RIDEAU REFLECTIONS

Newsletter of the Friends of the Rideau **Spring/Summer 2019**

A WORLD CLASS EXAMPLE OF ADAPTIVE ENGINEERING

Weir & overflow dam at Edmunds Lockstation
photo by Ken W. Watson

In our Fall/Winter 2018 newsletter it was noted that the Rideau Canal made the list of top 200 Engineering projects of the last 200 years (as determined by the Institution of Civil Engineers). One of the reasons is that it is a world class example of adaptive engineering, coming up with engineering solutions to meet local conditions and trying different engineering methods during construction to see which would work the best. This is unlike engineering projects of today where everything is pre-determined to the millimetre before the first shovel hits the ground.

The best known example of adaptive engineering is the use of waste weirs on the Rideau Canal. Those familiar with the history of the Rideau Canal know that these were not originally planned. The first design was for the main dams to be overflow dams, the height of the water simply regulated by the height of the dam. However, Colonel By's experience with spring flooding on the Rideau showed him that he had to make engineering changes. His solution was to have waste water weirs as an "indispensably necessary" addition to most of the lockstations. For example, in his 1830 report for Black Rapids he wrote:

> "Having observed that the Spring floods flowing over the Dam, had a great effect upon the Bed of the River immediately in front of the same, by tearing up the Strata, I considered it indispensably necessary to provide for the safety of the Dam, and conceived that a Waste Weir, sufficiently wide to allow a large portion of the Water of the River to pass through it during the Spring floods, was the safest as well as the cheapest mode that could be adopted, and I am happy in being able to state, that this work completely answered the purpose desired in the Spring."

His engineering solutions were not cookie cutter solutions, he was also trying out different engineering solutions at different lockstations. An example of this that can still be seen today is the design of the tunnel sluices. Tunnel sluices are the openings in the large foundation (the breastwork) at the head of most locks that allow the water from above the lock to flow into the lock chamber. The sluices channel the water into the head of each lock chamber at a 90 degree angle to minimize turbulence in the lock. At the original 1832 locks with tunnel sluices, two different engineering designs were used.

At most lockstations, the original design was to place a sluice valve in the middle of the tunnel. That valve would be opened and closed using a crab (hand winch). A square manhole provided access to the sluice valve mechanism. However, at two of the locks, Kingston Mills and Jones Falls, a different engineering design was used, one using face valves, valves located on the upper wall at the entrance to each tunnel sluice. To prevent the

ANNUAL SPRING MEETING

Saturday, May 25, 2019 **(see back page for details)**

Friends of the Rideau is a volunteer, non-profit organization, working to enhance and conserve the heritage and charm of the Rideau Canal.
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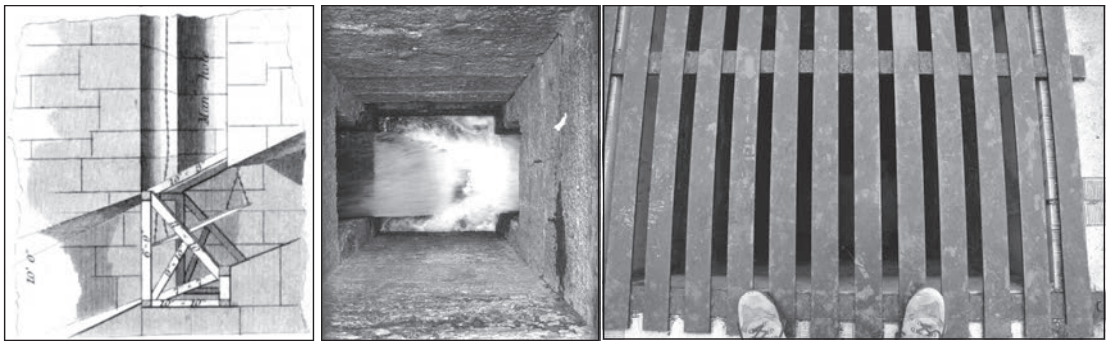

Manholes leading into tunnel sluices

The image on the left shows the original design of an in-tunnel valve. The middle picture is looking into a now empty manhole, to where the tunnel valve used to be prior to removal in 1839. The wooden grates that originally protected the manhole openings were replaced in 1900 with iron grates after the Superintendent of the Rideau Canal broke through a wooden cover in 1899 and got sluiced into a lock.

