THE RIDEAU CANAL

Yesterday and Today

David Sadler
June 1977
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ACKNOWLEDGEMENTS

This information package -- "The Rideau Canal - Yesterday and Today" was produced during the winter of 1976-77 for the Interpretation Office of the Rideau Canal.

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David Sadler
June 1977
INTRODUCTION

This paper was written for use by the operating staff of the Rideau Canal. With the growing awareness towards areas of national historic significance by the public it was felt that a general overview of the Rideau Canal was required.

This book has been broken down into two sections. The first section is a general history covering the who, what, where, why and when of the Rideau Canal. The second section is a study of the individual lockstations. It deals with such matters as construction problems, inventory of Canal structures and other historic notes.

The history of the Rideau Canal is not complete. Books, unfortunately, do not provide all of the answers, many facts remain in the memories of you the operating staff. Perhaps you have first-hand experience or maybe stories have been handed down to you. Whether they are fact or folklore, they all add to the flavour of our Canal.

If any of the staff have information that has not been covered in this paper, blank pages have been left at the end for your use. Any information should be sent to your Area Office or the main office in Smiths Falls. Please participate.
Although construction of the Canal did not start until 1826 interest in it dates back to the 1780's. At the
day of the American Revolution, the British government
was faced with the problem of settling a number of
discharged British soldiers and fleeing United Empire
Loyalists. In 1783, two military officers by the names
French and Jones were sent to survey the Ottawa and
Rideau Rivers as possible areas for settlement.
Lieutenant Jones surveyed both sides of the Ottawa River
between Montreal and the Chaudiere Falls. Lieutenant
French travelled up the Ottawa River, portaged the
Rideau Falls, proceeded along the Rideau to its source
in the Rideau Lakes, portaged to the Gananoque River,
sailed down to its mouth and returned to Montreal via
the St. Lawrence.

In his report, French indicated the abundance of fertile
land, suitable for settlement. Although no settlements
resulted from the survey at this time, French proved that
there was a route connecting the Ottawa and St. Lawrence
Rivers.

Settlement during this period was concentrated along
the St. Lawrence River. It was not until the 1790's
that settlements such as Burritts Rapids (1793) and
Merricks Mills (1794) penetrated the wilderness of the
Rideau Corridor.
Hull, founded by Philemon Wright in 1800, was another settlement that aided significantly in the development of the Rideau area. Wright carried on timbering operations along the Ottawa River.

The development of British North America was interrupted by the war of 1812. The security of the Province of Upper Canada was in danger. Invasion by the United States seemed inevitable. The future of the province depended upon the ability of the British to secure the Great Lakes. This would make northern movement by United States forces extremely difficult.

At the mouth of the Great Lakes stood Kingston, the naval stronghold for Upper Canada. The sole communication route between Upper and Lower Canada was the St. Lawrence River. If the American army severed this link between Kingston and Quebec, then Upper Canada would be at the mercy of the Americans. The British were amazed that no attempt was made and credited much of the success of the British fleet on Lake Ontario to the "...stupidity of the enemy". The reasoning behind American strategy is unknown, but it is understood that future plans were being made to cut off Canada's supply route if the war had lasted any longer.

The British were well aware of the fragile link between Upper and Lower Canada. There was consideration given to alternate routes well before the end of the war. The Rideau Canal seemed to be the best alternative. This route would link Quebec to Kingston, by way of the Ottawa and Rideau Rivers, without coming in contact with the international border.
After the war, hostile feelings and the fear of invasion still lingered. In 1815, Lieutenant Jebb surveyed the Cataraqui and Rideau Rivers and Irish Creek, as possible routes for a Canal system.

Although the Rideau had been surveyed before by Lieutenant French in 1783, Jebb's survey was the first report from a military standpoint. There were two routes the Canal could take. One route travelled from the Rideau Falls to Irish Creek, which runs into the Rideau River just below the present day Kilmarnock Lock. The Canal would run along the Irish Creek and Gananoque River, flowing out into the St. Lawrence River at Gananoque.

The alternate route followed the Rideau River and Lakes to their summit, then descended down the many lakes and rivers making up the Cataraqui Watershed. The latter route is the one the Canal follows today.

In the years following the War of 1812, a number of military settlements developed in the Rideau Corridor. The purpose of these settlements, located at such places as Perth and Richmond, was twofold. Firstly, their location acted as a secondary line of defense to support the United Empire Loyalist settlements along the St. Lawrence River and secondly, to encourage the discharged soldiers to settle in this area and not return to Britain.

Little was done to promote the construction of the Rideau Canal until 1821. At this time the Legislature at York passed an act, "to make provision for the improvement of the internal navigation of the province". Initial attention was concentrated on the problems associated with Niagara Falls. The Provincial Government of Upper Canada was more concerned with the economic value of a St. Lawrence-Great Lakes Canal system than the military significance of the Rideau Canal.

Eventually, the Rideau was taken into consideration. A civil engineer named Samuel Clowes was assigned to survey the Rideau River. In his report he decided to abandon the shorter route along the Irish Creek because of the inadequate water supply and the large amounts of excavation required. Clowes chose the route the Canal follows today.
In his report, Clowes included the following three estimates:

<table>
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<th>CANAL</th>
<th>A</th>
<th>B</th>
<th>C</th>
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<tbody>
<tr>
<td>Depth</td>
<td>7 ft.</td>
<td>5 ft.</td>
<td>4 ft.</td>
</tr>
<tr>
<td>Width at bottom</td>
<td>41 ft.</td>
<td>28 ft.</td>
<td>20 ft.</td>
</tr>
<tr>
<td>Width at surface channel</td>
<td>61 ft.</td>
<td>48 ft.</td>
<td>32 ft.</td>
</tr>
<tr>
<td>Lock Length</td>
<td>100 ft.</td>
<td>80 ft.</td>
<td>75 ft.</td>
</tr>
<tr>
<td>Lock Width</td>
<td>22 ft.</td>
<td>15 ft.</td>
<td>10 ft.</td>
</tr>
<tr>
<td>Bridges (clear vs width)</td>
<td>22x10 ft.</td>
<td>15x10 ft.</td>
<td>10x10 ft.</td>
</tr>
<tr>
<td>Lock material</td>
<td>stone</td>
<td>stone</td>
<td>wood</td>
</tr>
<tr>
<td>Cost in pounds</td>
<td>230,785</td>
<td>145,802</td>
<td>62,258</td>
</tr>
<tr>
<td>Cost in dollars</td>
<td>1,015,454</td>
<td>641,529</td>
<td>273,935</td>
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Both Britain and Upper Canada agreed on the military significance of the Rideau Canal. The British Government offered to lend Canada £70,000 ($308,000) to assist in the building of the Canal but the money was refused. Canada was still interested in developing a canal system along the St. Lawrence River. It was becoming increasingly evident that if the Rideau Canal was to be built, it would have to be of British concern.

In 1825, the Duke of Wellington, Master General of the Ordnance, ordered a study of the defense of British North America (The Smyth Report). This committee studied the feasibility of Clowes' plan. In their report, they questioned the estimates, but approved the overall plan. The only change in Clowes' original plan was the increased size of the locks (108' x 20'), to allow gunboats to pass. An additional £23,000 ($101,000) was added to compensate for this change, bringing the estimated cost to £169,000 ($744,000).

Wellington's influence on the British government, plus the approval of the Rideau Canal by the Smyth Report seemed to be the two vital forces that brought the start of the Canal to reality.
Early in 1826 the go ahead for the Canal was given. Wellington wasted no time. He appointed Lieutenant-Colonel John By of the Royal Engineers to supervise the project. By May 1826, Colonel By was in Quebec, making plans for what was to be one of the largest and most controversial projects of its time.

Before its completion, the Rideau Canal would be responsible for the taking of thousands of lives through engineering mishaps and dreaded malaria. The Canal would also exceed its initial estimate of £169,000 ($744,000) by nearly five fold.

Construction of the Rideau Canal (1826 - 1832)

Colonel By was instructed to build a transportation system from the Ottawa River to Kingston. The locks were to be built of stone masonry measuring 109 feet long, 20 feet in breadth and with a depth of 5 feet. The Canal was to follow the route suggested by Samuel Clowes and not the shorter route along the Irish Creek. Colonel By was warned before hand that merchants who were interested only in commercial development of the region would encourage him to bring the Canal down the St. Lawrence River to Kingston instead of using the indirect Ottawa-Rideau River route.

Shortly after By's arrival in Canada, he wrote to his superiors in Britain to say that the Canal could not possibly be built for £169,000 ($744,000). He estimated the cost at approximately £400,000 ($1,760,000). Colonel By's first trip to the Rideau was in the fall of 1826. His Excellency, the Earl of Dalhousie, accompanied By on this trip. A number of priorities were taken care of during this initial trip, one of them being the location of the entrance to the Rideau Canal. Ottawa owes its existence to the Canal because on September 26, 1826, it was decided that the entrance to the Canal would be located where the present day Ottawa Locks are situated. This date is considered to be the day Ottawa was founded, because shortly after the entrance was determined, the land was cleared and the development of Bytown was underway. By also arranged for a bridge to be built across the Chaudiere Falls, connecting Hull to the Canal site. Plans for By's headquarters and home were also laid out at this time. The foundation of By's house still exists in Major's Hill Park in Ottawa, overlooking the Ottawa Locks adjacent to Parliament Hill.
John MacTaggart, the Clerk of Works for the Canal, surveyed the proposed route during the first winter. The bush was so thick and impenetrable that MacTaggart and his survey crew took five days to travel from the bank of the Ottawa River to Dow's Great Swamp, a distance of less than 4 miles. MacTaggart reported that waterfalls, rapids and mosquito-infested swamps plagued the entire route of the Canal.

MacTaggart's initial trip along the Rideau, plus a host of other experiences during the construction of the Canal are revealed in his book, "Three Years in Canada". These written accounts help us to appreciate the problems and magnitude of such a project. Actual work on the Canal started in the summer of 1827. By contracted the work out to a number of private contractors. The work was divided into five categories:

1. building the locks of stone masonry
2. excavation earth and clay
3. excavation of rock and gravel
4. construction of heavy dams
5. framing aqueducts and bridges of wood
Soldiers, a surgeon and plenty of provisions were supplied by the British government at each of the construction sites. The presence of soldiers illustrated the tension in Upper Canada at this time. The fear of invasion from the Americans was very much alive during the construction of the Canal and for some time after its completion.

The first of many problems that Colonel By encountered was with the contractors. The masonry contractors were experienced craftsmen and created few problems, but many of the excavation contractors were inexperienced men, attracted to the job by the apparent simplicity of excavation work. They ran into numerous problems and the majority of them became bankrupt before their work was completed. This problem cost the Canal considerable time and money. Conflict also arose with contractors over payment for the work they had done. The engineers measured the amount of earth or rock removed and multiplied this by the rate per cubic foot. Frequently, the engineers' figures did not match those of the contractors. This created uneasy feelings between the two groups.

By the summer of 1827, Colonel By had set up permanent residence on the Canal. He made his first trip through the proposed route early that summer while MacTaggart finished the survey he started the winter before. MacTaggart's new estimate increased the cost of the Canal to £486,000 ($2,138,000), however, later that summer, Lieutenant Pooley, one of the young Royal Engineers officers made a more extensive survey and shaved £12,000 ($52,000) off MacTaggart's estimate. On completion of his report, Pooley was sent to England to present the revised estimate to the Board of Ordnance. Along with his estimate, went a recommendation from Colonel By to increase the size of the locks to accommodate naval steamboats and wooden spars, which were still required by the British Navy.

Work on the Canal was slow and tedious. Excavation of soil was by pick and shovel and wheelbarrow, while rock was drilled laboriously by a rock chisel and sledge. A 1 3/4 inch hole 12 feet per day or a 3 inch hole 4 feet per day. The holes were then filled with gunpowder and blasted. The small rubble was then removed by wheelbarrows and the heavier pieces by hand hoists. The construction of the lock gates and sluices also took considerable time and effort.
Because of the large amount of manual labour required in all aspects of the construction, a large labour force was needed. The local population was far from adequate. The bulk of labourers were Irish immigrants. Masons were obtained from Montreal and Quebec. It has been estimated that 2,000 to 6,000 labourers worked on the canal. In his book "Three Years in Canada", MacTaggart tells of the misfortunes bestowed upon hundreds of these workers.

"Some of them...would take jobs of quarrying from contractors, because they thought there was good wages for this work, never thinking that they did not understand the business. Of course, many of them were blasted to pieces by their own shots, others killed by stones falling on them. I have seen heads, arms, and legs blown in all directions; and it is in vain for overseers to warn them of their danger, for they will pay no attention. I once saw a poor man blow a red stick and hold it deliberately to the priming of a large shot he had just charged. I cried out, but it was no use. He seemed to turn round his face, as if to avoid the smoke; off went the blast...he was killed in a moment."
It is estimated that hundreds of these workers, ignorant of the danger of blasting, were killed at Newboro alone. The reason Newboro took so many lives was because of the extensive excavation of rock at that site. Similar results most likely repeated themselves in other areas where large amounts of rock had to be removed such as Poonamalie, Jones Falls and Ottawa.

From the time Colonel By arrived in Canada, he requested the approval of larger locks. Initially the locks were to be 108' x 20' but Colonel By recommended a much larger lock (150' x 50'). These larger locks would accommodate the steamboats which were being used on the Great Lakes at that time as trade vessels. Colonel By estimated that the enlargement of the locks would cost an additional £50,000 ($220,000). It was not until the spring of 1828 that the enlargement of the locks was approved. Whatever had been built of the smaller locks had to be torn down and rebuilt. The new locks measured 134' x 33' and would handle the new steamers quite easily.

By 1831 the end was in sight, but completion of the Canal was to be set back once more before it was finished. It was thought that the Canal would be completed by the summer of 1831 but William Merrick, owner of the mill at Merrick's Mills (Merrickville), decided to dam the river in the fall of 1831 in order to repair his mill. This lowered the water level downstream and made navigation impossible. Therefore, the opening of the Canal was delayed until the spring of 1832.

Many references state that the first complete trip on the Rideau Canal was from Bytown to Kingston but actually it was the opposite. On May 24, 1832, Colonel By, his family and a few fellow officers boarded a vessel named "The Pumper", which was renamed "The Rideau" for this occasion. The party was honoured in a number of little villages along the route to Bytown. The Canal, in spite of all its problems and drawbacks, was finally completed. Two years later the Ottawa River system was completed, linking Montreal to Kingston without coming in contact with the stretch of international border from Cornwall to Kingston.

The Problem of Malaria

In addition to the numerous labour, engineering and administrative problems, Colonel By was also confronted with the dreaded malaria disease. The men referred to it as "swamp fever". It was believed that the disease was caused by the stagnant air associated with swamps and bogs. Even the word "malaria" supports this misconception. The Italian words "mal" "aria" translated, means "bad air". In attempt to rid the Canal of this disease, large sections of forest surrounding the marshes were cleared.
Colonel By believed that fresh air circulating through the swamps would eliminate the malaria but, unfortunately, his efforts were in vain. It was the mosquito that hosted the disease, not the swamps.

Malaria is caused by a microscopic organism that lives in the bloodstream of the human body. The disease is transmitted by the female mosquito. There is no other method of acquiring the disease than from the bite of a mosquito that has previously bitten a person with malaria. The mosquito is therefore not the cause of malaria but rather the carrier of the disease.

Malaria was not common to Canada before work on the Canal began. It is believed that malaria was introduced by soldiers of the British Army. These soldiers must have contracted the disease in tropical areas where malaria thrives. The large mosquito population entered Canada—within a few years malaria was a feared killer.

Malaria is a recurring disease; once contracted, the victim may suffer repeated attacks. Colonel By believed he had several cases of malaria but, in reality, the attacks were all caused by the initial disease.

Malaria was a serious problem on the Canal. Colonel By makes reference to it in almost every report. Over the course of construction, malaria was responsible for hundreds of deaths. In the summer of 1828, malaria literally stopped work on the Canal. Mosquito-infested areas were hit the hardest. Cranberry Marsh and the Isthmus (Newboro) were the two most affected areas on the Canal. MacTaggart makes reference to these incidents and the hundreds of men "laid down with this disease, many of which never rose again".

Both Colonel By and MacTaggart contracted malaria. The numerous relapses of the disease are believed to have been a major factor in Colonel By's early death.

Today the mosquito population is as large as ever but, due to improved standards of living, modern malarial control and antimalarial drugs, the once dreaded disease is no longer a problem. Today people enjoy the many activities the Rideau Canal has to offer. The nasty bite of the mosquito is still very much a part of the Canal but people consider it a nuisance rather than the "bite of death".
Military Concern on the Rideau Canal

The protection of the Rideau Canal has taken many forms. During its construction, British soldiers were stationed at every work site. The fear of American invasion warranted such actions. To protect the individual lock station after construction was completed, Colonel By proposed to build blockhouses at every station. The high cost of such a job resulted in the construction of only five blockhouses. Today, four of these defensible structures still exist. They are located at Merrickville, Newboro, Narrows and Kingston Mills. The fifth blockhouse was located at Burritts Rapids but it was never completed in ideal form. It is believed to have been completed in 1836, but in the form of a single storey lock house. In 1914, it was reported to be in very poor condition, it was torn down and a frame two storey house was constructed on the original foundation.

The closeness of Kingston Mills to the American border is an obvious reason for the construction of one of the blockhouses, but why were the other four blockhouses built where they were?

A road leading from Brockville to Merrickville made the central portion of the Canal quite vulnerable in the event of an invasion by the Americans. For this reason, the blockhouses at Merrickville and Burritts Rapids were constructed. Between Newboro and Narrows is the summit of the Canal. If these locks were destroyed, the reservoir for the Canal would be lowered to a point where navigation from the Rideau Lakes to the Cataraqui River would be impossible.
Other measures to protect the Canal were adopted after its completion in 1832. These included defensible lockmasters' houses, guardhouses, a fort and Martello Towers.

The defensible lockmasters' houses were constructed sometime within the 15 years following the opening of the Canal. They were constructed of stone, with gun slits on every side and roofed with tin, making them fireproof. These houses were always built on a height of land which provided a clear view of both approaches. The fear of invasion by the Americans and the threat of sabotage during the Rebellion of 1837 were the reasons behind the military architecture and strategic location of these houses. It has also been suggested that a third explanation can be given for their presence. Up until this time, canalmen and lockmasters were living in buildings erected by the work crews during the construction of the Canal. These buildings were wooden, temporary structures which, by this time, were probably in very poor condition. By combining a home a defensible structure, the Ordnance Department solved two problems with one building.

Today, eleven lockmasters' houses still exist on the Canal. Through the years many changes to these houses have occurred. These changes are a reflection of the social and political changes that occurred on the Canal. As the threat of war decreased, the defensible nature of the house was no longer needed. As a result the gun slits were filled in. The need for a more comfortable and spacious home resulted in additions, interior renovations and, in some cases, the construction of a frame second storey.

Lockmasters' houses made defensible
Defensible lockmasters' house at Davis
As military threat subsided, defensible structures became more livable.

Another defensible structure built along the Canal were the squared-log guardhouses. They were built during the period of unrest following the Rebellion of 1837 as an anti-sabotage measure. Only three such buildings were constructed, one at Jones Falls, Ottawa Locks and White Fish Dam. All three guardhouses have been torn down.
Unrest between the provinces of Canada and the United States lingered on for decades after the War of 1812. In 1836, Fort Henry was built, replacing a smaller fort and in 1846, during the Oregon Boundary Dispute, the famous Martello Towers were built. Both Fort Henry and the Martello Towers surround the mouth of the Cataraqui River. This protected Kingston Harbour and the Rideau Canal from invasion. The Martello Towers were the last military structures built near the Canal. The 1850's marked the end of the military phase on the Canal.

Financial Problems

Over the years of construction, maintenance and use, the Rideau Canal has been plagued by financial problems. The final cost of £800,000 ($3,520,000) was shocking, especially to the British government who financed the project and who initially figured that £169,000 ($744,000) would suffice.

