at Davis Station, has been granted permission to use either cast iron or copper soil pipe between the toilet and the inlet pipe leading to the septic tank at this building.

Drilling a new well, and installing new plumbing fixtures, a sanitary drainage system, a septic tank and tile bed was undoubtedly a costly procedure. The Department nevertheless encountered such costs at all of the defensible lockmasters' houses located outside urban areas in the 1950s and early 1960s. Plumbing was added to Nicholson's, Poonamalie, Upper and Lower Brewers in 1953, to Kilmarnock in 1954, to Jones Falls in 1963 and most likely to Chaffey's as well at about this time. Such costs were simply part of remodelling these residences to a contemporary standard of living.

At Davis, this new improvement was not long to be appreciated. On July 30 1962, J.S. Moses vacated the defensible lockmaster's house, ending its long history as a lockmaster's residence.
During the brief time that Moses was lockmaster, the Department of Transport was busy revising its management practice to accommodate post War trends in increased specialization, standardized practice and rationalized approach, as were most large organizations in Canada during this period. The new housing policy was one of the first steps in this process. Pressure to take a fresh look at departmental assets and procedures grew, side by side with lockmasters' discontent.

Canal officials were both sympathetic with the lockmasters' position and under compulsion to produce operating plans for the future. These facts are evident in a memo written by Rideau Canal Superintendent L.W. Clark in 1961:

Rental for canal dwellings has been a sore spot since 1956 when the flat rate rental for each dwelling was introduced. On several occasions I have recommended that rental for a number of dwellings be reduced but no action on these recommendations was taken. ....

All the dwellings on this canal are old, poorly laid out, ill equipped and hard to heat. To modernize any dwelling to a standard of dwellings now being constructed by general contractors would cost at least 50% of the construction cost to provide a modern, fully equipped, three-
bedroom dwelling. An extensive program on modernizing canal dwellings
is not recommended ....

Having rejected the viability of revitalizing the old lockmasters' houses, the
Branch considered building new ones, and ultimately decided that it was not
possible to be cost effective and please everyone. As a result, the Canal
officials opted "whenever possible to phase ourselves out of the housing
business." The long term success of this policy in meeting Canals' objectives
was described by W.D. Bennett, Acting Chief of the division in 1974:

Over the past 15 years we have due to this policy been able to
remove or adopt for some other purpose some 70 dwellings with the
result of the elimination of many administrative problems, no
effect on the moral of employees and no decrease in service to the
public.

Implementation of this policy in the early 1960s meant that each newly
appointed lockmaster was able to choose whether he wanted to live in the
lockmaster's house at the canal or elsewhere.

When J.A. Watters was appointed lockmaster at Davis in mid 1962, he chose
to live elsewhere. This left the lockmaster's house vacant, and the Canals
Branch looking for a tenant who was willing to occupy the building on a yearly
lease so that it could be vacated when a new lockmaster was appointed if he
should choose to live there. The building sat vacant during the winter
of 1962, and in the early spring of 1963 the government showed it to at least three tenants who seriously considered living there. Ultimately none of them were willing to commit themselves. The problem was clearly stated in a letter from a fourth and later applicant, Major C.H. Metcalfe:

The inside of the house was, as you warned me, in poor condition enhanced by the general appearance and smell of uncleanliness.

Although plaster is visibly damaged in many locations, the state of the papered wall indicates that a great deal of hidden plaster damage also exists and that all walls and ceilings should be replastered or repaired by covering with gyproc or other similar panelling. Woodwork throughout needs painting and all floors re-conditioned or recovered with linoleum. A number of window panes are broken. The water pump has been removed. The other plumbing appears to be in good condition, as did the roof which of course I couldn't examine too well for leaks.

The previous estimate of $1000 for repairs appears to be in order if skilled labour is used. I myself am a do-it-yourself exponent. On this basis my estimate would be up to $500 and the remainder of the week-ends of the summer and autumn for completion of the job.

In view of the above a lease for one year at a time with
one month notice to vacate is too one-sided for me to consider. ... 

When the house is required for a Lockmaster and if no tenant has undertaken repairs, the Government will have to carry out considerable renovation before, in all fairness, anyone is permitted to live in the house.

To my regret because the site is excellent and the road into the Lock is in good shape, I cannot consider leasing the house under such terms as you indicated are normal for this type of government lease.

Thank you very much ....

As this letter indicates, by May of 1963 the Branch had decided that it was unlikely a tenant for the building would be found and that

It is in order to disconnect the pressure water system and to remove the intake pipes from the well at this building and to reinstall in the well the hand pump which I understand is on hand at Davis Lock Station. By this method, the lock staff at Davis Lock Station will be able to get fresh water.

In June or July of 1963 the plumbing fixtures were also removed from the house to be reused in another canal building. On July 23 of 1963 the
lockmaster's house at Davis had been declared surplus to canal requirements and turned over to the Crown Assets Disposal Corporation "for sale and removal from Canal land." Tenders for purchase of the building were offered, but even before they closed the Department had begun to prepare its next step.

Should no one tender to purchase the building for removal, consideration will be given to demolishing the building under contract or consideration might be given to sale of the building with the right to leave it on canal land providing the purchaser comes under lease with the Department for the canal land involved...

None of these axes was ever to fall. Sale of the Davis lockmaster's house and the lockmasters' houses at Newboro and the Narrows (which were not defensible buildings) was stopped at the request of the Historic Sites Branch, Department of Northern Affairs and National Resources. "Your tender call, which gave rise to my Minister's letter of September 26, clearly specified demolition of several historical buildings," wrote E.A. Cote of the Department of Northern Affairs and National Resources a few months later. He was describing the first instance of Historic Sites' interference in Canal administration. "We still have had no discussion with your officers on the alternatives to demolition," continued Cote's letter, and went on to discuss the benefits of long-term lease at an "economical rent" as the preferred course for "ensuring the preservation of historical buildings
It would be interesting to look back and determine whether, when John Baldwin signed the first lease on the Davis Lockmaster's house in 1964, he recognized the building's historical and architectural significance. In the preceding months he had heard it described as a "building ...converted into a lockmaster's house a number of years ago ...[which] has very little historical value". Officials of the Department of Transport generally were not impressed by the importance of any of the three buildings Historic Sites Branch had decided to rescue.

I find nothing in the buildings that can recommend they be preserved as historic sites. While they were originally constructed as blockhouses they were never used for their designed purposes. The only historic point about them is that they show a type of construction used about 1850. The buildings have been so much altered in reconstruction as dwellings that to restore them to original condition would cost an unreasonable amount.

Baldwin himself had the impression "that there were only two or three buildings
along the canal system worthy of preservation". It would be interesting to know whether he thought that Davis was one of them. He certainly realized there was a possibility: "This house is much closer in appearance to the original structure [than most of the other lockhouses]", he wrote to Cote in February of 1964, indicating that of the three Davis was the one most likely to merit a delaying action. He offered to transfer ownership of the building to the Department of Northern Affairs "if you agree" but the latter was in no position to accept it. By this point the entire subject of Rideau canal buildings was under consideration by the Historic Sites and Monuments Board of Canada who had "called for a full professional study of all buildings erected in connection with the Rideau Waterway in the 19th century."

Perhaps because he felt the building had some historical merit, and undoubtedly because he appreciated the beauty of its location, Baldwin leased the lockmaster's house at Davis on May 1 1964 for a five year renewable term. Many years later, he described the condition of the house when he took possession as

in a state of major disrepair after having been vacant for some time. All heating installations, water service, electrical power had been removed and disconnected in preparation for demolition. Plaster had fallen from walls and ceiling and lathing underneath was damaged as well as portions of flooring. Some windows were broken and storm windows were non-existent or deteriorated to a
state impossible of use (and storm doors). A part of the roof on the "summer kitchen" area had caved in. Eavestroughing had rusted through & collapsed. Chimney was in disrepair. Other items could be listed but this I believe is a broad enough listing.

It is difficult to see how the building, which had been lived in until 1962, could have disintegrated to such a condition in two short years. In all probability it had been roughly treated by Canal employees removing services to install elsewhere, for the unwritten understanding in all documentation concerning Davis lockmaster's house in this period is that it was slated for demolition.

According to the terms of the lease Baldwin signed with the Department of Transport, the Canals Branch were responsible for repair that was the result of normal use while Baldwin took on the responsibility of making the building habitable. As the repair report above indicates, this was no small task. During the first five years they leased the building, the Baldwins reinstalled plumbing by connecting the water system to the old well and replacing plumbing fixtures in the rear bedroom of the lockhouse. They completely rebuilt the interior of the building by patching up the plasterwork then covering the walls with wallboard and refinishing the moldings in the stone portion. New plywood floor and linoleum were placed in the bathroom, kitchen addition and summer kitchen areas. The roof on the summer kitchen was replaced, new walls, a ceiling and insulation were installed as the area was converted to a bedroom. The large window that faces from
this room to the lock was also installed at this time, as was the front portion of the porch on the summer kitchen, giving the room direct access to the house. Inside the kitchen addition, the pantry was removed, as "in the course of the re-adjustment of certain partitions in the wooden attachment to the block house at Davis" a piece of wall paper was found beneath an 1898 newspaper presumably on or near the connection to the partition wall of the pantry (Figures 43,44). New eavestroughing was also installed, and the chimney pointed and repaired to keep the structure sound.

During the first five years of Baldwin's lease, two important changes occurred in Canals Branch which must be borne in mind when considering decisions influencing Davis and other defensible lockmasters' houses. The first of these was a further change in departmental housing policy. In 1969 Canals Branch decided to get out of the housing business entirely. Although the department did not intend to ask lockmasters to vacate these houses unless they were required for other purposes, "when a lockmaster position became vacant the replacement lockmaster would not be given permission to occupy the dwelling" unless his doing so was clearly in the Ministry's interest. From 1969 forward, all houses that became vacant were considered for possible sale or demolition: a few were rented on leases with a clause stipulating a thirty day notice to vacate while decisions were made concerning their future. In outlining the implementation of this policy, the Chief of the Canals Division also stipulated

(3) Historic dwellings may be retained by the Ministry or transferred
to a municipality or historic group.

(4) For construction purposes or for aesthetic reasons a recommendation may be made to designate a dwelling as required for canal purposes, even though it is occupied. Each such case shall be considered on its own merits. Recommendations shall be made by the Superintending Engineers to the Chief, Canals.

As the quotation above indicates, the second major change was that Canal officials had begun to acknowledge that the Rideau Canal was a heritage canal and that, as its owner, the department was responsible for its preservation. As Baldwin had written in 1964 before he left the Department of Transport, "We are in full sympathy with the idea of preservation of historically or architecturally important or interesting buildings within the limits of our own ability, but we still feel there is some misunderstanding with regard to what is, in fact, feasible." The job of the Canals Branch was to make sure that the canals operated.

One Canals Branch priority in the late 1960s was the provision of proper public washroom and canal employees' facilities at each lock station. Such facilities were essential if lockmasters were no longer to live at the canal. In essence, pressure for the provision of watch house facilities paralleled the threat of demolition for defensible lockmasters' houses, as both resulted simultaneously whenever a lockmaster moved out of his residence. Initially Canals had intended to demolish all unused buildings along the canal as they presented both a maintenance problem and a public hazard. Defensible
lockmasters' houses were included on this list with the extra consideration that whenever demolition of a lockmaster's house occurred it was to be replaced with a new watch house. In view of the need to respect the history of the Rideau Canal, however, Canals Branch were prepared to work out a compromise. Canals officials had discovered that the defensible lockmasters' houses had initially been small one storey buildings, just the size required for use as watch houses. Since some of the lockmasters' houses already contained adequate plumbing, the Branch practically decided to "demolish all appurtenances era" thereby accomplishing both objectives. In consequence, Canal crews removed the second storey and additions from the defensible lockmaster's house at Old Sly's in the spring of 1966 and applied a modern roof so that the building could serve as the watch house required by the station.

Similar orders were issued for the "dismantling and demolishing of appurtenances to the masonry house[s]" at Jones Falls and presumably also at Poonamalie and Chaffeys in 1966. These orders were never executed, for ripples of public protest against the work that had been done at Old Sly's had begun. In the fall of 1966 Canal officials attended a public meeting at Chaffey's which severely censured their activities. On his return, one official wrote:

I think we would be regarded as dictatorial if we went ahead with projects of the type that were criticized until things settle down and we get more indications of support. We still have the
responsibility for this Canal and must eventually proceed with essential portions of the programme even if we do not have unanimous support; however tactically, I think it is better to not rush things.

At Poonamalie the situation satisfactorily resolved itself when the local community asked that the lockmaster's house be left as a future museum, and a new watch house was built. The Chaffey's and Jones Falls situations were left in abeyance while activities were planned on other parts of the canal. Hartwell's was the next defensible lockmaster's house slated for diminution to a watch house, either in the fall of 1967 or in 1968, after new watch houses were constructed at Hogsback and Black's Rapids. Works in the National Capital Region were, however, subject to National Capital Commission approval, and none had been received. Canal employees were understandably frustrated. As the engineer charged with this construction wrote to the Chief of Canals, "I trust Mr. Granz, that you realize our predicament. I am determined to get the buildings ... to an early start... I do not wish to be stopped at the last minute as in the case of the Chaffey's job last November." The work on Hartwell's did, however, not proceed.

In the meantime, Canal officials continued to examine the existing lockmasters' dwellings with a view to returning them to their earliest form. Davis, too, was examined with this preservation philosophy in mind. When Baldwin approached the Department for renewal of his lease in 1969, the possibility of demolishing the wooden portion of the building was mentioned.
When Baldwin insisted it was essential for use as living space, Canals officials sought his co-operation in moving the wooden additions to a less obvious side of the building. In a letter dated June 5, 1969, Baldwin replied to these suggestions, raising the practical problem that moving the addition to the east side of the building would block access from inside the house, close off windows and shut off the cellar stairway. His letter concludes that these same issues were "in all probability, the reason why the leanto was originally constructed in its present location of the south side wooden structure is essential, the size of the stone structure being too small for use otherwise." To consolidate this point of view, Baldwin produced the 1898 newspaper his contractor had found beneath the partition when renovating the kitchen. Uncertain how to respond, the Department of Transport consulted Historic Sites who "consider that the wing has real significance, as it shows how the blockhouses along the canal were transformed from military to peaceful use." As a result of this pronouncement, Canals decided to leave the addition alone and repair it as required.

Baldwin used the opportunity presented by this lease renewal to obtain permission to install electric heat in the building. This was granted and in the next few years he introduced two wall units with fans and seven baseboard units (four 7 to 8 feet long, three 5 feet or less) with wattages of 1500 to 2500, depending upon the unit. He also installed a new fuse box, several new lights and a 40 Gallon Cascade hot water heater.
of the lease also provided Baldwin with the opportunity to raise the subject of repairs around the lockmaster's house that were the Rideau Canal Office's responsibility. These repairs included replacement of the pressure pump and installation of a larger pressure tank for the building, patching the concrete steps to the basement and replacing the concrete slab outside the door, and patching the concrete slab by the kitchen door "on the down stream end of the building". The list also included construction of a better foundation for the frame additions of the building:

It is possible to jack up and re-block the attached frame section, it is also necessary to replace one joist at the extreme end of the section, it is also recommended that one extra stringer be installed and blocks placed under it also to give what we consider the required support to avoid further sagging estimated the Canal Superintendent. All of this work was done by canal work crews with the exception of the plumbing which was done by a contract through Canals. The other job on this list was pointing and patching the stonework on the lockhouse, and the stonework on the surrounding wall.

The stone work of the building proper requires very little pointing and can be done very easily. However, the dry wall [around the building], to do a proper job whereby it would not appear as a clumsy patch job it is in our opinion necessary to tear the wall down to ground level and rebuild it ...
again estimated the Canal Superintendent. "Patch it and point it" replied
M.J. McCarty, Operations Superintendent of the Rideau Canal. The
resulting job is the concrete overlay that is damaging the original lockhouse
mortar today.

Two years later, Baldwin was back in touch with the Canal Office because
the roof was leaking. "I am attaching pictures of the roof which indicate
that the leaks are occurring near the peak of the roof," wrote the
Canal Superintendent after an inspection of the house. "I would suggest that
the joints between the shingles be cleaned out and that we caulk the joints
with roofing cement". Canal crews performed this repair when they
demolished the canalman's house at the lock in 1971. That the department was
willing to make this repair at all was probably related to the fact its repair
crew was already working on another building at the lock. Baldwin indicated he
performed further roof repairs himself in later years, using roof cement on
the additions to the building. At some time during this period,
Baldwin also added custom made storm doors and windows to the house
(Figures 52-57).

In the years that followed the Baldwins were content to occupy the
lockmaster's house at Davis as a summer cottage without making major changes.
Canals Branch, on the other hand, were still sorting out the implications
of preserving the Rideau canal raised by the issues of lockhouses and watch
houses. For a time canal officials continued to propose stripping back various
lockhouses to make them suitable for watch houses, but no more of this actually
Canal officials initiated a joint task force with Parks Canada to manage the preservation aspects of the Canal in 1972, and after a while Parks' suggestions that the lockmasters' houses should be occupied while their future was planned began to make an impact.

"... it is preferable that the building be occupied by an employee (even at the abated rental) rather than having it vacated and incur the additional expense for security surveillance. In portraying our use of a heritage canal lockmaster dwelling there is merit in having it occupied by the current lockmaster."

wrote one Parks official for communication to the Superintendent of the Rideau Canal in 1975. "... slow down a bit," wrote another. "... Since all of these buildings have been declared to be of national historical importance, I do not think we can afford to look the other way when structural alterations are being done on them to meet a short-term project."

In 1975 the defensible lockmasters' houses were formally transferred to Parks Canada along with the rest of the Rideau Canal to be administered as a heritage resource. Since that time, the defensible lockmasters' houses at Chaffey's, Jones Falls and Poonamalie have been stripped back and restored to the period of their construction, while those at Lower Brewer's, Upper Brewer's, Hartwells, Old Sly's, Clowes and Nicholson's are occupied by canal staff in a variety of capacities, and Upper Brewer's is leased to a private individual. Davis continued to be occupied by the Baldwins until 1984 when a steep rent
increase forced them to leave the building.

To a great extent this increase was prompted by a fire which burned down the barn at Davis on October 12, 1983. The fire totally destroyed the barn and did considerable damage to the house (Figures 58-61). "Firemen cut a hole in the roof to draw the smoke out with a fan and extinguish a small fire in the attic," reported W.C. Bell the Area Manager. "I found ... quite extensive damage to the back porch and basement entrance, all the window sash on that side of the house were burned also the doors." Once the fire had been extinguished the canal maintenance crew put a patch on the roof and plywood over the damaged doors and windows. During the next year, most of these areas were rebuilt and repaired by canal staff although the water damaged areas of the bathroom and wing room were never repainted, nor was the eavestroughing on the east side of the house and along the roofing of the rear entrance ever replaced. Before he left, Baldwin suggested the water seepage from this into the cellar was heavy and would possibly cause future damage.

The total cost of repairs to the house was $9,900. Calculation of this sum, unfortunately for the Baldwins, drew attention to the current value of the house.

Before he left in the fall of 1984, John Baldwin prepared a list of outstanding repairs required on the building. These included:

- gaps in the stonework (mortar missing?) at soil level in wing wall with consequent leakage through wall into basement.
Page missing from the print edition.
Since 1985 Parks has "mothballed" the defensible lockmaster's house at Davis: it has remained vacant while its future is planned. John Baldwin noted over twenty years ago, that the house at Davis "is much closer in appearance to the original structure [than most of the other lockhouses]." Today the building at Davis still remains the least substantially altered long serving defensible lockmaster's house on the Rideau Canal.
Chapter 1 - Endnotes


5. For a full elaboration of his reasons see enclosure in By to Durnford, 14 January 1832, WO 44, Vol. 20, p.428.


12. Ibid.

13. Ibid, citation, p.25.


15. WO 44, Vol.16, folio p.8. Letter G. Ellicombe, Pall Mall to R. Nicolls, Commanding Royal Engineer, 1 June 1832. Citation, p.25.


19. Ibid.


32. De Jonge, loc cit, p.4.
34. Once defences against American attack began to take shape, the British realized that as a defence force, the militia were far from ideal. They were undisciplined, potentially American sympathizers, and they expected to collect pensions from wounds and active service. When Thomson became Governor of Upper Canada in 1839 he was instructed "you will prevent as far as may be compatible with the public safety either the augmentation, or the continuance on foot of the Volunteers, or the Sedentary Corps which were embodied during the last winter as a reinforcement to the regular Army." Archives Report, 1932, p.530, cites RG 7 G 1, No. 1, G 43 p.40, Russell to Thomson, 7 September 1839.


