NATIONAL HISTORIC PARKS
AND SITES BRANCH

DIRECTION DES LIEUX ET DES
PARCS HISTORIQUES NATIONAUX

MANUSCRIPT REPORT NUMBER 212
TRAVAIL INÉDIT NUMÉRO 212

HISTORIC BRIDGES ON THE RIDEAU WATERWAYS SYSTEM:
A PRELIMINARY REPORT
(1976)

THE ST. PETER'S CANAL SWING BRIDGE
(1976)

THE UPPER DORCHESTER COVERED BRIDGE,
WESTMORLAND COUNTY, NEW BRUNSWICK
(1977)

by
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PARKS CANADA
DEPARTMENT OF INDIAN
AND NORTHERN AFFAIRS

PARCS CANADA
MINISTÈRE DES AFFAIRES
INDIENNES ET DU NORD

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Illustrations

Abstract

This report locates and identifies bridges of historic interest on the Rideau waterways system. The historic bridges are grouped according to their general type (moveable or fixed) and their material(s) of construction. A history and description of each of these structures is given along with a brief history of the bridge site.

Historic Bridges on the Rideau Waterways System

Introduction

Over the navigation channel of the Rideau Canal, including the Tay Canal branch, there are a total of forty-two bridges. Of these, six are railway bridges: 5 fixed high levels, and 1 bascule; and 36 are road bridges: 19 fixed high levels, 1 vertical lift, 1 bascule, and 15 swing bridges. In addition, there are 17 bridges at lock stations which span either the river or the waste weir channel. Of these, nine are constructed on dams/waste weirs, six over the waste weir or river channel and two are railway bridges. In all there are 59 bridges on the Rideau Waterway. None of these bridge structures were erected at the time of the canal's construction. The oldest bridge structures date from 1888. The timber king post truss swing bridges, however, are replicas of an older type of swing bridge which has been retained through reconstruction.

Of these 59 bridges 26 are briefly described in this paper. These bridges were selected on the basis of criteria established for assessing the historical significance of bridges over the Rideau waterways system in an internal document prepared by the writer in 1975.

The present report consists of short historical accounts of the individual bridges selected on the basis of the 1975 document. The bridges are grouped, and described, according to general type (moveable or fixed) and material(s) of construction. Eventually a more definitive treatment of the bridges will be done.

To supplement the information contained in this report, the "Rideau Canal: Preliminary Site Studies" series, produced by Restoration Services Division, Engineering and Architectural Branch, with the assistance of the Research Division, National Historic Parks and Sites Branch should be consulted.

Timber Swing Bridges

The five timber swing bridges found on the Rideau Canal are replicas of a swing bridge designed for use on the Rideau Canal in 1864 (Fig. 39)[1] which was in turn a modification of a type of swing bridge erected on the canal as early as 1843 if not before (Figs. 37, 38).[2] Previous to that date moveable bridges on the Rideau Canal were of the rolling bridge type (Fig. 36).[3] The timber swing bridges have been completely rebuilt at approximately twelve year intervals over the years; but their basic structure has been maintained with but a few minor alterations.

The superstructure of each bridge consists of a heavy timber frame span, supported by a corbel frame under the heel section of the span, and strengthened by means of a Kingpost truss set over each of the two main stringers. Each truss consists of a heavy timber main post and three iron suspension rods which are fixed at one end to the main stringer at the heel, toe, and mid-point of the long-arm, and at the other end, to the transverse cap beam directly over the main posts. The bridge is further strengthened by knees and braces placed inside the main posts and the frames. To provide horizontal stability, the bridges are further equipped with iron roller wheels which run about the pivot on a concentric iron track circle, some 12 feet in diameter, set into the pivot pier. There are also roller wheels set into the toe and heel beams which run on the abutments of the bridge to provide ease of opening and closing. With the exception of the working parts, several angle braces and the suspension rods, the whole of the superstructure is constructed of timber with a plank deck and wooden railings. The timber swing bridges vary slightly in length; but are approximately 70 feet long and have a standard clear width of 12 feet with a loading capacity of five tons. All are manually operated by means of a capstan and chains or a push bar (Fig. 39).[4]

Timber swing bridges today are to be found at Nicholsons locks, Kilmarnock, Jones Falls, Brass Point and Lower Brewers (Washburn). All but the Brass Point bridge either span or are adjacent to lock chambers and comprise a single swing span. Of this group of timber swing bridges, the oldest crossing site is that at Kilmarnock built at the time of the construction of the canal, c.1832. The other bridges were built at Nicholsons locks in 1864, Lower Brewers (Washburn) in 1872, Jones Falls in 1883, and Brass Point in 1887 (Figs. 2-6).