Left image from "Detailed description of some of the works on the Rideau Canal" by Lt. Denison, Papers on Studies connected with the Corps of Royal Engineers, Vol III, 1839. Photos by Ken W. Watson

sluice from air locking, a small vent in the middle of the tunnel was used. The vents at Kingston Mills have square covers, the vents at Jones Falls have round covers. Another difference is that at these locks, a rack and pinion system is used to open and close the valves rather than a crab. Colonel By planned to use rack and pinion controls for all the locks, but he changed the design for the in-tunnel valves, substituting iron valves in place of wooden valves and a crab and chain mechanism in place of the originally planned rack and pinion mechanism.

With the opening of the Rideau Canal in 1832, they gained lots of real world experience in how these two different sluice mechanisms worked. The Rideau, as a newly flooded environment, had lots of debris, things such as branches coming off rotting trees in addition to the regular aquatic vegetation that would get uprooted, head to the locks and get caught up in the sluice valves. In addition, saw mills along the waterway were dumping large quantities of sawdust into the water and this also created sluice valve failures. The locks at Kingston Mills and Jones Falls, with their accessible face valves, were easy to maintain, but the other locks, with their in-tunnel valves, were much more difficult to maintain, as debris was much harder to clear from inside the tunnel.

In 1839 the in-tunnel valves were removed and replaced by face valves. The now empty sluice tunnel manholes were covered over with wooden slats to prevent lock staff from accidently falling in. That worked until 1899 when Superintendent Philips, while on an inspection tour, broke through the wooden slats covering a manhole at the Long Island locks and got sluiced into the lock (with just a few bruises). Subsequent to that incident, he ordered that all wooden slat covers be replaced with iron slats, the ones we can see covering the manholes today.

There are many other examples of adaptive engineering along the Rideau. It's to be remembered that they were still working out solutions in 1827 and 1828. Surveys of the sites were still being done 1827 and one of the engineers, N.H. Baird, was quoted in 1828 as stating that a solution to navigation through Smiths Falls "seems rather a puzzler." The final decision to increase the size of the locks in June 1828 necessitated an engineering re-think at many of the lockstations. The locks at Ottawa for instance, were originally planned as two flights of four locks with a turning basin in the middle. That had to be changed to a single flight of 8 locks with the new larger sized locks.

At Hogs Back, the stone arch dam fell down three times during construction. The plan for that was abandoned in favour of a timber crib (stone filled) dam design, which still stands today. At the Ottawa locks, the sills moved due to hydraulic pressure during the first tests of the locks. Colonel By consulted with the contractors, Thomas MacKay and John Redpath, to come up with an engineering solution to fix that problem. When the lock at Upper Brewers was almost washed away in May 1832, due to the failure of a mill dam holding back the raised waters of Loughborough Lake, Colonel By came up with the design for a safety gate that would protect the lock – two such gates were installed, one at Upper Brewers and one at Newboro.

The fact that there is a lock in the middle of a lake (Narrows) is another example of an adaptive engineering solution to a construction problem, the hard and fractured bedrock at

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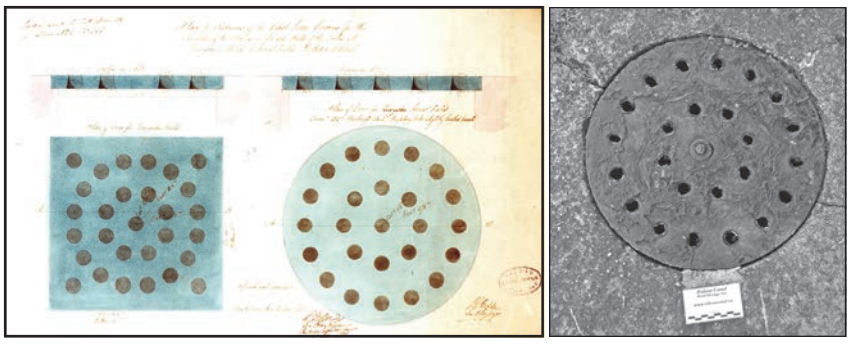

Tunnel Sluice Vent Covers

The diagram shows the engineering designs for the cast iron sluice vent covers for Kingston Mills (left) and Jones Falls (right) - drawn by Captain D. Bolton in 1836. The photo is of a current sluice vent cover at Jones Falls (photo by Ken W. Watson)

2019 AGM

Our AGM will be held on Saturday, May 25 in the second floor board room of the Rideau Canal Office of Parks Canada (location of the Rideau Canal Visitor Centre in Smiths Falls). Our focus at the AGM will be on the upcoming management plan consultations. We hope to have **Susan Millar**, heritage planner with Parks Canada, give us an update on the new management plan and participate in our discussions.