36. RG 8 Series I, Vol. c 59, p. 217, Letter, Respective Officers to Colonel Rowan, Military Secretary, Quebec, 5 December 1838.

37. RG 43 Vol.1878. Nicholson's lockmasters' journal confirms that work on the lockmasters' house at Clowes began as soon as the Nicholson's building was well under way. See entries late July, early August 1838.

38. Just when and how this was done is not immediately clear. No estimates appear in either Rideau Repair and Maintenance or Barrack Estimates for 1838-9. Expenses are not included in the special Parliamentary grant for Expenses in Consequence of the Rebellions in Upper Canada in 1841 (WO 55 Vol. 1917) either. There is a good possibility that Ordnance officials did not want to submit estimates for these buildings until all of the costs of constructing them were clear. If this is the case, estimates for
the three early buildings may have been included later in a bulk special approval of lockmasters residences under the Extraordinary expenses, or alternatively after 1841 buried in other Canadian defence or Rideau spending. No clear record of any approval has been located.


40. WO 44, Vol. 16, p.264. Estimates for 1841-42 cites the authority for this change as a "letter from the Lords of the Treasury dated 20 May [1840] and the Board Minute annexed of 8 June 1840.


42. WO 44, Vol. 16, p. 256, S. Thomas to R. Byham, 10 April 1840.


45. Archives Report, 1939, p.101, 102 gives specific references to these votes.


47. It is WO 55, Vol.1917, Micro B 3040.

48. These may not have been copied from the PRO in the first place, or they may be buried in a special series. This contract did not permit time for a more thorough search than has already been conducted. If this topic is to be pursued, a good starting point might well be RG 7 G 9 and G 9A. In the 1840-41 period they did include references to the information that appeared in the Rebellion fund. Other papers from the RG 7 and even the RG 1 series might also be relevant. An attempt was made to try some of these series during the 1839-1841 period with little result except a better contextual grasp of the period. Broadening the time period to 1837-1845 might produce more satisfactory results. There would probably also be considerable value in studying more of the British papers concerned -- some of CO 42 and various internal papers from the Ordnance office in Britain.

49. Phillpotts, first report, pp.73-78.

50. Ibid, p.76.

51. RG 8 Series 1, C 59, p.309-313, Letter Oldfield to Sir R.D. Jackson, Commander of the Forces, 20 July 1840. Col. Oldfield, the Commanding Royal Engineer in Canada, certainly regarded ensuring the commercial viability of the Rideau as one of his major tasks. This is evident in his response to charges questioning their value: "I beg to inform Your Excellency that I shall not cease my endeavours to forward to the utmost of my abilities
the commercial interests of these Provinces as connected with the Rideau
and Ottawa Canals, and that I shall be at all times most happy to secure
and pay every attention to any suggestions that may be offered for the
efficiency and improvement of the navigation."

December 1840.

53. The authority for this change was a "letter from the Lords of the Treasury
dated 20 May [1840] and the Board Minute annexed of 8 June 1840", WO 44,

54. Tenders printed in the Bytown Gazette, 20 August 1840, cited in James De
Jonge, p.33.

55. Ibid, Bytown Gazette, 12 November 1840, p.33.

56. WO 55, Vol. 876, p.21, Sydenham to Master General of Fortifications,
24 December 1840.


Frontier, 1 February 1841.

His Excellency Sir Richard Downes Jackson. Report analyzing Canadian
defence, and recommending works that need to be constructed. Appendix No.
4, referring to the defence of the Montreal District.

60. WO 55 Vol. 876, p.98, Letter R.Byham to the Inspector General of
Fortifications, 8 March 1841.

of Fortifications, 15 March 1841.

Fortifications, 22 March 1841.


64. A comment appended to the 1842-43 estimates states that the amount towards works in this estimate had already been advanced from the Commissariat Chest by Warrant from the Commander of the Forces (L 11370.7.0 "for expenditure on the spot". The estimate was submitted with the Report of the Inspector General of Fortifications dated 3rd January 1842 E/128. It has not yet been located. WO 44, Vol. 16, p. 288. A similar provision was made for 1843-44. See Ibid, p.194.

65. WO 55, Vol. 876, p. 380-381, Letter R. Byham to F.W. Mulcaster, 9 November 1842. The first quote comes from the letter. The second is a marginal comment that may have been made by Mulcaster.


69. There are two indications of this. One is the R.C.O. quoted in note 76 below which indicates that these men "should be considered part of the Storekeepers Department" once the period was over. The other is an indication that the position of lockmaster had become a paramilitary post found in WO 55, Vol.876, p.342, Letter Byham to Gen. Sir F. Mulcaster, 10 October 1842 preparing for the return to normal operating conditions: "The Lords Commissioners of Her Majesty's Treasury having been pleased to
approve of the Non-Commissioned Officers of the Ordnance Military Corps who may be selected for the appointments of Lockmasters on the Rideau Canals being allowed to retain their pensions whilst they hold them."


77. Ibid.

78. with the exception of Upper Brewers' as mentionned in note 46 above.

79. WO 55, Vol. 878, p. 675. Letter Byham to Inspector General of Fortifications, 14 August 1844. This appears to have been part of a lengthy series of communications on reducing the temporary establishment conducted through the period March to October 1844. See Letter Byham to Lt. Gen. Mulcaster, 11 October 1844, WO 55, Vol. 878, p. 683. As this letter attests, an estimate for the year 1844-45 was certainly approved under the auspices of the special provisions.

80. Chaffey's: RG 8 Series I, C 60, p. 199, F. Sissons, Montreal to Capt. B.
Chapter 2 - Endnotes

1. RG 43 Vols 1878 and 1879.

2. In August of 1840, the government advertised tenders for the construction of lockmasters' houses at Maitlands, Edmonds, Smiths Falls (attached) and Jones Falls to be completed by 31 May 1841. (Tenders printed in the Bytown Gazette, 20 August 1840, cited in De Jonge, p.33.) Tender advertisement for the construction of lock houses at Poonamalie, Smiths Falls detached "to be completed by the 31st of August 1841". (De Jonge, cites Bytown Gazette, 12 November 1840, p.33.).


4. Wm. Oldfield, "Memorandum upon the nature and value of Materials as also on Labour in Canada from Information in the Office of the Commanding Royal Engineer", ([Montreal], 1841, located in Metropolitan Toronto Library, Reference Collection), p.73.


6. Clegg's drawings made in early 1842. William Clegg was Clerk of Cheque for
the Rideau Canal, and appears to have operated from Quebec during the early
1840s. He clearly spent time on the Rideau earlier in the 1830s and later
in the 1850s as confirmed by entries under his name in Public Archives
Canada's Hill Collection and Nicholas Sparks Collection as well as the
RG 8 C Series Index in the 1832-38 period and also in the 1850s. Why he
was drawing sketches on the Rideau in the early 1840s is not known. Quite
possibly he was travelling with an official party when he drew the views
of the Rideau that appear to have been made in the spring of 1842. The
Sweeney diary confirms that "the governor went through in the Beaver" on
May 18 1842. Perhaps Clegg was one of his party: the time period for
production of the sketches of the lock stations would appear to be
appropriate -- he shows Upper and Lower Brewers incomplete, and Davis not
yet begun. Given the fact Clegg depicts a completed lockmasters' house
at Chaffey's and tenders were not published for the construction of
a lockmaster's house at Chaffeys for another two years, it would be better
if the date of Clegg's trip could be identified more precisely. While
the possibility that he might have prepared these sketches on different
trips over the time period 1842-44 obviously has to be admitted, the
consistency in their style and identification argues that they were prepared
at one time as a series. If so, they were evidently prepared after spring
thaw (between April 1 and April 7 according to the Sweeney diary) and
late May when the 1842 Census was taken.


8. Census of the Province of the United Canadas, 1842, Leeds County, South

10. RG 8, Series I, C 60, p.199, F.Sissons, Montreal to Capt. B. Taylor, 24/7/1844", *Gazette* advertisement quoted from De Jonge, p.33.

11. There are enough features of this building common to the features of Davis that suggest the two might have been built by the same person, probably Purcell. The stone is the same, and so is the roof pitch. If census evidence had not indicated that Davis was under construction in 1842 it would have been likely that Davis was built with this money. As it is, there is the possibility that the funds from this contract were used to pay Purcell and other craftsmen for constructing two buildings rather than one, or that they were used to pay pick up costs for completing construction of all of the defensible lockmasters' houses.

12. RG 8, Series 1, C 61, p.197-8, from Respective Officers, Montreal, Request to tender for lockmaster's house, Ottawa, 4 July 1849.


17. RG 43 Vol. 1879, entry June 12 1839.


22. See Chapter 5.


27. See Chapters 4 and 5.


33. Ibid, p.128.

34. Ibid p.125.
35. Ibid, p.128.
37. Wyman, Hartwell's, Hogsback, No.1, Vol.1, Appendix 1, p. iv.
38. Ibid.
39. Ibid.
40. It may well have been the foundation of the previous lockmaster's house that was uncovered in the archaeological dig on the site at the southwest corner of the frame addition. If so, the foundation should extend for a distance of approximately twenty feet or greater under the stone patio area as the front facade of the earlier building appears to be similar in proportion to the present lockmaster's house. See Archaeological Report. Caroline Phillips to Maria Blicharski, "Davis Crown House -- Preliminary Report", 26 October 1988.
42. Ibid.
44. Ibid p. 308.
45. Ibid.
46. Wyman, Appendix 1, p.iv.
47. Archaeological Report.
48. Pasley p.29.
49. Ibid p.309.
50. Oldfield, p.62.
52. Wyman, p.iv.
54. Vincent p.50-51.
56. Oldfield, p.67.
58. Wylie, p.77.
59. Oldfield, p.57.
60. Aides Memoires, Part 1, p.163.
61. Wyman, Appendix 1, p.iii.
64. WO 44, Vol. 16, Estimates for repair and maintenance of the Ottawa
and Rideau Canals, 1839-43, entitled "Expenditures, 1843", enclosure
entitled "Abstract of Estimates [1843-44] as recommended to be authorised",
p. 298-299.
to Col. Oldfield, Commander of the Royal Engineers in the Canadas, Quebec,
27 Sept. 1839.
66. Oldfield, 78-81.
69. RG 43, Vol. 1878, entry July 17, 1843.
70. Oldfield, p.67.
71. Wylie, p.77-78.
73. Oldfield, p. 66.
74. Vincent, p.175.
75. Vincent, pp.176-179.
77. Ibid, p. 229-30.
78. In the case of Davis lockmaster's house it is important to remember that the lockmaster was in all probability involved in the construction of the house as a mason. As such, he would also have done the interior plaster work. He was building his own house, and he would probably have added any features he could to make it more comfortable. If, however, he was involved in forming such openings it is doubtful whether they would have been tin lined. They may have been merely plastered or stone or brick filled holes.
79. The Triennial Contracts issued by the Royal Engineers in 1844 include provision for four and six panel doors. See Appendix D.
80. Oldfield, p.62.
82. Vincent, p.157-158.
83. Ibid, p.165.
84. RG 8 Series II. Vol.31, "Nine Returns from Kingston". Building No. 1,
Storekeeper's house, also buildings 65 and various residences listed.


86. Oldfield, for Davis p.33, 35: for all locks, p.32-35.

87. Sweeney journal, 10 May 1842.

88. It would be worth pursuing this point a little. The timing concerned suggests these buildings may well be at the leading edge of a change in British military architecture, particularly as it is seen in remote locations in the colonies. In his book on The Royal Military Canal (London: David Charles and Newton Abbott, 1972), p.137-8 P.A.L. Vine suggests that the British were fed up with acres of expensive unusable fixed field works. This seems to have been a major thrust in the political view of military activities in the 1830s. Military construction seems to have been blocked generally (not only on the Rideau Canal) in the mid and late 1830s and everywhere but in Canada in the early 1840s. Military officials probably had to change their background philosophy about what might provide adequate defensibility -- i.e. fewer military installations, and less dramatic ones in minor areas. It is quite possible that the design of the defensible lockmasters' houses -- which were built under the special circumstances of the revolt (which was greatly exaggerated by the military in Britain to permit them some scope for activity) -- were used to provide evidence that the military had indeed mended its ways and could be fiscally and philosophically responsible if given the opportunity. The publication of Circular 303 in 1845 suggests the Canadian situation was either a test case (which succeeded) or an example (which successfully convinced). That the adaptation of civilian
buildings as permanent field works had become a standard military practice by the late 1840s and early 1850s is indicated by the ease and regularity with which it is discussed in the Aides Memoires published during that period. It would also be interesting to follow Bolton's career to see whether he was involved in similar adaptations elsewhere, for when he was removed from the Rideau Canal in 1843 he must surely have been considered an expert in the practice.

Chapter 3 - Endnotes

1. RG 43 Vol. 1878, Nicholson's lockmasters' journal, entry dated October 26 1841 gives a list of the arms issued. This is almost identical with the lists of arms returned in 1856 from Davis lock (Public Archives Canada, MG 24 E 2, Lockmaster's Journals, Davis Lock, 1846-1876, Vol.3, p.299), Nicholson's lock (RG 43, Vol. 1879, R.C.O. in rear of book) and Poonamalie (RG 43, Vol. 1917) which were, in turn, identical to one another.

2. WO 55, Vol. 886, p.477-498 contains the copies of the contracts issued for 1847 amended for 1850. In general content they do not vary from the 1844 version seen in Appendix C. Each version does, however, contain many specific variations.


8. Sweeney journal, 8 October 1842.
9. Wylie, p.81
10. Wylie, p.82.
12. MG 24 E 2, Vol.3, p.257, Rideau Canal, Davis Mills, 13 March 1852. Weekly Progress Reports of Works and Repairs Carrying on in Royal Engineer Department at this Station between the 8th and 13th Inst. Work conducted under work order 120/13, 14 October 1851.
14. Documents confirm the existence of a second lock labourer at Davis lock throughout this period. His job was cut by the Canadian government when it assumed control of the canal in 1858. MG 24 E 2, Vol. 4, p. 325. Memo James D.Slater to Lockmaster Johnston, 5 May 1859.
15. 1848 Census, Reel M-5909, Leeds County, South Crosby Township, p.49, No.22. That year he also produced 60 pounds of wool and 40 pounds of butter for market. In all, Purcell is recorded as having eight acres of land as pasture and six under cultivation.


27. RG 11 B1(a), Vol. 184, p.856."Schedule of Works and Repairs Required for the Season of 1867". That the repair was completed is confirmed as it was included in the printed Annual Report of the Department of Public Works for 1868, Appendix 9, p.39.


29. Canada. Department of Public Works, Annual Report for the years 1870 and 1871 (Ottawa, 1871 and 1872), Appendix 8, p.28-30 and Appendix 10, p.35-36 respectively.


5 May 1874.


34. MG 24 E 2, Vol. 4, p.337. Memo. A. Abbott, F.W. Ottawa to the Lockmasters from the Narrows to Jones Falls inclusive, Ottawa, 9 December 1871.

35. This may explain why some requests for repairs during this period are never followed up in annual reports by a confirmation of work performed on the lockhouse concerned. It is also quite possible that materials costs for many of the smaller repairs were never requested at all under these circumstances.


38. Canada Census, 1871, Micro C-10,002, South Crosby, District 67, South Leeds, Subdistrict G, Division 1, p. 71, and Canada Census, 1861, Micro C-1044, South Leeds, District 1, South Crosby, p. 34.

39. This is an observation based on the few entries made in the lockmasters' journal by Johnston between 1857 and 1871. They are mis-spelled, and infrequently made. See MG 24 E 2, Vol.4, p.320 to end.

40. There is some indication that Johnston was to have left Davis for an appointment at Poonamalie in 1866, and an Archibald Boyd appointed
lockmaster at Davis. (RG 11 B, Vol. 787, p. 10456, Letter F. Braun to Slater, 13 May 1866.) This does not seem to have happened, for 1871 Census documents show Johnston still at Davis. Letter appointing Foster is Ibid, Letter No.16342, Order in Council dated 31 May 1871.

Chapter 4 - Endnotes


2. Tulloch, MRS 177, p. 184.

3. RG43, Superintendent's Letterbook, Vol.2012, p.403. Letter Phillips to Foster, 6 March 1897. "Your letter received & before I proceed to answer it, I would point out that we are not in the habit of giving orders to Lockmasters, subject to conditions proposed by them before being carried out. You have received orders to go to Jones Falls, which you must do when I notify you to go."

4. RG 43, Superintendent's Letterbook, Vol. 2006, p. 134. His father is recorded as having been appointed lockmaster first in 1857 upon the recommendation of the Board of Ordnance which means he may have come directly from Britain or British service at the time. Canada Census, 1881, C-13,232, South Leeds, District K, Crosby South, p. 10, #12. Alfred Foster is recorded as 32 years of age in 1881.


7. RG 11 B 1 (a) Vol. 441, p. 1902, Letter Fred A. Wise, Superintending Engineer to F. Braun, Secretary, Department of Public Works, 4 July 1874.


10. When F.A. Wise assumed the position of canal superintendent in 1872 he began to issue instructions to lockmasters about the quality of repairs that must be made. His memos discussed work methods, standards and also the purchase of materials. See MG 24 E 2 Vol. 4 p.340-1. Memos Wise to Lockmasters, 14 April 1873, 11 April 1874.

11. Annual Report for 1874, loc cit. also see footnote 14 below.

12. The building was owned privately by the long time lockmaster until retired early in the twentieth century when the department bought it back. For purchase see RG 43 Superintendent's Letterbook, Vol. 2006, part 2, p. 186.

13. Since neither of these buildings is recorded as receiving repair in annual reports until 1886 and 87 when some major repairs were performed at Lower Brewers, it is possible that these buildings were in private hands during this time.

estimate requests $100 in unspecified repairs for the lockhouse at Clowes -- sufficient to do all three jobs. It is most unlikely that two separate jobs were done, i.e. plaster and roofing then expense of a further $100. Such spending was outside the scale of funds committed to any of the buildings.


18. RG 43 C I 2(m), Vol. 1963, Davis Lockmasters' Records, Letterbook 1869-1876, entry 5 July 1875.

19. Ibid, various shipping entries, 1875.


21. Much later, when rolled metal roofing was placed on the kitchen, there is a notation that wooden shingles were removed. RG 43 Superintendent's Letterbook, Vol.2021, Part 2, p. 809. Letter Phillips to Moriarty, 3 September 1925.


27. RG 43, C I 2(m), List of Repairs and Memos loosely bound in front of Vol. 1963, Book 1894-1899.

28. RG 43, Superintendent's Letterbook, Vol. 2008, Part I, p.356, Letter F.A. Wise to Chas. McConigal, Newboro, 25 August 1888 include acceptance of a tender offered by McConigal to build additions to the Lockmaster's house and repair block house at Newboro. He was also employed on lock repairs at Davis in 1878-9, 1880, 1885, 1887, and 1889 according to various entries in the lockmaster's journal, RG 43, C I 2(m), List of Repairs and Memos loosely bound in front of Vol. 1963, Book 1894-1899.

29. Ibid, Letterbook 1882-1887, entry 12 November 1886, notation "started coal stove 7 p.m." opposite entry "R. Davis' boat Tomato & Craftsman travelling Portland to Kingston - cargo stove." The following May 13, Foster purchased 173 barrels of coal for the first time.


31. except for the metal roofing

1901 contains the information that "the late Lockmaster Bolton ... at Jones' Falls when ... [he] was superannuated in 1897, was paid by the Dept. for a stable at that place which he had built himself." Also, Ibid, Vol. 2011, p.180, Letter A.J. Phillips to C.A. Schreiber, 31 August 1894 records a claim by "Mrs. McGillvray, widow of the late lockmaster at Washburn, for compensation for a certain building erected by him."


35. Public Archives Canada, RG 43 BI.1, Canal Correspondence, Vol. 999, file 10698, Letter A. Forster, Lockmaster to the Hon. the Min. of Railways and Canals, 30 March 1885.


37. RG 43, CI 2(m), Notes, March - April 1885.

38. Ibid, entries 1885-1889.

39. RG 43 CI 2(m), Notes, 1895, 1896.


41. Wyman, Appendix 1, p.iii.

42. These roofs were not replaced until 1893, 1895, 1895, 1897, and 1897 respectively according to the Annual Reports for 1893 (Appendix II, p. 161-64), 1895 (Appendix I, p.151-54), 1897 (Appendix I p.142).

Memo Wise to Braun, 5 July 1880.


45. RG 11, B1(a), Vol. 184, p.860, "Schedule of Works and Repairs Required for the Season of 1867".


46. Ibid.

47. See Appendix E on Empire Steel Shingles and compare with Figure 42 showing detail of roof.

48. MRC Catalogue A, 1903, p.17.

49. RG 43 CI 2(m) "Notes" for 1894 reports that the carpenters arrived from Jones Falls, where the Annual Report for 1895 which reports addition of a galvanized roof for Davis also reports one for the lockmaster's house in Jones Falls (Appendix 7, p.150-54.).