Colonel By estimated that the cost of the Canal would be at least £400,000 ($1,760,000) even before construction began. Two cost studies for the Canal were carried out in 1827 by John MacTaggart and Lieutenant Pooley. Their estimates were £486,000 ($2,138,000) and £474,000 ($2,086,000) respectively.
The construction was barely underway at this point and already the British Government was concerned at the cost and questioned the validity of the initial estimates of Samuel Clowes. Colonel By was also under fire by the Government, but a committee of engineers formed to check on him, found nothing wrong with his plans to flood out rapids along the route by the construction of dams.

Although impressed by his plans, the government was still quite concerned with the cost of the project. Therefore, another committee was appointed to check the project as it was being carried out and make any necessary changes. They also had the power to stop the project at any time if they felt that it was not being carried out efficiently and economically. Approval of the larger locks was also in their hands if they considered the change essential. Their report was completed in June 1828, but by this time the estimated cost had risen to £576,757 ($2,538,000). The committee reviewed this estimate and reduced it to £558,000 ($2,455,000), they also agreed on the larger sized locks (134' x 33').

A large expense to the Canal was obtaining land surrounding the lock areas so that the lockmasters' houses, blockhouses, etc. could be built to properly defend the stations. Because of the high demand for land along the Canal, the landowners were asking ridiculously high prices for their pieces of land.

By 1831, the end was in sight. The cost of the Canal to this point was an astonishing £715,408 ($3,148,000) with an estimated £60,615 ($267,000) required for its completion. Colonel By's estimate was £776,023 ($3,415,000), thus exceeding the original estimate (£558,000) ($2,455,000) approved by the Commission in 1828 by £216,023 ($951,000). The extra cost was accountable though. As construction progressed the adoption of waste weirs, larger dams and embankments were considered necessary, especially after the dam at Hogs Back collapsed twice, once in 1828 and again in the same year.

Colonel By remained on the Canal until it was completed, but was then recalled to Britain to face a committee and account for the money spent in excess of the initial estimate approved by the Commission of 1828.

Examination of the incident found fault with the Ordnance accounting procedure and not Colonel By. He was exonerated but the honour he should have received for his incredible feat was never bestowed upon him. He retired from the Royal Engineers shortly after and the incident was soon forgotten. He died four years later in 1836, at the age of 53. His numerous attacks of malaria are believed to have been the major factor in his early death.
When it is considered that the Canal project was carried out without being properly surveyed; that the construction was subject to the harshness of the Canadian Climate in both summer and winter; that malaria literally halted work for weeks at a time on a number of occasions and that a number of accessories were added to the original plan, it is incredible that the Canal was built so close to the Commission's initial estimate of £558,000 ($2,455,000).

Problems and Conflicts

From the beginning, the Rideau Canal was confronted with numerous problems and conflicts of interest. By the end of the 19th century three main groups had evolved.

The first group was the shipping companies who needed a constant, high water level to ensure safe navigation throughout the summer and fall.

The second group involved the farmers. They complained of the high water level the Canal maintained because it impaired the drainage of their fields.

The third group was the mill owners. Like the shipping companies, they preferred a constant, high level of water. Often their water supply was shut off through the weirs to keep water levels high enough for navigation, unfortunately, water levels had to be kept above navigational levels in the spring to ensure adequate water in the late summer and fall. This action resulted in a poor relationship between Canal officials and mill owners.

Conflict between these two sides also arose because of the accumulation of waste from sawmills. Navigation problems resulted in many areas along the Canal because of this waste. The government took prompt action to eliminate such problems but the mills continued to dump their waste in the river and the government continued to charge them for dredging the channels.

The biggest problems the Canal encountered was the "drowned land claims" filed against it. The clearing of land along the banks of the Rideau caused spring run off to be heavy and quick. This meant extensive flooding for a short period of time during the spring. This resulted in a shortage of water in late summer and fall. To compensate for this shortage, dams were built to increase the water reservoir for the Canal. Farmers who owned the land flooded by these dams demanded compensation for their losses.

The increasing problems confronting the Canal in the late 19th century led most people to consider the Canal to be an expensive outdated transportation system. A number of
Contemporary problems along the Canal

Suggestions were examined to eliminate the Canal, but none were carried out.

Today, the Canal is confronted with many of the problems which evolved from the 19th century. The high cost of maintenance and operations of the Canal still persists.

Flood plain management or the lack of it has also made its way into contemporary problems of the Rideau Canal. The development of the flooded plain in the Ottawa area has resulted in yearly disasters for many homeowners along the low-lying land of the Rideau River. Flood plain management is a relatively recent problem on the Canal but flooding itself is as old as the Rideau River.

In the mid-19th century, farmers complained of the high water levels kept by the Canal. Today, cottagers at the headwaters of the Rideau Lakes are concerned with the drastic drop in the level of water during the summer. This causes numerous problems with navigation and safety of the "Sunday" boaters.

Pollution is also a concern of the Canal. The combination of urban sewage and boat pollution continues to be a problem on the Rideau Canal.
Changes in Canal Function

Prior to the construction of the Canal a number of small communities dotted the Rideau Corridor, many of which were centred around milling operations. These mills serviced local farmers from the surrounding areas. The following is a list of the pre-canal mills: Kingston Mills, Upper and Lower Brewer's, Davis, Smiths Falls, Merrickville, Burritts Rapids, Jones Falls and Chaffeys.

The settlements were small and very poorly linked to each other and the rest of Canada. It was the Rideau Canal that was responsible for bringing them closer to each other and the rest of Canada. The importance of a communication link in Canada at this time, especially a canal, was stressed strongly by MacTaggart. "Canals in the country are much to be preferred before land-roads, through the woods; they are more easily constructed, and will require less repairs afterwards. Let the dry-stone lock be the one used to pass the rapids and key-work dams; the numerous rivers and streams, which wind through Canada in all directions, point to Canals as the root of improvement."
In the infant stage of operations, the Canal was the sole lifeline of the Rideau Corridor. Commercial vessels used the system to service the farms, mill sites and settlements of the area.

For at least a decade after the Canal opened, one of its minor functions was to pass Indian canoes travelling to and from their hunting areas (the Rideau Lakes and River).

It has been said that the Rideau Canal was never used for its intended purpose. In the first two decades after the completion of the Canal, military boats and men did use the Canal, but not under war conditions. Military traffic was never heavy compared to commercial use, but was a regular user of the system until the 1850's. Commercial use on the other hand played a major role in terms of traffic flow on the Canal throughout the 19th century. A study of the flow patterns from 1832-1895, reflects the direction the Canal was going in terms of a transportation route and also the economic activity within the Rideau Corridor.

The first pattern was a one-directional circular pattern from Montreal to Kingston through the Rideau Canal. The emphasis was on transporting merchandise and empty barges from Montreal to Kingston and return via the St. Lawrence with wheat, flour and pork for Atlantic trade. This pattern lasted from 1832-1848. This early pattern clearly illustrates the rapid adoption of the system. The reason for the circular flow pattern during the early stage of the Canal was to move barges quickly and cheaply to Kingston. Secondly, technology had not overcome the rapids of the St. Lawrence route. Other than logging, the economic activity of the Rideau area itself was non-existent.

The next flow pattern was from 1849-1860. The initial reason for the change in pattern was the completion of the St. Lawrence Canal. The new route from Montreal to Kingston was shorter and faster than the Rideau Canal and, therefore, stole most of the ascending traffic. In spite of the St. Lawrence Canal, a large, significant amount of traffic remained on the Rideau Canal. The bulk of this traffic was steamers moving passengers and general cargo along the Rideau system. Floated or barged timber increased significantly during this period, especially American vessels. American ships would sail up to Bytown via the Ottawa River to pick up Gatineau lumber and return to the United States by way of the Rideau Canal. It was evident that the Ottawa-Rideau system was becoming the circular pattern for timber products.
The third flow pattern (1861-1875) illustrates the increased lumber trade and maturing of commercial activity in the Rideau Corridor. The movement of empty barges into the Rideau area to bring out timber products and iron ore increased significantly. At the same time, increased movement of passenger and merchandise into the area increased. This traffic generally was to Smiths Falls and Ottawa. Traffic flow from the Kingston end versus the Ottawa entrance was approximately 5 to 1, indicating the decline of the Ottawa-Rideau system in terms of inter-regional movement. It was becoming increasingly evident that the Rideau Canal was merely a branch of the St. Lawrence. The Rideau Canal was fast becoming a intra-regional communication link. The increase in passenger usage indicated the lack of other forms of transportation in the Rideau Corridor at this time (i.e. roads).

The last flow pattern of the 19th century (1876-1895) saw a general decline of timber of the Rideau Canal, but an increase in coal vessels from Kingston to Smiths Falls.

The rise of Smiths Falls in the last 25 years of the 19th century as a railway centre was responsible for the majority of coal shipped on the Canal. The coal for the trains was shipped from the United States. Large barges transported the coal across Lake Ontario to Kingston. These barges were much too large for the Rideau Canal to handle so the coal was transferred to smaller barges at Kingston. This method survived well into the 20th century. In 1920, the last barge of coal sailed from Kingston to Smiths Falls. It had become more economical to transport the coal in railway cars on ferries across Lake Ontario and ship them on to Smiths Falls by rail.

By 1885, new all-purpose steamers replaced the barges. These new vessels were capable of carrying passengers, general cargo, coal and lumber. As the century came to a close, the Rideau Canal was essentially bi-directional, servicing only the people within the Rideau Corridor. The impact of railways and highways did not hit the area as early as expected because they did not service the hinterland adequately. The increase in passenger and tourist trade between Kingston and Ottawa at the end of the 19th century confirms the lack of proper rail and roads through the area.

Two of the most popular passenger steamers of this era were the "Rideau King" and "Rideau Queen". They gradually became obsolete with the improvement of road and rail transportation.
As commercial traffic declined in the latter years of the 19th century, recreational traffic increased. This new use for the Canal has been increasing in popularity to this very day.

With the increase of pleasure crafts, a number of safety regulations had to be enforced. Such as:
1. A speed limit in artificial channels (1908)
2. Installation of lifebuoys at all lockstations (1911)
3. Smoking was prohibited in locks (1914)

Other problems arose with the increase in recreational boating:
1. There were no charts or channel markers to follow, which made navigation for "Sunday" boaters difficult and sometimes dangerous.
2. Boat wakes caused bank erosion.
3. Rapid spring run-off because of deforestation plus the changing drainage pattern of the Rideau Watershed caused a shortage of water during late summer. As a result, commercial boats were unable to use the Canal.

Many people consider the twelve-hour day the canalmen of today puts in, quite long but, compared to the canalmen back in the 1800's, they have it pretty soft. Up until 1871, the Canal was open 7 days a week, 24 hours a day. From 1871 to 1914, the Canal was closed all day Sundays, but because of the increasing demand on the Canal by recreation boats the Canal was forced to stay open Sundays.
The increased number of people on the Canal also created a demand on the area surrounding the Canal. Resorts like the Opinicon at Chaffey's Locks or Hotel Kenney at Jones Falls were built to accommodate these boating enthusiasts. The need for public parks and picnic areas was also in demand. Town organizations and Canal officials made areas along the Canal suitable for such purposes. The most extensive of these groups was the Ottawa Improvement Commission.

By World War I, the Rideau Canal was used strictly by local traffic within the Rideau region. Commercial traffic had found cheaper and more efficient means of transporting their goods.

The function of the Rideau Canal has changed a number of times in its history but, no matter who it was catering to, the Canal has always been in financial trouble. The introduction of tolls in 1832 was an attempt to help decrease the high cost of operations and maintenance. Between 1832 and 1903, the tolls were altered many times in an attempt to increase traffic flow, but all were in vain. By 1903 the tolls were eliminated and the Rideau Canal became a free service to the public. During the 71 years of tolls on the Canal, the average annual revenue from the fee was $5,000.00, a far cry from the high cost of maintenance.

Tolls were reintroduced in 1975 as part of a change in Parks Canada policy.

Today, boats from virtually all over the world travel on
the Rideau Canal, but recreation is not just limited to boating and other summer sports. The winter also provides a treasure house of enjoyment for the outdoor enthusiasts. In Ottawa, thousands of skaters enjoy a four mile stretch of the Canal between the National Arts Centre and Hartwells Lock.

The Canal has gone through drastic changes since 1832. It is hard to image the political unrest between Canada and the United States that initially prompted the construction of such a Canal. It is equally hard to look at the Rideau Corridor today with all its activities and imagine that it was once an area lacking in population, transportation routes and usable resources. Today the Canal is not an essential mode of transportation, a far cry from how MacTaggart first envisaged it.

The functional changes on the Canal can be divided into four separate periods:

1. 1832-1853 The "Military Phase"
2. 1853-1914 The "Commercial Phase"
3. 1914-1972 The "Recreational Transport Phase"
4. 1972- ? The "Historical Phase"

All of these periods have left their mark, in one way or another, on the Canal and its corridor.
Structural Changes

The major structures of the Rideau Canal underwent few changes in the first 100 years of operation. Maintenance, however, was a constant problem. The locks were vulnerable to the harsh Canadian climate which eroded the stone work. By the late 19th century, cost of repairs were increasing. The dams and weirs were also under increasing strain. As the land surrounding the Rideau Canal was cleared, spring run-off became increasingly rapid. Consequently, further stress on the decaying Canal structures meant an increase in maintenance. By the mid-1800's, the cost of maintenance was so high that government officials were reluctant to incur expenditures other than those necessary to keep the Canal in navigable condition. The Canal survived into the 20th century with much of its original appearance unaltered.

The stone work of the locks and dams appear original. Up until the 1920's, deteriorated blocks were replaced with similar stone masonry. After this date concrete blocks resembling the original blocks were used to replace the old blocks. A careful investigation of the blocks can determine its type. The majority of their blocks are still of stone.

Wooden structures, on the other hand, have not fared as well. Lock gates have been replaced approximately every 15 years. They have altered slightly in design but much of the original appearance has survived.
When the Canal was built, 24 waste weirs were installed, 15 of which were constructed as rock-filled cribs. The wooden crib and the stone waste weirs have all been replaced by concrete structures except for the cut stone waste weir at Clowes Lock.

Operation of the gates has undergone a number of changes since the Canal was built. The original method consisted of pulleys along the floor of the lock and an endless chain which ran up the wall to a crab. The gate was closed or opened by turning the crab. This method was constantly being fouled up by debris and was modified within a few years. The new method added a long balance beam to the top of the lock. The chain was attached to the end of the beam instead of the bottom of the gate. Both methods can still be seen on the Canal. The original system has been retained on one gate at both the Ottawa and Kingston Mills Lockstations. The second system can be seen at a number of stations.

The third system adopted by the Canal utilizes a draw bar and eliminates the long balance beam and pulleys. The bar is attached to the top of the gate at the mitre post and runs back under the crab. A chain is attached to the end of the draw bar. It runs back along the bar, around the drum of the crab and is then fixed to the other end of the draw bar. The gate is opened or closed by turning the crab in one direction or the other. The draw bar method is the most common system seen on the Canal today.

The most recent operating system is the hydraulic method. It has been adopted at three lockstations — Black Rapids, Smiths Falls Combined and Newboro.

Other modern changes such as a concrete lock chamber at Combined and steel gates at Newboro have also been adopted.

Administrative Changes

Canal operations were controlled by a number of departments from 1832 to the present. Initially, the British Ordnance Department controlled Canal operations (1832-1857).

The majority of lockmasters and canalmen employed on the Canal at this time were veterans of the British army who participated in the construction. This ensured that there would be ample skilled workers to repair and maintain the Canal.
A TYPICAL LOCK

SECTION A-A
VERTICAL EXAGGERATED - NOT TO SCALE

PLAN VIEW - A TYPICAL LOCK
SCALE 1" = 20'

STOP LOG SILL
GATE SILL
GATE RECESS
SLUICE CHAMBER OPENING

WING WALL
WINGWALL CRAB
SLUICE VENT
LOCK COPING
BOLLARD
SHORT SWING BAR
FLOW
LOCK GATES
SLUICE CHAMBER

LOCK GATES
GATE SLUICE
GATE RECESS
LOWER APPROACH WHARF
WINCH OR CRAB
WALL SLUICE
SHORT SWING BAR
FLOW
LOCK GATES
SLUICE CHAMBER

SCALE 1" = 20'
By the early 1840's, the British government was trying to get out of paying the enormous bill for Canal maintenance. They wanted to turn the Canal over to surrounding land. The provinces would not agree on the British terms. In 1857, the British finally agreed to give total authority of the Canal and the surrounding Ordnance lands to the provinces. For the next ten years, the Board of Works for Upper and Lower Canada supervised the Canal. As soon as the provincial government took control of the Canal, attempts were made to cut expenses.

The Canal staff was cut drastically, men were discharged during the winter, Ordnance land was sold and fees for locating mills at dams were enforced. Despite the attempts to reduce expenditure the Canal continued to be in the red.

After confederation the Canal was put under the jurisdiction of the Department of Public Works and continued so until 1889 when it was replaced by the Ministry of Railways and Canals.

In 1936 the Ministry of Railways and Canals became the Department of Transport. They continued to control the Rideau Canal until 1972 when the government turned the Canal over to Parks Canada, a branch of the Department of Indian Affairs and Northern Development. The government recognized the historical and recreational importance of the Canal.

The objective of Parks Canada is to identify a system of resources which is representative of Canada's natural and human history, to preserve these resources and to encourage an awareness of their values through use and enjoyment.

This broad goal can be sub-divided into National Parks, National Historic Parks and Agreements for Recreational and Conservation Programs (ARC). The Rideau Canal is considered to be a historic waterway within the ARC Program. Its purpose is to provide both an area for water-oriented activities and to give us a better appreciation and insight into Canada's early years when canals were very important forms of communication and transportation.

Communication along the Canal was slow up to 1889 when a telegraph line was constructed the length of the Canal. Before the telegraph was installed, communication between locks was sent by the boats passing through the Canal. By 1906 the telephone was in use and connected Ottawa, Hogs Back, Long Island and Black Rapids. Within ten years most of the lockstations throughout the system were equipped with telephones.
Such problems as physical deterioration of the Canal structures, shortage of water and increasing financial deficit continued to plague the Canal after Confederation. This led to the questioning of the Canal's continued value. Plans to shut down the Canal were proposed, but all the plans were abandoned in the initial stages.

An attempt to improve efficiency of the Canal and thereby increase traffic and decrease the deficit of the Rideau Canal was undertaken. Dredging of shallow areas, especially artificial cuts was done on a regular basis and buoys to mark the channel were placed at the most dangerous spots.
PART TWO

STUDY OF THE INDIVIDUAL LOCKS
KINGSTON MILLS

Kingston Mills is the most southerly station on the Rideau Canal. It is located about 4.5 miles upstream from Kingston Harbour on the Cataraqui River. Although the first lockstation is located at this point, the Canal officially starts at the La Salle bridge crossing Cataraqui Bay in Kingston Harbour.

A natural channel between two granite cliffs leads up to the first lockstation on the Canal. These towering granite structures illustrate one of Canada's most distinguished landforms, the Canadian Shield. To the right of the locks is the old course of the Cataraqui River. Today it is the site of one of many small power houses along the Canal which utilize the water power available to them. The bottom three locks are continuous, but the fourth is separated by a large turning basin, once used to load and unload cargo. A dam was constructed at the lock to raise the level of the Cataraqui River to a navigable level from Kingston Mills to Lower Brewer Mills a distance of 10 miles. The centre of the dam is constructed with stone but the wing dams that reach out over a thousand feet to each side was built of clay and broken stone. The use of dams along the Canal was one of Colonel By's basic designs. By building dams, areas such as rapids or marshes were flooded out providing navigable waters without extensive excavation or dredging.

The Kingston Mills station is rich in character. A number of themes are conveyed at this site. A feeling of engineering accomplishment in a rugged and challenging natural setting is the most obvious, but a closer look reveals the military significance of the station. The presence of the blockhouse, which is strategically located to view the entire site, brings to mind the reason for the Canal's existence. Other characteristics of the station include recreational activity, transportation and natural history.