Our AGM is also a great opportunity to come out and meet the directors and members of Friends of the Rideau. We share a common love of the Rideau Canal so there is no lack of interesting conversation. Come out and show your support of Friends. See the back page for full details.

Everyone is welcome to attend!

The Depot

We hope to have The Depot in Merrickville open in June, depending on availability of summer students and volunteers. And speaking of volunteers, we could use some help, all we ask is that you bring your knowledge and enthusiasm for the Rideau and share it with visitors. If interested or if you wish to learn more, please contact us at info@rideaufriends.com.

Summer Activities

A pleasant part of our summer activities is participating in a number of Rideau-themed events along the waterway, and getting to meet supporters and visitors. Our presence is often weather-influenced (2017 was not a great year!) but we always hope for warm, sunny days. The plan this year is to have our booth set up at several summer events:

- June 1 – Rideau Paddlefest in Smiths Falls.
- August 5 – Colonel By Day at the Ottawa Locks.
- August 10 – Manotick Classic Boat Show at Rideau Ferry.
- August 17-18 – the Rideau Ferry Regatta.

Thanks to the organizers of these events; the Rideau Roundtable, Parks Canada/Bytown Museum, the Manotick Classic Boat Club and the Rideau Ferry Regatta organizing committee, for including us. We hope to see you at one or several of these events.

We welcome anyone that would like to help us meet and greet the public during these events. Please contact us at info@rideaufriends.com.

Hunter in our booth at the Classic Boat Show

Message from the Chair

Dear Friends,

It seems that spring may be coming, judging by the flood warnings being issued regularly as this is written. Let's hope that there is not a crisis like we saw in 2017, and that there is enough water in August to maintain adequate navigation depths in the Rideau Canal.

Elsewhere in this newsletter you will read a report on the start of an interesting research project on the natural ecosystems of the Rideau Canal system and the impact of human activities. Friends of the Rideau took part in the first of a series of workshops, together with representatives of other non-governmental groups. It is our hope that the outcome of this project will be a set of recommendations to the several levels of government responsible for managing the various elements that affect the Rideau Canal, reflecting the aim of "Science to support Parks Canada's historic Rideau and Trent-Severn waterways to maintain and enhance ecosystem services." To achieve success the researchers need to hear from all of us and understand our concerns, so if you have the opportunity to connect with the team, be sure to do so.

Parks Canada continues to implement the major program of repair and restoration work along the Rideau announced in 2015-2016. Of course the impact of the work will be reduced during the navigation season, but notably visitors to Jones' Falls will see the scope of long-overdue work at that site. Friends had hoped that the 2018-2019 repair work would have included fixing the foundation (or lack of) at The Depot, our visitor centre in Merrickville, but that wasn't the case. We are assured that work will begin in October this year – we certainly hope so as the floors in parts of the building are rather spongy!

For Friends supporters living in Ottawa, the controversy over the proposed addition to the Chateau Laurier will strike a familiar note. Given that the site overlooks the Ottawa Locks, one would have expected Parks Canada to have concerns about the changes to the heritage landscape the proposal will have for what is possibly the most-visited site on the Rideau. The several iterations of the design for the addition, commissioned by the hotel owners, have been described as having all the merit and charm

Chair's Letter—continued from page 3

of a Holiday Inn (no offence intended to that brand). But Parks has not raised any objections, despite heritage landscape protection/preservation having been one of the issues of concern raised by ICOMOS in its 2006 survey of the Rideau Canal as a World Heritage Site candidate. Given the iconic status of the Chateau Laurier, Heritage Ottawa (disclosure: I am a board member) has initiated a campaign to have the project challenged and supporters of Friends of the Rideau may find it useful to visit the website to read some interesting perspectives (heritageottawa.org/chateau-laurier-addition).

I hope to see you on the Rideau this summer. Come and visit us at The Depot. Write and tell us what you would like us to work on (info@rideaufriends.com).

- Hunter McGill

Report from Parks Canada

Parks Canada's Historic Rideau Canal opens on Friday, May 17th on the Victoria Day long weekend and staff are busy preparing to welcome the first boaters of the season.