52. RG 43 CI 2(m), "Notes", Copy, General Circular to All Lockmasters, from F.A. Wise, Sup't Eng'r, 30 Sept. 1890.
53. Ibid, Memo from Wise to Lockmasters, 14 July 1893.

54. RG43 CI 2(m), "Notes", General Circular to Lockmasters from F.A. Wise, 29 December 1891.


56. Ibid, Book 1882-1887, entry 29 May 1886; Book 1887-1894, entries 12 August 1895, 9 November 1896, 17 November 1896.


58. RG 43 Superintendent's Letterbook, Vol. 2011, p.700, Letter Phillips to Foster, 8 December 1895. Similar work was also done under contract at Hartwells by Snaith in 1893: "I enclose Robert Snaith's a/c for furnishing cutting and delivering the stone for a new sill at Hartwells Locks according to the enclosed specification & Bill of Stone, & request that a cheque for $700 be issued in his favour." (RG 43 Superintendent's Letterbook, Vol. 2010, p.14, Letter Wise to Schreiber, 8 March 1893.)


60. RG 11 B, Vol.758, Letter No. 83468, Board of Works to Slater, 4 December 1866.


62. RG 43 CI 2(m), "Notes" a comparison of the lists of craftsmen employed various works, 1884-1896.

63. Ibid, "General Circular to all Lockmasters from F.A.Wise" 1 April 1892.

64. Ibid, Circular to Lockmasters from F.A. Wise, 12 June 1893.

65. RG 43, Superintendent's Letterbook, Vol.2008, p.120, Letter Wise to
Foster, 14 June 1886.

66. See RG 43 CI 2(m), 12 November 1886 and 13 May 1887. Foster bought the coal himself, 173 barrels worth in the winter of 1887.

67. RG 43, Superintendent's Letterbook, Vol. 2006 includes an estimate for the change to coal oil from seal oil in the late 1860s, p.185. The Estimate of Staple Materials, Ibid, Vol. 2010, p.70 for 1895 shows coal oil was in standard use along the canal.


Chapter 5 - Endnotes


2. Interview with Jean (Alford) Rowe, Elgin, 14 January 1989.


8. Tulloch, MRS, p. 182.

9. The resignation of lockmasters at both Lower Brewers and Kingston Mills was demanded in 1896, although both were re-instated at the opening of navigation in 1897. This suggests the MP wanted to make appointments to these posts, but could find no one who wanted them. Perhaps a possible candidate for Lower Brewers turned down the appointment when he saw the state of the lockmaster's house, drawing the MP's attention to the state of the building -- no attempt was made to trace this type of evidence. All material was obtained from Tulloch, MRS, p.187.

10. A new kitchen was also built at Poonamalie in 1899 (Annual Report, 1899, Appendix I, p. 214) although the lockmaster appears to have remained the same. Further research would be required to determine whether a political debt was involved here as well. Whether this kitchen was actually built may also be in some doubt, as a second report of a kitchen addition is noted in the Annual Report for 1903, Appendix I, p. 182-186.

11. RG 43 CI 2(m), back cover of Lockmaster's Journal dated 1869-76. Signed "Ely, Elgin, May 4th 1899".

12. RG 43 Superintendent's Letterbook, p. 592, Letter Phillips to Forster, 26 October 1897.


15. RG 43 CI 2(m), Lockmaster's journal, 1947-1957, front cover.

17. A comparison of the cargoes listed in RG 43 CI 2(m) Vol. 1963 Davis lockmasters' journals show a broadening in the types of cargoes carried on the canal between the 1880s and early 1890s. Those listed in the 1882-1887 journal comprised primarily lumber, cordwood and merchandise, while those in the 1890-94 journal contained scrap iron, coal, salt, phosphate, and granite as well as a wider variety of lumber products (i.e. railway ties, and telephone poles as well as earlier products).


19. Annual Reports for 1904 (Ibid) and 1907 (Appendix II, p.167, 168), 1908 (Appendix II, p.176) respectively.


22. By this point second storeys had already been added to Chaffey's (1895) with government support from the Conservatives, and also to the lockmasters' houses at Old Sly (1886-87) and Maitland's (1889) primarily at the cost of the lockmasters with some government provision of materials. A second storey was later to be added to the lockmaster's house in Smiths Falls attached (1929). Annual Reports for 1899 (Appendix I, p.214), 1907 (Appendix II, p.165-70), 1916 (Appendix III, p.123-28), and 1929 (Appendix 5, p.103-104) respectively.


1913 (Appendix VI, p. 306-313) and 1914 (Appendix VI, p. 330-337) respectively.


29. Annual Reports for the year identified, loc. cit.


31. RG 43, Superintendent's Letterbook, Vol. 2013, p. 419. Letter Phillips to W.G. Charleson, 29 May 1899: "I beg to inform you that your tender for the supply and delivery at the store house, Ottawa Locks of 120 cans, 25 lbs each chemically pure white lead in oil at 6.00 per lb, also 100 cans, 5 lbs each paint Swedish lamp black in oil at $10.00 per lb is accepted. Please have the whole amount above stated delivered this week as our boat will be here to distribute it along the canal next week."


34. Jean Rowe, Interview.

197
35. Letter cited in note 33 above records that during the summer the water from the lake "becomes dirty and unfit for drinking unless first boiled and then cooled with ice".

36. This work was done on contract by Mr. J.E. Deling of Elgin. See RG 43, Superintendent's Letterbook, Vol. 2014, Part 2, p. 573, Letter Phillips to Deling, 12 October 1905.

37. RG 43 Superintendent's Letterbook, Vol. 2017, Part 3, p.193, Letter Phillips to Alford, 3 January 1916. Alford was never compensated for this sink, as Jean Rowe recalls he took it with him when he left Davis lock upon retirement.


41. Jean Rowe, Interview.


45. Annual Reports for 1930 (Appendix 5, p.107-108), and 1931 (Appendix 4, p.71-72).

46. Engineering Section, Rideau Canal Office, Department of the Environment, Smiths Falls, 1930 Canal Building Inventory.

47. Jean Rowe, interview.


53. Jean Rowe says there was never a telephone in the lock house until after she left home in the late 1930s. Robert Pyne (Interview, 6 December 1988) confirmed that a wall phone was installed in the early 1940s in both the lockmaster's and the lock labourers' houses suggesting there was no telephone line until that time.

55. See Ibid, Letter A.R. Whittier to E.B. Jost, 2 December 1940. Whittier claims that by 1936 when the policy of rental was changed, $108 had been collected by the Department to pay the original $66.40 installation bill.


60. Ibid, Letter Dubuc to O'Hara, 12 November 1934.

61. Department of the Environment, Parks, Rideau Canal Office, Smiths Falls, Registry, File C 2507-6, Staff Accomodation, Lower Brewers. Letter Lockmaster Ball to A.R. Whittier, 12 September 1938.


66. All information above from Jean Rowe, Interview.

68. Both Jean Rowe and Robert Pyne claim that Alford built the basement entrance way and extended and screened the porch area. See also Figures 48, 49, and 50.


70. Robert Pyne, interview.


72. Ibid. Letter C.G. Wilby, Area Manager Delta R.O.A. to Mr. A.R. Whittier, 27 April 1951. See also letter from Pyne to Whittier, 14 April 1951, which confirms the house was not yet wired by that time.


77. Robert Pyne, Interview.


80. Robert Pyne, Interview.


82. Ibid, Whittier to Pyne, 10 June 1952.


84. Ibid, Letter Whittier to Pyne, 9 June 1953, and Pyne to Whittier, 8 June 1953.


86. RG 12 B13, Vol.3686, File 4250-1, Part 1, Memo J.R. Baxter, Director of Administration and Personell to Director, Canal Services, 31 October 1956.

87. Ibid, Memo, Treasury Board to Administration and Personell, 16 November 1956.

88. Ibid, Memo L.W. Clark to R.J. Burnside, Director, Canal Services, 28 September 1956.


90. For information on Nicholson's, and Poonamalie see the Annual Report of the Department of Transport for 1953-4, p.48. For the others see Rideau Canal Office Files C 2507-6, Letter Superintending Engineer to Lockmaster D.P. Gilbert, 5 October 1953 (for Upper and Lower Brewers), File C 2507-12.


Chapter 6 - Endnotes


4. Ibid.


8. Ibid, E.A. Cote, Department of Northern Affairs and National Resources, 6 February 1964.

9. Ibid L.W. Clark to J.N. Ballinger, 8 November 1963 states "The
Lockmaster's house at Davis Station has been withdrawn from sale as this building may be leased to a departmental official for cottage purposes."

10. Superintending Engineer, Rideau to Mr. Clarke G. Walton, 3 September 1963.


13. Ibid, Cote to Baldwin, 6 February 1964.


15. Ibid. Memo Clare Sanderson, Realty Officer to Carl Peel, Assistant Superintendent, 25 June 1984.


17. Mrs. Rowe noted this. She said there was never a window on that wall before the Baldwins moved in.


33. Ibid.


41. Ibid, Memo Clare Sanderson, Realty Office, Smiths Falls to Carl Peel, Assistant Superintendent, 25 June 1984. Also, J.F. Cullinan, Counsel, Legal Services, to Mr. W.M. Evans, Regional Management Advisor, Parks Canada, 13 April 1984.


46. Rideau Canal Office, File C 2507-7 Vol. 2, Baldwin to Cote, 27 February
1964.

47. It may also be the least altered -- the other possible contender is Upper Brewers, but Upper Brewers did not serve as a lockmasters house during the 1884-1899 period or as long as Davis did in the twentieth century.
Figure 1. This tollhouse was built by the Royal Staff Corps on the Military Canal at Iden, England in 1834. It may have served as a model for the construction of the post 1837 lockmasters' houses on the Rideau Canal in Canada. (P.A.L. Vine, *The Royal Military Canal*. [London: David & Charles: Newton Abbot, 1972], p.139.)
Figure 2. Hartwell's Station No.2 by William Clegg. (Public Archives Canada, C 1202).
Figure 3. Nicholson's Station No.7 by William Clegg. (Public Archives Canada, C 1207).
Nicolsons

Station No. 7 — 43 1/2 miles from Belfountain.
Figure 4. Maitland's Station No.10 by William Clegg. (Public Archives Canada, C 1210).
Hertland
Station No. 10
5.5 miles from Bytown
Figure 5. Edmond's Station No.11 by William Clegg. (Public Archives Canada, C 1211).
Edmondts{1}
Station N° 11 — 59 1/2 Miles from Bytown.
Figure 6. Old Sly's. Station No.12 by William Clegg. (Public Archives Canada, C 1212).
Old Slys, 1828-1832. Station No. 12 - 60 1/2 miles from Lytown

by

Wm. Clegg

Wash drawing

Credit PAC
Figure 7. Smiths Falls. Station No.16 by William Clegg. (Public Archives Canada, C 1213). Both defensible lockmasters' houses can be seen in this picture.
Figure 8. Poonamalie. Station No.14 by William Clegg. (Public Archives Canada, C 1214).
First Rapids on the Red River
Station 14 - 60 miles from Pembina.
Figure 9. Chaffey's. Station No.17 by William Clegg. (Public Archives Canada, C 1217).
Figure 10. Davis, Station No.18 by William Clegg. (Public Archives Canada, C 1218).
Figure 11. Brewers Upper Mills. Station No.20 by William Clegg. (Public Archives Canada, C 1220).
Figure 12. Brewers Lower Mills, Station No.21 by William Clegg. (Public Archives Canada, C 1220).
Brunnes Station, 1856
Station No. 21 - 110 miles from Bytown
Figure 13. Another view of Davis Mill Locks by Burrows (date c mid 1830s). (Ontario Archives).
Figure 14. This sketch of Davis lock was prepared by Burrows in December of 1840 (Ontario Archives).
Figure 15. The floor plan of this new cookhouse at Sorrel shows parallel windows were planned for either side of its front door. A single storey design of 26 feet by 30 feet, this building also exhibits the same roofline and chimney cap as most defensible lockmasters' houses suggesting this was a standard type of Ordnance construction. (WO 55, Vol. 1917, p.142 appendix. Estimates for a New Cookhouse at Sorrel, plans are dated 23 April 1838.)
New Cock-horse
Spuel.

Scale of 4 feet to one inch.
Figure 16. The Lodge at Kingston Mills is under construction to the left of the centre of the photo. This building too has a central door and balanced parallel windows as its front facade. (Ontario Archives)
Figure 17. Davis Lockmaster's House, 1988. (Engineering and Architecture, Department of the Environment, Parks, Ontario Region.)
Figure 18. Kilmarnock Lockmasters's House, 1987. (Engineering and Architecture, Department of the Environment, Parks, Ontario Region.)
Figure 19. Jones Falls Lockmaster's House, 1982. *(Rideau Canal Office, Smith's Falls, A22-67.)*
Figure 20. Nicholson's lockmaster's house, 1980s. (Engineering and Architecture, Department of the Environment, Parks, Ontario Region.)
Figure 21. Poonamalie lockmaster's house, 1980s. (Engineering and Architecture,
Department of the Environment, Parks, Ontario Region.)
Figure 22. Smith's Falls attached, 1980s. (Engineering and Architecture, Department of the Environment, Parks, Ontario Region.)
Figure 23. Lockmaster's house, Upper Brewers, 1930. (Historical Research files, Department of the Environment, Parks, Ontario Region.)
Figure 24. Lockmaster's house, Kilmarnock, c 1890. (Rideau Canal Office, Smith's Falls, A22-12)
Figure 25. Lockmaster's house, Old Sly's, 1925. (Ordnance Land, Department of Indian and Northern Affairs, accession Rideau Canal Office, Smith's Falls, A13-24.)
Figure 26. Lockmaster's house, Clowes, 1930. (A. Davis, accession Rideau Canal Office, Smith's Falls, A9-4)
Figure 27. Lockmaster's house, Smiths Falls detached, late nineteenth century.

(Rideau Canal Office, Smith's Falls, B11-55.)
Old Beckwith Street Lock House and Bridge

his picture shows the old and the lock house on the Beckwith Street Bridge right hand side. The picture belongs to D. H. Grant of Smiths Falls. He estimates the shot is at least 50 years old. The picture was formerly Lombardy. The Record News welcomes old pictures from its readers which will appear at random. Pictures are kept whose pictures have appeared are asked to drop by The Record News office to pick them up.
Figure 28. Lockmaster's house, Chaffey's Mills, c 1885. (Newman Collection, accession Rideau Canal Office, Smith's Falls, A20-22).
Figure 29. Lockmaster's house, Ottawa, c 1860. (Public Archives Canada, PA 169050.)
Figure 30. Davis lockmaster's house, 1988. Note the straight arch design over the door and window openings. (Engineering and Architecture, Department of the Environment, Parks, Ontario Region.)
Figure 31. Instructions on using the "straight arch" in the Royal Engineers' text *Outline of a Course of Practical Architecture* by C.W. Pasley (Pasley,... [Chatham, Royal Engineers, 1826], p.108 accession Historical Research, Department of the Environment, Parks, Headquarters).
Practical Architecture.

The bricks used in Arches always show their thickness in the face of the wall, which thickness being from 2½ inches at the utmost, this dimension is used at the top of the straight arch, or at the extrados of the curved one, and from thence it diminished, owing to the face of the Arch-Brick, to the soffit of the straight Arch, or to the intrados of the curved one.

This splay is by Bricklayers termed the Somereting an Arch.

The bricks used in external Arches are always rubbed with great care to the proper splay or wedge line from the face; and according to gauges or regular measured mortises. For this reason, they are usually shaped and set in arches, to distinguish them from inside or rough Free, in which common bricks are used, without being bedded or shifted in any way.

Figure 157 represents in eleva-

Fig. 157

tion a straight arch of the description we are considering, such as is most always used for this window, as frequently for the door of dwelling houses, and which, at this width of foot, ought to have about 21 arch-bricks. The vertical height of such arches, is most always made equal to that four courses of common brickwork, and as the whole thickness necessary for such an arch, diminishing it obliquely, according to the lines of the joints of the Arch-Bricks, and which therefore varies according to the situation of the arch, cannot be obtained out of one brick, but is usually in two pieces. But the horizontal joints shown in the above drawing are false joints, marked for effect, usually at one third, and at two thirds of the height.

This figure is a correct elevation of one of the Windows in the grounds of the Residence of the Governors of Oswego, which was built other, and is high. The slant sill before treated of is shown below the aperture. The tail piece of the flat arch is not however represented, the being only in profile, on a small scale, and accordingly was not included in an Architectural Drawing.
Figure 32. The earliest illustration of Davis lockmaster's house, date 1875 or slightly earlier. (*Newman Collection*, accession Rideau Canal Office, Smith's Falls, Slide A21.)
Figure 33. Section of a plan of Davis lock prepared by F.W. Whinyates, R.E.,
17 September 1851. (Public Archives Canada, National Map Collection,
RG 84 M 86703/3V Item 34. NMC 97795.)
Figure 34. Lockmaster's house at Lower Brewers, 1980s. (M. Stranak, accession Rideau Canal Office, Slide A24.)
Figure 35. The east facade at Davis. Two parallel windows subdivided by a single internally subdivided loophole about ten feet long.

(Architecture and Engineering, Department of the Environment, Parks Ontario Region.)
Figure 36. The north facade at Davis: a third standard variable facade.

(Engineering and Architecture. Department of the Environment, Parks, Ontario Region.)
Figure 37. An 1850 photograph of the Poonamalie lockmaster's house showing the fireboards on the loopholes by Edwin Whitfield. (Public Archives Canada, C 13299.)
Figure 38. Lockmaster's house, Hogsback, 1893. (Ballantyne Collection, accession Rideau Canal Office, Smith's Falls, A3-23.)
Figure 39. Portion of F.W. Whityates, "Rideau Canal. Plan shewing the boundaries marked on the ground belonging to the Ordnance.

(Public Archives Canada, National Map Collection, NMC 97795.)
Figure 40. During the nineteenth century the lockmasters' houses were often occupied by large families as this photograph of the Newman family at Clowes shows. (Newman Collection, accession Rideau Canal Office, R4-12.)
Figure 41. Plan of the Davis Lock Site, prepared in 1932 by the Chief Engineer's Office, Department of Transport. (Rideau Canal Office, Engineering Section.)
Figure 42. Photograph of the roof, Davis Lockmaster's House showing the detail of the metal shingles. Compare with Appendix E. (Department of the Environment, Parks, Ontario Regional Office, Engineering and Architecture.)
Figure 43. Wallpaper from the pantry at Davis. Apparently the Baldwins discovered this paper behind 1898 newspaper. It does, nevertheless, appear to be the same as the wallpaper in Figure 44 which was applied on top of the plaster on the interior of the house. The plaster on lathe was not applied until the 1920s. (Department of the Environment, Parks, Ontario Regional Office.)
Figure 44. Wallpaper from the north east bedroom, Davis, discovered during conversion of the room to a bathroom in the 1960s. (Department of the Environment, Parks, Ontario Regional Office.)
Figure 45. Lockmaster Philander Alford (left) his wife, and parents, c 1890.

(Jean Rowe, Elgin.)
Figure 46. Lockmaster Elah Alford and his wife are the figures in the centre of this picture. (Jean Rowe, Elgin.)
Figure 47. Poonamalie lockmaster's house, 1908, showing the pitched roofed second storey added early in the twentieth century. (Patterson, accession Rideau Canal Office, A16-8.)
Figure 48. Photo of Davis lockmaster's house taken by in 1930 survey of canal buildings. (Engineering Section, Rideau Canal Office.)
Figure 49. Photo of Davis lockmaster's house during the Alfords' time, probably in the 1940s. (Jean Rowe.)
Figure 50. Photo of Davis lockmaster's house taken in a 1952 survey of canal buildings. (Historical Research, Department of the Environment, Parks, Ontario Region, No. 420-32-3-953-5839.)
Figure 51. Plan of the Davis lock site prepared during the 1952 survey of canal buildings. (Public Archives Canada, RG 12 B 13, Vol. 3696, file 4602-85-1, Vol. 2, 1952.)
Figure 52. Photo of the Davis Lockmaster's house, 1969 during discussions between the Baldwins and Canal officials on necessary repairs.

(Rideau Canal Office, Realty File C 8606-713.)
Figure 53. Photo of the Davis Lockmaster's house, 1969 during discussions between the Baldwins and Canal officials on necessary repairs.

(Rideau Canal Office, Realty File C 8606-713.)
Figure 54. Photo of the Davis Lockmaster's house, 1969 during discussions between the Baldwins and Canal officials on necessary repairs.