Earlier uses of the Canal have left only a small trace of its presence. Before the Canal was built, the water power at Kingston Mills supplied a large grist mill which in turn supplied the surrounding area. The building of the Canal brought the military significance to light, followed by commercial and finally recreational activity. The rebirth of industry along the Canal saw the return of the grist mill and subsequently the construction of the power station. It should be noted that the industrial activity along the Rideau and Cataraqui system before and after the construction of the Canal was determined by the availability of water power.
The relationship between Kingston Mills and Kingston dates back to 1783 when a grist mill and saw mill were established to supply the naval establishment at present day Kingston. The saw mill played an increasing role for shipbuilding in the Kingston area and sawed timber for the construction of homes for a growing community.

The Cataraqui Falls created a major obstacle for navigation and therefore were bypassed during the construction of the Canal. The construction of the locks, dam and embankments altered the landscape drastically. It flooded out the existing river bed and large amounts of land bordering the river from Kingston Mills to Lower Brewers Mills. Unlike other sites, the construction of the locks at Kingston Mills did not destroy initial human developments (mills). They have worked side by side from the beginning to the present. The Gananoque Light & Power Company is evidence of this.

Like Kingston, the lockstation was supplied with military defence for protection from both American invasion and the threat of sabotage from brigands and rebels during the rebellion in Upper Canada. The American Civil War in the 1860's once again brought concern to the protection of the Canal and again soldiers were stationed at Kingston Mills.

The increase of economic activity on the Canal increased the significance of Kingston Mills. It was considered to be an outport of Kingston because a navigable channel from Kingston Mills to Kingston was not built until 1837. This meant that Kingston Mills was a loading or unloading harbour for Kingston.

The significance of Kingston Mills as a trans-shipment point...
is supported by the fact that the Grand Trunk Railway was constructed over the lower lock and that the station was located between Kingston and the locks, thereby easily servicing both.

Another transportation route that has significant historical value at Kingston Mills is the road leading from Kingston to Montreal that crosses the upper lock. The road dates back to precanal days and after many alterations, still exists today.

Today, recreational activity plays a major role in Canal functions. As early as the 1850's, Kingston Mills was considered a popular resort for picnics and other summer activities. A refreshment stand was erected below the locks for the convenience of the visitors and the turn of the century saw Canal land being rented out for the construction of cottages.

Despite the numerous ties to Kingston, a separate identity did exist at Kingston Mills. The village was small but to some extent was self-sufficient. The presence of mills, inns, taverns and a rock quarry illustrates that the village was not totally dependent on Kingston. In fact it serviced Kingston with such products as timber and flour.

Inventory of Canal Structures

Existing Structures:

A) Canal and Site Buildings
- Blockhouse
- Lockmaster's House
- Lock Office
- Storehouse
- Gananoque Light and Power Company Powerhouse
- Stone house and wood outbuilding near quarry, west of locks

B) Engineering Structures
- Four locks
- Basin between third and fourth locks
- Original stone dam weir
- Embankments to east and west of original dam
- Gananoque Light and Power Company dam and weir
- Fixed bridge and embankment over power company's dam
- Steel swing bridge over lock
- Railway bridge and line
C) Other Points of Interest

- Quarry to west of locks
- Existing archeological remains: mill foundation, foundations of two canal buildings

Missing Structures:

A) Canal and Site Buildings

- First and second lockmaster's houses
- Lockman's residence (The Lodge)
- Lockman's residence
- Additions to Blockhouse
- Storage buildings barn beside present storehouse
- Pre-canal grist and saw mill (s?)
- Additions to Blockhouse
- Storage buildings barn beside present storehouse
- Pre-canal grist and saw mill (s?)
- Inns and taverns
- First Grand Trunk Railway Station (between Kingston Mills and Kingston)
- Other buildings (Clerk of Works house, store, railway buildings, shanties, stables, smith's shop, etc.)

B) Engineering Structures

- Original waste weir (partially missing)
- "Long Bridge" (over waste weir and dam)
- Wooden swing bridge over locks
- First steel swing bridge over locks
- Wooden bridge joining first lockmaster's house to site
- First and second railway bridges

Blockhouse:

The blockhouse at Kingston Mills is one of four such buildings on the Rideau Canal. It is one of the oldest buildings on the Canal (1832) dating back to the Canal construction period. It is a building of considerable historic significance which reflects the Canal's military purpose. Unlike the other blockhouses, it has not been rebuilt.

The blockhouse was built to accommodate lock attendants plus double as a "secure depots in time of war for provisions, ammunition and small arms for the militia". The lower walls were made of stone four feet thick, which support a floor of thick beams and a layer of masonry. This made the first floor fire-proof and nearly bomb-proof. By also intended the upper storey and roof to be tinned to make it indestructible by fire but such measures were never undertaken.

...33
The blockhouse has undergone a number of changes to suit various use requirements. It was used until 1965 as living quarters by one of the canalmen. New windows were cut, loopholes blocked, a new door opening cut, and a ground addition built which was recently removed.

**Lockmaster's House:**

This structure was built in 1904 for lockmaster Anglin. His previous house had deteriorated badly and was thought to be a health hazard for him and his family. This building served as a lockmaster's residence well into the 20th century. Today it is used by the Canal staff as a lunchroom and storage area.

**Lock Office:**

Very little is known about this building. A similar building appears in a 1930 photo but it is unknown if it is the same building. It is a one-storey frame building used by Canal employees.

**Storehouse:**

A number of references have been made in Canal records of storehouses being constructed at Kingston Mills. The earliest on record was in 1882 and the most recent in 1923. It is difficult to determine when the storehouse that exists today was built. The storehouse is a frame storey and a half building, and is in good condition. It has been relatively unaltered from its original construction.
Powerhouse - Gananoque Light and Power Company:

The generating station is not part of the Canal, but due to its reliance on the Canal, its history is worth while. The powerhouse was constructed in 1913 by the Gananoque Electric and Water Supply Company Limited. Negotiations with the government for the construction of the powerhouse took several years. Government officials were concerned about the effect of the generating station on the Canal. Since 1832, the Canal was confronted by angry mill owners over their rights to water. Canal officials were determined not to let a similar situation arise with the power companies.

The presence of the powerhouse did alter the landscape of the lockstation but didn't effect Canal operations. The presence of the power plant, with penstocks, a new dam and waste weirs, changed the site drastically. The old grist mill that was in operation until this time was demolished.

The history of the Gananoque Power Company dates back into the 19th century. It is one of the oldest private power companies left in Ontario. It also has other operations along the Canal.

The station is in good condition and is likely to continue supplying the Kingston Mills area with electricity in the future. Hopefully, the station will preserve the historical attributes it possesses. With the increased visitation to the Kingston Mills Locks, the power station could be an appreciated addition to the interpretative service.

Stone House and Barn at Quarry:

About 4 miles west of Kingston Mills are the remains of one of the limestone quarries thought to have been used to supply the masonry required in the construction of the Canal. Little is known about the operations or the length of time it was in use. Two buildings remain at the site today. One is a storey and a half stone building that is believed to have been the quartermaster's house. Today it is abandoned and has deteriorated considerably. The other structure was a barn. It has been destroyed by fire and only the stone foundation remains. The age of these buildings is unknown but are 19th century architecture.

The small amount of excavation apparently carried out here leads experts to believe another larger quarry in the area was responsible for the stone required to supply Kingston Mills.

New forms of industry...
Engineering Structures:

Originally, three locks were to be constructed at Kingston Mills to overcome the falls on the Cataraqui River. Two other separate locks were to be built further upstream at the Jack and Billidore rapids. A mistake in water level calculations forced Colonel By to revise his plans. The presence of wetlands along the route also convinced Colonel By to raise the water level at Kingston Mills, flooding out the rapids and marshes upstream as far as Lower Brewers. This meant an additional lock at Kingston Mills and a dam to raise the level of water 20 feet. By doing this, Colonel By eliminated two locks further upstream, and made the task of dredging a channel much easier. The contractor who undertook the task of building the Canal structures at Kingston Mills was Robert Drummond. He became one of Kingston's largest landowners and shipbuilders. It was his boat "The Pumper" that was used by Colonel By to officially open the Canal.

A number of challenges confronted Drummond in his work. The excavation of rock through the granite gorge with hand-drills was a feat in itself. Like other areas along the Canal, Kingston Mills was plagued by malaria. The straightening and deepening of the channel upstream also caused considerable concern. A large bar in the channel below the locks hampered navigation from Kingston Mills to Kingston. Several years after the completion of the Canal (1837) the channel was cleared, making Kingston, not Kingston Mills, the terminating point of the Canal.
Early canal days at Lower Brewers. A ten mile journey along the flooded reach above Kingston Mills brings us to Lower Brewers lockstation. This single lock with a life of 13 feet is situated amidst a quiet rural setting.

Four features stand out as historical structures: the defensible lockmaster's house, the wooden swing bridge, the mill and the generating station.

In pre-canal days a sawmill was in operation at Lower Brewers. It was one of two mills owned by Mr. Brewer. The other mill was located at Upper Brewers. Both mills were destroyed by Canal construction.

The presence of the lockstation at Lower Brewers did not stimulate the growth of a settlement. Prior to the 1860's, the Lower Brewers settlement comprised of the lockmaster and his canalman. The construction of a grist mill at Lower Brewers by J. Foster in the 1860's rejuvenated the pre-canal activity. Shortly after the construction of the grist mill, a woollen mill and various stores were added to the site. This increase in commercial activity at Lower Brewers was far from unique. The rise of rural development was found throughout the Canal. A need for services such as processing flour, feed and yarn was a must for the local farmers.

Shortly after the turn of the century a brick manufacturing operation appeared. The abundance of clay in the area prompted such an industry to locate at Lower Brewers.

An improvement in transportation lead to the decline of these numerous rural economic pockets. The rise of the automobile in the early 20th century resulted in the decline of such places as Lower Brewers. Farmers were able to travel further to process their products or to pick up supplies. This created larger industrial centres and fewer local operations. By the 1940's the effect of this change was evident at Lower Brewers. The local mills could not compete with low cost and convenience of the large industrial centres.
Finally, business declined to such an extent that the main mill structure was sold to the Gananoque Light and Power Company. For a few years after the generating station and the mill operated together. The power station provided electricity to the mill, so some grinding did continue for a short time after. The powerhouse continued operations until 1970 when the generator burnt out. This marked the end of the industrial activity at Lower Brewers which had existed in one form or another from the early 18th century.

The development of the Lower Brewers site is an excellent cross-section of the changing economic pattern of the Rideau Corridor.

INVENTORY OF CANAL STRUCTURES

Existing Structures:

A) Canal and Site Buildings
- Lockmaster's house
- Storehouse
- Lock Office
- Post-canal mill building
- Gananoque Light and Power Company powerhouse on mill foundation
- Residence on land leased by G. McBroom
- Wooden structures on land leased by G. McBroom
- Adjacent farm buildings
B) Engineering Structures

- Single lock
- Embankment (dam and weir)
- Wooden swing bridge
- Concrete fixed bridge over waste weir
- Canal channel

Missing Structures:

- Pre-canal mill
- Post-canal mill building (foundations are still under powerhouse)
- Wooden buildings on post-canal mill lot
- Wooden fixed bridge over waste weir
- Original waste weir bridge
- Stables, storehouses, etc.
- Perfect Tile and Brick Company yard near station

Lockmaster's House:

The original one-storey lockmaster's house was constructed some time between 1832 and 1847. Its military significance is evident in both its construction and location. It was built of rough masonry with loopholes on all sides and is situated on the man-made island between the original river and the artificial channel and lock. The strategic location of the house enables a clear view of both the upper and lower approaches to the lock.

Besides protecting the lock it was also used to house the militia in time of war and to store arms and munitions.

A second-storey frame addition was built in 1898-99. This was a familiar undertaking throughout the Canal during this period. It has been suggested that changing social standards prompted such alterations.

The military purpose of the defensible lockmaster's house was no longer necessary, but the desire for a more liveable home was evident. In 1898 the Department of Railways and Canals declared that this house was unhealthy for human use. In the next two years considerable changes were made. The second storey was added, consisting of four rooms and the downstairs walls were "furred, lathed and plastered".

Additions to the house were added and removed throughout the years as the needs of the lockmaster changed or the structure deteriorated. The last addition was
built around 1930. It was a wooden frame structure with a concrete foundation. The loopholes have been filled in but because the stone does match the original stone used, the loopholes can easily be identified.

The building was used as a home up until the 1960's. Department of Transport regulations in the 1960's discouraged the use of Canal buildings as homes for their employees.

**Storehouse:**

This one and a half storey frame building is believed to have been built in 1930-31. An early storehouse was built in 1851. This type of building is a familiar site along the Canal. They were used for a Canal office, storage and accommodation for canalmen and maintenance crews that travelled from one lock-station to another.

**Lock Office:**

The age of this building is unknown but it is similar in design to buildings that were built in the late 19th and early 20th centuries.
Post-canal Mills Complex:

Like many other points along the Canal the excess water at Lower Brewers was used to operate a mill. A sawmill operated here before the Canal was built but changes in the landscape during construction forced Mr. Brewer, owner of the mill, to abandon it.

Until the Canal was a responsibility of the Canadian government, little was done to encourage the rejuvenation of mills along the Canal. The enormous cost of running the Canal prompted the Ordnance Department to sell water privileges along the Canal. In 1861, James C. Foster was granted the lease at Lower Brewers to build a grist mill.

Foster died in 1884, but his wife kept the mill until 1896, when she sold the mill to William and Robert McBroom. Since at lease 1878 a John Hughes took charge of the mill. No record shows Hughes buying the mill but an 1878 map shows Hughes as the operator of the mill. The map also indicates a woolen mill and a store at the site.

Lower Brewers is a typical example of the rural economy of the early 20th century. Its services to farmers were numerous. Its store provided supplies, the mills converted the wool to yarn and the yarn to clothes and the wheat to flour.

By 1940 the automobile had decreased the problem of transportation and the rise of the large industrial complexes had made the small mills obsolete. In 1943 the main mill building was sold to the Gananoque Light and Power Company. The electricity from this plant powered the other mill. It is unknown how long grinding continued at the mill but feed was sold until 1968.

Power House:

Operations at Lower Brewers by the Gananoque Light and Power Company are fairly recent compared to Kingston Mills where operations began in 1913. The company was interested in Lower Brewers before this time but McBroom was not willing to sell his water rights. The decline of local milling encouraged McBroom to finally sell in 1942. The powerhouse was built the following year on the foundation of the old mill.

Operations continued until 1970 when the generator burnt out. The other three stations owned by the
Gananoque Light and Power Company -- Jones Falls, Upper Brewers and Kingston Mills are still in operation. The power company originated in the 19th century and is one of the few private companies left in Ontario.

Engineering Structures:

The engineering structures at Lower Brewers are 120 foot long dam, 9.5 feet high, a waste weir, a single lock and two bridges -- one crossing the waste weir and a wooden swing bridge crossing the lock.

The dam raised the water of the Cataraqui Creek, flooding out the low-lying swamp along the creek up to Upper Brewers Mills.

Samuel Clowes was the first contractor at Lower Brewers, but because of difficulties he was forced to quit. His work was constantly being flooded by the mill owner at Upper Brewers and his work was frequently halted because of malaria. Robert Drummond took over for Clowes and completed the job.

The lock at Lower Brewers has been a constant problem since construction. An engineering report in 1906 revealed that the lock was "located in the wrong place... on cross timbers bedded into a very poor foundation of soft clay and sand". As early as 1840 the lock required repairs. Throughout its history the lock has been repaired regularly. Parts of the lock have been rebuilt along the way but leaking still persists. In the spring of 1976 parts of the wall collapsed. The entire lock was rebuilt the following winter.
The swing bridge at Lower Brewers is a reconstruction of the original swing bridge built in 1872. It is hand-operated and is one of five such bridges still in use on the Rideau Canal. The others are located at Nicholsons, Kilmarnock, Jones Falls and Brass Point.
Upper Brewers is located about 1 1/2 miles upstream from Lower Brewers Locks. It consists of two locks with a total lift of 18 feet. The locks are at the foot of an artificial channel while a powerhouse, owned and operated by the Gananoque Light and Power Company, is located at the head of the channel. Besides the powerhouse, an arched dam of earth and stone and a waste weir were built at the northern end of the channel. The original channel of the Cataraqui River flows to the east of locks, creating a man-made island on which the defensible lockmaster's house and lock office are located. A number of cottages dot the shoreline to the west of the channel, one being an old houseboat called "The Ark". It is now on land and has been converted into a cottage. Also on the west side are a few old buildings -- a general store, a stable and the Deane residence. All of which are no longer in use.

Similar to Lower Brewers, the land surrounding the lockstation at Upper Brewers rises up from the locks. The slopes are heavily forested with both deciduous and coniferous trees.
A road on both sides of the lockstation service the site but because there is no through traffic, few people visit Upper Brewers. The majority of visitors come by boat and even then they are just passing through.

Although an area of little activity today, Upper Brewers was a busy village in pre-canal days. In 1827 when construction began on the Canal "Brewer's Upper Mills" as it was then called, consisted of a sawmill, grist mill and a brewery. John Brewer, the founder of the village (1802) and owner of the mills was also the contractor for the Canal work. Before the work began Colonel By bought the mills and surrounding land from John Brewer. The mills were shut down and left to deteriorate.

Like so many other contractors, John Brewer ran into problems. Cranberry Bog, located just north of the site, caused most of the concern. This marshy area was the most feared place along the Canal. Upper Brewers, located just south of this "hell hole", was the worst site throughout the Canal for malaria. In the summer of 1828 malaria was so bad that it literally halted work at Upper Brewers. This fear of both malaria and the Cranberry Bog no doubt resulted in a high percentage of desertion amongst the workers.

In addition to the malaria problem, Brewer ran into financial problems. He was unable to complete the project and fled the country. He was succeeded by John Drummond, who completed the job.

Between 1832 and 1851, Upper Brewers lay dormant in terms of commercial activity. In 1850 William Anglin and a partner bought the mill rights at Upper Brewers. A year later a sawmill was constructed and operations began. It is not known what happened to his partner but within a few years Anglin had built up a prosperous business. By 1863 his mill site consisted of 48 upright saws, 3 circular saws, 1 stone for grinding grain. A number of buildings for storage and residential use were also reported at this time.

Business thrived until the 1870's when the mill ran into economic difficulties. This was caused partly by a depleting forest reserve in the surrounding area and partly by the lack of water to power the mills. The latter was a problem common to all mill owners throughout the Canal. On occasion, water to the mills had to be cut off in order to raise the water level. This was quite common in the spring. Water levels had to be kept...
higher than usual to ensure safe water levels in the late summer and fall. Consequently, water to the mills was cut off and operations had to be temporarily shut down. Despite its problems the mill continued on a reduced scale until the 1890's. Once again, Upper Brewers fell into a dormant period in terms of commercial use.

Sometime before 1868 Patrick Deane, the lockmaster at Upper Brewers from 1856 to 1898, built a house on the west side of the locks. Other buildings were later added. Members of the Deane family occupied these buildings for a century, after which the property was willed to Regiopolis College in Kingston.