New this season on the Rideau Canal is an equipped camping offer. Visitors may rent camping kits at Kilmarnock, Beveridges, and Chaffeys lock stations and enjoy one of these picturesque sites for $70 a night. Kits include such equipment as a tent, sleeping mats, portable stove, mess kits, and other gear to make your camping experience an easy and enjoyable one.

This year we are also pleased to announce the return of our paddle promotion. Paddlers can take advantage of 50% off their seasonal lockage pass and enjoy the experience of locking through with other boats. Kayaks and canoes are most welcome in the locks and the Rideau Canal's series of lakes and rivers are great places to explore by paddle.

We invite visitors to pay a visit to Jones Falls, a beautiful, serene lock station where you can view the Sweeney House Museum and our working Blacksmith Shop. See how some of the earliest lockmasters lived and enjoy the views and surroundings.

For more details, please see our website at www.pc.gc.ca/rideau or follow us on twitter @RideauCanalNHS and for up to the minute updates on mooring space, events, and more, follow @RideauBoatInfo.

- Ontario Waterways, Parks Canada

Infrastructure Update: Parks Canada has indicated that due to unexpected problems with bedrock at Jones Falls, the new timber bridge won't be ready until sometime in July.

Using Science to Support Ecosystem Management of the Rideau Canal

A three-year research project, involving a team from the University of Ottawa and Carleton University, with support from the Université de Sherbrooke, has begun its study of the environmental health of land and water along the Rideau Canal. Funded with a $600,000 grant from the Natural Science and Engineering Research Council of Canada, the team will be working in partnership with Parks Canada, though the latter is not the client for the results of the study. The team is composed of conservation biologists, evolutionary and aquatic ecologists, limnologists, water resource engineers and social scientists. The aim is to study the Rideau as a complex social-ecological system and come up with findings and recommendations to improve management of the Rideau Canal system. The lead researchers are Prof. Nathan Young and Prof Stephen Cooke.

The first of a series of four workshops, involving civil society representatives (lake associations, Rideau Roundtable, Friends of the Rideau, Queens University Biological Station, Watersheds Canada and the Rideau Waterway Land Trust) took place on March 21. The purpose of the workshop was to discuss what can be done to maintain or improve the environmental health of land and water in the Rideau Canal, to understand the thinking of Rideau constituent groups, and identify, where possible, common concerns. The specific goals of the project include:

- The influence of dams and lock stations on abiotic (i.e. water, sediment, nutrients) and biotic (i.e., plankton, recreational fish, at risk fish and turtles, invasive species) connectivity at a system and at a reach scale
- Identify the effects of shoreline habitat and aquatic macrophyte management strategies on ecosystem structure
- Investigate the perspectives of key stakeholders related to waterway management scenarios and communication strategies.

Over the coming months three more workshops will be organized, involving the private sector, governments (including Parks Canada) and indigenous groups. The results of the research will be made public over time, as the various phases of the work and analysis are completed, via scholarly publications, recommendations to governments and communities, and other public communications. There is considerable potential for improvement in the management of water and land resources along the Rideau Canal, if governments at all levels follow up on the results of this project.

- Hunter McGill

2019 Lock Hours of Operation

Dates	Days	Hours
May 17—June 23	Mon to Thurs	10 am to 4 pm
	Fri to Sun, holidays	9 am to 7 pm
June 24 – Sept. 2	Mon to Thurs	9 am to 6 pm
	Fri to Sun, holidays	9 am to 7 pm
Sept. 3— Oct. 14	Mon to Friday	10 am to 4 pm
	Sat to Sun, holidays	9 am to 5 pm

2019 Fees

Single Lockage & Return	= $ 0.90 per foot
One Day	= $ 1.60/ft
Transit (one way)	= $ 4.65/ft
Six Days (any six days)	= $ 5.05/ft
Seasonal	= $ 8.80/ft

Rideau Canal Management Plan

It's coming down to the wire for public consultations on the draft management plan for the Rideau Canal. That plan, already four years overdue, is expected to be released in draft form this spring and made available for public review. The plan will ostensibly guide what Parks Canada does on the Rideau Canal for the next ten years.

A looming problem is that as soon as a Federal election is called, all work on the management plan will have to stop, including any public consultations. So those consultations have to be done sooner rather than later. Parks Canada was unable to provide us with any information on those consultations for this newsletter.