The five timber swing bridges are excellent replicas of the 1864-65 model Rideau Canal swing bridge and closely approximate the appearance of the rolling bridges erected on the canal at the time of its construction.[5] These bridges contribute a great deal toward maintaining the original appearance of the canal as built by Colonel By. They provide functioning examples of a type of historic bridge structure which can no longer be found standing on any of the other Canadian canals.

Four moveable bridges were built at the time of the canal's construction.[6] As early as 1843 these were beginning to be replaced by swing bridges and in the following decades new swing bridge crossings were built across the canal. By the late 1880s, on the eve of the decision of the Department of Railways and Canals to commence replacing timber swing bridges with steel structures, there were 18 timber swing bridges on the Rideau Canal.[7] Thirteen of these were single span swing bridges. The other five were swing spans forming part of larger continuous span, low level, crossings.[8] By 1930, the number of timber swing bridges had been reduced to 13. This number has dwindled further until today only five remain, including the Brass Point swing span.

Combination Timber Swing and Fixed Steel Bridge: Brass Point (1902-03)

The Brass Point timber Kingpost truss swing span forms part of a long low level bridge which crosses the narrow neck of water connecting Cranberry Lake and Little Cranberry Lake. It is located approximately half way between the Jones Falls and Upper Brewers lock stations and carries Burnt Hills Road across the waterway. This county road connects Seeley's Bay on Highway 15 on the East side of the Canal with Battersea on the main county road to the west of the canal.

The present Brass Point bridge consists of a Kingpost truss timber swing span and four fixed steel spans. The swing span is of the same design as the other Kingpost swing bridges on the Rideau Canal; while the four steel spans are low through trusses of a Warren truss design. The bridge overall is 467 feet 6 inches long with 3 steel spans of 100 feet, one of 95 feet, and a swing span of 72 feet 6 inches. The steel spans have a clear road width of 15 feet; while that of the swing span is a standard 12 feet. The loading capacity rating of the crossing has been downgraded to as low as two tons in recent years due to the deteriorating condition of one of the timber crib piers (Fig. 6).[10]

The first bridge erected at Brass Point in 1887, consisted of eight timber truss fixed spans and a Kingpost truss swing span supported on rock filled timber cribs and abutments.[11] During the winter of 1902-03, the fixed timber spans were replaced by the existing four steel spans and the sub-structure was rebuilt from the waterline up.[12] The timber swing span has been renewed from time to time with the latest renewal dating from 1964.

At one time there were as many as five low level continuous span crossings on the Rideau system. In addition to the Brass Point bridge these included bridges erected at Becketts Landing and Manotick in 1867, Olivers (Rideau) Ferry in 1874, and Wellington (Kars) in 1879. Each of these consisted of multiple fixed spans in conjunction with a Kingpost truss swing span. Today, the Brass Point bridge is the only one of its type standing on the Rideau Canal or anywhere else in Ontario.

Vertical Lift Bridge

Pretoria Avenue, Ottawa (1915-17)

The Pretoria Avenue vertical lift bridge which joins Pretoria Avenue on the left, or west bank of the canal to Hawthorne Avenue on the right, or east, bank is unique on the Rideau System and is apparently the only bridge of its type in Canada. Moreover, it remains virtually unchanged in appearance from the date of its construction.