It was not until 1939 that industry relocated itself at Upper Brewers. This time it came in the form of a power generating station owned and operated by the Gananoque Electric Light and Power Company. Four such stations were built by the Gananoque Company (Jones Falls, Upper Brewers, Lower Brewers and Kingston Mills). All but one (Lower Brewers) are still in operation.
INVENTORY OF CANAL STRUCTURES

Existing Structures:

A) Canal and Site Buildings
   - Defensible lockmaster's residence
   - Lockmaster's house
   - Lockmaster's garage
   - Deane buildings
   - Powerhouse
   - Powerhouse residence
   - Summer cottages

B) Engineering Structures
   - Locks
   - Dam
   - Embankment
   - Waste Weir
   - Fixed wooden bridge
   - High level bridge
   - Wooden deck
   - Concrete pier

Missing Structures:

A) Canal and Site Buildings
   - Lock labourer's houses and outbuildings
   - First storehouse
   - First lock office
   - Canalman's house
   - Second storehouse
   - Pre-canal mills and other buildings
   - Anglin mills

B) Engineering Structures
   - Self-acting safety gate
   - Pre-canal wooden bridge
   - Fixed bridge over the waste weir, ca 1830
   - Rolling bridge over the upper lock, ca 1828-32
   - Fixed bridge over the river, ca 1830
   - Fixed bridge over the river, 1849
   - Offset pivot swing bridge over the locks, 1851-68
   - Centre bearing swing bridge, 1868-1967

Defensible Lockmaster's Residence:

This house is one of 11 such defensible structures built in the 15 years following the construction of the Canal.
The defensible lockmaster's house at Upper Brewers is believed to have been built in 1842 and is one of 5 that has had no second storey added. Its strategic location on the hill at the head of the cut emphasizes the military significance of the buildings. It was occupied by the lockmaster and his family until 1868 when the lockmaster (Deane) built his own home. It was not used again until 1894 when the Superintending Engineer Wise told Deane to use the house himself or give it to his lock labourer Milne. Deane moved back in to keep Milne out. Four years later in 1898 Deane died. At this time it was reported that the house had been vacant for some time. Deane was replaced by Thomas Todd. A kitchen was added to the building and a stable was built close by. It is believed that the loopholes were enlarged into windows at this time and the porches removed.

Another report in 1930 reveals that the house was once again vacant and in very poor condition. The lockmaster was living in the canalman's house at this time. In 1940 Professor Humphrey leased the building from the Department of Transport and proceeded to repair it. In 1950 his lease was cancelled and Charles Ballard of Ottawa was granted a new lease. Ballard used it as a cottage until 1968 when he turned it over to Bob Crockett of Kingston.
Lockmaster's House:
The original house was built for the lock labourers. It was located above the locks, west of the Canal. By the 1860's it has deteriorated beyond repair. The house was not replaced until 1896-97 when the present house was built on the west side below the locks. The lockmaster took over this house sometime before 1930 and a house beside the locks was built for the canalman's family.

Lock Office:
The present building was constructed by the Department of Transport in 1967. It replaced a small frame building which was located at the top of the upper lock on the east side. The original office was built in the days when the Canal was open 24 hours a day. The long distance between the defensible lockmaster's house and the locks resulted in the construction of this building. It was used by the lockmaster and canalmen for protection and sleeping accommodations while they were on duty.

Powerhouse:
This generating station was built in 1939 by the Gananoque Electric Light and Water Supply Company. It is located below the waste weir where the Anglin mill was once located.

A house was built in 1946 for the powerhouse attendant, Charles Milne. The Milne family has an interest in Upper Brewers that goes back four generations. Charles Milne's son is the present canalman, his father was the lockmaster and his grandfather was a canalman for Patrick Deane.

Engineering Structures:
The two locks at Upper Brewers are located at the bottom of the artificial channel. Considerable work had been needed to maintain these locks since the turn of the century. Leakage through the walls and floor has resulted in considerable reconstruction. In the winter of 1910-11 parts of both locks were rebuilt with new stone. During WW I concrete was poured to stop leakage through the floor. In 1932 the east wall of the upper lock was rebuilt with concrete.

The dam, situated at the northern end of the artificial channel was constructed to raise the level of water in both Cranberry Bog and Whitefish Lake. Another dam at present day Morton was also built to prevent the water from draining down the Gananoque River.
Originally the dam at Upper Brewers was to be 16 feet high, but it was decided to increase it by an additional 2 feet. This increased the level of water in Cranberry Bog and reduced the amount of excavation required through the marsh.

A number of problems related to the dam followed its construction. The latest was a break caused by a "violent freshet" or spring flood in 1901.

A number of bridges have been constructed through the years at Upper Brewers. The last bridge was a swing bridge crossing the lower lock. It was built in 1868 and resembled those bridges at Lower Brewers, Nicholsons, Kilmarnock, Jones Falls and Brass Point. The bridge at Upper Brewers was torn down in 1967.
JONES FALLS

The Jones Falls lockstation is located between Whitefish and Sand Lakes. These two lakes are just part of a chain of lakes which the Canal follows along the Cataraqui Watershed. Jones Falls, like most of the lockstations between Kingston Mills and the Narrows, is located on the Frontenac Axis. The Frontenac Axis is an extension of the Canadian Shield which joins the Adirondack Mountains to the rest of the Shield. It is made up of a shallow layer of soil (stoney glacial till) and Precambrian rock (granite). The landscape is determined by the bedrock which has produced the irregular hilly topography common to this area. Over one-third of the Canal corridor lies within this geological region (Frontenac Axis). It is also part of the Great Lakes-St. Lawrence mixed forest region which accounts for the diverse tree vegetation in the area.

The construction of the Jones Falls lockstation was one of the largest feats on the Canal. Its contractors were faced with overcoming a series of rapids one mile long with a fall of 60 feet.

Work at Jones Falls began in 1827 and was completed in 1832. The contractors for the job were Thomas McKay and John Redpath. Colonel By's Clerk of Works, John MacTaggart, suggested a number of schemes to overcome the fall at Jones Falls but Colonel By developed a plan bolder than anyone had imagined. He proposed to build an arch dam 60 feet high and 350 feet in length. This dam was more than twice as high as any other dam built in North America at this time.

Six continuous locks of a 10 foot lift were originally planned for Jones Falls. This plan had to be abandoned when approval for a larger sized lock was granted. The site was not large enough to accommodate six of the larger locks (133' x 34'). Instead, four locks were constructed, each with a lift of 15 feet. The lower three locks were built in a series with the fourth lock separated by a basin.
INVENTORY OF CANAL STRUCTURES

Existing Structures:

A) Canal and Site Buildings

- Defensible lockmaster's house
- Blacksmith's shop
- Lock office
- Storehouse
- Hotel and houses in village

B) Engineering Structures

- Four locks
- Stone arch dam
- Overflow weir for dam
- Whitefish Dam (Morton)
- Wooden swing bridge
- Highway bridge, also wooden
- Dam and sluice for intermediate basin
- Sluice and penstocks for generating station
Missing Structures:

A) Canal and Site Buildings

- Guardhouse
- Officers' quarters
- Whitefish blockhouse (similar to guardhouse at Jones Falls)
- Original stone house

B) Engineering Structures

- Original wooden bridges (swing bridge and highway bridge)
- Original dam at Morton
- Original sluices for overflow dam

Defensible Lockmaster's House:

This defensible structure is located on a hill above the upper lock. Its clear view of both the upper and lower reaches supports the defensive nature they were originally designed for. It was built in 1838 by the Ordnance Department. Their purpose was really three-fold: 1) to protect the lockstation from American invasion; 2) guard against sabotage (Rebellion of 1837); 3) to provide adequate living accommodation for the lockmaster.

By the late 1830's, early 1840's the need for permanent housing for the Canal staff was probably in demand. Before this the lockmaster and canalman used the temporary buildings erected by the people involved in Canal construction. More than likely, these houses were poorly built and not very comfortable. The demand for housing, coupled with the need for defensible structures, was probably the reason that prompted the British Ordnance Department to combine a defensible structure and living accommodations.

The defensible house was used by the lockmaster well into the 20th century. There has been little alteration to its original appearance. No second storey was added to it as was to many of the other defensible houses. A wing and porches were added along the way but have now been removed.

Blacksmith's Shop:

It is located on the west bank of the station, just below the upper lock. The shop is made of stone and
was built in 1843. The size and remoteness of the Jones Falls site were the reasons given for the construction of such a building. Without the blacksmith's shop, repairs to the gates and other Canal structures would have taken weeks.

Guardhouse:

The guardhouse, located to the east side of the third lock, was constructed in the late 1830's or early 1840's. It was built in response to the Rebellion of 1837. It was a squared log building, one storey high and approximately 20 feet square. The guardhouse doubled as a defensive structure in case of sabotage during the Rebellion of 1837 and also as a building to house the lock labourers. It was restored once in the 1930's but was eventually demolished during World War II.

Lock Office and Storage Building:

These two buildings are of frame construction and represent the "commercial phase" of the Canal. By this time the need for military buildings no longer existed.

The lack of military architecture in these buildings illustrates the cessation of political unrest and the birth of commercial activity on the Canal.
Generating Station:

Unlike other lockstations that were built at the site of a pre-canal mill, Jones Falls did not stimulate the renewal of milling activities in the latter half of the 19th century. Industry did not relocate at the site until the 1940's. At this time a power generating station was built. This station, owned by the Gananoque Light and Power Company, is one of four such plants along the Canal. The other three are located at Kingston Mills, Upper Brewers and Lower Brewers. All but Lower Brewers are still in operation.

Engineering Structures:

There are four major engineering structures at Jones Falls -- locks, dam, bridges and waste weir. The locks and waste weirs were built of sandstone blocks from the Elgin quarry. During the first 100 years of operation, the deteriorated blocks were replaced by similar blocks from the original quarry. Early in the 20th century the blocks were replaced by concrete pre-cast blocks. This practice was familiar throughout the Canal in the 1920's.

In 1905-6 the clay and gravel dam in the basin was replaced by a concrete one. A sluice was installed in the dam to regulate the level of water in the basin.

The arch dam, also constructed from sandstone, was built in 1829-30. It was the highest arch dam built in North America at the time and is without a doubt the most impressive piece of engineering work on the Canal. Since its construction there has been only one alteration. In the 1940's, holes were drilled in the dam to fit the penstocks for the generating station.
The wooden swing bridge at Jones Falls is a reconstruction of the original bridge built by the British government between 1830 and 1840. This type of bridge is unique to the Rideau Canal as far as Canada is concerned. The wooden swing bridge was common throughout the Canal until the steel truss bridge was introduced in the late 19th century. There are five remaining wooden swing bridges on the Canal -- Lower Brewers, Brass Point, Kilmarnock, Nicholsons and Jones Falls.

Jones Falls Dam - the most impressive engineering structure on the Canal
DAVIS LOCK

Davis lock is situated four miles upstream from Jones Falls. A single lock lifts the boats nine feet from Sand Lake to an artificial channel which leads to Opinicon Lake. A number of granite outcrops jutting from the heavily forested shoreline surrounding the lockstation reminds the visitors of the geological characteristics common to the area (Canadian Shield).

Prior to the construction of the Canal, Davis Mills was a quiet community surrounding a mill operation. It is believed that Walter Davis, owner of the mill, set up his operation around 1800. Like so many other mill sites, Davis Mills was destroyed by the construction of the Canal. At many places along the system, new commercial activities were stimulated by the Canal but this was not the case at Davis. Even the renewal of milling operations which was a familiar trend along the Canal around the 1860's did not occur at Davis locks.

Davis lock (1930)

The history of Davis lock is supplemented by colourful tales of "hidden gold". A sum of money was given to Walter Davis by the Ordnance Department for payment of the land used to construct the lock. It is said that Davis buried the money for safekeeping. He eventually died and the money was never recovered.
Another tale claims that the money for payment of Davis' land was stolen by one of the labourers before reaching Davis lock. The worker was found dead a short ways away from the lock but the money was not with him. It is said to have been buried and apparently was never recovered.

Although these stories are believed to be no more than local tales, it does add an interesting flavour to the history of Davis lock.

INVENTORY OF CANAL STRUCTURES

Existing Structures:

A) Canal and Site Buildings
   - Defensible lockmaster's house
   - Lock office

B) Engineering Structures
   - Lock
   - Waste Weir
   - Waste weir channel
   - Fixed concrete bridge over waste weir
   - Dam
   - Timber crib wharves

Missing Structures:

A) Canal and Site Buildings
   - Davis' mill
   - Log watchhouse
   - Cook house
   - Other early buildings
   - Canalman's house

B) Engineering Structures
   - Timber waste weir (1832-ca 1930's)
   - Timber truss fixed bridge over the waste weir channel

Defensible Lockmaster's House:

There are eleven defensible lockmasters' houses along the Canal, all of which were built by the Ordnance Department during the fifteen years following the
Defensible lockmaster's house retains original design. The house at Davis is one of five which did not get a second storey added but other additions were constructed to accommodate the lockmaster's needs. The Davis' defensible house is the only residence that still retains its loopholes. For some reason, they have survived through the years. The other ten houses have had their loopholes filled with stone.

Like the other defensible structures, the house at Davis lock is located on top of the highest piece of land. This strategic location provided the lockmaster with a clear view of both the upper and lower approaches to the lock.

Other than the additions to the house in 1889 the external features of the house have changed very little. The roof is still covered with tin shingles, the stone porch is still intact and the loopholes have not been filled in.

Sometime before 1963 the house was vacated. The Department of Transport decided to sell it and the surrounding land but the Deputy Minister of Transport, John Baldwin, offered to lease it. Mr. Baldwin has renovated the house and is now using it as a summer cottage.
Lock Office:

The lock office was constructed in 1874-75, replacing a previous log storehouse. Similar buildings were built along the Rideau in the 1870's and 1880's (Lower Brewers, Newboro). They have all been torn down except for the one at Davis.

Except for a few alterations, the lock office has remained in original form.

Engineering Structures:

Canal construction at Davis was carried out by John Drummond between 1827 and 1831. The lockstation consists of a single lock, dam, waste weir and artificial channel.

A sixteen foot high dam was built to raise the water level in Opinicon Lake. This was a familiar procedure throughout the Canal because it eliminated the excavation of a channel through swampy or shallow waters. The construction of a waste weir helps regulate the water level above the dam.

A timber truss bridge over the waste weir was also built to provide access to the lockstation.

Considerable maintenance was required during the history of Davis lock. Repairs were first needed in 1837. The pressure created by the spring flooding had weakened the breastwall. It was grouted and strengthened with iron straps. Leakage through the floor years later forced the Ordnance Department to replace the floor of the lock.

The waste weir was also a problem throughout its history. Its opening was too small to handle the excess water in the spring floods. Similar problems were reported at other stations along the Canal, but nothing was done about it.

In the late 19th century repairs were needed once again. The wing walls and sills were rebuilt, the floor was relaid and the walls were grouted. During World War I this work had to be done once more. This time the floor was built of concrete, not timbers.

The original waste weirs have been rebuilt a number of times. It was rebuilt in the early 1870's, 1879 and again in 1903 – all of these were built of timber. It was finally replaced by a concrete waste weir in the 1930's.
All the waste weirs were built of the same size, ignoring the recommendation to enlarge them. The spring floods were responsible for the destruction of all these waste weirs. If they had been enlarged they may have withstood the pressure of the spring freshets.

Canalman’s House:

This house was built in 1887-88 to accommodate the canalman. It was located on the south side of the lock and was a 1 1/2 storey frame building. It was used by the canalmen and their families up to the 1940's. In 1963 it was put up for sale with the defensible lockmaster's house but there were no takers. It deteriorated beyond repair and was finally demolished in 1972.
Chaffeys established prior to Canal

A settlement was established at Chaffeys well before the Canal was built. The drop in water from the Indian to the Opinicon Lakes was a suitable site for milling operations. Late in the 19th century Samuel Chaffey settled at the location that today bears his name. It was on a trail that led from Brockville to the military settlement of Perth.

By the time plans were being made for the Rideau Canal, Chaffey had established an impressive mill complex which included a mill dam, distillery, carding mill, sawmill and a grist mill. MacTaggart, in his survey report of 1827, mentioned this thriving community. Milling operations played a major role in settling the frontier. They provided a vital service to the people of the area. Once a mill was established it was not long before a community surrounded it.

The Canal also had an impact on the area. The construction activity altered the landscape drastically. A number of buildings were erected to house the workers, the mill complex was destroyed and the Canal structures were built.

Although the Canal destroyed the activity that supported the community, it in turn stimulated new directions for the small settlement. A large number of people were brought to the site during the construction period, some of whom remained on the Canal after its completion. Many of these men were hired by the Canal to operate and maintain the locks. For the next few decades the community increased in size. Milling was reintroduced once again during the latter half of the century.

By the turn of the century a new form of commercial activity was evolving. This was the beginning of the recreational period. The first resort at Chaffeys was in the form of room and board. The Simmons began taking tourists in 1886. The house was eventually turned into a resort.

Another hotel began around the turn of the century. It was owned at that time by W.H. Fleming. The hotel was sold to William Laishley who named it "Idylwild". It was soon passed on to a private group from Ohio who renamed the resort the "Opinicon Club". This group was noted for their "...fishing by day and gambling and partying by night". The club survived until the early 1920's. It was then changed once again to a hotel.

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The original owner of the hotel, W.H. Fleming, added a number of rooms to an existing building. It is believed that this structure was the original residence of John Chaffey.

Many of the families in the Chaffey's area have, at one time or another, been connected with the Canal. The first owner of the Opinicon Hotel, W.H. Fleming, is believed to have been a descendant of the first lockmaster, William Fleming. Fleming was a corporal in the Royal Sappers and Miners. He was recommended for the position by Colonel By. Fleming was succeeded by James Simmons in the 1850's. It is believed that Simmons also worked on the Canal during its construction. Both the Fleming and Simmons families eventually got involved in the resort business at Chaffey's.

INVENTORY OF CANAL STRUCTURES

Existing Structures:

A) Canal and Site Buildings
   - Lockmaster's house
   - Lock office
   - Mill
   - Stable/barn
   - Opinicon Hotel
   - Lockman's house
   - Miller's house
   - The Scott (Chaffey) grave lot

B) Engineering Structures
   - Lock
   - Sluice/Weir/Dam
   - Swing bridge
   - Fixed bridge
   - Railway bridge

Missing Structures:

A) Canal and Site Buildings
   - Pre-canal mill
   - Kitchen
   - Blacksmith's shop

B) Engineering Structures
   - original waste weir (possibly included within existing weir)
   - original wooden swing bridge
Lockmaster's House:

A blockhouse was initially planned for Chaffeys Lock but it was never built. In its place a one-storey stone defensible lockmaster's house was built. The actual date is not known but is was built sometime between 1844-1847. Before this house was built the lockmaster lived in a log building erected during the construction of the Canal.

The purpose of the defensible structure was to accommodate the lockmaster's family and to provide military defense for the lockstation. An 1852 report refers to the house as being "Stone, tinned and loopholed". The house remained in its original form until the latter part of the 19th century. By this time the threat of war was no longer a primary concern. Complaints by the lockmaster of the poor living conditions within the house resulted in the rebuilding of the house.

Renovations to other defensible houses along the Canal were also undertaken during the 1890's. The Chaffeys lockmaster's house had a frame second storey and possibly some wooden additions added at this time.

The building continued to be used as a residence until 1964. At this time the additions were removed and the building took on the new function of a storehouse.
Lock Office:

Little is known about the lock office. Its architectural design resembled late 19th century or early 20th century design but the actual date is unknown. It provides the Canal staff with office and storage space.

Lockman's House:

The lockmaster at Chaffeys was assisted by a full-time and several seasonal lockmen. The lockman and his family occupied part of a house year round, while the temporary men used the rest of the house during the operating season.

The precise date of construction of the house is unknown, but it probably dates back to the late 19th century. Today the building is used by the Opinicon Hotel as a laundromat.

Mills at Chaffeys Lock:

The original mill complex was built by Samuel Chaffey prior to the Canal. It was eventually destroyed by the construction activity associated with the Canal.

Late in the 19th century the pre-canal activity was reintroduced. The exact date is unknown. Local accounts say a mill, built by John Chaffey, was constructed in the 1860's on the site of the present day mill. It supposedly burnt in the next decade.

The cornerstone on the present structure dates 1872, but steel bars in the foundation have an 1870 date on them.
The mill was definitely built before 1883. By this time the mill was well-established. The need for a bridge to cross the locks was increasing. A bridge would not only provide milling services to both sides of the Canal but also encourage additional settlement.

The mill continued its operations well into the 20th century. According to a local residence, Mrs. J. Laishley, who came to Chaffeys in 1925, the mill was not in operation at that time.

