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BRIDGES OVER THE TRENT SEVERN WATERWAY

1826-1978

W. George Richardson

1978

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by W. George Richardson

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Abstract

The purpose of this report is to record the history of all fords, ferries and bridges crossing the navigation channel of the Trent Severn Waterway. The record includes the details of the types of ferries and bridges at each location, when they were erected, modified or replaced and for what reason. To substantiate the reasons for construction and change, a general survey is made of the physical characteristics of the waterway before canalization, the canoe routes used, and the forms and routes of land transportation (road and rail) in the vicinity of the waterway. Settlement of the area, lumbering and agriculture are also mentioned. The construction of the locks and canals that make up the waterway is briefly outlined as it affects bridge construction. The various roles of bridges in the community is mentioned also.

The major portion of the report traces chronologically the construction of the bridges in six geographic sections. The specific technical details about each are contained in the appendix.

The final section contains an examination of the evolution of bridge design along the waterway based on the information and statistics evolved in the study and on the state of the art elsewhere in Canada and the U.S.A. during the same period.

The conclusion reached is that the construction of these bridges along the Trent Severn Waterway between 1833 and 1978 could well represent a micro study of bridge building across Ontario at the same time.

Preface

The aim of this report is to examine the historical significance of the bridge structures on the Trent Severn Waterway in a local, regional and national context. The study covers all crossings including bridges, fords and ferries over the main and branch navigation channels.

The Trent Severn Waterway is an inland canal joining Lake Ontario with Lake Huron via the Trent River, Rice Lake, Otonabee River, Kawartha Lakes, Talbot River, Lake Simcoe, Lake Couchiching, Severn River and Georgian Bay. A branch canal down the Scugog River to Lake Scugog is also covered.

Today this waterway is primarily used for recreation but over its long history it has had great significance to the region and the nation. Situated as it is, between the upper and lower Great Lakes, it was once thought to be an important link in the route between Eastern Canada and the prairies. Although it failed to become an important national transportation route, its regional significance was enormous. These connected waterways opened up central Ontario. They brought in settlers and supplies and took out the products of the farm and the forest. The waterway would be superseded by roads and railways, but its initial role cannot be overlooked. Locally, it was also significant, not only for immediate transportation but also as an important source of power and fresh water. Therefore the waterway is not only the geographical centre of the area but the cultural heart as well.

In addition, as the waterway joined Lake Huron to Lake Ontario, it acted as a barrier to land transportation between Eastern Ontario and Southern Ontario and divided areas through which it passes. As settlement spread along both sides of the waterway, some method of crossing it had to be found. These crossings were themselves part of the local and national network of road and rail transportation and form the subject of this study.

Because of the complexity of the project, some explanation is necessary about the method used to organize the material. Over the years, engineers have taken four major river systems and dozens of lakes, joined together with sections of man-made canal, to form a waterway 275 miles long. The construction of the waterway spans a period of 145 years from 1833 to present.

Unlike the Rideau, Erie or Welland canals the Trent was not built in one single phase. No overriding consideration of defence or commercial necessity forced its builders to finish the job once it was started. Instead it was built in phases as money became available and pressure on the government became irresistable.

These phases of lock construction had a great effect on the construction of bridges. As dams and locks were built, fords were flooded and more bridges were needed. Bridge building was often directly related to lock and dam construction.

The story of the construction of the bridges will be organized into seven sections as follows:

Section 1. Trenton to Rice Lake
2. Rice Lake to Young's Point
3. Burleigh Falls to Rosedale
4. Balsam Lake to Lake Simcoe
5. Lake Simcoe to Georgian Bay

6. Scugog River
7. Holland River

These sections are recognized as distinct geographical entities and to a degree, contain small transportation networks of their own. In addition, over the last 100 years, the major programs of lock, dam and bridge construction have been organized along similar boundaries.

Another point to note is that although the mandate of this paper is to discuss only crossings over the navigation channel, there are occasions when transportation patterns existed long before the canal was built and must be included to round out the picture. This usually occurs only when the final canal is constructed adjacent to, but not on, the original watercourse. The bridges on the original watercourse therefore are not over the canal but usually directly linked to those now over the canal, and are very definitely part of the same transportation network. Typical examples are found in the city of Peterborough and the towns of Lakefield and Bobcaygeon.

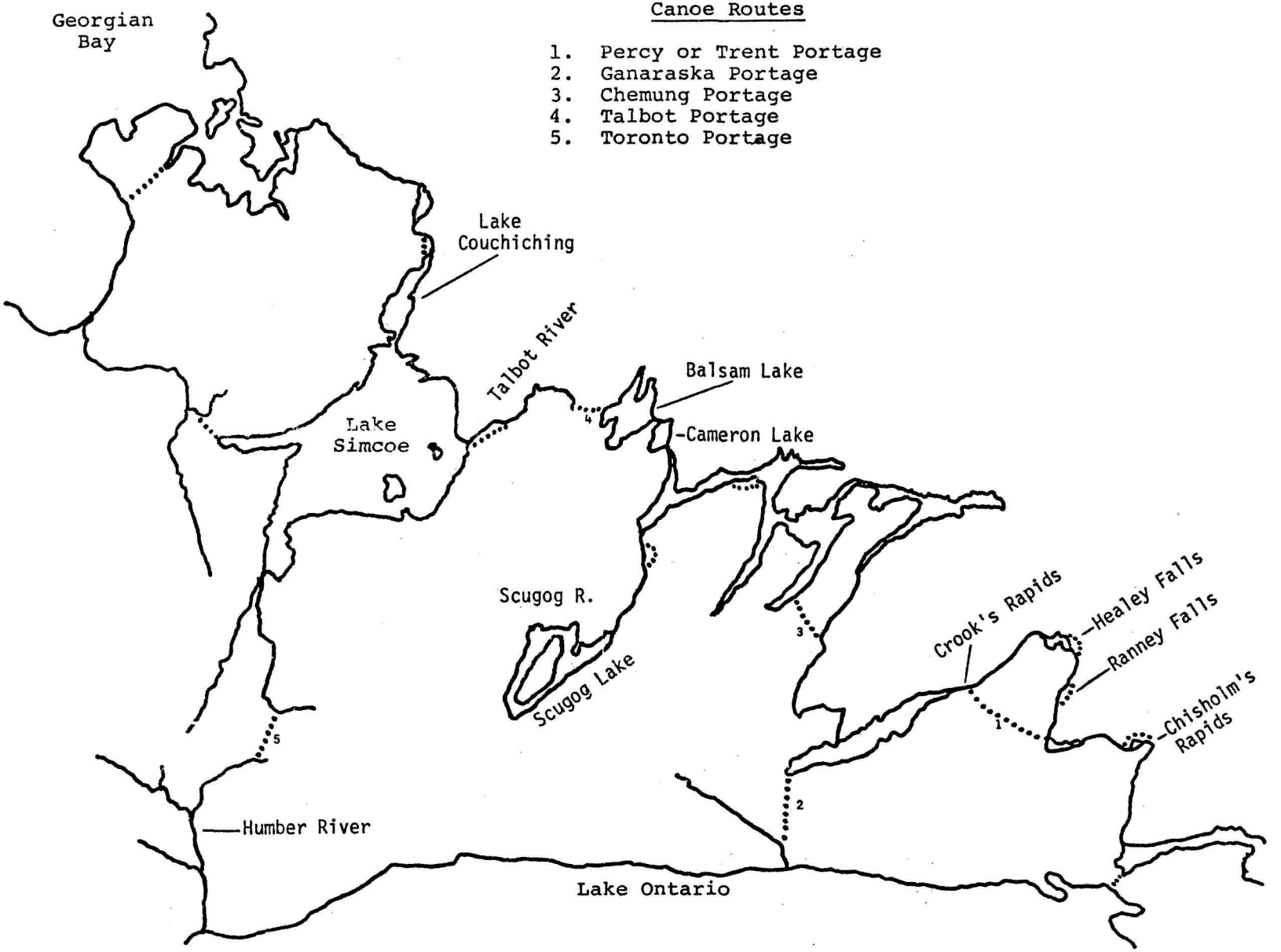
The bridges are numbered consecutively from South to North starting at Trenton with Number 1. Several bridges have been added since this numbering system was initiated and the author has arbitrarily inserted them into the numbering system so that bridge 4A is between 4 and 5.

Introduction

For well over 100 years residents of Central Ontario have dreamed of a continuous waterway connecting Lake Huron with Lake Ontario which would eventually attract vast numbers of ships bearing grain from the West and ore from the upper lakes and which in turn would bring prosperity to the area surrounding the canal. But they dreamed in vain: the route was far too circuitous and the cost of building a canal to accommodate lake freighters far too high. Relatively few commerical vessels regularly travelled the full length of the canal although the routes were popular with pleasure cruisers.

This does not mean that the waterway did not bear commerce. In fact, a huge amount of commercial shipping and lumbering used the waterway over the years, but seldom on more than one section at any one time. In reality the Trent Severn Waterway is best described as a network of waterways which, when combined with adjacent roads and railways, provided excellent service to the better part of six counties. Peterborough and Victoria in particular, have been very dependent on this combined form of transportation. It is, therefore, easier to assess the significance of this waterway by considering it as a collection of local transportation routes than one single canal.

A study of the various construction phases of the canal emphasizes the role of local traffic which invariably was the motivation for the early projects. This traffic


Canoe Routes
1. Percy or Trent Portage
2. Ganaraska Portage
3. Chemung Portage
4. Talbot Portage
5. Toronto Portage
Georgian Bay
Lake Couchiching
Talbot River
Balsam Lake
Lake Simcoe
Cameron Lake
Scugog R.
Scugog Lake
Crook's Rapids
Healey Falls
Ranney Falls
Chisholm's Rapids
Humber River
Lake Ontario

was by no means always shipping. Much of the early construction involved timber slides as well as locks, dams and bridges. The various sub-systems of the waterway will be outlined in the following paragraphs to bring out the complex nature of transportation in the area.

Pre-Settlement Transportation

The native people had used the waterways for countless centuries for transportation. Not only did the waters carry their canoes but also yielded valuable fish all year round. The woods around the lakes and rivers were full of game. The area has several valuable archaeological sites which bear witness to their occupation.

The water routes are well-known, having been travelled by succeeding generations as well as leaving well-worn portage paths for use by the European settler.

Champlain's accounts of his voyage through the area, guided by Mississaugas, reveals a route similar to the modern canal except for several portages.[1] However, the journeys made by John Collins, Deputy Surveyor General as reported in 1790 are better documented, and illustrate most of the better known Indian routes with the portages.[2] A trip into the interior from Lake Ontario might start off up the Trent River as far as Percy Landing. Here the traveller struck out due west on the "Trenton" or "Percy" portage to a point just below the east end of Rice Lake, near the present village of Hastings. This avoided several falls and rapids from Ranney Falls to Healey Falls. One might also reach Rice Lake by travelling westward on Lake Ontario to the Ganaraska River (Port Hope). Here the traveller struck due north on the Ganaraska portage to the west end of Rice Lake. Less than 10 miles separates Lake Ontario and Rice Lake at this point.

From Rice Lake the traveller journeyed up the Otonabee River to the present site of Peterborough. A portage was then made northwesterly to Chemung Lake, thereby avoiding the northern lakes. The journey continued by water through the remaining Kawarthas to Balsam Lake. Here the Talbot portage began which crossed the height of land over to the Talbot River and on to Lake Simcoe.

One could then journey northward through Lake Couchiching and the Severn River to Georgian Bay or southward to the tip of Lake Simcoe down the Holland River to the Toronto portage. The latter portage met the Humber River which flowed into Toronto Bay. Thus a journey into the interior from Lake Ontario might commence from the mouth of the Trent, the Ganaraska or the Humber.

Although Lake Scugog is only about 20 miles from Lake Ontario there is no reference to a portage route this way. Such a route lacks a good river to start from as there are only small creeks running north from Lake Ontario.

A brief description of the naturally navigable stretches of the waterway will help to understand the development of early transportation patterns. The best authority is undoubtedly the two surveys undertaken by N.H. Baird.[3] The purpose of them will be discussed later under the section on Canal Construction.

The lower Trent was obstructed by "Nine Mile Rapids" to about the present village of Frankford. The next six miles were navigable to Chisholm's Rapids (Glen Ross). From here to Percy Landing were another 12½ miles of good water. The 15 miles from Percy Landing to the west side of Healey Falls were not good but the next 13 miles to Crook's Rapids (Hastings) were very good. There were six miles of good navigation right into Rice Lake which was also completely navigable.

The Otonabee was clear from Rice Lake up to Whitla's Rapids (South Peterborough) except for three shoals at the mouth. The rest of the river was not navigable right up to the Katchewanooka Lake. There were two major obstructions from here to Bobcaygeon - the rapids at Young's Point and Burleigh Falls. The Chemung portage avoided Young's Point and Burleigh Falls and provided unobstructed passage into Buckhorn and Pigeon Lakes to Bobcaygeon. After Bobcaygeon, one had access into all of Sturgeon Lake and the Scugog River. The Scugog River is navigable right down to the lake (actually a large swamp) except for the rapids at Purdy's Mills (Lindsay).

Rather than turn south down the Scugog, one could traverse Sturgeon Lake all the way to Cameron's Falls (Fenelon Falls) at the entrance to Cameron Lake. Between Cameron Lake and Balsam Lake was a bad stretch of rapids which were definitely not navigable.

It is obvious that a sensible combination of good water and portages enabled one to journey to many areas with a light boat. It will also become apparent that in time, with the right combination of a few strategically placed locks, and a good portage road or railroad a number of local routes could be established for commerce or pleasure.

This brief survey will also point out that where there were rapids or falls there was water power for grist mills and saw mills which were often the nucleii for future towns. The fast water in the rapids or falls also suggests a narrowing of the river which might indicate a future bridge site because of shorter spans, good foundations and towns to generate traffic. It is also to be expected that main roads could eventually be built to connect towns and particularly river crossings. Railroads would also connect towns and seek the easier river crossings.

Thus the configuration and condition of the watercourse

set the stage for the development of transportation in the area. It also profoundly affected settlement itself but early settlement also depended heavily on the agricultural potential of the land and the commercial potential of the forest.

Of course, the waterway would undergo many changes. Dams would be built to flood rapids to improve navigation and provide power. New canals would be cut and the deforestation of the land would cause erosion. Creeks would silt-up and change course.

Settlement and Agriculture

The earliest permanent settlement of Upper Canada was carried out by the United Empire Loyalists. They settled first near the Cataraqui River (Kingston) and the Bay of Quinte. Some also settled in the Niagara Penninsula. Settlement soon spread westward along the shore of Lake Ontario and all the land in the front townships was quickly taken up. The land was good but the availability of good transportation along the lake was almost as important, and it would be many years before the second level of townships were settled.

The first settlers had arrived at Trent Port (Trenton) by 1790; in that year John R. Bleecker (son-in-law of Capt. J.W. Meyers, founder of Belleville) obtained land near the mouth of the river. He operated the first ferry across the river. After his death in 1807 his wife took over the ferry and operated an Inn.[4] A mill was built in 1795 and after some initial difficulties the community prospered. Small settlements appeared at Ranney's Falls near Campbellford and Percy Landing near Meyersburg shortly thereafter.

In 1818, the government purchased about 4000 square miles of land from the Mississauga Indians , comprising most

of the counties of Peterborough and Victoria.[5] The surveyors began at once to lay out the townships.

If a line were drawn running east to west immediately north of the Kawartha Lakes it would represent the southern boundary of the Precambrian Shield. The land south of this line over-lies sedimentary limestones and is generally suitable for agriculture once the heavy forest growth is cleared. The Shield country is very uneven with thin soils covering huge granite formations. There are random pockets of soil suitable for agriculture but generally after the forest cover is removed the thin soils are quickly eroded by wind and water leaving an agriculturally sterile but spectacularly beautiful country. This line also would serve to distinguish those townships which are known as southern or northern.

Settlement spread slowly northward. It was not until 1820 that settlement started to appear on the north side of Rice Lake.[6] There were very few settlers even on the south side at this time.

The first settler in the area of the present city of Peterborough was Adam Scott who established a saw mill and grist mill on the Otonabee River in 1820, but no appreciable immigration followed him.[7] The most important influx of settlers was undoubtedly the Peter Robinson immigration. The arrival of over 2000 immigrants at Scott's Plains in 1825 marks the real beginning of the settlement of Peterborough County.

After some initial difficulties the settlers took up their land, cleared the forest and established farms. The rapid success of the settlement is illustrated by the fact that during the winter of 1827-28 farmers sold about five thousand bushels of surplus wheat to the storekeepers in Peterborough.[8]

The first settlement of Victoria county occurred in Emily township and was in reality an extension westward of

the Peter Robinson settlement. More settlers came in 1830 via a similar route north from Cobourg or Port Hope, around or across Rice Lake into the townships of Cavan, Emily and Ops.[9] Others started north from Toronto up Yonge Street to Lake Simcoe and then eastward to the townships of Mariposa and Eldon.

One of the Victoria county's most influencial early settlers arrived in 1830. William Purdy erected a mill at the rapids on the Scugog where Lindsay now stands. Purdy's dam flooded hundreds of acres of land on the river and Scugog Lake. Angry settlers destroyed it and a new and lower dam was built. Although Purdy left the area this remained an important mill site and focus for the future town of Lindsay.[10] Mills were also established on the Pigeon River (Omemee 1825), Bobcaygeon (1834), Buckhorn (1830) and Fenelon Falls (1834).[11]

In 1848, Early Grey, Governor-General of Canada reported that in the townships of Douro, Smith, Otonabee and Ennismore and Asphodel (present county of Peterborough) and in Emily and Ops (present county of Victoria) there were 11,401 settlers occupying 207,000 acres of land.[12] Their major agricultural crops were fall wheat, oats and potatoes. Wheat was the main export crop while oats and potatoes were also the traditional and familiar crop for the Scottish and Irish settlers. The usual complement of livestock was raised but very little except wool was exported from the area.

The northern townships of Peterborough and Victoria counties were surveyed in the 1830's presumably after the surveyors finished with the southern townships. However, settlement did not follow immediately because of the unsuitability of the land for agriculture. Some settlement occurred on northern shores of the Kawarthas and some water

power sites were occupied by mills but the townships were used mainly by lumbermen in the early years. The government attempted to settle these townships with a scheme to build Colonization Roads into the more remote parts of the province and give grants of land along the roads. Although proposed in the 1850's most of these roads were not started until the 1860's. Some settlement followed but scarcely enough to consider the areas settled even 100 years later.

In summary, by 1833, when the first survey was carried out for the canal, successful settlement had been established along the Trent and the Otonabee Rivers and south of the Kawarthas in Victoria county. By 1850 they were thriving, and the shipment of the surplus agricultural produce prompted government and businessmen to contemplate improving the exit routes down the Trent, the Otonabee and the Scugog and to supplement them with roads and railroads.

Lumbering

The forest resources surrounding the waterway were abundant almost beyond belief. The mixed forests of the southern areas gave way to stands of pure pine in sandy pockets of the northern townships. To the early settler the trees were a nuisance to be cleared off the land. Much of the early timber was cleared from the fields and burned. Potash salts were produced from the ashes and provided one of the farmers' first cash crops.

Not all the lumber was wasted, though. Saw mills were established almost as quickly as grist mills and produced lumber for the local market. By the 1840s settlement had moved northward and purer stands of white pine were encountered. North of Lakefield and up into the Kawarthas, lumbermen started to produce square timber for export to Britain as the supplies of pine in the Ottawa Valley began

to dwindle.[13]

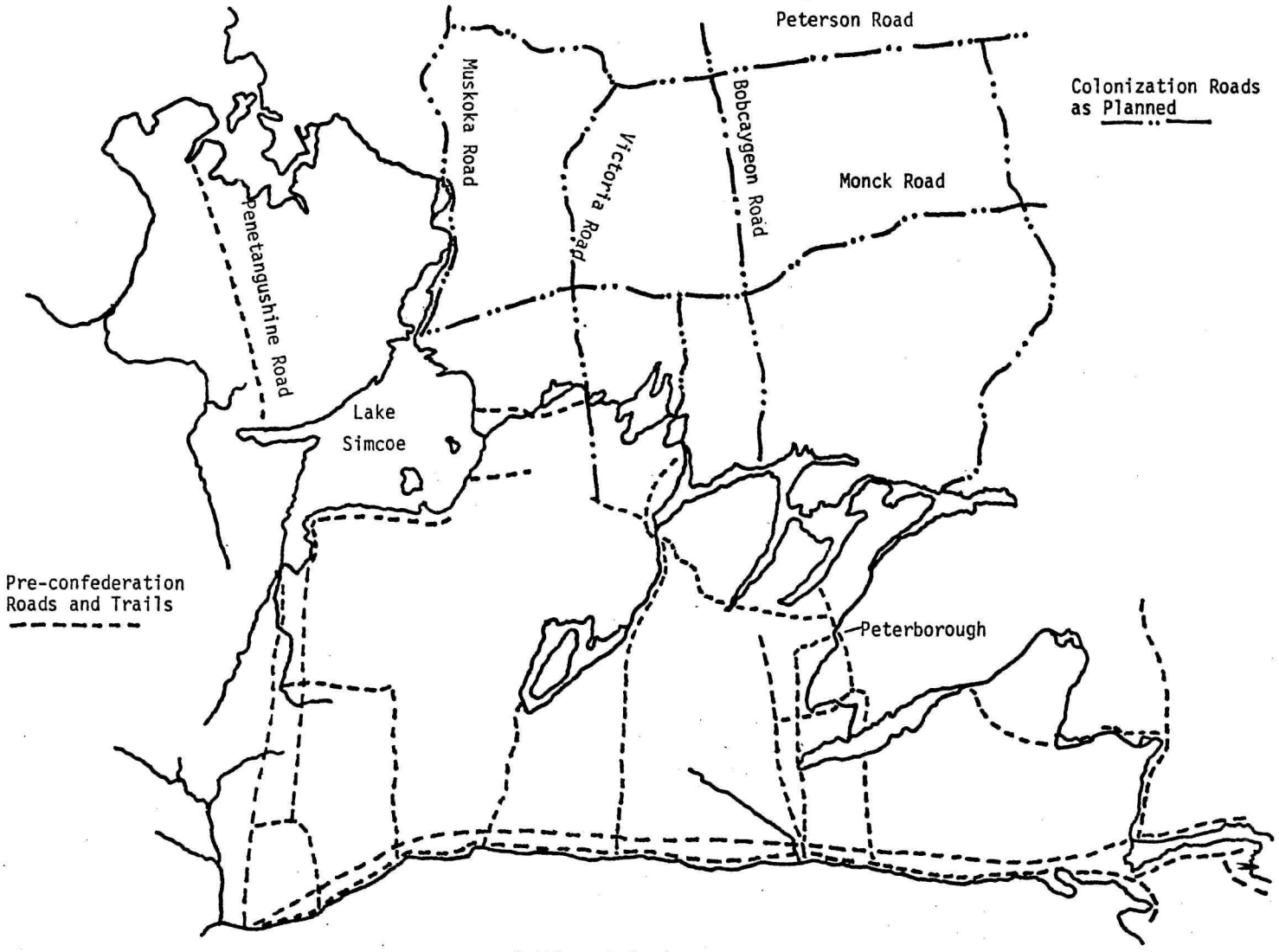
The square timber trade is very wasteful and vast areas of pine were greedily cut over and rafted to Quebec. Lumbermen like Mossom Boyd who started as sawyers quickly concentrated on square timber and made fortunes. Kirkconnell states that all pine was cleaned out of North Victoria County in thirty years from 1850 to 1880.[14] However, square timber was a passing phase. The sawn timber trade remained the bulwark of many communities.

The wood was transported many ways. As logs, it was rafted in standard sized rafts down the streams to the rivers and either to the saw mill or right to Lake Ontario to be taken on to Quebec. As the log rafts moved down the river they encountered many obstacles, natural and man-made. The rafts could be broken up and the logs run through the rapids or over the dam and then reassembled into a raft. A more efficient method was to construct timber slides which by-passed the obstacle and enabled the rafts to stay intact.

Lumbermen banded together and built slides or paid a fee to use someone else's slide. By 1855 the government had abandoned their early ideas of a canal and turned some of the existing works over to the "Trent Slide Committee". This arrangement was terminated around 1870.

Other major obstacles encountered were the footings of various bridges over the waterway. Many of the early bridges were not well built and were frequently damaged sometimes destroyed by careless raftsmen.

The surplus sawn lumber was removed by barge and later by railroad and the lumber traffic proved a godsend to the early underfinanced lines. Lumbering has therefore been an important and integral part of the economy of the area. The early promoters of the canal considered the transportation of wood products to be one of the main benefits of a canal, and indeed it was. As time passed and the sawn timber trade



Settlement Roads

completely eclipsed the square timber trade, more lumber was shipped by rail and today the canal is seldom used for this purpose.

Early Transportation Patterns

Road

Prior to 1790 most travellers in Upper Canada went by water in the summer and sleigh in the winter; the rest walked. Some local roads were constructed within the first settlements but none connected the settlements.

The first change came when Upper Canada was created in 1791 and Simcoe was appointed Lieutenant Governor. Having selected York as his capital he was determined to have land communication within the colony. Yonge Street was completed after a fashion from Toronto to Lake Simcoe and by 1796 ran roughly parallel to the old portage. There was a feeble attempt to extend Dundas Street east from Toronto to Kingston in the 1790's but it was never properly completed. In 1798 Asa Danforth was awarded the contract to build a proper road from Kingston to Toronto along the lakefront. The road between Kingston and Trenton passed through Loyalist settlement and was quickly built. The section from Trenton to Toronto took another three years and still was not much more than a winter road. Finally the "Kingston Road" was built in 1816-17 and superseded all previous roads between Kingston and Toronto.[15] A stage run was soon established for carrying passengers and mail between the cities.

Gradually interior roads were built as required and as money became available. Very few of the early roads were recorded except in personal diaries and reminiscences. The government took little interest in local roads. The

early maps seldom showed road detail except for portages as has already been mentioned. One of the few exceptions was the map printed for the Canada Company in London in 1828.[16] It showed the Kingston Road clearly. It also showed a road from Trenton northward along the east bank of the Trent. The main road followed the Trent as far as Glen Ross and then continued due north to Marmora. A branch turned west at Glen Ross and followed the river approximately five miles and abruptly stopped. The main road undoubtedly serviced the Marmora iron works.

This map also showed a road following the Percy Portage with branches running south to the present town of Colborne but did not show any road from Cobourg to Rice Lake. There was very little evidence to support the branches from the portage to Colborne and several accounts supporting the latter.

As early as 1825, there was a trail from Cobourg to Rice Lake which was used by the Peter Robinson immigrants.

The road to Crooks' Rapids (Hastings) was undoubtedly an old one because the earliest bridge on the waterway was built across the Trent here in 1826. It gave access to the townships of Asphodel and Otonabee (i.e. north side of Rice Lake) and brought in the first settlers to that area.

An advertisement in the Cobourg Star of 1833 offered the following transportation: stage from Cobourg to Sully on Rice Lake; steamer to Peterborough; steamer from Bridgenorth to Bobcaygeon (as soon as the portage road between Peterborough and Chemung Lake is completed).[17] A ferry operated irregularly across Rice Lake from at least 1820.[18] The portage road was completed in late 1833.[19]

The Canada Company map clearly showed a road from Port Hope to Rice Lake, as might be expected, along the old Ganaraska Portage. This road had been extended northward in 1819 and was known as the Cavan Road. An

alternate route known as the Emily Road was opened from Port Hope to Millbrook and on into Emily township in 1820-21.[20] These roads brought in many settlers in the next decade.

The Port Hope-Peterborough Road had one other extension that was chartered as the Cobourg and Monaghan Road and Bridge Company in 1850.[21] The charter called for a plank or gravel road from Fitzgerald's Point on Rice Lake, across the Township of Monaghan, over the Otonabee by bridge to the road allowance between Lots 11 and 12 in the township of Otonabee. The road eventually extended from Millbrook to Peterborough and crossed the Otonabee on the old Bensfort bridge.

Yonge Street was shown on the map as extending from York to Lake Simcoe - another road parallel to, and east of, Yonge Street was shown curving up the east side of Lake Simcoe almost to Beaverton. Eventually Yonge Street would connect with the Penetanguishene Road from Kempenfelt Bay to Penetanguishene.

The map does not show one of the most important roads into the area. Capt. Rubidge laid out a road between Bannister's Point (Picnic Point) to Peterborough sometime before 1826.[22] The road was an important route for settlers and remains a main road today. The Otonabee was bridged at Peterborough in 1827 connecting Rubidge's road with the Chemung road.

In September 1831, Colonel S. Strickland settled above the Otonabee rapids and started the village of Lakefield. He subsequently cut the first road to Peterborough.[23]

The road from Peterborough was gradually stretched westward stage by stage to Omeemee, then to Reaboro and Lindsay.

The report of the Board of Works in 1844 refers to the building of the Scugog road from Windsor Harbour (Whitby)

to the "Head of Scugog Navigation" sixty miles in length.[24] The route apparently headed towards Fenelon Falls and beyond and then turned westward to the bridge at Atherley Narrows.

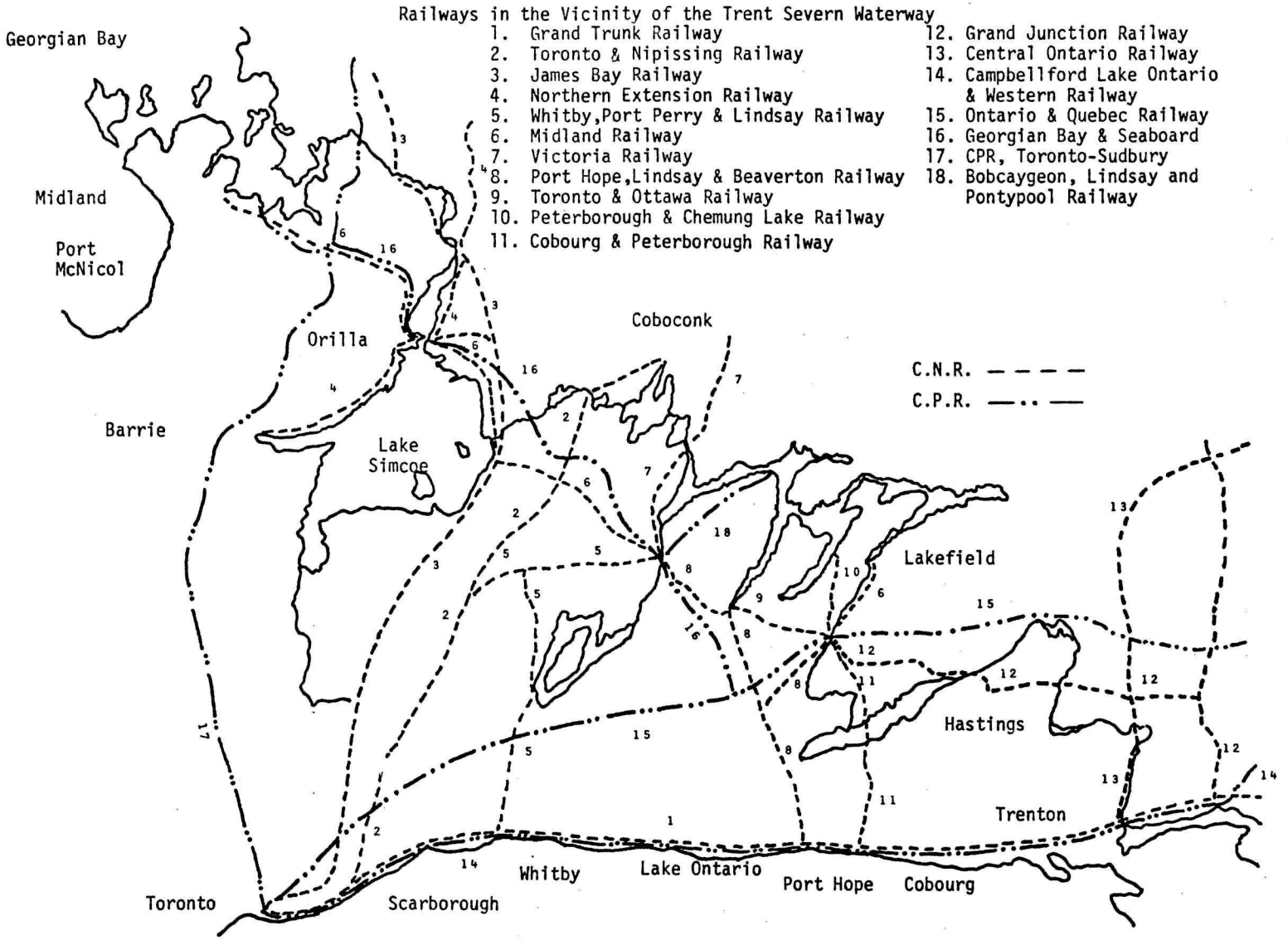
From these first key settlement roads sprang the townships and county roads that would fan out and service the southern townships.

By the mid 19th century it became apparent to the government that settlers were reluctant to proceed farther into the wilds and away from Lake Ontario and the St.Lawrence and Ottawa rivers without some incentive. Therefore the colonization road scheme was launched in 1853. This called for major roads to be constructed northwards into the back country where settlers would be offered grants of land along the right-of-way. The proposed roads were the Muskoka Road, Victoria, Cameron, Bobcaygeon and Burleigh roads in central Ontario and Hastings, Addington and Frontenac roads in the east. East-west roads were planned to join these roads in the northern counties.[25]

The Burleigh road was started in 1860 and edged slowly northward for years. Very few settlers followed. The Cameron road pushed north from Rosedale, and the Bobcaygeon road was started in 1857 and brought some settlers to Somerville township. The Victoria road was built about 1863. Unlike the previous three roads, this road started much farther south at the north-east corner of Mariposa township, and proceeded northward across the Talbot River into the northern townships and on to the Peterson road. This was a very important road in the area and opened up some good agricultural land in Eldon and Carden townships.

The Muskoka road began at the foot of Lake Couchiching (Washago) and proceeded due north to the Parry Sound road. This was the first major road North of the Severn River.

Most of these roads failed to stimulate as much settlement


Railways in the Vicinity of the Trent Severn Waterway
1. Grand Trunk Railway
2. Toronto & Nipissing Railway
3. James Bay Railway
4. Northern Extension Railway
5. Whitby,Port Perry & Lindsay Railway
6. Midland Railway
7. Victoria Railway
8. Port Hope,Lindsay & Beaverton Railway
9. Toronto & Ottawa Railway
10. Peterborough & Chemung Lake Railway
11. Cobourg & Peterborough Railway
12. Grand Junction Railway
13. Central Ontario Railway
14. Campbellford Lake Ontario & Western Railway
15. Ontario & Quebec Railway
16. Georgian Bay & Seaboard
17. CPR, Toronto-Sudbury
18. Bobcaygeon, Lindsay and Pontypool Railway
C.N.R.
C.P.R.
Georgian Bay
Midland
Port McNicol
Orilla
Coboconk
Barrie
Lake Simcoe
Lakefield
Hastings
Trenton
Toronto
Scarborough
Whitby
Lake Ontario
Port Hope
Cobourg

as the government hoped but the westerly roads all resulted in a major canal crossing sooner or later. For years the Severn River area would remain a wilderness.

Water

Only brief mention will be made here about the many steamboats that appeared on various lakes and rivers as early as the 1830's. As the navigable sections were extended, the steamboats soon followed. The steamboats carried huge amounts of traffic, passenger and freight and many steamboats were employed towing timber cribs and lumber barges. These ubiquitous craft were largely responsible for the swing sections built into the many bridges over the canal.

Rail

CNR and its Ancestors[26]

Railway development in the area of the Trent Severn waterway was incredibly complex. This is not only because there were a host of small railways criss-crossing one another in a small area but because of the frequency with which they changed their names and their affiliations. As a result, only the barest sketch will be attempted in order to relate this very important mode of transportation to the whole picture.

In the 1830 s and 1840 s Canadians watched the phenomena of railroads grow in Britain and the U.S. and theorized on the benefits such a transportation system would bring to Canada. Many railways were chartered in these decades but they all failed for the same reason - no money. So much of the country's money was going into the Welland,

Rideau and St.Lawrence Canals that none, government or private was left for speculation on railroads. Finally, the Guarantee Act was passed in 1849. This act promised government backing for railroad company bonds under certain conditions. This was the starting gun that ushered in the great railroad building boom of the 1850's.

The *Cobourg Railroad Company* received its charter in 1834 and was only the second chartered railway in Upper Canada. However, it was 1853 before the twice-reorganized *Cobourg and Peterborough Railway Company* turned the first sod. The railway crossed Rice Lake on a flimsy trestle and reached Peterborough in 1858. The *Peterborough and Port Hope Railway* was completed the same year. The Cobourg line could not compete and eventually whatever assets were left passed to the *Grand Trunk*. The Rice Lake bridge was nearly demolished by ice in the winter of 1861-62. The *Grand Trunk* railway had completed its line between Montreal and Toronto in 1855, passing through Trenton.

The possibility of timber traffic encouraged investors to incorporate the *Peterborough and Chemung Lake Railway* in May 1855. Construction started in 1857 and after many non-technical difficulties the portage line was finished in 1891. The line was abandoned in 1902.

The *Port Hope, Lindsay and Beaverton Railway Company* was chartered in 1854 with the intention of bringing the resources of Victoria County out to Lake Ontario. Lindsay was reached in 1857. As already noted, the branch to Peterborough was completed the next year. The flow of agricultural produce, timber and manufactures over the line exceeded all expectations. Peterborough and Lindsay finally had an all weather transportation route for their produce. In 1869 the line was rechartered as the *Midland Railway of Canada*. In 1870 a spur was built from Peterborough to Lakefield and in 1871 the spur from Lindsay to Beaverton was opened.

The *Midland* made plans for a branch from Peterborough to Bobcaygeon but the plans fell through. The depression of 1873 caused some beneficial reorganization including changing to standard gauge and adopting the steel rail. The company survived.

Peterborough businessmen were also anxious to have a railroad of their own and in 1852 the *Grand Junction Railroad Company* was chartered to build a line from Belleville to Peterborough and on to Toronto. After innumerable vicissitudes the line was finally completed from Belleville to Peterborough in 1880. It was taken over by the *Midland* in 1881.

The *Whitby and Port Perry Railway Company* was chartered in 1868 and opened their 20 mile line in 1871. In 1874 it became the *Whitby and Port Perry Extension Railway* with authority to build almost anywhere in North America. It got as far as Lindsay in 1876 and was amalgamated with the *Midland* in 1881.

In 1871 the *Fenelon Falls Railway Company* was chartered to build a line from Lindsay to Fenelon Falls. When no funding could be raised the charter was amended to the *Lindsay, Fenelon Falls and Ottawa Valley Railroad* with the announced aim of servicing the iron ore bodies of Haliburton County and stands of pine at Lake Opeongo. Provincial and municipal grants followed and the line reached Haliburton in 1878 (after being renamed the *Victoria Railway Company* in 1873). It went no further. It became part of the *Midland* in 1880.

William Gooderham, the wealthy Toronto distiller, backed the *Toronto and Nipissing Railway Company* which received its charter in 1868. The line went north from Toronto, east of Lake Simcoe to Coboconk. Construction started in 1870 and was completed in 1873. In 1881 it joined the *Midland*.

Without going into the details of a very involved corporate history, another line can be added to the list. The charter of the *Toronto and Ottawa Railway* was used by the *Grand Trunk* to build a line between Peterborough and Omemee in 1884.

Two extensions of the famous Northern Railway affected the waterway. A subsidiary, the *Toronto, Simcoe and Muskoka Junction Railway* (later the *Northern Extension*) connected Barrie and Orilla in 1872, crossed over to the west side of Lake Couchiching, reached Washago in 1873 and crossed the Severn in 1874. This too became part of the *Midland* in 1881.

The *James Bay Railway Company* was incorporated in 1895. In 1906, the name was changed to the *Canadian Northern Ontario Railway* and in 1929 it entered the CNR system. It crossed the canal near Gamebridge, Washago and Ragged Rapids between 1903 and 1907.

One more railway affecting the waterway as the *Central Ontario Railway* which began as an extension of the *Prince Edward Railway Company*. This railway connected Picton to Trenton in 1879. In 1884 it was rechartered the *Central Ontario* and proceeded north from Trenton, across Glen Ross, to Eldorado and Coe Hill. Its aim was to draw out the minerals and timber from the interior.

Finally two corporate amalgamations round out this part of the railroad story. *The Midland Group* was absorbed into the *Grand Trunk* in 1883 and the *Grand Trunk* became part of the *Canadian National Railways* in 1921.

Canadian Pacific Railway[27]

During all this activity in central Ontario, the CPR had been chartered in 1880 to build a transcontinental railway from Callander, Ontario to the Pacific coast. By 1885 the

line was complete and the *Canada Central Railway* was added to make a through line from Montreal to Port Moody.

Long before the main line was complete, the directors of the *CPR* were trying to find ways to gain access to the lucrative markets in southern Ontario. The *CPR* was successful in invading the old *Grand Trunk* preserve by leasing charters of small railways and building the lines for their own purpose.

One of the most important was the *Ontario and Quebec Railway* chartered in 1871 but not started. The *CPR* leased it in 1884 and built the line between Smith Falls and Toronto passing through Peterborough. Added to the *CPR*'s branch line from Ottawa to Smith Falls, this made a direct line from Ottawa to Toronto. The next most urgent line was designed to give the CPR a rail access to Lake Huron and in 1910, the *Georgian Bay and Seaboard Railway* was leased. The line went from Bethany Junction on the Ottawa-Toronto line to Port McNicol through Lindsay and Atherley. It was built between 1911 and 1914, and abandoned in 1937.

Another route to Toronto was opened by leasing the charter to the *Campbellford, Lake Ontario and Western Railway* which was built between Perth and Toronto via Belleville and Trenton in 1913. It passed nowhere near Campbellford!

One other small branch was built by the *CPR*. The *Lindsay, Bobcaygeon and Pontypool Railway* was chartered in 1890, leased in 1903 and built between Lindsay and Bobcaygeon in 1903-04.

Finally, the completion of the line from Bolton Junction to Romford Junction gave the *CPR* a direct independent connection from Toronto to Sudbury in 1908.

Building the Waterway

It may be assumed that the concept of a waterway connecting Lake Ontario and Lake Huron has been promoted tirelessly by area residents, community leaders, businessmen and politicians since the arrival of the first settler. There were also many promoters who gave urgent reasons why individual sections should be built to facilitate local traffic. Nevertheless, no matter how strong the argument, it could not alter the basic fact that a through waterway was considered by many to be uneconomical and unnecessary competition for other canals and railways. It was therefore constructed piecemeal by governments responding to various local pressures.

Phase I Precanal Era to 1836

This phase covers the early period when the canal was just a dream up to the first real construction. After much discussion the legislature of Upper Canada appointed commissioners in 1833 to receive plans and begin any work necessary to improve the inland waters of the Newcastle District. Their mandate covered only the Otonabee River, the Kawartha Lakes and the Scugog River down to Lake Scugog. No mention was made of a complete waterway to connect the upper and lower Great Lakes.

As a result, the commission decided to construct a lock to by-pass the rapids at Bobcaygeon as a preliminary and temporary measure. The lock was built between 1833 and

1835. This opened a stretch of navigation from Purdy's Mills (Lindsay) to Chemung Lake (a short portage to Peterborough) as well as local traffic in Sturgeon and Pigeon Lakes.

Phase II 1837 - 1867

In 1833, N.H. Baird was instructed to make the first of his famous surveys of the waterway from the mouth of the Trent to Rice Lake. His second survey of the section between Rice Lake and Lake Simcoe was completed two years later. In both cases Baird outlined a reasonable plan to by-pass obstacles by building locks or flooding rapids by dams or a combination of the two.

The Baird report was favourably received by the legislature and work was to commence immediately at specific locations in the two sections. First, on the Trent, locks were started near the mouth of the river, at Chisholm's Rapids (Glen Ross) and Crooks' Rapids (Hastings). Dams were also planned at the head of Nine Mile Rapids (Widow Harris'), Chisholm's Rapids, Healey Falls, and at Crooks' Rapids. Second, on the inland waters, locks were started at Whitla's Rapids, and Purdy's Mills; dams were planned at Whitla's Rapids, Buckhorn, Bobcaygeon and Purdy's Mills. Work commenced in 1837 but unfortunately the government's money and inspiration were insufficient and operations were suspended in 1839. In the first section only the dams at Chisholm's Rapids and Crooks' Rapids were finished. In the inland section, only the dams at Buckhorn and Bobcaygeon has been completed. All the rest were either incomplete or not yet started.

After the union of the provinces in 1841 the works were placed under the Board of Works who began to finish the job and complete the following locks and dams. The locks

at Chisholm's Rapids (1844), Crooks' Rapids (1844), Whitla's Rapids (1843), and Lindsay (1844) were completed and the wooden lock at Bobcaygeon was rebuilt in stone in 1857. Dams were finished at Nine Mile Rapids, Ranney Falls, Fiddler's Island, Middle Falls, Healey Falls, and Whitla's Rapids. Numerous timber slides and bridges were also constructed. The lock at Trenton was not finished.

To summarize; by 1867 the Lower Trent was still not fully navigable, Nine Mile Rapids to Meyer's Island was open, and Healey Falls to Rice Lake was navigable. The Otonabee was open to Little Lake and navigation between Chemung Lake, Buckhorn Lake, Pigeon Lake, Sturgeon Lake and Scugog Lake was fully open. One could travel from Healey Falls to Port Perry with only one portage between Peterborough and Chemung Lake.

Phase III 1868 - 1881

After Confederation the canal became the responsibility of the Federal Department of Public Works. However, it was the Provincial Government that carried out the next construction under pressure from area residents. New locks at Young's Point and Rosedale were constructed (between 1868-1872) and the old lock at Lindsay was rebuilt in 1870. This opened navigation from Lakefield to Burleigh Falls and Fenelon Falls to Balsam Lake.

Phase IV 1882 - 1894

The building of the CPR raised the prospect of a huge traffic in prairie grain over the waters from Port Arthur to Kingston. More interest was generated in the completion of the waterway. A lock was built at Fenelon Falls between 1882 and 1886 although through traffic was held up until

a swing section was added to railway bridge in 1894. Locks were also built at Burleigh, Lovesick and Buckhorn between 1883 and 1887. The Fenelon improvements finally gave access to Balsam Lake from Sturgeon Lake and the other three locks joined Lakefield with all the interior lakes and Scugog. The old lock at Lindsay was repaired again in 1885.

Phase V 1895 - 1907

In 1895 the federal government finally decided to finish the canal. The Peterborough-Lakefield division of the Otonabee which included a large section of man-made canals, a hydraulic lift lock and six other locks up to and including Lakefield, were completed in 1904.

The Balsam-Simcoe division, involving another hydraulic lift lock at Kirkfield, five other locks and two sections of excavated canal were opened in 1907.

These two divisions represented the greatest challenge to engineers yet met on the waterway and the miles of new canal called for many new bridges. Navigation was possible now between Healey Falls and Lake Couchiching.

A projected canal down the Holland River from Lake Simcoe to Newmarket was begun in 1906 but never finished.

Phase VI 1907 - 1920

The Ontario-Rice Lake division was started in 1907 and was finished in 1918 having been somewhat delayed by the war. The Lower Trent required six locks and the section around Campbellford another seven.

At Rosedale the old wooden lock was replaced by a new concrete lock and a short canal between 1908 and 1911. In 1909 the Lindsay lock was rebuilt for a fourth time.

The Severn division, started in 1914 and formally opened in 1920, also was delayed by the war. The work involved 2 locks, 16 dams, 8 bridges and 2 marine railways. The first voyage from Lake Ontario to Georgian Bay was made between July 3 and July 12, 1920, 87 years after the first tentative beginnings!

Phase VII 1920 - Present

Only routine maintenance was carried out until 1962 when the federal government announced a ten year program to update and improve the canal structures. This resulted in extensive repairs and reconstruction to some old locks and in 1965 the marine railway at Swift Rapids was replaced by a lock. In 1978 the marine railway at Big Chute was replaced by a new marine railway with a capacity of 100 tons. The old railway will be retained for interpretive purposes but will not be operated.

In 1972 the waterway was transferred from the Federal Department of Transport to Parks Canada, then a branch of the Department of Indian and Northern Affairs.

The Role of the Bridge

Thus the area was opened up, settlement began and trade flourished. Transportation networks spread on rails, roads and water, wherever the need arose. The routes frequently intersected and if the intersection involved a water route, a bridge was required. These intersections were more than just pieces of technology. They played a key role in the economy, in society, in politics and in culture and art.

In the Economy

The contribution of the early bridges to the economy was initially in assisting in settlement. As farming was begun on both sides of the river, communication across bridges was essential to take produce to the mills and to the markets. As agriculture expanded and prospered more goods were produced than could be absorbed locally and outside markets were sought. Initially the surplus was shipped by boat or wagon, or a combination of both. The main roads, therefore, had to be well supplied with crossings. However, the most important method of transportation after the 1850's was the railroad for which well constructed bridges were absolutely essential.

For example, the Trenton bridges were a main link in the road and rail traffic between Toronto and Montreal. The roads and railroad from Port Hope to Lindsay and Peterborough were life-lines to those areas and the bridges over the Otonabee and Scugog provided the crossings. The

bridges across the narrows at Athereley connected two large areas separated by lakes Simcoe and Couchiching, and carried agricultural produce into Orillia from the rural areas of north Victoria.

In Society

The social impact of bridges is so large that it is often taken for granted or glossed over. First, they enabled settlers to reach inland townships over bridges at Hastings, Bensfort, Campbellford and Lindsay. In the second wave of settlement into the northern townships, most of the colonization roads started with a bridge as at Burleigh, Bobcaygeon and Rosedale.

After settlement was established, the bridges connected rural areas on both sides of the waterway to enable travelling ministers and schoolteachers to reach their flocks as well as the normal visits that families paid to relatives and friends.

Bridges were often focal points in the villages. They were always meeting places, fishing places, parade routes, and places to watch boats and lumber go by. The steamers were always a spectacle as they went through the locks and past the swing bridges. In many cases the local citizens rallied to the bridge when it was in danger of fire or flood. The Campbellford bridge was nearly washed away one spring and the townspeople hauled rocks, logs and other weights to hold it down. [1]

In Politics

The bridges were often a source of political conflict and discussion. Frequently the local users of the bridge would petition their councillors to repair the bridge.

The pros and cons of the state of the bridge and the nature of the repairs would often spark lively debate. It would be particularly lively if the bridge happened to be between two townships or two counties where the responsibilities of each council was in dispute. The cost of repairing or replacing bridges was often more than a small municipality could bear and recourse was necessary to a district or provincial government.

Most municipal councils had special road and bridge committees and the minutes of these councils contain many references to debates over the conditions of their charges.

In Culture and Art

Bridges were one of the largest man-made structures in the rural or urban landscape and being situated at important transportation junctions, village centres or on picturesque river banks they were a favourite subject for painters and photographers. Many paintings and photographs contained a bridge somewhere in the landscape, if not the focal point of the picture. These illustrations, therefore, became an important tool to historical researchers.

Canal Crossings

After some general comments on fords, ferries and bridges, the location of each bridge will be examined followed by some observations on bridge technology.

Fords and Ferries

As new settlement spread into the area there is no doubt that the water routes presented an obstacle to land travel. Early settlers usually accepted these limitations and tried to plan their journeys to avoid water obstacles if at all possible. In winter, crossing the ice was simple if certain precautions were taken. In summer, the first method of crossing would be to find a shallow spot in the river and ford it. In the dry part of mid-summer many stretches of the rivers were easily fordable by foot, horseback or high wheeled wagon. The location of most of these has long since been forgotten and only a few are remembered by the incorporation of the word "ford" in a village name, as in Frankford and Campbellford. A few are recorded in the records such as at Hastings (Crook's Rapids) and Whitla's Rapids.

Many early fords were flooded during canal construction. Flooding rapids and shallow places was an integral part of the plan to improve navigation. The report of 1844 confirms this.

The ferry was another simple form of river crossing widely used by settlers. Some were elaborate boats able

to carry people, wagons and horses with government licences to operate such as Bleeker's Ferry at Trenton. Others were no more than rowboats operated intermittently by a local citizen as at Percy Landing. In some cases merely an unmanned boat was left at the crossing and a traveller had to hope he found it on his side.[1]

An 1817 map by Owen, Crawford and Smith shows a ferry at Trenton and one at Frankford above the site of the present bridge. An undated plan shows a ferry at Healey Falls. In 1827 a petition was made for a ferry at Rice Lake stating that no regular ferry was presently in service, although a lease was granted to John Bannister in 1820 to run one.[2] Several accounts by early settlers refer to paying someone to row them across the lake.

A ferry operated from time to time across the Otonabee at Peterborough. Chemung Lake was crossed by ferry for years before the first floating bridge was built. A ferry operated for several years at Harrington Narrows (the narrows between Chemung and Buckhorn Lakes). The Peterborough Directory of 1888 refers to a ferry required at Bobcaygeon because the Buckhorn dam raised the water level. There was no reference to which channel required the ferry.[3] There was also a ferry at Gannon's Narrows up until 1904.

Bridges

This survey of bridge building reveals that the earliest bridges were constructed as an aid to settlement. More bridges were added in response to heavier volumes of traffic as new areas were opened up and more people and goods were being moved. The various phases of canal construction caused some bridge building and modification; fords were flooded, new canals required bridging and navigation channels needed swing bridges. In the immediate

post-confederation period railroads spread into the interior of the province and posed new problems for the engineer. Trains required much heavier bridges than horse-drawn wagons and as trains themselves became progressively heavier so did their bridges.

The steel rail replaced the iron rail in the 1870 s and new locomotives and rolling stock evolved. They were heavier and faster. Eventually curves would have to be straightened, track realigned and new bridges built or strengthened. This change-over to heavier equipment did not directly affect more than one or two bridges on the waterway but indirectly affected bridge design for all new bridges. Twenty of the twenty-four railway bridge crossings were built after the conversion to the steel rail occurred. Therefore, when the need for heavier highway bridges developed, the experience gained in railroad bridge design proved invaluable.

However most highway vehicles remained unchanged for nearly 100 years. The change came with the introduction of the internal-combustion engine and pneumatic-tired automobiles. The period following World War I saw the gradual acceptance of the motor car as a family and business vehicle. Vehicle traffic increased enormously during this period. Between 1920 and 1930 the registration of motor vehicles in Canada rose from 408,790 to 1,232,489. The Ontario Department of Highways had been created in 1915, and the improvement in the roads that followed was dramatic. More people were travelling farther and faster and bridges that were designed for horse-drawn vehicles would have to be replaced.

The brief flurry of activity following World War I was interrupted by the Great Depression and during the 1930 s little more than routine maintenance was possible. When

replacement was necessary, the new pattern unequal arm through plate girder swing spans were introduced. The day of huge overhead truss bridges was nearly over.

During World War II only one bridge was built and that was the footbridge (66A) across the Scugog in Lindsay.

After a 14 year hiatus highway bridge building was resumed in 1952. By this time it was apparent that the increase in traffic on the waterway and the highways caused conflicts at swing bridges and lengthy delays for boaters and motorists. It was decided therefore, that whenever a bridge required replacement it would be replaced by a high level bridge if at all possible.