As "Friends of the Rideau" we are of course very concerned about heritage issues, including the lack of attention being paid to Rideau heritage interpretation. In May 2018, Minister McKenna released her report on the 2017 Let's Talk Parks Canada consultations. In that report she directed Parks Canada to have ***"an emphasis on commemorative integrity at national historic sites, together with the need to dedicate additional resources to education and interpretive programs.*** We've seen no evidence of this happening on the Rideau Canal. In fact, there are actually less resources being put into interpretation this year. It's very disappointing. We'll have to ensure that the management plan clearly commits Parks Canada to supporting their legislated heritage mandate.

We plan to have a discussion about Friend's input into the new management plan at our AGM. Come on out and give us your thoughts—all are welcome!

Adaptive Engineering—continued from page 2

Newboro. Colonel By originally anticipated that he could simply dig a canal cut through the isthmus at Newboro (no lock). The survey he had showed only a small difference in water elevation between Rideau Lake and Mud (Newboro) Lake. But that survey was in error, the difference was greater than By anticipated and it now meant he had to put a lock into the channel. The hard and fractured bedrock at the Isthmus also came as a surprise, it was extremely difficult to excavate the channel as deep as it needed to go. By realized that if you couldn't dig the channel deeper, a solution was to raise the water level in that channel. This led to the idea of building a dam and lock at a narrowing in Rideau Lake, the Upper Narrows, and raising the level of Upper Rideau Lake.

Testament to that story exists today with the lack of breastworks, the normal upper foundations for a lock, at Newboro and Narrows. While Colonel By didn't have the technology to dig the channel as deep as he wanted to, he knew that at some point that technology would come along. So he didn't plan for the locks at Newboro and Narrows to be permanent, he built them without breastworks (upper foundations), so that the locks could be removed when the time came that the channel at Newboro could be sufficiently deepened. That was never done, but lack of breastworks and the placement of sluice valves in the upper gates at Newboro and Narrows remain in testament to By's engineering foresight.

When you're out and about at the locks this summer, have a look at the weirs. See them as an engineering solution to a problem. Have a look at the manholes leading into the tunnel sluices. Contrast those with the small sluice vents at Jones Falls and Kingston Mills. They all tell the story of engineering the Rideau Canal.

- Ken Watson

2019/20 Membership Renewal

A reminder that this is membership renewal time (our membership year runs from June 1 to May 31). If your membership is up for renewal, you'll find a handy renewal form with this newsletter. We thank you very much for your support.

Hotel Kenney Closure

For the first time in 142 years, the historic Hotel Kenney will not be opening its doors for the upcoming season. It will remain closed for 2019 as the owners work out what to do with the building. The hotel was bought by Frank Foltz from the last Kenney owner, Joe Kenney, in 2008.

Current plans are to keep the ice cream shop open for the summer months.

FRIENDS OF THE RIDEAU

ANNUAL SPRING MEETING

Saturday, May 25, 2019
9:30 am to noon
2nd Floor Boardroom, Parks Canada Office
34 Beckwith Street South, Smiths Falls

9:30 am	Meet and Greet
10:00 am	Annual General Meeting
10:20 am	Management Plan Discussions

Our 2019 Annual General Meeting will focus on Friend's input into the new Rideau Canal Management Plan. The Management Plan is the only opportunity provided by Parks Canada for public input into the management of the Rideau Canal. Friends wishes to ensure that issues important to us, issues important to the future of the Rideau Canal, are incorporated into that plan.

Although not yet confirmed, we hope to have **Susan Millar**, heritage planner with the Rideau Canal Office of Parks Canada, present at the meeting to provide us with an update to the plan and answer questions about the new Rideau Canal Management Plan.

Come out and meet some Friends
Everyone is welcome

The Rideau Canal Office easy to find – it's the big stone building with the grain elevator sitting at the south end of the main downtown area – the same building that houses the Rideau Canal Visitor Centre (34 Beckwith Street South) in Smiths Falls.

Paddling the Rideau Canal

This group of Girl Guides on Sand Lake in 2018 is continuing in the long tradition of Girl Guides paddling on the Rideau Canal. Back in 1929, the buildings on Fettercairn Island (now Richardson Island) in Indian Lake were given to the Girl Guides of Canada for use as a training centre. The Fettercairn Island Training Camp operated every summer until the late 1930s. Even today, you'll find some locals calling it Girl Guide Island. Photo by Ken W. Watson.