Engineering Structures:

The original plans for the Chaffeys lock intended to bypass the mills. The mill owner, Samuel Chaffey, was to carry out the work. The plan called for two dams and two locks. The approval of the larger locks forced By to alter his plans. He decided to place the lock chamber in the river bed, thereby destroying the mills. By deepened the river bed and installed a waste weir. Colonel By eliminated one dam. The raising of the water level above Davis also resulted in only one lock being built instead of two.

Work began in 1827 by a private contracting company owned by John Sheriff. The man in charge of Chaffeys was Mr. Haggart. Samuel Chaffey was originally given the contract but he died of malaria shortly after obtaining the contract.

During construction, the site was referred to on many accounts as "Haggart's Job". The bachelor's generous hospitality to all that passed the site earned him this namesake.

The only problem encountered during the construction period was malaria. Colonel By ordered that trees be cut down to better circulate the air. He believed the bad air in the swamp was causing the malaria. In reality, the mosquitoes were carrying the disease, spreading it every time they bit a worker. As expected, Colonel By's remedy for riding the area of malaria failed. As for construction problems, Chaffeys encountered no major engineering difficulties.

Work was partially slowed down by the lack of a local quarry. Sandstone had to be hauled six miles from the Elgin Quarry.

The repairs at Chaffeys have been minimal throughout its history. The waste weir was rebuilt in 1891.
and in 1902 part of the upper wing wall was replaced. Other than these two examples very few changes have occurred at Chaffey's lock.

A bridge existed prior to the Canal. It crossed Chaffey's mill on a trail from Brockville to Perth. The bridge was destroyed during Canal construction. It was the intent of Colonel By to replace this fixed bridge with a swing bridge to allow boats to pass. Unfortunately, lack of funds forced Colonel By to abandon his plan. Several petitions were sent to the government requesting a bridge. They felt a bridge would encourage farmers from both sides of the Canal to bring their products to the mill. A bridge may also encourage additional settlement in the area.

A wooden swing bridge was eventually built in 1884, almost 60 years after the previous bridge was destroyed. The wooden structure survived until 1949 when it was replaced by a steel swing bridge.
NEWBORO

The Upper Rideau Lake is the summit of the Rideau Canal. The Newboro lockstation is one of two exits leading from the Upper Rideau Lake. It opens up to the southwest into Newboro Lake, the first of a number of lakes and rivers making up the Cataraqui Watershed. The Canal follows a chain to its terminus, Lake Ontario. The other exit from the Upper Rideau Lake is the Narrows lockstation. It is located on the east side of the lake and is the opening to the Rideau system. It flows to the northeast, emptying into the Ottawa River at the nation’s capital.

The geology of the lockstation is quite different from the sites between Kingston and Chaffeys. They are all part of the Frontenac Axis, an extension of the Canadian Shield. Newboro on the other hand is on an outcrop of limestone and till which is part of the Smiths Falls Limestone Plain. Its most striking characteristic is the flatness of the plain compared to the ruggedness of the Shield.

The Newboro lockstation consists of a single lock, which lifts the level of water seven feet from Newboro Lake (originally called Mud Lake) to its summit. The Newboro lockstation is lacking in many features that are common to other stations. Newboro has no dam, swing bridge, road crossing the site or a waste weir. The water normally passed through a weir is run off through the gate sluices.

The Isthmus (Newboro) as it was once called, was not an active place in pre-canal days. Only a few families had settled there prior to the building of the Canal.

Work began in 1827 by the excavation contractor William Hartwell. His task was to build an artificial channel one and a quarter miles in length between Upper Rideau Lake and Mud Lake. It was not long until Hartwell ran into serious problems. A number of his men were stricken with the deadly "swamp fever", many of which died. The majority of the survivors fled for their lives. Due to the large amount of excavation required, many men were killed in blasting mishaps. Other contractors tried after Hartwell but they too ran into similar problems.

Finally, Colonel By decided to use the 7th company of Royal Sappers and Miners to do the work instead of contracting the job out again. By also altered his plans somewhat. Instead of excavating a deep channel from Mud Lake to the Upper Rideau Lake, Colonel By constructed a dam at the Narrows. This raised the water level 4 feet, which lessened the amount of excavation at Newboro considerably.
During construction, the Isthmus was a busy place. Over 60 log buildings were erected to provide offices, workshops and housing for the hundreds of workers and their families.

Surprisingly enough not all the workers left this forbidding place when the Canal was finished. The construction activity had encouraged merchants to come to the area.

After the Canal was completed, most of the Sappers and Miners and civilian workers probably left Newboro but the place was not deserted. The construction activity had encouraged merchants to come to the area. A small community had evolved and remained after the Canal was completed. By the mid-1800's the industries in Newboro included numerous mills, foundry, tanneries, a distillery and a furniture factory. Most of this activity was located around the mills to the east of the town on the shore of Newboro Lake. Later, commercial activities included a cheese factory, hotels and iron and phosphate mines.

A man responsible for much of the development of the Newboro area was Benjamin Tett. He settled at Newboro in 1828. By 1832 he had established a saw mill and store at Buttermilk Falls (Bedford Mills) and a shipping and timbering operation at Newboro. These establishments expanded tremendously in the few decades to follow. The Canal was responsible in part for this. The shipping of lumber products, and grain, along the Canal to cities in Canada and the United States was a familiar operation for Tett's company.

In 1843 Tett built a home on the corner of Drummond and Main Street. The house along with some of the mill complex and the store at Bedford Mills can still be seen today.

Tett died in 1878, but his businesses carried on until the 1920's by his heirs.

INVENTORY OF CANAL STRUCTURES

Existing Structures:

A) Canal and Site Buildings
   - Lock Office
   - Blockhouse
   - Garage
   - Whalen's house

B) Other Buildings
   - Tett house and other heritage buildings
   - Tett saw mill
C) **Engineering Structures**

- single lock (hydraulic)

**Missing Structures:**

A) **Canal and Site Buildings**

- approximately 60 construction site buildings
- Original one-storey lock office
- Log storehouse
- Lock labourers' houses and outbuildings
- Second watchhouse/storehouse
- Third lock office

B) **Other Buildings**

- The Tett warehouse and wharf

C) **Engineering Structures**

- Ordnance fixed bridge over the channel
- Various timber truss fixed bridges over the channel (1860-1888)
- Steel truss fixed road bridge (1897)
- 1886 steel truss railway bridge
- 1919 steel plate girder railway bridge

**Blockhouse:**

Colonel By's original plan called for a blockhouse at all lockstations, but because of the expense he was forced to abandon the idea. The purpose of the blockhouses were to protect the Canal structures. Only four blockhouses were built.

The Newboro blockhouse was built on a hill to the north of the lock by William Tett. He also had the contract for the blockhouse at the Narrows. Both blockhouses were completed in late 1833.

The blockhouse was never used to defend the lockstation but it is reported that on July 4, 1838, loyal citizens in fear of American invasion were called to defend the Canal.

The lockmaster at Newboro, D. McDonald (1832-56), was a retired military man. He was a member of the 7th company of Sappers and Miners who were involved in the construction of Newboro. The majority of lockmasters were military, carpenters or masonry people involved in the construction of the Canal. This procedure ensured By that the people involved with Canal operations would have a good knowledge of the Canal.
The blockhouse underwent numerous repairs and alterations through its time. These changes were to provide a more comfortable residence. It was used as a residence until 1963. The Department of Transport's policy at that time was to have no on-site residences. In 1967 plans were made to renovate the building.

**Lock Office:**

The lock office was built in 1967 replacing a previous wooden office/storehouse. The new office contains public washrooms, storage area, a canal office and the equipment for the operation of the hydraulic gates.

**Engineering Structures:**

As mentioned before, an artificial channel connecting the Rideau and Cataraqui systems was constructed at Newboro. Work was tedious because of the large amount of excavation required. Many men lost their lives by blasting mishaps and malaria. Newboro was considered one of the worst places along the Canal for malaria.

By's original plan did not include locks at Newboro. It was only when he decided to raise the summit level that he realized that he had to install locks at the bottom of the cut. Without locks the pressure would be too great at Chaffey's Lock.
The locks were built of sandstone. Initially they had no masonry breastwork. This would simplify its dismantlement if someday the channel was deepened and the locks were not needed.

It was important to keep the locks in good shape. Newboro, being the first lock on descent to Kingston, it was important to minimize leakage for the water reserve.

Through the years of operation, parts of the lock walls have been replaced. Up until the 1920's reconstruction was of stone from the Elgin quarry. After that time concrete blocks were used instead.

After the 1920's repairs were minimal until the mid-1960's. It was at this time that the hydraulic operated steel gates were installed. The old crabs remain on the breastwork but only on display.

A number of bridges have been built at Newboro. The first of which was a timber king post truss bridge. It was replaced by a timber queen post truss bridge in 1860.

A steel Pratt bridge in 1897 replaced the Queen post bridge. The present bridge was built in 1952.

The first railway bridge at Newboro was built in 1886. It was a steel Pratt bridge. It was replaced in 1919 by a steel girder span bridge. It survived until 1953 when the railway line was abandoned. Today, only the abutments of the two bridges remain.
NARROWS

A five mile stretch from Newboro brings us to the Narrows lock station. The body of water just covered was the Upper Rideau Lake, the summit of the Rideau Canal. A four foot drop at the Narrows brings us into the Big Rideau. It is the second of three Rideau Lakes, the last being Lower Rideau Lake which runs from Rideau Ferry to Poonamalie Locks. All three lakes are divided by a narrow channel.

The lock at the Narrows is the first of 33 in our descent to the Ottawa River. The boats will be lowered 273 feet over 80 miles. Even though the Canal drops 115 feet in just over five miles as it enters the Ottawa River, the average lift from the summit to Ottawa is only 8.3/feet lock opposed to 11.6 feet/lock from the Upper Rideau to Kingston.

The geology of the Narrows site is a combination of the Smiths Falls Limestone Plain on the east and the Canadian Shield on the west. The two distinctive topographies associated with these features are easily identified. The relatively flat topography of the limestone plain can be seen on the east side of the lock, while the irregular, hilly and rocky characteristics of the Shield can be seen on the west.

The Narrows lock is constructed in an 800 foot rock and earth embankment that stretches from shore to shore. Before the Canal was built, this site, as its name implies, was a narrow channel only 100 feet wide. A road from Kingston to Perth crossed the lake here. It was so shallow through no bridge was needed.
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Colonel By's initial plan was to deepen this channel to a navigable depth. The contract was granted to William Hartwell in 1827, but due to financial problems Hartwell had to withdraw. The Isthmus-Narrow area was one of the worst sites for malaria on the entire Canal. For this reason, Colonel By found it very difficult to find another contractor willing to take the job. The Narrows site lay idle for two years.

The problem in excavation of the rock at Newboro forced By to change his plan. He decided to raise the level of water in the Upper Rideau by four feet. He would do this by constructing a dam at the Narrows. By doing this he would reduce excavation at Newboro by four feet.

Scores of men were killed in 1828 by malaria and by blasting mishaps at Newboro alone. The change in By's plan most likely spared hundreds of lives. The contract for the dam and lock was given to Bell and Richardson who completed the work by late 1831.

Today, one of the busiest lockstations on the Canal, the Narrows has remained isolated in terms of settlement and visitation by road. The lack of a bridge in early days no doubt impaired the development of a community. The lack of a mill at the Narrows also held back the development of a village. In 1861 a list of potential mill sites included the Narrows but no mill was ever built. The only development at the Narrows has been related to providing the lock staff with accommodations.

INVENTORY OF CANAL STRUCTURES

Existing Structures:
A) Canal and Site Buildings
   - Blockhouse
   - Lockmaster's residence
B) Engineering Structures
   - Lock
   - Embankment and waste weir
   - Fixed wood bridge over waste weir
   - Steel swing bridge at lock
   - Concrete wharf
   - Wood crib wharf
C) Other Points of Interest
   - Archaeological remains of foundation of lockman's house
Missing Structures:

A) Canal and Site Buildings
- Cookhouse, 1836
- Storehouse, ca. 1836
- Lock labourers' house, 1841
- Second storehouse
- Lockman's house
- Stable, fl. 1850

B) Engineering Structures
- Original timber waste weir
- Wharves
- Wooden swing bridges over lock
- Wooden Fixed bridges over wast weir

C) Other Points of Interest
- Mooney's farm buildings on south shore

Blockhouse:
The blockhouses built along the Canal were to serve both as a military fortification and a residence for the lockmaster and labourers. The contract for the blockhouse was given to William Tett in 1831. He was also responsible for the Newboro blockhouse. Both were completed in fall of 1833.

A number of renovations to the blockhouse have occurred through the years. Most of the alterations were attempts to make the structure more liveable. In 1890, a two storey frame addition was added to the blockhouse. Other interior changes were frequently carried out.

In 1963, the lockmaster, Jack Mutchmore, moved from the blockhouse to a new brick house to the north of the lock. The structure lay idle for several years until 1967 when all additions not considered part of the original blockhouse were removed. Today the blockhouse serves as the lock office and provides washroom facilities to the public.

The blockhouse never saw actual fighting but it remains today as a reminder of 19th century British military architecture and the initial purpose of the Canal.
Recent Lockmaster's Residence:

This brick house was built in 1963 for the lockmaster. He occupied the house until 1967. Following Department of Transport policy, the house was left unoccupied when the lockmaster moved out in 1967.

In 1974 it was used as a temporary office for the Southern Division of the Canal, but other than that it has been vacant.

Missing Buildings:

A number of frame buildings varying in function have been constructed at the Narrows through the years. Included in this list are a cookhouse (1836), first storehouse (ca.1836), second storehouse, third storehouse (lock office) (1914), lock labourers' house (1814), lockman's house and numerous shed, stables and barns.

Engineering Structures:

As mentioned before, the single lock was built in the embankment constructed to raise the waters of the Upper Rideau Lake. Also incorporated in the dam was a wooden waste weir. It was built at the site of the original channel. Many waste weirs have replaced the original. The first concrete waste weir is believed to have been built in 1925.
Repairs to the lock chamber has been moderate. Since its construction parts of the walls have been repaired and replaced. In 1922, both wing walls were replaced with concrete blocks. There has been few changes since this time.

The dam has also had its share of renovations. It is reported that it was rebuilt in 1840-41 and again in the 1890's. Clay dredged from the Newboro cut and gravel and stone were used to stop the leaking. Since then no problems have evolved.

Bridges were a late addition to the Narrows lockstation. When the lock was built no permanent bridge over the lock was built, although temporary bridges in the 1840's were built in the winter months. In 1858 a petition from local residents asked the government to build a bridge at Narrows, Chaffeys, Davis and Jones Falls. At the time the only bridge to the south were at Newboro and Upper Brewers Mills. To the north the closest bridge was at Smiths Falls, 22 miles away. A ferry service was being provided at Olivers Ferry (Rideau Ferry), approximately halfway between the Narrows and Smiths Falls.

The petitioners believed the lack of a bridge connecting the Kingston to Perth road at the Narrows was not only inconvenient but a drawback to development of the area.

The other areas requesting bridges were at the time ignored because of their lack of settlement. However, the government felt justified in restoring the old Kingston to Perth route. In 1867 a swing bridge was built.

The wood swing bridge was renewed a number of times (1885, 1897-98, 1917, 1937 and 1848-49). The timber king post truss swing bridge was replaced in 1964 by a steel swing bridge.
BEVERIDGES (Tay Branch)

In 1830 the Tay Navigational Company was formed. Its purpose was to raise money to build the Tay Canal. Since Perth was only a small settlement, the company had difficulty in raising the capital. A number of requests were made to the government. Their persistence was finally rewarded. In January 1832 the government of Upper Canada granted the company the money needed to complete the Canal.

The Tay Canal ran from a turning basin in Perth to Port Elmsley along the Tay River, a distance of approximately 6.5 miles. Compared to the work involved in the Rideau Canal, the construction of the Tay Branch was minor. Very little excavation was required to build the channel and the five locks along the system. The construction of the lock chambers differed from those on the Rideau Canal. The Tay locks were built of wood not stone.
Numerous drawbacks plagued the construction of the system, most of which were political problems, not construction mishaps. The Canal was finally finished in 1834 and regular service from Perth to Kingston and Bytown began. The Canal functioned as a transportation route for only 15 years. It continued in a lesser role until 1865. During this period the Tay Canal was used to float timber down to the Rideau. In 1865 several locks were destroyed by logs. The locks were not repaired and the system was abandoned.

By the time of confederation, the Rideau Canal had been reduced to serving local traffic from Kingston to Ottawa. Trade amongst the corridor settlements during the latter half of the 19th century was sufficient enough to consider expanding the Canal in terms of branch canals. Among the proposed canals were the Tay, Gananoque, Devils Lake and Bob's Lake. It was believed that development of the above system would help stimulate the economy of these areas.

The people believed that the logging development of their areas was due to the lack of a direct communication link with the markets.

The only canal to be built from these potential routes was the Tay Canal. The Perth area was already exporting timber, iron ore and lime phosphate. The merchants of the area felt a canal would facilitate transportation of their products and stimulate additional economic growth in the area.

In 1880 merchants and residents of the area urged the government to rebuild the Tay Branch. Water was still considered the most efficient means of transporting goods. A petition was sent to their member of parliament, John Haggart. Haggart, at this time, was the Minister of the Department of Railways and Canals.

In 1882 a report was submitted to the government, suggesting two routes that the Canal could take. One system followed the Tay River as did the original canal and the other suggested that an artificial cut be made from Beveridge Bay on the Lower Rideau Lake through a swamp to the Tay River just above the locks of the first canal. The latter plan was accepted. Two locks with a lift of 13 feet each were constructed in an artificial channel. The dam and waste weir were built across the Tay below the junction of the new cut. The locks were completed in 1887.
The new channel connecting the Rideau with the Tay River was immediately christened "Haggart's Ditch" in appreciation for the support given by John Haggart.

Today, Beveridges lockstation consists of its engineering structures and a handful of buildings. Adjacent to the upper lock is a two-storey frame building that is used for storage and as a lock office. Judging by its architectural design, this building was probably built in the late 19th or early 20th century. Since the two locks at Beveridges are separated by a lengthy channel, a second lock office was necessary for the lower lock. The lower office is similar in design to the modern lock offices built from 1967-1974.

The last building at the station is the lockmaster's house. It is situated just above the lower lock. The house is a two-storey frame building that was probably built shortly after the Tay Branch was completed.

The desire to expand the reach of the Rideau Canal was not limited to the Tay River. As early as 1836 interest was shown in the Gananoque River. The Gananoque and Wiltsie Navigation Company was promised money to make the river navigable but the Rebellion of 1837 interrupted their plans. The money for the project was never granted.
Requests to improve the Gananoque River continued into the 20th century. A number of petitions were presented to the government during this time. Surveys were carried out along the river but nothing was done to improve the Gananoque River. Much of the concern through the years was by the mill owners along the river. They were interested in increasing the water supply to power their mills, not to make the river navigable.

The issue was last raised in 1911 but Superintending Engineer Phillips decided that the costs outweighed the benefits.

The need to open up the area was no longer a concern because a railway line had already been built through the area. Also, the shortage of water in the Rideau system meant no water could be spared to run through the Gananoque River. A number of factors also convinced Phillips to reject the proposal. The cost of the construction of the locks, maintenance, salaries for lockmen, compensation for five mills that would be destroyed in the construction and payment for drowned land claims together convincingly outweighed the benefits of developing the Gananoque River.

Two other systems were considered in the 1880's. They were Devils Lake and Bob's Lake system, neither of which were ever carried out.
POONAMALIE

Twenty miles through the Big Rideau and Lower Rideau lakes brings us to the first lockstation on the descent to Ottawa. Its location on the Rideau was responsible for the initial name given to the station - First Rapids. It was called so interchangeably with Poonamalie until the late 1850's after which the name Poonamalie dominated. The name Poonamalie is also a reflection of one of the characteristics of the site. The "solid screen of cedar foliage", as Leggett describes it, that one encounters as approaching the lock was responsible for the naming of the lock. An officer of the Royal Engineers who had previously been in India was reminded of the beautiful cedar-lined roads that he had seen in India. He therefore gave the lockstation the Indian name, Poonamalie.