(Rideau Canal Office, Realty File C 8606-713.)
Figure 55. Photo of the Davis Lockmaster's house, 1969 during discussions between the Baldwins and Canal officials on necessary repairs.

(Rideau Canal Office, Realty File C 8606-713.)
Figure 56. Photo of the Davis Lockmaster's house, 1969 during discussions between the Baldwins and Canal officials on necessary repairs.

(Rideau Canal Office, Realty File C 8606-713.)
Figure 57. Plan of the Davis Lockmaster's house made during an inventory of canal buildings in 1972. (Rideau Canal Office, Realty File C 8606-713.)
Figure 58. Fire damage to the Davis lockmaster's house, 1983. (Rideau Canal Office, Realty File C 8606-713.)
Figure 59. Fire damage to the Davis lockmaster's house, 1983. (Rideau Canal Office, Realty File C 8606-713.)
Figure 60. Fire damage to the Davis lockmaster's house, 1983. (Rideau Canal Office, Realty File C 8606-713.)
Figure 61. Fire damage to the Davis lockmaster's house, 1983. (Rideau Canal Office, Realty File C 8606-713.)
Figure 62. Davis lockmaster's house, 1916. (Rideau Canal Office, R4-019-B-0020.)
1st If a Governor or Commander of the Forces shall deem it necessary under circumstances of peculiar or pressing emergency, such as internal Rebellion, or the sudden or unexpected breaking out of War, to order a Work for which the assistance of the Ordnance Department is required, he is to call upon the Commanding Engineer, in writing, to prepare a plan and Estimate for the Service, and if the Governor or Commander of the Forces approve of the same, he will (previously annexing his signature of the approval in the Estimate) give the Commanding Engineer a written Order to execute the Work, quoting the date of the Warrant, which he should at the same time issue to the Commissariat Officer to provide the necessary Funds, without which the Commanding Engineer will not be justified in executing the Work.

2nd The Estimates and Plans prepared by the Engineer Department, under the above authorities, are to be made out in the form and detail required by the Engineer Code for any Ordnance Service, and the Commanding Engineer upon receiving authority to execute the Work,
is to carry it on in the same manner as if it were an Ordnance Service, with only this difference, that instead of quoting the Master General's and Board's authority, the Vouchers and Bills of Expenditure are to be marked Special Services ordered by the Governor or Commander of the Forces, as the case may be, and correctly headed and identified by date with the Governor's or Commander of the Forces Orders and Warrant for the Work, so that on these Documents reaching the Surveyor General's Office through the Storekeeper at the Station, the necessary information, together with the usual Certificates of the Officers who superintended and inspected the Work, may appear, and thus afford the means of examining and passing the Accounts after the Services shall have received the Master General's and Board's approval like any ordinary Ordnance Vouchers.

3rd By the first opportunity after the Work shall have been so ordered, the Governor or Commander of the Forces, as the case may be, will report the same to the Secretary of State for the Colonies, with a full explanation of the causes and reasons which have induced him to take the responsibility of ordering the Service without the previous sanction of Her Majesty's Government, transmitting at the same time copies of the Plan and Estimates he has so ordered.

4th The Secretary of State for the Colonies upon receiving these Documents
will forward the same to the Lords of the Treasury, with his opinion as to the propriety or otherwise of the measures adopted by the Governor or the Officer Commanding the Troops; and the Treasury Board, in the event of their being satisfied with the expediency of those measures, will communicate with the Master General and Board, with a view to such revision and modification of the details of the Plans and Estimates of expense as they may consider necessary to submit to the Treasury Board for their final directions; and the amount of such Expense to the Lords of the Treasury may then approve, is then to be provided in the next Estimate that may be laid before Parliament by the Ordnance, under the special heading Works ordered by the Governor, or Officer Commanding the Troops in the Colonies, without the previous sanction, but with the subsequent approval of the Home Authorities.

5th The repayment of the Sums expended for these Services will be claimed from the Ordnance by the Commissioners for Auditing the Public Accounts, according to their usual practice, and as soon as the Vote of Parliament may be obtained, the Amounts will be placed to the Credit of the Account out of which the Sums were issued in the first instance from the Military Chest and thus the Accounts will be adjusted between the Departments in London, without any further proceeding by the Officers on the spot.
6th The Commanding Engineer will also as soon as possible transmit for the information of the Master-General and Board, through the Inspector General of Fortifications, Copies of the Plans and Estimates referred to in these regulations, accompanied by such observations and remarks as he may consider desirable that the Master-General and Board should be informed upon, for the Service so ordered, reporting also the time of commencement, the manner in which it is carrying on, and the probable period at which the Work will be completed.

7th These Regulations in no ways alter any Law or Custom according to which Military Works and Buildings in Colonies, possessing Representative Assemblies are paid out of the Revenues of the said Colonies.
APPENDIX B

COMPARISON OF THE EXTERIOR WALL FACADES AND ROOFS OF THE DEFENSIBLE LOCKMASTERS' HOUSES ON THE RIDEAU

Explanation

This appendix consists of an analysis of the roof and wall facade features of the defensible lockmasters' houses from historical and modern photographs. It is particularly an attempt to determine the composition of the early wall facades of each building.

Wall facades have been analyzed by their relationship to the common front facade of a central door and two parallel flanking windows. Surface numbers have been assigned presuming the viewer is facing the front facade (Surface 1) and looking to the surface on either the right (Surface 2) or the left (Surface 4) of the front facade. The rear facade (Surface 3) is self explanatory.

The construction group referred to is according to the phases of defensible lockmasters' house construction defined in Chapter 2 i.e.1838 (Group 1), 1840-41 (Group 2), 1841-3 (Group 3), post 1843 (Group 4).

References to photographic sources have been given by collection number reference and year only. All photos beginning with A or B numbers are found in the
Rideau Canal Office, Smith's Falls files. PAC is used as the Public Archives Canada designation. OA is the Ontario Archives designation. These photo references are neither exhaustive nor comprehensive, but rather are intended only to give a general indication of the nature of the sources used.

Abbreviations used to describe buildings are as follows:

lp = loophole  
w = window  
d = door  
off/c = off centre  
c = centred  
l1 = parallel  
s = standard front facade (door and 2 flanking parallel windows)  
p = peaked roof  
r = hipped roof with ridge  
? = do not know  
a = appears to be -- usually deduced from later photographic evidence, or only partially visible in available evidence

Wall sfce 1 = front facade  
Wall sfce 2 = facade to right when facing front facade  
Wall sfce 3 = rear facade  
Wall sfce 4 = facade to left when facing front facade
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APPENDIX C

ROYAL ENGINEERS' AIDES MEMOIRES ON THE CONSTRUCTION OF LOOPHOLES

(Aides Memoires to the Military Sciences, Part I [Chatham, Royal Engineers, 1845], p.308-315)
LOOPHOLE.—The term 'loophole' is understood to denote the opening in a masonry wall or stockade, for the use of musketry, as an embrasure is for that of artillery.

The nearly uniform dimensions of all infantry muskets of the present day, and a due attention to economy and convenience in building, have reduced the form of the loophole to two or three conditions, adapted to suit the purposes of defence.

It is usual to distinguish these by the direction of the exterior opening. Thus we call the loophole—vertical or horizontal, according as the exterior opening is upright, or the contrary.

The vertical construction is best adapted for sites where great vertical range is required, such as for the banking of high escarp, or steep slopes, &c.

Under all other circumstances, the horizontal loophole will be found most effective and most convenient. It affords greater advantages for defence, because, with great lateral extent, it combines sufficient vertical range to include the height of a man, which, under ordinary circumstances, is all that will be required.

The interior opening of the loophole can be of the same form in both these conditions, for a man to use his musket conveniently: it should not be less than 2 feet wide and 1 foot six inches high. Vertical loops are seldom constructed for more than one man to serve at a times; and in brick walls they are placed with their centres not less than 3 feet apart. Horizontal loops, on the contrary, can be constructed to contain two or even three men, the interior opening having an increase of not less than 2 feet per man.

The extent of the exterior opening depends upon the range required, but it should not exceed 3 inches, and the hole in the exterior should be at least 7 or 8 feet above the level of the ground at the outside, to prevent the loophole from being fixed into.

The length of barrel of a musket in our Service is about 3 feet 3 inches. As it is necessary that the muzzle should extend 3 inches outside of the loop, to prevent inconvenience from the explosion, it is evident that the ordinary form of loop is inapplicable to a wall of a greater thickness than 2 feet 6 inches, or at least 3 feet.

When this dimension is increased, it becomes necessary to make a corresponding modification in the arrangement of the loop.

Let us take 3 feet as a convenient thickness of wall, and construct the loop either vertical or horizontal, as before described.

Then, for any additional exterior thickness of wall up to 5 or 6 feet, the sides of the loop can be formed in successive courses of brick, as described in Lieutenant- Colonel Abbeville's Memorandum in the eighth volume of the 'Professional Letters,' which is given at length in this Article.

But when the thickness of wall exceeds 6 feet, this method will be found inconvenient.
on account of the great increase to the exterior opening; and in this case it is usual to form an arched recess in the interior, of whatever additional depth is required to make up the thickness of wall.

The recess may be made to contain three or four loops as may be convenient, and if the piers and arch be carried through to the exterior, the formation of the recess does not so much tend to weaken the wall.

The following excellent method of forming horizontal loops in brick-work has been suggested by Lieut.-Colonel Alderson, R.E.

Horizontal loopholes present a much wider range of fire than vertical ones, for the space exposed, and in boundary walls, defensible barracks and guard-houses, reverse fires and caisson-ports, are decidedly preferable.

The present horizontal loophole is a cast iron frame, built into the wall so as to weaken it as little as possible. It is adapted for a wall three bricks thick.

The same principle may be adopted in walls of any thickness.

Fish-belly girders (a, c, d) are provided to strengthen the upper part of the loophole, and enable it to carry the wall above. Arches, however, may be turned as over window openings, if preferred. Half-inch iron will be sufficient for the sides and bottom of the frame.

By giving the loophole the present form, it sets with great firmness in the wall.

In reverse fires and caisson-ports, whose object is the defence of the passage of the ditch, when the enemy is otherwise occupied than in returning the fire of them, external objects will be better seen by making the larger opening of the loophole outside, in which case the smaller opening may be increased from 1½ to 6 inches.

In boundary walls, barracks, and guard-houses, the larger opening should be inside; it will afford in the two latter more light, and provide shelves for the occupants; and in the former it will present a smaller object, and make the opening higher from the outside.

Loopholes should always be higher or lower than a man's height from the level of the ground immediately in front of them. When this cannot be effected, there should be a drop or ditch in front.

Six feet is the length of the larger opening of the present loophole frame, which may be considered as a maximum, to be reduced according to circumstances. In towers or other works situated on high and commanding points with no level ground within range, the section described by fig. 4, Plate I., is recommended.

These loopholes, though here represented of cast iron, may also be made of slate, or hard stone.

The above observations are chiefly applicable to the loophole when formed in brick; but when the wall is of stone, or the loophole itself set in stone in a brick wall, we are enabled, by a modified arrangement in the sides of the loop, to give such greater security to the defenders without entailing a great increase of expense.
LOOPHOLE.

It will now appear that if the lines a c—b d were to form the sides of the loop, the greatest protection will ensue to the defender when the opening at e is as small as possible.

It is necessary, however, that both men should be enabled, if required, to fire direct to the front; and a due regard to light and ventilation will not allow of this opening having a less length than 2 feet, so that the vertical area of the opening at this point will be about 2 feet by 11 inches high.

To insure resistance against a musket-ball, and to give proper strength to the side of the loop where a soft stone is used, the thickness f g should not be less than 6 inches, though it will be of advantage to diminish this dimension whenever a harder material will allow of it.

The sides g b–h c forming portions of the lines limiting the lateral range of the loops, the lines k f—l i are directed on the angles h and g, and lines drawn from a and d, to intersect them at k and i, and forming an angle of 40° with a f and d i, it being assumed that a bullet will not effectually reflect from a wall at a greater angle.

On examining this construction it will be evident that no bullet can possibly reflect into the interior after striking the side of the loop, except upon the small portions f g, h i; and that while the range of 120° is preserved, the vertical space through which a bullet must pass to enter the interior is only 2 feet long by 3 inches high.*

A construction something similar to that just described will be found in a Paper by Lieut.-Colonel Ord, in the eighth volume of the 'Professional Papers,' and drawings of which are given in Plate III. figs. 1, 2 and 3.

"Figs. 1 and 2 represent a simple horizontal loophole for two men to fire through. They should be, when practicable, made of cut stone throughout: if of brick-work, the head should be arched, as shown by dotted lines in fig. 4, the sides of common brick, and the holes of good hard Dutch clinlers or fire-bricks (when manufactured of a hard nature), and set in cement.

"All the four sides have one break on return, offering an important obstacle to balls from without, whether from a direct fire, or after having been reflected from some other object.

"The zigzagged loophole (fig. 3) is a plan that may be adopted with great advantage, where it is desirable, or even convenient, to have the mouth of the loophole towards the enemy, and which, in consequence of the numerous 'facets' covered with sheet iron, will be found to afford scarcely less security than the plain-sided one, with the narrow opening outwards."

The following description of Lieut.-Col. Ord's loopholed window for defensive barracks, etc., and other buildings requiring a reasonable supply of light and ventilation, is taken from the same Paper.

"Figs. 4, 5, 6, 7, represent the loopholed window. The dimensions, when the window is to be used as a loophole, are the same as those in figs. 1 and 2, Pl. III., and this is effected as follows: a wrought iron abattant, or falling shutter, is attached to the head of the iron window frame by means of a pivot or hinge, the two ends working in iron eyes or rings. The pivot is of round bar iron, with the sheet iron forming the abattant riveted to it: this abattant is lowered to the iron rests (see fig. 7), and thus forms a very complete loophole. When employed as a window, the

* The dimensions in the diagram are merely assumed to illustrate the principle, which is applicable to any variation either in the thickness of wall or size of loop.—R. T.
LOOPHOLE.

abattant is raised by winch-handles, which are fixed on the square ends of the pivot or hinge, and, being bolted, remain continually up.

* The iron sashes are removed for action, and the loophole is then clear.

* By examining fig. 7, it will be clear that no injury can be done to the defender by shots between the abattant and the head of the window above it, unless the firing should be of such a nature that an ordinary loophole would be almost destroyed by it.

* Plates are riveted to the angles of the abattant to strengthen it. The necessity for them, and their dimensions and numbers, would be left to the discretion of the Engineer, as the strength required would of course vary according to the fire likely to be brought upon it, which would depend on the locality.

* The loopholed window should also be in cut stone, whenever practicable.

* This window may be lengthened to 6 feet when necessary, this length being the maximum."

Great difference of opinion exists in our Service with regard to the comparative advantages of loopholed fire and that of the ordinary parapet; but in sites liable to be commanded within musketry range, and unexposed to the fire of artillery, and for the close defence of the ditches, &c., of permanent works, the loophole presents most unquestionable advantages.

The general application of loopholed fire in all fortresses recently erected or in course of execution on the Continent, together with the attention paid to the direction and construction of the loops themselves, afford ample evidence on this point. It would appear that the vertical construction is almost universal in these works.* Figs. 1 and 2, Plate II., are descriptive of the arrangement of some loops at Grenoble, and form a good example for the adjustment of vertical loops upon uneven ground.

Respecting the local distribution of loops, no positive rules can be laid down where every thing depends upon the nature of the site. The following observations may perhaps be of general application.

Where the loops are formed in long continued walls properly flanked by artillery or musketry, such as in the gorges of large works, they can be dispersed at longer intervals, in proportion as the command of the ground immediately in front of them is of more or less importance.

When, however, the interval between them exceeds 7 or 8 feet, the fire becomes weak and futile; and it will be found of advantage in these instances to concentrate the loops in detached numbers towards those points most necessary to command, rather than to pierce the wall equally throughout its whole length; because, in the former case, the men will rush at once to the points most necessary to defend, and will be more under command than when detached singly at longer intervals.

On the contrary, in encampments, reverse fires for the defence of the ditch, and where the object will be to prevent the passage of a large body of men, the loopholes cannot be too great numbers, or too closely approximated to each other; provided always that sufficient space is allowed on each side and in rear of the loophole for one man to use, and another to load his musket, in rear of him; and it may be here observed that 2' 6" to 3' from centre to centre of the loops, and 6 feet width of passage in rear, are the minimum dimensions that will answer these objects.

When there are any additional obstacles in the ditch, such as the 'cunettes' of a permanent wet ditch, or palisades, or other impediments in the ditches of Field Forts,

* From Captain Maurice's 'Essai sur la Fortification Moderne.'
it is of course advantageous to concentrate a considerable portion of the loopholed fire immediately in front of such obstacles; and, indeed, the same advantage may be obtained for all loopholed walls, by the construction of shutters, &c., at a convenient distance in front of them; but every loophole should be laid out with reference to locality and its specific object, like an embrasure.

Many distinguished Officers in our Service can state from experience that no obstacle is more terrific or appalling to troops than a strongly constructed palisade or other impediment in the ditch, flanked by a powerful loopholed fire, well sustained and well directed.

Memorandum.—For the hasty construction of loopholes in the field, the reader is referred to 'Field Fortification.'—R. T.

Note on Embrasures.—As the construction of embrasures varies without reference to localities or any specific conditions, the following observations are offered upon the principles on which they should be constructed.

We are taught that the interior opening at the gunwaille for cannon should not be less than 2 feet 2 inches, and at the exterior part of the embrasure it should be half the thickness of the parapet; these dimensions apply to earthen parapets that are more than 9 feet thick. When less, and the parapets are built of masonry or brickwork, the following will be found more suitable, by giving the external width of the embrasure one-third of the thickness of the parapet, plus the interior opening: for example, if it is 6 feet thick, the exterior width will be 4 feet 2 inches; and if 9 feet, 5 feet 2 inches. These normal dimensions give the minimum opening to the embrasure to afford the maximum cover to the men, gun, and carriage, and within which is the smallest space the explosion will permit, as explained by the lines a e and

Fig. 1.
id perpendicular to $x'y'$ in fig. 1. But the line of fire only extends to the triangle, $xzy$; and if the muzzle of the gun is directed by the gunner beyond, he will destroy his own cover by blowing away the cheeks of the embrasure.

Although these rules are based upon certain principles, yet their application is not arbitrary, and there are exceptions which should be considered in laying out the embrasure; as for example, when the battery is exposed only to the oblique fire of an enemy, in flanks and re-entering angles, to follow the normal dimensions is contracting the power of your artillery, to the loss of flanking fire, as explained in fig. 2, where it is shown that the line $g'h$ and the gate $h$ are not seen from the em-

![Fig. 2.](image)

brasures. Now as the interior may be only exposed in the directions $oa$, it is unnecessary to give the minimum opening, and as this deficiency of flanking fire may expose a fortress to a coup-de-main, it is time enough to contract the embrasures in the flanks when the counter batteries of the besiegers are about to be established.

To what extent local circumstances will permit a deviation, rests in the judgment of the Engineer; but an extension to the angle $xzy$, fig. 1, will preserve the cheeks of the embrasure, and add to the scope or lateral breadth of the fire of the artillery.

When a gun is mounted upon a travelling carriage of which the genouillare is 3 feet high, the interior opening at the genouillare may be 2 feet 6 inches, and for the dwarf traversing platform 3 feet, and a corresponding addition to the exterior width, giving the cheeks of the embrasure a slope of 1/4 the height, as in fig. 3.

![Fig. 3.](image)
Oblique Embrasures are occasionally pierced in parapets for particular objects; but except under circumstances explained in fig. 2, they are objectionable, as shown in fig. 4.

When the parapets are exposed to a direct fire from an enemy, and the embrasures are cut obliquely for some especial purpose on the lines P P, the following difficulties occur: the parapets on the lines oo become too thin, and are not shot-proof; the interior is too confined, and is liable to be blown away by the firing of the guns; increased, too, because they cannot be run up on the platform, the width of the carriage and space required for the men preventing it, as shown on the dotted lines wc.—G. G. L.

ADDITIONAL NOTE ON EMBRASURES.