The first bridge on the Pretoria Avenue site was built in 1889-90 by the Department of Railways and Canals about 600 feet north of the present lift bridge, at the foot of John Street (Argyle Avenue). This was a steel truss swing bridge resting on timber piers. When the bridge eventually proved to be too narrow and light to handle increasing traffic demands, the Corporation of the City of Ottawa entered into an agreement in 1915 with the Federal Government, with the former undertaking to build an electrically operated steel lift bridge on the line of Pretoria Avenue south of the existing swing bridge, which was to be removed. Construction commenced in 1915; and the present structure was completed in 1917.[13]

The Pretoria Avenue bridge erected in 1915-17 is a Strauss direct lift bridge manufactured by the Strauss Bascule Bridge Company of Chicago, U.S.A. It is a vertical lift, deck bridge consisting of three steel spans: a centre arched lift span some 84 feet long centre to centre of bearings, and two fixed approach spans. Overall the bridge is 205 feet long with a 44 foot clear roadway and two six foot wide sidewalks. The bridge rests upon two concrete piers set in the river and its abutments. They are faced in stone above the water line with the piers being carried above the deck of the bridge, to provide towers to house the operating machinery and the bridge operator. The bridge has a vertical lift of 20 feet, which provides a total 30 foot clearance over the water when raised. It is electrically operated by means of vertical climbing racks and counterweights located in the towers (Fig. 7).[14]

In appearance the bridge has altered little over the years. The open centre truss span and the facing on the exterior of the outside fixed span plate girders date from the original, as does the trellised iron crossing guard at either end of the bridge. The original asphalt covered timber deck and two lines of street car tracks have been removed and a different deck installed. This consists of reinforced concrete on the fixed spans and an open steel grating on the lift span.

Steel Through Truss Swing Bridges

At present there are five through truss swing bridges extant on the Rideau Canal system. All are rivetted steel structures, and were erected in the period 1888-1903 when the Department of Railways and Canals followed a policy of replacing the timber King post truss swing bridges with iron and/or steel superstructures. These bridges were of various truss types; and the five which remain differ widely in their structural design. They are to be found at Long Island, Burritts Rapids, the Narrows, and on Beckwith and Drummond streets in Perth (Figs. 8-12).

All of these structures are of the unequal arm, or bobtail, centre-bearing type of horizontal swing bridge which turn and are supported upon a pivot pier erected on one wall of a lock or on one bank of the navigation channel. They are stabilized by means of counterweights placed under the short arm, or heel, of the swing span, and by roller wheels fixed to the underside of the bridge outside of the centre pivot. The roller wheels run on a concentric track circle, about 12 feet in diameter, set into the pivot pier. Three of these bridges consist of single swing spans which either cross the navigation channel (Burritts Rapids), or over a lock (Long Island and the Narrows). The other two, the Beckwith and Drummond street bridges, cross the Tay River channel in Perth and each comprises a swing and a fixed span.

Burritts Rapids (1897)

Burritts Rapids is the oldest bridge crossing on the Rideau system with the first bridge across the river at that site dating from 1824.[15] At the time of the construction of the canal, Burritts Rapids was one of the six sites on the canal chosen for the erection of bridges.[16] A fixed bridge was constructed there in 1832 some 900 yards above the lock. This bridge provided a 28 foot clearance over the water.[17] In 1851, a timber kingpost truss swing bridge was erected on the site.[18] This bridge was renewed at intervals thereafter until 1897 when the present steel through truss swing bridge was constructed.[19]

The present Burritts Rapids bridge, erected in 1897, is an unequal arm, or bobtail, through truss structure of one span which crosses the south, or navigation, channel of the Rideau River at Burritts Rapids. It is supported upon a masonry abutment and pivot pier which form the banks of a 33 foot wide navigation channel. The bridge is 65 feet 6 inches long with a clear road width of 13 feet. It is manually operated by means of a turning lever inserted in the deck over the pivot. It has a plank deck, and wooden railings along the inside of two trusses. This bridge has the mostinteresting appearance of all the steel through truss swing bridges on the Rideau Canal as it is of an assymetrical truss design combining a Pratt and Fink truss.

Indeed, the Burritts Rapids bridge is of a design not found on other Canadian canals, or for that matter likely anywhere else (Fig. 8).

Long Island: 1935 (1903)

There was no bridge crossing at Long Island prior to the con- struction of the Rideau Canal. With the construction of the Long Island flight of locks, the stone arched dam, and the waste weirs over the by-wash channel on Nicoll's Island and Mud Creek in 1827-32, it was possible to cross the Rideau River there on foot. Pedestrians could do this by walking across the top of the lock gates and along the top of the other engineering structures. Indeed, there was a footpath connecting the stone arched dam and the two waste weirs. However, no bridge was constructed over the locks.[20]

In 1863, a fixed bridge, the Dawson bridge, was built across Mud Creek just below the Nicoll's Island by-wash channel by a group of local residents. At the same time, they instituted a ferry service to convey vehicles and travellers from the east bank of the Rideau River around the head of the locks to the stone arched dam from where they could proceed directly to the Dawson bridge.[21] This was the first road crossing at Long Island.