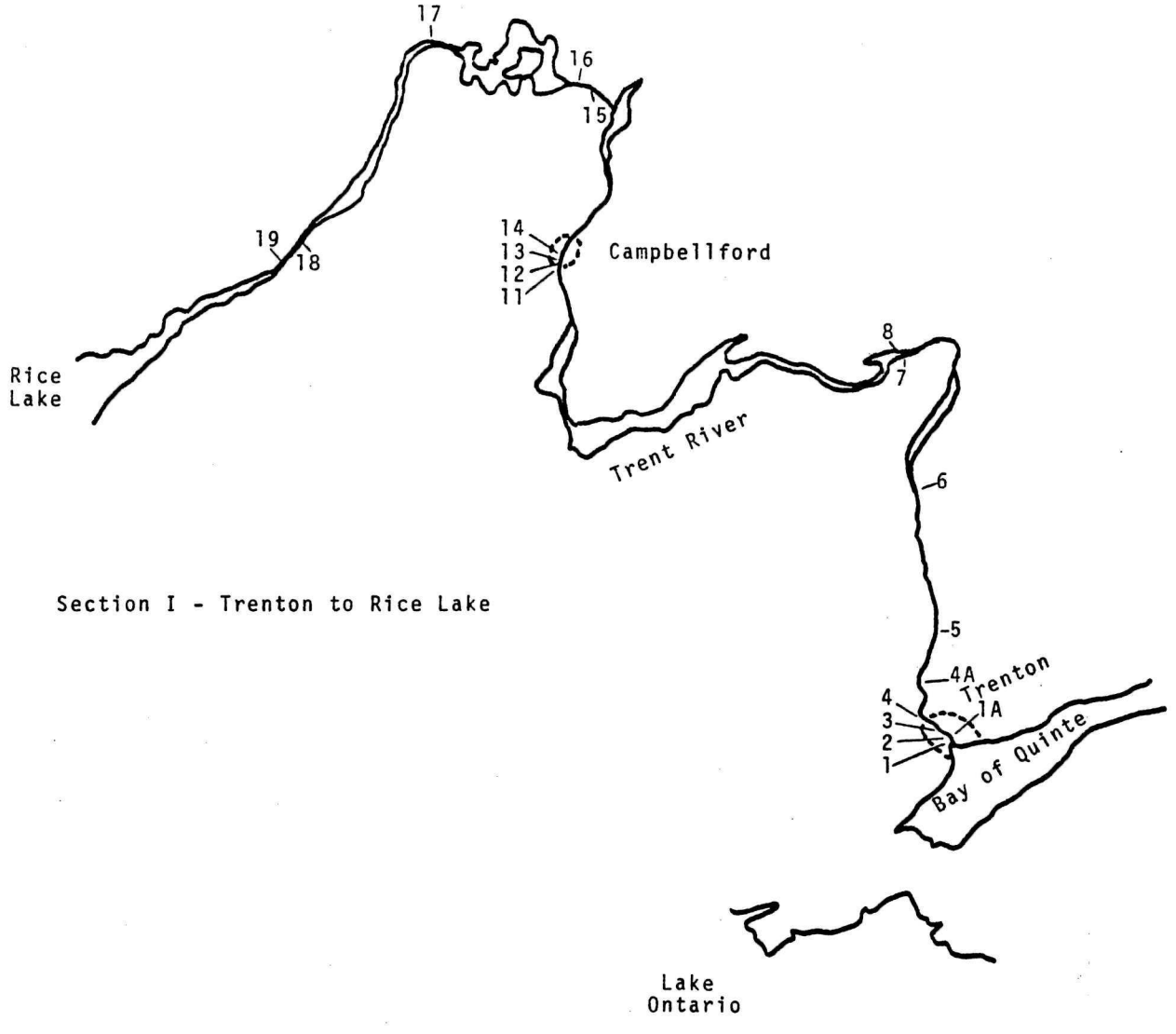
In 1962 the Department of Transport announced a decision to update the Trent Severn Waterway over the next ten years.

Twenty-one highway bridges were built over this period and twenty were high level. Two other older bridges were demolished. Only one more swing bridge was erected - the very last.

By the end of the ten year program in 1972, nearly all bottle-necks to highway traffic were overcome. There were only 14 swing bridges left on the waterway out of a grand total of 55. Since 1972, two more swing bridges have been replaced and two more might be in danger (i.e. Hastings (18) and Bobcaygeon (35)).

In this summary of bridge construction and modification, only major changes will be cited. That is, original construction, the addition or replacement of a swing span, relocation or other significant modification will be outlined. Routine repairs that do not change the location, operation or basic configuration of the bridge will not be mentioned.

The history of the bridges will be grouped under the seven geographical sections and will be described in



Section I - Trenton to Rice Lake

chronological order within each section.

Section I Trenton to Rice Lake

Being the most southerly portion of the waterway and the first settled, this section contains the earliest record of bridges. Originally the Trent river was very shallow and fordable in many places and therefore only the most heavily travelled crossings were bridged. Four main highway bridges were built in the pre-confederation period, 1,6,14 and 18. Only three more were added before the turn of the century, 5,7 and 17. Railroads had added another three bridges to the total by 1900, 4,13 and 19.

The greatest bridge building boom took place in the period 1907-1920 during the construction of the canal along the Trent when 15 bridges were built or rebuilt. The last railroad bridge was reconstructed in 1925. Eight more highway bridges were constructed after World War II, mostly during the period, 1962-72.

The first record of a bridge being built on the Trent Severn waterway is in 1826. A bridge (18) was built over the Trent above the rapids at Crook's Rapids (Hastings), where the river narrowed. The bridge was carried away the following spring by the ice and was immediately rebuilt in the same location. This crossing was an important access for settlers to the area north of Rice Lake. The bridge is sometimes referred to as Asphodel Bridge.

One of the most interesting and longlasting bridges was the covered bridge (1) that replaced the ferry in Trenton in 1834. A draw section was included because the bridge was so close to the lake that most of the harbour was cut-off and also because the canal was anticipated. The first bridge (6) over the Trent at Frankford was constructed in 1836.

The next two bridges were built as a direct result of the first attempt to improve navigation on the river. In 1844 the dam at Ranney Falls flooded out the ford at Campbellford and a wooden bridge (14) was built shortly after. A photograph dated 1865 shows the fixed span having covered trusses and the swing span appears to be a Howe truss. At Crook's Rapids (Hastings) the dam and locks were also completed in 1844 and the bridge (18) was relocated downstream over the lock. This bridge would be rebuilt again in 1858 because the previous bridge had deteriorated. The new bridge had covered trusses to preserve it.

Just above the covered bridge at Trenton, the Grand Trunk Railway built a bridge (4) in 1856 on its new main line from Montreal to Toronto. Finally, the first bridge at Glen Miller (5) was built sometime between 1860 and 1879.

In the immediate post-confederation era, no new lock construction was undertaken along the Trent. However, some bridge construction was necessary. The ice had destroyed the old bridge at Frankford (6) and a new one was erected in 1869. Old drawings of this bridge indicate that it had several spans as if there were small islands in the river. At least six spans of the 1869 bridge were completely covered with a wooden roof. The first highway bridge at Glen Ross (7) was finished in 1871. The specifications for this bridge will be discussed later in this report. In June 1870, G.W. Ranney, Superintendent of Trent Works, said "The bridge is very much required for a large tract of the country, the want of which has diverted a leading road from the back townships to the front round a long bend of the river going south and east". In 1875 the *Grand Junction Railway* started a bridge (13) at Campbellford; because of the company's difficulties the bridge was not finished until 1879.

In 1881 the same *Grand Junction* line crossed the Trent

above Hastings with a swing bridge (19). The Campbellford highway bridge (14) was rebuilt in 1877.

In 1874, a bridge was built across the "narrows" at Trent Bridge (17) despite opposition from the millers at Hastings. They feared a further constriction across the river below their mills would rob them of power. The swing bridge at Hastings (18) was renewed in 1875.

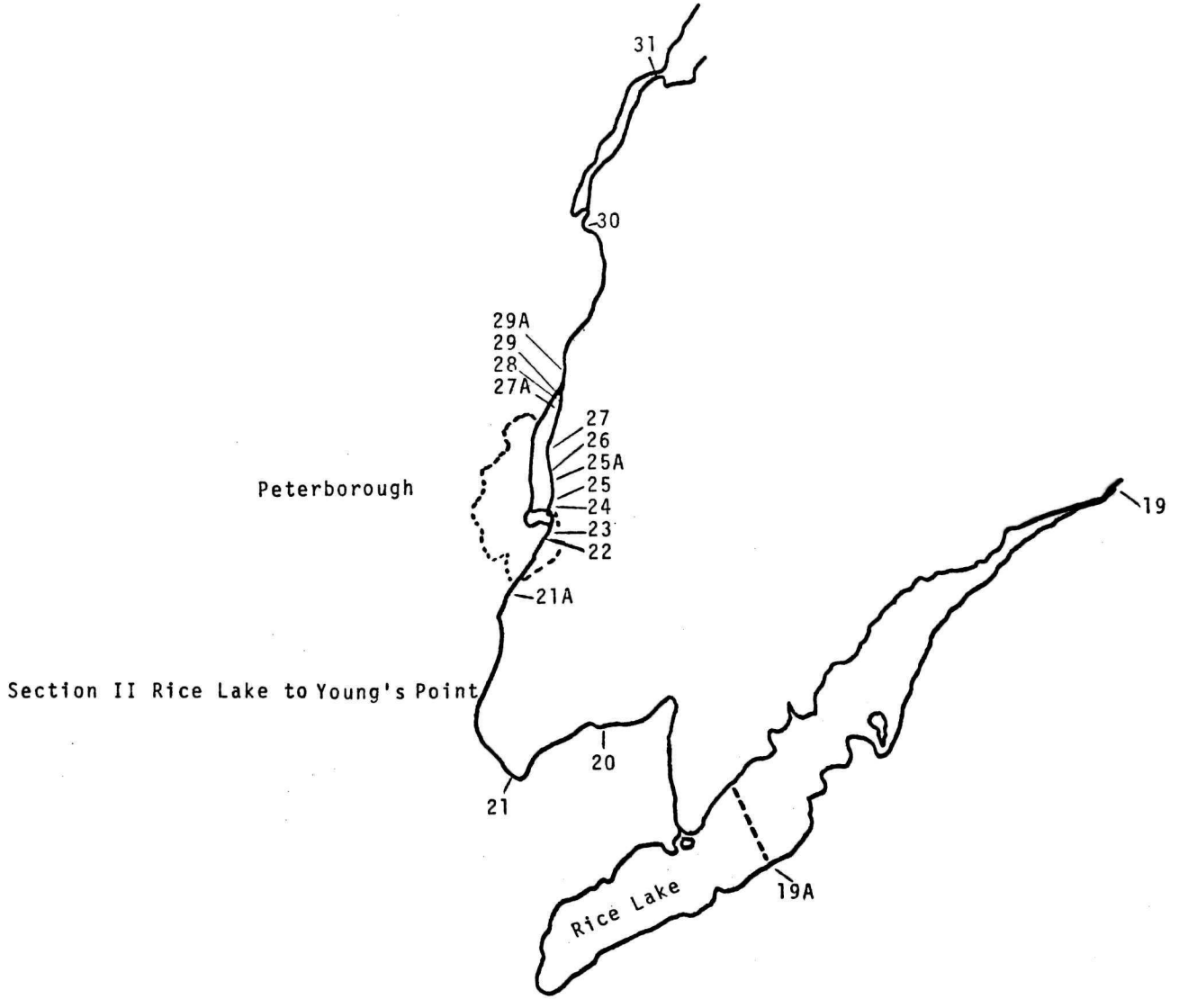
Between 1882 and 1907 several bridges were built or modified. The old covered bridge (1) at Trenton received a new steel through truss swing span in 1887. The Glen Miller Bridge (5) was rebuilt by the municipality in 1894.

Another bridge built during this period was the *Central Ontario Railway* Bridge (8) over the canal at Glen Ross completed in 1882. No swing span was incorporated probably because this portion of the canal was seldom used. A report in 1887, however, complains about the obstruction and adds that the locks are in good order. A swing would be incorporated when this section was rebuilt in 1909. The *Grand Trunk* (ex *Midland*) realigned its track through Campbellford and rebuilt the bridge (13) in 1890.

The main Campbellford bridge was rebuilt twice during this period. In 1897 an interesting iron bow-string truss bridge was erected. It was typical of the age that was experimenting with iron and steel trusses of various shapes. It would be replaced by a more common Warren type pony truss bridge in 1904.

In 1903 the old ferry at Healey Falls that had operated for so many years was replaced by a bridge (16). The bridge at Trent Bridge (17) was rebuilt with a swing section in 1893-94. Hastings highway bridge (18) had another rebuilding in 1890-91. The wooden span was replaced by iron.

Finally, in the period 1907-1920, a determined effort was made to turn the Trent into a navigable waterway.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21A
Peterborough
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Section II Rice Lake to Young's Point
20
21
Rice Lake
19A

During these years every bridge between Trenton and Rice Lake was rebuilt or modified with the sole exception of the old highway bridge (18) at Hastings. The picturesque old covered bridge (1) at Trenton was entirely replaced by a new steel through truss bridge. When the *Canadian Northern Railway* was completing its line between Desoronto and Toronto in 1911 a swing bridge (2) was built across the canal. In 1913 the new bridge (3) on the *Campbellford, Lake Ontario and Western Railway (CPR)* was completed. The *Grand Trunk* bridge (4) was modified after the new canal and lock were constructed beside the river and a high level span was added almost over the lock in 1910.

Five existing bridges had swing spans added or replaced: Glen Miller (5) in 1909, Glen Ross (7) highway and Glen Ross (8) (*Central Ontario Railway*) both in 1909, Healey Falls (16) and Trent Bridge (17) both in 1912.

Three other existing bridges were completely rebuilt. The old covered bridge at Frankford (6) was replaced by a steel through truss bridge in 1910-11. The *Grand Trunk* high level bridge (13) in Campbellford was replaced with a new high level span in 1917-18 although a bascule bridge was contemplated. The main highway bridge (14) was converted to the very latest type of Strauss Bascule bridge in 1913-14.

Three entirely new bridges were added to the system. Two bridges gave access to the *Northumberland Paper Mills* that had been cut off by the canal. An equal arm swing bridge (11) carried the road over the canal and another Strauss Bascule (12) brought a railway spur line. The third was built at Healey Falls (15) to give access to the power plant cut off by the new canal. The superstructure of this bridge had been previously used at Trent Bridge.

Finally, the substructure of the railway bridge (19) at Hastings was extensively rebuilt in 1908. This ten year

period saw 16 bridges built or modified in this section alone. Only in the period from 1967-72 would more bridge building be carried out and that over the whole canal.

After 1921, only two railroad bridges were built. The *CNR* bridges at Hastings (19) on the Trent and Whitla's Rapids (22) on the Otonabee were rebuilt with identical through steel plate girder swing sections. No highway bridges were rebuilt until the Hastings bridge (18) received its seventh rebuilding in 1952. This was a 1930 pattern unequal arm plate girder swing. The bridge carrying highway 401 was built in 1958.

During the rebuilding period 1962-72 four movable bridges were replaced by high level structures: Glen Miller (5) in 1970, Campbellford (14) in 1969, Healey Falls (16) in 1967, and Trent Bridge (17) in 1969. The latter two were moved upstream to new sites as county roads were re-aligned. The Campbellford span replaced the monstrous Strauss bascule lift bridge.

One new bridge was added at Trenton in 1967. A high level bridge (1A) was built in line with Dixon Road. An additional crossing was urgently needed in the city.

The last two changes on the Trent River section include a new high level bridge at Frankford (6) in 1974 and the demolition of the last bascule bridge on the waterway at Campbellford (12) in 1973.

Section II Rice Lake to Young's Point

This section contains the whole of the Otonabee River plus lakes at either end. The lower half of the Otonabee has always been easy to navigate while the rapids between Peterborough and Lakefield were a great hazard until the canal was finished during the years 1895-1904. Unlike the Trent, there were very few fords over the Otonabee and a

bridge at Peterborough was essential to the early settlement. The Hunter Street bridge was first built in 1827 and would be rebuilt many times. It served as a main connector between Rubidge's road and the Chemung portage road. Although it does not cross the canal it leads directly to the lift lock (25A). Another early bridge was built at Lakefield in 1833. Catherine Parr Traill states that the bridge was built by settlers. The new canal does not pass under this bridge. Only three highway and two railway bridges were built over the Otonabee before the beginning of the canal in 1895. During the canal construction nine bridges would be built and only two new bridges would be added up to 1978. Twelve bridges would be rebuilt.

The earliest bridge in this section across the navigation channel would be the Rice Lake trestle-bridge Rice Lake had been crossed by ferries since at least 1820 and some early steamboats actually sailed right on up the Otonabee to Whitla's Rapids. However, the first land crossing was constructed by the Cobourg and Peterborough Railway Company in 1854. The crossing was primarily a trestle from Harwood to Picnic Point with a wooden swing section in the centre to permit water traffic. Winter storms and ice weakened the bridge and it was abandoned in 1860 and most of the bridge section washed away in the winter of 1861-62. The railway generally was a failure.

In 1851 the *Cobourg and Monaghan Road and Bridge Company* built the Bensfort bridge (20) across the Otonabee and in 1867 the Wallace Point bridge was built by the *Wallace Point Bridge and Road Company*. Both these bridges were toll bridges and had swing sections. The new lock (1843) at Whitla's Rapids was also crossed by a bridge (22) in 1855.

Also before Confederation, the Hunter Street bridge was rebuilt in 1847 and 1855 with the latter having covered

trusses. In 1854 the Otonabee was bridged again at Nassau above Peterborough. This bridge is also not on the waterway but is in line with a bridge (29) built over the new canal in 1897.

The Otonabee was again crossed with a bridge at Lakefield in 1854 built by Col. Strickland to replace the earlier bridge. The river was not navigable and when the canal was cut beside the river in 1895-1904, a new bridge (30) was built to connect with the old bridge.

During the lock construction between 1867-1881, a swing bridge (31) was built over the lock at Young's Point in 1870. Later on, in 1873 the lock and dam at Whitla's Rapids were rebuilt. The locks had had very little use because of the competition from the *Port Hope and Peterborough Railway* and had been allowed to deteriorate. A new swing bridge (22) was built across the lock at this time.

Three other bridges were built or rebuilt before the canal construction in 1895. In 1883 the *Midland Railway* (ex *Grand Junction*) bridged the Otonabee (23) and became the first railway to enter Peterborough from the east. The *Grand Junction* went no further.

The Wallace Point bridge (21) was rebuilt in 1889 and in 1894, the Bensfort bridge (20) was also rebuilt 3/4 mile upstream from the old site.

The most active period of bridge building occurred during the canal construction between the years 1895-1907.

The first part of this construction involved cutting a new canal to the west of the Otonabee from Little Lake to Nassau. The new canal became an obstacle to east-west land traffic and had to be bridged on certain selected routes. A through truss bridge (24) was built to carry Maria Street across the canal. The *Ontario and Quebec Railway* (now *CPR*) had built their line through here in 1883 and although they had previously agreed to provide a

swing span should the canal be built, they refused to do so. The *Department of Railways and Canals* built the swing span (25) in 1880 and charged the railways part of the cost.

The great hydraulic lift lock is next on the canal and Hunter Street passes through the structure by a tunnel (25a). Beyond the lift lock, new bridges were built to carry the Norwood (26) and Warsaw (27) roads in 1894. The Lakefield spur of the *Grand Trunk Railway* had been built in 1870. A new swing span (28) was erected over the canal also in 1897. A new swing (29) span for the highway bridge at Nassau was completed in 1897. This road was one of the main routes into Douro township from Peterborough. The Otonabee had been bridged in 1854 and 1884 to carry this road.

A new canal was also cut beside the river through Lakefield and a new high level bridge (30) was connected directly to the old bridge over the river in 1897. The lock at Young's Point received a new bridge (31) in 1906.

In the years between 1907 and World War II, no new bridges were built and only four were rebuilt. The CNR swing bridge (23) south of Little Lake was rebuilt in 1925 (see also Hastings (19)). Bridges 19 and 23 were the last railway swing bridges built over the waterway. In 1936, the bridge over lock 19 at Whitla's Rapids was moved 100 feet north and replaced by a through truss unequal arm swing bridge (22). This would be the last through truss bridge built on the waterway. Also in 1936, the Lakefield high level bridge (30) was said to be unequal to the strain of modern traffic and was replaced by a new steel through truss span.

The Bensfort bridge (20) received a new swing section in 1938. The old pony truss was replaced by a new pattern unequal arm through plate girder swing.

No more bridges were built in this section until after World War II. In 1954, the Young's Point bridge (31) was

rebuilt downstream as a high level bridge. The Warsaw Road through truss swing bridge (27) was replaced by a through plate girder bridge in 1956. In 1959, a new bridge (21a) was built south of Peterborough to act as a by-pass for Highway No. 7.

The rebuilding decade 1962-72 saw several changes on this section. At Maria Street in Peterborough a prewar pattern unequal arm deck plate girder swing bridge (24) replaced the old through truss bridge in 1965. Any attempt to build a high level bridge at this spot would have raised unsightly embankments in the flat park-like area. This was the last swing bridge of any kind built over the waterway.

Also, on the Otonabee, Bensfort (20) (1970), Wallace Point (21) (1968) and Whitla's Rapids (22) (1972) were all converted from swing to high level. The first two are in rural areas and because the embankments were raised, a much straighter approach was constructed and traffic flows improved. Whitla's Rapids was now a city bridge and was much too busy to be out of action during a swing.

One of Ontario's newest universities straddles the canal in north Peterborough. A spectacular reinforced concrete footbridge (29a) joins the two campuses of Trent University in a very attractive setting.

Only two more bridges were rebuilt on this section since 1972. The Lakefield high-level bridge (30) was rebuilt in concrete in 1974. The old Nassau highway swing bridge (29) was demolished and its replacement was constructed 3/4 mile to the south in 1976. Because the new bridge lies between bridges 27 and 28 it has been renumbered 27a for this report.

Section III Burleigh Falls to Rosedale

This section is made up of several lakes and short rivers which are usually referred to as part of the Kawartha Lakes. The Chemung Lake crossings 61 and 61A are included in this section because they relate more closely to the Kawarthas than to the Otonabee or Scugog river systems.

While the Kawartha Lakes area is not entirely suitable for agriculture and as a result was settled several decades later than the southern areas, it was always regarded as a natural transportation link between the more populated areas around Lindsay and Peterborough. The area also supplied much of the timber that was shipped out to Quebec and the U.S. Many of the towns in this section were also the starting places for the colonization roads in the 1850 s and 60 s.

Bridge building in this section occurs mainly in four periods. First, in the settlement period when bridges were built mainly to satisfy local demands. Second, the period around 1860 after the first locks were built and the colonization roads were beginning. Third, the period between 1882 and 1894 when a major effort was launched to complete the waterway in this section, and fourth in the post World War II period.

The first bridge in this section was built by the government between 1833 and 1835 at Bobcaygeon (35). It was destroyed by the spring flood of 1843 and replaced in 1845. In 1858 a new swing section was built over the canal.

There was a bridge at Buckhorn in 1834, built as part of the dam and not across a canal. The bridge would be replaced twice more in 1845 and 1858 before any lock was built.

Two other early bridges have vague histories.

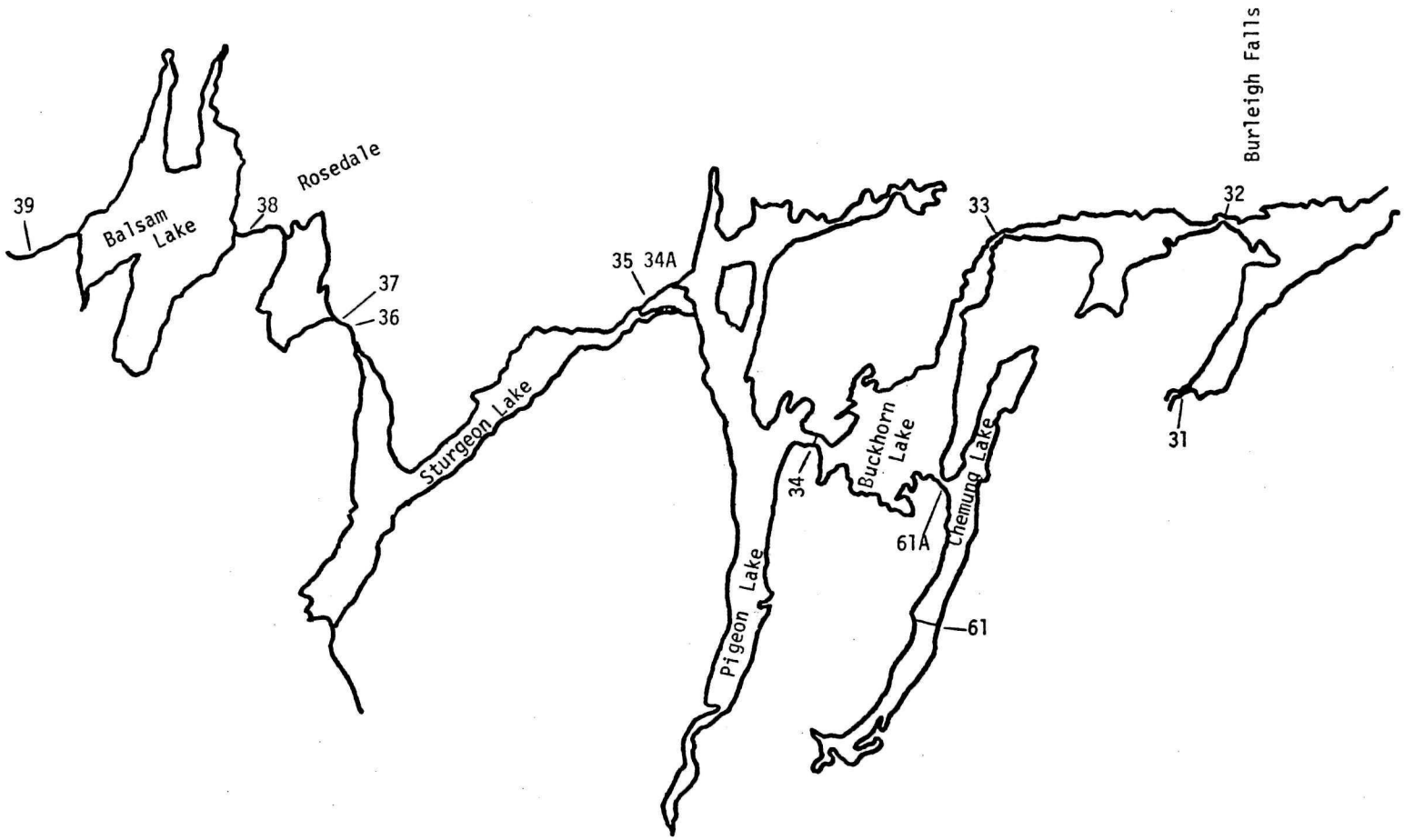
There is no record of the first bridge at Burleigh Falls (32) but it was almost certainly built in 1860-61 for the Burleigh colonization road. This road was described as starting at Burleigh Falls and would be no use to anyone if it could not be reached. There was money voted for the road in 1860, 1861, 1862 and 1866.

The first bridge at Rosedale (38) was constructed before 1868 because in that year Victoria County minutes refer to the necessity of altering the bridge to permit ships to pass. The first bridge was undoubtedly built as part of the Cameron colonization road. Records of money spent on this road show £200 in 1858, £1500 in 1859 and £1200 in 1864. Therefore, the bridge was probably built in 1859 or 1864.

In the post-confederation period, new locks were built at Rosedale between 1868-72, and in the process a new wooden swing bridge (38) was installed in 1871. Two bridges were built at Fenelon Falls. A precanal era bridge (36) was built in 1868 about 100 feet west of the present bridge. The Victoria Railway bridge (37) was built in 1876 as a fixed bridge. Work started on the swing span in 1882 when the lock was built, but for some reason, was not finished until 1894. The swing bridge (35) at Bobcaygeon was re-built again in 1878.

During the period, 1882-94, when the canal was being completed, all the swing bridges over locks were renewed. Wooden swing sections of the King post Howe truss pattern were placed at Burleigh Falls (32), Buckhorn (33) and Fenelon Falls (36) in 1888. In 1892 the wooden swing at Bobcaygeon (35) was replaced by a steel unequal arm deck truss section. Deck trusses are seldom used in a swing bridge because the truss is below the roadway and thus is a greater obstruction to waterborne traffic.

Section III Burleigh Falls to Rosedale



In 1898 the wooden swing bridge at Rosedale (38) was replaced by a steel through truss span. An additional crossing was needed between Buckhorn and Bobcaygeon and the old ferry at Gannon's Narrows was replaced by a floating bridge (34). This very interesting bridge had four floating spans anchored to the shore and four masonry piers. The floating swing section was moored between the abutment at the south shore and the fourth pier. A cable running to a buoy upstream enabled the bridge to be swung.

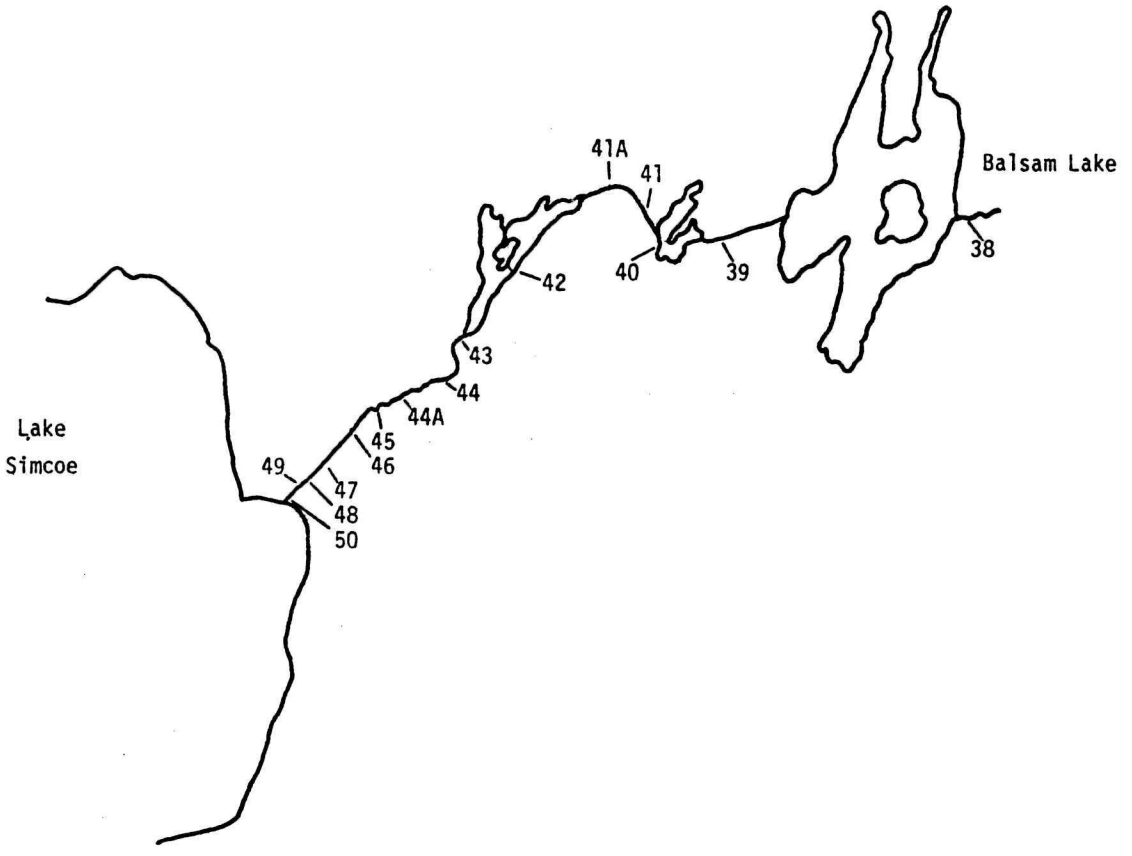
In 1922, the first deck plate girder highway swing bridge was erected at Bobcaygeon (35). This would be the first of many of its type but they were already common on the railroads where the first deck plate girder had been built in 1894. Similar steel swing spans would replace the old wooden swings at Fenelon Falls (36) in 1931, Burleigh Falls (32) and Buckhorn (33) in 1938.

After World War II all the highway swing sections except Bobcaygeon would be convered to high level. In 1953 the floating bridge at Gannon's Narrows (34) was replaced by a causeway and a high level through truss bridge. This is the only Parker pattern truss on the waterway. The bridges at Fenelon Falls (36) and Rosedale (38) were converted to high level in 1963, as was Burleigh Falls (32) in 1968 as part of the waterway modernization.

An entirely new bridge was built over the canal at Bobcaygeon (34a) in 1975 in line with Highway 36 entering the town. This provided a much needed alternate crossing to the one lane swing bridge (35) over the lock. The Buckhorn swing (33) was replaced by a new high level bridge in 1977 but not without some opposition.

Crossings 61 and 61a are also included in this section because they cross the branch channel from Chemung Lake to Buckhorn Lake. The bridge over Chemung (Mud) Lake has a long history. It was first built around 1869. Two early

Section IV - Balsam Lake to Lake Simcoe



drawings remain. They were probably plans for the reconstuction of the bridge which took place in 1901. The 1897 drawing show three floating fixed spans anchored to piers and one swing span on the west side mounted on a fixed abutment. The 1898 drawing shows a causeway in place of the floating spans. The 1897 plan was implemented. In 1972, it was entirely rebuilt with a causeway and a high level bridge span over the channel.

The ferry at Harrington's Narrows (61a) is even more of a puzzle. Verbal evidence reports that in the 19th century the ferry did not cross the narrows but ran from the tip of the peninsula of the Curve Lake Reserve to the mid line of Smith township (between concessions IX and X). In the 20th century, the ferry crossed the narrows to Ennismore township. In 1913 a request was made for a floating bridge. Photographs on file show two log rafts propelled by poles. In the 1920's the ferry operated on a chain connecting the two shores and was propelled by a hand-operated winch. One resident believes the ferry ceased to operate in 1926, and has not been revived.

Section IV Balsam Lake to Lake Simcoe

Prior to 1895, transportation along this route involved a long portage from Balsam Lake over the height of land to the Talbot River and then down the river to Lake Simcoe. Improvement of this route required the excavation of several miles of canal which was very expensive, and thus was postponed until the end of the century. The record of bridges also starts from 1895 as 11 out of 14 bridges were built over the new canal or stretches of the Talbot flooded by dams. Two of the bridges had antecedents on the river but even these had to be rebuilt over the waterway.

On the first cutting from Balsam Lake to the new lift lock, a swing bridge was built at Victoria Road (39) and high level bridges at the Portage Road (40) and *Grand Trunk (ex Toronto and Nipising)* crossing (41) in 1898. The Lift Lock (41a), another canal crossing, was opened in 1907.

In 1905 a unique high level concrete arch bridge (42) was built across the channel in Canal Lake. On the second cutting, in 1902, five identical equal arm pony truss swing bridges were supplied by the *Hamilton Bridge Works* and erected by the contractor *Larkin and Sangster* at Bolsover (43), Boundary Road (44), Kanes (46), Gamebridge (47) and Lake Shore Road (50).

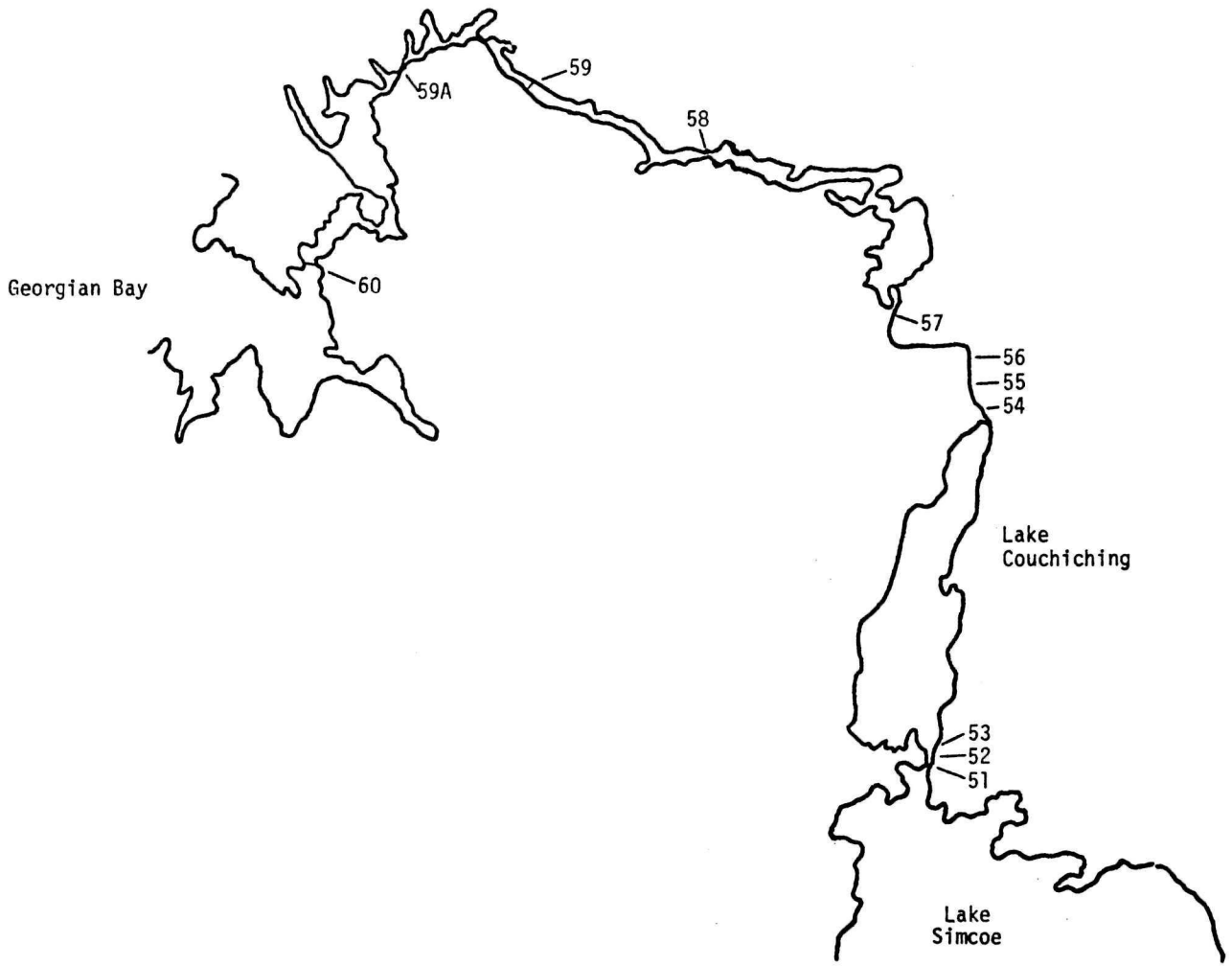
Two railroad bridges were also erected near Gamebridge; a high level *Grand Trunk Bridge* (48) in 1904 and a swing bridge (49) for the *James Bay Railway* in 1906. In 1910, the *CPR*, under the charter of the Georgian Bay and Seaboard Railway, built a swing bridge (45) at Talbot Station. This bridge was demolished in 1938 when the line was abandoned.

The next bridge was built in 1958, when the Portage Road was realigned and a new high level bridge (40) was built a few yards north of the old bridge. Here the departmental policy is most evident. The land around the bridge is exceedingly flat and large expensive embankments were needed to gain enough height to erect a fixed span over the channel.

Highway 12 was realigned at Gamebridge in 1961 and a high level bridge (47) replaced the old swing bridge. The Victoria Road deck truss swing bridge (39) was also replaced with a high level bridge in 1969.

The final change on the Talbot River section was the construction of the new Kane's Bridge (44a) (1972) nearly a mile east of the old bridge (46). The old bridge was

Section V - Lake Simcoe to Georgian Bay



demolished the same year. The new location is about mid point on a wide stretch of the Talbot containing many permanent homes and serves to connect the shores more effectively than at the old location.

Section V Lake Simcoe to Georgian Bay

The bridges in Section V are found at the Narrows at Atherley and on the Severn River. The narrows between Lakes Simcoe and Couchiching has been used continuously as a crossing place for centuries. The first bridge (51) replaced a ferry in 1846 and was rebuilt in 1856. It was operated as a toll bridge. The Monck colonization road started from this location. There is no record of it being rebuilt again until 1926 although it must have been repaired many times.

The *Northern Extension Railway* reached Atherley Narrows in 1874 and constructed a bridge (52). It would have to be a swing bridge because the low lying banks would make a high level bridge too expensive. One of the first bridges to cross the Severn was at Hamlet (57) in approximately 1870 , long before the river was canalized.

At Atherley Narrows the *Canadian National (Grand Trunk)* bridge (52) was reconstructed in 1912 by the *Grand Trunk* and rebuilt again in steel in 1920 by the Board of Railway Commissioners.

In 1910 under the Charter of the *Georgian Bay and Seaboard Railway*, the *CPR* started their branch line from Bethany Junction (southwest of Peterborough) to Port McNicol. As a result a swing bridge (53) was constructed across the narrows. It was demolished in 1937.

In the years between 1914 and 1920, the Department of Railways and Canals finally tackled the Severn River to complete the waterway. Up to this time only two bridges had

crossed the river. The *Northern Extension Railway* built a bridge at Ragged Rapids in 1907. It would be subsequently rebuilt in 1919-20 as a high level bridge (58) because the dam at Swift Rapids raised the water level. The *CPR* line bridged (59) the river in 1907 at Severn Falls and was sufficiently elevated that no modification was necessary.

The highway bridges over the new waterway were all new. Swing bridges were constructed over the new cutting to carry the Muskoka Road (54) (an old colonization road), and the *Grand Trunk* (55). The *Grand Trunk* was slightly re-aligned to give a better crossing. A high level highway bridge (56) was built across Couchiching lock and a previous wooden bridge of undetermined age was demolished.

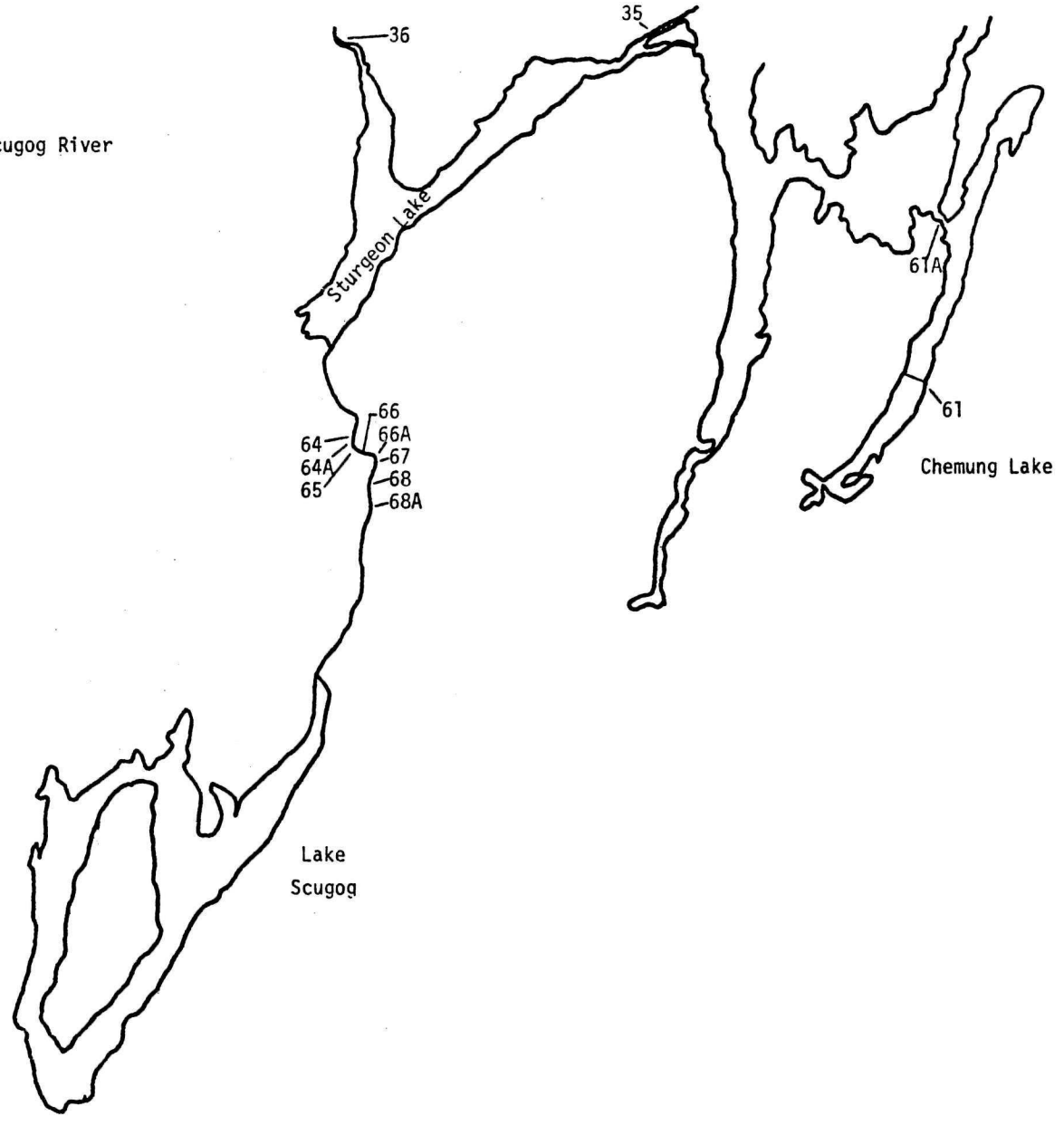
The new Hamlet bridge (57) was rebuilt 2000 feet south of the old bridge in 1922. A new swing span was erected and parts of the old bridge were used for the fixed spans. Big Chute Marine Railway (59a) was opened in 1917 and provides another method of crossing the canal.

Finally, a swing bridge (60) was built across the lock at Port Severn in 1915. This bridge is very similar, though not identical to the five bridges on the Balsam-Lake Simcoe section.

From 1921-1978 only two major pieces of new construction were undertaken on the canal. The Marine Railway at Swift Rapids was replaced with a lock in 1965. This was not a crossing in the sense that the lift locks or Big Chute Marine Railway are crossings because Swift Rapids is so remote that only rough roads reached the site. In 1977 a new marine railway was started at Big Chute (59a). This replaced the old one.

At Atherley Narrows the long bridge (51) was rebuilt in 1926. The fixed spans were the latest reinforced concrete bow string arches and the unequal arm swing span

Section VI - Scugog River



was a steel through truss , certainly, no aesthetic gem by modern standards. The old wooden truss high level bridge (56) over the lock at Couchiching was replaced by a steel through plate girder span in 1931.

After World War II, the swing bridge over the Muskoka Road at Washago was rebuilt as a high level bridge in 1954 and the road realigned.

In 1964 the Old Bridge (51) at Atherley with its mixture of concrete arches and steel trusses was replaced with a high level bridge ensuring uninterrupted traffic both above and below the bridge. The railway swing (52) above is normally left open as the rail traffic is light.

The Muksoka Road bridge (54) was widened from two to four lanes in 1966 to handle the very heavy tourist traffic up to the Muskoka area.

Section VI Scugog River

The eight bridges over the Scugog are an integral part of the story of settlement and transportation in the heart of Victoria County. There were four highway bridges, three railway bridges and one footbridge. Two of the railway bridges were demolished and not replaced.

The four highway bridges have very interesting histories and in the early period, were closely connected to the construction and re-construction of the lock and water traffic along the Scugog.

In the pre-confederation period, when the first lock was finished, a wooden bridge (66) was constructed over it in 1843. This bridge burned in the great fire of 1861 and a temporary bridge (65) was built over the river downstream in line with Wellington Street. The new bridge (66) was lined up with Lindsay Street rather than directly over the lock and was completed in 1864. The detailed specifications

for tender for this bridge remain on file and reveal much about early bridge building techniques.

In the meantime two more highway bridges were built across the Scugog. Just south of Lindsay, on the main road, the first "Ops" bridge (68) was constructed about 1860. It served travellers until about 1867 when a damaged section was removed. The bridge was not rebuilt until 1872. Further south along the middle line of Ops township, a low level wooden bridge (68a) was constructed, also about 1860. This bridge was known as "Ambrose's" bridge and was fixed because there were few boats along the river requiring a swing or high level bridge.

The situation changed in 1870. The old lock had been allowed to deteriorate and effectively prevented water traffic from Lindsay south along the Scugog. A new lock was built in that year. The temporary bridge (65) at Wellington Street was becoming unsafe and was replaced with a swing bridge in 1871. The Lindsay Street bridge (66) also received a new swing section in 1871 as did the Ops bridge (68) in 1872. All three swings had King posts with Howe trusses. The old bridge (68a) on the middle line was now an obstruction to traffic and a section was removed about 1870 when a steamboat was built in Port Perry. Apparently the remaining lumber was salvaged by the local residents and the bridge disappeared. The township council had refused an offer from the Provincial government to build the bridge in favor of an improved bridge (68) at the main crossing nearer town. It would be over 80 years before another bridge was built at this location.

The Lindsay Street bridge (66) was again rebuilt in 1879 and 1890. The latter building was probably caused by the reconstruction of the lock in 1885. The lock was rebuilt for a fourth time in 1909 and the two city bridges were rebuilt shortly thereafter.

The Wellington Street swing bridge (65) was replaced by a bascule bridge in 1911. The builders reported that this was the first bascule bridge in operation in Canada. It was soon followed by the two at Campbellford but no others were ever built across the waterway. In 1915 the old wooden swing bridge (66) at Lindsay Street was replaced by a steel swing span.

Only two bridges were built in the next forty years. The Ops bridge (68) was replaced with a reinforced concrete bow string arch similar to the fixed spans at Atherley (51). One bridge was built during World War II. This was the footbridge (66a) across the Scugog at Russell Street. As Lindsay started to develop on the east side of the river, the lack of bridges for pedestrian traffic became acute, particularly for school children. There were no other bridges for pedestrians between the Lindsay Street bridge and the Ops bridge, a distance of over 1½ miles.

In recent years the movable highway bridges were all replaced by high level structures at Lindsay Street (66) in 1954, Wellington Street (65) in 1965 and Ops (68) in 1969. When a by-pass was constructed south of Lindsay for Highway 7 in 1958 a high level bridge (68a) was constructed on the old middle line crossing site.

Lindsay was also an important railroad junction. By 1857, the Port Hope, Lindsay and Beaverton Railway reached the east bank of the Scugog in Lindsay. In 1869 it was renamed the Midland, and in 1870, it crossed the river with the extension to Beaverton. This bridge (64a), also was a King post Howe truss wooden swing bridge. However, because of the *Midland Railway* reorganization, a new high level bridge (67) was built south of the city in 1883 and the old bridge (64a) was abandoned and removed in 1887. The high level bridge (67) was rebuilt in 1901 and again in 1916.

The last bridge in the story of this section, was the high level bridge (64) built by the *CPR* in 1914 as part of its Georgian Bay line. It was demolished in 1937 when the line was abandoned.

Section VII The Holland River

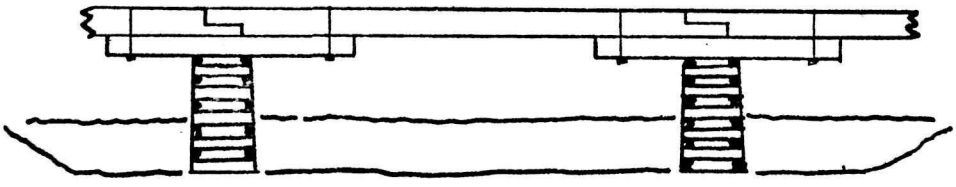
The projected canal up the east branch of the Holland River from Lake Simcoe to Newmarket was begun but never completed. Some locks and dams were built and four swing bridges were erected at the most important crossings. The first bridge over the Queensville Road was erected in 1908 with the Dominion Bridge Company supplying the superstructure. The next three at Yonge Street, Second Concession and Green Lane were built in 1911 and Hamilton Bridge Works supplied the superstructures. The first and longest bridge had an equal arm through truss swing section while the latter three were unequal pony truss swings almost identical to the Talbot River swing bridges.

The Yonge Street bridge and the Queensville Road bridges were replaced by fixed bridges in 1962 and 1972 respectively.

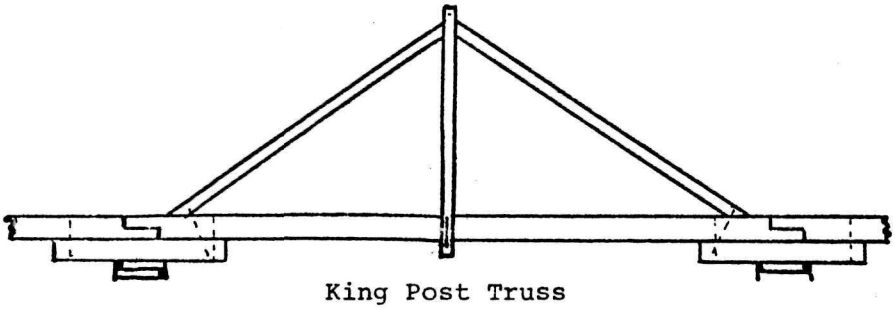
Bridge Technology

Very few specific details about individual bridges have survived from the period before 1880. However, some general and fairly reliable assumptions about their structure can be made, based on the information available from one or two bridges and from a knowledge of bridge building techniques in North America at that time. Most published histories of bridge building do not deal adequately with the small local bridges found on the canal as the authors tend to elaborate on the engineer's ability to build bigger and bigger bridges.