The simple form of embrasure still in general use, and which is merely an extension of the simple form of loophole, has come down to us from a remote epoch, and appears to have been adopted on the following principles: 1st. By a narrow internal opening to keep the men as much as possible under cover. 2nd. By a wide external opening to give as much lateral range as possible, consistent with the stability of the parapet. The actual range attained with a parapet of 18 feet thickness and 9 feet external aperture, does not extend over more than 27°; but on the old system of Vauban, of placing the embrasures 18 feet from centre to centre, four guns could be brought to bear on any point of the ground before them at 80 yards, three at 67 yards, two at 45 yards; so that, considering the proper lengths of curtains and lines of defence, it may be justly said that in this, as in other arrangements of the early masters, the dimensions adopted were selected on principle. 3rd. In an 18-foot parapet, the distance from the muzzle of the gun to the cheeks need never be less than 1' 9'', as the gun ought never to be laid close to any cheek when firing parallel to it. 4th. The funnel shape, expanding outwards, greatly facilitates the escape of the elastic gases, smoke, &c., and this is an additional reason for making that portion of a loophole, in thick walls, which is beyond the muzzle of the musket, expand outwards. It is evident, therefore, that the early form of embrasure, however simple, was not established without reason, and possesses many advantages. Occasionally, in very ancient fortresses, a casemate was formed in the parapet, and the gun advanced into it, the rear being open; a plan which had its advantage in cases where the parapet was unusually thick, and the range would have been much diminished without an inordinate extent of aperture; and, in modern times, Montalembert has adopted this arrangement, with a view to obtain increased range with diminished exposure. On his plan, the pivot of traversing platforms is, in a 6-foot parapet, carried forward to about 2 feet from the front, and a range of 60° is obtained with an opening of 3 feet 9 inches; whereas the same range would have required an opening
PLAN SECTION AND ELEVATION OF AN HORIZONTAL LOOP HOLE.

Fig. 1 Plan

Fig. 2 Section on A B

Fig. 3

Fig. 4, Section of a Loop-Hole for Hill Forts

John Wool, St. High Halten 1818
Section and Elevation

Descriptive of Vertical Loops at

CHERBOURG
PLG.A. SECTIONS OF HORIZONTAL LOOP-HOLES.

Fig. 2

Section

Fig. 3

Section

Plan—Fig. 1.

Fig. 4

Interior Elevation

Plan of Shutter—Fig. 6.

DETAILS OF A LOOP-HOLE WINDOW.

Fig. 5

Plan—Fig. 7.

J. W. L.}

London John Blake, High Holborn 324.
of 8 feet, had the pivot been placed, as at Cherbourg, in the parapet but only 1 foot 6 inches from the interior of the wall. This appears a great advantage, but there is a disadvantage connected with it in actual service which has been overlooked; namely, that the wall must be cut away in a corresponding degree in the rear, to permit the gun to traverse so that the carriage is brought, when trained to either side, within the parapet; and even after recoil, the inconvenience of loading must be considerable. Montalembert intended, however, his embrasure merely for casemates; but Lieut. Penrice proposes its application to parapets of greater thickness, in order to replace entirely the old embrasure; and in that case the difficulty pointed out would be still greater, and the extent of parapet in the rear required to be cut away, in order to admit of ready manipulation, much augmented.

In the ninth volume of the 'Corps Papers,' it has been proposed to modify still further the opening of Montalembert's embrasure, by adopting a check of more than one plane, so arranged as to prevent a shot entering by ricochet from its surface. On this latter point, there is much misapprehension from confounding the ricochet angle with low charges with that of high charges; and as embrasures are more exposed to the fire of guns with full service charges than to the true ricochet fire with low charges, the precaution directed against the latter is unnecessary against the former. By the experiments carried on at Metz, it has been shown that a 12-lb. French shot with a charge of one-half its weight began to ricochet only at 20°; and with one-third only at 25°; and that in each case there is penetration to the extent of nearly 6 inches, the ball being reflected at a considerably higher angle by scooping out the masonry, and in so doing, losing its velocity to such an extent as to be capable of doing little subsequent injury. The great evils are, the ruin of the embrasure, and the destructive effects of its splinters; and these are perhaps best guarded against by preserving the simple earthen embrasure, strengthening only the throat by a concrete backing extending inwards for about 3 feet, to receive the shock of the shot after it has penetrated the earth. Without therefore wishing to check improvements in loopholes, or in embrasures, a doubt may be fairly expressed whether the advantages expected from the more complicated forms proposed are really equivalent to the disadvantages which attend them in service; and whether the simple loophole and embrasure, properly applied and arranged, has not yet a practical superiority over those proposed to replace them.—J. E. P.

MACHICOLIS.*—Machicoulis galleries are constructed over the entrance to a building or enclosure, or over parts where an opening is liable to be effected by crow-bars, or by firing a charge of powder, &c. Their use is to enable a perpendicular musketry fire to be directed upon the enemy outside, and to facilitate pouring down melted lead or other missiles upon them.

Blockhouses are often constructed with the upper stories projecting all round, so as to afford them this means of defence (cite 'Blockhouse'); and in the Article on

* By Captain Bainbrigge, R. E.
APPENDIX D

TRIENNIAL CONTRACTS FOR THE CONSTRUCTION TRADES ON THE RIDEAU AND OTTAWA CANALS

1844

(Public Archives Canada, MG 13, WO 55, Vol. 886, p. 456-475)
SCHEDULE

OF

CONTRACT

FOR

BRICKLAYERS', MASON'S, STONE-CUTTERS',
Paviors' AND PLASTERERS'

WORK,

FOR THE SERVICE OF THE

HONORABLE BOARD OF ORDNANCE,

AT

THE

CANALS.

Montreal:

PRINTED BY LOVELL AND GIBSON, SAINT NICHOLAS STREET.

1844.
NOTICE.

Any Person who desires to Tender should fill up the undertaking which will be found at the end of this document, stating whether he is willing to contract at the Prices stated in the Schedule, or if not, at how much per cent on the whole of the Prices, either above or below.

It must distinctly understood that the per centage is to be on the whole of the Prices, and not on the different Items:—so that the Contractor's Bills must be made out at the Printed Prices, and the per centage, if there is any, will be simply added to or deducted from the Total Amount of each Trade.

The person tendering must also give his Address and the Names, Professions, and places of abode, of his proposed Sureties.

The Tenders should state whether they are for the whole Line of the Rideau and Ottawa Canals, or for the Ottawa Canals only, from Carillon to Grenville; or for the Rideau from Bytown to the First Rapids, inclusive; or from the First Rapids or for the Ottawa Canals only, from Carillon to Crenville; or for the whole Line of the Rideau and places of abode, of his proposed Sureties.

The Tender of the Person who offers for the whole of the Line, will be accepted in preference, provided the terms are considered sufficient and advantageous to the Public.

The Tenders should state whether they are for the whole Line of the Rideau and Ottawa Canals, or for the Ottawa Canals only, from Carillon to Grenville; or for the Rideau from Bytown to the First Rapids, inclusive; or from the First Rapids or for the Ottawa Canals only, from Carillon to Crenville; or for the whole Line of the Rideau and places of abode, of his proposed Sureties.

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The Tender of the Person who offers for the whole of the Line, will be accepted in preference, provided the terms are considered sufficiently advantageous to the Public.
9.—An Invoice signed by the Contractor, is to be sent in with each delivery of Materials for Stores or Day Work, and the Contractor is to be furnished with a Receipt, signed by the proper Officer of the Ordnance Department, (or Military or Civil Officer of the Royal Engineers, as in charge, as sometimes occurs at detached Stations, the Board of Ordnance Department be in charge, as sometimes occurs at detached Stations, the Board of Ordnance Department be in charge, as sometimes occurs at detached Stations, the Board of Ordnance Department be in charge, as sometimes occurs at detached Stations, the Board of Ordnance Department be in charge), specifying the description, quantities, weights, or measurements, as the case may be, of the Materials. These Receipts are to be produced with the Invoice, when demanded, for quarterly Bills, and the claims will not be allowed. Either the Contractor or the Superintendent Officer shall produce the Invoice, and the Contractor should not neglect to send an Invoice of any materials they are not recovered by the Department, and the expense thereof recovered from the Contractor, in the manner prescribed in Article 4.

10.—The Materials for Measurement and Day Work are to be delivered by the Contractor at such an hour and place as may be directed by the Superintending Officer, in the act of the Board of Ordnance, to be regularly stacked by the Contractor’s Workmen for the convenience of counting, weighing, or measuring them, without any charge being made by the Contractor or agent thereof.

11.—If it appears to the Superintendent Officer that any work has been executed with unwieldy, imperfect, or unsatisfactory Workmanship, the Contractor shall notify and reform, or reconstruct the same, in whole or in part, as the same may require, at his own cost and charge; and in the event of his refusing or neglecting to do, within a period specified by the Superintendent Officer, or to take back any Materials or Articles which are considered by the said Officer unwieldy, of bad quality, or not agreeable to the terms of the Contract, and to provide immediately suitable Materials or Articles in lieu of those condemned, then the Superintendent Officer shall be at liberty forthwith to employ other Tradesmen to perform the Measured Work, and to cause the Materials for Store or Day Work to be purchased, or removed, or any expenses thereby incurred being deducted by the Contractor, agreeably to Article 4.

12.—If the Contractor or his Workmen, whilst engaged on Ordnance Services, shall break, deface, injure, lose or destroy any part or parts of Masonry, Brickwork, Carpentry, Plastering, Glass, Ironmongery, or any other work belonging to the Ordnance Department, or to private buildings contiguous to the Ordnance premises at which they are employed, the Contractor shall cause the same to be made good, in a perfect and workmanlike manner, at his own or the Workmen’s expense; or in default thereof the Superintendent Officer shall cause it to be done by some other Tradesman, the amount being deducted from any sums due, or to become due to him from the Ordnance Department, or levied according to the premises in Article 4.

13.—The several Works and Materials are to be measured out, without reference to any local custom that may obtain, excepting where it may be directed to the otherwise, in any of the terms in this Contract.

14.—No Work to be undertaken, or by night work, by the Contractor, excepting the permission in writing of the Superintendent Officer shall have been previously obtained.

15.—The Contractor shall furnish for each Barrack or Station, by right each workman, at every waking hour, a Nominative List of the Men employed by him for the Ordnance Department, on that particular day, on Day Work, and also a Statement of the number of Artificers and Labourers employed on Measured Work. The Contractor shall furnish the Superintendent Officer with a Weekly Account of the Day Work, Time, and a plain and clear description of the Services on which they have been employed, in all such daily work charge will be allowed for the same. The Contractor to supply his own paper for all such Daily and Weekly Accounts, which are to be made out in the form prescribed by the Ordnance Department. The Men supplied for such Work to be competent, and to work the number of hours prescribed by the Ordnance Regulations.

16.—The Contractor to provide all Scaffolding, Ladders, Cordage, Tackle, and all necessary Implements and Tools for the use of the Workmen, whether employed in Day Work or Measured Work, together with the Carriage or Carriage thereof to the spot which may be appointed, and also to remove the same when no longer required, without making any claim for their use, carriage or removal. The Contractor is also to provide, erect, take down, and remove, at his own cost and charge, all Scaffolding that may be required in the execution of the Measured Work, and to make his Scaffolding and supply Ladders subject to the Orders, and to the approval of the Commanding Royal Engineer, or Superintendent Officer of the Department.

17.—The Contractor shall be responsible to give due notice to the Superintendent Officer, whenever any Work or Materials are intended to be carried out in the earth, in the bodies of walls, or otherwise, in order that the correct dimensions may be taken before being so covered, in default whereof the same shall be measured at the Contractor’s expense, or no allowance made for such Work or Materials.

18.—The several Articles in the following List or Schedule are to include all Materials, works, or services, in any way expressed in the contract; and any deviation from the contract, or deviation of the Services on which they are entered, for their use, carried, or removed. The Contractor is also to provide, erect, take down, and supply Ladders to the Superintendent Officer, the Materials in question will be removed by the Department, and the expense thereof recovered from the Contractor, in the manner prescribed in Article 4.

19.—The Superintendent Officer shall be at liberty forthwith to employ other Tradesmen to perform the Measured Work, and to cause the Materials for Store or Day Work to be purchased, or removed, or any expenses therein incurred being deducted by the Contractor, agreeably to Article 4.

20.—The Superintendent Officer shall be at liberty, without vitiating this Contract, to employ any number of Military Artificers and Labourers, and to supply from their own Stores any proportion of the whole of the Materials required for Day Work, as also for Measured Work, and approved, provided that the price charge, as some times occur in detached Stations, as the Receipts whore expressed to the contrary, and no alteration is to be made in the Articles or in the description of the Services on which they have been employed, in all such daily work charge will be allowed for the same. The Contractor to supply his own paper for all such Daily and Weekly Accounts, which are to be made out in the form prescribed by the Ordnance Department. The Men supplied for such Work to be competent, and to work the number of hours prescribed by the Ordnance Regulations.
BRICKLAYERS', MASON'S, STONE-CUTTERS', AND PAVIORS' WORK.

EXCAVATIONS, Etc.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Rate per Cubic Yard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Digging and throwing out Ground of any kind (except Rock) to any depth required, including providing and fixing shoring where necessary, filling in after removing the ground round Foundations of Walls, sides of and over Drains, or other underground Brick or Masonry; and removing and leveling the Stuff excavated to a distance not exceeding 50 yards.—per cubic yard.</td>
<td>0.9</td>
</tr>
<tr>
<td>2.</td>
<td>Removing the Stuff arising therefrom and leveling, if ordered, including Stages, wheeling, planks, &amp;c. &amp;c. a distance exceeding 50 yards, and under 1000 yards distance.—per cubic yard,</td>
<td>0.3</td>
</tr>
<tr>
<td>3.</td>
<td>Add to the price of items 2 and 3 for every additional 100 yards, the Stuff, &amp;c. &amp;c. carried,—per cubic yard,</td>
<td>0.2</td>
</tr>
<tr>
<td>4.</td>
<td>Finding Earth or Rubbish for filling in, including forming and leveling,—per cubic yard,</td>
<td>1.0</td>
</tr>
<tr>
<td>5.</td>
<td>Excavating and throwing out, &amp;c. as in item 1, through Rock of any kind, the Stones to remain the property of the Ordnance,—per cubic yard,</td>
<td>4.6</td>
</tr>
<tr>
<td>6.</td>
<td>Removing the Stones arising therefrom to a distance not exceeding 100 yards, and piling them,—per cubic yard,</td>
<td>0.6</td>
</tr>
<tr>
<td>7.</td>
<td>Best Clay Paddle, including Ramming and Padding the same, behind the Lock Walls, &amp;c.—per cubic yard,</td>
<td>1.9</td>
</tr>
<tr>
<td>8.</td>
<td>Finding best Clay Paddle, including forming the same in Coffers, Dams, &amp;c.—per cubic yard,</td>
<td>1.3</td>
</tr>
</tbody>
</table>

MASONS' WORK.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Rate per Cubic Yard</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>Rubble Masonry of Granite, Grit, Freestone, or Lime Stone, to a depth of 10 feet, (the place affixed) approved &amp;c. &amp;c. done in courses of 9 to 12 inches high, and not less than one thorough bond Stone to every 8 feet cube, built with best Roach Lime and River or Bank Sand Mortar, to any height required.—per cubic yard,</td>
<td>0.9</td>
</tr>
<tr>
<td>10.</td>
<td>Driveway, executed as item 9, all beds horizontal and joints vertical, built to any height.—per foot cube,</td>
<td>0.6</td>
</tr>
<tr>
<td>11.</td>
<td>Ashlar Work of Fine Bouchardet or Lime Stone, to a depth of 10 feet, (the place affixed) approved &amp;c. &amp;c. done in courses of from 10 to 14 inches high, set alternately header and stretcher; headers to average from 2 feet 6 inches to 3 feet long; stretchers not to be less than 2 feet 6 inches to 3 feet long, 12 inches bed, built with best Roach Lime and River or Bank Sand Mortar, to any height required.—per foot cube,</td>
<td>0.5</td>
</tr>
<tr>
<td>12.</td>
<td>Ashlar Work chiselled and rough Bouchardet of Lime or Free Stone, done in courses of from 14 to 24 inches high, set alternately header and stretcher; headers to average from 4 to 5 feet long, and stretchers not less than 3 feet long; the depths of the beds not to be less than the height of Stones, and the vertical Joints to be squared back not less than 10 inches; the Ashlar to be laid in the best Ashlar Bonds of Bouchardet, or occasional Plastermens of Boudardet laid in courses of from 4 to 5 feet long, carried up course by course with the fronts, and built with best Roach Lime and River or Bank Sand Mortar, and grotted with hot Lime every course.—per cubic foot,</td>
<td>1.3</td>
</tr>
</tbody>
</table>

N.B.—The Board of Ordnance reserve to themselves the right of employing any other Workmen than the Contractor under this Schedule, whenever they may think fit; and all Work performed under the direction of the respective Barrack Masters at each Station, and such Works are consequently excepted from this Contract.
### Masons’ Work—Continued.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Rate per Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Chiselled and rough Boucharded Ashler, according to such dimensions as may be ordered, exceeding 50 cubic feet, either for headers or stretchers for repairing or strengthening walls, laid with best Roach Lime and River or Bank Sand Mortar,—per cubic foot</td>
<td>2.3</td>
</tr>
<tr>
<td>14</td>
<td>Ditto, ditto, if laid in bed of cement, and 1 River or Bank Sand,—per cubic foot</td>
<td>3.6</td>
</tr>
<tr>
<td>15</td>
<td>Boucharded Masonry in vaulting, Courses from 4 to 8 inches thick, executed as No. 9, and the soffits hammer dressed,—per cubic foot</td>
<td>0.8</td>
</tr>
<tr>
<td>16</td>
<td>Ashler Work of Fine Boucharded Granite, Grit, Free, or Lime Stone, in vaulting, executed according to instructions,—per cubic foot</td>
<td>2.6</td>
</tr>
<tr>
<td>17</td>
<td>Taking down Rubble Masonry, and cleaning and piling the stones, within 50 yards, and removing the Rubbish,—per cubic foot</td>
<td>1.1</td>
</tr>
<tr>
<td>18</td>
<td>Re-building Rubble Masonry, as Items 9 and 10;—Mortar and Workmanship only,—per cubic foot</td>
<td>2.1</td>
</tr>
<tr>
<td>19</td>
<td>Taking down Ashler Masonry, and cleaning and piling the stones, within a distance of 50 yards, and removing the Rubbish,—per cubic foot</td>
<td>0.2</td>
</tr>
<tr>
<td>20</td>
<td>Add to Item 10, for Hammer-dressed Face, when so ordered,—per superficial foot</td>
<td>0.8</td>
</tr>
<tr>
<td>21</td>
<td>Add to Item 10, for rough Boucharded Face, when so ordered,—per superficial foot</td>
<td>0.4</td>
</tr>
<tr>
<td>22</td>
<td>Re-building Ashler Masonry, including re-dressing or making good all broken Ashlers, as Item 11;—Mortar and Workmanship only,—per cubic foot</td>
<td>0.4</td>
</tr>
<tr>
<td>23</td>
<td>Re-building Ashler Masonry, including making good and dressing all broken Ashlers, as Item 18;—Cement Mortar and Workmanship only,—per cubic foot</td>
<td>0.4</td>
</tr>
<tr>
<td>24</td>
<td>Taking out old Joints of Ashler Masonry and pointing it with Roman Cement,—per superficial foot</td>
<td>0.4</td>
</tr>
<tr>
<td>25</td>
<td>Ditto, ditto, and pointing Joints with Mortar,—per superficial foot</td>
<td>0.1</td>
</tr>
<tr>
<td>26</td>
<td>Taking out old Joints of Rubble Masonry and pointing it with Roman Cement,—per superficial foot</td>
<td>0.3</td>
</tr>
<tr>
<td>27</td>
<td>Raking out old Joints of Rubble Masonry and pointing and striking them, as may be ordered, exceeding 50 cubic feet, either for headers or stretchers,—per superficial foot</td>
<td>0.8</td>
</tr>
<tr>
<td>28</td>
<td>Taking down old Brick-work, cleaning and piling the bricks within a distance of 50 yards, and removing the Rubbish,—per cubic foot</td>
<td>0.1</td>
</tr>
<tr>
<td>29</td>
<td>Re-building Brick-work, any height;—Mortar and Workmanship only,—per cubic foot</td>
<td>0.6</td>
</tr>
<tr>
<td>30</td>
<td>Brick Box Drains, half Brick sides, Brick flat bottom, and covered with a Brick flat, 5 inches wide and 6 inches high in the clear, laid in Roach Lime and Sand Mortar, (Canadian Bricks)—per lineal foot</td>
<td>0.10</td>
</tr>
<tr>
<td>31</td>
<td>Nine-inch Brick Barrel Drain, half Brick all round, laid in Roach Lime and Sand Mortar, (Canadian Bricks)—per lineal foot</td>
<td>1.3</td>
</tr>
<tr>
<td>32</td>
<td>Twelve-inch ditto, ditto, ditto,—per lineal foot</td>
<td>2.0</td>
</tr>
<tr>
<td>33</td>
<td>Fourteen-inch ditto, ditto, ditto,—per lineal foot</td>
<td>2.6</td>
</tr>
<tr>
<td>34</td>
<td>Fifteen-inch ditto, ditto, ditto,—per lineal foot</td>
<td>3.2</td>
</tr>
<tr>
<td>35</td>
<td>Common Brick Cornices, String or Eave Courses, &amp;c., extra,—per lineal foot</td>
<td>1.6</td>
</tr>
<tr>
<td>36</td>
<td>Add to ditto, if done in Roman cement,—per lineal foot</td>
<td>0.2</td>
</tr>
<tr>
<td>37</td>
<td>Rubbed and Gauge Arch, set in Pasty, including all cuttings, extra,—per superficial foot</td>
<td>0.4</td>
</tr>
<tr>
<td>38</td>
<td>Axed Archs of good common Bricks, including all cuttings, extra,—per superficial foot</td>
<td>0.4</td>
</tr>
<tr>
<td>39</td>
<td>Add to Items 47 and 48, if done in Roman cement,—per superficial foot</td>
<td>0.1</td>
</tr>
<tr>
<td>40</td>
<td>Air Gratings fixed, and openings made good to old work;—the Gratings to be provided by the Ordnance,—each</td>
<td>2.0</td>
</tr>
<tr>
<td>41</td>
<td>Brick Chimney Pots, 18 inches high, set in Mortar, including clearing away the old Pots,—each</td>
<td>0.6</td>
</tr>
<tr>
<td>42</td>
<td>Filleting with Hairy Mortar,—per lineal foot</td>
<td>0.4</td>
</tr>
<tr>
<td>43</td>
<td>Filleting with Roman Cement,—per lineal foot</td>
<td>0.2</td>
</tr>
<tr>
<td>44</td>
<td>Holes cut in Walls to receive ends of Rails, Girders or other Timbers, from 4 to 9 inches deep, making good included,—each</td>
<td>1.6</td>
</tr>
<tr>
<td>45</td>
<td>Barrack Grates of any size, with or without Cast Iron Backs fixed, including Fire Bricks and all Materials,—per lineal foot</td>
<td>0.6</td>
</tr>
<tr>
<td>46</td>
<td>Taking down ditto, cleaning the Bricks and removing the Rubbish,—per lineal foot</td>
<td>0.10</td>
</tr>
<tr>
<td>47</td>
<td>Re-setting Barrack Grates, and making good with Fire and other Bricks,—per lineal foot</td>
<td>3.6</td>
</tr>
<tr>
<td>48</td>
<td>Officer's Grates, fixed as described at No. 56,—each</td>
<td>8.0</td>
</tr>
<tr>
<td>49</td>
<td>Taking down ditto, as described at No. 56,—each</td>
<td>3.0</td>
</tr>
<tr>
<td>50</td>
<td>Re-fixing ditto, as described at No. 57,—each</td>
<td>4.0</td>
</tr>
<tr>
<td>51</td>
<td>Setting an Oven or Copper with Canadian Brick Faceing and Fire Brick Linings,—each</td>
<td>40.0</td>
</tr>
<tr>
<td>52</td>
<td>Taking down and Re-setting ditto;—Mortar and Workmanship only, including re-placing burnt or broken Bricks,—each</td>
<td>25.0</td>
</tr>
<tr>
<td>53</td>
<td>Backing Grates with Fire Bricks, edge to face, when the Grate does not require re-setting, and removing the Rubbish,—per superficial foot</td>
<td>3.6</td>
</tr>
<tr>
<td>54</td>
<td>Backing Grates with Common Canadian Bricks, edge to face, when the Grate does not require re-setting, and removing the Rubbish,—per superficial foot</td>
<td>0.1</td>
</tr>
</tbody>
</table>
STONE-CUTTERS' WORK.