The one and a half mile artificial channel and lock chamber bypassed the original rapids. A natural depression was used to start the channel.

The lock at Poonamalie has a lift of five feet. There was no major repair needed to this lock during the 19th century. The dam, however, has been a constant problem since the mid-1800's. This structure is of great importance because it restrains the waters of the Big Rideau and Lower Rideau lakes. It also controls the water supply from Poonamalie to the Ottawa Locks.

In the 1860's the dam was raised to enable more water to be stored. To this point the Canal was encountering problems in maintaining a sufficient water supply year-round. Being at the lower end of the Rideau Lakes the dam is extremely vulnerable to the heavy spring runoffs common throughout the Canal. In the spring of 1869 part of the embankment at the top of the cut was washed away. Local residents helped to repair the break and navigation was soon restored. In 1904 a large sheet of ice broke part of the main timber dam. Phillips, the Superintending Engineer, blamed the break on the unusually low water level in the lakes.

When the ice broke up in the spring, instead of flowing over the dam it struck against the back of the dam causing the structure to weaken.
By the time the ice had disappeared 150 feet of the 200 foot dam structure was destroyed. The break in the dam caused damage to roads and bridges in Smiths Falls and as far downstream as Merrickville. Phillips decided to build a new dam of concrete instead of rebuilding the timber dam. The new dam was built below the old dam. The timber crib dam was used as a cofferdam during construction and then torn down.

The shallow cut at Poonamalie has been a concern of Canal officials for many years. As low water levels increasingly became a problem in the late 19th century, boats frequently hit bottom in the cut. In 1909 Matthew Ryan of Smiths Falls was given a contract to remove 18 inches of rock from a shallow area in the cut. Low water levels continued and in 1910-11 steel brackets for flashboards were installed on the dam. This provided an additional six to eight inches to be held back in the lakes for a longer period of time.

At the turn of the century the lock chamber at Poonamalie required some work. In 1903 the south wing wall was rebuilt; in 1907-08 the gate recesses were rebuilt and in 1913 the floor was concreted to prevent leakage.

The defensible lockmaster's house at Poonamalie was built around 1842. A frame second storey was added in the late 19th century (1893).
SMITHS FALLS (Detached, Combined, Old Slys)

Like so many other towns along the Rideau Corridor, Smiths Falls was a product of the American Revolution. Many United Empire Loyalists who wished to remain subjects of the Mother Country fled to Canada. Thomas Smyth was one of these Loyalists. He settled near Brockville in 1784. For remaining faithful to the Crown Smyth was granted four hundred acres of land in Leeds County (site of present day Smiths Falls). He saw no potential in his land and so did not attempt to develop it. Smyth ran into financial trouble and was forced to mortgage his land to Joseph Sewall. In 1823 Smyth, his two sons and his son-in-law, William Merrick, founder of Merrickville, leased a portion of land and established a sawmill.

Smyth had not paid the mortgage debt or the interest on the land. Sewall brought action against Smyth and the land was put up for sale in 1825 by Sheriff John Stewart of Brockville. The land was bought by Charles Jones for £105. The following year Jones sold the land for £600 to Abel Russell Ward, a United Empire Loyalist who had settled at Maitland. Ward immediately started to clear land and reconstruct Smyth's original mill. A short time after Colonel By ordered the removal of the mill to make way for the Canal.

Ward claimed £5,000 for damages. The large claim indicates that he had established a substantial milling operation by this time. Colonel By settled with Ward for £1,500, one of the largest claims made by mill owners on the Canal.

At the time of Canal construction a small settlement had already been established. It was initially called Wardsville but it was soon changed to Smyths Falls and eventually to Smiths Falls.

A 36 foot drop in less than a quarter of a mile was the obstacle to overcome at Smiths Falls. Although one of the larger falls along the Canal, the construction of the locks around the obstacle did not prove to be too difficult. A natural depression to the south of the river was used to accommodate a flight of three locks. A single lock (Detached) was also built above the flight. The river was left relatively untouched except for the dam which was built across the head of
the falls. The only major problem the contractor, James Simpson, encountered during construction was the numerous springs in the rock.

A mile below Combined lockstation is a flight of two locks. This station is named for the original settler at this location who was referred to as Old Sly.

The locks were built in the old river. To build the locks in the river bed the water had to be diverted. A channel and waste weir were built to the south of the locks through the limestone to control the water. Erosion of the rock since excavation has eliminated any trace of the original cutting. Today it looks like the original river bed. A stone arched dam was also built to connect the weir and locks.
Defensible lockmasters' houses were built at all three stations in Smiths Falls. The house at Old Slys was built in 1838 and the houses at Combined and Detached around 1842. Only the house at Combined has a second storey which was added late in the 19th century. The Detached lockmaster's house had deteriorated very badly and was torn down in 1894. It was replaced with a two-storey brick house which was torn down in the early 1970's. The lockmaster's house at Old Slys had a kitchen added in 1867 but no second storey. Today it is the lock office for the staff.

Structural changes concerning engineering works can be considered routine. Periodic replacement of the masonry of the locks and wooden gates were necessary throughout its history. The only major change was the building of a new single hydraulic lock at Combined lockstation between 1972-74 which replaced the old flight of three hand-operated locks.

Smiths Falls grew rapidly following the construction of the Canal. An article in Smith's Gazetteer in 1846 described the town as a "...flourishing little village pleasantly situated on the Rideau River and on the Canal, fourteen miles from Perth. It contains
about 700 inhabitants. There are fifty dwellings, two grist mills (one with four run of stones), two sawmills, one carding and fulling mill, seven stores, six groceries, one axe factory, six blacksmiths, two wheelwrights, one cabinet maker, one chairmaker, three carpenters, one gunsmith, eleven shoemakers, seven tailors, one tinsmith and two taverns.

Progress during the next ten years was slow. The period between 1850 and 1880 saw an increase in development. Numerous old homes were built, some of which still remain, and businesses established during this period. The population in 1881 was 2,248.

In 1884 the Canadian Pacific Railway was being built across the continent. The line was to pass through Smiths Falls. By 1888 the population had increased to 3,555. Smiths Falls had become an important divisional point for the C.P.R., which explains the rapid increase in population.

Smiths Falls continued to prosper well into the 20th century but as railway transportation declined, Smiths Falls levelled off in terms of expansion and prosperity.
EDMONDS AND KILMARNOCK

Within the first five miles downstream from Smiths Falls, the boater passes through two lockstations. The first lockstation is Edmonds Lock, a single lock with a lift of 9 feet. Three miles downstream is another single lockstation called Kilmarnock Lock.

Edmonds:

Edmonds Lock was originally called Mills Lock after the first lockmaster, Edward Mills. Edmonds Lock is one of three lockstations with an overflow arch dam. The other dams are located at Clowes and Black Rapids. Colonel By originally planned to construct all the dams of the overflow nature. The height of the dam would maintain a navigable level above the lock. Any excess water would flow over the dam. Unfortunately, the excess water and ice during spring flooding caused considerable damage to the overflow dam. On numerous occasions the dam at Black Rapids was damaged by the raging Rideau River. Because of the constant problems encountered at Black Rapids, Colonel By decided to revise his plans and build the dams higher and incorporate a waste weir into the structure. The overflow dams already completed were left as is. All the excess water flowed through the waste weir and not over the dam. This relieved much of the pressure exerted on the dam. The water level could also be controlled by adding or removing stoplogs from the waste weirs. Waste weirs were eventually incorporated into all the overflow dams.
The Edmonds dam, because of its overflow design has been susceptible to damage from spring flooding. For example, in 1897 many stone blocks were dislodged during the spring freshet. They were immediately replaced by oak blocks which in turn were eventually replaced by new masonry blocks. Other repairs to the lockstation have been relatively routine.

The original lockmaster's house at Edmonds, like so many other houses, had fallen into disrepair by the late 19th century. A number of these houses were restored but the Edmonds house was torn down in the early 20th century. It was replaced on the same site by a two-storey frame house. This house survived until the mid-20th century when it too was removed.
Another structure that has not survived is the mill at Edmonds lockstation. It was located below the dam on the north side. The mill was built post-1860. Little is known about the mill because the study on this site has not yet been completed.

Kilmarnock:

The original name of this lockstation was named after the owner of the surrounding land, James Maitland. It was called Maitlands Lock fairly consistently throughout the 19th century, with the occasional reference to it as Kilmarnock.

Maitland was given the position of lockmaster at the station as partial compensation for his land. He continued in this capacity until 1846 when he was granted a retirement allowance. The Maitland family operated a ferry from the mainland to the island on which the lockstation is now located.

The largest concern during the construction of this station was malaria. It was so serious that Colonel By was forced to alter his plans. He re-positioned the lock so as to save excavation and time, thereby reducing the workmen's exposure to the disease.

Sketch of Kilmarnock lockstation in 1830's
The only major problem encountered after the construction of the lock and associated structures was the maintenance of the water level from Kilmarnock to Edmonds. Leakage through the dam at the southern end of the island was a constant problem during the 19th century. The dam was finally repaired in 1913-14.

Today Kilmarnock maintains two historical structures, the defensible lockmaster's house and the wooden swing bridge. The lockmaster's house is believed to have been built in 1842. It was originally a one-storey structure but a second storey was added early in the 20th century. The adding of the second storey to a defensible lockmaster's house was not an unusual procedure along the Canal, however, all of the houses except for the one at Kilmarnock had a frame second storey. The house at Kilmarnock had a stone second storey added.

The wooden swing bridge at Kilmarnock is built on the pattern of the 1865 prototype. The wooden swing bridge was common throughout the Canal until the steel truss bridge was introduced in the late 19th century. There are five wooden swing bridges remaining on the Canal -- Lower Brewers, Brass Point, Nicholsons, Jones Falls and Kilmarnock.
MERRICKVILLE

The Merrickville lockstation is located within one of the oldest settlements in the Rideau Corridor. The town of Merrickville was founded in 1794 by William Merrick.

Merrick was attracted to the site by the water power potential of the 1/4 mile set of rapids. He constructed a dam across the river and then built grist, saw and carding mills. It was not long before a community sprang up around the milling activity. In 1821 Merrick built a stone house overlooking his mills. Today his mills are gone but his house remains.

When the construction crews arrived in 1827, the town of Merricks Mills was a thriving little town of about 300. Unlike most of the pre-canal sites, Merricks Mills was not destroyed by Canal construction. After the Canal was completed, the excess water once again turned the wheels of the mills. The improved transportation system caused a surge in commercial activity around the village. By 1851 Merricks Mills has built up an impressive industrial complex. During this commercial phase of the Canal, a number of stone and brick buildings were built, many of which can still be seen today.

Merricks Mills continued to thrive into the mid-1860's. The end of the industrial growth is closely related to the decline of the commercial phase of the Canal. The rise of Smiths Falls as a major railway town soon pushed Merricks Mills into the background in terms of the economic hub of the area.

*Industrial View, Merrickville, Ont.*
Merrickville attempted to keep pace with Smith's Falls. In 1915 a power company was formed at Merrickville to provide electricity for the mills and the foundry. Most of the operations were unable to compete and were soon out of business. The only successful operation was the woolen mill. It continued to function until 1954.

Amusing relics of earlier years still exist throughout the Canal and Merrickville is no exception. An iron ring still hangs outside the blockhouse at Merrickville. In the past, during quiet periods the canalmen used to drift uptown to the local saloons. When a boat appeared the lockmaster stuck the iron hoop with a hammer, bringing the canalmen on the run.
INVENTORY OF CANAL STRUCTURES

Existing Structures:

A) Canal and Site Buildings
   - Blockhouse
   - Depot
   - Lock office
   - Watchhouse
   - Lockmaster's house

B) Groups of Buildings
   - Industrial buildings - The Island
   - Industrial buildings - The Mainland
   - Merrick House
   - The Village buildings

C) Engineering Structures
   - Locks, basins and canal cut
   - Canal dams and embankment
   - Merrick's mill, dam and roadway
   - Dam No. 10 and retaining wall
   - The Smye Bridge
   - The Swing bridge
   - The Fixed bridge
   - The Railway bridge

Missing Structures:

A) Canal and Site Buildings
   - Lock labourer's house
   - Storehouse
   - Drill shed
   - Log house

Blockhouse:

The Merrickville blockhouse is the largest of four such structures built on the Canal. The others are located at Kingston Mills, Newboro and Narrows. A fifth blockhouse was started at Burritts Rapids but was never completed in ideal form. The blockhouse at Merrickville was built by the same contractor responsible for the locks and channel. The blockhouse was built of a coarse limestone first storey and a timber second storey with gun slits. The roof
was covered with tin to make it fireproof. A dry moat surrounded the blockhouse was also built. If the explosives in the blockhouse were to ignite the moat would direct the blast upwards, not outwards. Similar moats are still used today when storing explosives.

The blockhouse's military purpose is quite obvious. It was capable of handling 50 troops. The only military significance it played was in 1837-38 when lockmaster, John Johnston used it to drill the local militia during the Rebellion of 1837.

The blockhouse continued to be used as a residence for the lockmaster until the early 1900's, when the state of the structure was so bad that it was a hazard to live in. Since no lockmaster's house was built at Merrickville the lockmaster was given a housing allowance.

The blockhouse was repaired and continued to be used as a storehouse and workshop. In 1964 preparations were made to restore the blockhouse following the 1852 Royal Engineers' plan. The restoration was completed and the blockhouse was leased to the Merrickville and District Historical Society. In 1966 this historical group opened the blockhouse as a museum.
Depot:
This structure was built sometime around the 1870's by Hiram Easton, a local mill owner and merchant. Easton used the building to store goods in until they could be picked up and shipped down the Canal. Since its construction the building has changed hands many times. It was eventually donated by the Local Lions Club to the Historical Society in 1967. It is presently called the "Then and Now Shop" which is a part of the museum.

Lock Offices:
In 1965 a frame structure adjacent to the blockhouse was constructed. It was used to accommodate the lock staff and provide storage space for the station. Prior to 1965 the blockhouse provided this space. During the winter of 1976/77 another lock office was built beside the middle lock. This two-storey frame structure provides the lock station with an office, storage space and public washrooms.

Lockmaster's House:
The blockhouse was used as a residence up until 1909. For the next 27 years the lockmaster was given a housing allowance. In 1936 the lockman's house from the Narrows was transported by barge to Merrickville for use by the lockmaster. It was placed on a concrete foundation on the north side of Main Street across from the old school (presently an apartment building). The house is now in private hands. When it was sold is not known.

Merrick House:
The stone house on the north shore overlooking the mill buildings is the third house built by William Merrick. It was built in 1821. It is believed that the stone cottage to the northeast of the house was the second Merrick house. The first house was a log cabin built in the 1790's when Merrick first arrived.

Engineering Structures:
The three locks, two basins and artificial channel were all constructed "in the dry". The locks were located at the lower end of an artificial channel 1100 yards long. The total lift of the locks is 25 feet.
Leakage through the basin walls was a serious problem from the beginning. Numerous attempts were made to stop the leaking. Finally in 1892, the north side of the basin walls were rebuilt. The south side was rebuilt at the turn of the century. The locks were also rebuilt in the years to follow. After 1920 all repairs to the masonry structures were done with concrete blocks instead of the traditional stone masonry.

The first dam at Merrickville was a wooden dam with two cut stone waste weirs at each end. Colonel By originally planned an arch dam but apparently he changed his mind. The dam was located just below the artificial cut. The dam leaked badly from the beginning and was soon replaced. The new dam (1841) remained until 1916 with little repair needed. The earth embankment however broke in 1847 during the spring flood. The break was repaired by the hard work of the local citizens throughout the night. Today only remnants of the old dam can be seen. The embankment, however, is still intact.

Merrick's dam, built in the 1790's, crossed the river channel below the rapids. The dam was most likely constructed of wooden bracked with earth and rubble. With the construction of the road from Brockville to Richmond after the War of 1812, Merrick's dam made a convenient causeway across the river. An additional wooden roller bridge was built across the locks.
In 1831, William Merrick decided to repair his mills. To do so he raised the level of water above his dam, thereby causing the water below the dam to fall below navigational level. Colonel By has hoped to officially open the Canal in the fall of 1831 but because of Merrick's actions By had to wait until the following spring.

The present day dam was built in 1914-15 in front of Merrick's mill dam. The new dam replaced the previous timber dam about a 1000 feet upstream.

Today, three bridges make up the crossing at Merrickville:

1) a fixed concrete and steel bridge over the waste weir (constructed prior to 1957)
2) a fixed plate girder bridge over the "Smye" (erected in 1924)
3) a plate girder swing bridge over the upper lock (built in 1933, electrified in 1955).
Clowes lockstation is located about 2 1/2 miles downstream from Merrickville. The engineering structures at Clowes consists of a single lock located on the west shore; a stone waste weir and an arched overflow dam.

Many people believe this lock was named after Samuel Clowes, the man responsible for mapping out the route of the Canal in 1824. Contrary to this belief, the lock honours James Clowes, the owner of a nearby quarry. Clowes' quarry supplied stone for the construction of the locks, dams and weirs at Merrickville, Clowes and Nicholsons.

In 1827, James Clowes was granted the contract to build the lock chamber and dam. A year later, Colonel By broke his contract. By refers to the incident in one of his letters "...James Clowes who has cut a large quantity of good stone for the Locks, and commenced the Dam, but in so unworkmanlike a manner, that I broke his contract..."

James Clowes was replaced by Alexander Hayes who completed the work.

Problems were encountered early at Clowes. The spring flood of 1828 caused substantial damage to the partially completed dam. Colonel By realized that a dam alone would never withstand the pressures exerted on it by the river flow. Instead of increasing the height and thickness of the dam, By decided to install a water weir. He also changed the curvature of the dam to lessen the unnecessary pressure on the structure.
Early in the 20th century a break in the dam was noticed. The pressure exerted on the dam caused the structure to shift downstream. Reinforcement was a must to prevent the dam from advancing any further. It was decided to strengthen the dam with a layer of concrete. This plan was not carried out until three years after the break was noticed. In 1913 a 160 foot section of the dam was torn down and rebuilt. Concrete was added along the original section of the dam.

The last engineering structure, the waste weir, has also required frequent repairs; heavy spring run-offs have caused considerable damage on a number of occasions. In 1901 a spring freshet destroyed the central pier of the waste weir. To prevent a similar event occurring again, the weir was rebuilt as one large weir instead of two separate bays.

Again in 1907, the waste weir was showing signs of wear. That fall and winter the entire weir was rebuilt. Repairs since that time have been routine.

Today the waste weir at Clowes is the only one that is built of stone. The rest of the weirs along the Canal have been rebuilt in concrete.
Clowes lockstation has always been a peaceful site. Prior to Canal construction there is no mention of settlement or milling operations. Since the development of Andrewsville and its mill complex in the mid-1800's, Clowes has become closely linked to it. Today, Clowes still remains in a rural setting with no commercial activity.

INVENTORY OF CANAL STRUCTURES

Existing Structures:

A) Canal and Site Buildings
   -Defensible lockmaster's house
   -Lock office

B) Engineering Structures
   -Lock
   -Waste Weir
   -Overflow dam

Stone of a Royal Engineer who died during the Canal construction
Missing Structures:

A) Canal and Site Buildings

- Lock office
- Stables

Defensible Lockmaster's House:

The defensible lockmaster's house was built in 1838 but unlike most of the houses it had no loopholes. Through the years few alterations have occurred to the structure. An addition was built during the 1880's which still remains today but no second storey was ever added. Other than regular repairs through the years, the only alteration was the addition built in the 1880's.

Lock Office:

This office resembles other buildings built between 1967-74. It is identical to the offices at Nicholsons and a number of others along the Canal. The office provides space for the lockmaster's office, storage, kitchen-lunchroom and public washrooms. It replaced a two-storey frame building that was built in 1881. The old lock office/storehouse was demolished during the period 1964-72 to make way for the new office.