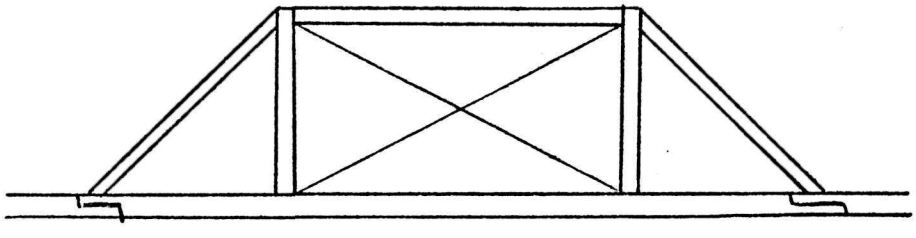
Wooden Bridge Structures



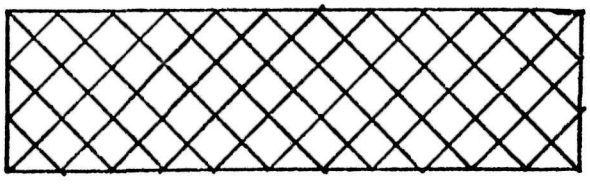
Beam Bridge on Timber Cribs



King Post Truss

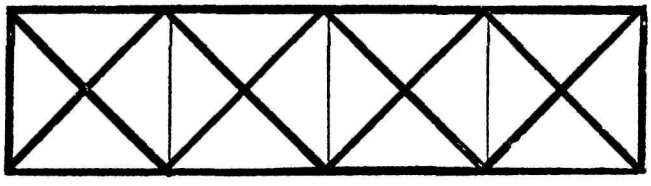


Queen Post Truss

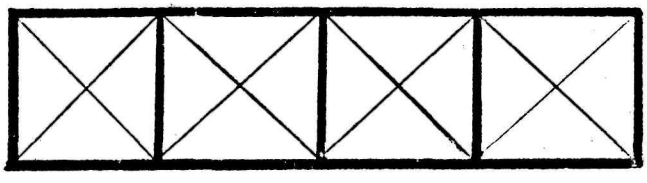


Lattice Truss

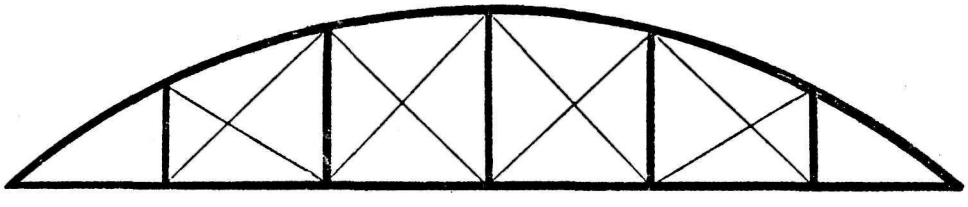
Combination Wood and Iron



Howe Truss

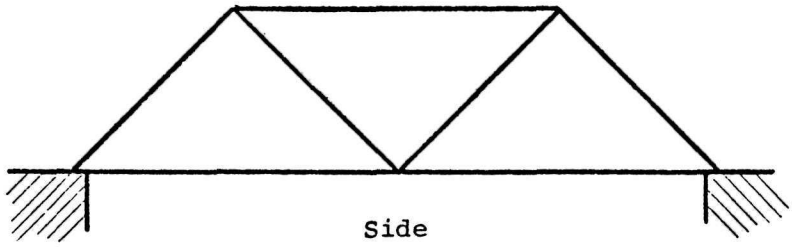


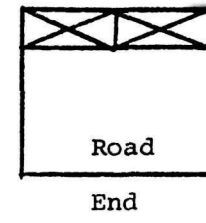
Pratt Truss



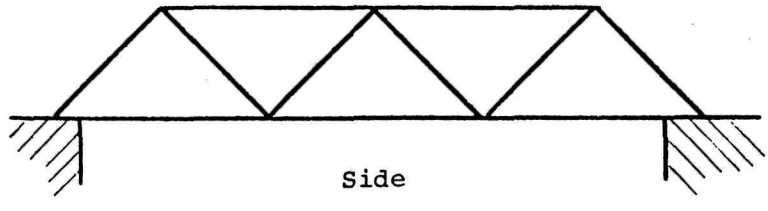
Bowstring Truss

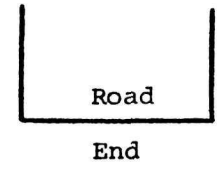
Metal Truss Bridges



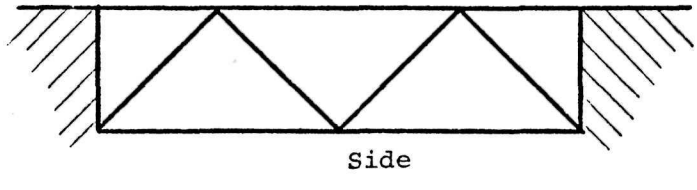


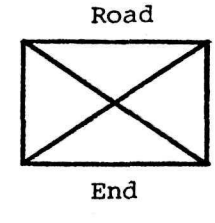
Through Truss





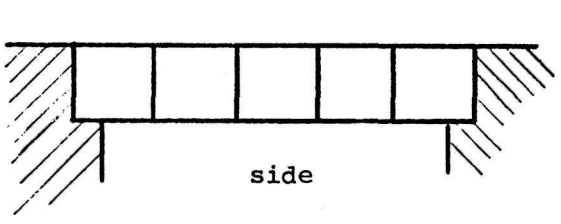
Pony Truss
(also sometimes referred to as through truss)

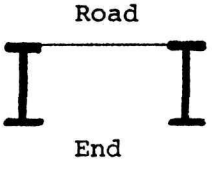




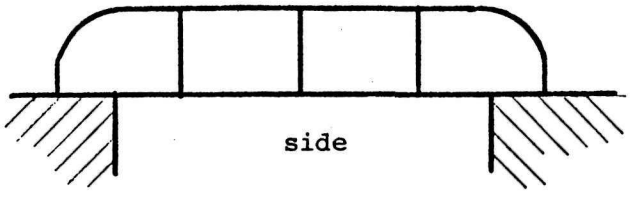
Deck Truss

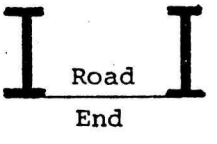
Plate Girder Bridges





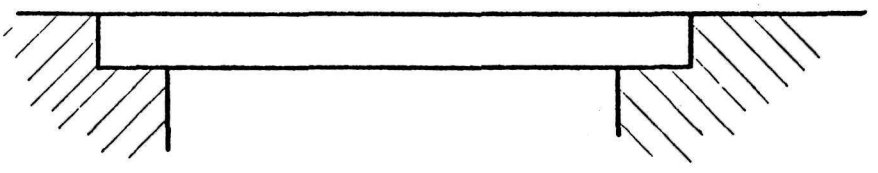
Deck Plate Girder



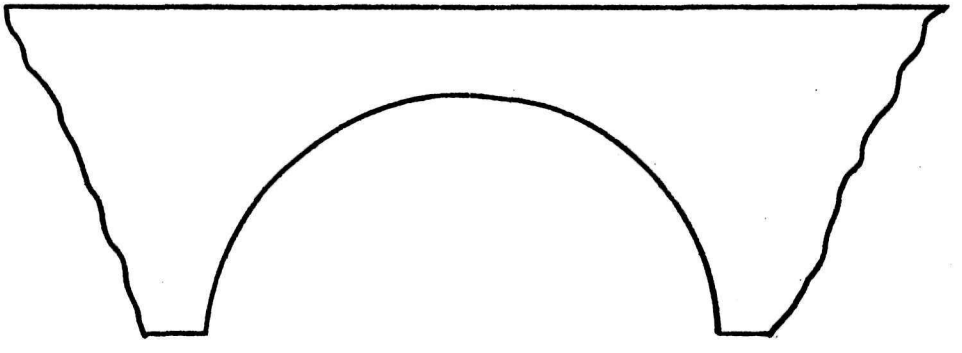


Half or Through Plate Girder

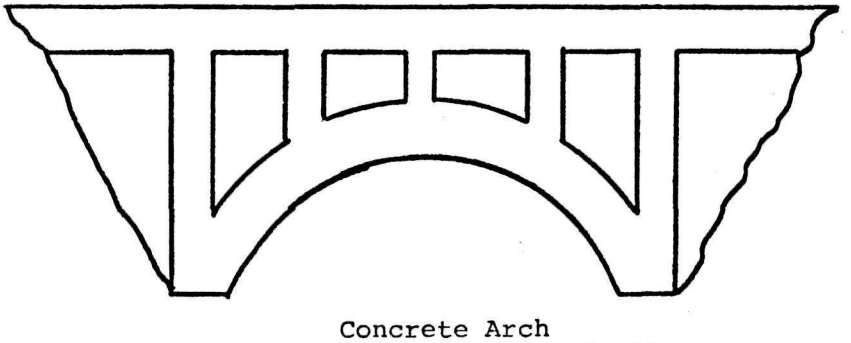
Concrete Bridges



Concrete Beam
(usually reinforced with steel)



Concrete Arch
(unreinforced or mass concrete)



Concrete Arch
(reinforced, open spandrel)

While this tendancy is understandable, it is regrettable because the vast majority of bridges built in North America were under 200 feet in length - these were the bridges on which most people travelled and the bridges which county engineers and railroad engineers had to build and maintain. Information on Canadian bridge building techniques is scarcer still. Climate, remote locations, tiny budgets, lack of iron and lack of trained builders are some of the special problems Canadians faced.

However, three invaluable documents have been discovered which reveal many details of the early bridge building techniques. The first is the detailed "Specifications for the Construction of a Bridge to be built over the Scugog River at Lindsay" dated 16th March 1863. The specifications for the 1870 bridge at Glen Ross are also available although the drawings for both documents are missing. The third document is the drawing of the original covered bridge at Trenton built in 1834. In 1915, just before the bridge was replaced, an official in the *Department of Railways and Canals* requested a detailed drawing of the bridge. The drawing is preserved in the Trent Canal office in Peterborough.

A mental picture of the early bridge sites can be built up from the descriptions of the waterway before canalization and from the discussion of fords and ferries already mentioned. If it became essential to build a bridge,certain factors would have to be considered, such as: the distance to be spanned; the force of the current; the condition of the bottom; the shape and materials of the banks; the local road network; traffic volumes; seasonal fluctuations in water levels and action of ice in the winter and in the spring; traffic on the river in boats and logs; materials available and of course, finances.

In most cases such as Frankford, Hastings or Peterborough for example, the first bridge was wooden because of the availability of good wood. The piers were timber cribs with dove-tailed corners and filled with stone. The quarry at Bobcaygeon supplied good building stone and the 1863 specifications for the bridge at Lindsay called for cut stone masonry cribs and abutments. Probably some attempt was made to remove loose material from the footings but no dredges or caissons would be available. The basic structure of the bridge was a beam. That is, timbers were laid from pier to pier without the benefit of trusses. The distance between the piers was governed by the length of timbers available. The long beams were joined by a lap joint or "scarfed joint" at the piers. Frequently they were supported by a "corbel" beam which was placed between the pier and the main beam and overlapped the joint by about 10 feet. This provided some cantilever support. The floor would have then been laid on the beams and some kind of railing erected. Often a floating guard boom was anchored in the river upstream to prevent logs and debris from damaging the piers as seen at the Trenton bridge.

This was the simplest of all bridges and would quickly deteriorate because of the weather and the abuse it received from traffic on the river. The piers were often so close together that the bridge was almost a dam with holes in it. The constriction of the flow of water caused currents around the piers that would seriously erode the footings in a very short time.

Improvements were soon made. Knowledge of better structures could be gained from the Royal Engineers building the Rideau Canal or from experienced immigrants from the U.S.A. A far greater span could be achieved on a wooden bridge with a King post or Queen post truss. These were the simplest forms of trusses and were able to withstand

slow moving loads quite well. They were used over distances from thirty to eighty feet. They relied on some iron fasteners and bracing rods but the quantity of iron was not unreasonable.

The Trenton bridge appears to incorporate a Queen post truss but because many other members and a roof are included the initial Queen post is substantially strengthened. These early bridges were often built without detailed calculations. The additional strength permitted a span of 89 feet and the long life of the bridge attests to its strength.

The protection of wooden members from the elements was a serious problem. Painting was possible, but controversial, even if available. First of all, some felt that the paint prohibited the wood from curing and "breathing". Others were convinced that painting helped to preserve the wood but felt that good paint was almost impossible to buy.

The frequent solution was to cover the bridge. The cover might include a roof and plank walls which might double the life of a bridge. Uncovered, it might last 10-12 years, covered it would last 20-30 years. The Trenton bridge lasted 82 years! An alternative was to cover only the trusses on the sides but not the deck. Several bridges had the side members completely encased with planks, such as Campbellford, Hastings and Peterborough. This latter method may be unique to Canada or even Ontario. It avoided a serious disadvantage of the roofed bridge. Once winter arrived, sleighs were universally used and the roofed bridges prevented snow from falling on the deck and therefore snow had to be hauled onto the bridges to convey the sleighs. Later builders would advocate covering the trusses with galvanized iron rather than planks. Galvanized iron was also used at a later date between adjoining

timbers in the bridge if the timbers were not the same wood. It was believed that this prevented any reaction between disimilar woods which would contribute to rot.

The lattice truss is also an all-wooden truss used in bridges and very frequently found in covered bridges in New England and Quebec. It has the advantage of using a large number of uniform parts and being simple to erect. The large number of parts required numerous fasteners which tended to weaken the structure in time. It was not an efficient truss because, unlike later trusses, one could not calculate the stresses on each member, and usually there were far more than necessary. Finally, it was not adjustable and therefore difficult to maintain. A lattice truss may have been used in the Frankford bridge ca. 1869.

The early bridges often had swing sections which usually were unequal arm King posts truss spans. There are a few photographs of this type of bridge from a later period as well as drawings of the Rideau Canal bridges. The King post truss would often be supplemented by a lattice truss or even a Howe truss for strength.

There were several of the latter over the waterway as can be seen in early photographs of Campbellford, Young's Point, Burleigh Falls, Chemung, Bobcaygeon, Fenelon Falls and Lindsay.

In 1847, Squire Whipple published "A Work on Bridge Building" in the U.S. which was the first serious scientific approach to bridge building. The concept of a truss made up of triangular panels capable of mathematical analysis was thereafter generally adopted. One of the main concepts of a truss is that it must be designed so that the forces on each member are axial with the member and either compressive or tensile. If the loads on the truss are only on the joints, then each member must be in tension or compression.

The size and shape of each member can be determined from the designated load, but if the design is faulty and a member is placed under torsion or sheer forces it will fail.

The Howe truss was patented in the U.S. in 1840 and became very popular. It was the first bridge to use wood and iron for different members. One of the main advantages of this truss was that it could be quickly erected out of uniform parts and that it could be adjusted periodically by maintenance men to compensate for thermal expansion and contraction and general settling of the bridge. The Pratt truss 1842-44 eventually replaced the Howe truss because it recognized the principle that compression members should be as short as possible to prevent buckling while tension members could be as long as necessary. The bridge was originally designed to use wood in compression and iron in tension but eventually was adapted for all iron and then all steel. Howe and Pratt trusses would have been widely used in Canadian bridges. A.W. Campbell states in 1886 "The general practice in building wooden bridges is to use the King truss up to thirty-five feet span, the Queen or trapezoidal truss up to eighty feet and the Howe or Pratt truss up to one hundred and sixty feet span".[1]

There were other problems with wooden bridges that would eventually lead to their obsolescence. They were inflammable. Before settlers and lumbermen cleared off the forest many fires also consumed the local bridges. This was particularly unacceptable to railroads. The early wood burning locomotives constantly sent out a stream of sparks and dumped their ashes on the right-of-way. Guillet states that "the bridges on colonization roads were burned out at least once a year".[2] It would seem unlikely that the forest could grow back that quickly so this must be taken as an exaggeration.

A more pressing problem in the latter half of the

19th century was the lack of good lumber. Several engineers complained about the quality of the material and the fact that good lumber was nearly as expensive as iron.

One author in 1895 made a plea for retaining timber bridges, and made some interesting observations. First, that bridge builders should use driven piles for the foundations of their piers and timber bents instead of stone filled cribs. He also recommended that the superstructure not be firmly fastened to the substructure so that in the event of a flood or spring ice the superstructure would be carried away rather than smashed to pieces. It could often be recovered later and remounted. He goes on to say "of late years all long spans of important bridges are built of iron and steel on masonry abutments and piers, but for ordinary country roads, wooden bridges with spans up to 60 feet in the clear are preferable when constructed as above mentioned".[3]

Unlike Europe very few masonry bridges were built in Canada. The reason is undoubtedly because of the lack of material and masons, and an abundance of wood. Masonry was not even used extensively in foundations on the Trent bridges.

The composite bridges of iron and wood were used in Canada for well over half a century but would gradually be replaced by all iron bridges. There is a ill defined transition period that requires explanation. Iron was used in various ways in early bridges. Wrought iron has great tensile strength while cast iron has compressive strength, neither has half the strength of steel. However, steel was far more expensive and hard to obtain. Bessemer's process for producing steel was invented in 1855, the Siemans-Martin open hearth process followed soon after but it was not until 1870 that enough steel was available for railroads to convert their wrought iron rails to steel.

This conversion consumed most of the steel produced and it was not until about 1890 that bridge builders started to use steel. There were reasons for this other than availability; the quality of steel improved greatly over this period as well.

On the Trent canal, many metal bridge trusses were erected in the 1880's and 1890's. They are commonly referred to as steel bridges but it is quite likely that many were wrought iron or a combination of wrought and cast iron. In any case, cost was a big factor and most of the bridges on this system were owned by the municipality where cost might be the most important factor. Frequently engineers complained of the parsimony of the local council.

Originally when metal trusses were assembled, the various members were secured at each joint by a single pin. This is referred to as a "pin-connected truss". In theory, as each member was free to swing about the pin, no stresses except tension or compression could be applied to that member. Even today, for purposes of calculation, engineers assume each joint to be a single pin connection.

In practice, a pin-connected truss was quick and easy to erect in the field and very popular in Canada in the 1880's and 1890's. However, the finished structure was not as rigid as a rivetted truss and rattled and shook when a vehicle passed over it. This resulted in excessive wear. Therefore, Canadian bridge builders followed the British practice and changed over to all rivetted connections. This gave a much more rigid structure but rivetting in the field was more difficult until the pneumatic rivetter was invented in the 1890's.

There are only three pin-connected trusses remaining on the waterway. The first is the small swing span (15) at Healey Falls which is seldom used. The second is the old span at Young's Point (31) now restricted to pedestrain

traffic, and the third is the fixed span on the Hamlet Bridge (57) which is in regular use. This span was part of the old bridge and was moved to the new site when the bridge was reconstructed in 1922. (Pin-connected trusses are quite rare anywhere in Ontario.)

An analysis of the known facts about Trent bridges shows that the earliest "steel" truss highway bridge was the Wallace Point (21) bridge of 1885 and this type of bridge was built up to 1936 (22) at Whitla's Rapids. The latter date is unusual because most of these bridges were built between 1885 and 1920. Railroads used them only for a short period from 1898 to 1919.

However, the railroads had already advanced one step further and built their first deck plate girder bridge in 1894 (37) and continued to build them up to 1925 (19,23). The first highway deck plate girder did not appear until 1922 (35) and the last in 1965 (24). The advent of the deck plate girder is a major step in science of bridge building. The girder is similar to a very large "I" beam. They are more efficient structurally but require a higher grade steel, and are more difficult to erect. The truss is shipped in pieces and assembled on the site. The girder is shop rivetted or welded and shipped to the site assembled. Large cranes are necessary to place the girders on the piers. The girder bridge is also much more unobstrusive and more pleasing aesthetically.

There are now only two highway and four railway through truss spans left on the system. The very first railway plate girder bridge at Fenelon Falls (37) is still in operation and is the oldest bridge over the navigation channel.

As mentioned before, the decision to replace highway swing bridges with high level bridges was made in the 1950's and since then most of the old iron trusses and plate girders have gone.

A few interesting masonry bridges were built. They were so rare that one can not help speculating that they were experiments only. The earliest and strangest of all is the concrete arch at Canal Lake (42). This bridge was erected in 1905. The 1933 list refers to it as a reinforced concrete arch. If it is truly reinforced, it would be the first of its kind in Canada. However, the drawings show no reinforcing rods anywhere and from the configuration of the bridge one could assume that it could be mass concrete without any reinforcing. Very few mass concrete bridges were built anywhere in North America. The Peterborough lift lock is unreinforced mass concrete and was being constructed at the same time.

The other two bridges at Atherley (51) (1926) and Ops (68) (1932) are the open spandrel type of concrete arch that clearly would have to be reinforced. The Ashburnham bridge in Peterborough (1921) was the longest concrete arch span in Canada for many years.

Conclusion

Bridges on the Trent-Severn Waterway are and were essential links in the transportation systems throughout the area. They assisted settlement, agriculture, and commerce and served society in a number of important ways. Therefore in most cases, the structures were first and foremost utilitarian. They were built by pragmatic councils and road builders who were overcoming an obstacle as quickly and inexpensively as possible. There were no gigantic rivers or valleys to cross, therefore no cantilever bridges like the Quebec bridge, no suspension bridges like the Niagara bridge or no unusual bridges like the tubular Victoria bridge at Montreal.

The early bridges were built of wood by local craftsmen. As time went by, specialists in bridge building appeared and eventually bridge companies. Their approach was always very practical. The Industrial Age had arrived and iron and steel were fabricated in standard shapes suitable for members of bridge trusses. Standard patterns evolved and were widely adopted. Seldom did an engineer design a bridge from "scratch" for a specific location.

Thus, while we cannot make any extravagant claims for the innovative design or size of these bridges, they do have one great importance. Because they were built over such a long period, for different clients and purposes, during depression and prosperity, they do represent a microcosm of bridge building in Canada during these years. A study of the evolution of these bridges reveals the trends

in this form of technology in Canada and the effects that our climate, geology, geography, politics and economics have had on its development.

Future Work

The most obvious future work is to fill in the blank spaces in the bridge data forms. The most readily available sources have been checked but there are many more fugitive sources to locate. The first step would be to locate municipal records in municipal offices. The second step would be to check back issues of newspapers. This would be an enormously time consuming task that would be expensive.

It is also possible that many photographs or drawings exist that show the configuration of old bridges. Perhaps a letter to the editors of all the local newspapers along the waterway would yield some interesting information.

This report did not go into the technical detail relating to the operation of the movable bridges. Research could be directed to the types of locking devices, pivot arrangements, power sources, gearing, roadways, truss types and special arrangements for winterizing.

This study also concentrated only on bridges crossing the navigation channel. The study should be broadened to include all spans over sections of the river parallel to the canal as well as bridges over streams feeding the waterway.

Another worthwhile task would be to document all the bridge companies involved in constructing these bridges. Some of the company records may be still available which would shed more light on bridge design and erection methods.

Appendix A. Bridge Data Forms and Photographs.

1. The bridge forms in this appendix contain data where available on all bridges which have at any time crossed the navigational channel of the Trent-Severn Waterway. The succession of bridges at each site is shown in columns on the forms reading from right to left. Hence the data given in the column on the extreme left is for the bridge currently on the site.
2. The dates used are the dates of completion of the superstructure and substructure. If information is shown for superstructure but not substructure it may be assumed that there was no change in the substructure and vice versa.
3. The abbreviation OA means overall measurement.
4. Because of space limitations, shortened references have been used for the footnotes.

Canal Crossing

Number 1

Location 0.00 Name Trenton Route Highway 2

DATE	1916	1887	1866	1835	1790
SUPERSTRUCTURE					ferry
Fixed Spans	3			4	
Form	through truss			covered	
Material	steel			wood	
Length	3 x 119'			4 x 130'	
Movable Type	equal arm	equal arm	swing	draw	
Form	through truss	through truss		truss	
Material	steel	steel		wood	
Length	204'			130'	
Power	electric			manual	
SUBSTRUCTURE					
Form	concrete			wood	

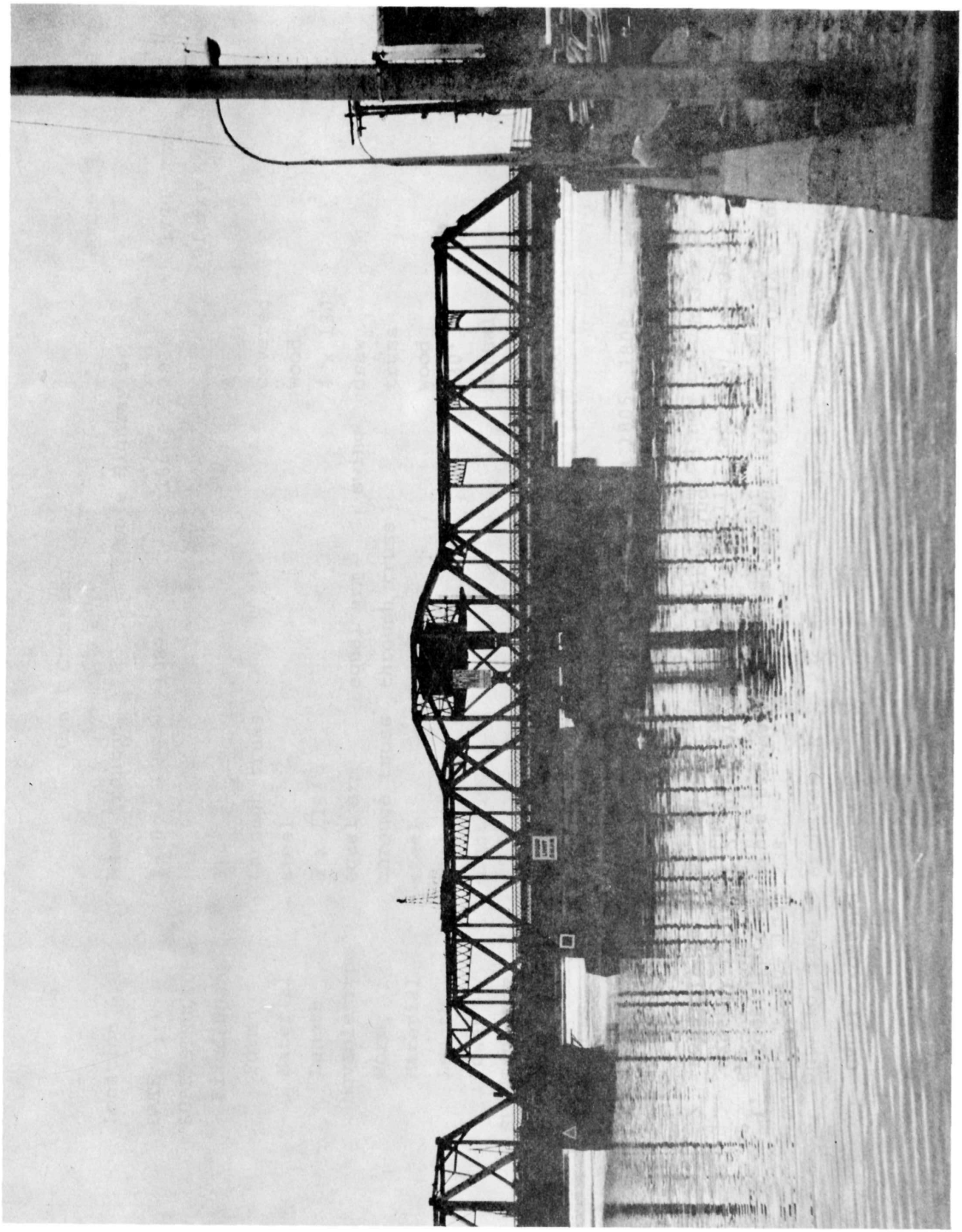
REFERENCES

1. Ontario, Public Archives, Bleecker family papers 1805, 1808.
2. Upper Canada, Journal of Assembly 1832-33, Appendix pp. 41-42.
3. The Advocate (Trenton) 26 Aug. 1915 referendum on new bridge.
4. Canada, Sessional Papers, 1917, Vol LII, No 11, Paper 20, pp. 131-132.
5. Boyce, G.E., Historic Hastings, Hastings County Council, Belleville, 1967, pp. 9, 40, 104, 238.
6. Ontario, Public Archives, R.G. 22, Series 7, Ferries, Trenton, 1827.

Canal Crossing Number 1 - continued

NOTES

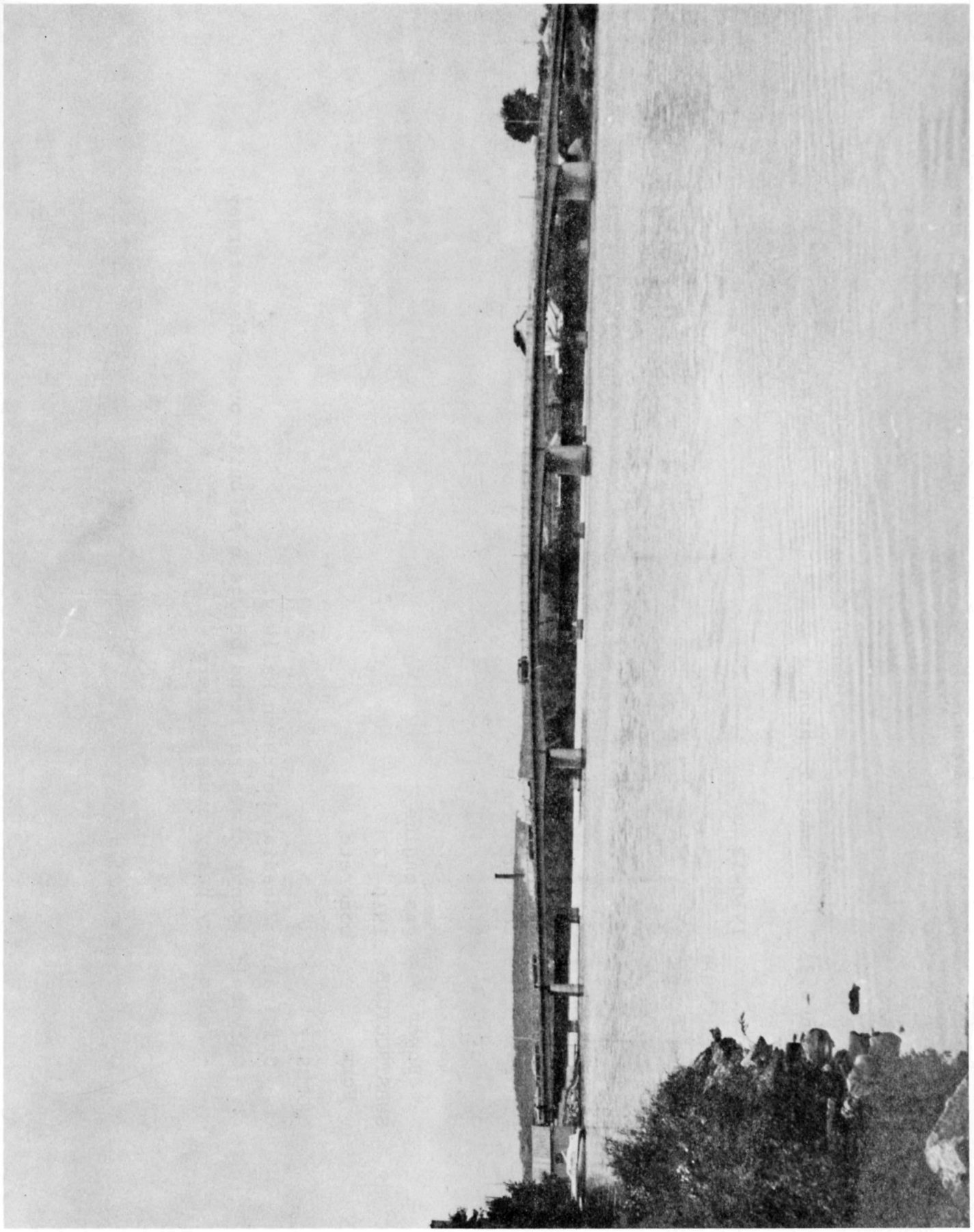
1. Oldest through truss highway swing span on the waterway. Only 2 remain from overall total of 22 highway swings.
2. Possibly earliest and most important crossing.



Canal Crossing Number 1A

Location 0.32 Name Trenton Route Dixon Road

DATE	1967
SUPERSTRUCTURE	high level
Fixed Spans	5
Form	deck plate girder
Material	steel
Length	
Movable Type	
Form	
Material	
Length	
Power	
SUBSTRUCTURE	
Form	concrete



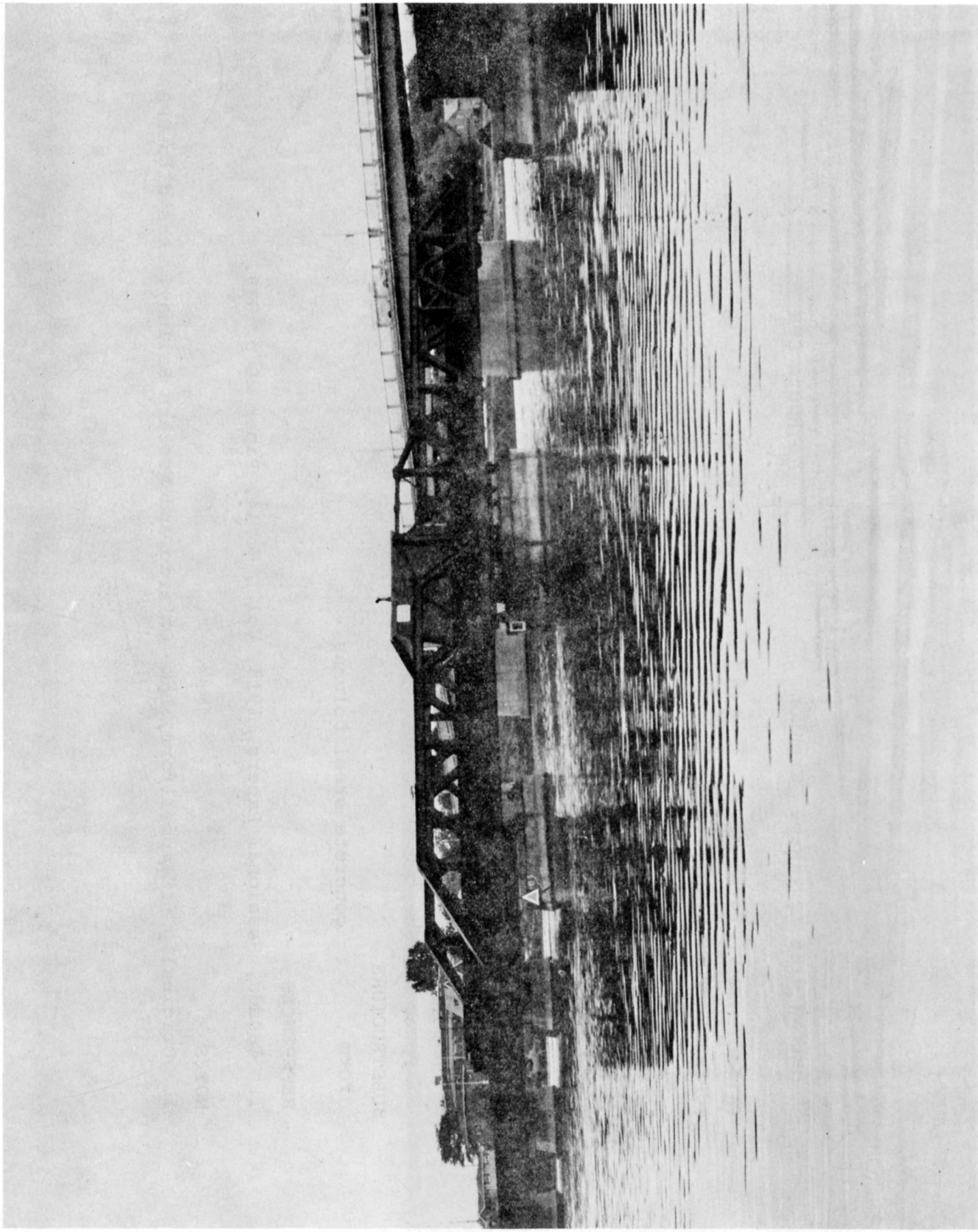
Canal Crossing Number 2

Location 0.36 Name Trenton Route CNR

DATE	1910-12
SUPERSTRUCTURE	
Fixed Spans	8
Form	deck plate girder
Material	steel
Length	65' each
Movable Type	equal arm
Form	through truss
Material	steel
Length	179'-0"
Power	gas engine
SUBSTRUCTURE	1910-12
Form	concrete

NOTES

1. Originally Canadian Northern Railway.
2. Only half (pony) truss railroad bridge ever built over the waterway.
   - Hence very heavy truss members.



Canal Crossing Number 3

Location 0.86 Name Trenton Route CPR

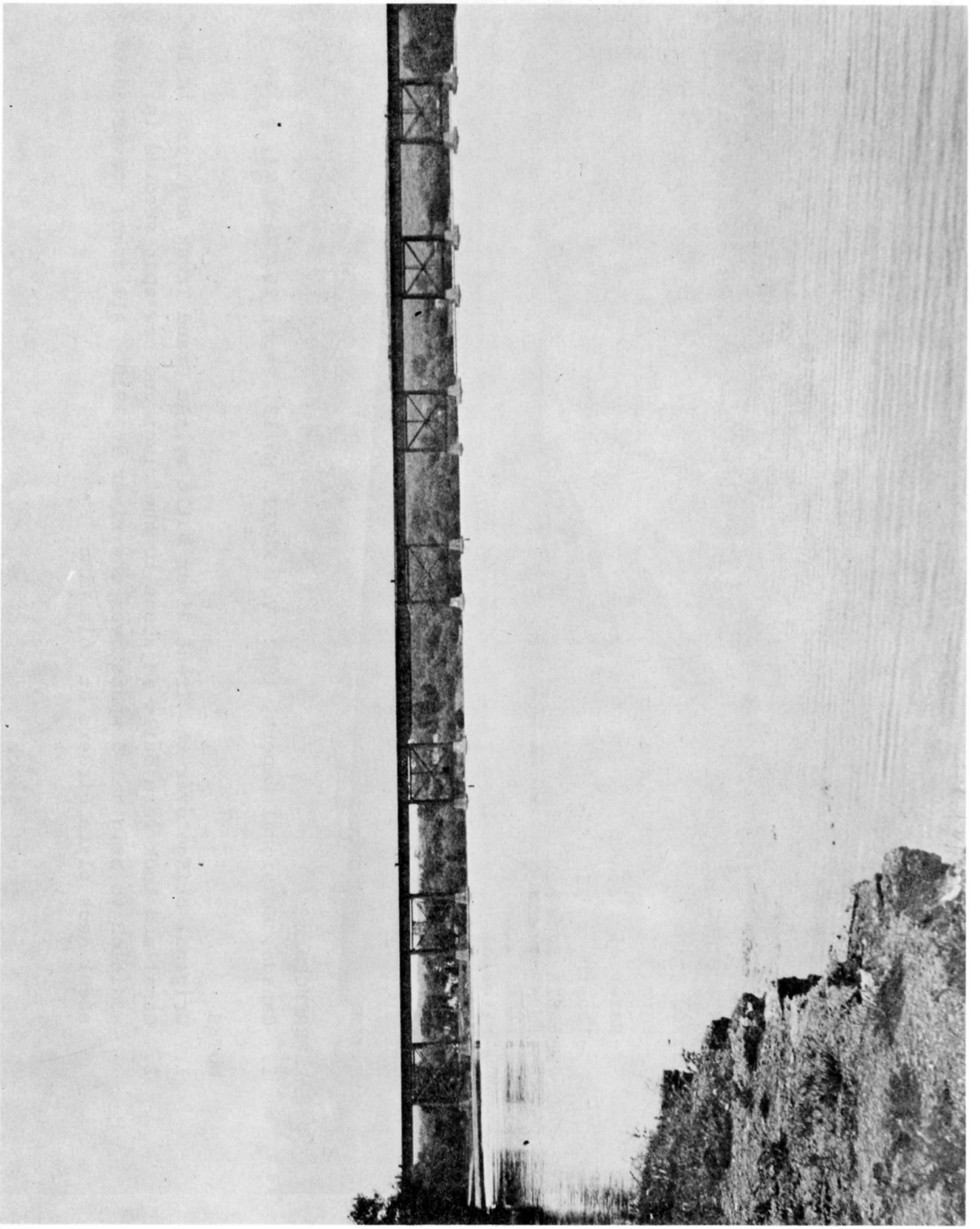
DATE	1913
SUPERSTRUCTURE	high level
Fixed Spans	26
Form	deck plate girder
Material	steel
Length	overall 1212'
Movable Type	
Form	
Material	
Length	
Power	
SUBSTRUCTURE	
Form	concrete steel columns

REFERENCES

1. Canada, Sessional Papers, 1915, Vol L No 14, Paper 20 p. 339.

NOTES

1. Originally - Campbellford, Lake Ontario and Western Railway, leased to CPR.



Canal Crossing Number 4

Location 1.74 Name Trenton Route CNR

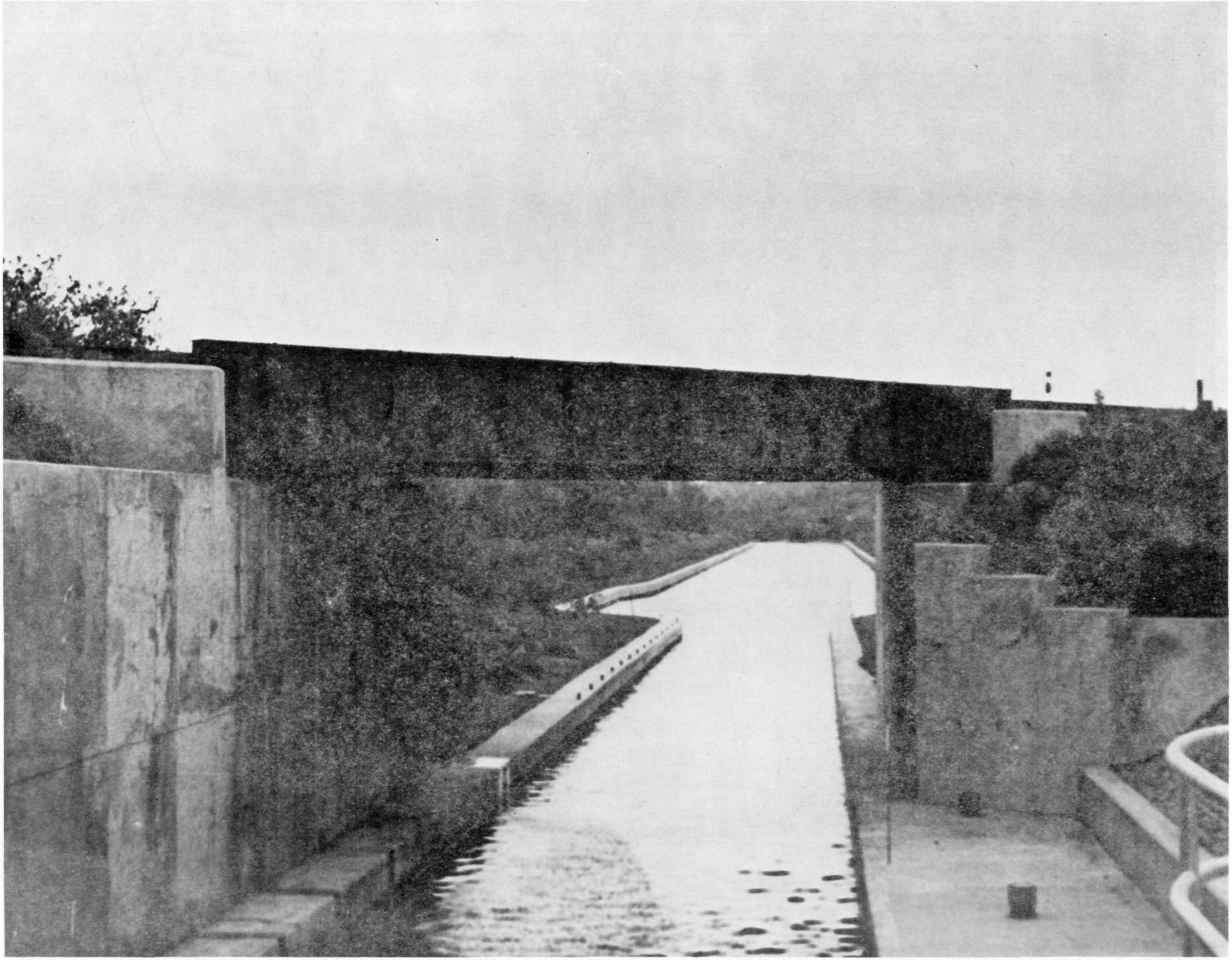
DATE	1910	1856
SUPERSTRUCTURE	high level	
Fixed Spans	1	
Form	½ deck plate girder	
Material	steel	
Length	85'	
Movable Type		
Form		
Material		
Length		
Power		
SUBSTRUCTURE		
Form	concrete	

REFERENCES

1. Canada, Sessional Papers, 1912, Vol XLVII, No 13, Paper 20, Part VI, p. 36.

NOTES

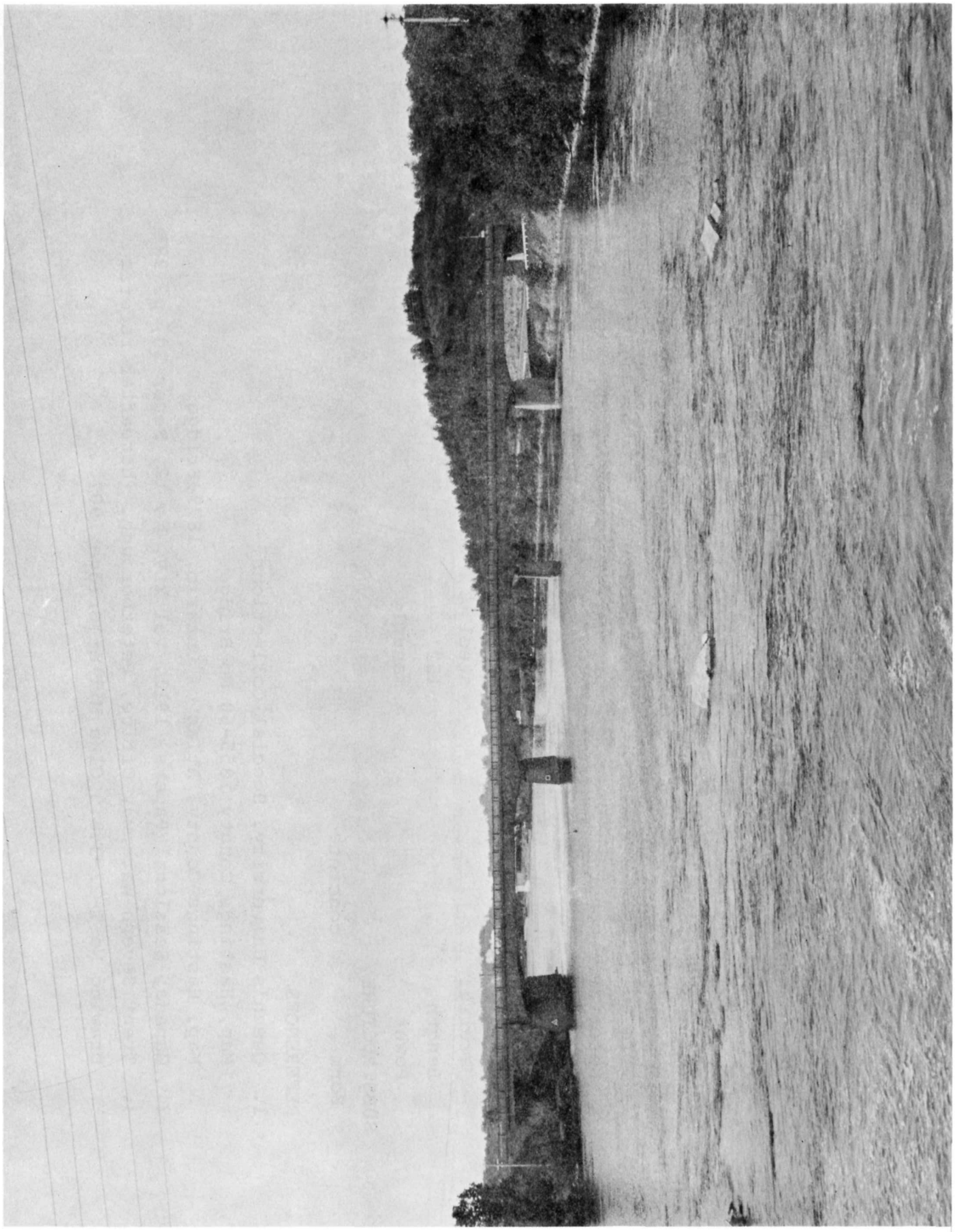
1. Original bridge over the Trent River built by the Grand Trunk Railroad in 1856.
2. Canal and lock were built adjacent to the river and new span erected in addition to original 5 spans over the river in 1910. All spans converted to steel deck plate girders at this time.



Canal Crossing Number 4A

Location 2.24 Name Trenton Route Highway #401

DATE	1958
SUPERSTRUCTURE	high level
Fixed Spans	4
Form	steel
Material	deck plate girder
Length	
Movable Type	
Form	
Material	
Length	
Power	
SUBSTRUCTURE	
Form	concrete



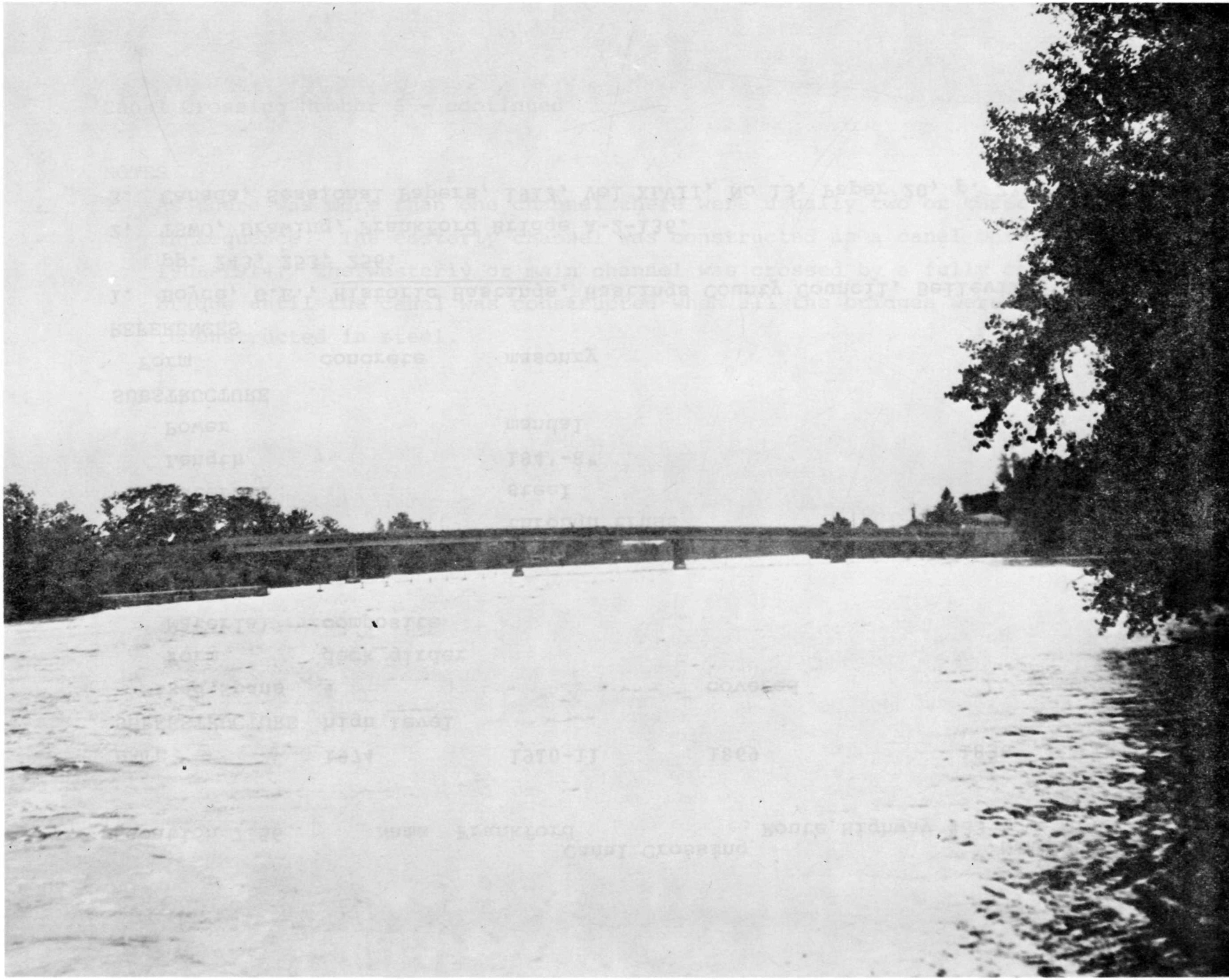
Canal Crossing Number 5

Location 3.67 Name Glen Miller Route County Highway

DATE	1970	1907-09	1894	ca.1860-79
SUPERSTRUCTURE	high level			
Fixed Spans	6	4	4	
Form	beam	through truss	through truss	
Material	concrete	steel	steel	
Length				
Movable Type		equal arm		
Form		pony truss		
Material		steel		
Length		152'		
Power		manual		
SUBSTRUCTURE				
Form	concrete			

REFERENCES

1. Queen's University, Special Collections
   Map, Hastings County 1855-60 No Bridge
   Map, Hastings County, Atlas of Ontario, 1879-Bridge
2. Canada, Sessional Papers, 1911, Vol XLV, No 12, Paper 20, p. 285.
3. Trent Severn Waterway Office, Peterborough, (hereafter referred to as TSWO), Drawing No T-22-348.3 Glen Miller Bridge 1907.



Location 7.56 Name Frankford Canal Crossing Route Highway #33 Number 6

DATE	1974	1910-11	1869	1836
SUPERSTRUCTURE	high level			
Fixed Spans	4		covered	
Form	deck girder			
Material	composite			
Length				
Movable Type		unequal arm		
Form		through truss		
Material		steel		
Length		184'-8"		
Power		manual		
SUBSTRUCTURE				
Form	concrete	masonry		

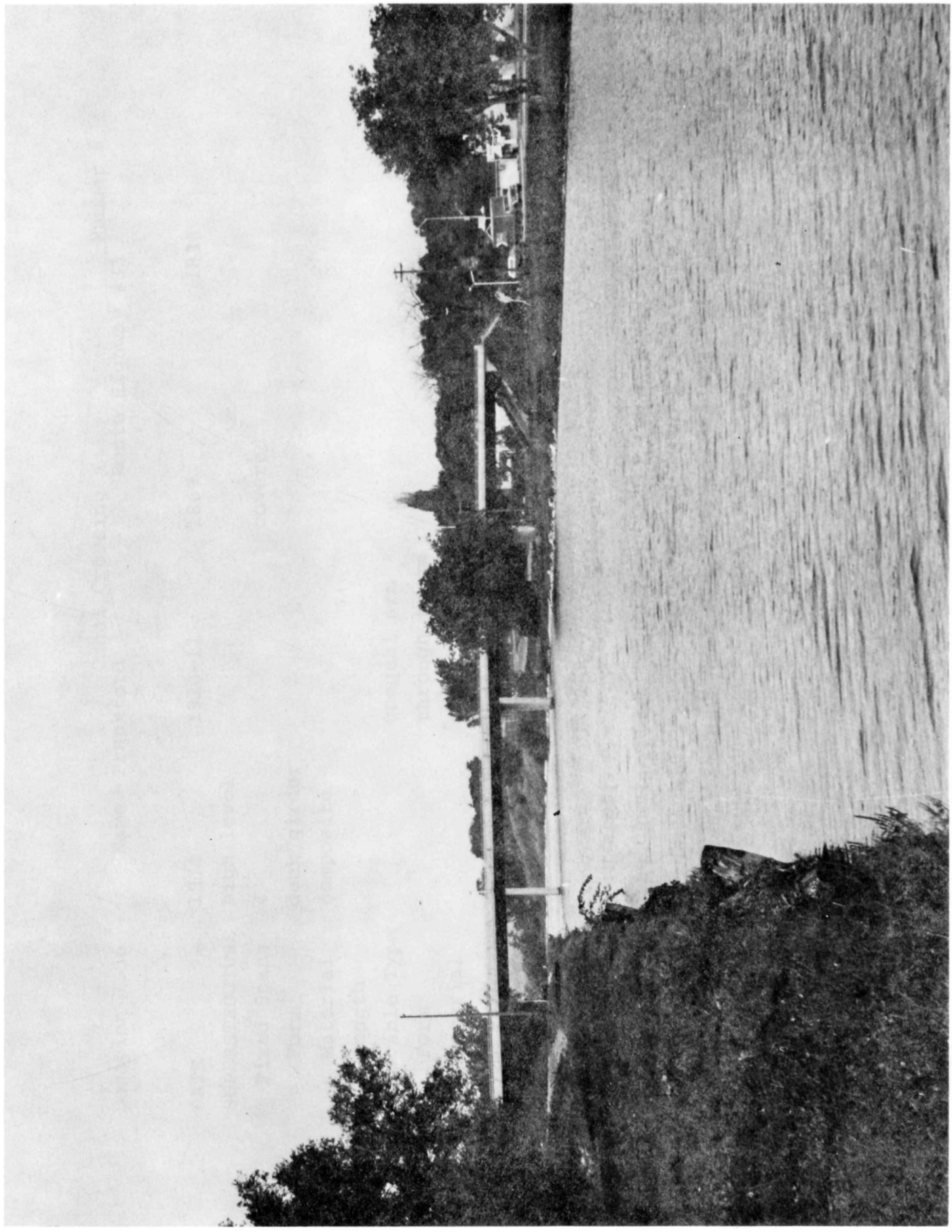
REFERENCES

1. Boyce, G.E., Historic Hastings, Hastings County Council, Belleville 1967, pp. 243, 253, 256.
2. TSWO, Drawing, Frankford Bridge A-2-136.
3. Canada, Sessional Papers, 1913, Vol XLVII, No 13, Paper 20, p. 270.