21. Fine Bevelled or Coping Stone, being or being rounded off, such as Pier, Chimney Shals, and Copas, Piered or Plinths, backed, chamfered, weathered or checked, when required, including setting—Memorandum to No. 10 to be allowed for the cubic content, per foot superficial.

22. Dado, dito, on chamfered edge of the cornice or pediment, allowing Memorandum for No. 10, per foot superficial.

23. Dado, dito, on radiating Joints of Arches, per foot superficial.

24. Dado, dito, on Hearth Stones, not less than 6 inches thick, with radiated margins, including Stone and Mortar, per foot superficial.

25. Rough Bevelled or Punched Flagging of Lime or other Stone, 4 inches thick, squared, jointed and set, per foot superficial.

26. Taking up, squaring and re-laying Flagging of any thickness, including jointing when required, Mortar, and removing Rubble, per foot superficial.

27. Taking up, squaring, setting, and laying Flagging, including Mortar and removing Rubble, per foot superficial.

28. Polished Lime Stone in Chimney Pieces and Hearth Stones, including fixing, per foot superficial.

29. Dado, dito, in radiating Joints of Arches, per foot superficial.

30. Extra for Sinking Rebeés as for Door and Window Rebeés, according to order, per foot linear.

31. Limestone Window Sills, sunk, weathered, and bored, according to order, per foot linear.

32. Cutting Channel Courses in Flagging or 2 to 3 inches wide, properly squared, per foot linear.

33. Mortice, Broad Arrows, Letters or Figures, not exceeding 1 inch long, in stone of any quality— each.

34. Cramps or Rides for Gates, Door Scrappers, &c. Let in, including Labour, Fuel and Lead, each.

35. Aris or Chamfering on Stone, when specially ordered— per foot linear.

36. Refitting in ditto do. do—per foot linear.

37. Deduct from any of the Work in Nos. 65 to 69 if any Rough Bevelled or Punched— per foot superficial.

38. Cut Bowes Pipe Holes, including fixing and making good old work when required—each.

39. Holes cut through Flagging, as for Coal Plates, Stink Tapers &c. including rebating— each.

PAVIOIRS WORK.

40. Everyting, provided good Ground can be obtained within a distance of 3 miles, 1 inch thick, including Spreading and Leveling—per yard superficial.

41. Add for every additional inch in depth—per yard superficial.

42. The work for a Paved surface, laid in good Grass, and well Levelled, per yard superficial.

43. Taking up and Re-laying with Pavettts, including Hewed, hammering—per yard superficial.

PAVIOIRS WORK—Continued

44. Everyting, provided good Ground can be obtained within a distance of 3 miles, 1 inch thick, including Spreading and Leveling—per yard superficial.

45. Deduct from any of the Work in Nos. 65 to 69 if any Rough Bevelled or Punched— per foot superficial.

46. Cut Bowes Pipe Holes, including fixing and making good old work when required—each.

47. Holes cut through Flagging, as for Coal Plates, Stink Tapers &c. including rebating— each.

FOR STORE OR DAY WORK.

48. Labour, including fuel, with board and uniform allowance, per 1000, 100.

49. Labour, including fuel, per man, per day.

50. Labour, including fuel, per man, per hour.—

STATEMENT OF THE MANNER OF MEASURING THE WORKS DENOMINATED IN THE FOREGOING SPECIFICATIONS.

The measurements of Masonry and Brick Work, except Chimney Ficks, are to be taken at their true lengths, and no allowance made for projecting fIches. All measurements in ft. 4 in. to No. 9 on one face and No. 10 on the other, one for each item respectively. No deduction is to be made from the work for a Paved surface, laid in good Grass, and well Levelled—per yard superficial. The work for a Paved surface, as for Coal Plates, Stink Tapers &c. including Hewed, hammering—per yard superficial.
**PLASTERERS' WORK.**

### RENDERING

<table>
<thead>
<tr>
<th>Row</th>
<th>Description</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>Rendering one coat rough</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>109</td>
<td>Dino, ditto, and set with fine stuff</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>110</td>
<td>Ditto, ditto, and set with fine stuff</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>114</td>
<td>Ditto, ditto, and set with fine stuff</td>
<td>per superficial yard</td>
</tr>
</tbody>
</table>

### LATHING AND PLASTERING

<table>
<thead>
<tr>
<th>Row</th>
<th>Description</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Lathing only</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>114</td>
<td>Lath and Plaster, one coat</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>115</td>
<td>Ditto, ditto, and set with fine stuff</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>116</td>
<td>Ditto, ditto, and set with fine stuff</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>117</td>
<td>Ditto, ditto, and set with fine stuff</td>
<td>per superficial yard</td>
</tr>
</tbody>
</table>

### ROUGH CASTING

<table>
<thead>
<tr>
<th>Row</th>
<th>Description</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>118</td>
<td>Rough Casting on Brick or Stone, one coat</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>119</td>
<td>Ditto, ditto, and set with fine stuff</td>
<td>per superficial yard</td>
</tr>
</tbody>
</table>

### LIME WHITE AND WHITE-WASHING

<table>
<thead>
<tr>
<th>Row</th>
<th>Description</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>121</td>
<td>Lime White, one coat</td>
<td>per square of 100 superficial feet</td>
</tr>
<tr>
<td>122</td>
<td>Ditto, ditto, twice</td>
<td>per square of 100 superficial feet</td>
</tr>
<tr>
<td>123</td>
<td>Whitewash Whiting and Size</td>
<td>per square of 100 superficial feet</td>
</tr>
<tr>
<td>124</td>
<td>Ditto, done twice</td>
<td>per square of 100 superficial feet</td>
</tr>
</tbody>
</table>

### COLOURING

<table>
<thead>
<tr>
<th>Row</th>
<th>Description</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>127</td>
<td>Stone or Buff, once done</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>128</td>
<td>Ditto, twice done</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>129</td>
<td>Lemon Cobalt, once done</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>130</td>
<td>Ditto, twice done</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>131</td>
<td>Blue Cobalt, once done</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>132</td>
<td>Ditto, twice done</td>
<td>per superficial yard</td>
</tr>
</tbody>
</table>

### BUNDRIES

<table>
<thead>
<tr>
<th>Row</th>
<th>Description</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>152</td>
<td>Taking down old Lathing and Plastering, and removing the Rubbish,</td>
<td>per superficial yard</td>
</tr>
<tr>
<td>153</td>
<td>Ditto, ditto, rendering, or rough Casting, and ditto</td>
<td>per superficial yard</td>
</tr>
</tbody>
</table>
PLASTERERS’ WORK.

RENDERING.

106.—Rendering one side rough,—per superficial yard, 0 7
109.—Ditto, ditto, and set with fine stuff,—per superficial yard, 0 10
110.—Ditto, two coats, and ditto, ditto,—per superficial yard, 1 2
111.—Ditto, Ditto, and Floating,—per superficial yard, 1 1
112.—Ditto, ditto, and set with fine stuff,—per superficial yard, 1 4

LATHING AND PLASTERING.

113.—Lathing only,—per superficial yard, 0 6
114.—Lath and Plaster, one coat,—per superficial yard, 0 10
115.—Ditto, ditto, and set with fine stuff,—per superficial yard, 1 2
116.—Ditto, two coats, ditto, per ditto, 1 4
117.—Lath, Plaster, and Float,—per superficial yard, 1 4
118.—Ditto ditto, and set with fine stuff,—per superficial yard, 1 6

ROUGH CASTING.

119.—Rough Casting on Brick or Stone, one coat,—per superficial yard, 0 8
120.—Ditto ditto, two coats,—per ditto, 1 0

LIME WHITE AND WHITE-WASHING.

Including Scraping and Scraping when the Work is finished.

121.—Lime White, done once,—per square of 100 superficial feet, 0 11
122.—Ditto, done twice,—per ditto, ditto, 1 1
123.—Whiting, with Whiting and Size, done once,—per square of 100
superficial feet, 1 4
124.—Ditto, ditto, ditto, done twice,—per square of 100
superficial feet, 2 0
125.—Scraping off old White-wash,—per square of 100 superficial feet, 0 10
126.—Scrape, Wash, and Stop old Walls to receive new White-wash,
Lime Wash, or Colouring,—per square of 100 superficial feet, 1 8

COLOURING.

Including Scraping when the Work is finished.

127.—Stone or Buff, once done,—per superficial yard, 0 3
128.—Ditto, twice done,—per superficial yard, 0 3
129.—Lemon Colour, once done,—per superficial yard, 0 31
130.—Ditto, twice done,—per superficial yard, 0 31
131.—Blue Colour, once done,—per superficial yard, 0 3
132.—Ditto, twice done,—per superficial yard, 0 4
133.—Salmon Colour, once done,—per superficial yard, 0 3
134.—Ditto, twice done,—per superficial yard, 0 3

SUNDRIES.

135.—Taking down old Lathing and Plastering, and removing the Rubbish,
—per superficial yard, 0 11
136.—Taking down old Rendering or rough Casting, and ditto ditto,—per
superficial yard, 0 11

FOR STORE OR DAY WORK.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>137.—Plasterer,—per day,</td>
<td>0 8</td>
</tr>
<tr>
<td>138.—Plasterer’s Apprentice,—per day,</td>
<td>0 6</td>
</tr>
<tr>
<td>139.—Labourer,—per day,</td>
<td>0 9</td>
</tr>
<tr>
<td>140.—Boy,—per day,</td>
<td>1 6</td>
</tr>
<tr>
<td>141.—Cedar Laths, split, 3 feet long,—per 100,</td>
<td>0 71</td>
</tr>
<tr>
<td>142.—Ditto, ditto, 4 ditto,—per 100,</td>
<td>0 81</td>
</tr>
<tr>
<td>143.—Hair Mortar,—per cubic foot,</td>
<td>0 7</td>
</tr>
<tr>
<td>144.—Fine Stuff,—per cubic foot,</td>
<td>1 1</td>
</tr>
<tr>
<td>145.—Plaster of Paris,—per stone,</td>
<td>1 6</td>
</tr>
<tr>
<td>146.—Whiting,—per stone,</td>
<td>1 6</td>
</tr>
<tr>
<td>147.—Hair, dried and shrunk,—per lb,</td>
<td>0 2</td>
</tr>
<tr>
<td>148.—Size,—per gallon,</td>
<td>0 10</td>
</tr>
<tr>
<td>149.—Roach Lime,—per bushel,</td>
<td>0 6</td>
</tr>
<tr>
<td>150.—Sharpe River or Bank Sand,—per cubic yard,</td>
<td>2 6</td>
</tr>
</tbody>
</table>

The Work to be measured nett, and all openings to be deducted.
SCHEDULE
OF
CONTRACT
FOR
CARPENTERS' WORK, IRONMONGERY,
SHINGLING AND TINNING,
FOR THE SERVICE OF THE
HONORABLE BOARD OF ORDNANCE,
AT
THE CANALS

Montreal:
PRINTED BY LOYELL AND GIBSON, SAINT NICHOLAS STREET.
1844
NOTICE.

Any Person who desires to Tender should fill up the undertaking which will be found at the end of this document, stating whether he is willing to contract at the Prices stated in the Schedule, or if not, at how much per cent on the whole of the Prices, either above or below.

It must be distinctly understood that the per centage is to be on the whole of the Prices, and not on the different items—so that the Contractor's Bills must be made out at the Printed Prices, and the per centage, if there is any, will be simply added to or deducted from the Total Amount of each Trade.

The person tendering must also give his Address and the Names, Professions, and places of abode, of his proposed Sureties.

The Tenders should state whether they are for the whole Line of the Rideau and Ottawa Canals, or for the Ottawa Canal only, from Carillon to Grenville; or for the Rideau from Bytown to the First Rapids, inclusive; or from the First Rapids inclusive, to Kingston Mills inclusive.

The Tender of the Person who offers for the whole of the Line, will be accepted in preference, provided the terms are considered sufficiently advantageous to the Public.

TERMS OF CONTRACT.

For Carpenters' Work, Ironmongery, Slinging and Tying in the Construction of the Honorable Board of Ordnance, at the Oldsite Works Canal.

1. The person whose Tender may be accepted, in case required, to enter into a Bond with two eligible securities, jointly and severally, (payable &c.) to be bound under a penalty of £500, &c., for the due performance of this Contract, according to the following Terms.

2. The Contractor shall execute, in the most substantial and workmanlike manner, and with materials of the best quality, all such works as the Board of Ordnance, or their Officers, may, from time to time, direct him to perform under this Contract.

3. The Contractor shall conform minutely to all designs, drawings, and instructions in writing, signed by the District Commanding Royal Engineer, or in his absence by the Superintendent Officer at the District Head Quarters, and shall not execute any work whatever for which he has not written authority, nor any order of the Engineer Department without such due written authority, as the Royal Engineer Department will not be responsible for any work executed on verbal Orders given by any person whatsoever.

4. Should any Work or Article have been omitted to be done in the Specifications, which would be obviously intended by the drawings, and necessary to complete the Works, the same shall be performed according to the directions of the Officer of the Engineer Department, having the supervision of the Works, without any additional payment.

5. Any extra expense beyond the prices specified in this Contract, which may be incurred in the performance of the work required by the Ordnance Department, being to the neglect or omission of the Contractor, or his Workmen, in any of the cases mentioned in Article 6, shall be deducted from any sum due to the Contractor, or his Workmen, under this Contract, or if such sum shall not be sufficient to cover the amount due, the Contractor shall be responsible for the balance.

6. The Contractor shall perform all such work as may be required of him, within such time as shall be directed by the Superintendent Officer, and in order to prevent inconvenience to the Public Service by improper delay on the part of the Contractor, the following course is to be adopted: The Superintendent Officer will stipulate the periods by which certain portions of the work are to be completed, and if the Contractor should fail to complete the same or any subsequent portions within the time stipulated by the Superintendent Officer, he is to be at liberty to direct the Contractor to discontinue the work forthwith, and to employ other persons to execute the remaining portions. Any extra expense that may be incurred by this proceeding is to be defrayed by the Contractor, according to Article 8.

6. If it should be necessary in slight Jolts to employ a Workman or Workmen part of a day, or as charge is to be made for the time he or they are actually at work, beyond a reasonable time for the Workmen to go to the job, and return to the Contractor's House, which however is in no case to exceed one hour and a half, except in cases where an emergency intervenes, when the allowance of time is to be arranged by the Superintendent Officer and the Contractor.

7. If the Contractor shall fail to provide, at such time as may be appointed by the Superintendent Officer, the number of approved Workmen demanded for the Service of the Ordnance Department, at the Stations to which this Contract applies, that Officer shall be at liberty to hire as many Workmen as will complete the necessary; and the Men thus hired by the Superintendent Officer will be held in employ until the termination of the work for which the whole number may have been demanded, and any extra expense that may be incurred by this proceeding is to be defrayed by the Contractor, according to Article 8.

8. If the Contractor fail to provide at the appointed times, any of the Men of the required quality that may be demanded of him for the Service of the Ordnance Department at the Stations specified in this Schedule, the Superintendent Officer shall be at liberty to order the said Men to be produced from some other Purchases, paid and supplied thereby incurred being defrayed by the Contractor, according to Article 8.
17. The Contractor shall be responsible to give due notice to the Superintendent Officer, whenever any Work or Materials are intended to be moved in the care in the work, if the exact manner is not then be taken before being so moved, so as to be accompanied, and that a current disassembled be made at the Contractor’s expense, or no allowance made for such Work or Materials.

18. The several Articles in the following List or Schedule shall include all Materials, except where expressed to the contrary, and no alteration is to be made in the Printed or Manuscript. Price in the Schedule, but the per centage off or on those prices to be generally on the whole of the items of each Trade.

19. All the Materials to be supplied and used by the Contractor for the Ordnance Department, whether for Day Work, Steel, or Measured Work, are to be the best of their several kinds.

20. The Contractor is to receive at his own cost any Materials or Rubbish that may be removed by the execution of all Measured Work performed by him, and may receive, for the removal of the material in such places as may be directed by the Superintendent Officer, and if the work is measured to such places as may be directed by the Superintendent Officer, the materials in question will be removed by the Superintendent Officer, and the expense thereof recovered from the Contractor in the manner prescribed in Article 4.

21. The Numbers in the Contract Schedule, under which the several items of Work are entitled to be paid for, shall be inserted in each Order; but should any work be ordered which is not specially mentioned in the Schedule, the price to be given for each work shall be stated in the Schedule.

22. The work shall be paid for at the prices specified in the Schedule, after adding or deducting, as the case may be, any allowance or deduction according to the per centage agreed upon to be made for being measured and delivered by the Contractor, and according to any alteration or addition to the work specified in the Schedule.

23. The Board of Ordnance shall be at liberty, without violating this Contract, to employ any number of persons to assist the Contractor in any manner, whether from their own Stores or from any other sources, as the situation of the Work may require.

24. The materials supplied by the Contractor shall be in the form prescribed by the Ordnance Department. The materials supplied by the Contractor shall be in the form prescribed by the Ordnance Department.