In 1874, Mr. James Latimer under contract with the government, built a swing bridge across the upper lock at Long Island. The bridge that Latimer erectedwas an unequal arm, or bobtail, centre-bearing kingpost truss swing bridge.[22] The design was that adopted for use on the Rideau Canal in 1864-65.[23] Facsimiles of this model swing bridge are still being erected on the Rideau Canal today. The timber kingpost swing bridge at Long Island was rebuilt from time to time until 1935 when the present steel structure was erected over the upper lock.[24]

The present Long Island swing bridge was built by the Hamilton Bridge Works Company of Hamilton, Ontario, and erected just above the locks at Hogs Back in 1903. In 1930, it was dismantled and moved to Long Island for storage prior to its being re-erected there in 1935. This is an unequal arm, or bobtail, centre-bearing swing bridge supported upon a masonry pivot pier and abutments which rest on the lock walls. It is a low through, or pony, truss structure of a Pratt truss design with trellised posts. The bridge is 72 feet 8 inches long with a 12 foot roadway. The inside of the two main girders is lined with wooden railings. This bridge has a wooden floor consisting of three-inch planks spiked to timber joists, and was designed to have an eight ton carrying capacity. It is manually operated by means of a turning lever inserted through the deck of the bridge to operate the rack and pinion turning unit (Fig. 9).[25]

Narrows (1898)

Prior to the construction of the lock and waste weir at the Narrows in 1831-32, the 'Kingston and Perth Road' passed along a narrow tongue of land which separated Upper Rideau and Big Rideau Lakes.[26] The water channel which cut through this narrow neck of land to connect the two lakes was very shallow, approximately 18 inches deep, and was forded by travellers using the road.[27] During the construction of the canal however, an embankment was built on this tongue of land and the level of Upper Rideau Lake raised some four feet. The lock and waste weir were built in this embankment; but only the waste weir was bridged.[28] No crossing was provided over the lock.[29] In 1867, however, the Department of Public Works constructed a timber kingpost truss swing bridge over the lock, thereby re-opening the old 'Kingston and Perth Road' connection via the Narrows.[30] This structure was renewed periodically over the years until 1964 when the present through truss steel swing bridge was erected just above the Narrows lock.[31]

The present Narrows bridge was originally erected in 1898 at Beveridges locks on the Tay Canal.[32] In 1961, the building of a fixed high level bridge at Beveridges rendered the swing bridge superfluous and it was moved to the Narrows, stored, and eventually re-erected there.[33] This bridge is a rivetted steel through truss structure of the unbalanced arm, or bobtail, type with the two main girders being a modified Pratt truss. It is 69 feet 9 inches long with a 13 foot clear road width and a loading capacity of five tons. The floor of the bridge consists of three inch planks spiked to longitudal timber joists. Wooden railings are affixed along the inside of each of the two main girders. The bridge is manually operated by means of a turning lever inserted into the deck of the bridge over the pivot (Fig. 10).[34]

The Narrows swing bridge, and that at Long Island, are the only two examples on the Rideau Canal of a pony truss swing bridge.

The Drummond and Beckwith Street Swing Bridges, Perth (1888-89)

The Drummond and Beckwith swing bridges in Perth on the Tay Canal branch of the Rideau Canal, are all that remain of the five swing bridges erected over that canal branch when it was rebuilt in 1883-91. Both bridges comprise a fixed and swing span and cross the river channel in Perth on their respective street alignments. These bridges were built by the Robert Weddell Bridge and Engine Works of Trenton, Ontario, and are of the same basic design. The swing spans can best be described as being a Kingpost truss with latticed main posts and transverse cap beam from which suspension cables are hung to support the ends of a low through girder span of the Howe truss type. The fixed spans are simple Howe trusses. Structurally the swing spans are of the unequal arm, or bobtail, centre-bearing swing bridge type stabilized by means of a ring of roller wheels outside of the pivot. Each of the swing spans is 77 feet long with a clear road width of 14 feet 6 inches, and has a