Canal Crossing Number 6 - continued

NOTES

1. As there was more than one channel there were usually two or three bridges in sequence. The easterly channel was constructed as a canal between 1906-1914. The westerly or main channel was crossed by a fully covered bridge until the canal was constructed when all the bridges were reconstructed in steel.



Canal Crossing Number 7

Location 13.86 Name Glen Ross (Chisholm's Rapids) Route County Road

DATE	1909	1871
SUPERSTRUCTURE		
Fixed Spans	none	
Form		
Material		
Length		
Movable Type	unequal arm	
Form	pony truss	
Material	steel	
Length	100'	
Power	manual	
SUBSTRUCTURE		
Form	concrete	

REFERENCES

1. Canada, Parks Canada, file C-4652/T90-477. Correspondence, D. Stack, Supt. Engineer, 12 September 1888.
2. Canada, Sessional Papers, 1913, Vol XLVII, No 13, Paper 20, p. 270.

NOTES

1. Aforementioned file contains undated specifications for the bridge. (Probably ca. 1870)
2. Present bridge over canal connects with another bridge over the river. The latter is a five span through truss bridge.
3. Present swing span one of seven remaining pony truss spans of the pre-World War I vintage.

Canal Crossing Number 8

Location 13.96 Name Glen Ross (Chisholm's Rapids) Route CNR

DATE	1909	ca. 1833
SUPERSTRUCTURE		low level
Fixed Spans	none	1
Form		
Material		
Length		
Movable Type	equal arm	
Form	through truss	
Material	steel	
Length	210'	
Power	manual	
SUBSTRUCTURE		
Form	concrete	

REFERENCES

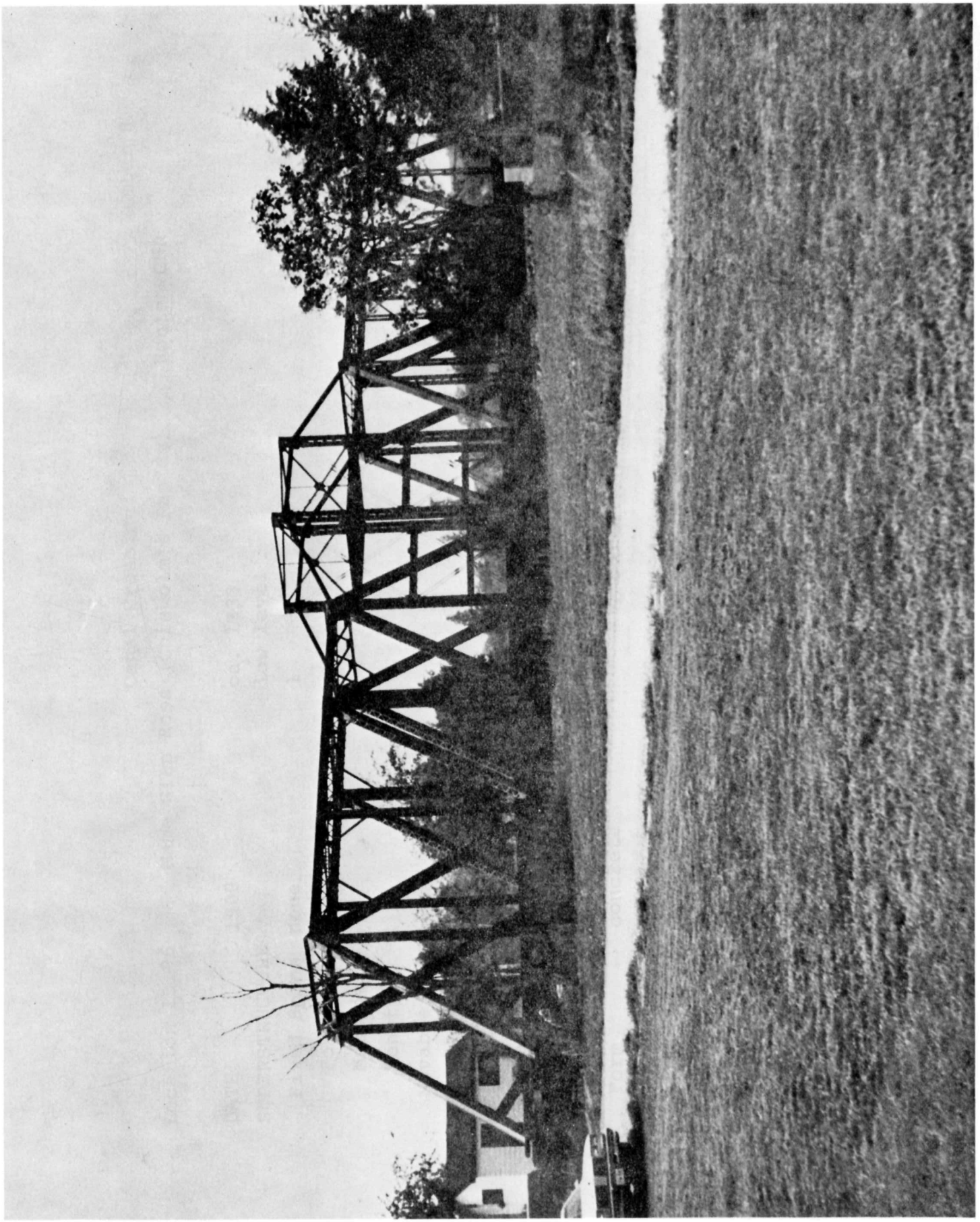
1. Canada, Sessional Papers, 1883, Vol XVI, No 6, Paper 8, p. 112.
2. Canada, Sessional Papers, 1888, Vol XXI, No 9, Paper 8, p. 129.
3. Canada, Sessional Papers, 1911, Vol XLV, No 12, Paper 12, p. 291.

NOTES

1. One of four remaining through truss swing bridges. All are of different construction. This is the only one with a central tower rather than "A" frame.

Canal Crossing Number 8 - continued

2. Original bridge was hazard to canal traffic and had to be replaced.
3. Built by The Central Ontario Railway.



Canal Crossing Number 11

Location 29.75 Name Campbellford (Ranney Falls) Route Local Road

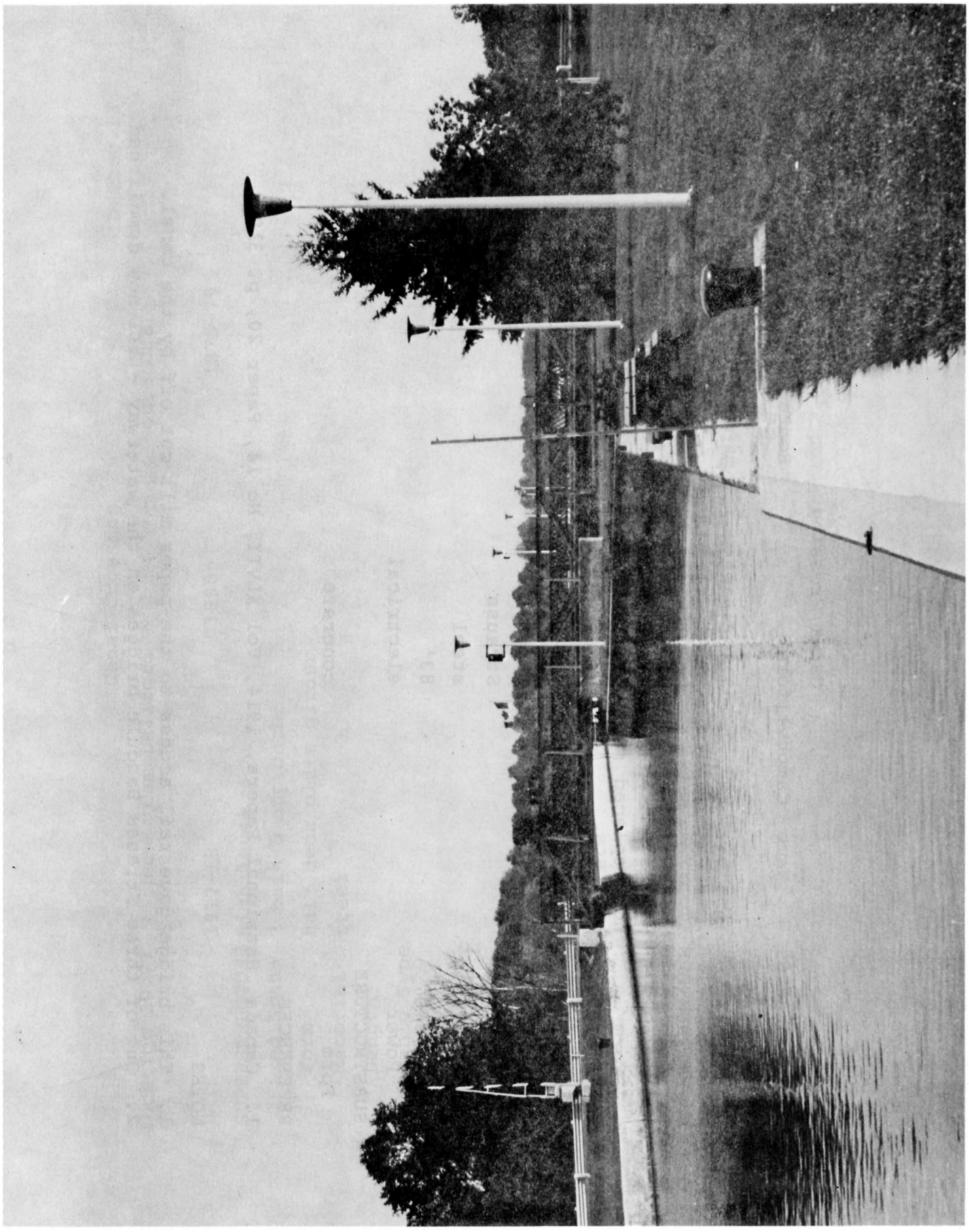
DATE	1912
SUPERSTRUCTURE	
Fixed Spans	none
Form	
Material	
Length	
Movable Type	equal arm
Form	pony truss
Material	steel
Length	100'-0"
Power	manual
SUBSTRUCTURE	
Form	concrete

REFERENCES

1. Canada, Sessional Papers, 1914, Vol XLVIII, No 14, Paper 20, p. 319.

NOTES

1. This bridge gave access to the paper mill cut off by the canal.



Canal Crossing Number 12

Location 30.69 Name Campbellford Route CNR

DATE	1972-73	1912-13
SUPERSTRUCTURE		
Fixed Spans	demolished	1
Form	not replaced	half deck plate girder
Material		steel
Length		79'-9"
Movable Type		Bascule
Form		Strauss
Material		steel
Length		83'
Power		electrical
SUBSTRUCTURE		
Form		concrete

REFERENCES

1. Canada, Sessional Papers, 1914, Vol XLVII, No 14, Paper 20, p. 319.

NOTES

1. This bridge gave rail access to the paper mill cut off by the canal.
2. One of three Strauss Bascule bridges on the waterway - all now demolished.

Canal Crossing Number 13

Location 30.77 Name Campbellford Route CNR

DATE	1917-18	1890	1875-79
SUPERSTRUCTURE	high level		
Fixed Spans	3 main 5 approach		
Form	half deck plate girder		
Material	steel		
Length			
Movable Type			
Form			
Material			
Length			
Power			
SUBSTRUCTURE			
Form	concrete		

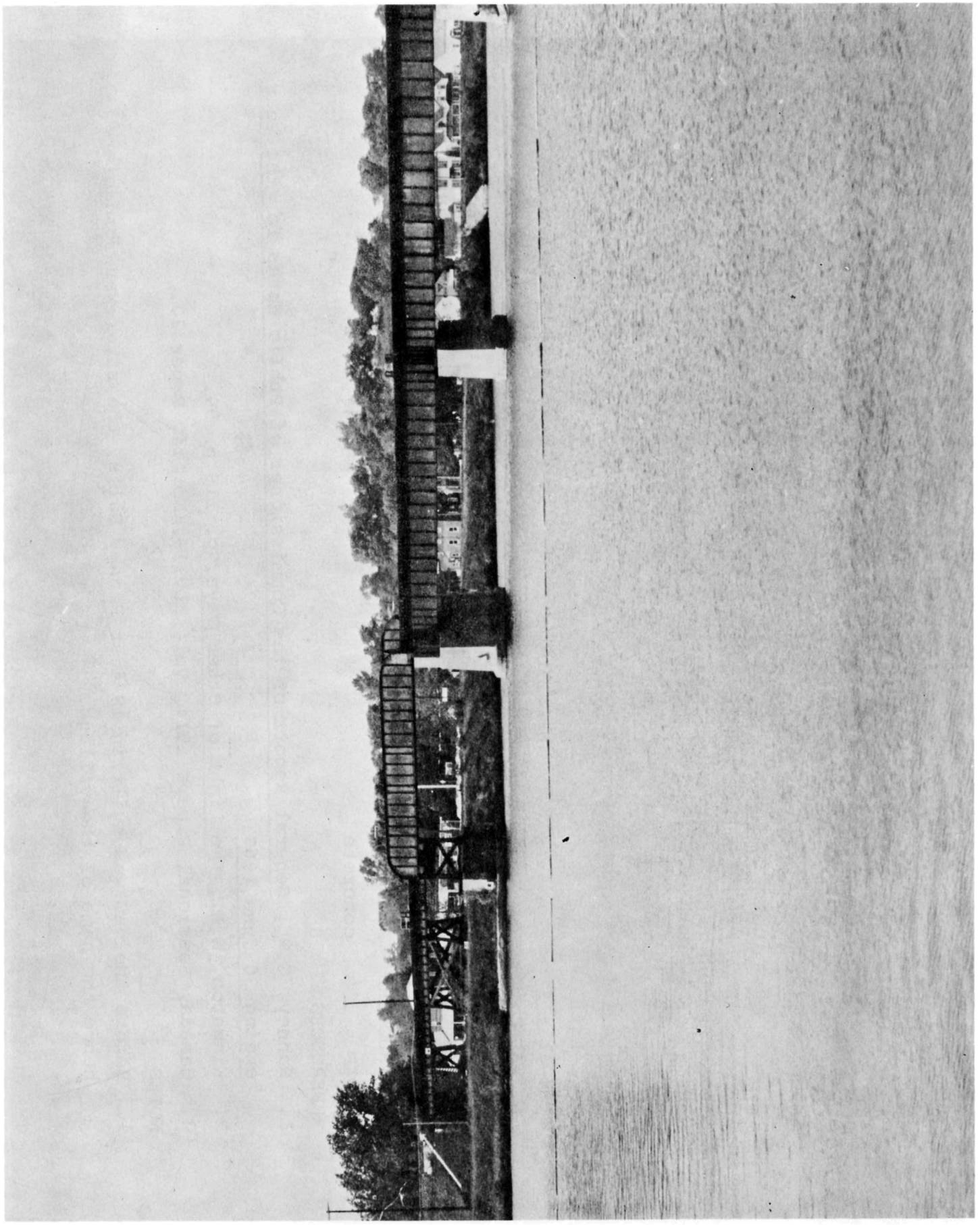
REFERENCES

1. Kingston, W.A., The Light of Other Days, p. 86.
2. Canada, Sessional Papers, 1920, Vol LVI, No 6, Paper 190, p. 71.

Canal Crossing Number 13 - continued

NOTES

1. Original bridge built by Grand Junction Railway, later the Midland, later CNR.
2. 1890 rebuilding caused by realignment of track.
3. 1917-80 construction was 25 feet south of previous bridge - constructed as high level because of new canal.
4. Only the channel span is half deck plate girder the remaining spans are deck plate girders.



Canal Crossing Number 14

Location 31.13 Name Campbellford Route Bridge Street

DATE	1969-70	1913-14	1904	1897	1877	1844
SUPERSTRUCTURE	high level					
Fixed Spans	3	2	5	5		
Form		truss	pony truss	bow string truss		
Material	concrete beam	steel	steel	iron	iron	wood
Length		251' overall				
Movable Type		Bascule				
Form		Strauss				
Material		steel				
Length		112'-6"				
Power		electrical				
SUBSTRUCTURE						
Form	concrete					

REFERENCES

1. Ranney, G.W., General Report of the Commissioner of Public Works for the year ending 30 June 1867.
2. Kingston, W.A., The Light of Other Days, p. 110 p. 99.
3. Canada, Sessional Papers 1914, Vol. XLVIII, No. 14, Paper 20.

NOTES

1. Before the dam was built in 1844 at Ranney Falls, the river was fordable - hence the name of the village.

Canal Crossing Number 15

Location 36.18 Name Healey Falls Route Local Road

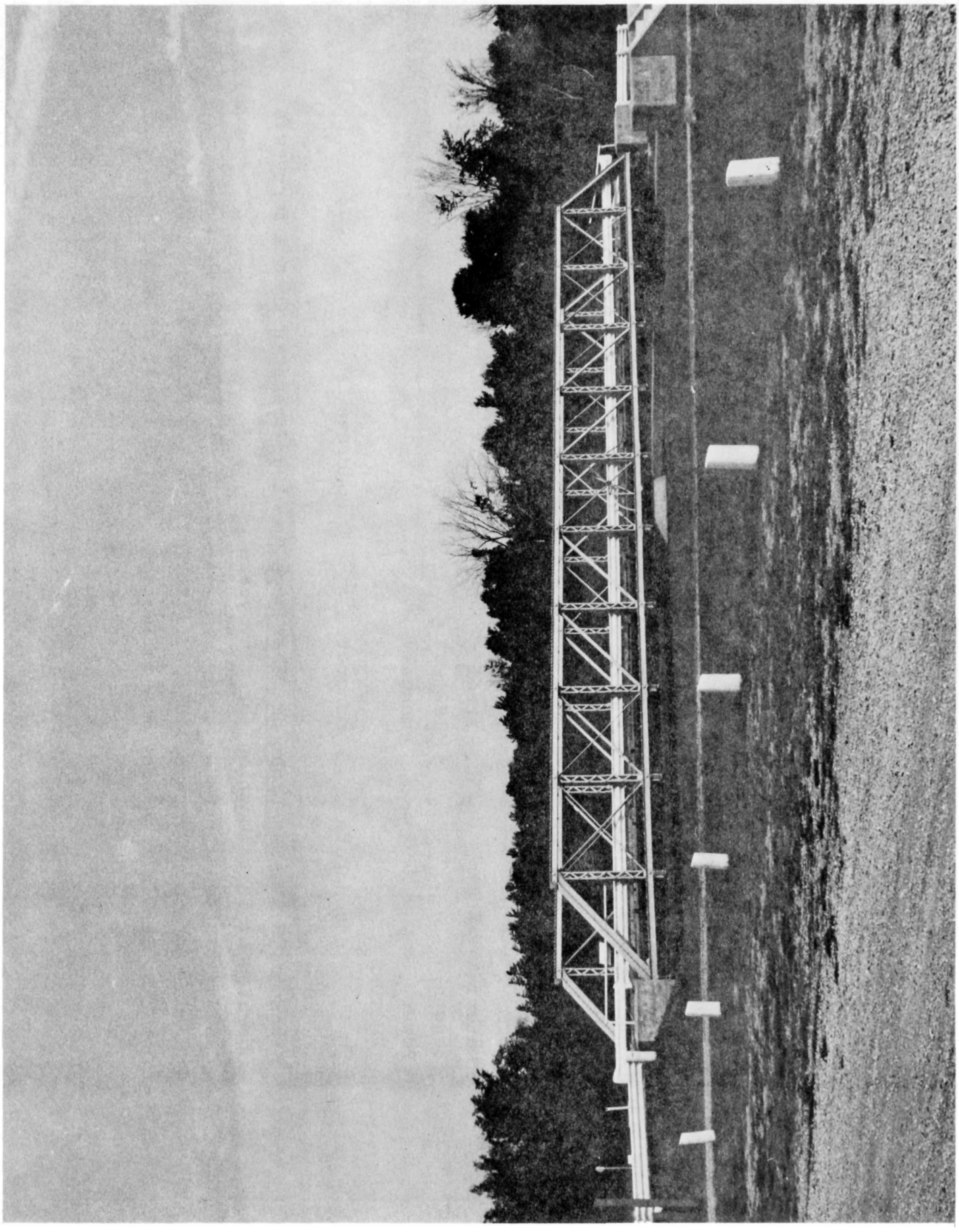
DATE	1914
SUPERSTRUCTURE	none
Fixed Spans	
Form	
Material	
Length	
Movable Type	equal arm
Form	pony truss
Material	steel
Length	112'-6"
Power	manual
SUBSTRUCTURE	
Form	concrete

REFERENCES

1. Canada, Sessional Papers, 1941, Vol XLVIII, No 14, Paper 20, p. 319.

NOTES

1. Bridge superstructure previously used at Trent Bridge. Originally constructed in 1894.
2. This is the only pin connected truss swing section on the waterway.
3. Used only to take local traffic to the powerhouse.



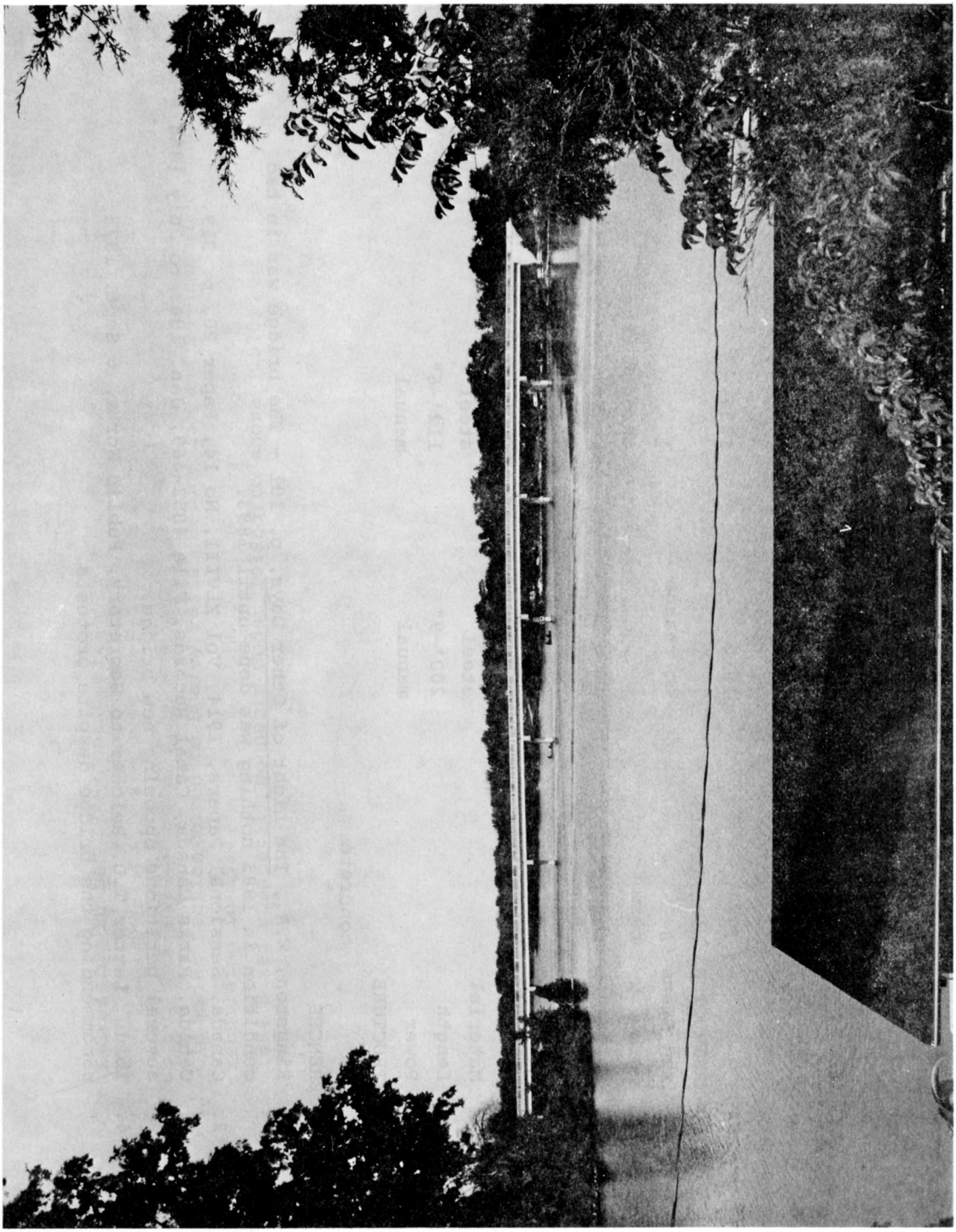
Canal Crossing Number 16

Location 37.11 Name Healey Falls Route County Road

DATE	1967	1912	1903	Ferry
SUPERSTRUCTURE	high level		fixed	
Fixed Spans	7	4	3	
Form	beam	through truss		
Material	concrete	steel		
Length		384'-8" overall		
Movable Type		equal arm		
Form		through truss		
Material		steel		
Length		152'-0"		
Power		manual		
SUBSTRUCTURE				
Form	concrete	concrete	concrete	

REFERENCES

1. Kingston, W.A., The Light of Other Days, p. 100 - remarks that a ferry was operated at this location for many years.
2. Canada, Sessional Papers, 1904, Vol XXXVIII, No 8, Paper 20, p. 168.
3. Canada, Sessional Papers, 1914, Vol XLVIII, No 14, Paper 20, p. 317.
4. Ontario, Public Archives, map collection, Plan A-8-604, no date.



Canal Crossing Number 17

Location 43.38 Name Trent Bridge Route Highway #30

DATE	1969	1912	1894	1874
SUPERSTRUCTURE	high level			
Fixed Spans	8	no change	1	
Form	beam		through truss	
Material	concrete		steel	
Length			147'-6"	
Movable Type		equal arm	equal arm	
Form		through truss	pony truss	
Material		steel	steel	
Length		200'-9"	112'-6"	
Power		manual	manual	
SUBSTRUCTURE				
Form	concrete			

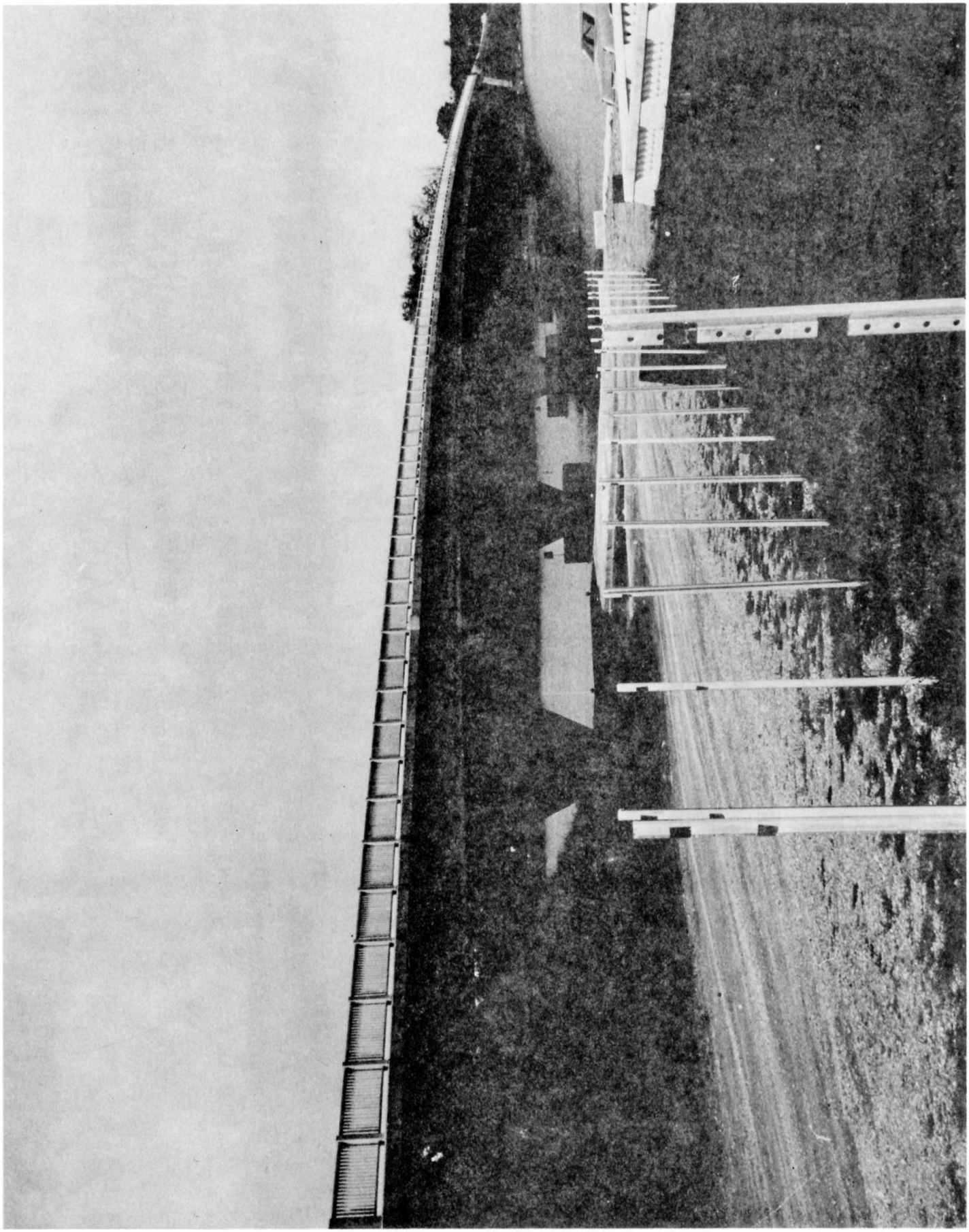
REFERENCES

1. Kingston, W.A., The Light of Other Days, p. 101 - The bridge was in bad condition in 1885 nothing was done until 1893.
2. Canada, Sessional Papers, 1914, Vol XLVIII, No 14, Paper 20, p. 319.
3. Canada, Parks Canada, Canal Records, File 4052-469, Jan. 1863 to July 1864 - several petitions opposing new bridge.
4. Ibid. Letter T.D. Belcher to Secretary, Public Works, 6 Sept. 1873 recommending the bridge despite protests.

Canal Crossing Number 17 - continued.

NOTES

1. Old swing section moved to Healey Falls (Bridge 15) and re-erected during rebuilding in 1914.
2. 1894 Fixed span still connects Cedar Island to shore (1978).



Canal Crossing Number 18

Location 51.16 Name Hastings (Crook's Rapids) Route Highway 45

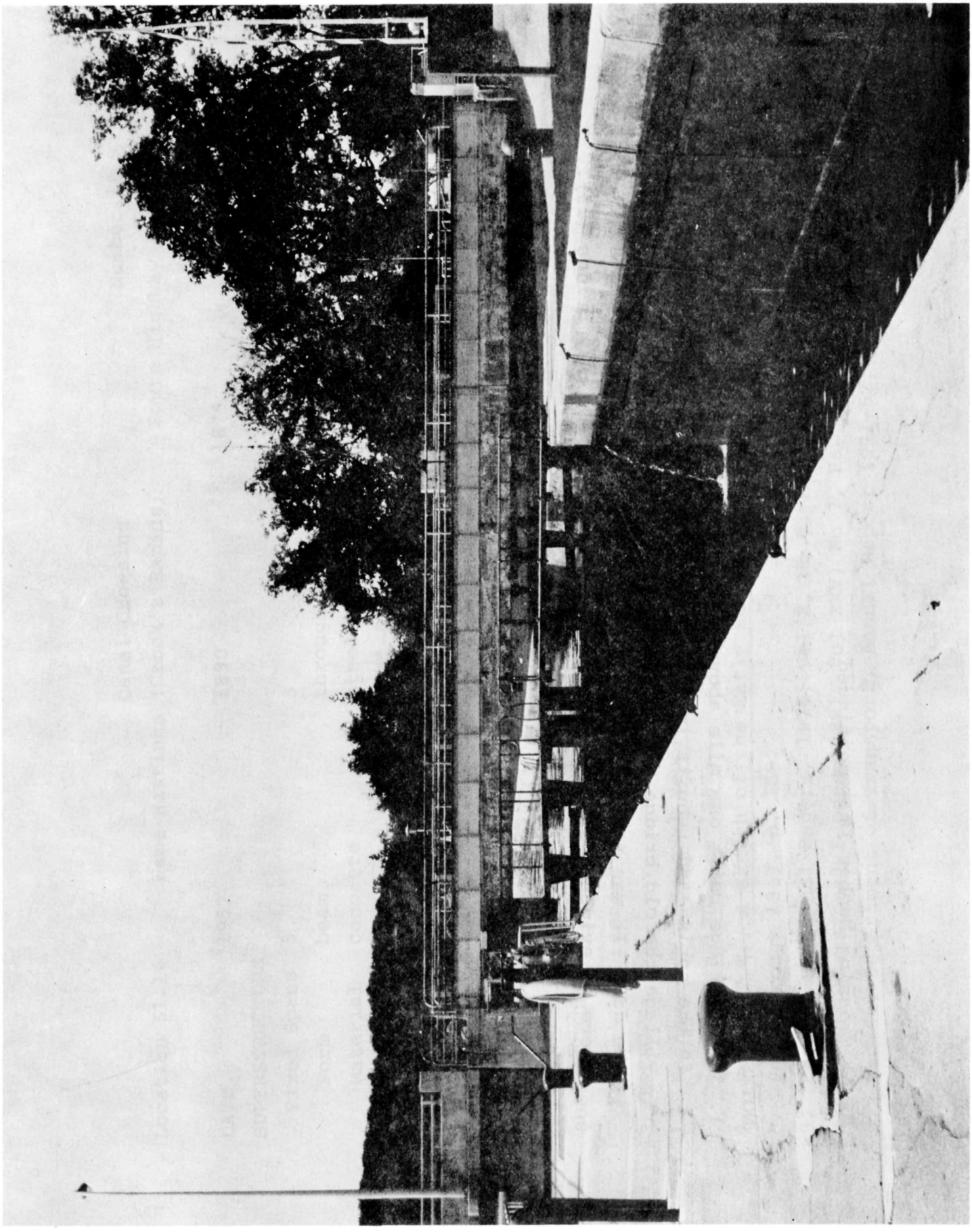
DATE	1952	1890	1875	1858 1845 1827 1826
SUPERSTRUCTURE				
Fixed Spans	5	3		
Form	beam	through truss		
Material	concrete	steel		
Length		464'-5" overall		
Movable Type	unequal arm	equal arm	swing	
Form	deck plate girder	through truss		
Material	steel	steel	wood	
Length	76'-2"	76'-2"		
Power	electric	manual		
SUBSTRUCTURE				
Form	concrete			

REFERENCES

1. Ranney, G.W., General Report of the Commissioner of Public Works for the year ending 30 June 1867.
2. Poole, T.W., A Sketch of the Early Settlement...in the County of Peterborough, Peterborough 1867, p. 159.
3. Canada, Sessional Papers, 1876, Vol X, No 6, Paper 6, Appendix #10, p. 55.
4. Canada, Sessional Papers, 1891, Vol XXV, No 7, Paper 9, Appendix #9, p. 139.
5. Canada, Department of Transport, Annual Report 1951-52, p. 56.

NOTES

1. First bridge built one mile above the village in 1826. It was destroyed in the spring and rebuilt in 1827. After the dam was constructed in the village the old bridge was replaced and moved to a new site just below the dam. It was replaced in 1858 because of its condition and again in 1875. There is evidence of these piers beside the newer railway bridge (19).



Canal Crossing Number 19

Location 51.95 Name Hastings Route CNR

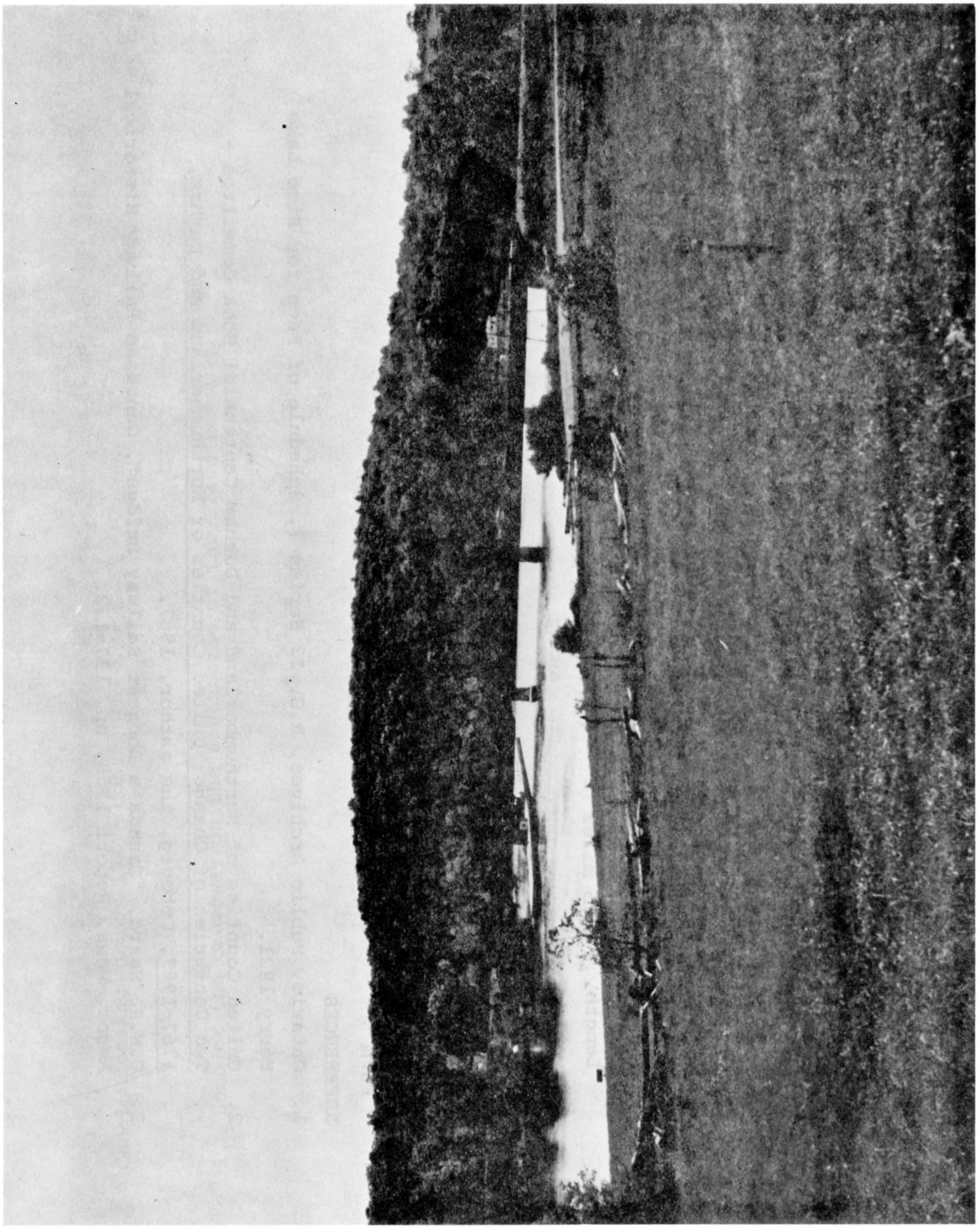
DATE	1925	1881
SUPERSTRUCTURE		
Fixed Spans	3	several
Form	deck plate girder	
Material	steel	
Length	240' overall	
Movable Type	equal arm	swing
Form	half deck plate girder	
Material	steel	
Length	130'	
Power	electrical	
SUBSTRUCTURE		
Form	masonry	masonry

REFERENCES

1. Canada, Sessional Papers, 1882, Vol XV, No 5, p. 129.

NOTES

1. Originally built by the Grand Junction Railway, later the Midland.
2. Old rock-filled wooden piers can be seen in the river immediately east of this bridge. These may be the piers of the 1826-27 highway bridge.
3. This bridge and bridge 23 in Peterborough were the last railway swing bridges built on the canal.



Canal Crossing Number 19A

Location 68.0 Name Rice Lake Route Cobourg and Peterborough Railway

DATE	1860	1854	ca. 1820
SUPERSTRUCTURE	(abandoned		
Fixed Spans	1861-62 washed away)	trestle	ferry
Form		wood and earth	
Material			
Length	2.5 miles		
Movable Type		swing	
Form			
Material		wood	
Length		120'	
Power		manual	
SUBSTRUCTURE			
Form			

REFERENCES

1. Ontario, Public Archives, R.G. 22 Series 7, Schedule of Fees for Rice Lake Ferry 1821.
2. United Counties of Northumberland and Durham Centennial Book Committee - Two Centuries of Change: United Counties of Northumberland and Durham, 1767-1967, Cobourg, the author, 1967.
3. C.W.K. Heard, "Canada's Longest Railway Bridge", Canadian Railway Historical Assoc. News, Report 1958, pp. 127-132.

Canal Crossing Number 19A - continued

NOTES

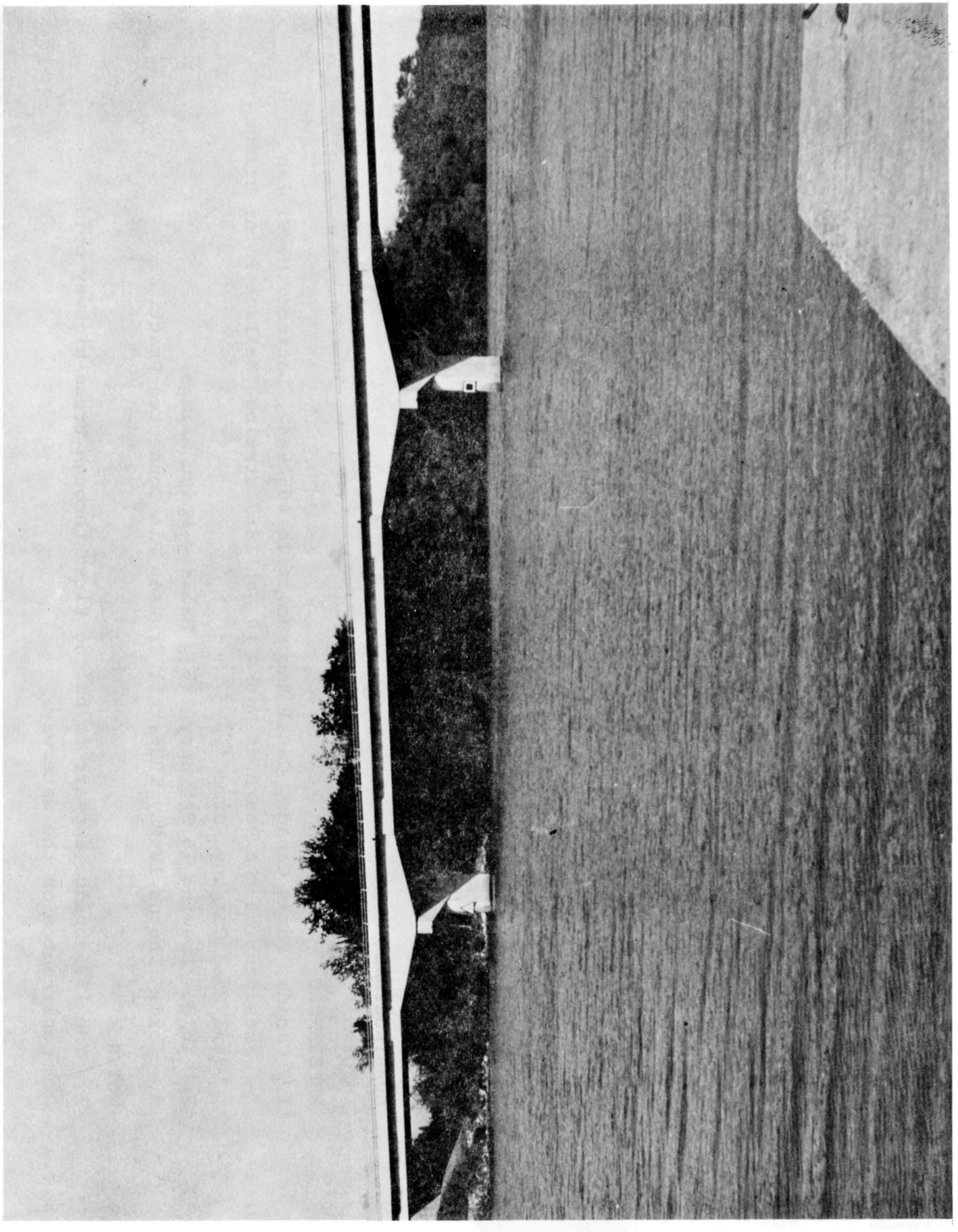
1. Some of the causeway on the south side of the lake remains.

Canal Crossing Number 20

Location 76.55	Name Bensfort (Monaghan's)		Route County Road	
DATE	1970	1937	1894	1851
SUPERSTRUCTURE	high level			
Fixed Spans	4	2	2	7
Form	concrete	through truss	through truss	
Material	beam	steel	steel	
Length		OA230'		OA1320'
Movable Type		unequal arm deck	equal arm	swing
Form		half plate girder	pony truss	
Material		steel	steel	
Length		88'-6"		41'
Power		manual		
SUBSTRUCTURE				
Form	concrete	masonry		

REFERENCES

1. Canada, Department of Transport, Annual Report, 1937-38, p. 56.
2. Canada, Journals of the Legislative Assembly, 1857 Appendix SS. Charter of the Cobourg and Monaghan Road and Bridge Company established 11 July 1850.
3. Canada, Parks Canada, Canal Records File 4052-510 Vol 1 Drawing 1895.
4. Ibid. Letter. G.W. Ranney to Secretary, Public Works, June 14, 1865, refers to defective swing bridge.



Canal Crossing Number 21

Location 80.35 Name Wallace Point (Hales Bridge) Route County Road

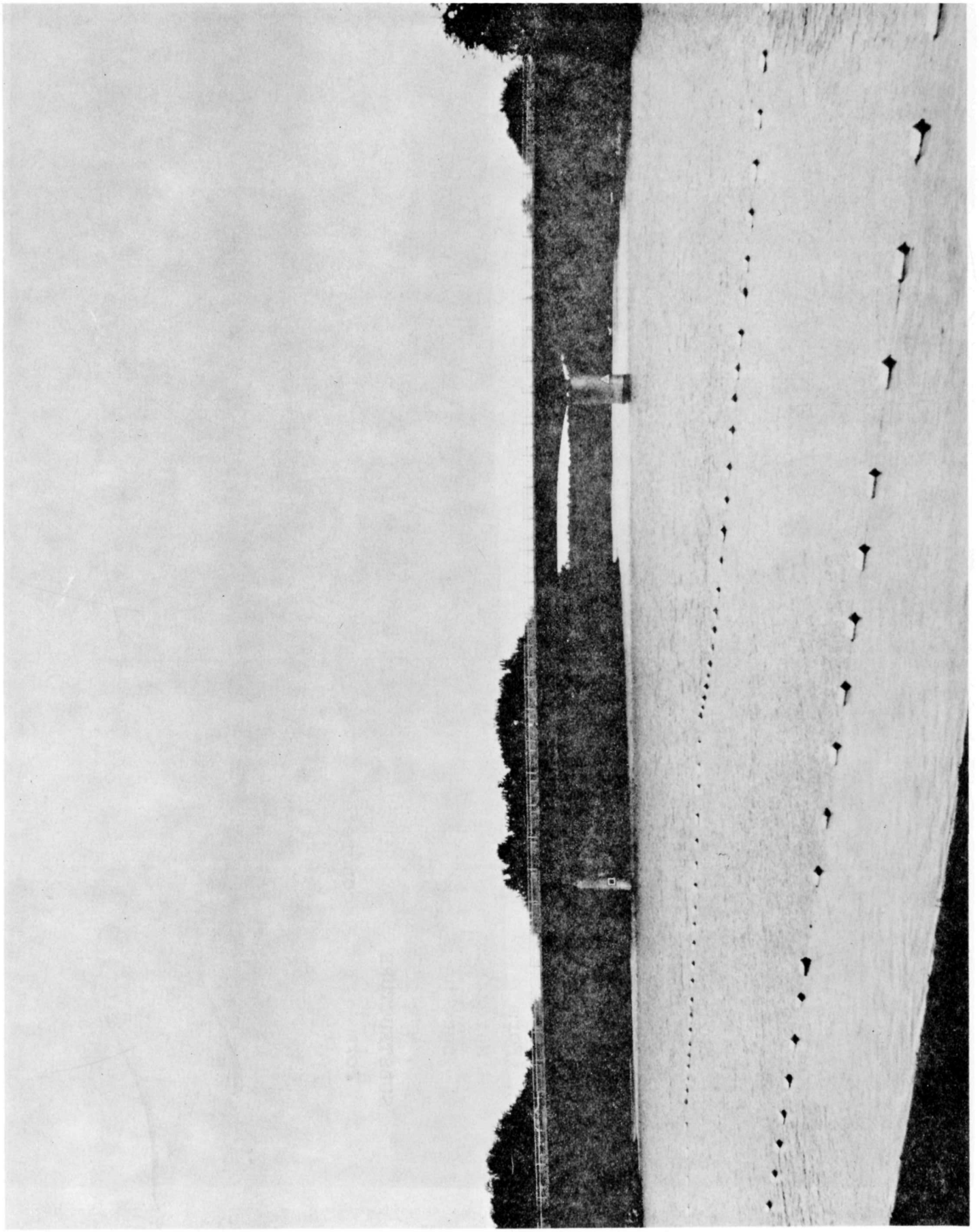
DATE	1967	1885	1867
SUPERSTRUCTURE	high level		
Fixed Spans	3	3	5
Form	deck plate girder	through truss	K post
Material	steel	steel	wood
Length		OA 332'-0"	140'
Movable Type		unequal arm	unequal arm
Form		through truss	K post,Howe
Material		steel	wood
Length		84'-6"	42'
Power		manual	manual
SUBSTRUCTURE			
Form	concrete		

REFERENCES

1. Canada, Parks Canada, Canal Records, file 4052-442, Letter T.M. Willan to President of the Board of Works 10 Jan 1867 stating "Wallace Point Bridge and Road Company Formed".
2. Ibid. Drawing 15 February 1867, Wallace Point Bridge.
3. Ibid. Photos 18 May 1936, All Trusses Pin Connected Pratt.

NOTES

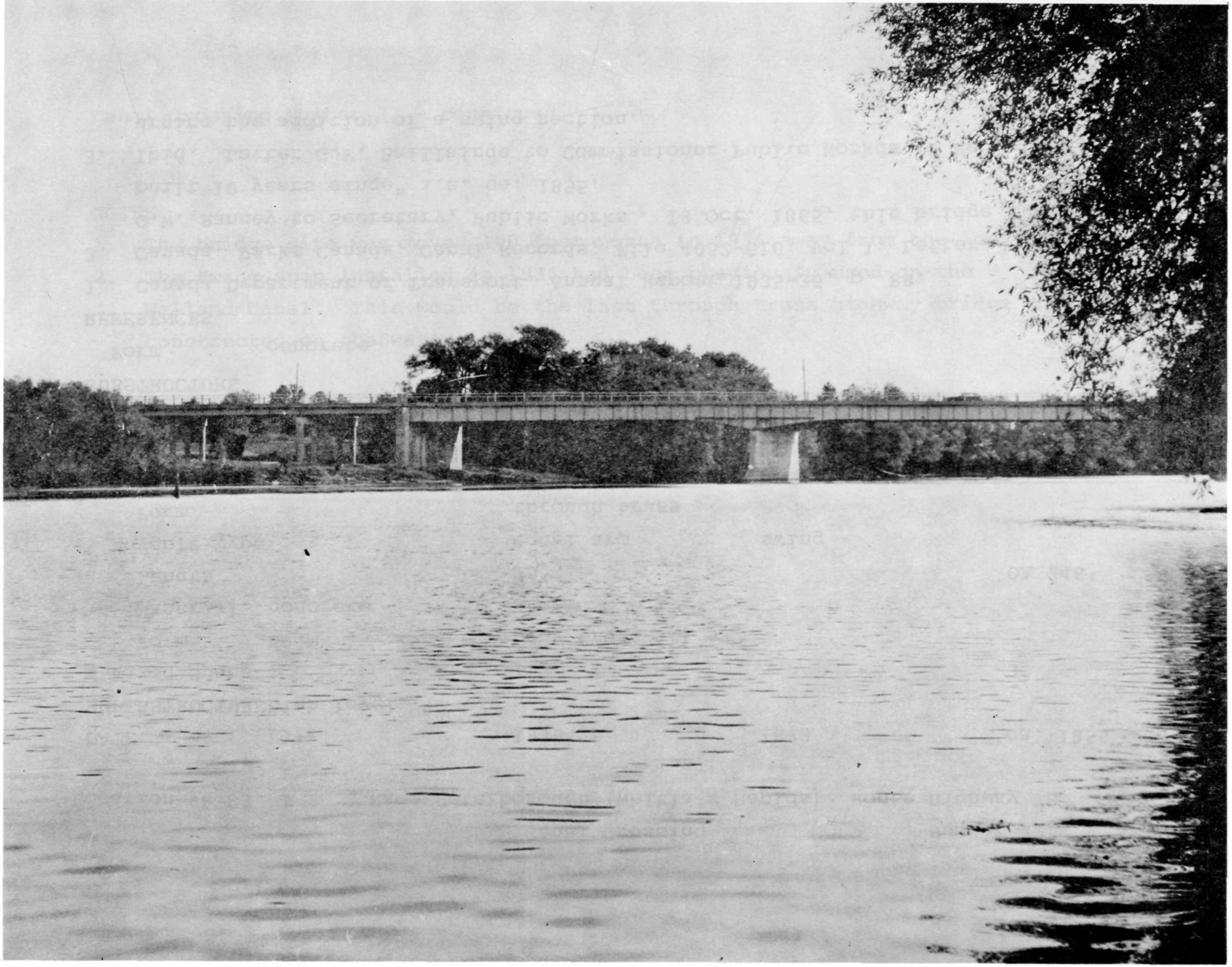
1. The 1885 bridge appears to be the first through truss highway bridge constructed on the waterway.