25. The Contractor shall furnish for each Barrack or Station, by eight o’clock every morning, a Nominative List of the Men employed by him for the Ordnance Department, on the particular day, or the total number of Artificers and Artificers employed, and the number of Measured Work. The Contractor shall furnish a Weekly Account of the Day Workmen’s Work, and a list of the Men employed, including the number of Measured Work. The Contractor shall furnish a Weekly Account of the Day Workmen’s Work, and a list of the Men employed, including the number of Measured Work.

26. The Contractor shall furnish for each Barrack or Station, by eight o’clock every morning, a Nominative List of the Men employed by him for the Ordnance Department, on the particular day, or the total number of Artificers and Artificers employed, and the number of Measured Work. The Contractor shall furnish a Weekly Account of the Day Workmen’s Work, and a list of the Men employed, including the number of Measured Work. The Contractor shall furnish a Weekly Account of the Day Workmen’s Work, and a list of the Men employed, including the number of Measured Work.

27. The Contractor is to supply all the scarce, without charging for the same, with the necessary means to count, weigh, and make the advertisement of his Work and Materials.
CARPENTERS' WORK.

MEASURED WORK.

SCANTLINGS.

The Timber to be of the best description, well seasoned, and free from sap, shakes and large or loose knots.

<table>
<thead>
<tr>
<th>Description</th>
<th>Metric</th>
<th>Cubic Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rough, first grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Framed, second grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Framed, third grade</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- (Metric and cubic feet values to be filled in based on the actual measurements.)

FIRE AND OAK BOARDING, FIXED COMPLETE.

<table>
<thead>
<tr>
<th>Description</th>
<th>Metric</th>
<th>Per Pallet Piece</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rafter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tongued</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- (Metric and per pallet piece values to be filled in based on the actual measurements.)

The price in the foregoing Table includes spikes, nails, oak tree nails, and all necessary hardware and labor.

The prices in the foregoing Table apply to Work straight of rails, including taking and stopping to all tops and bottoms, and all necessary splicing and stopping to all rails and all necessary splicing and stopping to all rails.

The Work to be measured net when laid, and the widths of the boards to be according to inches, and to be laid flat and well measured materials.

- (Additional descriptions and values to be filled in based on the actual measurements.)
FLOORS LAID COMPLETE.

<table>
<thead>
<tr>
<th>Width (in)</th>
<th>Pine</th>
<th>Oak</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>0.125</td>
<td>0.125</td>
</tr>
<tr>
<td>14</td>
<td>0.140</td>
<td>0.140</td>
</tr>
<tr>
<td>16</td>
<td>0.160</td>
<td>0.160</td>
</tr>
<tr>
<td>18</td>
<td>0.180</td>
<td>0.180</td>
</tr>
<tr>
<td>20</td>
<td>0.200</td>
<td>0.200</td>
</tr>
</tbody>
</table>

194. Deal cased Frames, prepared for single or double hanging, with oak sunk stiles, inch deal outside and inside linings, 2 inch heads, 1½ inch pelley pieces, tongues to inside and outside linings, 1½ inch parting heads, 1 inch back linings and parting strips, the dado void of 1 inch wide and 1 inch thick, including the fixing of the pelley, per superficial foot... 10

195. Nash Frames of pine 4 x 4, with oak sunk and rebated stiles, wrought framed, rebated and beaded inside and chamfered or beaded outside;... 6

196. Nash Frames of pine 4 x 21, with oak sunk and rebated stiles; wrought, framed, rebated, beaded and hollowed for the sash, with 2 inch bead planted outside, including wrought iron holdfasts for fixing, if ordered, per superficial foot... 5

SASHES.

197. Chamfer Bar or Ovalo Sashes, from 1½ to 2 inch thick, prepared for hanging, per superficial foot... 8

198. Add for hanging, including brass faced pulleys, cast iron weights and 1 inch white linings, per superficial foot... 3

199. Chamfer Bar or Ovalo Sashes, from 1½ to 2 inches thick, with rounded and hollowed stiles, threethreaded water boards, put on with white lead, including fixing and hanging with cast iron butt hinges and screws, and furnished with bolts and staples, according to order, per superficial foot... 3

ARCHITRAVES.

200. Single faced Architrape, made to order and fixed complete, per superficial foot... 5

201. Double faced dito ditto, and fixed complete, per superficial foot... 7

SKIRTINGS.

202. Square Skirting of deal, 1 inch thick, straight or raking, including backings and fillers, and grooved and tongued at angles, per foot, per superficial foot... 5

203. Beaded or torus moulded dito ditto, per superficial foot... 6

STAIRCASES.

204. Oak Steps and Risers, 1½ inch thick, wrought one side, and nosings rounded, including fixing and rough pine bracketing where required, per superficial foot... 10

205. Dito ditto, 2 inch ditto ditto, per superficial foot... 2

206. Pine Steps and Risers, 1½ inch thick, and executed 1904, per superficial foot... 6

207. Dito ditto, 2 inch ditto ditto, per superficial foot... 9

208. Dito ditto, housed into wall string and mitred to outer string, with returns nosings, per superficial foot... 10

209. Pine String Boards, 2 inches thick, wrought one side, per superficial foot... 5

210. Dito ditto, 1½ inch thick, wrought one side and moulded, per superficial foot... 7

211. Oak Handrail, averaging 2½ x 4½ inch, wrought and rounded, per linear foot... 10

212. Birch or Cherry dito wrought and moulded, per linear foot... 3
STAIRCASES—Continued.

213. Oak Newels, averaging 3 1/2 x 3 1/2 inch, wrought and chamfered,—per

214. Dado dito Turned,—per lineal foot, 1 0

215. Oak Bar Balusters, 1 x 1 inch, housed into handrail and mortised into

216. Dado and Aprons, of Oak, Birch, or Cherry, rounded or moulded;—per

217. Turned Caps for Newels, including mitering,—each, 1 0

MOULDINGS.

218. Mouldings of all descriptions above three inches girth, not otherwise

219. Mouldings under three inches girth, executed as Item 218,—per lineal foot, 0 3

SUNDRIES NOT OTHERWISE PROVIDED FOR.

220. moulded Even Danes, out of Pine, of such size as may be ordered,

221. Accouterment Pine turned, of Ash or Oak, 2 inches long, 1 1/2 inch
diameter at large end, diminished towards the other end, and fixed,—per

222. Accouterment Rail of Pine, 4 1/2 x 1 1/2 inches, wrought one side and

223. Angle Staff of Pine, sunk and ploughed and fixed,—per lineal foot, 0 2

224. Angle Staff of Ash, beaded and dimo,—per lineal foot, 0 2

225. Band Rail of Pine, 4 x 2 inches, wrought and fixed,—per lineal foot, 0 3

226. Buttons of Oak or Ash, wrought and fixed, including screws,—each, 0 3

227. Beading,—per lineal foot, 0 1

228. Blocking, including glazing,—each, 0 2

229. Beaded Capping, under 3 inches wide, and fixed complete,—per

230. Sided Hemlock Timber, from 10 to 12 inches deep and 12 inches

231. Rough and fixed 4 inch Hemlock Plank on Dams, and Aprons of

232. Preparing and panel Framing Oak Timber and Plank for one pair of

233. Dado dito, 8 inch thick on dito,—per superficial foot, 0 5

234. Taking down old Lock Gates, taking off the Iron Work, &c., and

235. Putting together, Hanging and completing one pair of Sails Lock

236. Tamarack Knives for repairing Heel Posts of Lock Gates, 5 feet long,

237. Tamarack Knives for repairing Mitre Posts of dito, 5 feet long, from

238. Tamarack Knives for raising and securing Swing Bars of Lock Gates,

239. Taking off and re-fixing Swing Bars of Lock Gates, workmanship

240. Cedar Fencing, 4 logs high, with Pillow Blocks between; the rails
to be in lengths of 14 or 15 feet, as straight as possible, and none
to be less than 8 inches at the small end; Blocks to be from 3 feet

241. Cedar Beams not less than 10 inches diameter at the small end, flat

242. Fillets of Deal, according to order, rough,—per lineal foot, 0 1

243. Fillets of Deal, according to order, wrought,—per lineal foot, 0 1

244. Fillets of any size,—per lineal foot, 0 1

245. Dowels of Oak, according to order, and fixing, including the holes

246. Edges shot,—per lineal foot, 0 1

247. Holes cut and slubbed out, as to Water Closets,—each, 0 2

248. Housings for any purpose,—each, 0 1

249. Holes cut for Musket in Arms Racks,—each, 0 2

250. Mortises, cut,—each, 0 1

251. Necking, according to order,—per lineal foot, 0 1

252. Rounding Corners,—each, 0 3

253. Rounded Nosings on Edge, any size,—per lineal foot, 0 1

254. Re-laying Sashes, fixing new sashes when required,—each, 0 1

255. Re-laying Stakes, fixing new sashes when required,—each, 0 1

256. Re-laying Canadian Stakes,—each,

257. Re-laying Sashes,—each,
BARRACK FURNITURE—Continued.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>294.</td>
<td>Ditto, ditto, ditto, 30 feet long and upwards, executed as Item 297.</td>
<td>7</td>
</tr>
<tr>
<td>295.</td>
<td>Store Pipes of strong Sheet Iron, 3 lbs. each.</td>
<td>10</td>
</tr>
<tr>
<td>296.</td>
<td>Store Pipe Elbows of ditto, each.</td>
<td>6</td>
</tr>
<tr>
<td>297.</td>
<td>Keys for Store Pipes, each.</td>
<td>1</td>
</tr>
<tr>
<td>298.</td>
<td>Taking down, cleaning, and re-fixing Store and Pipes, including Wire and Nails when required, each.</td>
<td>16</td>
</tr>
<tr>
<td>299.</td>
<td>Putting up Store and Pipes, including Nails and Wire, each.</td>
<td>16</td>
</tr>
<tr>
<td>300.</td>
<td>Taking down, cleaning, and removing to Store, Store and Pipes, each.</td>
<td>6</td>
</tr>
<tr>
<td>301.</td>
<td>Bell Buckets of Oak, Iron Bound, not to hold less than 3 gallons, each.</td>
<td>26</td>
</tr>
</tbody>
</table>

TINNING.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>302.</td>
<td>Best L. C. Tin, in covering Roofs, showing 6 inches to the Weather, laid complete, per square of 100 superficial feet.</td>
<td>80</td>
</tr>
<tr>
<td>303.</td>
<td>Extra allowance for Hips, Gutters, and Ridges, and making good to Dormer Windows, per running foot.</td>
<td>4</td>
</tr>
<tr>
<td>304.</td>
<td>Stripping off old Tin Covering, and removing it to Store, per square of 100 superficial feet.</td>
<td>30</td>
</tr>
</tbody>
</table>

SHINGLING.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>305.</td>
<td>Covering with the best 18 inch straight Pine Shingles, showing 4½ inches to the Weather, and securely nailed to Sheeting, per square of 100 superficial feet.</td>
<td>12</td>
</tr>
<tr>
<td>306.</td>
<td>Extra allowance for making good round Gutters and Dormers, per running foot.</td>
<td>3</td>
</tr>
<tr>
<td>307.</td>
<td>Stripping off old Shingles, and removing them to Store, per square of 100 superficial feet.</td>
<td>20</td>
</tr>
<tr>
<td>308.</td>
<td>Covering Roofs with Sheet Iron, 1 lb. to the superficial foot, folded double, painted two coats on both sides before being laid down, and one coat afterwards on the outside; the Sheet Iron to lap at least one third, and to be securely nailed, per square of 100 superficial feet.</td>
<td>40</td>
</tr>
<tr>
<td>309.</td>
<td>Extra allowance for Hips, Ridges, Gutters, and making good round Dormers, per running foot.</td>
<td>4</td>
</tr>
<tr>
<td>310.</td>
<td>Stripping off old Sheet Iron Covering, and removing it to Store, per square of 100 superficial feet.</td>
<td>20</td>
</tr>
</tbody>
</table>

FOR STORE OR DAY WORK.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>311.</td>
<td>Carpenter, per day.</td>
<td>6</td>
</tr>
<tr>
<td>312.</td>
<td>Sawyers, per pair, per day.</td>
<td>12</td>
</tr>
<tr>
<td>313.</td>
<td>Carpenter's Appraiser of two years' standing, per day.</td>
<td>20</td>
</tr>
<tr>
<td>314.</td>
<td>Shingler, per day.</td>
<td>10</td>
</tr>
<tr>
<td>315.</td>
<td>Turner, per day.</td>
<td>5</td>
</tr>
<tr>
<td>316.</td>
<td>Labourer, per day.</td>
<td>3</td>
</tr>
<tr>
<td>317.</td>
<td>Charcoal, per bushel.</td>
<td>4</td>
</tr>
<tr>
<td>318.</td>
<td>Cord, patent ash, per yard.</td>
<td>3.5</td>
</tr>
<tr>
<td>319.</td>
<td>Cord, Whit, per lb.</td>
<td>1</td>
</tr>
<tr>
<td>320.</td>
<td>Nails, per lb.</td>
<td>1</td>
</tr>
<tr>
<td>321.</td>
<td>Line, Jack, best patent, per lb.</td>
<td>1</td>
</tr>
<tr>
<td>322.</td>
<td>Line, green, strong, for bells, per yard.</td>
<td>0.5</td>
</tr>
<tr>
<td>323.</td>
<td>Line, white, for window blinds, per yard.</td>
<td>0.25</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Price</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td>318</td>
<td>Lath, trammed</td>
<td>1 6</td>
</tr>
<tr>
<td>319</td>
<td>Oil, sweat</td>
<td>1 9</td>
</tr>
<tr>
<td>320</td>
<td>Paper, Chinese, or coarse</td>
<td>0 5</td>
</tr>
<tr>
<td>321</td>
<td>Fish, per lb</td>
<td>0 3</td>
</tr>
<tr>
<td>322</td>
<td>Ropes, barred</td>
<td>0 8</td>
</tr>
<tr>
<td>323</td>
<td>Ropes, white</td>
<td>0 9</td>
</tr>
<tr>
<td>324</td>
<td>Saw dust, per bushel</td>
<td>0 3</td>
</tr>
<tr>
<td>325</td>
<td>Shingles, Pine, 16 inches long, per 1000 of 100 rows, 3 feet 4 inches long</td>
<td>0 8</td>
</tr>
<tr>
<td>326</td>
<td>Sheet iron for roof covering, per box of 20 sheets</td>
<td>35 0</td>
</tr>
<tr>
<td>327</td>
<td>Tin, best quality, per box of 205 sheets</td>
<td>0 9</td>
</tr>
<tr>
<td>328</td>
<td>Tin, mineral</td>
<td>0 9</td>
</tr>
<tr>
<td>329</td>
<td>Tur, vegetable</td>
<td>0 11</td>
</tr>
</tbody>
</table>

**Scantlings Sawn or Hewn in Square**

<table>
<thead>
<tr>
<th>Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3210</td>
<td>Oak, best white Canadian, of any scantling ordered</td>
</tr>
<tr>
<td>3211</td>
<td>Ash, white or rock Elm, of any scantling ordered</td>
</tr>
<tr>
<td>3233</td>
<td>Hemlock, sides 10 to 12 inches deep and 12 inches wide, per running foot</td>
</tr>
<tr>
<td>3243</td>
<td>Cedars not less than 10 inches diameter at small end, per linear foot</td>
</tr>
</tbody>
</table>

**Oak Plank**

<table>
<thead>
<tr>
<th>Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3335</td>
<td>Pine plank</td>
</tr>
</tbody>
</table>

**Pine and Hemlock Plank**

<table>
<thead>
<tr>
<th>Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3360</td>
<td>Pine plank</td>
</tr>
</tbody>
</table>

**Screws**

<table>
<thead>
<tr>
<th>Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3529</td>
<td>Per dozen</td>
</tr>
</tbody>
</table>

**Nails, Iron**

<table>
<thead>
<tr>
<th>Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3629</td>
<td>Per doz</td>
</tr>
</tbody>
</table>

**Smiths' Work**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3468</td>
<td>Iron wrought in Bolts and Nuts of all descriptions</td>
<td>0 7 0</td>
</tr>
<tr>
<td>3490</td>
<td>Ditto in T and L Plates for Lock Gates</td>
<td>0 8</td>
</tr>
<tr>
<td>3550</td>
<td>Dito in Gooseneck Straps and Joint for Lock Gates</td>
<td>0 10</td>
</tr>
<tr>
<td>3515</td>
<td>Ditto for fitting up Crab Windlasses and machinery for raising Shores and Yavels</td>
<td>1 3</td>
</tr>
<tr>
<td>3592</td>
<td>Dito in Self-closing Hinges for Gates</td>
<td>0 8 0</td>
</tr>
<tr>
<td>3533</td>
<td>Dito in Ties and S's for buildings, with screw and nut at each end, and similar work</td>
<td>0 5</td>
</tr>
<tr>
<td>3574</td>
<td>Dito in Holdfasts and Spikes, of all kinds, and similar work</td>
<td>0 6 0</td>
</tr>
<tr>
<td>3575</td>
<td>Dito in hook and eye hinges, and dito</td>
<td>0 8 0</td>
</tr>
<tr>
<td>3576</td>
<td>Dito in Bum Mountings, short Chains and Rings for Stables, and similar work</td>
<td>0 7 0</td>
</tr>
<tr>
<td>3577</td>
<td>Dito in Window Bars, Balustrades, and similar work</td>
<td>0 5 0</td>
</tr>
<tr>
<td>3578</td>
<td>Dito in Straps, &amp;c. for Roofs, and similar work</td>
<td>0 6 0</td>
</tr>
<tr>
<td>3579</td>
<td>Castings of soft grey iron of any pattern, including cleaning, filing, and similar work</td>
<td>0 7 0</td>
</tr>
<tr>
<td>3580</td>
<td>Shells and Shells for Ship Work</td>
<td>0 5 0 5</td>
</tr>
</tbody>
</table>

**Additional**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3611</td>
<td>Labourers</td>
<td>3 0</td>
</tr>
</tbody>
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**Store or Day Work—continued**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>341</td>
<td>Cut</td>
<td>0 6 0 6</td>
</tr>
<tr>
<td>342</td>
<td>Clout</td>
<td>0 6 0 6</td>
</tr>
<tr>
<td>343</td>
<td>Tacks, Flemish</td>
<td>0 6 0 6</td>
</tr>
<tr>
<td>344</td>
<td>Brads</td>
<td>0 6 0 6</td>
</tr>
<tr>
<td>345</td>
<td>Clasp</td>
<td>0 6 0 6</td>
</tr>
<tr>
<td>346</td>
<td>Copper Nails</td>
<td>3 6</td>
</tr>
<tr>
<td>347</td>
<td>Brass Nails</td>
<td>4 2</td>
</tr>
</tbody>
</table>
IRONMONGERY—Continued.

414.—Locks, Stock, 8 inch, with 4 bolts and nuts, and staple on plate, with screws, each. 3 2
415.—Ditto, ditto, 10 inch, ditto ditto ditto with screws, each. 4 6
416.—Ditto, ditto, 12 inch, ditto ditto ditto with screws, each. 6 0
417.—Ditto, Iron Rim, 9 inch, with brass knob furniture and box staple, with screws, each. 5 6
418.—Ditto, ditto, 8 inch, ditto ditto ditto with screws, each. 6 0
419.—Ditto, Drawback for Hall Doors, 8 inch, complete, with brass knob furniture, each. 7 0
420.—Ditto, ditto, 10 inch, ditto ditto ditto, each 10 0
421.—Ditto, Iron Rim, dead shot, 8 inch, with 4 bolts, and wrought iron staple, each. 5 0
422.—Ditto, ditto, 10 inch, ditto ditto ditto and wrought iron staple, each. 6 0
423.—Ditto, Press, 4 inch, spring and tumbler, each. 1 8
424.—Ditto, Pad, 3 inch, Patent, each. 3 0
425.—Ditto, 4 ditto ditto ditto ditto, each. 3 5
426.—Ditto, Brass Drawer, 3 inch, ditto, each. 4 0
427.—Porter's Spring, japanned, 21 feet long, with 1 inch screws, each. 4 6
428.—Pulleys, Iron Screw, mounted with wood sheaves, each. 3 0
429.—Ditto, Liguanvite, 6 inch, for flag staves, each. 3 0
430.—Filling in Bows of Keys with brass, each. 3 0
431.—Wrought Iron in sheets, for Doors, &c., fixed, per lb. 0 6
432.—Copper Sheet, for Magazine Doors, fixed, per lb. 1 0
433.—Ditto wrought in Staples, Holdfasts, &c., per lb. 2 6
434.—Sash Fasteners, spring brass, each. 2 3
435.—Squares, iron, for Sashes, 4 inches on each arm, put on with 4 screws, and painted, each. 0 7
436.—Wire Lattice, according to order, per superficial foot, each. 1 0
437.—Taking off, repairing, oiling, cleaning and re-fixing Locks of all descriptions, each. 1 2
438.—Taking off, cleaning, oiling, and re-fixing Locks of all descriptions, each. 1 0
439.—Supposing a new Key to any Lock, including solid Bow and Labeling Key, each. 2 0
440.—Repairing Latches of all descriptions, including taking off and re-fixing, each. 1 10

The above prices include suppling new Staples to the Locks when necessary.