Engineering Structures:

The lock chamber at Clowes has required considerable attention. During the first 50 years little repair was necessary over and above routine maintenance. In 1887, part of the east wall collapsed. The lock was still functional so repairs were postponed until the following winter.

Major repairs were again needed in 1904 when the gate recess and hollow grain of the southeast wall collapsed below the water line. Navigation continued through the summer and the wing wall and recess were rebuilt during the following winter.

The overflow dam at Clowes has also caused a great deal of concern since its construction. Spring flooding seems to be the major cause of these problems. As early as 1847, spring freshets removed a number of the stone blocks. Again in 1904 and 1908 large portions of the dam were dislodged.
NICHOLSONS LOCKSTATION

A few hundred yards downstream from Clowes and on the opposite side of the river is Nicholsons Lockstation. This site consists of a 400 yard artificial channel which has been cut through the east bank of the river. Located at each end of this channel is a lock chamber. The total lift of the two is 15 feet.

Nicholsons lockstation was named after Robert Nicholson, a Loyalist immigrant, who fled to Upper Canada near the end of the 18th century.

Andrewsville, the village adjacent to the lockstation, was named after Rufus Andrews. He established a mill complex on the river during the mid-19th century.

Much of the original design at Nicholsons has remained. The timber swing bridge crossing the Upper Nicholsons lock is one of five bridges remaining along the Canal. The defensible lock master’s house has also survived. Its presence reminds us of the military purpose behind the Canal.

Construction of the Nicholsons locks began in 1827 by a private contracting firm named H.C. Stevens and Co.

Originally it was to be a single lock with a lift of 10 feet. An error in the calculations forced Colonel By to change his plans. The lift of the lock was 15 feet 2 inches not 10 feet, therefore, he was forced to cover the lift with two locks instead of one. This also required a long channel to be excavated through the rock.
Settlement at the station was sparse at the time of construction (approx. 50 people). In 1861 a man named Rufus Andrews located a flour mill adjacent to the lock.

Population increased during the latter half of the 19th century. By 1880 the population was around 200. Andrews had built a number of mills by this time. This commercial activity was considered an "economic magnet" which attracted people to the area. Andrews' sawmill operated under a number of different owners until 1899 when it was bought by Alonzo Bowen. The Bowen family owned the Kemptville Milling Company. The sawmill was changed into a hydro-electric station which provided Kemptville with electricity. It remained in this capacity until 1930. At this time the structure was destroyed by spring flooding.

The decline of Andrewsville is far from unique. A number of small villages along the Canal suffered a similar death. (Washburn, Brewers Mills, Kingston Mills). As the larger industrial centres developed and other forms of transportation improved (rail) the small towns along the Canal declined and in some cases disappeared completely.

INVENTORY OF CANAL STRUCTURES

Existing Canal Structures:

A) Canal and Site Buildings
- Defensible Lockmaster's house
- Garage
- Shed
- Lock office
B) Engineering Structures

- Locks 18 and 19
- Overflow dam
- Wast Weir
- Embankment
- Wharf
- Wooden swing bridge
- Fixed bridge
- Mill dam

C) Other buildings

- East bank farmstead
- Heritage buildings in and around Andrewsville

Missing Canal Structures:

A) Canal and Site Buildings

- Lockmaster's house (ca 1830)
- Lockman's house (c. 1880 and 1927)
- Storehouses (c. 1880 and 1922)
- Lock office

B) Engineering Structures

- History of the bridge site

C) Other buildings

- Sawmill/power station

Defensible Lockmaster's House:

In 1838, Lockmaster Jenkins and his labourers built a stone defensible house. It was originally one-storey with loopholes. Surprisingly enough, the side of the house facing the basin between the locks had no loopholes. It is strange that a defensible structure built to protect the locks did not have the appropriate loopholes.

The house survived the 19th century in its original form. A frame second storey was then added to provide additional space for the lockmaster and his family.

Lock Office:

Nicholsons has two identical lock offices, one at each lock. They are similar to other offices along the Canal. They were built by the Department of Transport between 1967 and 1974. The office at Lower Nicholsons
is located just above the swing bridge and is a new structure.

**Lockmaster's House (c. 1830)**

The first lockmaster's house was built during the construction of the Canal. It was located adjacent to the lower lock and provided shelter to the lockmaster's family for the first few years before the defensible house was built. A report in 1852 shows that the building is still standing but in very poor condition. At this time it was being used as a storehouse.

**Lockman's House (c. 1880 and 1927)**

The first lockman's house was built around the 1880's on the east side of the lock about 200 feet south of Upper Nicholsons. In 1927 the house was rebuilt. When this structure was destroyed is unknown. An aerial photograph in 1964 shows only the foundation.

**Engineering Structures**

The lock chambers at Nicholsons were built into the bedrock which provided a solid foundation. Little work was needed on the locks until 1910 when parts of the wing wall and sills were rebuilt. Other repairs have been made but compared to other stations, Nicholsons has had very little maintenance.

The stone arched dam, built above the locks was constructed to flood out a 1000 feet of rapids making this short stretch between Nicholsons and Clowes navigable.

No major repairs to the dam were required until the 20th century. In 1902-03 ice caused some stones to move. Leakage warranted a concrete core wall to be built in 1914 and again in 1924.

The waste weir in the dam was originally built of timber. It was destroyed in 1899 by ice and replaced by another timber crib weir the following year. Repairs plagued this second structure and was finally replaced in 1910 by a stone weir. Today the stone waste weir had been reinforced with concrete.

The embankment which runs along the artificial channel was built to prevent the water from flowing into the river and not the channel. Since its construction, the embankment has been in constant need of repair. Excess leakage has plagued this structure. As early as 1863 repairs were needed to stop the leaking.
During the construction of the Canal a drawbridge was planned. Due to the expense of such a structure it was never built. By the 1850's a petition was signed by the local residents requesting a drawbridge. A bridge would shorten the distance from Lanark County to Prescott by five miles and also lessen the travel from Leeds and Grenville counties to the Ottawa market. It was also agreed a bridge would help stimulate the sawmill operation. If a bridge was built over the lock, the petitioners would build one over the river. The government refused but in 1863 the municipalities of Wolford and Merrickville offered to build the bridge at their own expense. The government readily gave them permission.

The Andrews brothers built a swing bridge over the upper lock the following year. They also built a fixed bridge across the river to complete the crossing. Since then the bridge has been replaced numerous times, the most recent being in 1971. The fixed bridge has likewise been renewed on a number of occasions.

The last engineering structure to be mentioned is the mill dam. It was built the same time as the sawmill. The dam was left when the sawmill was demolished in 1930. Today only the piers remain.
BURRITTS RAPIDS

The Burritts Rapids lockstation is located between Lower Nicholsons and Long Island. Lower Nicholsons is .3 miles upstream from Burritts Rapids while Long Island is 25 miles downstream. The single lock which lowers the boaters 9 feet is situated at the downstream end of a one and a quarter mile artificial channel. This artificial channel is located to the south of the river along a natural depression. The village of Burritts Rapids is located on the Island between the river and artificial cut.

The village of Burritts Rapids was one of the earliest settlements within the Rideau Corridor. It was founded in 1793 by Colonel Stephen Burritt, a loyalist from Connecticut. He set up his home on the south bank and shortly after built a sawmill.

The following years witnessed the growth of a small community around the sawmill. Its quiet setting was briefly interrupted during the construction of the Canal.

The contract at Burritts Rapids was given to Philemon Wright. Besides contributing much to the development of the Rideau Canal, Wright was involved in timbering operations on the Ottawa River. He was also the founder of Hull.
Compared to other sites, Burritt's Rapids was relatively easy. The Canal required little excavation. The one and a quarter mile artificial channel that bypasses the rapids utilizes a natural hollow. The depression was used in the spring as a floodway, supplementing the main river channel. The formation of this artificial channel created an island on which the village is located. At the head of this island, Wright constructed a dam (224 feet long, 10 feet high). A waste weir was built during 1830-31 to relieve excess pressure on the structure and also help regulate water levels. At the opposite end of the island the single lock chamber and the associated buildings were constructed.

INVENTORY OF CANAL STRUCTURES

Existing Structures:

A) Canal and Site Buildings
   -Garage
   -Lock Office
   -Bridgemaster's House
   -Shed by weir

B) Engineering Structures
   -Lock
   -Channel embankments
   -Wharves
   -Swing Bridge
   -Overflow dam and weir
   -Fixed Bridge

C) Other Buildings
   -Anglican Church
   -Heritage buildings in and around the village

Missing Structures:

A) Canal and Site Buildings
   -Lockmaster's houses
   -Lockman's house
   -First bridgemen's house

B) Engineering Structures
   -Mill dam
   -Previous bridges

C) Other Buildings
   -Mill
Bridgemaster's House:

The house was constructed in 1925-26 by the Department of Railways and Canals. It was the second house built for use by the bridgeman. The house doubled as his office during navigation season.

Lock Office:

The lock office was built in 1970 by the Department of Transport. It is used by Canal staff as an office, storage area and public washroom facilities. It has replaced the previous lockmaster's house which, when in use, was used as a residence and lock office.

Anglican Church:

This church, built in 1831, is one of the first churches to be built along the Rideau Canal. Originally it was the Christ Church. Today the church is still in use as an Anglican Church.

Engineering Structures:

The single lock chamber was built between 1827 and 1831 with no major setbacks. It survived to the late 1800's with few repairs. Between 1897-1910 a number of sections of the walls had to be rebuilt. Since then, no major changes have occurred.

Two earth embankments were constructed along the channel to prevent the water from flowing into the river. The only problem associated with these structures was in 1909 when high water levels caused a break in the embankment. The opening was repaired and raised to prevent a similar event from reoccurring.

In 1949, a stone wall covered by concrete was constructed along the embankment.

Two bridges are located at Burritts Rapids, one a fixed bridge spanning the river and a swing bridge that crosses the Canal channel. The first swing bridge was constructed in 1851. It replaced a previous high level fixed bridge built during the Canal construction. In 1897, the wooden swing bridge was replaced by the existing steel through truss swing bridge.

The initial fixed bridge was built in 1824 by the Burritts brothers and Mr. Hudel. Since this, it has been replaced numerous times. The present steel deck truss bridge was erected in 1920. It is the only deck truss road bridge on the Rideau Canal.
Lockmasters' Houses

The lockmaster's house was originally to be a blockhouse. The lower stone walls were constructed but the wooden second storey was never added.

Even though a sketch by John Burrows shows the blockhouse in ideal form, it was never completed as such. Instead, in 1834 a roof was added to the first storey and it became a lockmaster's residence.

It continued to provide the lockmaster's needs until 1914. It was then reported to be in poor condition and was demolished. Shortly after a new two-storey house was built on the old foundation. It was eventually destroyed in 1969 to make way for the new lock office.

Lockmans' Houses

The first lockman's house was built around 1840. It is not certain but it is believed that he remained there until 1923. The house was not there on a 1930 plan.

It is believed that when the new storehouse was built in 1923, the canalman and his family moved into it. The storehouse remained on the site until 1969 when both it and the lockmaster's house were demolished.
The Mill

The rapids at Burritts Rapids played a major role in determining the location of the community. Milling operations in those days were an essential part of the community. The same year Stephen Burritt founded Burritts Rapids, he built a sawmill. In 1936 a photograph shows the three-storey mill on the north bank of the river just below the bridge. Robert Leggatt reported in 1955 that the mill was in ruins. Today there is no trace of the mill, but the rock-filled timber cribs of the mill dam can still be seen on the other side of the bridge.

A number of mill sites along the Canal were destroyed because of Canal construction. This was not the case at Burritts Rapids. Because the Canal channel was separated from the river, the milling operations were not destroyed.
LONG ISLAND

Downstream from Burritts Rapids the longest stretch of open water awaits the boaters. It is almost 25 miles from Burritts Rapids to Long Island, the next lockstation on the Canal.

Prior to the Canal this section of water at Long Island was not navigable. A set of rapids over two miles long with a drop of 25 feet made this portion of the river impassable.

Settlement from Burritts Rapids to the Ottawa River was almost before the Canal was built. Above Long Island the land was low and marshy. Only 2-3 small farms had been established prior to 1825. Just below Long Island a sawmill was in operation. It is believed that the sawn timber was floated down to the Jock River and up to Richmond. Richmond was the only settlement in the area at this time. A road leading from the Chaudiere Falls to Prescott passed through Richmond. This road was the only land route in the area.

Colonel By's original plan called for a masonry overflow dam and a flight of four locks (the top lock was to be a guard lock). No waste weir was involved in the original design. In the summer of 1827, changes were made in the plan. The guard lock was eliminated and the design of the dam was altered.
Two private contractors by the names of Thomas Phillips and Andrew White took on the job of building the station at Long Island. They were also responsible for the Black Rapids work. A stone lockmaster’s house was built during the construction by the contractors. They agreed to share the cost of the building with the British Government providing they could use the house during the construction period.

Construction began in 1827. A quarry was opened and excavation of the locks began. A number of changes had to be made during the early stages of the work. The lock size was changed from 108' x 20' to 134' x 33'. The largest alteration was the dam. Instead of an overflow dam, Colonel By decided to increase the height of all dams and install a waste weir to handle the excess water. Constant problems during the spring floods at Black Rapids convinced By to change the design of the dams on the Canal. The dam at Black Rapids remained an overflow type but a waste weir was installed to relieve some of the pressure exerted on the structure.

Unlike most stations along the Canal, Long Island was showing signs of development as early as 1830. Besides the Canal buildings there were a number of dwellings - a blacksmith shop, a carpenter’s shop and a store. Most of the early inhabitants of the village were involved with the construction of the Canal and remained in the area once the Canal opened.

The years following the construction of the Canal saw schools, churches and a hotel at Long Island. By the mid-19th century Long Island was deteriorating and by 1890 the village was deserted and in ruins. Long Island was deteriorating before Manotick was founded in 1860, but it is believed that the development of Manotick attracted many of the settlers from Long Island. Even the churches were moved from Long Island to Manotick. By the late 1800’s Long Island was reduced to a lockstation. The people that remained at Long Island were the people involved in the operation of the locks.

INVENTORY OF CANAL STRUCTURES

Existing Structures:

A) Canal and Site Buildings
- Lockmaster's house, 1915
- Lock Office, 1964-65
- Rideau Canal Northern Division Headquarters, 1972-73

B) Engineering Structures
- Flight of 3 locks, 1831
- Stone arched dam, 1830
- Long Island wast weir, 1947-48
- Mill Dam/wast weir, 1932
- White Horse shoal dam, 1926
- Steel truss swing bridge
C) Other Buildings
- Dawson Chapel
- Manotick Mill
- Experimental lighthouse testing station
- Geomagnetic research building

Missing Structures:

A) Canal and Site Buildings
- Saw mill, 1820's
- Lockmaster's house, c. 1828
- Blacksmith's forge
- Carpenter's shop
- Store
- Canalman's house c. 1915-1965
- Manotick bridgemaster's house

B) Engineering Structures
- Nicholl's Island Waste Weir, 1870
- Mud Creek waste weir, c. 1830
- Nicholl's Island timber crib weir, 1836
- Second Mud Creek weir, 1836
- Long Island and Manotick wasteweirs, 1858

C) Bridge Sites
- Long Island waste weir bridge, 1858
- Long Island Ferry and Dawson Bridge, 1863
- Manotick swing bridge crossing, 1868
- Long Island swing bridge, 1874
- Manotick swing bridge crossing, 1902

Lockmaster's House:

The first lockmaster's house was built by the two contractors, Phillips and White, in 1828. It was a one and a half stone structure with no defensive characteristics as did other defensible lockmaster's houses built between 1832 and 1847. The house required little maintenance through the years.

In 1915, the stone house was demolished and a new two and a half storey frame lockmaster's house was built. The new house was built on the same location as the previous house.
Lock Office:
The present lock office was built in 1964-65 by the Department of Transport. A similar building was also built at Kilmarnock the same winter. The building is occupied by the staff office, a storeroom and public washrooms.

Rideau Canal Divisional Headquarters:
This group of buildings were built in 1972-73 to provide office space for the staff of the Northern Area of the Rideau Canal. It is located directly east of the lockmaster’s house. Area offices are also located in Smiths Falls (Central Area Office) and Elgin (Southern Area Office). The area office is responsible for operation and maintenance in its area. The Northern Area includes the section from Ottawa Locks to the bottom of the Burritts Rapids lockstation.

Sawmill, c. 1820's:
A saw mill was in operation prior to the construction of the Canal. It was located on the right bank of the east branch of the river at the foot of Long Island. A timber crib dam with a sluiceway was built to the east branch of the river but a dam must have also been constructed on the west branch to maintain a high water level. When the Royal Engineers came to Long Island the mill was in operation. Colonel By bought out the mill owner, Mr. Hurlbert. The mill and the dam were then removed to allow the Canal work to be carried out.
The Blacksmith's Forge, c. 1828-30:

The blacksmith's forge was built during Canal construction some time before 1831. It was located directly behind the lockmaster's house. It was probably built of stone like the forge at Jones Falls. The forge disappeared some time between 1844 and 1852.

The Carpenter's Shop, c. 1828-30:

Like the blacksmith's shop, the carpenter's shop was built during the construction of the canal. The carpenter's shop was located to the east of the blacksmith's shop. Very little is known about this building other than its size and location. The inspectional report of 1852 does not mention a carpenter's shop at Long Island.

Engineering Structures:

The flight of locks at Long Island was constructed by Phillips and White. Sandstone was initially quarried from a local quarry at Long Island but shortly after construction began, limestone was brought in from either Hogs Back or Black Rapids or both. It is not clear whether this was done because of the difficulty in extracting the hard sandstone or the depletion of the rock at the Long Island quarry. As a result, the lock chamber was built of both limestone and sandstone.

Through the 19th century maintenance was routine. However, after the turn of the century major repairs were required. In 1913, the upper lock walls had to be rebuilt. A mistake in construction caused the walls to bulge out.

In 1920 the lower locks east wall was rebuilt in cut stone and in 1929 the entire centre lock was rebuilt in concrete blocks. The sills, especially the upper sill needed frequent repairs throughout their history.

The stone arched dam constructed just before the lower tip of Long Island stretches across the river from the mainland and Nicholl's Island. The dam still stands as it was constructed by White.

The waste weir at Long Island was built in 1847-48. This new concrete weir replaced the previous timber crib weir. Other weirs in the area are located on the west channel of the Rideau adjacent to the mill at Manotick, on the west side of Nicholl's Island and Mud Creek. All the timber crib weirs have now been replaced by concrete weirs.
The first bridge at Long Island was finally built in 1874, after years of complaints from the local population. It was a wooden king post truss swing bridge. Five such bridges remain on the Canal today, Nicholsons, Kilmarnock, Brass Point, Jones Falls and Washburn. The Long Island bridge was renewed a number of times until in 1935, the wooden bridge was replaced with a steel truss swing bridge.
BLACK RAPIDS

A five mile journey from the stone arched dam at Long Island brings the boaters to the Black Rapids Lock-station. The station consists of a single lock chamber constructed in the river bed of the Rideau, a wastewar, an overflow dam and various Canal buildings. Black Rapids is the last station in the system before the Canal enters Ottawa where the Canal and the Rideau River separate.

Before the Canal was built, Black Rapids was in the midst of a wilderness area that stretched from Burritts Rapids to the Ottawa River. The rapids at the site dropped 4 1/2 feet over a 1/2 mile stretch. The closest settlement to the Rapids was Richmond, a 24 mile journey up the Jock River from Long Island. Only one road penetrated this area prior to the construction of the Canal. It ran from the Chaudiere Falls to Richmond, then on to Burritts Rapids, Nicholsons, Clowes Quarry and Merricks Mills. At this point the road crossed the river and continued on to Prescott.