Canal Crossing Number 21A

Location 87.54 Name Peterborough Route Highway 7 By-Pass

DATE 1959
SUPERSTRUCTURE high level
  Fixed Spans 9
    Form
    Material
    Length
  Movable Type
    Form
    Material
    Length
    Power
SUBSTRUCTURE
  Form concrete



Canal Crossing Number 22

Location 88.83 Name Peterborough (Whitla's Rapids) Route Highway 7B

DATE	1972	1936	1873	ca. 1855
SUPERSTRUCTURE	high level			
Fixed Spans	4	1		3
Form	beam	pony truss		
Material	concrete	steel		
Length		76'		OA 246'
Movable Type		equal arm	swing	
Form		through truss		
Material		steel		
Length		214'		
Power				
SUBSTRUCTURE				
Form	concrete			

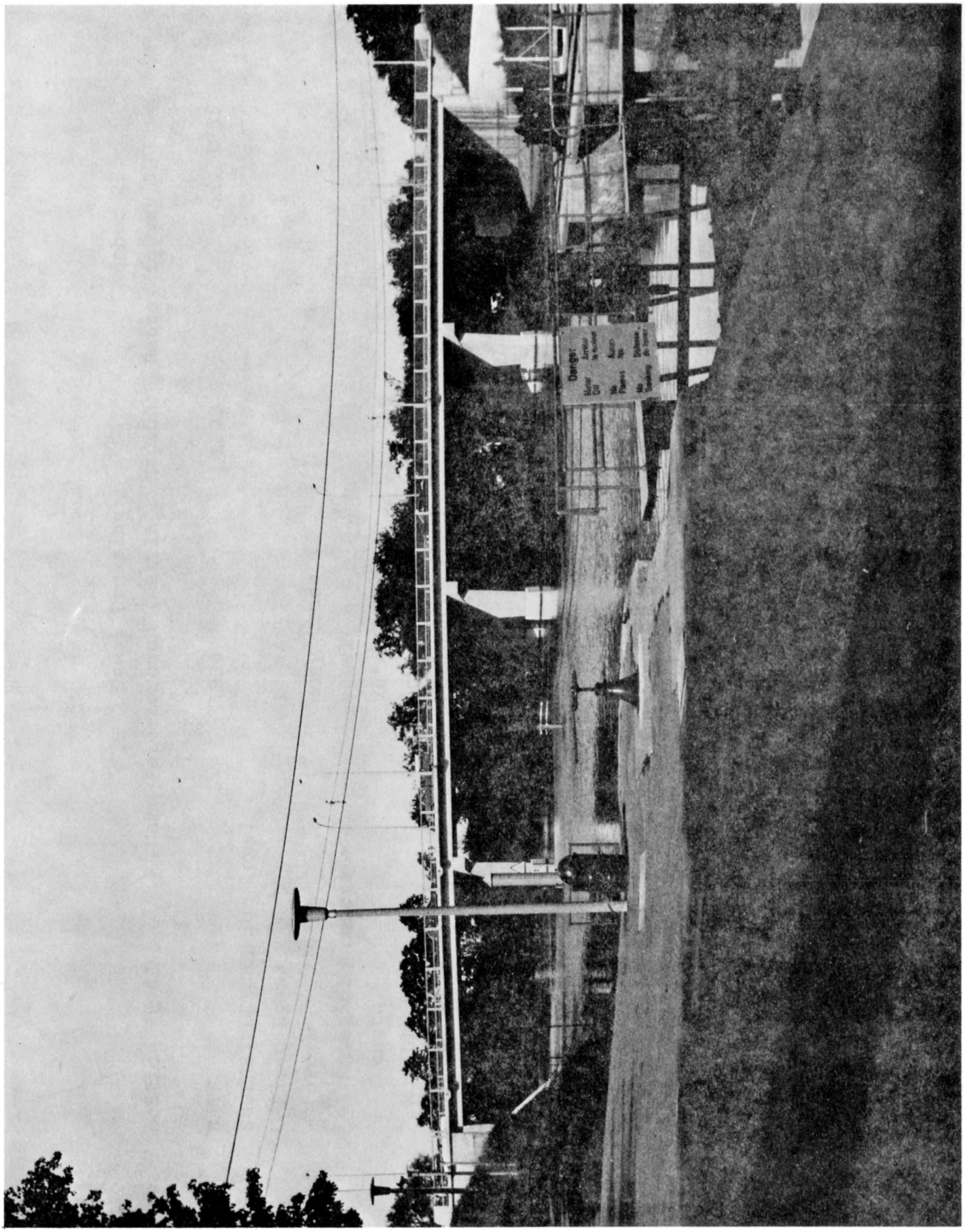
REFERENCES

1. Canada Department of Transport, Annual Report 1935-36, p. 88.
2. Canada, Parks Canada, Canal Records, File 4052-510, Vol 1, Letter, G.W. Ranney to Secretary, Public Works , 18 Oct. 1865, this bridge "... built 10 years since" i.e. ca. 1855.
3. Ibid. Letter G.F. Baillairge to Commissioner Public Workds, 9 Feb. 1866 - urging the addition of a swing section.

Canal Crossing Number 22 - continued

NOTES

1. The bridge site was moved 100 feet north in 1936 away from the locks.
2. The swing span installed in 1936 had been previously used on the Welland Canal. This would be the last through truss highway bridge constructed on the waterway.


Danger

Canal Crossing Number 23

Location 88.94 Name Peterborough Route CNR

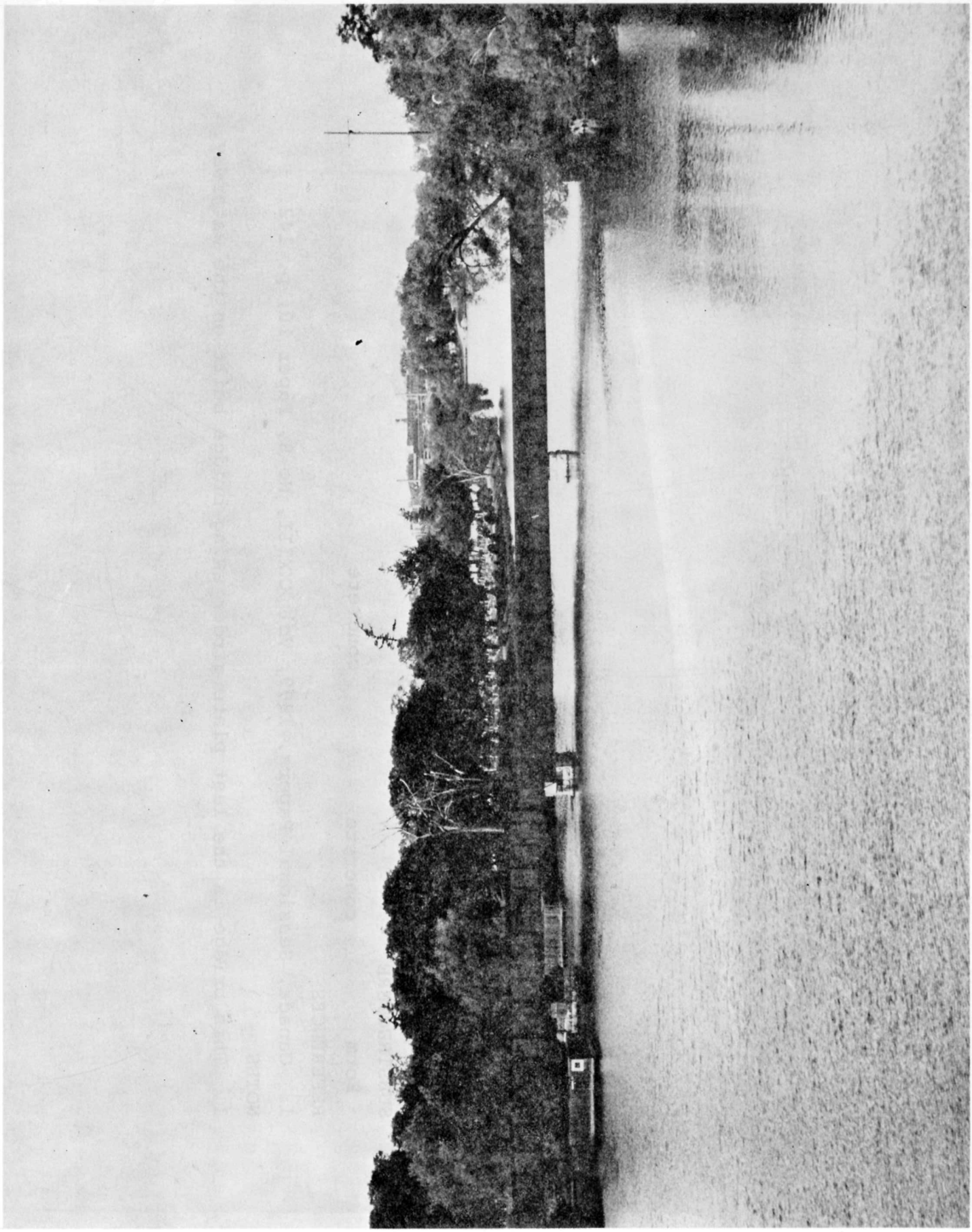
DATE	1925	1883
SUPERSTRUCTURE		
Fixed Spans	2	3
Form	deck plate girder	
Material	steel	
Length	84'-0"	
Movable Type	equal arm	swing
Form	deck plate girder	
Material	steel	
Length	126'-0"	
Power	electrical	
SUBSTRUCTURE		
Form	masonry	masonry

REFERENCES

1. Directory Town of Peterborough, 1888.

NOTES

1. This bridge is identical to the railway bridge at Hastings (19) except for the location of the controls. These were the last two railway deck plate girder bridges built over the waterway.
2. The Bridge was originally built by the Grand Junction Railway as were bridges 19 at Hastings and 13 at Campbellford.



Canal Crossing Number 24

Location 89.61 Name Peterborough Route Maria Street

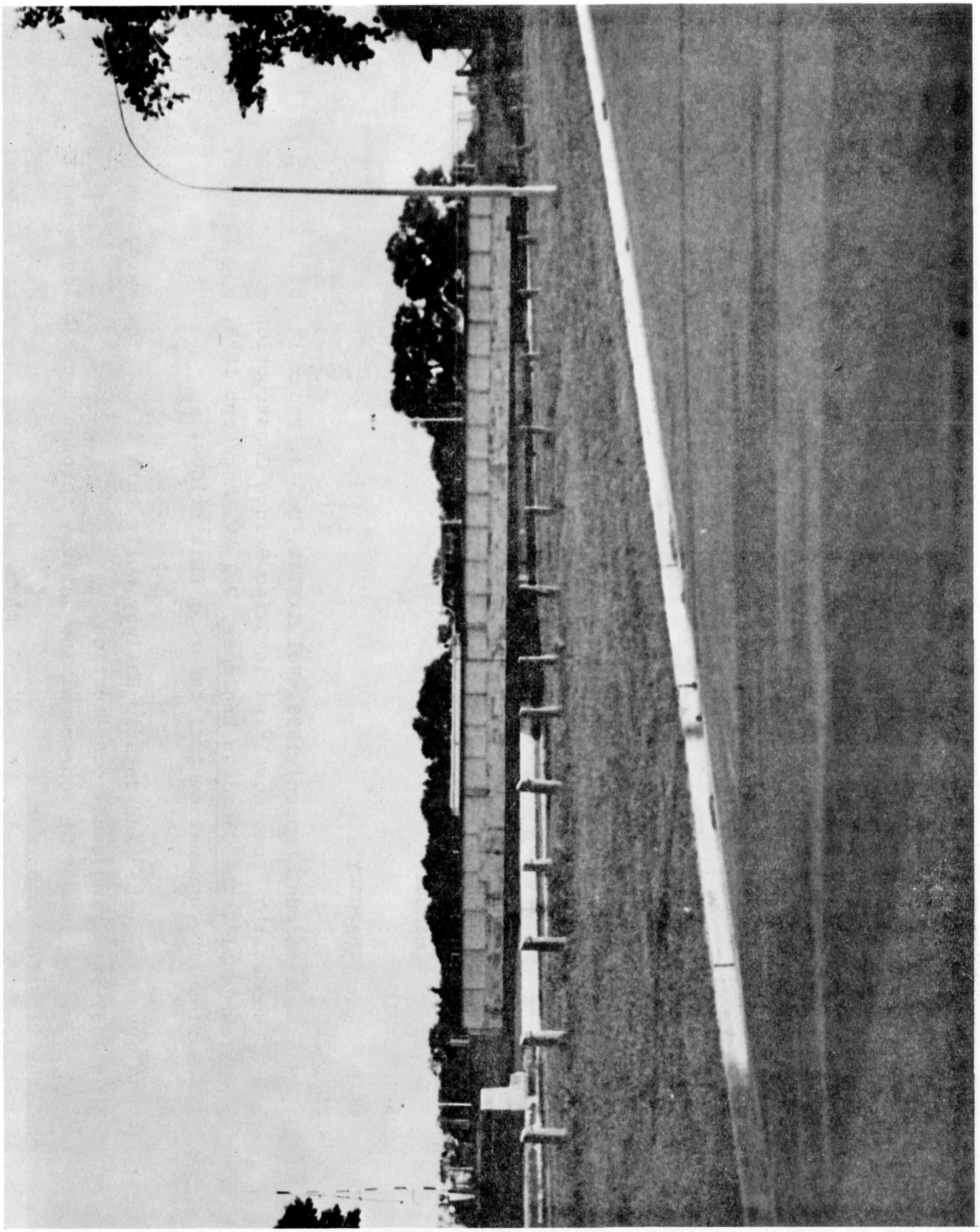
DATE	1965	1897
SUPERSTRUCTURE		
Fixed Spans	none	
Form		
Material		
Length		
Movable Type	unequal arm	equal arm
Form	deck plate girder	through truss
Material	steel	steel
Length		156'-0"
Power	electric	manual
SUBSTRUCTURE		
Form	concrete	concrete

REFERENCES

1. Canada, Sessional Papers, 1899, Vol XXXIII, No 8, Paper 10, p. 142.

NOTES

1. This bridge is the last plate girder swing bridge built on the waterway.



Canal Crossing Number 25

Location 89.72 Name Peterborough Route CPR

DATE 1898

SUPERSTRUCTURE

Fixed Spans none

Form

Material

Length

Movable Type equal arm

Form through truss

Material steel

Length 189'-92"

Power manual

SUBSTRUCTURE

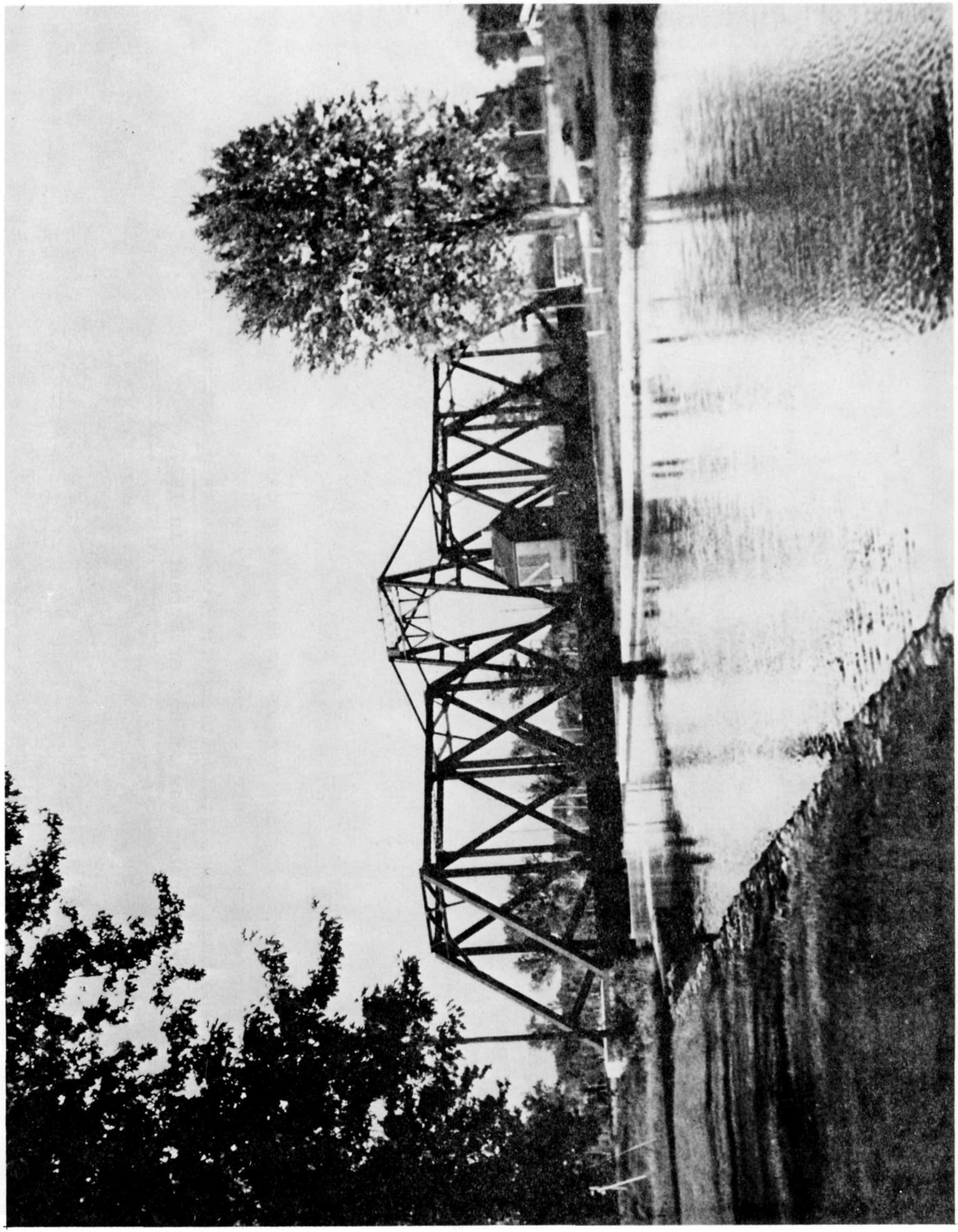
Form masonry

REFERENCES

1. Canada, Sessional Papers, 1898, Vol XXXIII, No. 8, Paper 10, p. 142.
2. R.B. Woodworth, "Some Novelties in Swing Bridge Construction on the Trent Valley Canal", The Canadian Engineer, Vol XV, Aug/Sept 1898, pp. 104-106, describes the unusual central tower of this bridge.

NOTES

1. In 1883 the Quebec and Ontario Railway built this line. The swing was added in 1897-98 during canal construction.
2. This bridge is one of four remaining railway through truss bridges and is the oldest of the four.



Canal Crossing Number 25A

Location 90.1 Name Peterborough Lift Lock Route Hunter Street

DATE 1904

SUPERSTRUCTURE

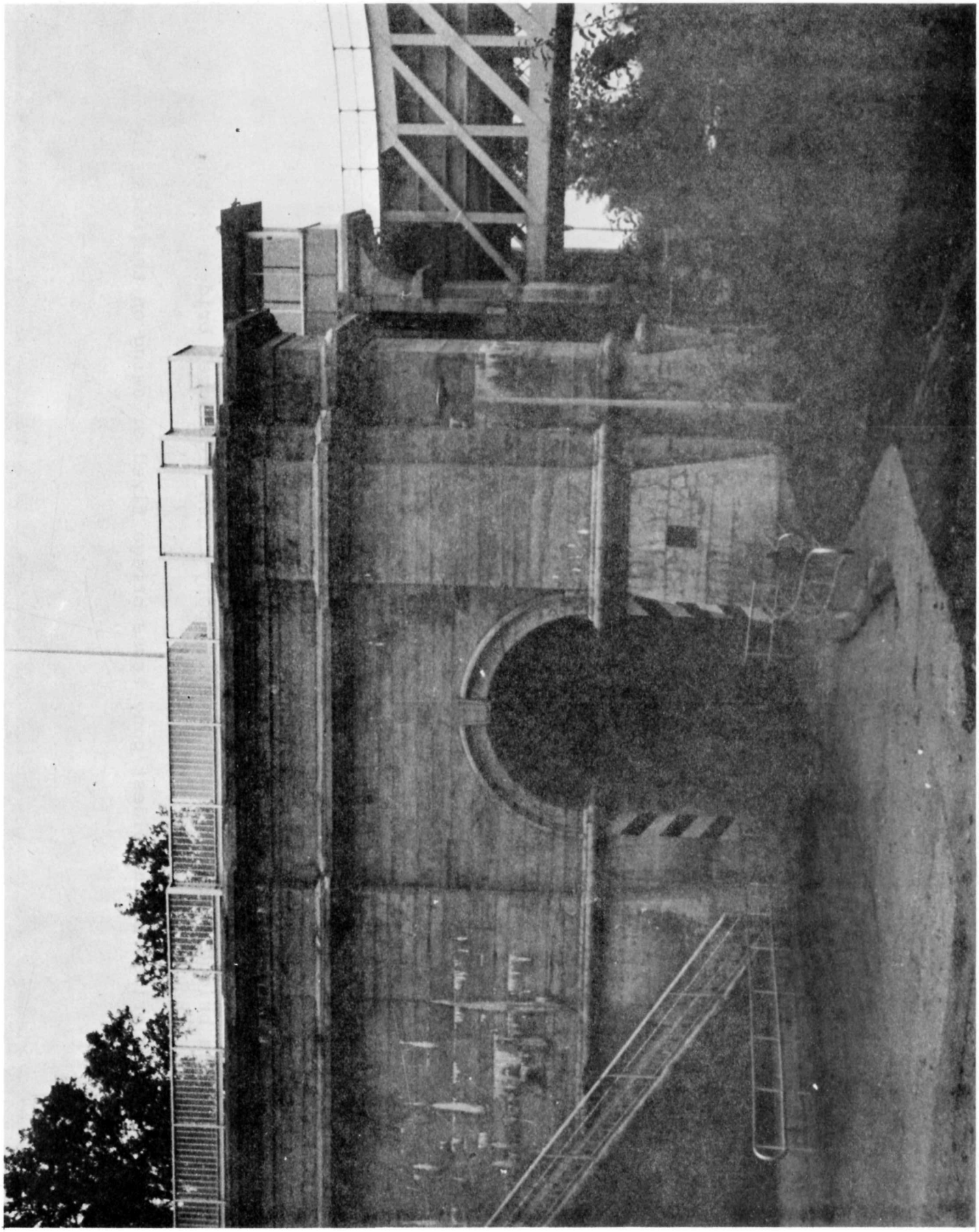
- Fixed Spans
  - Form
  - Material
  - Length
- Movable Type
  - Form
  - Material
  - Length
  - Power

SUBSTRUCTURE

- Form

NOTES

1. The lift lock provides a crossing under the canal.
2. The Hunter Street route has been a very important thoroughfare through Peterborough since its settlement. Poole states that the earliest bridge across the Otonobee was at Hunter Street in 1827.



Canal Crossing Number 26

Location 90.58 Name Peterborough Route Norwood Road

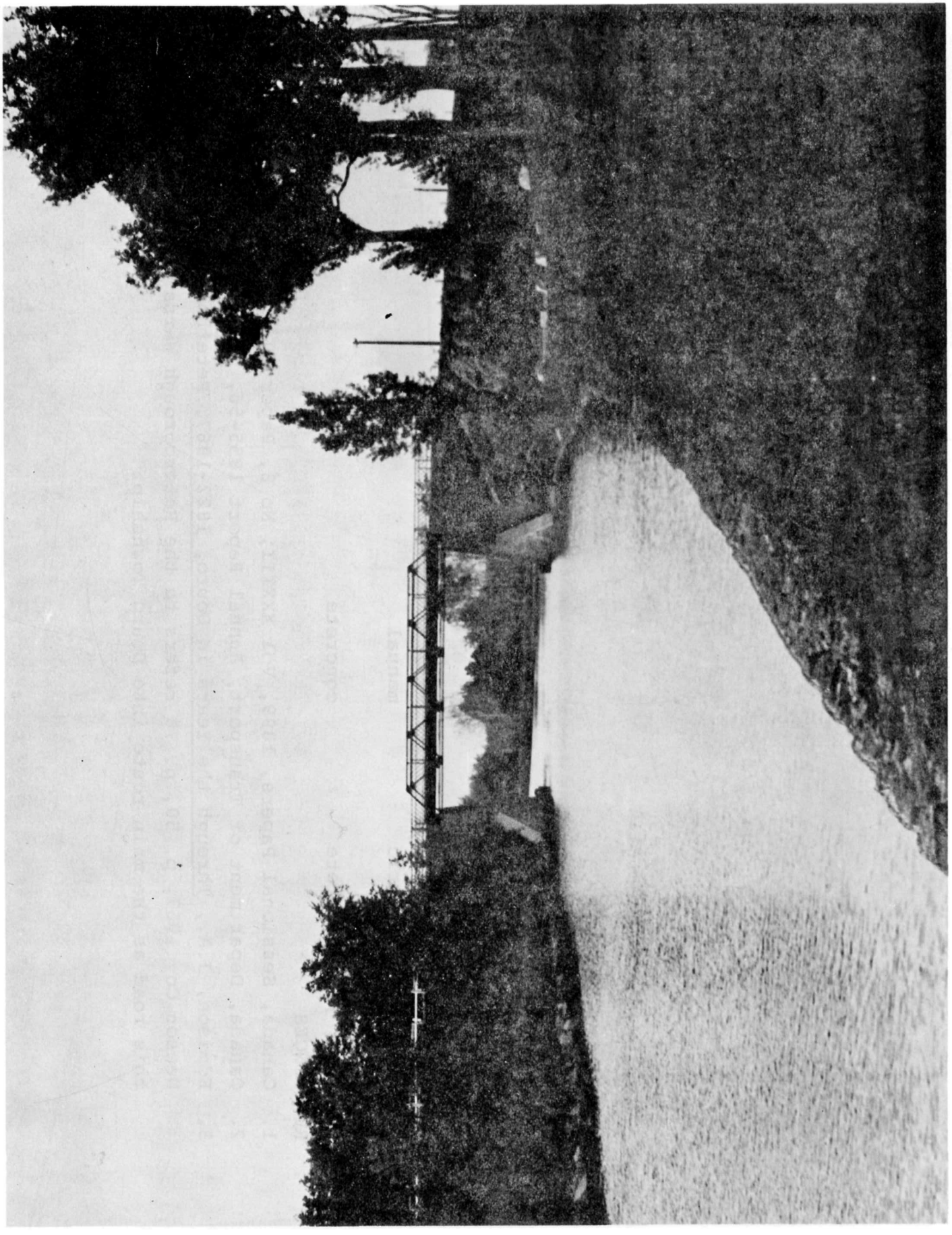
DATE	1897
SUPERSTRUCTURE	high level
Fixed Spans	1
Form	pony truss
Material	steel
Length	63'-0"
Movable Type	
Form	
Material	
Length	
Power	
SUBSTRUCTURE	masonry abutments
Form	

REFERENCES

1. Canada, Sessional Papers, 1899, Vol XXXIII, No 8, Paper 10, p. 142.

NOTES

1. This bridge is one of two remaining pony truss high level bridges on the waterway.
2. This bridge is the oldest pony truss bridge fixed or swing on the waterway.



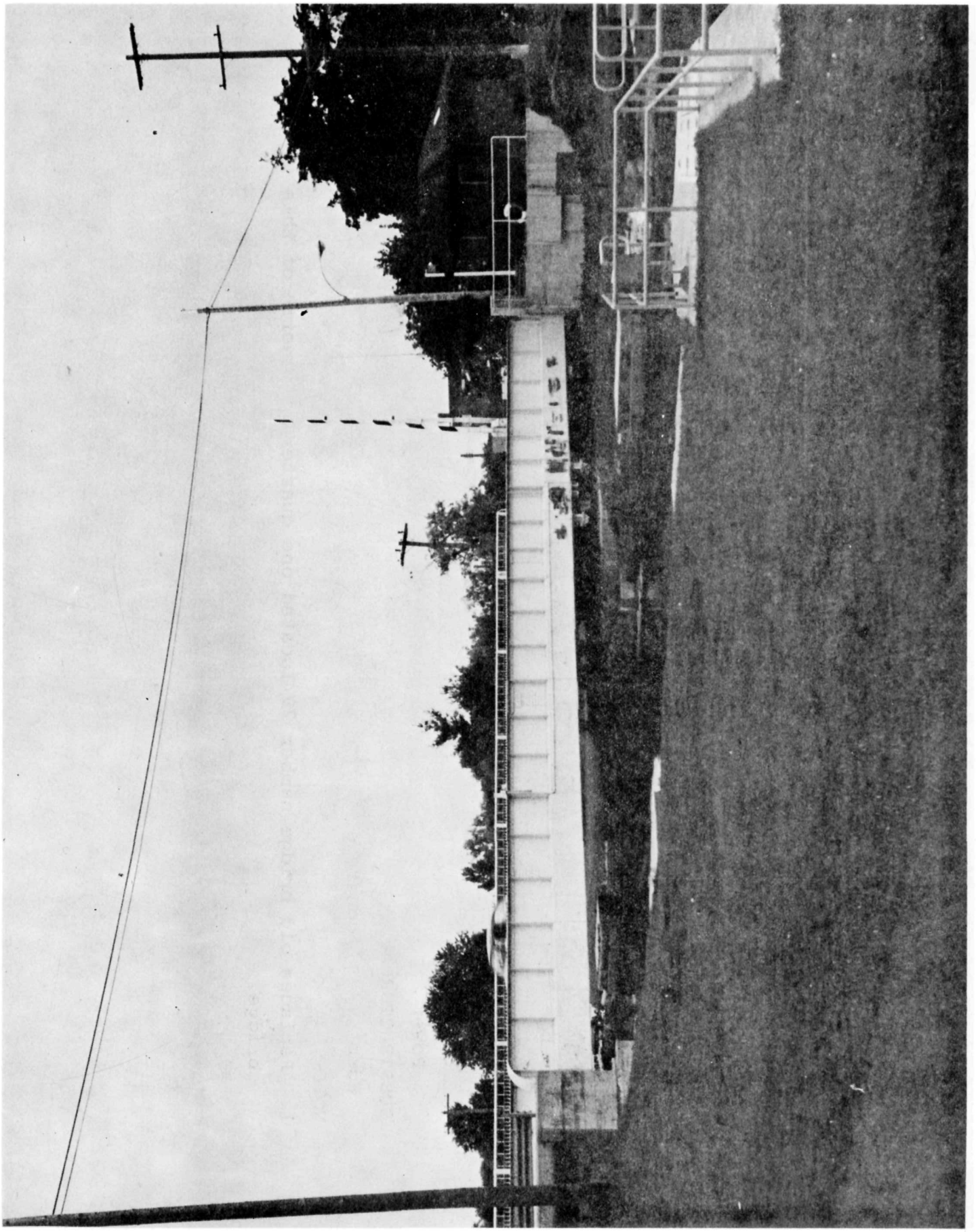
Canal Crossing Number 27

Location 91.01 Name Peterborough Route Warsaw Road

DATE	1956	1897
SUPERSTRUCTURE		
Fixed Spans	none	
Form		
Material		
Length		
Movable Type	unequal arm	equal arm
Form	half plate girder	through truss
Material	steel	steel
Length	102'-0"	139'-2"
Power	electric	manual
SUBSTRUCTURE		
Form	concrete	concrete

REFERENCES

1. Canada, Sessional Papers, 1899, Vol XXXIII, No 8, Paper 10, p. 142.
2. Canada, Department of Transport, Annual Report 1955-56, p. 62.
3. Edmison, J.A., Through the Years in Douro, 1822-1967, Peterborough, Newson Co. 1967, p. 50, p. 78 refers to the Peterborough Warsaw stage and this road as the main route into Douro Township.



Canal Crossing Number 27A

Location 93.27 Name Peterborough Route River Road

DATE 1976

SUPERSTRUCTURE high level

- Fixed Spans 3
  - Form
  - Material concrete
  - Length
- Movable Type
  - Form
  - Material
  - Length
  - Power

SUBSTRUCTURE

- Form concrete

NOTES

1. Replaces old bridge number 29 located one quarter mile north of this bridge.

Canal Crossing Number 28

Location 93.33 Name Peterborough Route CNR

DATE	1904
SUPERSTRUCTURE	
Fixed Spans	none
Form	
Material	
Length	
Movable Type	equal arm
Form	through truss
Material	steel
Length	221'-0"
Power	manual
SUBSTRUCTURE	
Form	concrete

REFERENCES

1. Canada, Sessional Papers, 1899, Vol XXXIII, No 8, Paper 10, p. 142

NOTES

1. One of the four remaining railway through truss bridges in original condition.
2. The longest manually operated swing span on the waterway.

Canal Crossing Number 29

Location 93.38 Name Peterborough Route Nassau Road

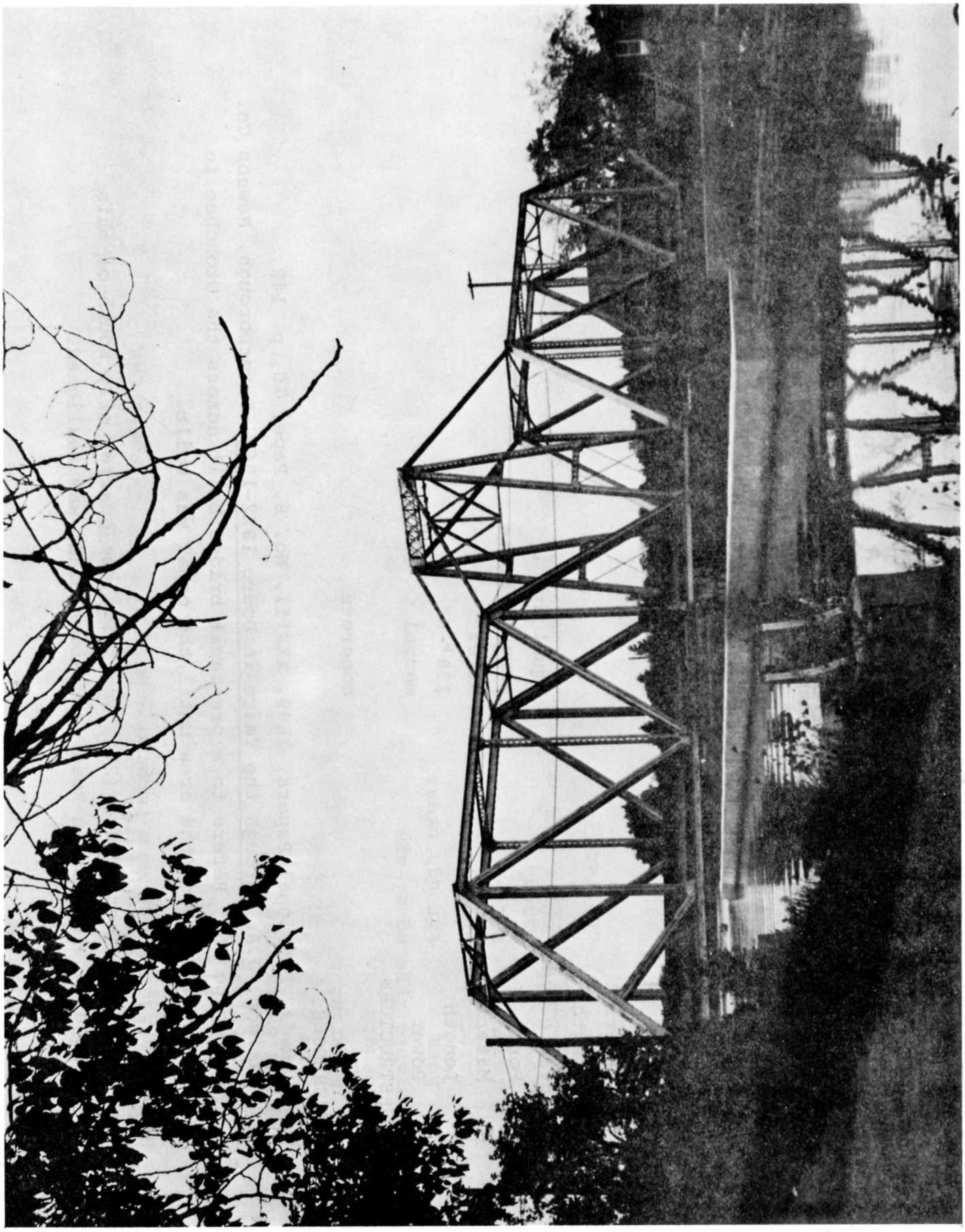
DATE	1976	1897
SUPERSTRUCTURE	demolished	none
Fixed Spans		
Form		
Material		
Length		
Movable Type		equal arm
Form		through truss
Material		steel
Length		138'-6"
Power		manual
SUBSTRUCTURE		
Form		concrete

REFERENCES

1. Canada, Sessional Papers, 1899, XXXIII, No. 8, Paper 10, p. 142.
2. Edmison, J.A. Through the Years in Douro 1822-1967, Peterborough, Newson Co. 1967 page 76. Refers to a pre-canal bridge built across the Otonobee in 1854 which served the area until the canal was built.

NOTES

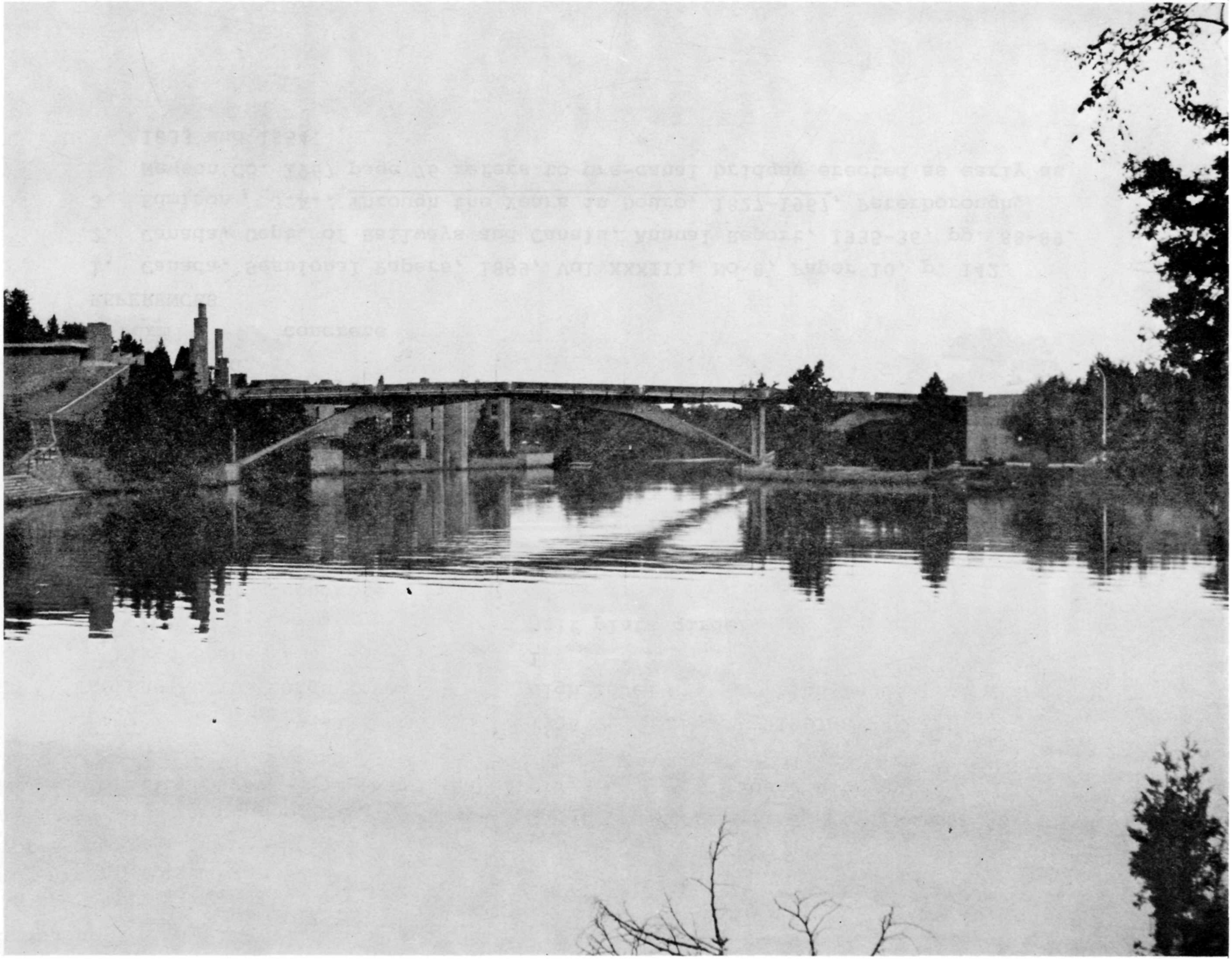
1. The replacement bridge (27A) was built one quarter mile south of this bridge and the Nassau Road (now River Road) was realigned.



Canal Crossing

Location Name Peterborough Number 29A Route Trent University Footbridge

DATE	1968
SUPERSTRUCTURE	high level
Fixed Spans	1
Form	arch
Material	concrete
Length	
Movable Type	
Form	
Material	
Length	
Power	
SUBSTRUCTURE	
Form	concrete



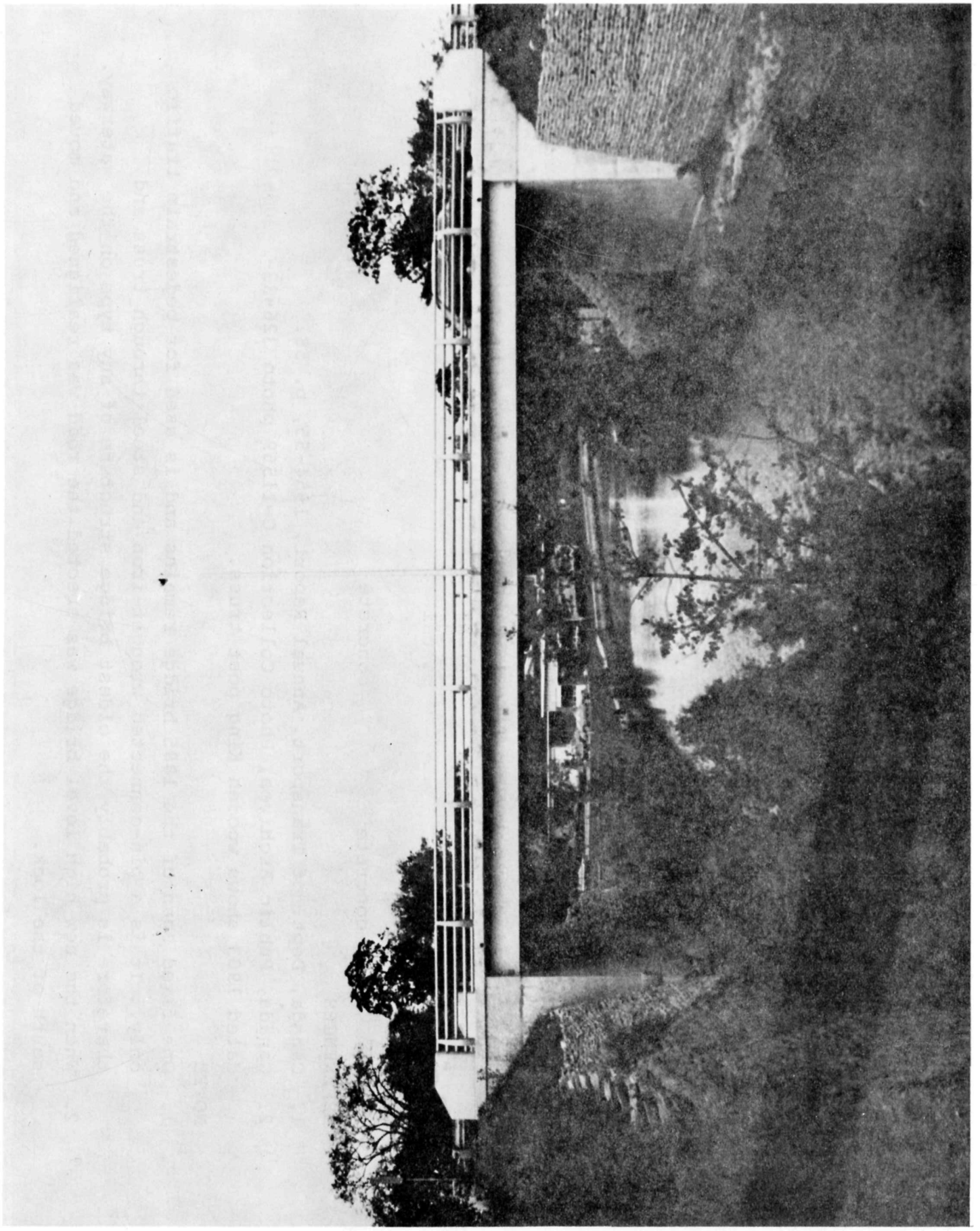
Canal Crossing Number 30

Location 99.00 Name Lakefield Route Highway 20

DATE	1974	1935	1897-8
SUPERSTRUCTURE	high level	high level	high level
Fixed Spans	1	1	
Form	beam	half plate girder	
Material	concrete		
Length	89'-0"	89'-0"	
Movable Type			
Form			
Material			
Length			
Power			
SUBSTRUCTURE			
Form	concrete		

REFERENCES

1. Canada, Sessional Papers, 1899, Vol XXXIII, No 8, Paper 10, p. 142.
2. Canada, Dept. of Railways and Canals, Annual Report, 1935-36, pp. 88-89.
3. Edmison , J.A., Through the Years in Douro, 1827-1967, Peterborough, Newson Co. 1967 page 76 refers to pre-canal bridges erected as early as 1833 and 1854.



Canal Crossing Number 31

Location 104.38 Name Young's Point Route Highway 30

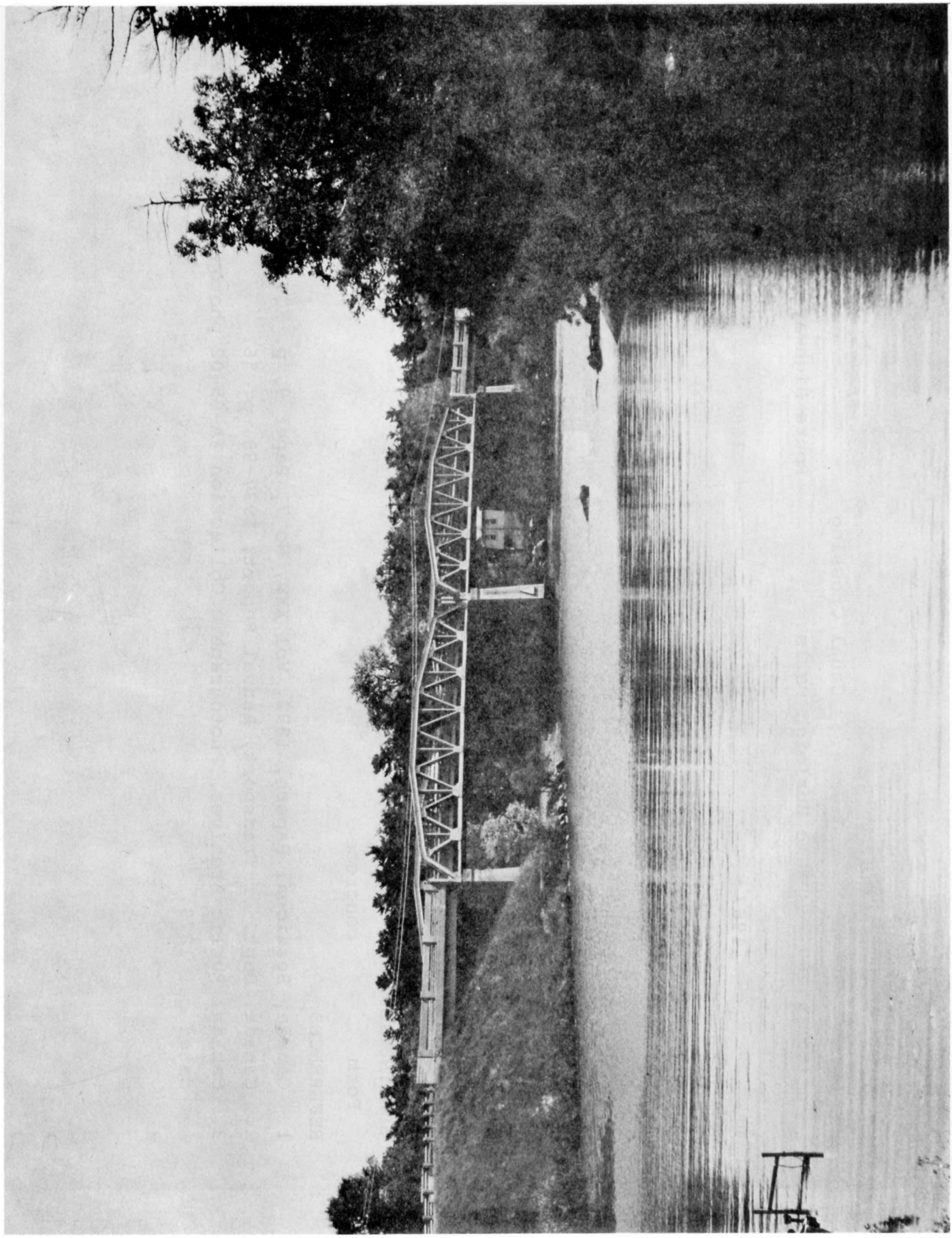
DATE	1954	1906	1891	1885	1870
SUPERSTRUCTURE	high level				
Fixed Spans	4			1	
Form	(2 truss 2 beam)			through truss	
Material	steel			steel and iron	
Length					
Movable Type		unequal arm	swing		
Form		through truss	K post		
Material		steel	wood		
Length		98'-8"			
Power		manual			
SUBSTRUCTURE					
Form	concrete	concrete			

REFERENCES

1. Canada, Dept. of Transport, Annual Report, 1954-55, p. 58.
2. Canada, Public Archives, Photo Collection C-11559 photo 326-33-2-903-0115 dated 1903 shows wooden King post truss.

NOTES

1. One fixed span of the 1885 bridge remains and is used for pedestrain traffic only. It is a pin-connected wrought-iron and steel through truss and therefore is probably the oldest bridge structure of any type on the waterway.
2. When the new high level bridge was erected the road was realigned and moved south of the lock.



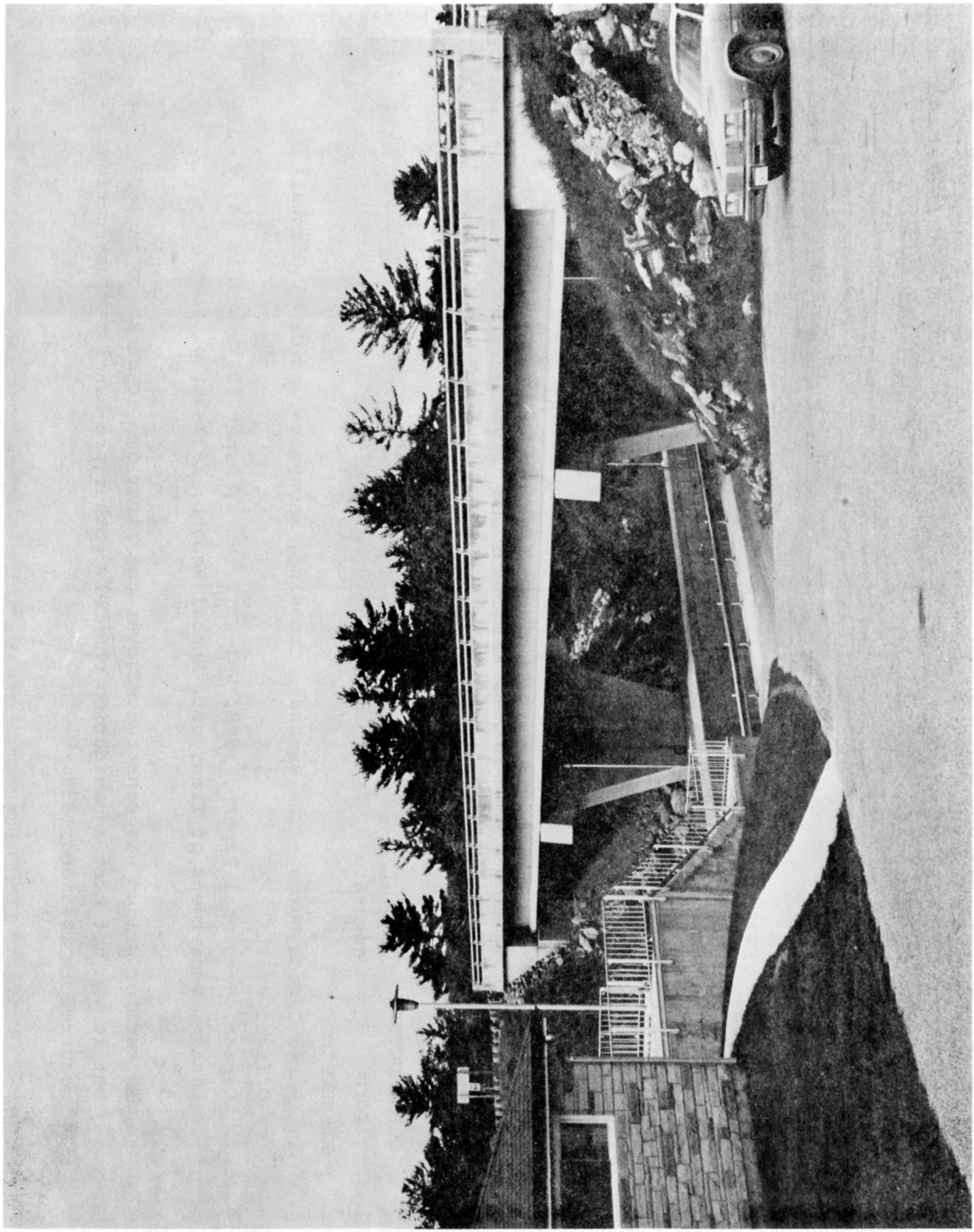
Canal Crossing Number 32

Location 113.00 Name Burleigh Falls Route Highway 28

DATE	1967	1937-38	1888	ca.1860
SUPERSTRUCTURE	high level			pre-canal
Fixed Spans	3	2	2	
Form	beam			
Material	concrete	concrete		
Length		20'-3" 19'-9"		
Movable Type		unequal arm	swing	
Form		half plate girder	K post	
Material		steel	timber	
Length		77'-11"		
Power		manual		
SUBSTRUCTURE				
Form	concrete			

REFERENCES

1. Canada, Sessional Papers, 1892, Vol XXV, No 7, Paper 9, p. XCVII.
2. Canada, Dept. of Transport, Annual Report, 1937-38, p. 56.
3. Canada, Public Archives, Photographic Collection PA-65402 photo 301-19-2-879-0224 dated ca. 1879.



Canal Crossing Number 33

Location 120.66 Name Buckhorn Route Highway 507

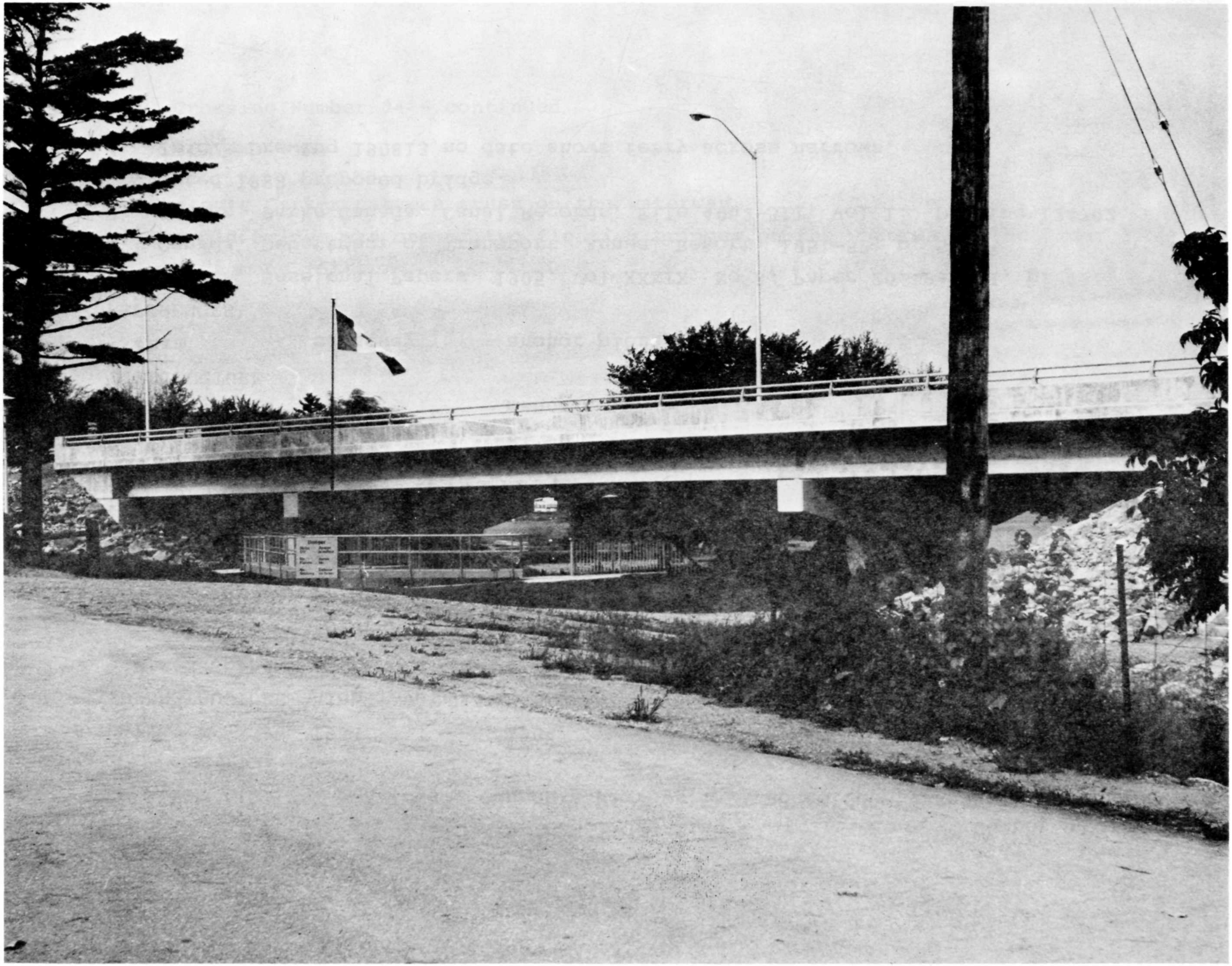
DATE	1977	1938	1888
SUPERSTRUCTURE	high level		
Fixed Spans	3		
Form	beam		
Material	concrete		
Length			
Movable Type		unequal arm	swing
Form		half plate girder	
Material			wood
Length		77'-11"	
Power		manual	
SUBSTRUCTURE			
Form	concrete	concrete	

REFERENCES

1. Parks Canada Notes - The Buckhorn Crossing, anonymous, no date, Cornwall Office.
2. Canada, Sessional Papers, 1888, Vol XXII, No 9, Paper 10, Appendix 16, p. 146.
3. Canada, Department of Transport, Annual Report, 1937-38, p. 56.