STATEMENT OF THE MODE OF MEASURING CARPENTERS' WORK. [For mongery.

The prices include the fencing, painting, and completing all work.

The measurements of Carpenters' Work to be all taken net, without reference to any local allowances.

The length of all Scantlings, Boarded Work, &c. to be taken from the extreme points of each separate piece.

The usual allowance in thickness, for planing, to be allowed on all Wrought Boarding.

Any Articles of Furniture, or Barrack Stores, not specially provided for under the head of Barrack Furniture, to be paid for respectively under the several descriptions of Work, as enumerated in the Schedule.

Step Ladders to be paid for under the head of Stair Cases.
the undersigned do hereby tender to provide and deliver into the Ordnance Stores, such articles, and to perform such services and works as are enumerated in the Schedule, at the prices affixed to each item; and should this Tender be accepted, do hereby bind myself to abide by and fulfill all the terms and conditions before mentioned, or in default thereof, to forfeit and pay to Her Majesty, Her Heirs and Successors, such penalties or sums of Money as before mentioned.

Dated the day of

Witness,

Service,”

SCHEDULE

OF

FOR

PAINTERS' AND PLUMBERS'

WORK,

FOR THE SERVICE OF THE

HONORABLE BOARD OF ORDNANCE,

AT

THE CANALS.

Montreal:

PRINTED BY LÖVEIL AND GIBSON, SAINT NICHOLAS STREET.

1844.
NOTICE.

Any Person who desires to Tender should fill up the undertaking which will be found at the end of this document, stating whether he is willing to contract at the Prices stated in the Schedule, or if not, at how much per cent on the whole of the Prices, either above or below.

It must be distinctly understood that the per centage is to be on the whole of the Prices, and not on the different items—so that the Contractor's Bills must be made out at the Printed Prices, and the per centage, if there is any, will be simply added to or deducted from the Total Amount of each Trade.

The person tendering must also give his Address and the Names, Professions, and places of abode, of his proposed Sureties.

The Tenders should state whether they are for the whole Line of the Rideau and Ottawa Canals, or for the Ottawa Canals only, from Carleton to Grenville; or for the Rideau from Bytown to the First Rapids, inclusive; or from the First Rapids inclusive, to Kingston Mills inclusive.

The Tender of the Person who offers for the whole of the Line, will be accepted in preference, provided the terms are considered sufficiently advantageous to the Public.

TERMS OF CONTRACT

For Painters' and Plumbers' Work, for the Service of the Honorable Board of Ordinance, at the Rideau and Ottawa Canal.

1. The person whose Tender may be accepted is, if required, to enter into a Bond with two sureties, to the effect that the whole of the Work shall be executed in a workmanlike manner, and according to the Specifications and directions of the Office of the Engineer, having the superintendence of the Work, without any additional payment.

2. Should any Work or Article have been omitted to be done in the Specifications, which would be otherwise intended by the drawings, and necessary to complete the Work, the same is to be performed according to the directions of the Office of the Engineer, having the superintendence of the Work, without any additional payment.

3. In case of any work done beyond the price specified in this Contract, which may be incurred in the performance of the Work required by the Ordinance Department, or if the Workman, in any of the cases mentioned in Articles 5, 6, 7, 8, 9, 10, and 11, does not complete the Work, the same is to be deducted from the amount due, or to be paid to the Contractor from the Ordinance Department, or by the Board of Ordinance to pay the amount of such extra expenses to each person as they may think proper to receive the same, and in case the Contractor should refuse to do so, then he is to forfeit his Bond.

4. The Contractor shall perform all such work as may be required of him, within such time as shall be fixed by the Superintendent of the Work, and in order to prevent increased costs to the Public Service by improper delay on the part of the Contractor, the following course is to be adopted, viz.: The Superintendent of the Work shall stipulate the periods by which certain portions of the work are to be completed, and if the Contractor shall fail to complete the same within the time stipulated by the Superintendent, the Contractor shall be liable to be deprived of the superintendence of the Work, and to employ other persons to execute the remaining portions. Any extra expenses that may be incurred by this proceeding is to be paid by the Contractor, according to Article 4. If it should be necessary in the work of any part, the Workman or Workmen may be employed to complete the work, in order to prevent the time to be saved at the expense of the Workman, so that, however, it is in no case to exceed one hour and a half, except in cases where great distance intervenes, when the allowance of time is to be arranged by the Superintendent and the Contractor.

5. The Contractor shall not provide, at such time as may be appointed by the Superintendent of the Work, the number of Workmen demanded for the Service of the Ordinance Department, at the Stations in which this Contract applies; that Office shall be the only person to determine the number of Workmen to be employed; and the same time must be kept by the Superintendent of the Work in employment until the termination of the Work, which may be determined by the Board of Ordinance. Any extra expenses that may be incurred by this proceeding is to be paid by the Contractor, according to Article 4.

6. If the Contractor fails to provide at any time, any Materials of the required quality, that may be demanded of him for the Service of the Ordinance Department, at the Stations specified in this Schedule, the Superintendent of the Work shall be at liberty to cause the same to be purchased from some other Tradesman, any extra expenses being defrayed by the Contractor, according to Article 4.
1. An Invoice signed by the Contractor, is to be sent in with each delivery of Materials for Sore or Day Work, and the Contractor is to be furnished with a Receipt signed by the proper Officer of the Ordnance Department, (in the manner hereinafter directed,) specifying the description, quantity, weight, or measurement, as the case may be,-of the Articles received:- these Receipts, however, to be produced by the Contractor as evidence in case of any dispute with the Ordnance Department, and so far as may be consistent with the Ordnance Department, and the Contractor, must be considered as evidence of the materials received and the quantities certified by the Officer signing the Receipt.-

2. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

3. If any damage be done to any materials furnished by the Ordnance Department, the damage to be paid for by the Contractor, and the Contractor is to be furnished with a Receipt signed by the proper Officer of the Ordnance Department, specifying the description, quantity, weight, or measurement, as the case may be, of the Articles received.

4. The materials are to be delivered to the Ordnance Department at the Ordnance Department, and the materials to be used as directed by the Ordnance Department.

5. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

6. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

7. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

8. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

9. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

10. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

11. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

12. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

13. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

14. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

15. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

16. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

17. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

18. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

19. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

20. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

21. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

22. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

23. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

24. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

25. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

26. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.

27. The materials furnished by the Ordnance Department, are to be received at the Ordnance Department by the Contractor, at his own expense, the same to be delivered to the third party at the Contractor's expense, and the materials to be used as directed by the Ordnance Department.
PAINTING.

SUPERFICIAL WORK.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>441</td>
<td>White Painting</td>
<td>per square yard</td>
</tr>
<tr>
<td>442</td>
<td>Lead Colour</td>
<td>per square yard</td>
</tr>
<tr>
<td>443</td>
<td>Brown or Chocolate</td>
<td>per square yard</td>
</tr>
<tr>
<td>444</td>
<td>Lead Colour on Gutters or Vertical Pipes</td>
<td>per running foot</td>
</tr>
</tbody>
</table>

LINEAL WORK.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>445</td>
<td>Lead Colour or Stone Colour</td>
<td>per running foot</td>
</tr>
</tbody>
</table>

NUMERICAL WORK.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>446</td>
<td>Ditto as above</td>
<td>per square yard</td>
</tr>
</tbody>
</table>

FOR STORE OR DAY WORK.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>450</td>
<td>Painter</td>
<td>per day</td>
</tr>
<tr>
<td>451</td>
<td>Painter's Apprentice</td>
<td>per day</td>
</tr>
</tbody>
</table>
| 452 | Oil Punt | per \\

GLAZIERS WORK.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>455</td>
<td>Glazing in new Sashes, with best Newcastle C. Glass</td>
<td>per square foot</td>
</tr>
</tbody>
</table>

Note: It is to be distinctly understood that the Board of Ordnance reserves to themselves the exclusive right of employing any other Tradesmen than the Contractor under this Schedule, to execute all such repairs to Barracks Damage, and occasional Whitewashing, as are to be performed under the direction of the respective Barrack Masters at each Station, and that such Works are not to be performed under the direction of the respective Barrack Masters at each Station.
APPENDIX E

EMPIRE STEEL SHINGLE PRODUCED BY THE METALLIC ROOFING COMPANY OF TORONTO

(Metallic Roofing Company Catalogue A, 1903, p.32-3.

Accession, Department of the Environment, Parks, Ottawa, Historical Research.)
FOR STORE OR DAY WORK.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Rate 1</th>
<th>Rate 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>472</td>
<td>Glazier, per day</td>
<td>6 6</td>
<td></td>
</tr>
<tr>
<td>473</td>
<td>Glazier's Apprentice, per day</td>
<td>3 0</td>
<td></td>
</tr>
<tr>
<td>474</td>
<td>Glass, best Newcastle C, delivered in such sizes as may be ordered</td>
<td>0 0</td>
<td></td>
</tr>
</tbody>
</table>

FOR STORE OR DAY WORK.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Rate 1</th>
<th>Rate 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>471</td>
<td>Plumber, per day</td>
<td>7 6</td>
<td></td>
</tr>
<tr>
<td>474</td>
<td>Sheet Lead, milled, per cwt.</td>
<td>3 0</td>
<td></td>
</tr>
<tr>
<td>475</td>
<td>Pig Lead, per cwt.</td>
<td>40 0</td>
<td></td>
</tr>
<tr>
<td>476</td>
<td>Rodder, per lb.</td>
<td>20 0</td>
<td></td>
</tr>
<tr>
<td>477</td>
<td>Nails, per lb.</td>
<td>0 0</td>
<td></td>
</tr>
</tbody>
</table>

The undersigned, do hereby tender to provide and deliver into the Ordnance Stores, such articles, and to perform such services and works as are enumerated in the Schedule, at the prices affixed to each item, and should this Tender be accepted, do hereby bind to abide by and fulfill all the terms and conditions before mentioned, or in default thereof, to forfeit and pay to Her Majesty, Her Heirs and Successors, such penalties or sums of Money as before mentioned.

Dated the day of

Witness,


"Empire" Steel Shingles.

PATENTED APRIL, 1883, AND NOVEMBER, 1885.

Suitable for all Descriptions of Roofs, down to One-quarter Pitch. Made from **tinned** Steel Plate, Galvanized or Painted. One grade only of each.

**FIG. 18.**
One sheet of Galvanized "Empire" Steel Shingle. Covering size, 11½ x 8½ inches; 152 sheets to a square.

**FIG. 19.**
One sheet of Painted "Empire" Steel Shingle. Covering size, 11½ x 8½ inches; 152 sheets to a square.

<table>
<thead>
<tr>
<th>Material</th>
<th>Code Word</th>
<th>Approximate Weight per Square without Crate</th>
<th>Average Shipping Weight per Square</th>
<th>Number of Squares to 40 Cubic Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galvanized</td>
<td>BARDSHIP</td>
<td>90 lbs.</td>
<td>100 lbs.</td>
<td>16 squares.</td>
</tr>
<tr>
<td>Painted</td>
<td>BASIAL</td>
<td>75 lbs.</td>
<td>85 lbs.</td>
<td>16 squares.</td>
</tr>
</tbody>
</table>

The "Empire" is the only shingle on the market that is galvanized after being formed into shape (all others being made from plates galvanized first), consequently there is no possibility of there being any cracking of the galvanized coating in forming, and no raw edges are exposed. They are first made up from soft stamping tinned steel plate, with every lock and fold perfect before the operation of coating commences. The sheets being already tinned, every particle of scale or foreign matter is already removed from their surface, and they do not have to go into any acid bath, as would be the case if black iron or steel were used.

They are then immersed in a huge kettle containing about eighteen thousand pounds of melted zinc, and kept at a temperature just below the burning point. When withdrawn they are thoroughly washed, first in hot, then in cold water, and are rubbed dry with sawdust, then put into a dry-steam chamber, which completes the operation—except brushing from their surface the particles of sawdust...
which adhere to them. This process requires a great amount of skill and care, besides the necessary handling, but when done, the goods produced in this manner are beyond a doubt the perfection of roof covering, and will outlast any other material, with the exception of, perhaps, copper. We will warrant the Galvanized "Empire" Shingles rust-proof, without the necessity of painting.

The painted "Empire" Shingles are thoroughly coated on both sides with the most expensive preservative of magnetic oxide of iron paint, made especially for us. (See page 20, "Painting.")

Fig. 20 represents our Patented Telescopic Side Lock, used only on the "Empire" Shingles. This lock, which amply provides for contraction and expansion of the metal, is provided with a concealed gutter running the entire depth of each shingle, and is capable of carrying off any water that might get into the lock to the next course below, so that leakage at the joints is an utter impossibility. Provision is also made, by means of this water gutter, for ventilation and the escape of gases, etc.; consequently there is no condensation of moisture nor sweating of the metal on the under side.

This lock is the perfection of simplicity in construction, and the "Empire" is the only shingle having a combined hook-over lock and water gutter, which is a very important feature, as it adds to the life of the roof very materially, preventing, as it does, any possibility of corrosion from the under side.

The corrugations forming the side lock and water gutter on one side, and the hook-over part on the other side, in addition to the ribs at the top, and the heavy design on the body of the plate, so stiffen these shingles that it is impossible to injure the legs or squeeze them out of shape, making the most rigid shingle that is produced.

Fig. 21 shows commencement of first two courses, starting every alternate course with a half sheet, so as to break joints.

The shingles are nailed to the sheathing with about two, one-inch twelve-gauge, wire nails through the flange on the right-hand side of each sheet, and the next sheet hooks over the nails and water gutter into the lock, so that all nail heads are covered, as shown in Fig. 21. The upper edge of each shingle, down to where the overlap comes, is provided with heavy beads, and the shingle being so stiff, it lies very close and tight at the butt to the underlying course, effectually preventing any drifting or backing up under the shingles.

The genuine all bear our name and registered trade mark, thus:

TRADE
"EMPIRE"
MARK.
APPENDIX F

PEDLAR'S IRON V CRIMP ROOFING USED ON THE KITCHEN ADDITIONS AT DAVIS

"V" Crimp Roofing

Can be applied to buildings without the use of Sheathing Boards, using 1 x 4 inch strips across the rafters at 24 inch centers.

We recommend this style of covering to those wishing a good, cheap and durable roof. Designed for Warehouses, Sheds, Barns, etc. For temporary structures, this is the cheapest and best roofing obtainable. Anyone capable of driving a nail can put on V Crimp roofing. It can be ladened and fastened in many other kinds. The V Crimp on each sheet is designed to fit over-over a triangular wood strip made especially for that purpose; the sheet is greatly stiffened thereby, and sagging or flowing off is prevented. Where the ends of the sheets are not generally lapped, a better way to finish and nail them together. Sheets are 12 inches long.

The V Crimp Wood Strip used for V Crimped Roofing size 1 x 1 1/2 inches. Can be procured from any mill, or we can furnish at cost.

<table>
<thead>
<tr>
<th>Name</th>
<th>Gage</th>
<th>Kind</th>
<th>Quantity</th>
<th>Price per Piece</th>
</tr>
</thead>
<tbody>
<tr>
<td>722A</td>
<td>22 Gauge</td>
<td>Painted</td>
<td>80 lbs.</td>
<td>$2.15</td>
</tr>
<tr>
<td>722G</td>
<td>24 Gauge</td>
<td>Painted</td>
<td>100 lbs.</td>
<td>$3.50</td>
</tr>
<tr>
<td>722A</td>
<td>22 Gauge</td>
<td>Galvanized</td>
<td>80 lbs.</td>
<td>$3.75</td>
</tr>
<tr>
<td>722G</td>
<td>24 Gauge</td>
<td>Galvanized</td>
<td>100 lbs.</td>
<td>$4.00</td>
</tr>
</tbody>
</table>

We can manufacture heavier grades up to 20 gauge.
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Wylie, William.

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File C 2507-5, Upper Brewers.

File C 2507-6, Lower Brewers.

File C 2507-9, Chaffey's


File C 2507-11, Hogsback.

File C 2507-12, Jones Falls.

File C 2507-13, Kilmarnock.

File C 2507-19, Hartwell's

320
Canada. Public Archives.

Canada Census

1891 Micro T-6350, South Leeds, South Crosby district.
1881 Micro C-13,232 South Leeds, District K, Crosby South
1871 Micro C-10,002 District 67, South Leeds Subdist G Div.1, South Crosby
1861 Micro C-1044 South Leeds, District 1 South Crosby
1851 Micro C-11,733 Leeds County, South Crosby
1848 Micro M-5909 Leeds County, South Crosby
1842 Micro M-5908 Leeds County, South Crosby

Maps. Rideau Canal.

MG 13 WO 44. Records of the British Military in Canada. Ordnance Office
   In-Letters. Selected material from index Finding Aid 342, located

MG 13 WO 55. Ordnance Miscellaneous. Selected material from detailed index,
   Finding Aid 592, Vols.870-887.


MG 24 E 2. Rideau Canal. Miscellaneous Papers, including Davis Lock Records,

MG 24 H 12. James Burrows. Diary. Contains Originals and copy of Edwin Welch,

   Vol. 31, files 2-4.
Photographic Division.

Chapin, C.J. Collection

Merrilees Collection, Groups A, C, F (Group B temporarily not available).

National Film Board Collection.

RG 1 Records of the Executive Council

E 4 Despatches from the Colonial Office to the Executive Council.
   Vols. 2 & 3 (H-1403).

E 12 Vol. 3. Phillpotts, George. Reports on the Inland Navigation of the
   Canadas. Called for by Lord Glenelg's Dispatch to the Earl of
   Durham dated London 23rd August 1838. First report dated 1838 and
   Appendix. (Maps received with Phillpotts letter dated 12 February
   1840.) Second Report dated 1840 and Appendix. (Maps received with
   Phillpotts letter dated 5th May 1841.)

RG 7 Records of the Governor General's Office

G 1 Despatches from the Colonial Office to the Governor General of
   British North America, 1833-1841. Reviewed selected material and
   comprehensive index located in Public Archives of Canada,


G 19 Military Secretary, Vols. 1-4, 21, 27.

RG 8 British Military Records for Canada.

   Series I (C Series). Correspondence of the British Military in Canada.

RG 11 Department of Public Works Records

RG 12 Department of Transport. Early Records.
All files that might have been pertinent. Those containing relevant information included:
Vol. 503-4, file 4606-6, Rideau Canal, General, 1864-1925.

All files that might have been pertinent. Those containing relevant information included:
Vol. 3616, file 4250-16-1. Inventory.


Vol. 3686, file 4118-85-4. Buildings, Construction, Maintenance -
Rideau Canal. Jones Falls.
Rideau Canal, Smith's Falls Canalman's House and Storehouse.
Vol. 3686, file 4250-1 pt.1. Canals, Construction, Maintenance -
General.
Vol. 3686, file 4250-8 pt.1. Canals, Construction, Maintenance -
Term Program of Canal Improvements.
Vol. 3696, file 4602-85 pt.1 Vol.1. Permits to Use. Rideau Canal -
Rental of Houses to Staff, 1927-1962
Disposition - Rideau Canal, Disposal of Nicholson's Lock Station.
Chaffey's Lock, Ont. Sale of Land.
Sale of Land at Old Sly's Lock Station.

RG 43 Department of Railways and Canals.
B I.1 Canal Correspondence. Vol. 157, 158,996, 999, 1291, 1525, 1671.
C I.1.a Letterbooks of the Superintending Engineer, Rideau Canal.
C I.2.c Lockmaster's Journals, Nicholson's Lock. Contain letterbooks
and diaries as well as lockmasters' journals for 1837-1854
and 1855-1914 respectively. Vol.1878 and 1879.


(Typed transcript prepared by S. Warren, available in files of Historical Research, Department of the Environment, Parks, Cornwall.)

Interviews with various individuals associated with Davis lockmaster's house including:


Jean Alford Rowe, daughter of former lockmaster Eli Alford, January 28, 1989.

Metropolitan Toronto Library Board, Reference Collection.

Carpentry and Building, 1879.

William Oldfield.

"Memorandum upon the Nature and Value of Materials as also upon Labour in Canada from Information in the Office of the Commanding Royal Engineer, 1841."

(Manuscript on file, Baldwin Room.)
South Crosby Heritage Association, Chaffey's Locks.

Notes, Indexes and Reports on file at the association, including Holiday Cemetery Recordings, Index to Sweeney Diaries, Photograph Files, South Crosby Township Records.