In early 1827 Colonel By prepared the plans for Black Rapids. He originally intended to construct a straight stone arched dam across the river just below the rapids and the mouth of Black Rapids Creek. This scheme, was intended to flood out the shallow rapids making it a navigable stretch of water. The lock was to bypass the dam on the west bank of the river. The gap between the two was to be filled by an earth embankment. No waste weir was intended. The excess water was to flow over the dam.
There was also to be two locks. One with a lift of 10 feet with a guard lock above it. Before work could begin, the Royal Engineers altered the plans. The straight dam was to be replaced by an arched stone dam and the guard lock was eliminated.

In July 1827, work began. The contractors were Thomas Phillips and Andrew White. The same men that undertook the task of building the Long Island station. A quarry was opened on the east bank of the river just above the dam. Limestone for the quarry was used for the construction of the dam, lock and a lockmaster’s house. The house was completed in 1829 and the dam and artificial channel in 1830. The following year the lock and earth embankment were completed.

Several difficulties were experienced over the course of construction which resulted in added expense and modification of the original plan. The biggest concern was the dam. It was initially intended to build all dams of the overflow type, but heavy spring floods forced the engineers to abandon this type of dam. At sites where the overflow type dam was already built, such as Black Rapids, Edmonds and Nicholsons, a waste weir was incorporated into the structures to relieve some of the pressure. Alterations to the artificial channel and lock chamber were also undertaken. The channel was lengthened and deepened as was the lock chamber.

As mentioned before, Black Rapids was in the midst of the wilderness prior to the construction of the Canal. On completion, the Canal stimulated settlement in many areas, but this was not the case at Black Rapids.

Black Rapids remained dormant in terms of commercial activity. In 1860 a report considered Black Rapids to be a potential mill site, but a mill was never built. For years the only residents around the site were the lockmaster and his labourers. The land was gradually cleared around the station and farms were established.

Prior to the Canal there was no access to the site by road, but following its completion a path was cleared along the river which ran from Bytown to Long Island. Today, it is the Prescott Highway (Highway 16)

INVENTORY OF CANAL STRUCTURES

Existing Structures:

A) Canal and Site Buildings
   - Lockmaster’s house (1914)
   - Lock office/watchhouse
   - Shed
B) Engineering Structures

- Lock, 1831
- Waste weir, 1925
- Concrete overflow dam, 1949-54
- Waste weir, 1949-50
- Lay-by piers
- Ice breaker piers

C) Other points of Interest

- Stone quarry

Missing Structures:

A) Canal and Site Buildings

- Two log houses, 1827
- Stone lockmaster's house, 1829
- Storehouse and stable

B) Engineering Structures

- Stone arched dam, 1830
- Timber Crib Flat Dam, 1862
- Second Timber Crib Dam, 1908-09
- Masonry Waste weir, 1832
- Timber Crib Waste weir, 1862
- Timber wharfs

Existing Site Buildings:

There are two existing buildings that are related to the Canal at Black Rapids. They are the lock office and lockmaster's house.

The lockmaster's house was constructed in 1914, replacing the original stone house which was built during the construction of the Canal. The existing house is of frame construction and is believed to be built on the original lockmaster's house foundation.
The lock office/watchhouse was built in 1968 by the Department of Transport. It is similar to other such structures erected between 1967 - 1974. The building incorporates a watch office, a workshop/storage room, a lunchroom, a utility room, and the public washrooms.

Missing Buildings:

Log Houses, 1927

Two log houses were built at Black Rapids in 1827. They were built by the contractors (Phillips and White) to house their workers. They were both located on the west side of the river just north of the lock.

Whatever happened to these houses is unknown. They may have been just temporary buildings which were torn down on completion of the construction or they may have survived as sheds for a short period of time. In any case, an 1851 report does not mention these buildings.

Lockmaster's House, 1829

A lockmaster's house was not originally planned for Black Rapids but White and Phillips agreed to share the cost of the building with the government in return for the use of the house during the construction period. Similar situations occurred on the Canal at Long Island and Kingston Mills.
After the Canal was completed the first lockmaster, William Newman, and his two lock labourers moved into the house. It continued to function as a lockmaster's house until 1914. By this time the poor condition of the house forced Canal officials to tear it down.

Engineering Structures:

The lock at Black Rapids were built of limestone from the nearby quarry. The stone blocks were laid in straight courses, each wall was five feet thick at the top and 8 feet thick at the bottom. After the stone was laid, the lock was made watertight by clay puddle and grouting. Clay puddling technique is the packing of clay to the outside of the lock wall. This formed a secondary wall 2 - 3 feet thick. It was then filled in with earth and rock.

Grouting, which is still a common procedure along the Canal, was also carried out. The joints of the wall were pointed with cement before the grouting procedure begins. First a hole is drilled in a vertical joint. Then a tube is inserted and liquid cement is forced into all the openings in the interior of the wall, making the wall watertight.

Two types of lock floors were built on the Canal, inverted stone arch and wooden floors. When the lock rested on solid rock foundation, a wooden floor was used. If the foundation was poor, an inverted stone arch floor was used. The solid bedrock at Black Rapids allowed a wooden floor. The floor was reconstructed once in 1856.

Through the years regular repair to the lock has left it with very little of its original masonry.

The major change to the lock occurred in 1969 when the lock gate operating system was converted from a manual to a hydraulic system. Black Rapids is one of the three stations that were converted over to this system. The other stations are Smiths Falls Combined and Newboro.

The Black Rapids station has been the site of four overflow dams. The first structure, built between 1827-1830 was a stone arched dam. Initially no waste weir was intended but heavy spring flooding forced the Royal Engineers to alter their plans. The weir lessened the pressure on the dam but ice and floodwood continued to damage the overflow dam. By 1860 the dam was in very poor shape. In the spring of 1862 the dam was demolished.
Replacing the stone arched dam was the first of two timber crib dams. The timber crib dam, as its name implies, was a series of wooden box type structures filled with rock.

Like the stone arched dam, this dam required regular repair. In 1906 it was completely rebuilt but was destroyed two years later by a spring flood.

In the winter of 1908-09 a second timber crib dam was built. This dam had no waste weir like its two predecessors. It was made up of three sections 125 feet long. Between each section a pier was built. These piers would act as supports for a bridge if a road crossing was ever required. The bridge was never built.

The first spring flood (1909) was a real test for the new structure because it was one of the worst floods ever recorded. The dam held up well but the embankment to the east did not. Much of the river bank was washed away. To prevent this from re-occurring the dam was extended an additional 100 feet.

The second timber crib dam was eventually replaced in three stages between 1949-54. Rotting timber forced the Canal to build a new dam. The final dam was constructed of concrete and was also an overflow dam. It also reintroduced a waste weir to the structure.
Hogs Back, the first of three lockstations within the city of Ottawa, is the point on the Canal where the river and the Canal separate. A sudden drop in the river from Hogs Back to its mouth eliminated that section of the Rideau River as a possible route for the Canal. Colonel By decided to dam the river at Hogs Back, raising the level of water high enough to drown out the seven miles of shallow rapids between there and Black Rapids. From the dam an artificial channel was built, lowering the Canal 115 feet in just over five miles to the northern entrance of the Rideau Canal.

The work involved at Hogs Back turned out to be one of the most challenging endeavours Colonel By would face during the construction of the Rideau Canal.

INVENTORY OF CANAL STRUCTURES

Existing Structures:

A) Canal and Site Buildings
   - Lockmaster's house
   - Lock office
B) Engineering Structures
- Flight of two locks
- Rock and clay embanked dam
- Concrete sluice dam incorporating road bridge
- Bridge at top lock

Missing Structures:
A) Canal and Site Building
- First stone lockmaster's house
- Second frame lockmaster's house
- Barn and outbuildings

B) Engineering Structures
- First sluice dam
- First waste weir dam
- First through-truss swing bridge
- Stone arch dam (never completed)

Lockmaster's House:
The lockmaster's house is a one and a half storey frame building. It has undergone little change since its construction.

The exact date of this building is unknown at present. It was originally used as a storehouse and shelter for the lockmen. The architecture of the building is similar to that of other storehouses built in the late 19th century. It was originally built on the east bank of the Canal but in the 1950's it was moved to the west bank.

Lock Office:
The lock office is a one-storey frame building that was built around 1930. It was originally used as a storehouse. Like the lockmaster's house, the lock office was built on the east bank and was later moved to the west bank. It is believed that the change in function accompanied the change in location.

First and Second Lockmaster's House:
A blockhouse was planned for Hogs Back but it was never built. Instead a defensible lockmaster's house was built in the 1840's. It was a one-storey stone house located on the west bank above the top lock. Photographs of the house at the turn of the century show that...
it has retained much of its original appearance. It was still a one-storey structure with its loopholes filled in with timber. An addition had also been added.

By 1907 the house was reported to be in very poor condition. It is believed that when the house was torn down, a frame building was erected on the original foundation. This building survived until the mid-40's at least. Sometime after 1945 the house disappeared.

**Engineering Structures:**

One of the most difficult engineering structures to be built on the Rideau Canal was the dam at Hogs Back. One of the major problems associated with the construction of the dam was the intense spring floods.

MacTaggart suggested that the dam be built downstream from the present dam but Colonel By believed the only place for the dam was at the falls themselves. He wanted to raise the water high enough to flood out the rapids up to Black Rapids. This meant the dam would have to hold back almost fifty feet of water. Many people considered it a foolish plan because the dam had to be constructed in swift flowing water. To this point in time nothing like it had ever been attempted.

In early 1827 Walter Fenlon was granted the contract. The original plan called for a 45 foot arched keywork dam with 3 locks of ten foot lifts to be built to the west of the dam. The dam was also to have a waste weir. Fenlon started work in 1827 but due to financial problems he withdrew in early 1828. During his year of operation, Fenlon built a railway to bring stone from the quarry on the east bank to the north side. It is believed that this was the first railway in Canada.

Before Fenlon left, the portion of the dam he had completed collapsed. He was making preparations for the spring flood but a sudden rise in water in February caught him unprepared.

Colonel By decided to alter his plans slightly. He decided to build a separate waste weir on the east side of the dam in an attempt to lessen the pressure...
on the dam during spring flooding. Colonel By also decided to do the work themselves instead of contracting it out again. A group of Sappers and Miners under the supervision of Captain Victor began rebuilding the dam. Philemon Wright was also involved in the building of the dam.

A second failure occurred in early April of 1829. During the previous winter the canalwork of the dam was constructed with frozen soil. In the spring, leakage began. Colonel By was summoned at his home in Bytown. He immediately took charge of the project. Although aware of the problem, Colonel By was not prepared for the event to follow. In one of his letters he describes this event. "I was standing on it (the dam) with forty men employed in trying to stop the leak when I felt a motion like an earthquake and instantly ordered the men to run, the stones falling from under my feet as I moved off".

Defeated twice by nature, Colonel By was growing increasingly frustrated. By late summer of 1829 Colonel By had plans to redesign the dam. Work was carried out by Captain Victor and by the end of the year the dam was finished.
The major problem during construction, the spring runoff, has since caused tremendous concern. The eroding of the dam by the running water and the damage caused by the ice and floodwood which jam in the sluices has put great strain on the entire structure.

The locks at Hogs Back have withstood the strain very well. There were no major changes until the early 1900's when parts of the lock wall and sills were rebuilt. Minor changes since that time have occurred but no major alteration to the lock chambers have been made.
HARTWELLS

Hartwells Lockstation consists of a flight of 2 locks. It is the second of three stations within the city limits of Ottawa. The Rideau River is to the east of the lockstation on the other side of Carleton University. Besides the locks the only other engineering structure at Hartwells is the sluice/culvert chamber. It empties into a underground channel. Originally, this sluice ran into a stream that flowed across to the Rideau River.

Colonel By suggested in a report in 1832 that a small blockhouse should be built at Hartwells to protect the locks. His request was ignored and not until 1852 was there any mention of a defensible structure at the locks. An inspection of the lock reported a lockmaster's house "built of rough masonry stone and roofed with tin".

Shortly after the turn of the century a number of alterations to the house occurred; these included a frame second storey, improvements to the interior and the stone exterior covered by clapboard.

Hartwells, in the early years of operation, served as a maintenance depot. The gully on the west bank was converted into a basin. This enabled tugs and scows that needed servicing to be repaired out of the way of the Canal traffic.
Storehouses, workshops and houses were added to the station, many of which were constructed of stone. Between the end of the century and the First World War, these stone structures were replaced by frame buildings. The construction of the Colonel By Drive and the University around World War II forced the station to retreat to the west bank of the Canal. Some of the buildings on the east side of the lock were demolished, the others were moved across the Canal to the west bank. The maintenance function of Hartwells had been moved by this time and the station fell once again into the single role of locking boats.

Hartwells lockstation is in the midst of a popular recreational area. Many people visit the station for a number of reasons. Visitation from the Experimental Farm and the University are frequent. The asphalt path that runs along the side of the Canal also attracts cyclists, walkers and joggers to the station.

INVENTORY OF CANAL STRUCTURES

Existing Structures:
A) Canal and Site Buildings
   - Lockmaster's house
   - Lockmen's house (present office)
   - Storehouse
   - Stable/Shed
   - Small store (ex-bridgekeeper's hut?)
B) Engineering Structures
   - Flight of two locks
   - Concrete sluice/culvert chamber

Missing Structures:
A) Canal and Site Buildings
   - Lockman's house
   - Various out-buildings

Lockmaster's House:
The defensible lockmaster's house was built in the 1840's by the Ordnance Department. It was nearly torn down in 1904 by the Canal engineers because of its poor physical state. A new house was built for the lockmaster but later in the century the lockmaster's house was renovated and used as a residence.
The house has altered greatly from its original design. A second storey was added and the entire structure covered by horizontal siding, making it impossible to identify its original form or function.

Lockman's House:

Prior to World War I a number of frame structures replaced deteriorating stone buildings. It is believed that the lockman's house, storehouse and stable all originated during this period.

The lockman's house is an L-shape, one and half storey frame building. It originally stood on the east side of the locks but was moved to its present location following World War II. Today it is used as a lock office for the Canal staff.

Storehouse:

Like the lockman's house, this building is a frame one and a half storey, L-shaped structure. It was also built before World War I replacing a stone building at the site. Its function has always been a storehouse, although today it is not in use.
Stable/Shed:

This building was also built in the early 1900's replacing the stone buildings at Hartwells. It was originally used as a stable but now it is a garage and storage building.

Engineering Structures:

Originally, Colonel By planned to construct an "arched keywork aqueduct bridge" at Hartwells. This above ground channel to cross two gullies at Hartwells. Walter Fenlon, a civil engineer from the United States was responsible for starting the excavation. He soon ran into financial trouble and was forced to withdraw.

The extensive excavation required at Hartwells forced By to resort to locks rather than the aqueduct. The construction of two locks, plus an increase of 4 feet in the water levels eliminated much of the difficult excavation.

The contract for the locks and weir were granted to Thomas MacKay. Rock for the masonry work was quarried near the river at Hogs Back.

These engineering structures went unaltered until the early part of the 20th century. At this time major repairs to the stone work were necessary.
OTTAWA LOCKS

The Ottawa Locks marks the northern entrance to the Rideau Canal. A number of rapids and falls along the Rideau River between Hogs Back and the mouth of the Rideau River forced Colonel By to construct an artificial channel 5 1/4 miles long to bypass this section of the river. Three lock groups (Hogs Back, Hartwells and Ottawa) lower the boats 115 feet from the dam at Hogs Back to the level of the Ottawa River.

In the fall of 1826 the Earl of Dalhousie accompanied Colonel By on his first trip to the Rideau River. One of their priorities was to locate the entrance of the Canal. On September 26 they chose the natural ravine where the present day Ottawa Locks are situated. This date is considered by many to be the day Ottawa was founded. Hull, by this date, was a prosperous logging town but no settlement on the southern side of the Ottawa River had yet taken place.

Once construction on the Canal started, land was cleared and the development of Bytown began. A number of buildings associated with the Canal work were erected shortly after. An Engineering office and commissariat store were built on each side of the locks and a barracks and a hospital on the hill west of the lock. Workshops were also built for carpenters and blacksmiths. It was not long until a village emerged. A bridge (The Sapper’s Bridge) was also constructed early in the works. It was a stone arch bridge that crossed the Canal above the upper lock and connected the buildings on both sides of the Canal.
The Ottawa Locks were among the first to be tested. Leakage was high so large quantities of cement were forced into the breasts, side-walls and floors. The cement, used to seal the chambers, was made from limestone quarried on the opposite side of the Ottawa River. It proved to be a better water-cement than other types sent from Great Britain.

Excavation of the channel above the locks was no easy task. On many occasions work was set back by the failing of the embankment. This condition persisted for about 3/4 of a mile. The channel then went through a natural ravine for about 2 miles. The depth was more than adequate, therefore, no excavation was necessary. At the end of the ravine excavation began again through gravel and boulders. This continued for about half a mile until Dow's Great Swamp was met. About seven hundred yards of excavation through the swamp brought the Canal to Hartwells lockstation.

INVENTORY OF CANAL STRUCTURES

Existing Structures:

A) Canal and Site Buildings
   - Commissariat Store (Bytown Museum)
   - Lock office
   - Colonel By's house (ruins)

B) Engineering Structures
   - Flight of eight locks
   - Plaza bridge

Missing Structures:

A) Canal and Site Buildings
   - Engineer's office/quarters
   - First lockmaster's house
   - Second lockmaster's house
   - Carpenters' shops
   - Industrial buildings at the base of western cliffs

B) Engineering Structures
   - Sapper's Bridge
   - Dufferin Bridge
The Commissariat Store:

This building was built in 1827 by Thomas Mackay. It is constructed of limestone and is a fine example of the excellent masonry work performed by MacKay. It was one of the first buildings constructed on the Canal.

The Commissariat Store's first function was in the form of a warehouse or storage area for the Canal work. Today it is the Bytown Museum, operated by the Ottawa Historical Society.

Lock Office:

The lock office was built in 1884 by the Department of Railways and Canals. It has undergone a number of changes to modernize the office since its construction.

Royal Engineers' Office:

Thomas MacKay was also responsible for the construction of the Engineers' Office. It was a three-storey stone building built in 1827 with exterior designs similar to the Commissariat building. It was initially used as a storehouse and office by the engineers until 1857 when Colonel Coffin, the Ordnance land agent, moved in. He continued to live there until 1879. At this time the government took the building back because of the need for office space. The third storey was removed around the turn of the century when the railway from Ottawa to Hull was built. The rest of the building was demolished in the early 20th century.

Second Lockmaster's House:

The first lockmaster's house was a log house, built during the construction period. Reference is made to this building in an 1852 report but it was no longer being used as a lockmaster's house. The defensible lockmaster's house was built in 1849-50. It was located near the site of the Chateau Laurier Hotel. In 1872 the construction of a new bridge (the Dufferin Bridge) connecting Wellington and Rideau Streets resulted in the destruction of the lockmaster's house. The need for accommodation near the lock was needed. The third floor of the Ordnance office was converted into an office but more space was still needed. In 1884 the stone office at the top of the locks was built to handle the additional needs.
Engineering Structures:

The construction of the flight of locks at Ottawa was surprisingly not as difficult as one might expect. It was a large and complex job but contractors ran into very few problems. Keeping water from the Ottawa River out and controlling the numerous springs seemed to be the main concern of the contractors.

Limestone for the locks was excavated from the cliffs alongside the works. Initially, a basin was to be built between the 4th and 5th lock but when the larger locks (133' x 34') were approved, the basin was eliminated. A basin above the locks was constructed instead.

Little change has occurred to the structures of the Ottawa lockstation since its construction. Some masonry blocks have been replaced throughout the years but much of the original stone is still intact.

The basin and waste weir located on the northeast side of the channel were filled in between 1871 and 1872.

Bridges:

The first bridge (the Sapper's) was built in 1827. It connected Sparks and Rideau Streets. It survived
until 1912 but was altered when an additional bridge called the Dufferin was built in 1872. This bridge joined Wellington and Rideau Streets. The two bridges formed a triangle crossing the Rideau Canal. These two bridges survived until 1912 when the Plaza bridge was constructed. The new bridge connected all three streets that were previously joined by the Sapper's and Dufferin bridges.
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