NOTES

1. An earlier bridge was constructed over the first dam at Buckhorn in 1833 but it was not over a navigation channel. Other pre-canal reconstructions occurred in 1845 and 1858.



Canal Crossing Number 34

Location 130.17 Name Gannon's Narrows Route County Road

DATE	1953	1904	Ferry
SUPERSTRUCTURE	high level		
Fixed Spans	1	4	
Form	through truss	floating	
Material	steel	wood	
Length		overall 1212'	
Movable Type		swing	
Form		floating	
Material		wood	
Length		81'-0"	
Power		manual	
SUBSTRUCTURE			
Form	causeway	anchor piers	

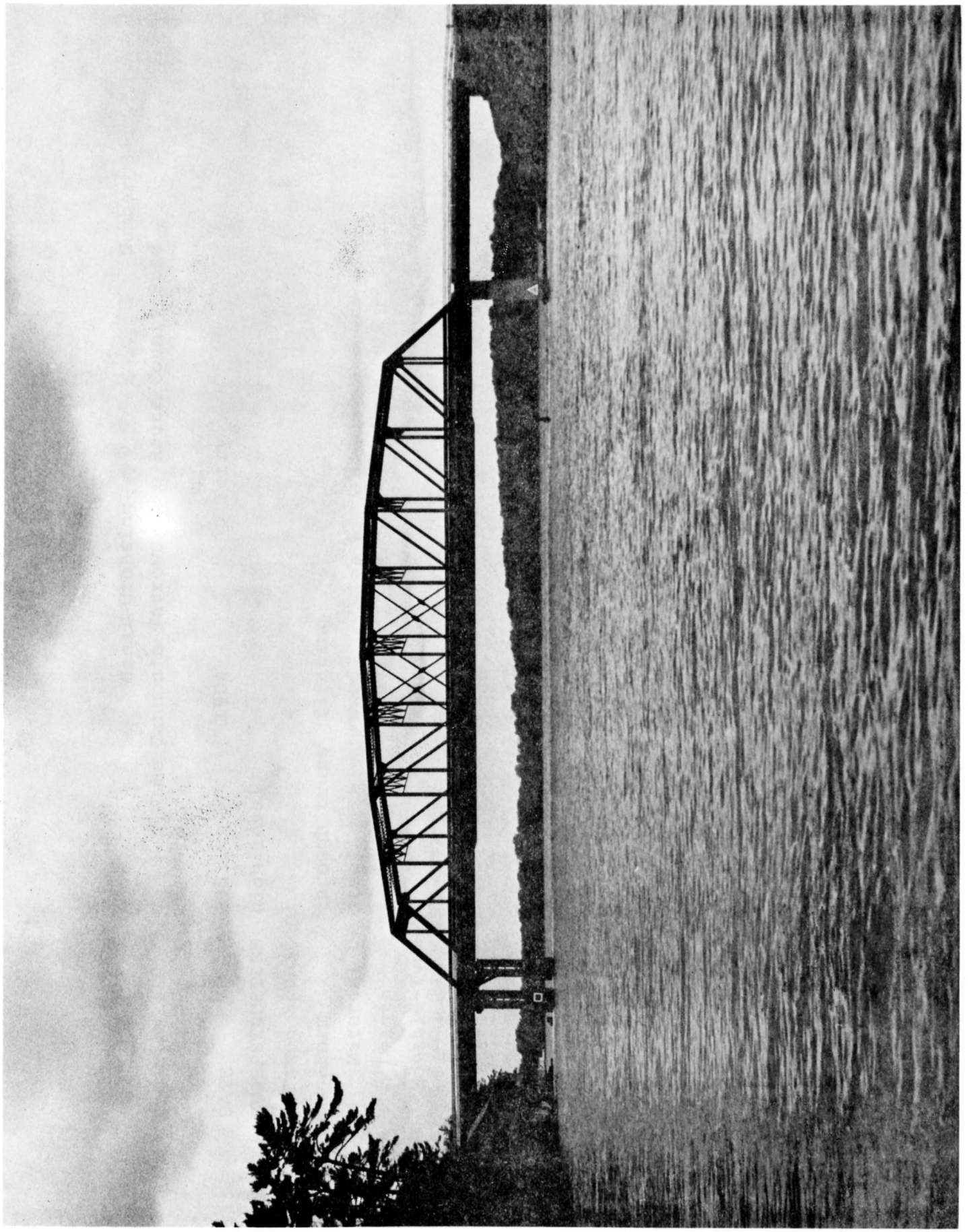
REFERENCES

1. Canada, Sessional Papers, 1905, Vol XXXIX, No 8, Paper 20, Part I, p. 43.
2. Canada, Department of Transport, Annual Report, 1951-52, p. 57.
3. Canada, Parks Canada, Canal Records, File 4052-511, Vol 1. Drawing 124702 dated 1888 proposed bridge.
4. Ibid. Drawing 190813 no date shows ferry across narrows.

Canal Crossing Number 34 - continued

NOTES

1. The only Parker pattern truss on the waterway.
2. The old bridge was one of two floating bridges on the waterway - the other was Chemung (61).



Canal Crossing Number 34A

Location Name Bobcaygeon Route County Road

DATE	1975
SUPERSTRUCTURE	
Fixed Spans	4
Form	deck plate girder
Material	steel
Length	
Movable Type	
Form	
Material	
Length	
Power	
SUBSTRUCTURE	
Form	concrete

Canal Crossing Number 35

Location 138.17 Name Bobcaygeon Route Village Street

DATE	1922	1892	1878	1858	1845	1835
SUPERSTRUCTURE						
Fixed Spans	none					
Form						
Material						
Length						
Movable Type	unequal arm	unequal arm	swing	swing		
Form	half plate girder	deck truss				
Material	steel	steel	wood			
Length	95'-0"					
Power	electrical					
SUBSTRUCTURE	concrete					
Form						

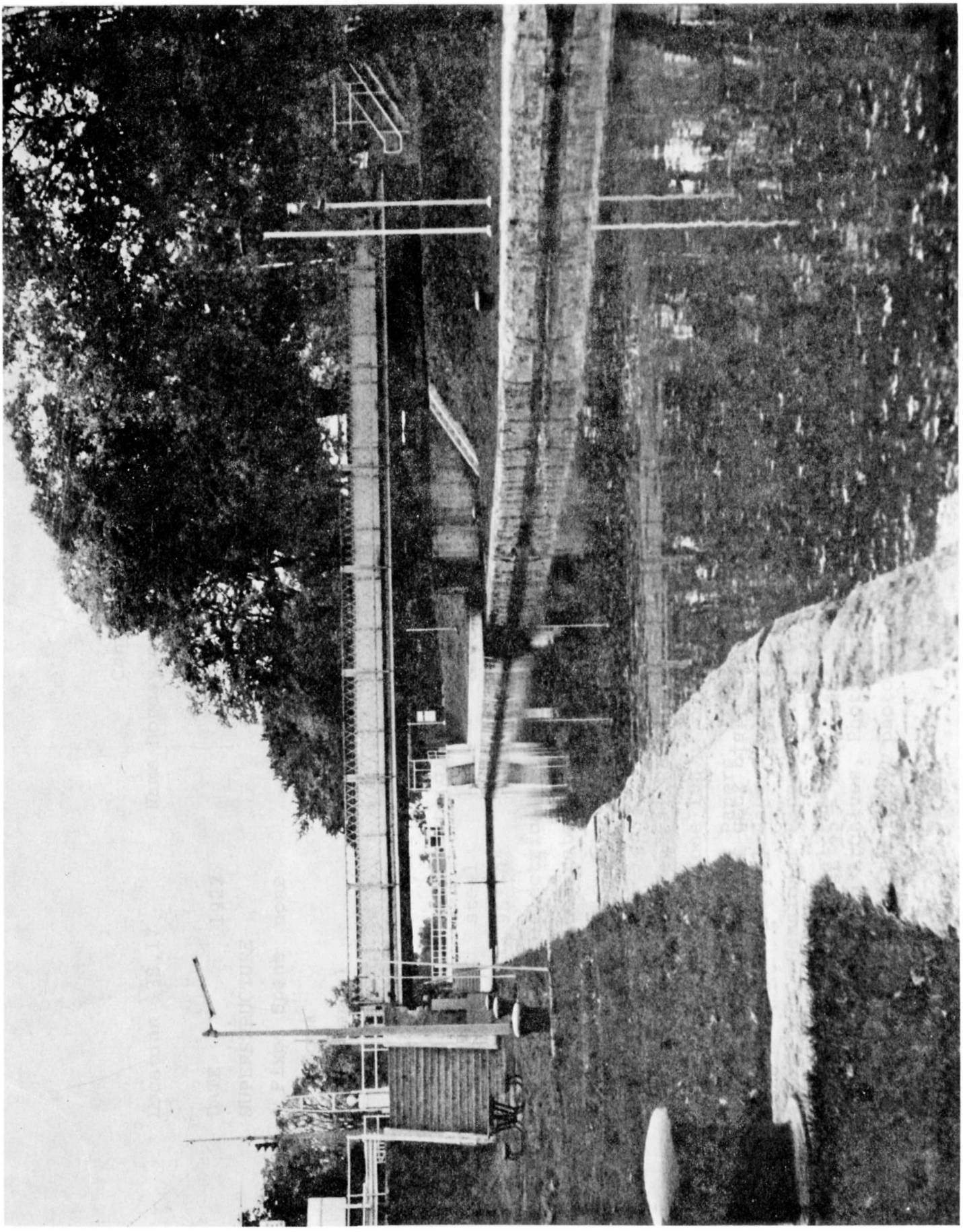
REFERENCES

1. Ranney, G.W., General Report of the Commissioners of Public Works for the year ending 30 June 1967.
2. Canada, Sessional Papers, 1879, Vol XII, No 7, Paper 8, Appendix 9, p. 46.
3. Canada, Sessional Papers, 1885, Vol XVIII, No 7, Paper 11, Appendix 6, p. 127.
4. Canada, Sessional Papers, 1893, Vol XXVI, No 6, Paper 9, Appendix 11, p. 140.
5. Canada, Sessional Papers, 1923, Vol LIX, No 6, Paper 32, p. 154.
6. Canada, Public Archives, Photograph Collection PAC C-21220 photo 330-33-2-903-0131 date 1903 also PAC 21241 photo 301-10-2-000-0136.

Canal Crossing Number 35 - continued

NOTES

1. This was the first deck plate girder highway swing bridge built on the waterway.



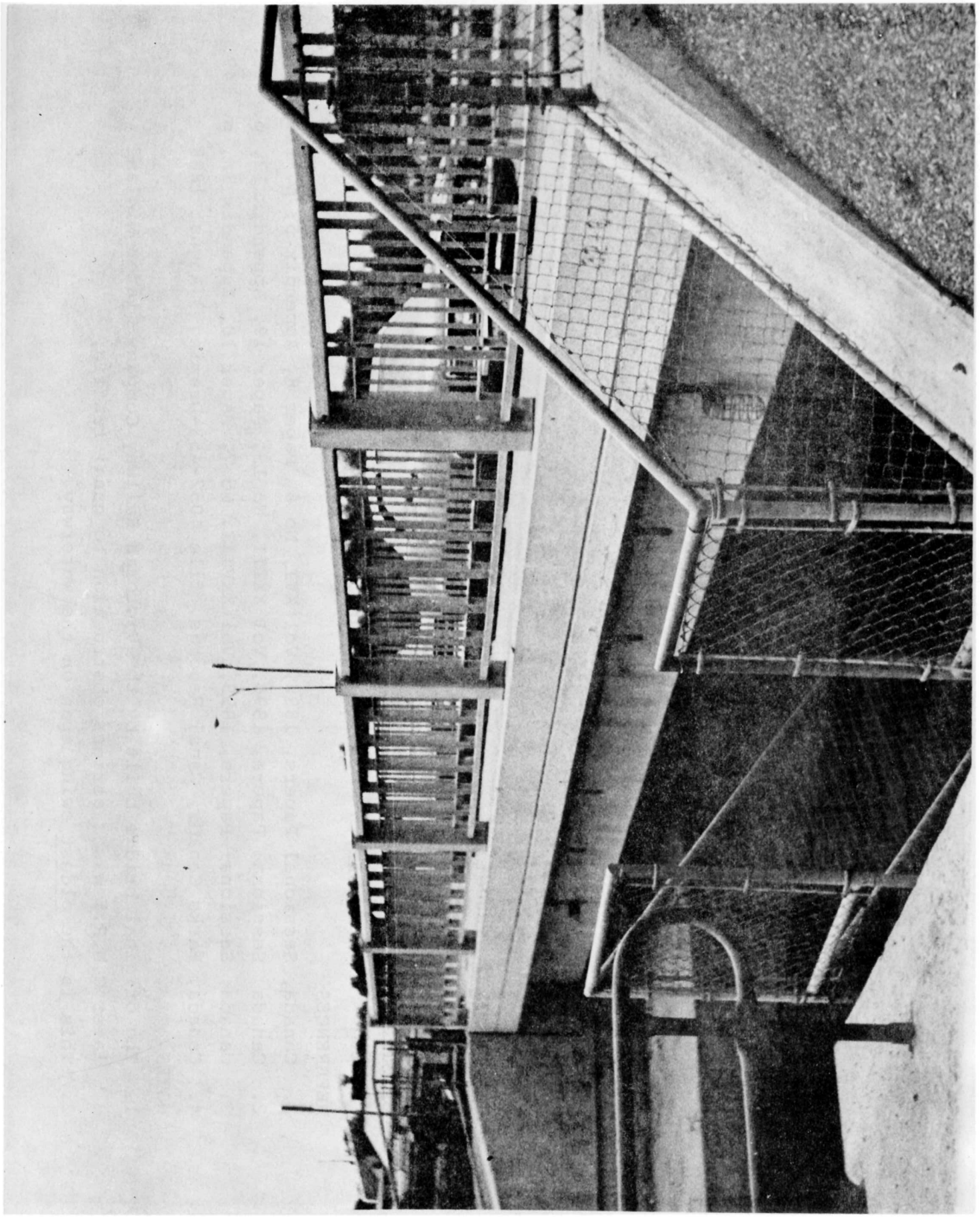
Canal Crossing Number 36

Location 153.61 Name Fenelon Falls Route Highway 121

DATE	1963	1931	1888	1868
SUPERSTRUCTURE	high level			
Fixed Spans	1	none		
Form	beam			
Material	concrete			
Length				
Movable Type		unequal arm	swing	
Form		half plate girder	K post	
Material		steel	wood	
Length		74'-0"		
Power		manual		
SUBSTRUCTURE				
Form	concrete			

REFERENCES

1. Ontario, Public Archives, Municipal Documents Victoria County, Journals of Proceedings and Bylaws, December 1868 "The Bridge at Fenelon Falls completed" (pre-canal era).
2. Canada, Sessional Papers, 1889, Vol XXII, No 9, Paper 10, Appendix 16, p. 147.
3. Trent University, Archives, photograph collection B-77-010 shows wooden bridge with King post truss. No date
4. Canada, Public Archives, Photo collection, 332-33-2-000-0782 shows swing bridge with King post combined with lattice truss, possibly Town pattern.



Canal Crossing Number 37

Location 153.98 Name Fenelon Falls Route CNR

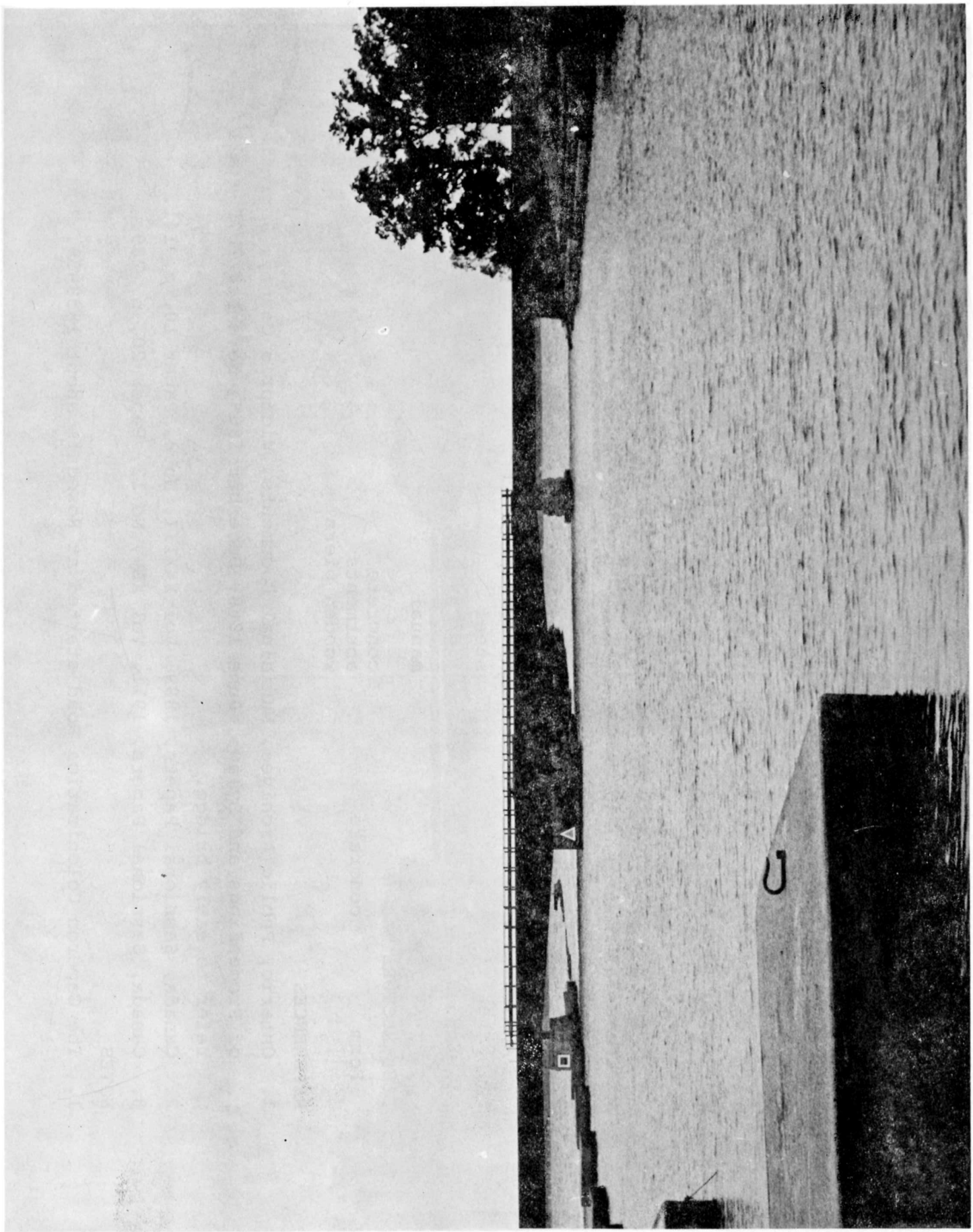
DATE	1894	1876
SUPERSTRUCTURE		low level
Fixed Spans	6	8
Form	deck plate girder	
Material	steel	
Length	301'-7" overall	441'-7"
Movable Type	equal arm	
Form	deck plate girder	
Material	steel	
Length	140'-0"	
Power	manual	
SUBSTRUCTURE		
Form	masonry	masonry

REFERENCES

1. Canada, Sessional Papers, 1882, Vol XVI, No 6, Paper 8, Appendix 5, p. 115.
2. Canada, Sessional Papers, 1890, Vol XXIII, No 13, Paper 19, Appendix 12, p. 120.
3. Canada, Sessional Papers, 1895, Vol XXVIII, No 7, Paper 10, Appendix IX, p. 149.
4. Canada, Parks Canada, Canal Records, file 4052-453-Drawing 3 August 1888.

NOTES

1. The original bridge built by the Victoria Railway Company (later Midland, later C.N.R.) was a serious obstruction to canal traffic.
2. This is the oldest swing span on the waterway.



Canal Crossing Number 38

Location 157.98 Name Rosedale Route Highway 35

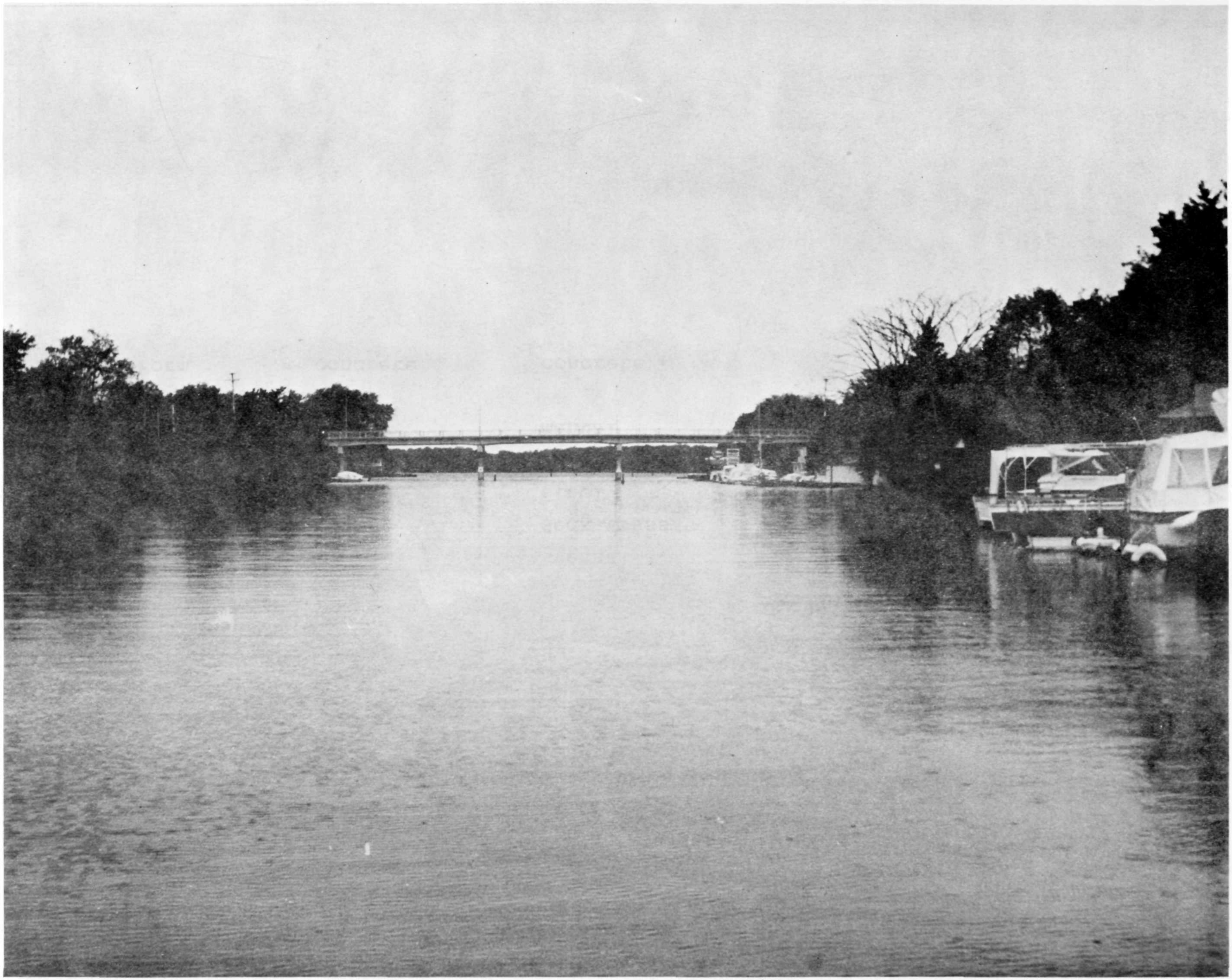
DATE	1963	1898	1871	ca.1860
SUPERSTRUCTURE	high level			
Fixed Spans	7	2		
Form	deck plate girder			
Material	steel			
Length		overall 136'-0"		
Movable Type		equal arm	swing	
Form		through truss		
Material		steel		
Length		138'-0"		
Power		manual		
SUBSTRUCTURE				
Form	concrete	concrete abutments wooden piers		

REFERENCES

1. Ontario, Public Archives, Municipal Documents, Victoria County, Journals of Proceedings and Bylaws, June 1868, December 1869, November 1875 - all refer to early bridge.
2. Canada, Sessional Papers, 1899, Vol XXXIII, No 8, Paper 10, p. 141.
3. Canada, Sessional Papers, 1911, Vol XLV, No 12, Paper 20, p. 289.

NOTES

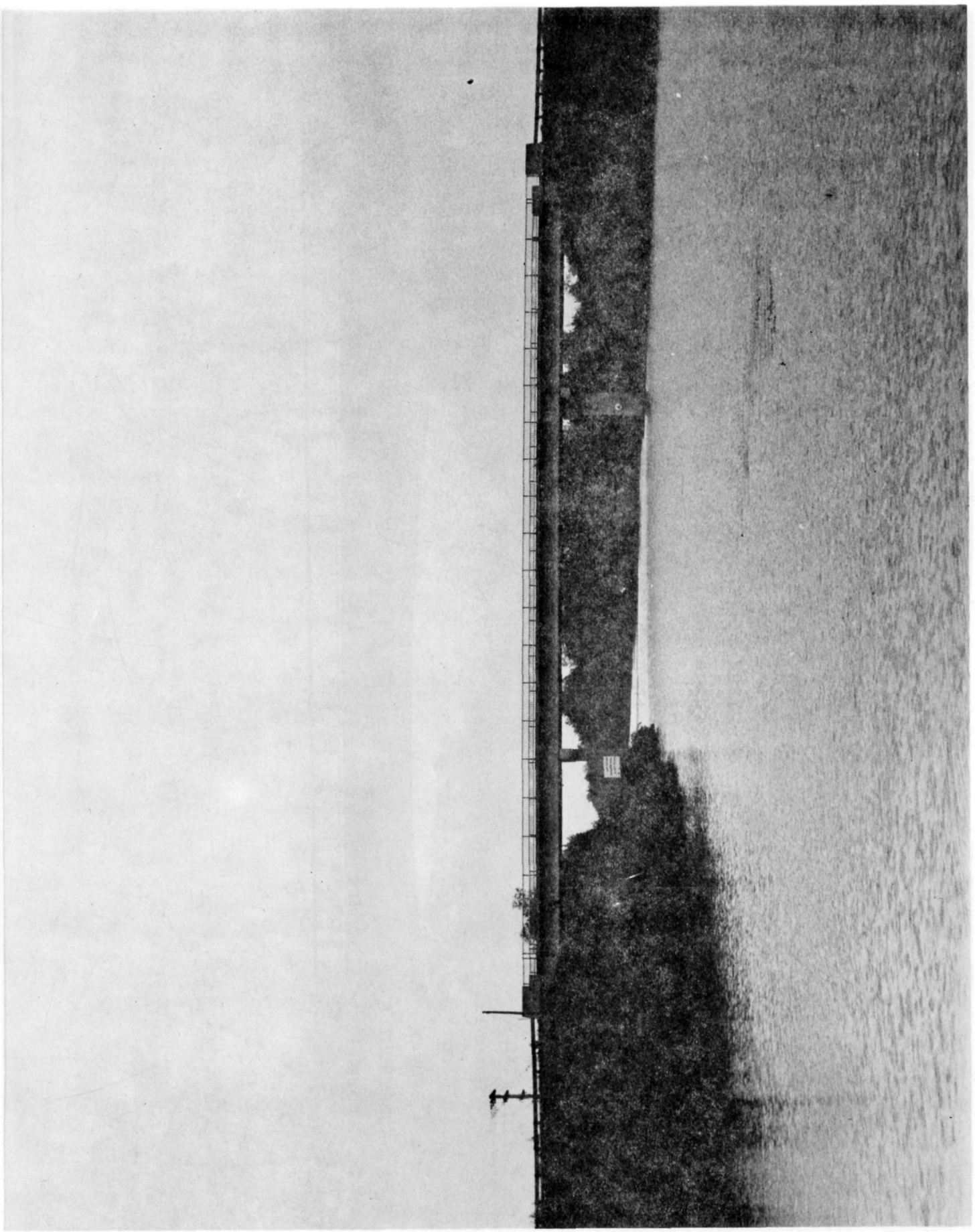
1. The Cameron Colonization Road started at Rosedale about 1858-59.



Canal Crossing Number 39

Location 165.24 Name Victoria Road Route Highway 505

DATE	1969	1898
SUPERSTRUCTURE	high level	
Fixed Spans	3	
Form	beam	
Material	concrete	
Length		
Movable Type		unequal arm
Form		deck truss
Material		steel
Length		93'-2"
Power		manual
SUBSTRUCTURE		
Form	concrete	concrete



Canal Crossing Number 40

Location 166.82 Name Portage Road Route Highway 46

DATE	1958	1898
SUPERSTRUCTURE	high level	high level
Fixed Spans	1	1
Form	beam	through truss
Material	concrete	steel
Length		113'-10"
Movable Type		
Form		
Material		
Length		
Power		
SUBSTRUCTURE		
Form	concrete	

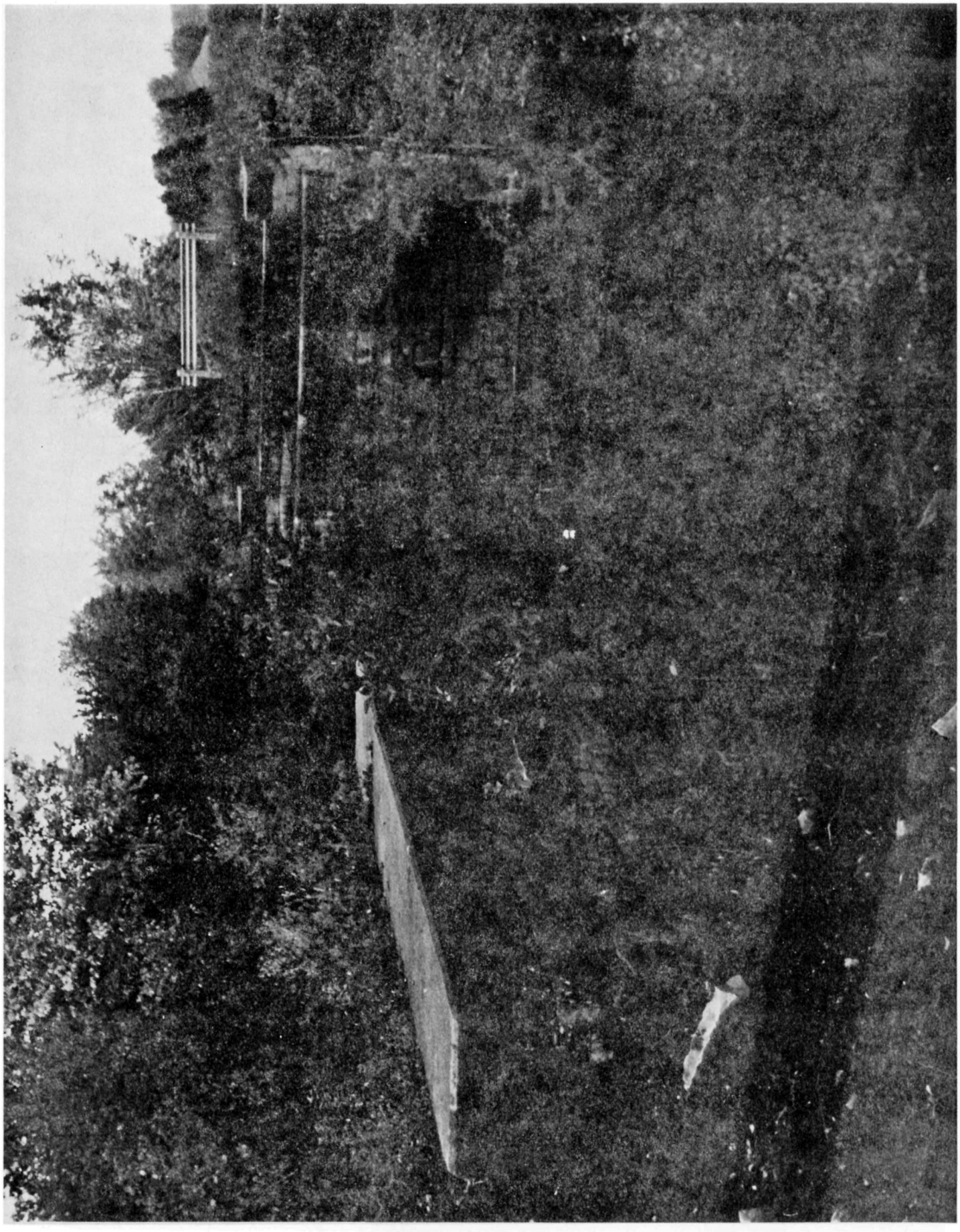
Canal Crossing Number 41

Location 167.98 Name Kirkfield Route CNR

DATE		1898
SUPERSTRUCTURE	demolished not replaced	high level
Fixed Spans		1
Form		half plate girder
Material		steel
Length		76'-0"
Movable Type		
Form		
Material		
Length		
Power		
SUBSTRUCTURE		
Form		concrete

NOTES

1. The original line was built by the Toronto and Nipissing Railway in 1872. The bridge was added when the canal was built.



Canal Crossing Number 41A

Location 169.36 Name Kirkfield Lift Lock Route Highway 503

DATE 1907

SUPERSTRUCTURE

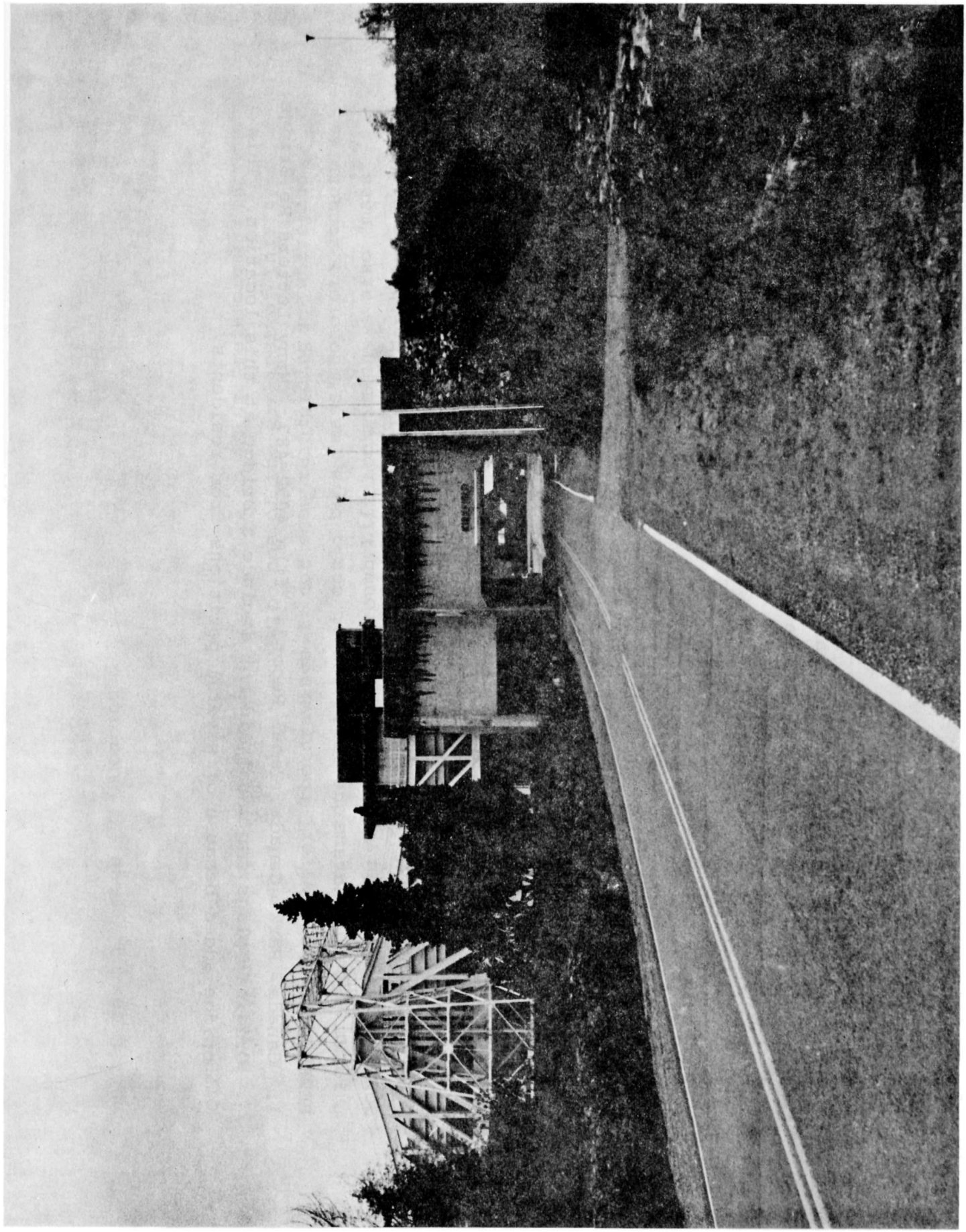
- Fixed Spans
  - Form
  - Material
  - Length
- Movable Type
  - Form
  - Material
  - Length
  - Power

SUBSTRUCTURE

- Form

NOTES

1. The lift lock provides a crossing under the canal.



Canal Crossing Number 42

Location 172.98 Name Canal Lake Route County Road

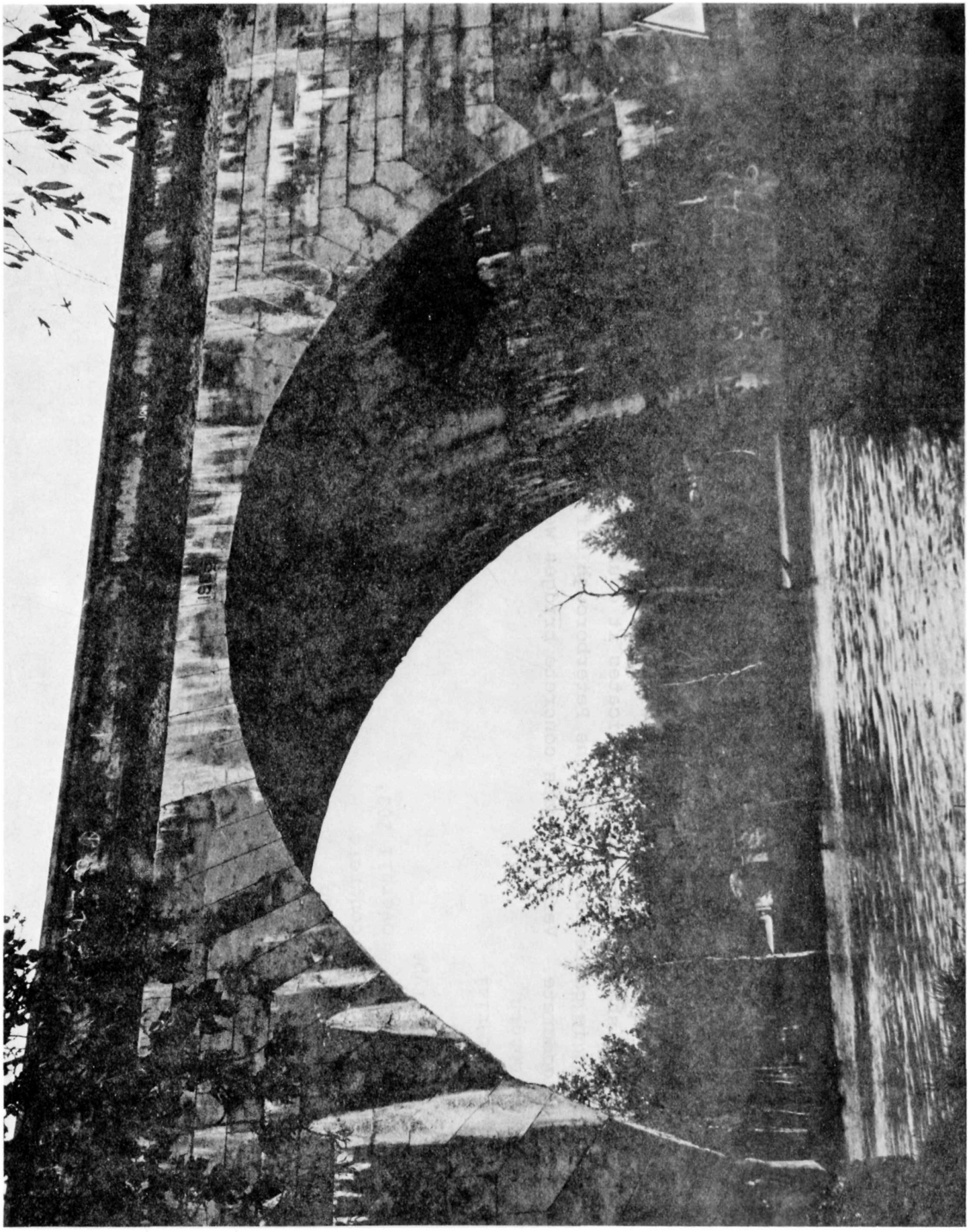
DATE	1905
SUPERSTRUCTURE	high level
Fixed Spans	1
Form	arch
Material	concrete
Length	overall 202'
Movable Type	
Form	
Material	
Length	
Power	
SUBSTRUCTURE	
Form	concrete

REFERENCES

1. Canada, Parks Canada, Canal Records, file 4052-487. Many Letters Re Bridge. Original plans for canal did not include a bridge at this location. This bridge added because of several petitions from residents.

NOTES

1. A very unusual bridge. The 1933 list refers to it as "reinforced concrete". If it is truly reinforced, it would be one of the earliest of this type in Canada. However, the drawings do not show reinforcing anywhere and the shape of the bridge indicates it could be a "mass" concrete structure. It is contemporary with the Peterborough Lift Lock which is also "mass" concrete. Very few mass concrete bridges were built in North America.



Canal Crossing Number 43

Location 175.23 Name Bolsover Route County Road

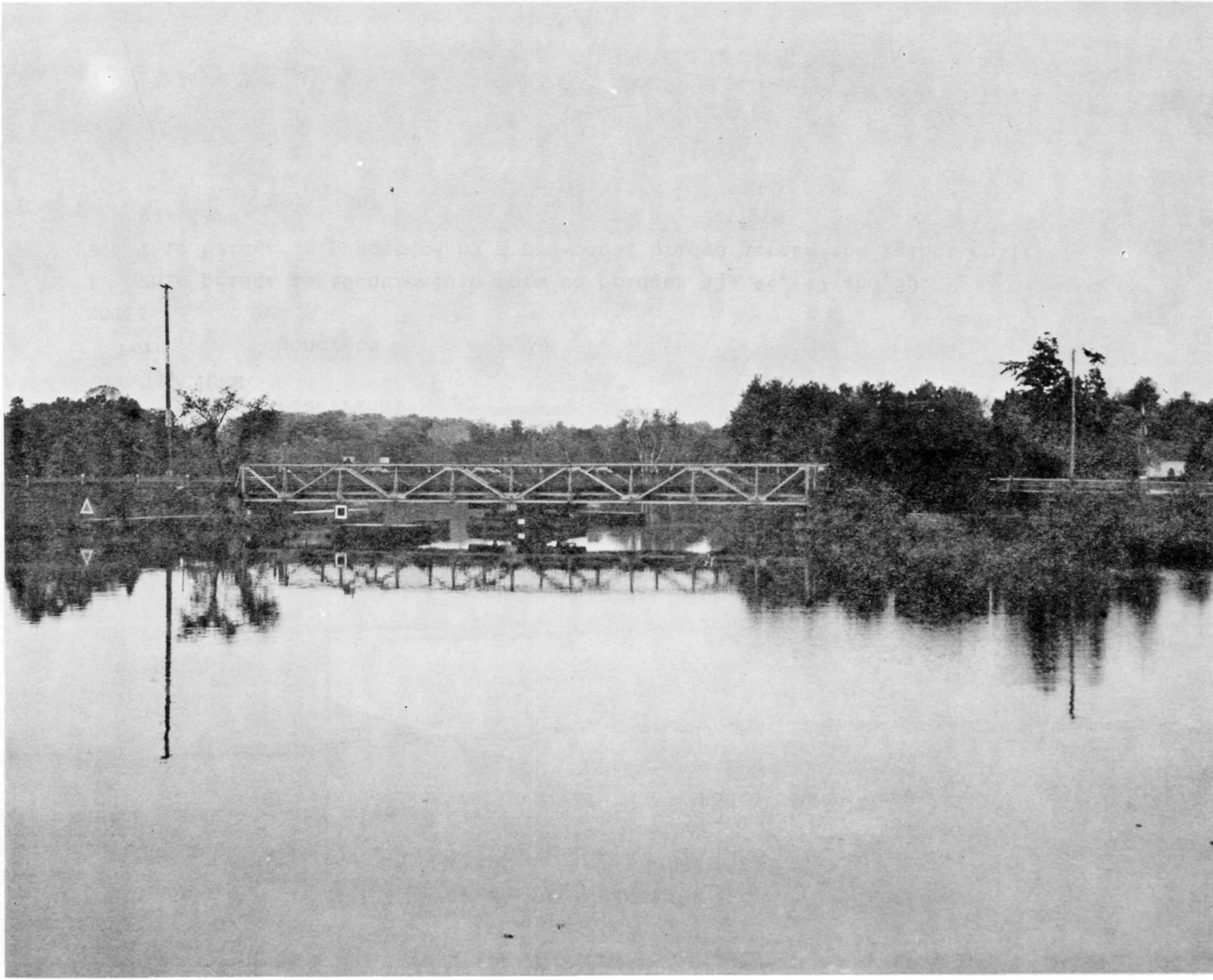
DATE	1901-2
SUPERSTRUCTURE	
Fixed Spans	none
Form	
Material	
Length	
Movable Type	equal arm
Form	pony truss
Material	steel
Length	132'-2"
Power	electrical
SUBSTRUCTURE	
Form	concrete

REFERENCES

1. Kirkconnell, W., Victoria County Centennial History Lindsay 1921, p. 41 refers to the colonization road called "The Portage Road" that crossed the Talbot River at this location using a ferry.
2. Map of the County of Victoria, Province of Ontario, published by Thomas Kains Esq. Craig and Company Lithographers Toronto 1877 - This map shows a pre-canal bridge at Bolsover.

NOTES

1. This bridge is identical in form to bridges 44, 46, 47 and 50.



Canal Crossing Number 44

Location 176.85 Name Boundary Road Route County Road

DATE	1901-02
SUPERSTRUCTURE	
Fixed Spans	none
Form	
Material	
Length	
Movable Type	equal arm
Form	pony truss
Material	steel
Length	138'-6"
Power	electrical
SUBSTRUCTURE	
Form	concrete

NOTES

1. This bridge is identical in form to bridges 43, 46, 47 and 50.
2. This bridge is preceeded by a pre-canal bridge across the Talbot built ca. 1889.

Canal Crossing

Location Name New Kanes Bridge Route County Road Number 44A

DATE	1972
SUPERSTRUCTURE	high level
Fixed Spans	4
Form	beam
Material	concrete
Length	
Movable Type	
Form	
Material	
Length	
Power	
SUBSTRUCTURE	
Form	concrete

		Canal Crossing	Number 45
Location 177.75		Name Talbot Station	Route C.P.R.
DATE	1938	1911	
SUPERSTRUCTURE	demolished		
Fixed Spans		none	
Form			
Material			
Length			
Movable Type		equal arm	
Form		half plate girder	
Material		steel	
Length		154'-8"	
Power		manual	
SUBSTRUCTURE			
Form			

NOTES

1. Originally built by C.P.R. under charter of Georgian Bay and Seaboard Railway.

Canal Crossing Number 46

Location 178.20 Name Kane's Bridge Route County Road

DATE	1972	1901-02
SUPERSTRUCTURE	demolished	
Fixed Spans		none
Form		
Material		
Length		
Movable Type		equal arm
Form		through truss
Material		steel
Length		133'-0"
Power		manual
SUBSTRUCTURE		
Form		concrete

NOTES

1. Same type of bridge as 43, 44, 47 and 50.

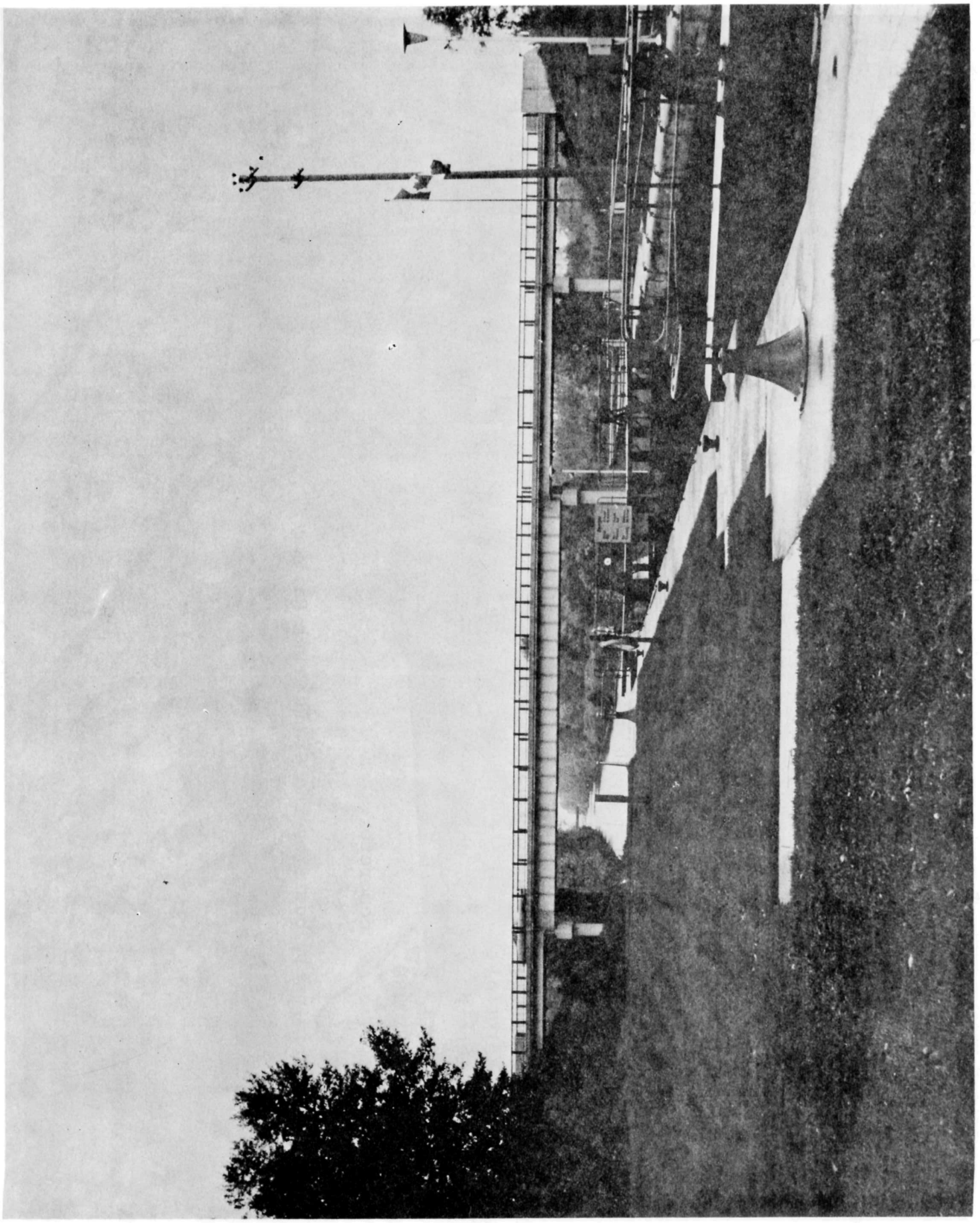
Canal Crossing Number 47

Location 180.79 Name Gamebridge Route Highway 12

DATE	1961	1902
SUPERSTRUCTURE	high level	
Fixed Spans	4	none
Form	deck plate girder	
Material		
Length		
Movable Type		equal arm
Form		through truss
Material		steel
Length		138'-6"
Power		manual
SUBSTRUCTURE		
Form	concrete	concrete

NOTES

1. The original bridge was identical in form to bridges 43, 44, 46 and 50.



Canal Crossing Number 48

Location 181.70 Name Gamebridge Route C.N.R.

DATE	1904
SUPERSTRUCTURE	high level
Fixed Spans	1
Form	half plate girder
Material	steel
Length	70'-1"
Movable Type	
Form	
Material	
Length	
Power	
SUBSTRUCTURE	
Form	concrete

NOTES

1. Originally built by the Grand Trunk Railway.

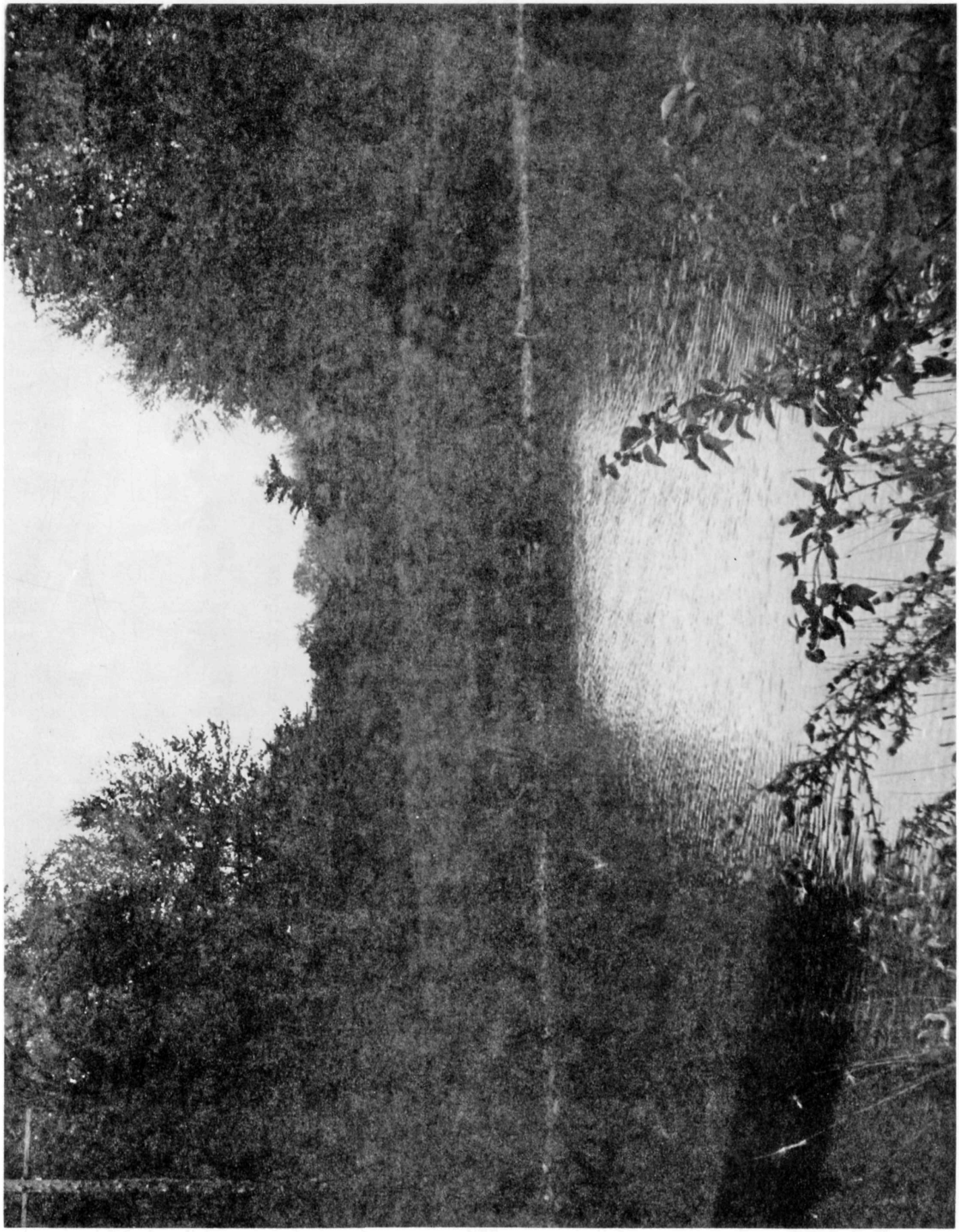
Canal Crossing Number 49

Location 181.85 Name Gamebridge Route C.N.R.

DATE	1906
SUPERSTRUCTURE demolished	
Fixed Spans	none
Form	
Material	
Length	
Movable Type	equal arm
Form	half plate girder
Material	steel
Length	134'-8"
Power	manual
SUBSTRUCTURE	
Form	concrete

NOTES

1. Originally built for the James Bay Railway Company.



Canal Crossing Number 50

Location 182.15 Name Gamebridge Route Shore Road

DATE 1902-03

SUPERSTRUCTURE

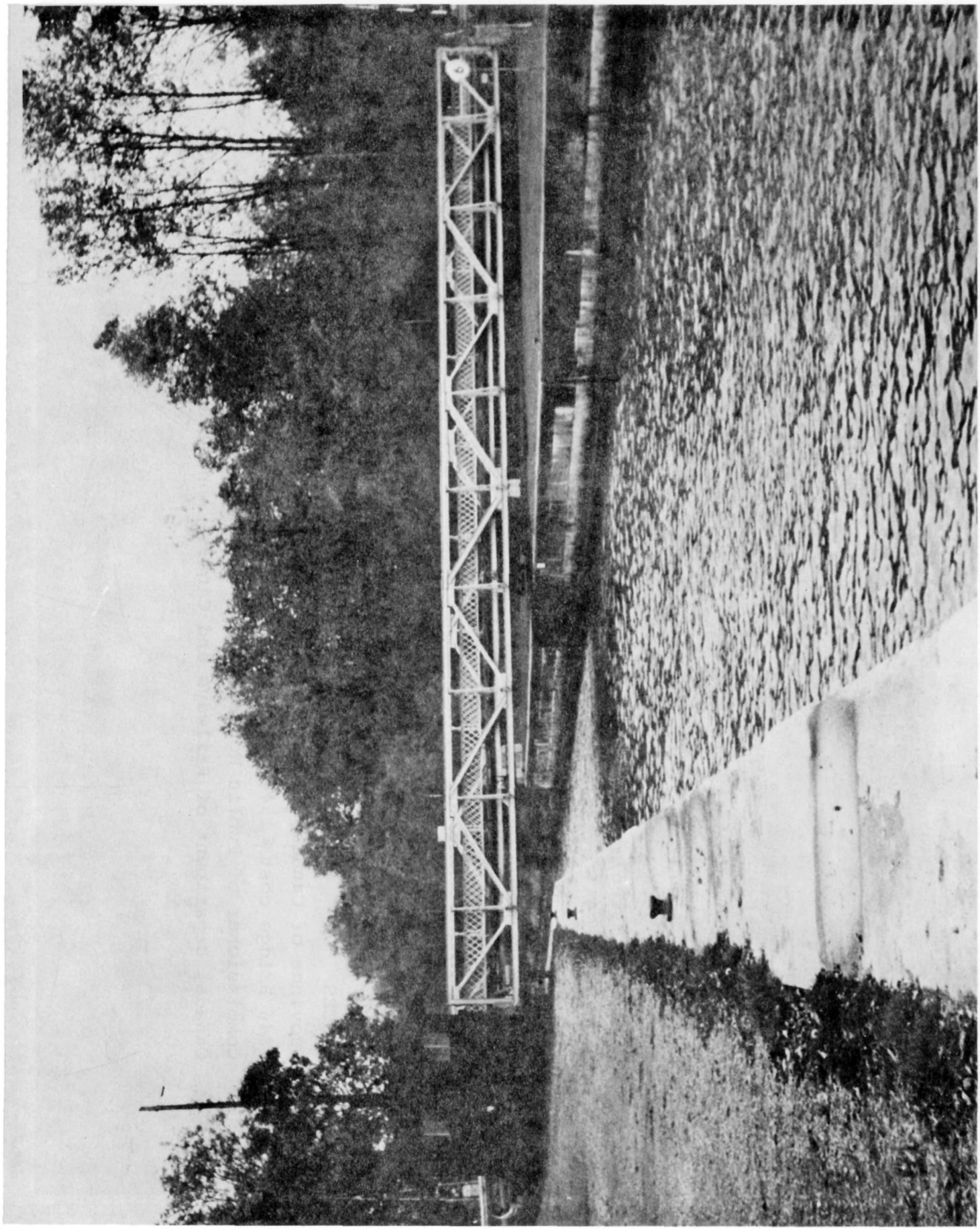
Fixed Spans	none
Form	
Material	
Length	
Movable Type	equal arm
Form	pony truss
Material	steel
Length	133'-0"
Power	electrical

SUBSTRUCTURE

Form

NOTES

1. This bridge is identical to the original bridges at 43, 44, 46 and 47.



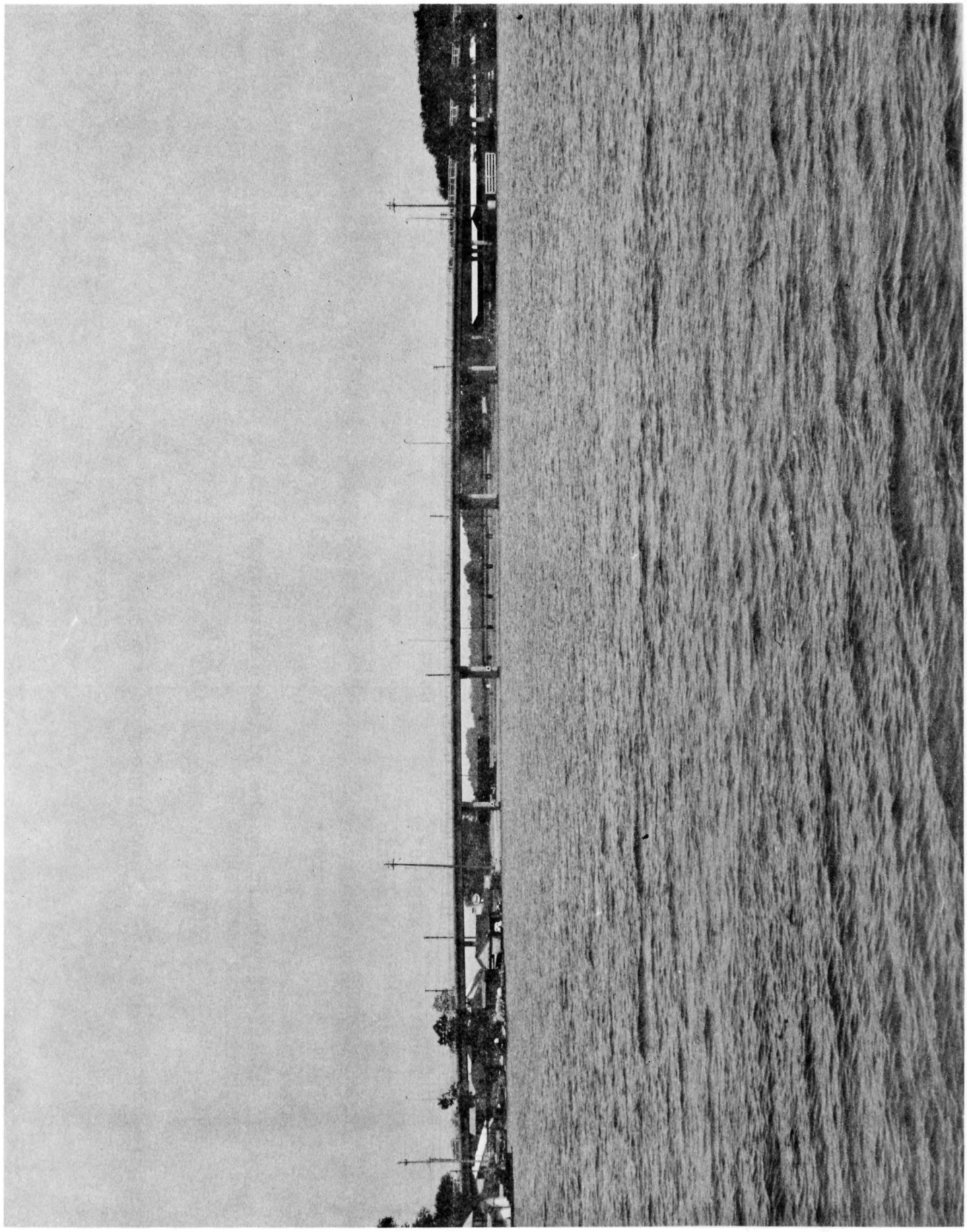
Canal Crossing Number 51

Location 197.57 Name Atherley Route Highway 12

DATE	1964	1926	1856	1846
SUPERSTRUCTURE	high level			
Fixed Spans	11	4		
Form	deck plate girder	bow string arch		
Material	steel	concrete		
Length	394' overall	overall 238'		
Movable Type		unequal arm		
Form		pony truss		
Material		steel		
Length		156'-4"		
Power		electric		
SUBSTRUCTURE				
Form	concrete	concrete		

REFERENCES

1. Province of Canada, Legislative Assembly, Journals and Appendixes, 1846 Bridge cost £1544.
2. Commissioner of Public Works Annual Report 1856, p. 19, bridge rebuilt.
3. Canada, Department of Railways and Canals, Annual Report 1925-26, p. 108.



Canal Crossing Number 52

Location 197.66 Name Atherley Route C.N.R.

DATE	1920	1912	1874
SUPERSTRUCTURE			
Fixed Spans	13	13	
Form	beam	trestle	
Material	steel	wood	wood
Length	272' overall	172' overall	
Movable Type	equal arm	swing	
Form	half plate girder		
Material	steel		wood
Length	148'-0"		
Power	electric		
SUBSTRUCTURE			
Form	concrete		

NOTES

1. Originally built by the Northern Extension Railway Company.

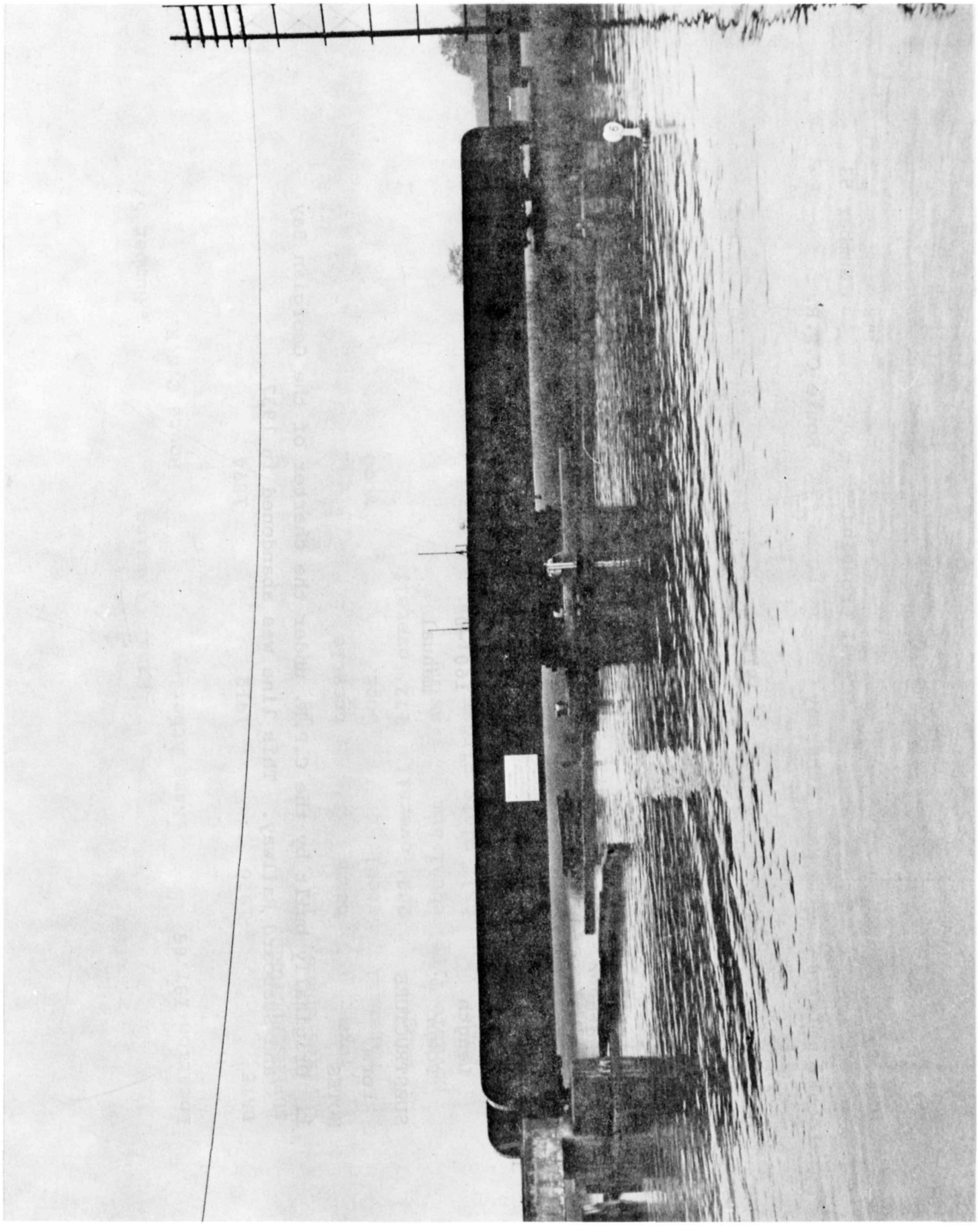
Canal Crossing Number 53

Location 197.8 Name Atherley Route C.P.R.

DATE	1937	1910
SUPERSTRUCTURE	demolished	
Fixed Spans		1
Form		deck girder
Material		steel
Length		40'
Movable Type		equal arm
Form		half deck girder
Material		steel
Length		160'-0"
Power		manual
SUBSTRUCTURE		
Form		

NOTES

1. Originally built by the C.P.R. under the charter of the Georgian Bay and Seaboard Railway. This line was abandoned in 1937.



Canal Crossing Number 54

Location 208.27 Name Washago Route Highway 11 (Muskoka Road)

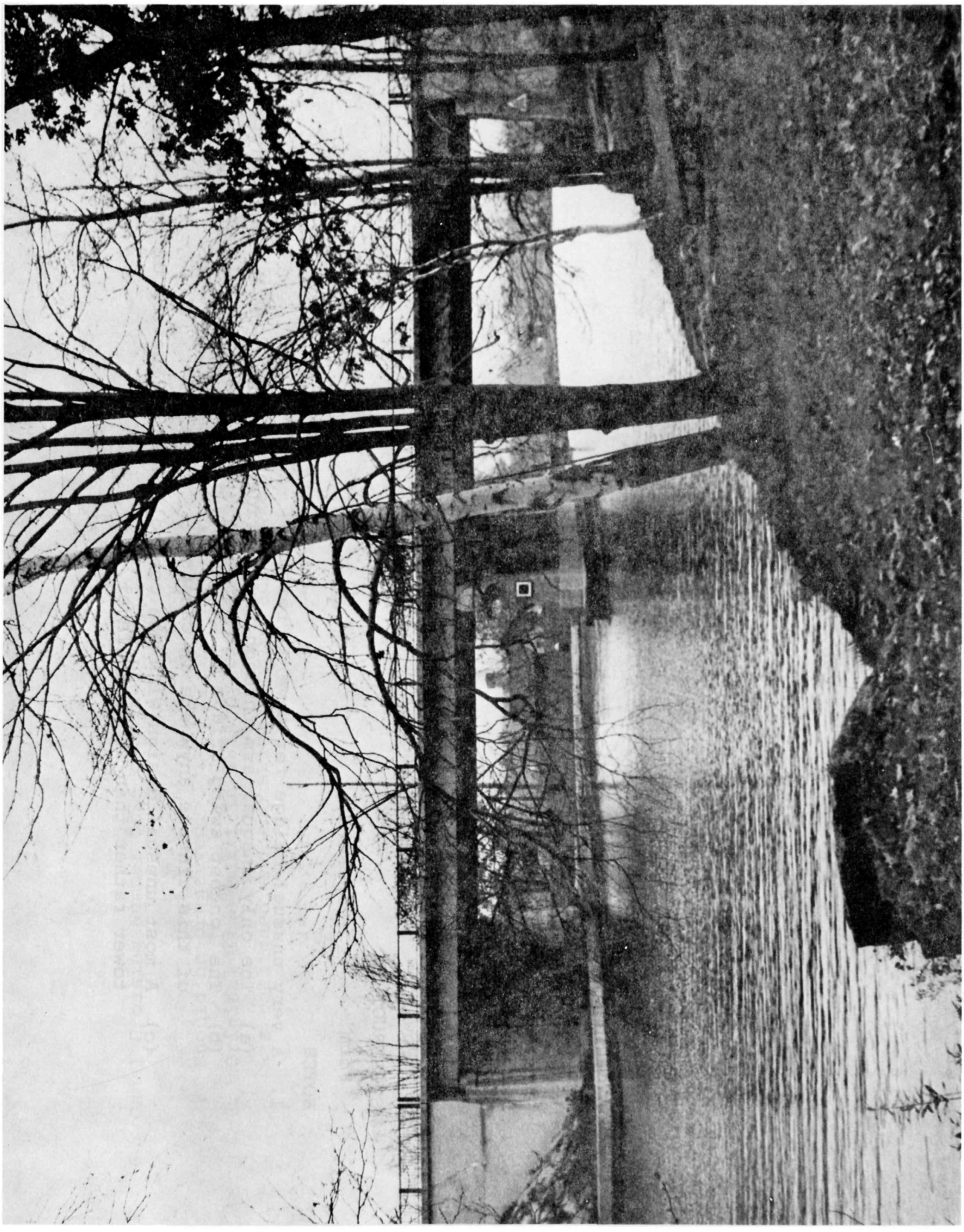
DATE	1966	1954	1915
SUPERSTRUCTURE	high level 4 lane	high level 2 lane	
Fixed Spans	2		
Form	deck plate girder		
Material	steel		
Length			
Movable Type			equal arm
Form			through truss
Material			steel
Length			200'-0"
Power			manual
SUBSTRUCTURE			
Form	concrete	concrete	concrete

REFERENCES

1. Canada, Sessional Papers, 1916, Vol XLX, No 11, Paper 17, p. 202.
2. Canada, Department of Transport, Annual Report 1954-55, p. 63.

NOTES

1. Between the years 1857-64 the Muskoka Colonization Road was started at the north end of Lake Couchiching. There may have been a bridge built at that time.



Canal Crossing Number 55

Location 209.14 Name Washago Route C.N.R.

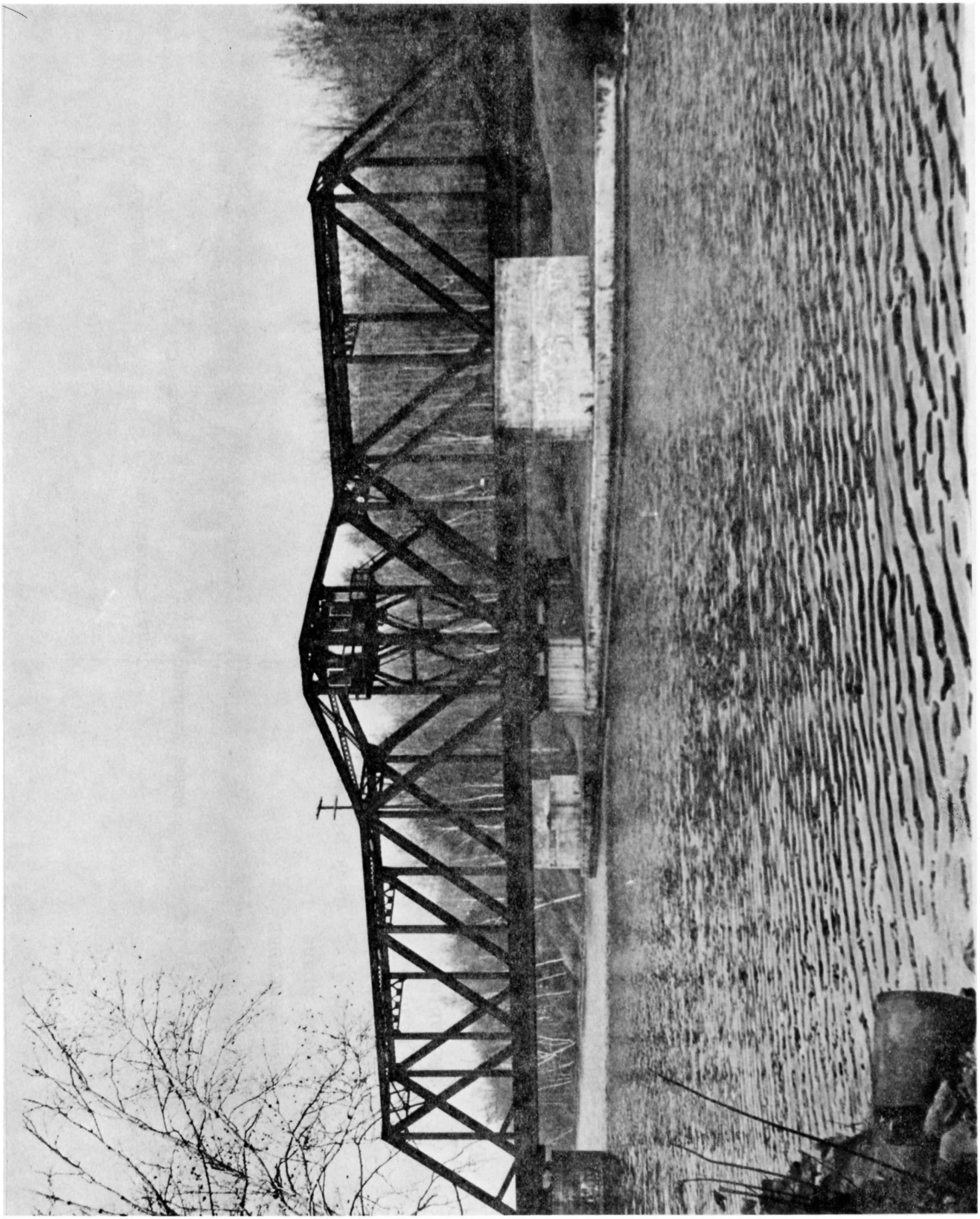
DATE	1919
SUPERSTRUCTURE	
Fixed Spans	1
Form	deck plate girder
Material	steel
Length	52'-6"
Movable Type	unequal arm
Form	through truss
Material	steel
Length	246'-1"
Power	gas engine
SUBSTRUCTURE	
Form	concrete

NOTES

1. A very unusual bridge for several reasons:
   (a) The only unequal arm through truss bridge remaining on the waterway;
   (b) The longest swing bridge on the system and perhaps one of the longest of this vintage anywhere in Canada;
   (c) A most unusual design with the control cabin at the top of the central tower rather than at track level.

Canal Crossing Number 55 - continued

2. Should be preserved.
3. Original line built in 1874 by the James Bay Railway in 1903-05. The line was realigned and the swing section added when the canal was built.



Canal Crossing Number 56

Location 209.90 Name Couchiching Lock Route County Road

DATE	1931	1919
SUPERSTRUCTURE	high level	high level
Fixed Spans	1	
Form	half plate girder	truss
Material	steel	wood
Length	59'-0"	
Movable Type		
Form		
Material		
Length		
Power		
SUBSTRUCTURE		
Form	concrete	concrete

REFERENCES

1. Canada, Department of Railways and Canals, Annual Report 1931-32, p. 89.

Canal Crossing Number 57

Location 212.73 Name Hamlet Route County Road

DATE 1922

SUPERSTRUCTURE

Fixed Spans 1

Form through truss

Material steel

Length 103'-0"

Movable Type equal arm

Form through truss

Material steel

Length 200'-0"

Power manual/electric

SUBSTRUCTURE

Form concrete

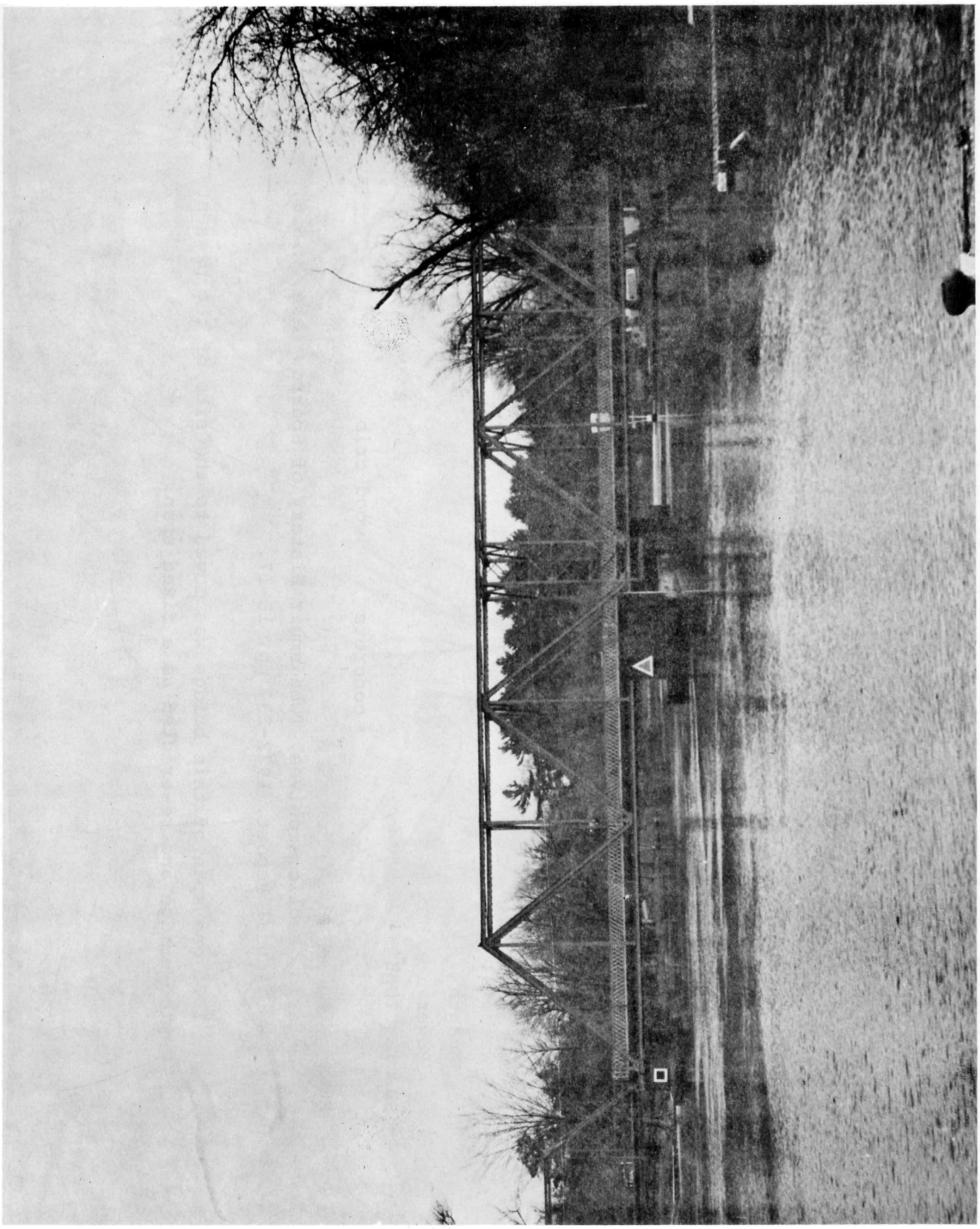
REFERENCES

1. Canada, Sessional Papers, 1923, Vol LIX, No 6, Paper 32, p. 154.

2. Canada, Sessional Papers, 1924, Vol LX, No 6, Paper 32, p. 151.

NOTES

1. In the pre-canal period there were several generations of bridges crossing the Severn River at a site 2,000 yards north of the present site. In 1922 one span of the old bridge was moved to the new site and used as the fixed span. This fixed span is the only pin-connected through truss span in full use on the waterway.



Canal Crossing Number 57A

Location 213.2 Name Hamlet Route Local Road

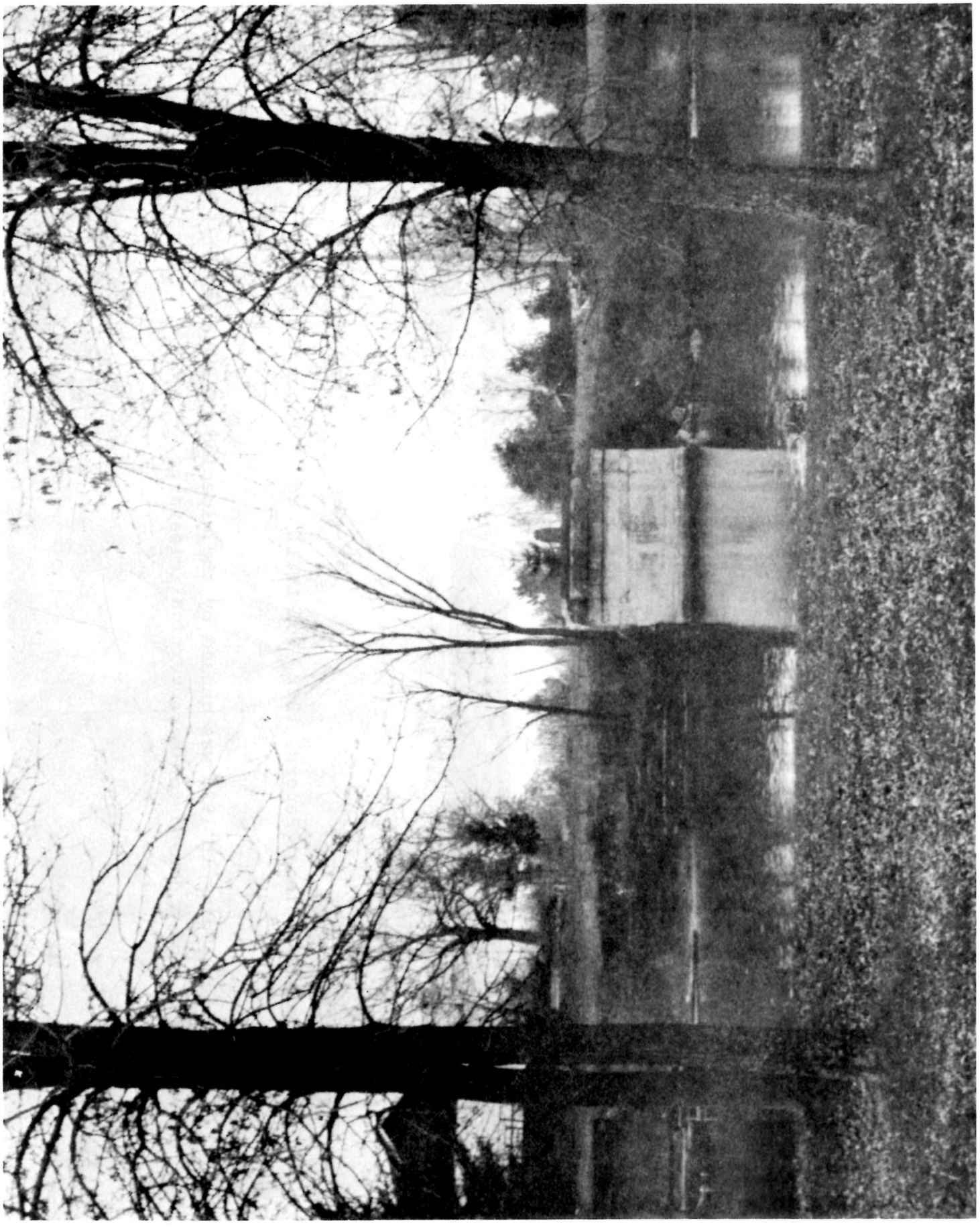
DATE	1922	1905	1882
SUPERSTRUCTURE	Demolished		
Fixed Spans			
Form		truss	
Material		steel	wood
Length		250'-0"	
Movable Type			
Form			
Material			
Length			
Power			
SUBSTRUCTURE			
Form		concrete	wood crib

REFERENCES

1. Ontario, Public Archives, Tweedsmuir History of Sparrow Lake, M.S.8, Reel 64.
2. TSWO, Annual Report, 1922-23, pp. 13-17.

NOTES

1. In 1922 one span of this bridge was moved to the site of the present Hamlet bridge and re-erected as a fixed span.



Canal Crossing Number 58

Location 222.40 Name Hydro Glen (Ragged Rapids) Route C.N.R.

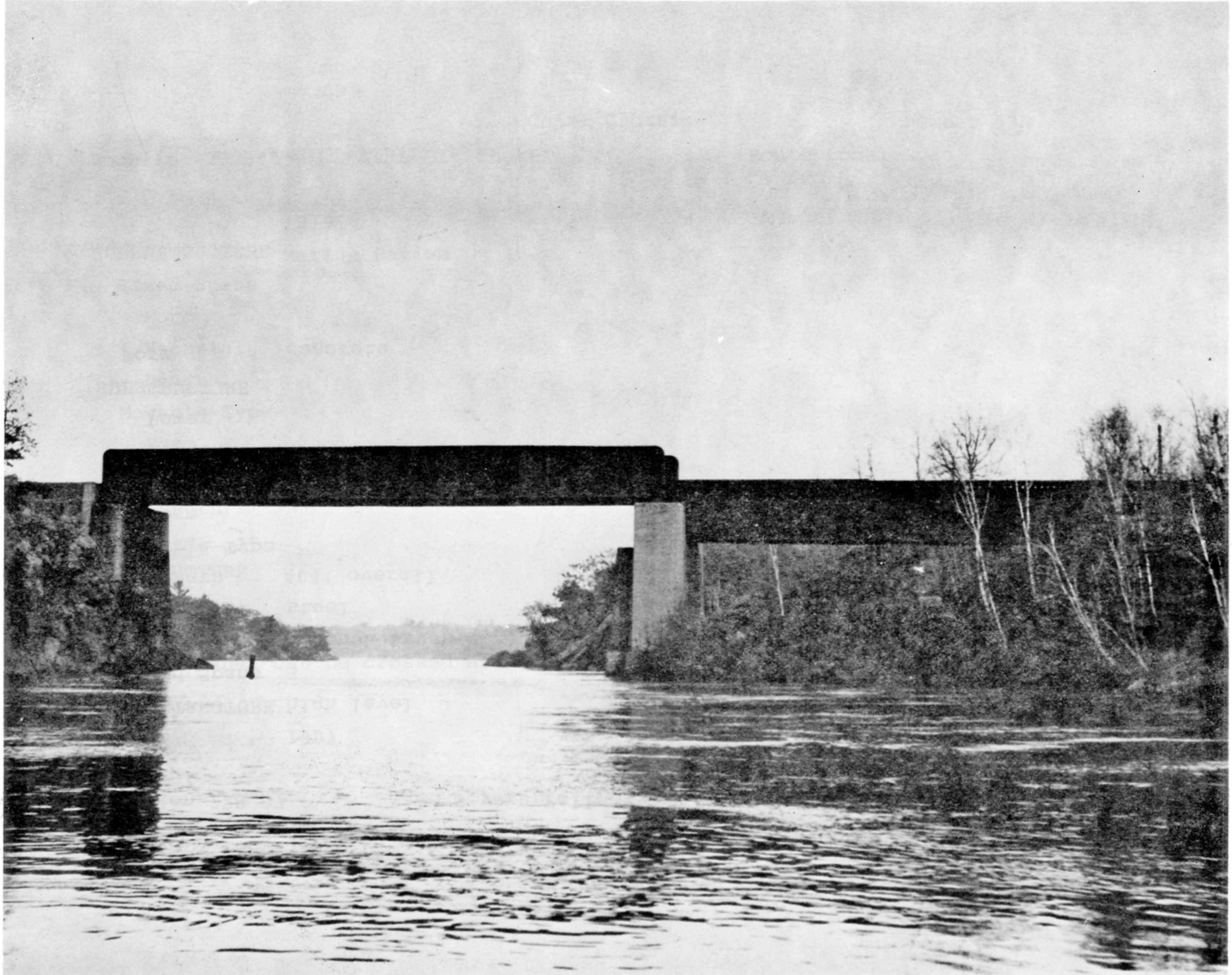
DATE	1920	1907
SUPERSTRUCTURE	high level	high level
Fixed Spans	2	3
Form	half plate girder	deck plate girder
Material	steel	steel
Length	123' overall	main 105'-0"
Movable Type		
Form		
Material		
Length		
Power		
SUBSTRUCTURE		
Form		

REFERENCES

1. Canada, Sessional Papers, 1922, Vol LVIII, No 6, Paper 20, p. 89.

NOTES

1. The rebuilding in 1920 was caused by the widening of the channel for the canal, and a demand for more vertical clearance.



Canal Crossing Number 59

Location 228.07 Name Severn Falls Route C.P.R.

DATE	1907
SUPERSTRUCTURE	high level
Fixed Spans	3
Form	through truss
Material	steel
Length	404' overall
Movable Type	
Form	
Material	
Length	
Power	
SUBSTRUCTURE	
Form	concrete

Canal Crossing Number 59A

Location 232.45 Name Big Chute Route Local Road

DATE 1919

SUPERSTRUCTURE Marine Railway

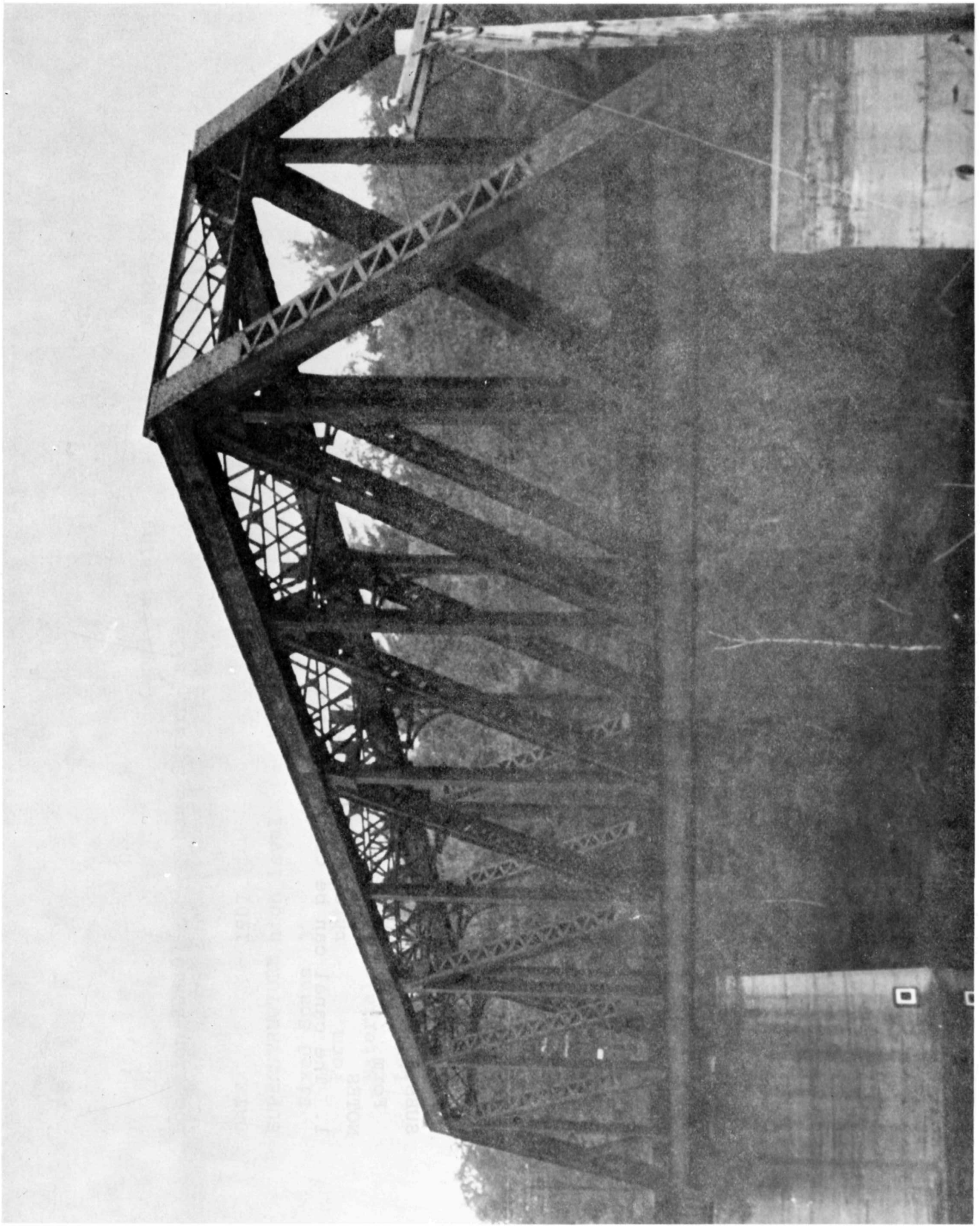
- Fixed Spans
  - Form
  - Material
  - Length
- Movable Type
  - Form
  - Material
  - Length
  - Power

SUBSTRUCTURE

- Form

NOTES

1. The canal can be crossed at the Marine Railway.



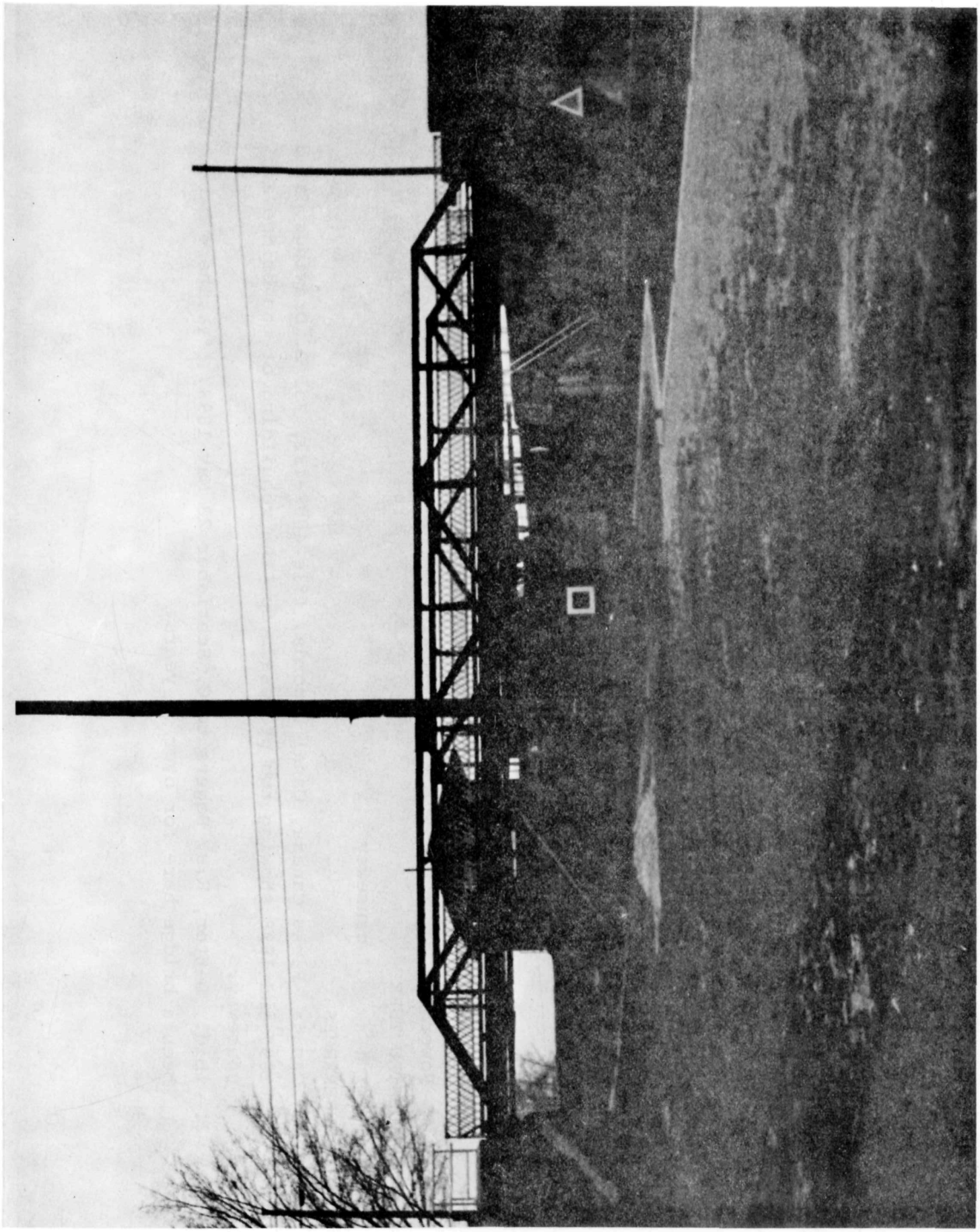
Canal Crossing Number 60

Location 240.55 Name Port Severn Route County Road

DATE	1915
SUPERSTRUCTURE	
Fixed Spans	none
Form	
Material	
Length	
Movable Type	equal arm
Form	pony truss
Material	steel
Length	94'-0"
Power	manual
SUBSTRUCTURE	
Form	concrete

REFERENCES

1. Canada, Sessional Papers, 1917, Vol LII, No 11, Paper 20, p. 132.



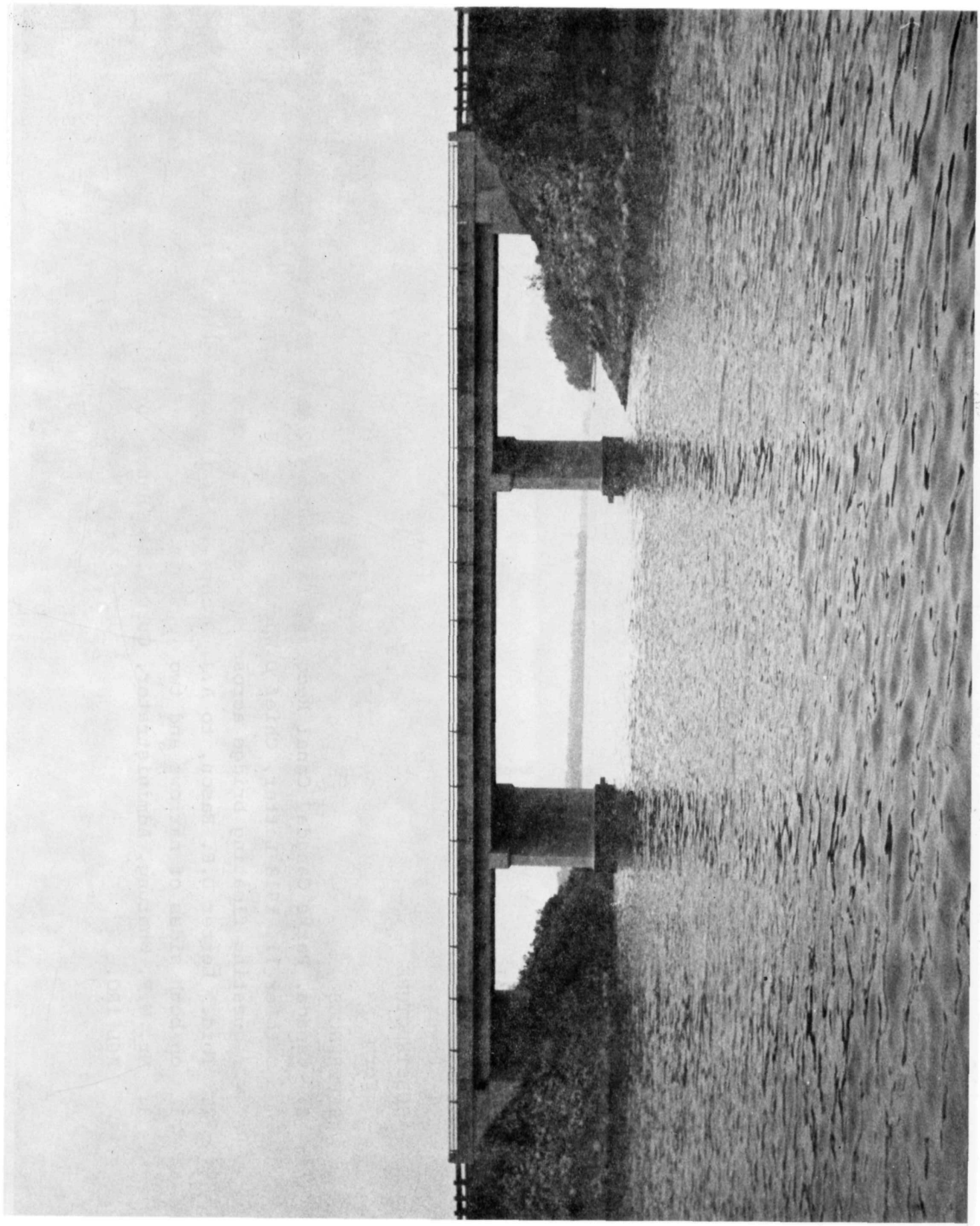
Canal Crossing Number 61

Location 132.68 Name Chemung Lake Route County Road

DATE	1972	1901	1869
SUPERSTRUCTURE	high level		
Fixed Spans	3 plus causeway		
Form	beam	floating	floating
Material	concrete	wood	wood
Length	2628' overall	overall 2628'	
Movable Type		swing	swing
Form		floating	
Material		wood	
Length		74'-6"	
Power		manual	
SUBSTRUCTURE			
Form	causeway		

REFERENCES

1. Canada, Parks Canada, Canal Records, file 4052-432, Vol 2. Drawings dated 1897 and 1898 showing two proposals for the rebuilding of the bridge and causeway.
2. Ibid. Letter, R.B. Rogers to C. Schrieber 23 May 1898. "...There has been a bridge here for over 30 years."



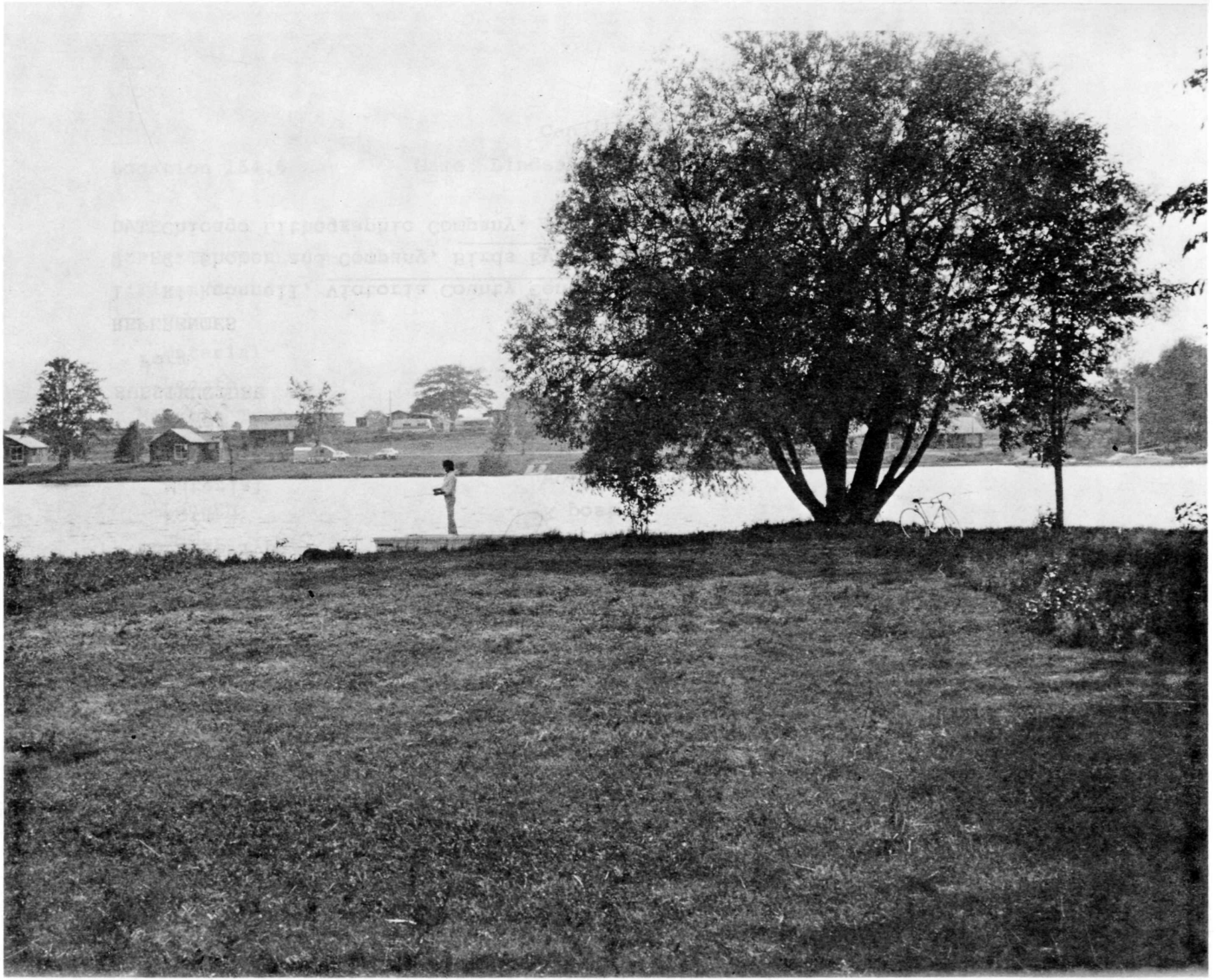
Canal Crossing Number 61A

Location 128.0 Name Harrington's Narrows Route Local Road

DATE	1926	pre 1900
SUPERSTRUCTURE	Ferry	
Fixed Spans		
Form		
Material		
Length		
Movable Type		
Form		
Material		
Length		
Power		
SUBSTRUCTURE		
Form		

REFERENCES

1. Canada, Parks Canada, Canal Records, file 4052-432, Vol 2, Letter, October 11, 1913 Letter, Chief D.Whetung Snr. to J.H. Burnham M.P. requesting floating bridge across the narrows to replace the ferry.
2. Ibid. Letter D.E. Eason, to A.J. Grant, 1914, includes photos of docks on both sides of narrows and two log rafts.
3. Mr. W.F. Whetung, Administrator, Curve Lake Band, Curve Lake, Ontario, K0L 1R0.



Canal Crossing Number 64A

Location 155.9 Name Lindsay Route Midland Railway

DATE	1887	1870
SUPERSTRUCTURE	demolished	
Fixed Spans		
Form		
Material		
Length		
Movable Type		swing
Form		K post
Material		wood
Length		
Power		
SUBSTRUCTURE		
Form		

REFERENCES

1. Kirkconnell, Victoria County Centennial History, Lindsay 1921, pp. 146-151.
2. C. Shober and Company, Birds Eye View of Lindsay, Ontario, Canada, 1875, Chicago Lithographic Company.

Canal Crossing Number 64

Location 154.6 Name Lindsay Route C.P.R.

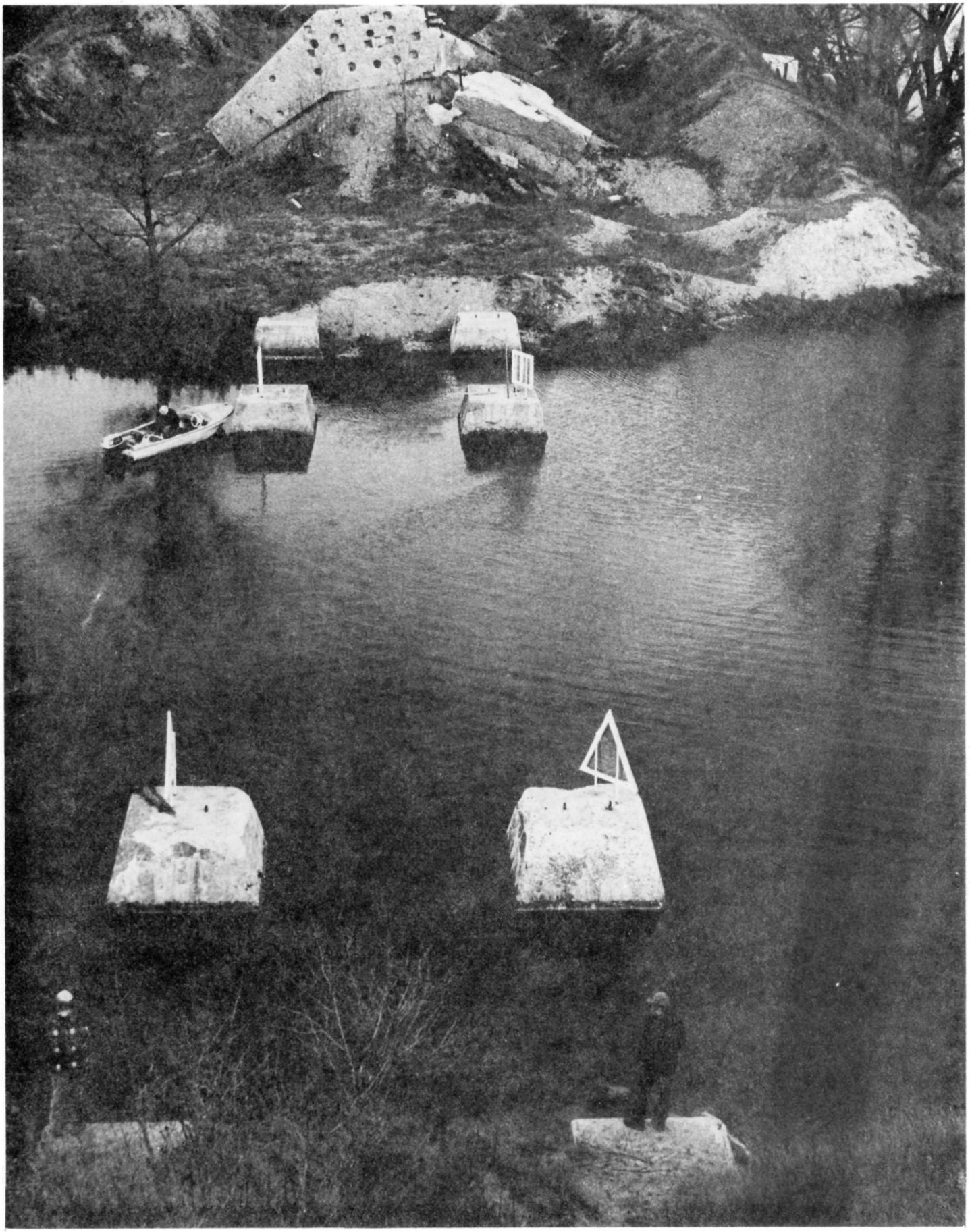
DATE	1937	1914
SUPERSTRUCTURE	demolished	high level
Fixed Spans		5
Form		deck plate girder
Material		steel
Length		274' overall
Movable Type		
Form		
Material		
Length		
Power		
SUBSTRUCTURE		
Form		masonry

REFERENCES

1. Carr, R.N., Land of Plenty, John Deyell, Lindsay, 1968, p. 48.

NOTES

1. Built by the C.P.R. under the Charter of the Georgian Bay and Seaboard Railway.



Canal Crossing

Location 156.19 Name Lindsay Route Wellington Street Number 65

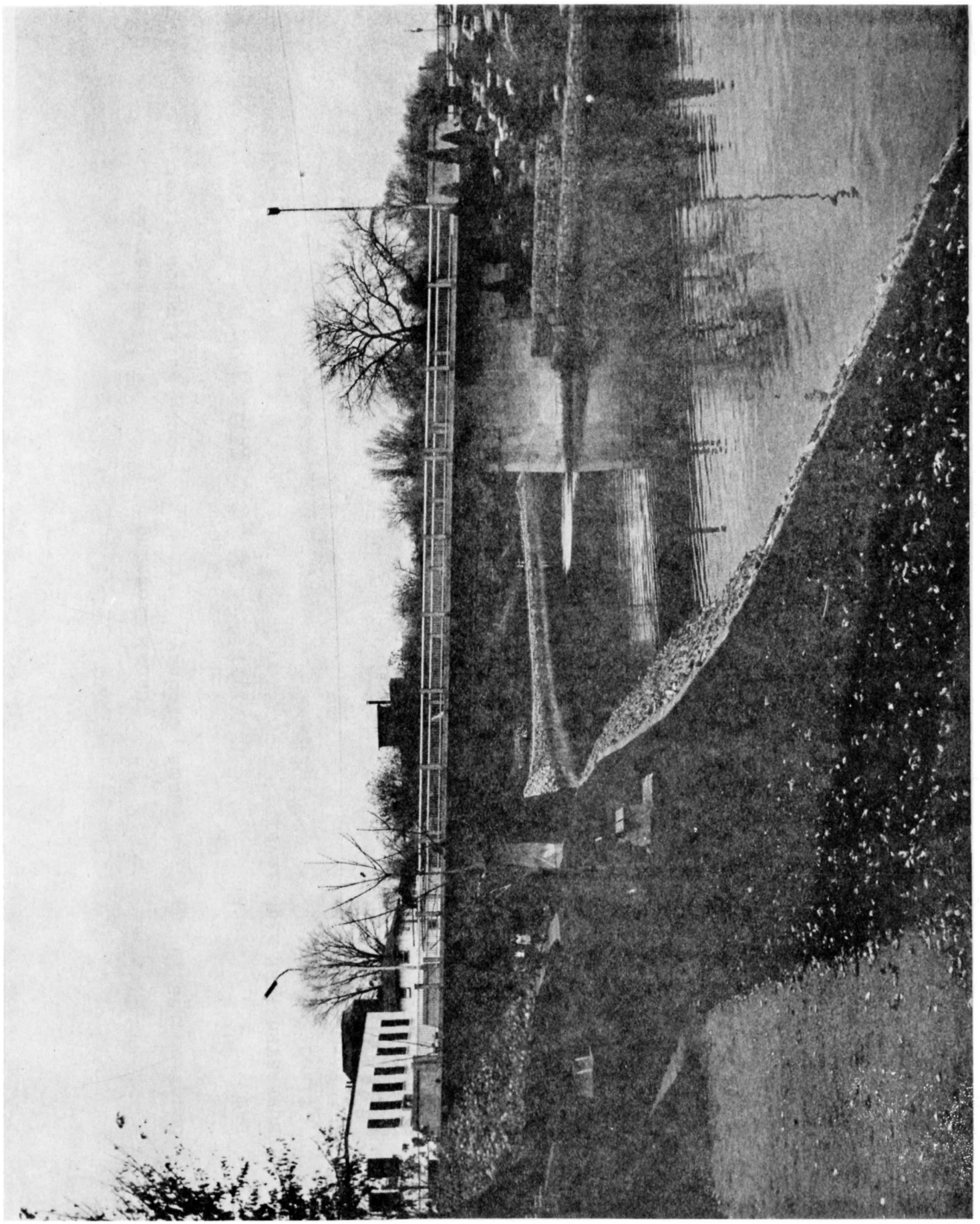
DATE	1965	1911	1871	1861
SUPERSTRUCTURE	high level			
Fixed Spans	1			
Form	beam			
Material	concrete			
Length				
Movable Type		Bascule	Swing	
Form		Strauss	K post	
Material		steel	wood	
Length		96'-6"		
Power		electric		
SUBSTRUCTURE				
Form	concrete	concrete		

REFERENCES

1. Ontario, Public Archives, Municipal Documents, Victoria County, Journal of Proceedings and Bylaws, June 1869 - $200 voted for new Wellington Street Bridge.
2. Canada, Sessional Papers, 1912, Vol XLVI, No 13, Paper 20, Part VII, p. 39.
3. Canada, Department of Transport, Annual Report, 1965-66 p. 35.
4. Canada, Parks Canada, Canal Records, file 4052-514, Vol I letter J.W. Dunsford to Chief Commissioner of Public Works, 6 July 1861.

NOTES

1. This was the first bascule bridge to put into operation in Canada. Letter, J.B. Strauss to A.J. Grant, May 1, 1911, File 460 TSWO.



Canal Crossing Number 66

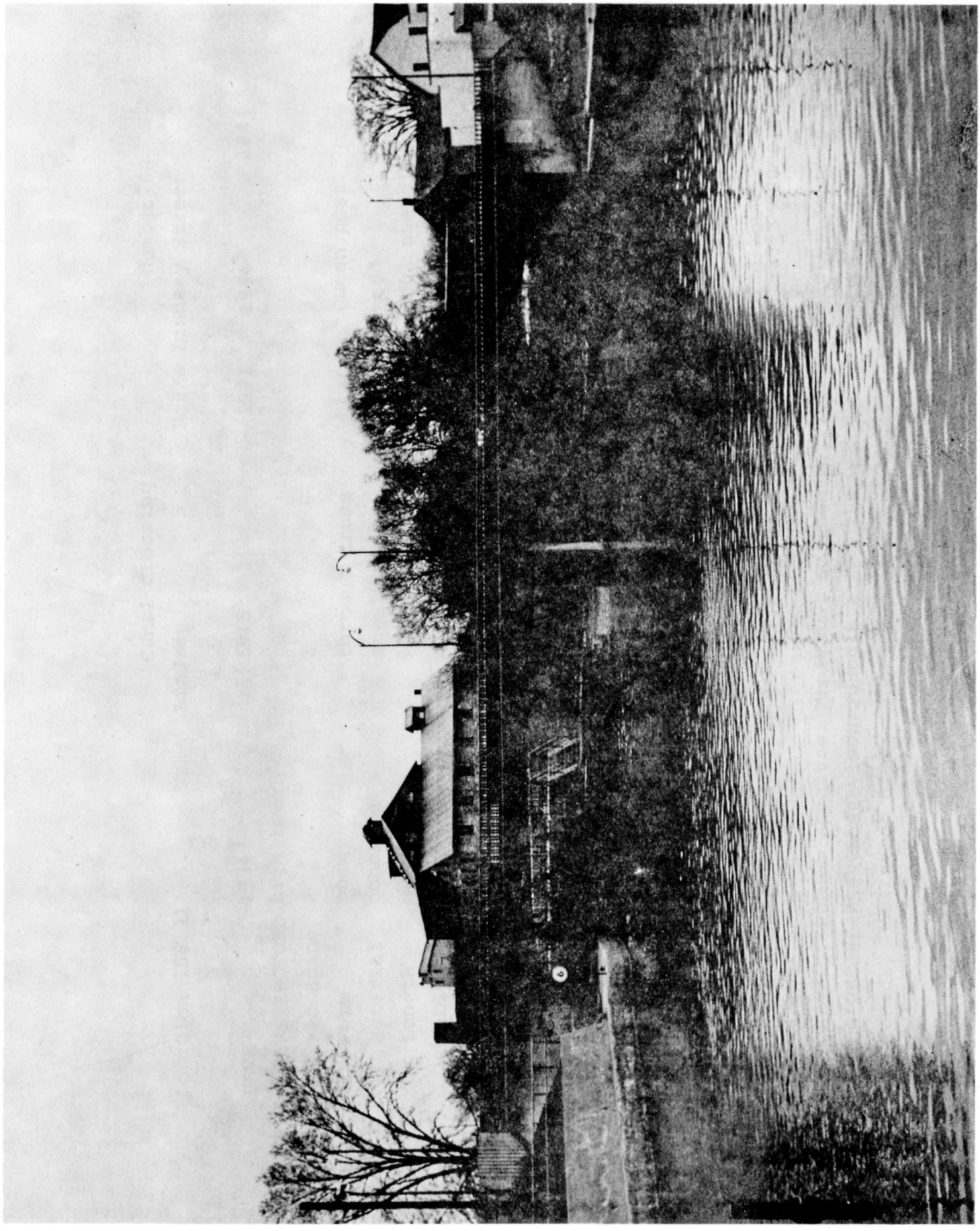
Location 156.31 Name Lindsay Route Lindsay Street

DATE	1954	1915	1871	1864	1844
SUPERSTRUCTURE	high level				
Fixed Spans	2	2		3	
Form	beam	through truss		Queen post	
Material	concrete	steel		wood	
Length		102'-0"overall		200' overall	
Movable Type		unequal arm	swing		
Form		through truss	K post		
Material		steel	wood		
Length		95'-0"			
Power		manual			
SUBSTRUCTURE					
Form	concrete	masonry			

REFERENCES

1. Canada, Sessional Papers, 1911, Vol XLV, No 12, Paper 20, p. 288.
2. Kirkconnell, W., Victoria County Centennial History, Lindsay 1921, p. 96.
3. Province of Canada West, Report of the Commissioner of Public Works 1851-62.
4. Ontario, Public Archives, Municipal Documents, Victoria County, Journal of Proceedings and Bylaws June 1876, p. 218.
5. Canada, Department of Transport, Annual Report, 1953-54, p. 58.

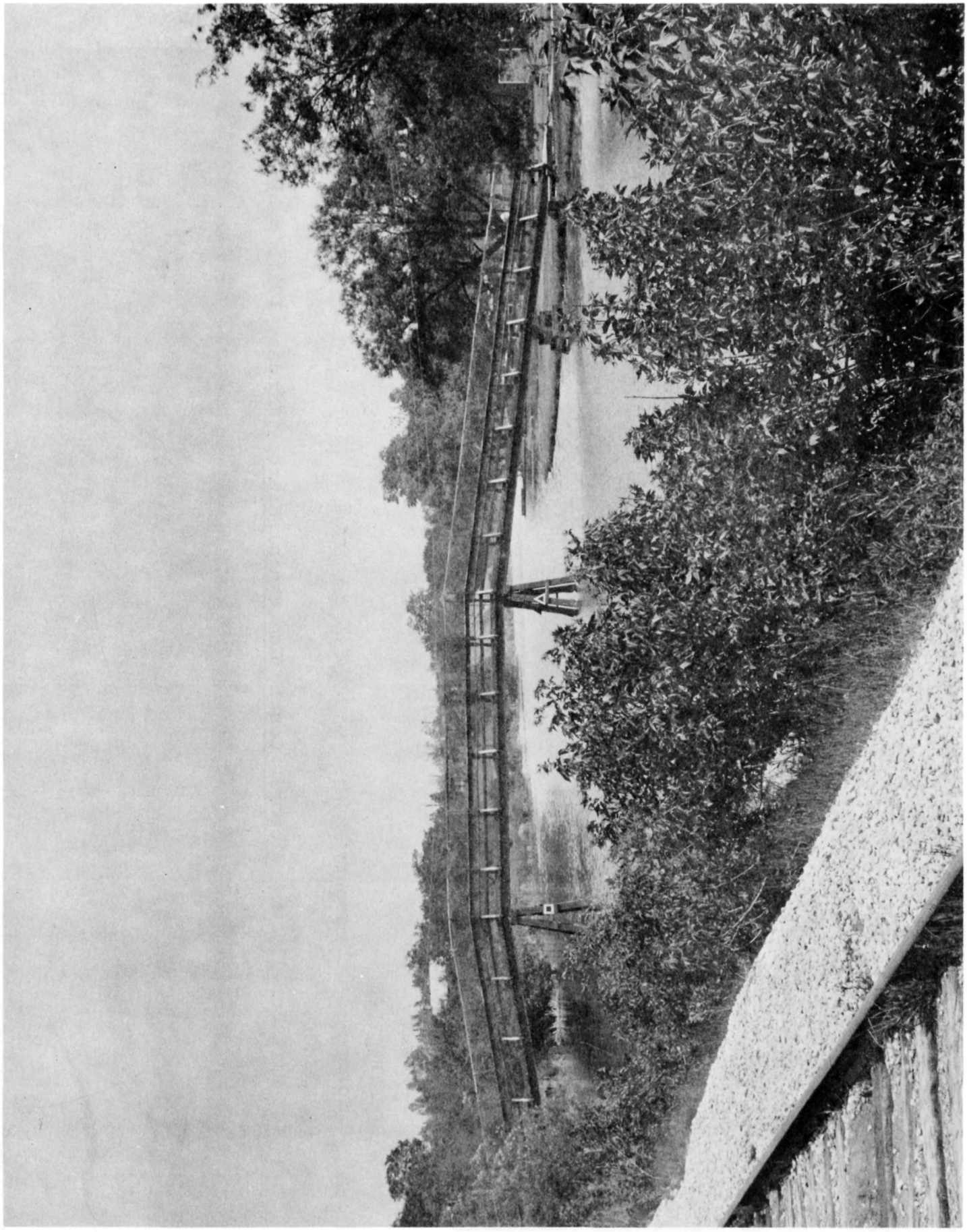
6. Canada, Public Archives, Photo collection, C-20046 photo 331-33-2-000-0125, no date, shows wooden swing bridge with King post truss.
7. C. Shober and Co., Birds Eye View of Lindsay, Ontario, Canada 1875, Chicago Lithographic Company.



Canal Crossing Number 66A

Location 156.8 Name Lindsay Route Footbridge

DATE	1946
SUPERSTRUCTURE	high level
Fixed Spans	3
Form	beam
Material	steel and wood
Length	
Movable Type	
Form	
Material	
Length	
Power	
SUBSTRUCTURE	
Form	wood



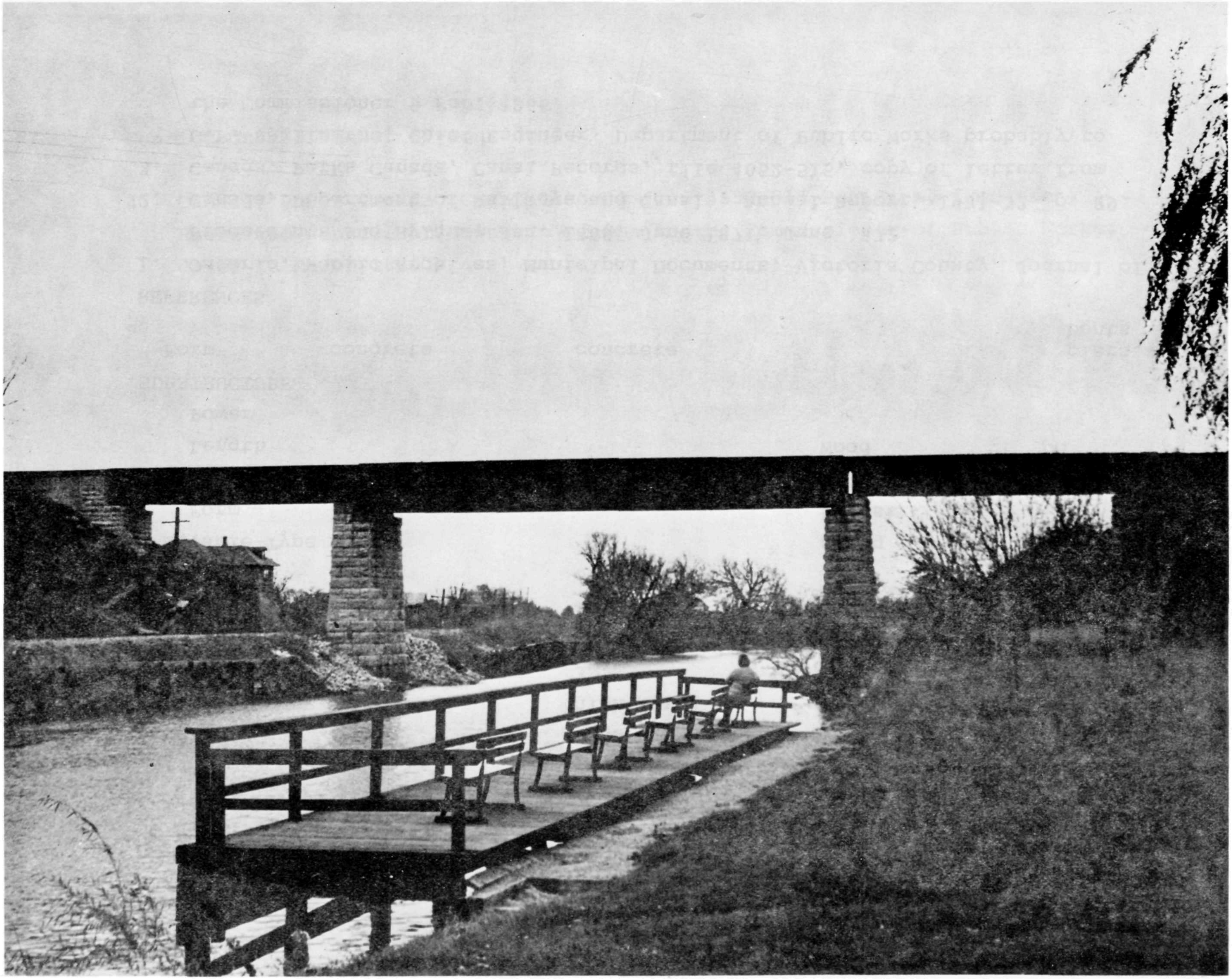
Canal Crossing Number 67

Location 157.2 Name Lindsay Route C.N.R.

DATE	1916	1901	1883
SUPERSTRUCTURE	high level	high level	high level
Fixed Spans	3		
Form	deck plate girder	through girder	
Material	steel	steel	steel
Length	180' overall		
Movable Type			
Form			
Material			
Length			
Power			
SUBSTRUCTURE			
Form	masonry		

REFERENCES

1. Kirkconnell, W., Victoria County Centennial History Lindsay 1921, p. 151.



Canal Crossing Number 68

Location 157.87 Name Ops Route Highway 7B

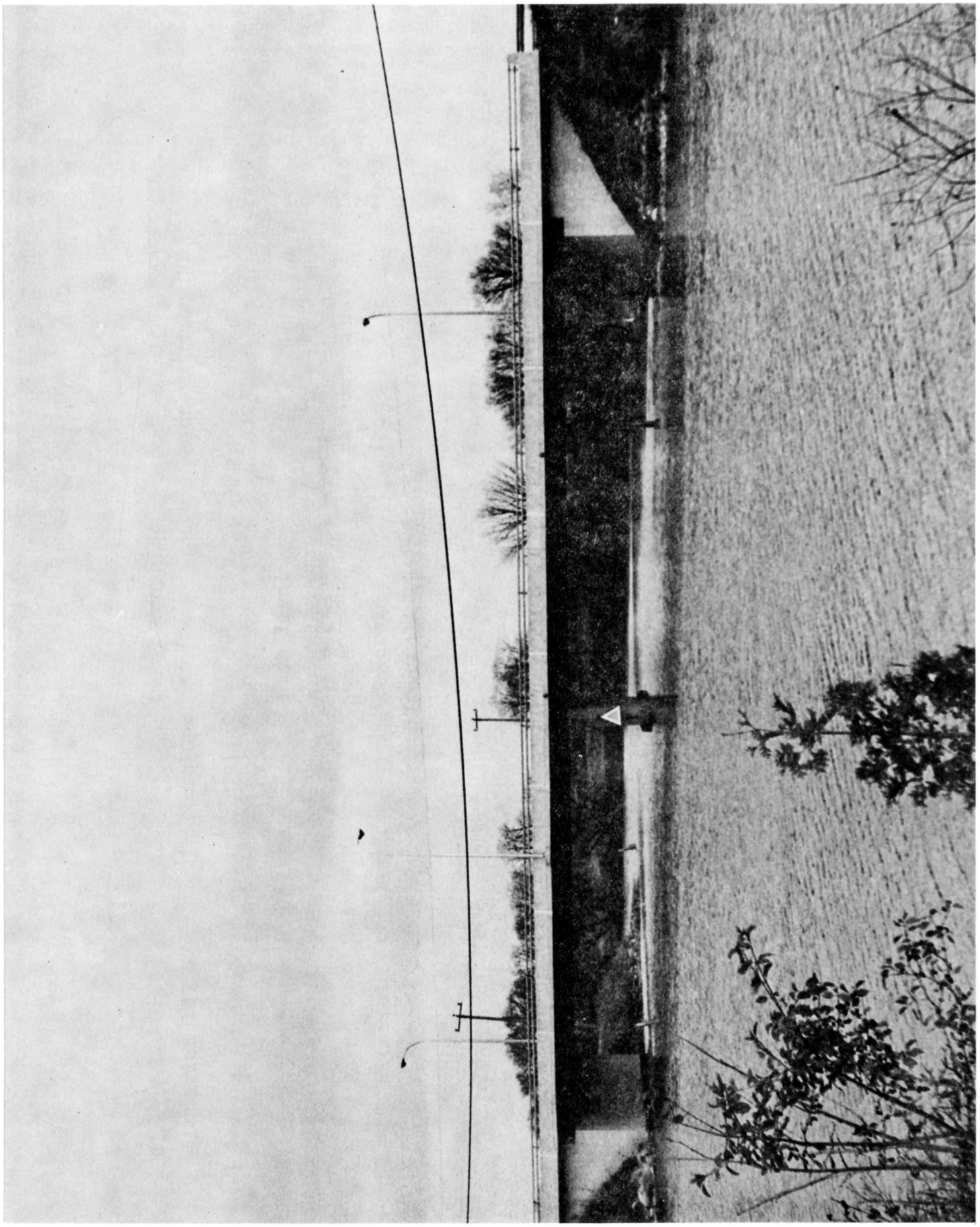
DATE	1969	1932	1872	1860
SUPERSTRUCTURE	high level	high level		
Fixed Spans	2	3	1	
Form	beam	arch	through truss	beam
Material	concrete	concrete	iron	wood
Length		overall 164'-2"		
Movable Type			swing	
Form			K post	
Material			Howe	
Length			Wood	
Power				
SUBSTRUCTURE				
Form	concrete	concrete		piers & bents

REFERENCES

1. Ontario, Public Archives, Municipal Documents, Victoria County, Journal of Proceedings and Bylaws, Jan. 1869, June 1871, June 1872.
2. Canada, Department of Railways and Canals, Annual Report, 1931-32, p. 89.
3. Canada, Parks Canada, Canal Records, file 4052-515, copy of letter from G.F. Baillairge, Chief Engineer, Department of Public Works probably to the Commissioner 9 Feb. 1866.

Canal Crossing Number 68-continued

4. Canada, Parks Canada, Canal Records file 4052-515 Petition, from the Reeve and Council of Township of Ops to the Commissioner of Public Works, dated 13 March 1869.



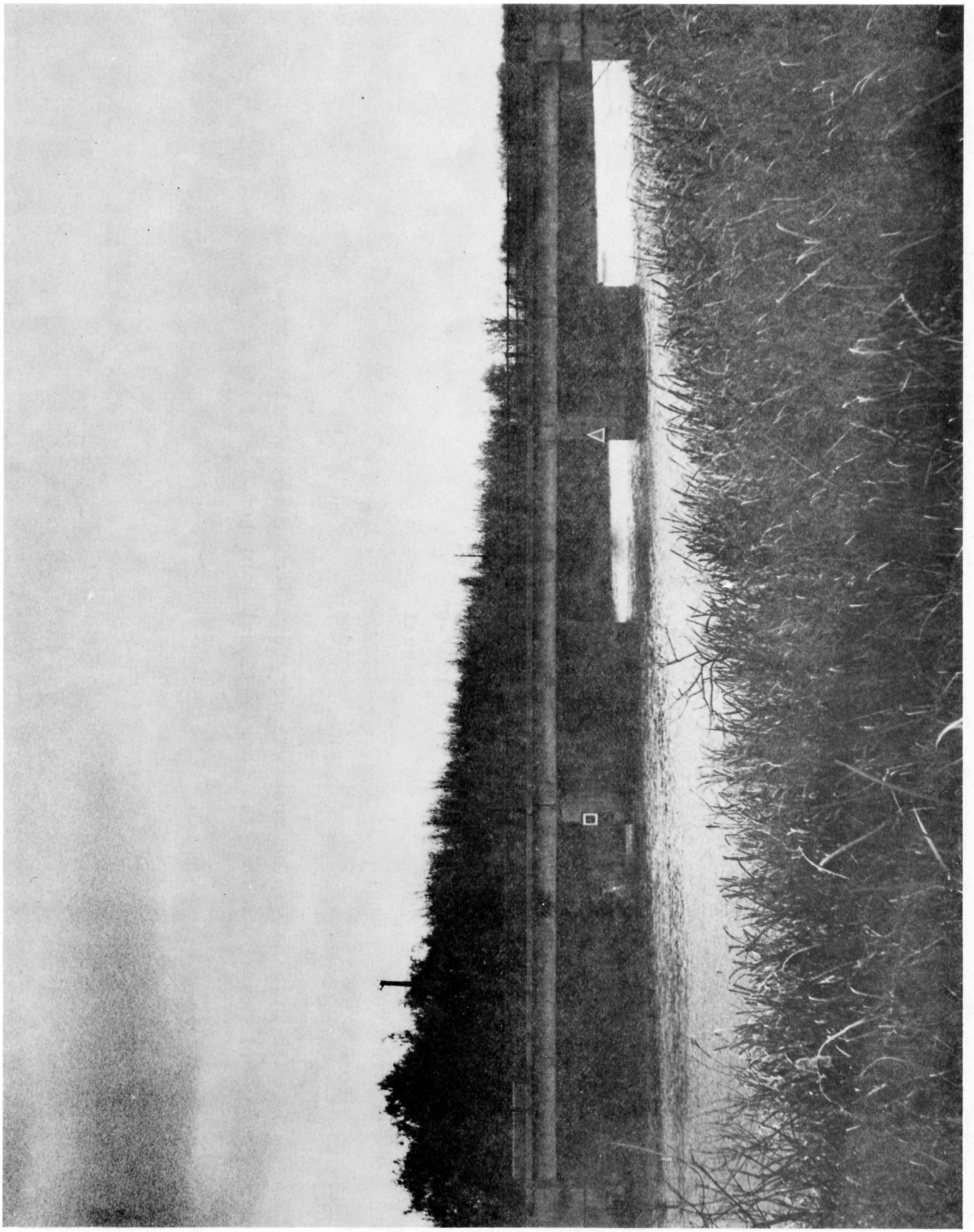
Canal Crossing Number 68A

Location 157.95 Name Ops (Ambrose's Bridge) Route Highway 7

DATE	1958	ca. 1870	ca. 1860
SUPERSTRUCTURE	high level	demolished	low level
Fixed Spans	3		
Form	deck plate girder		
Material	steel		wood
Length			
Movable Type			
Form			
Material			
Length			
Power			
SUBSTRUCTURE			
Form	concrete		

REFERENCES

1. Kirkconnell, W., Victoria County Centennial History, Lindsay 1921, p. 38. Refers to this bridge as "Ambrose's Bridge".
2. Ontario, Public Archives, Municipal Documents, Victoria County, Journal of Proceedings and Bylaws, June 1872.
3. Canada, Parks Canada, Canal Records, file 4052-515, copy of letter from G.F. Baillairge, Chief Engineer probably to the Commissioner of Public Works dated 9 Feb 1866.



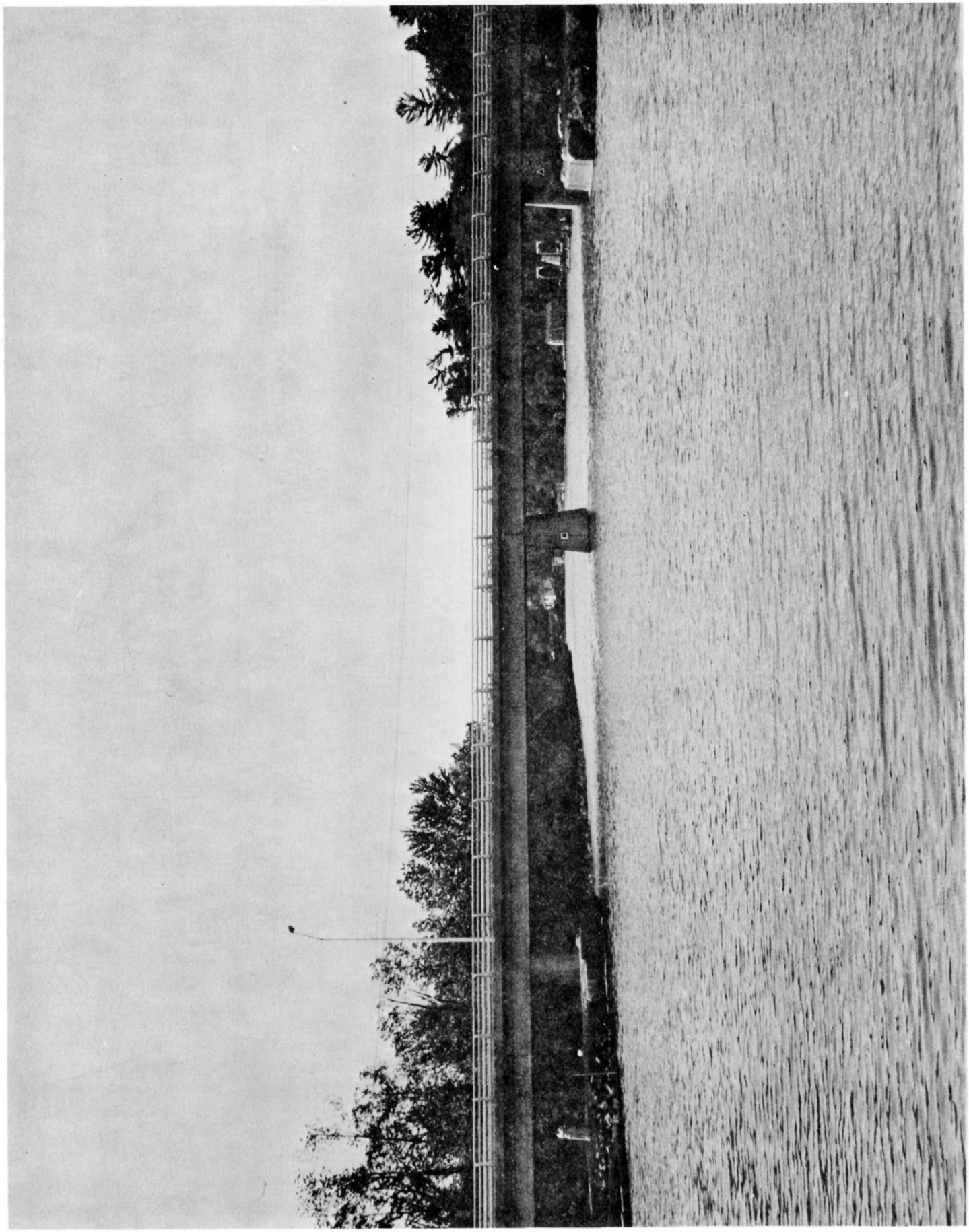
Canal Crossing Number H1

Location Name Holland Landing Route Queensville Road

DATE	1972	1907-08
SUPERSTRUCTURE		high level
Fixed Spans	2	12
Form	pile bent	beam
Material	approach	concrete
Length		
Movable Type		equal arm
Form		pony truss
Material		steel
Length		120'-0"
Power		manual
SUBSTRUCTURE		
Form		concrete

NOTES

1. The original swing span was very similar to the 5 Talbot River bridges but never swung as the Canal was not finished.

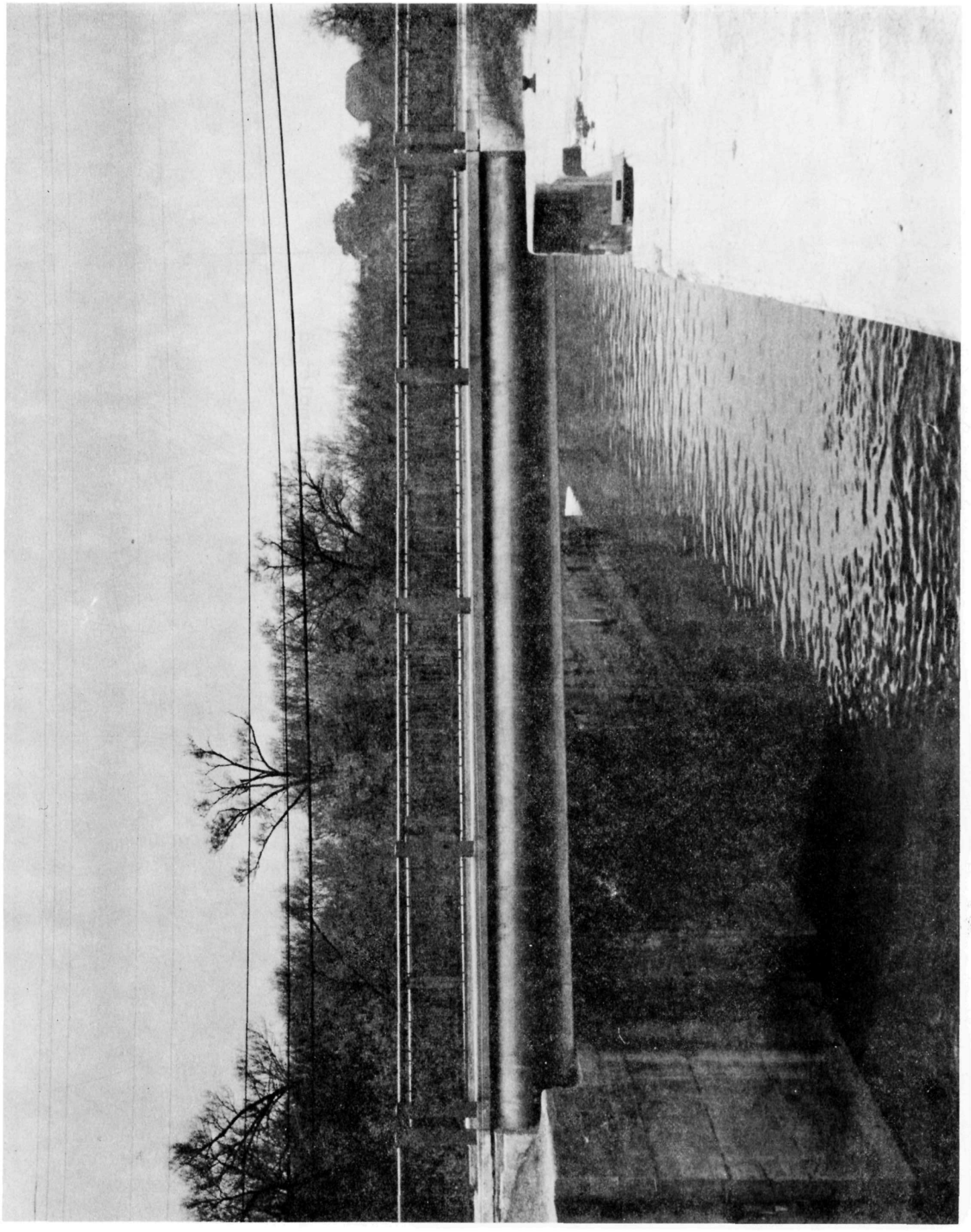


		Canal Crossing	Number H2
Location	Name Holland	Landing	Route Yonge Street

DATE	1962	1911
SUPERSTRUCTURE	fixed	
Fixed Spans	1	
Form	deck plate girder	
Material	steel	
Length		
Movable Type		unequal arm
Form		pony truss
Material		steel
Length		86'-0"
Power		manual
SUBSTRUCTURE		
Form		concrete

NOTES

1. The original bridge was never swung as the canal was not completed.



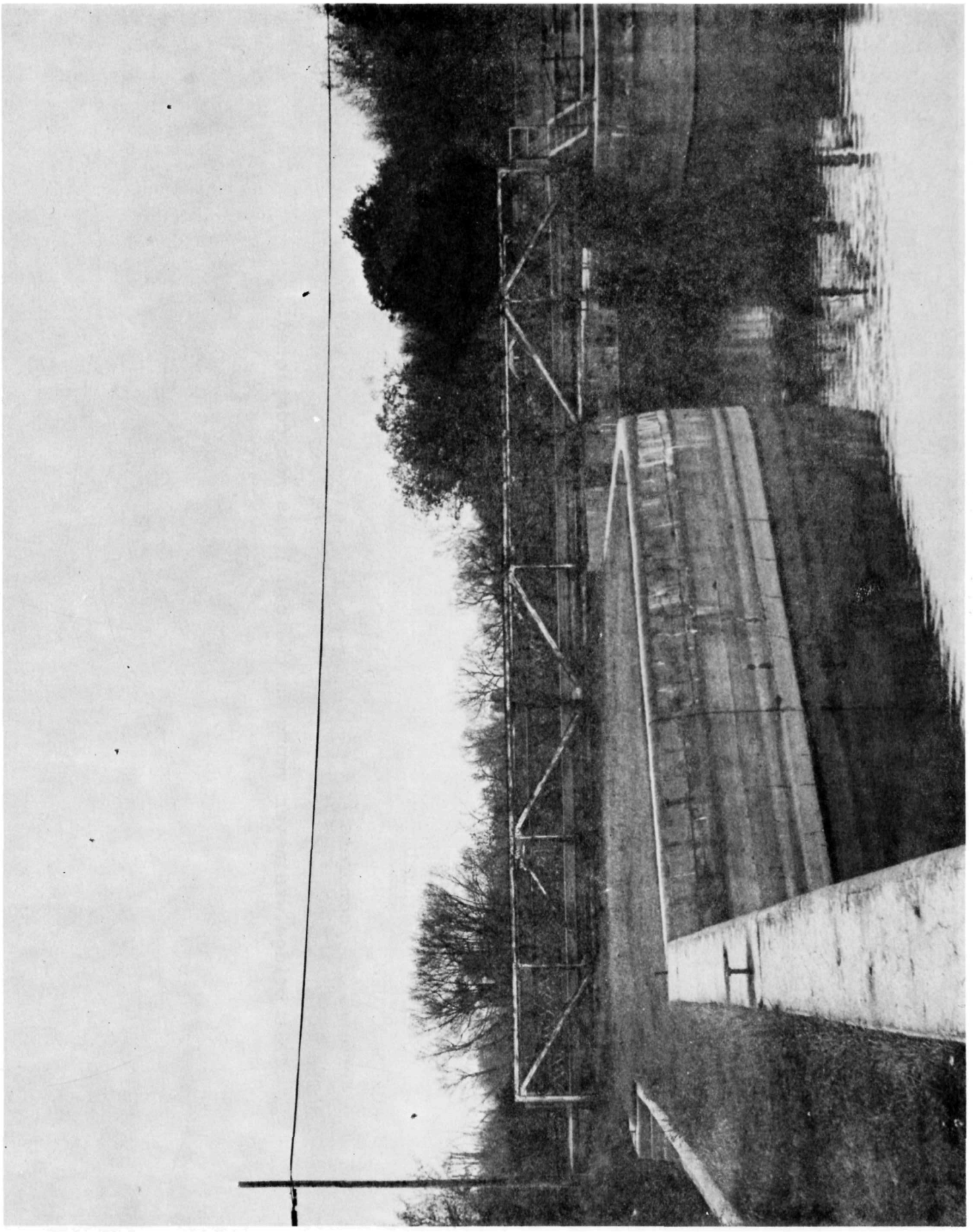
Canal Crossing Number H3

Location Name Newmarket Route 2nd Concession Road

DATE	1911
SUPERSTRUCTURE	
Fixed Spans	
Form	
Material	
Length	
Movable Type	unequal arm
Form	pony truss
Material	steel
Length	86'-0"
Power	manual
SUBSTRUCTURE	
Form	concrete

NOTES

1. This bridge was never swung as the canal was not completed.



Canal Crossing Number H4

Location Name Newmarket Route Green Lane Road

DATE 1909

SUPERSTRUCTURE

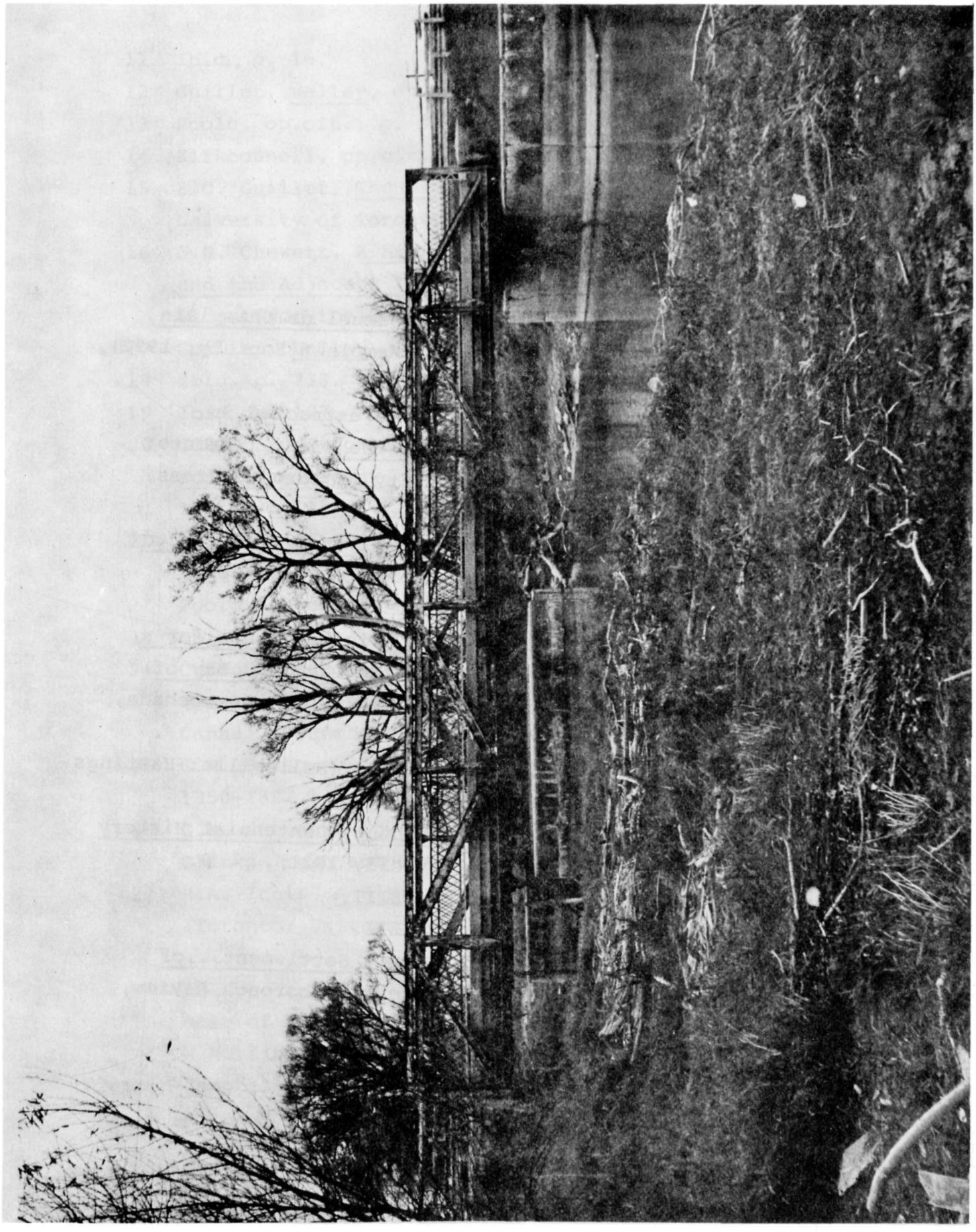
- Fixed Spans
  - Form
  - Material
  - Length
- Movable Type unequal arm
  - Form pony truss
  - Material steel
  - Length 88'-0"
  - Power manual

SUBSTRUCTURE

- Form concrete

NOTES

1. This bridge was never swung as the canal was not completed.



Endnotes

Introduction

1 Samuel Champlain, The Works of Samuel de Champlain ed. H.P. Biggar (Toronto: The Champlain Society, 1922), Vol. 3, pp. 58-62.

2 John Collins, manuscript notes as extracted in Edwin C. Guillet, The Valley of the Trent (Toronto: The Champlain Society, University of Toronto Press, 1957), pp. 137-142.

3 N.H. Baird, Report on the Trent River from Mouth to Rice Lake (Journal of House of Assembly of Upper Canada 1833-34).
N.H. Baird, Report of the Most Eligible Route for a Canal between Lake Simcoe and Rice Lake and Bay of Quinte (Journal of House of Assembly of Upper Canada, 1836).

4 Gerald E. Boyce, Historic Hastings (Belleville: Hastings County Council, 1967), p. 238.

5 Watson Kirkconnell, Victoria County Centennial History (Lindsay: Victoria County Council, 1921), p. 9.

6 Guillet, Valley, op.cit., p. XLIII.

7 Guillet, Valley, op.cit., p. XLII.

8 T.W. Poole, A Sketch of the Early Settlement...of Peterborough (Peterborough: The Peterborough Review, 1867, Reprinted 1967), p. 23.

9 Kirkconnell, op.cit., Chapter 2.

10 Ibid., pp. 37-38.

11 Ibid., p. 16.
12 Guillet, Valley, op.cit., p. 130.
13 Poole, op.cit., p. 92.
14 Kirkconnell, op.cit., p. 88.
15 E.C. Guillet, The Story of Canadian Roads (Toronto: University of Toronto Press, 1967), Chapter 4.
16 J.G. Chewett, A Map of the Province of Upper Canada and the Adjacent Territories in North America (Thomas Ridout for the Canada Company, 1828).
17 Guillet, Valley, p. 150.
18 Ibid., p. 238.
19 Ibid., p. 127.
20 CORTS Study Committee, The Rideau, Trent Severn, Yesterday, Today, Tomorrow (Toronto: Queen's Publisher, 1971), p. 33.
21 Province of Canada, Journal of the Legislative Assembly (1857), p. 33.
22 Poole, op.cit., p. 141.
23 Ibid.,p.151.
24 Canada, Board of Works, Report of the Board of Works (Montreal: Journal of the Legislative Assembly of Canada, December 1844), Appendix AA.
25 G.W. Spragge, "Colonization Roads in Canada West 1850-1867," Ontario History,Vol. XLIX, pp. 1-17.
26 G.R. Stevens, The Canadian National Railway (Toronto: Clarke Irwin and Company, 1960).
27 H.A. Innis, A History of the Canadian Pacific Railway (Toronto: University of Toronto Press, 1923).

The Role of the Bridge

1 W.A. Kingston, The Light of Other Days (Campbellford: Campbellford Herald, 1967), p. 99.

Canal Crossings

1 Kirkconnell, op.cit., p. 41.

2 Guillet, Valley, op.cit., pp. 233-234.

3 Peterborough Directory, 1888, p. 171.

Bridge Technology

1 A.W. Campbell, "Highway Bridges," Association of Provincial Land Surveyors (1886), pp. 69-78.

2 Guillet, Valley, op.cit., p. LII.

3 P.S. Gibson, "Highway Bridges," Association of Ontario Land Surveyors (1899), pp. 103-114.

Bibliographic Essay

In 1933 a comprehensive list of bridges was compiled by the Department of Railways and Canals. The list contained some basic technical information about the current bridges and a brief outline of their construction history. All of the information in the list was double-checked with other sources and found to have very few errors. This list also referred to each bridge over the navigation channel by number, starting with the Dundas Street highway bridge in Trenton as number one and proceeding through the waterway to the highway bridge over the mouth of the Severn River numbered 60. The bridges over the Scugog River branch are numbered 64 to 68 and the Chemung Bridge is number 61. The bridges over the Holland River were not numbered although they were included in the list. This is probably because the bridges received very little attention and maintenance from the canal authorities and were eventually turned over to the municipalities.

It would appear that this numbering system was adopted for the 1933 survey. No record of the system appears before 1933 but it is used extensively afterwards. Some anomolies appear in the list. There are no bridges 9 and 10. That is, the Glen Ross railway bridge is number 8 and the most southerly Campbellford bridge is number 11. It is reasonable to assume that bridges may have been planned or at least considered for the stretch of river in between. There is a bridge across the channel north of Wilson Island but the main navigation channel passes south of the island. It is

also likely that some crossing would have been considered in the vicinity of Meyers Island, probably over the locks themselves. No record has been found to indicate there ever was a 9 or 10 in the past.

One other example is the Midland Railway bridge in Lindsay. Built in 1870 and demolished in 1877 it falls between number 64 and 65 which indicates the numbering system was not used during the life of this bridge.

In any case the numbering system presently in use by the Canal authorities follows that of the 1933 list. It is also used in this paper as the basic reference system for the bridges. Those bridges and crossings that did not exist in 1933, because they had been demolished or not yet built, have added to the numbering system in their correct sequence. The two lift locks and the Big Chute marine railway are also included in sequence because they fall into the definition of a crossing for the purposes of this paper even if they add little to the material. The Holland River bridges have been arbitrarily numbered H1 to H4.

The verification of the data on this list was first established through the documents at Queen's University Library, primarily the Journals and Appendices of the Upper Canada Assembly for the years 1825-1840, and the Journals and Appendices for the Legislative Assembly of the Province of Canada 1841-1867 along with the various Sessional Papers for the Departments of Public Works, Railways and Canals and Transport during the years 1867-1970. The Report of the Commissioner of Public Works for the Province of Canada from 1851-1862 was particularly useful.

The Public Records in the Public Archives of Canada were examined: particularly RG1, Upper Canada Petitions; RG11, The Department of Public Works; RG12, the Department of Transport; and RG43 the Department of Railway and Canals.

But they yielded very little useful material. However, the Photographic Collection and the Map Collection of the PAC was very useful.

The Municipal documents found in the Public Archives of Ontario were a mine of information. The records of the District of Victoria, the District of Newcastle plus those of the counties of Victoria, Peterborough, Northumberland and Durham contain much information on transportation in general and roads and bridges in particular. The Directories of the counties of Peterborough and Victoria and the town of Peterborough were not very helpful on bridges. The map collection of the PAC was very useful in locating and dating some bridges.

The Public Archives of Ontario also contains several feet of records pertaining to the history of road and bridge construction in Ontario that is not available for general circulation. This is part of a collection begun by a special staff in the Department of Highways, however, due to financial restraint the staff was cut and the project was not finished.

A list of other sources used for this study follows.

Anonymous.
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