NYC Cornwall bridge
RG 12 vol 2777 file 3534-52

17 Sep 1896 From Bergin to Department
Applies for subsidy renewal for the Ontario Pacific also for a subsidy of 15% of the cost of the bridge across the St. Lawrence (estimated at $425,000).

18 May 1897 Petition to renew subsidy and change the name to Ottawa & New York.

10 March 1897 Letter/petition from Bergin
The line from Ottawa to Cornwall will be about 57 miles including the spur into the Town of Cornwall. Cornwall has granted $35,000.
Toronto Paper Co, Canadian Colored Cotton Co which includes Stormont Cotton and the Canada Cotton Co - all potential shippers.
At present they only have one railway. Although the town of Cornwall can ship in the summer season by boat this means of transportation is not resorted to for the reason that the Grand trunk impose a high heavy winter freight unless the shippers agree to ship all the year.
Construction of a second railway is necessary for the progress of the town.
The only practicable route between Cornwall and Ottawa is via Coteau. 108 miles, the proposed line will shorten this by 55 miles railway fare at present is $3.55, proposed is about $1.50.
Ottawa to New York via Canada Atlantic through car is 492 miles while the proposed route will be only 417 miles.

Petition asks for $183,680 for 57.4 miles including the spur into the Town of Cornwall and 125,000 for the bridge across the St. Lawrence.

24 March 1897 Petition from United Counties of Stormont, Dundas & Glengarry.
In support of Ontario Pacific.

Plan and Profile of the Bridge
Union Bridge Company May 1897. Subsequently amended.

21 June 1897 From D'Arcy Scott solicitor, Ottawa to Minister
Glad you have revoted the subsidy for the O&NY but you have not brought down the 15% for the bridge. It is imperative we get the subsidy because Ottawa will be voting on a by law (bonus of $75,000) next Thursday and it is one of the stipulations that we not receive the bonus until we have bridged the St. Lawrence and run through trains to New York. Estimated cost of the bridge in Canadian territory is $300,000.

7 July 1897 From Collingwood Schrieber to Minister
Have examined the plans for the bridge over the St. Lawrence River. 60' headway on the Canadian channel and 35' headway on the American channel. May be approved.

15 July 1897 OIC PC 1897-2083 approves general plans. See data base.

5 August 1897 From the Calvin Company (Hiram A. Calvin President)to Minister
While abundant provision has been made for the navigation of the north channel by having spans of 420 feet in width and 60 feet high the intention is to have the spans on the south channel only 280 feet wide and 35 feet high. There is a great deal more tonnage in the shape of freight passing down the south channel than there is down the north channel and it is the only practicable channel for rafts and for the large paddle wheel tug steamers which are used in the towing of them. Steamers using the south channel require just as much room as those using the North channel. We are the largest transportation company using the river and have been using this channel continuously since 1825. Spans of 280 feet in width and 35 feet in height will shut us and others out of this part of the river.

5 August 1897 From Collins Bay Rafting and Forwarding Company to Minister
Similar complaint to Calvin. Now all the rafting business of the St. Lawrence and all the steamers employed in the business pass through the south channel and the placing of the bridge would completely shut us out.

9 August 1897 Kingston Board of Trade
Protests plan of proposed bridge.

20 August 1897 from Cartwright to Schrieber
Calvin is quite satisfied with the modifications i.e. widening the peers (sic) to 370 ft and raising the spans to 37½ ft.

23 August 1897 From Geo. Parkes, O&NY to Minister
Bridge is in process of construction. Protests the proposed action.
First: the whole question has been fully investigated by your department and an OIC issued
Second: the bridge has been contracted under the present plan and is in process of construction and the steel work is so far advanced that it would entail a large expense and damage should construction be interfered with.
Third: we have exhausted every effort to ascertain the navigation requirements of this channel and are convinced the present plan will accommodate every character of craft that is likely to use it in the future.
Fourth: the present plan is perfectly adjusted to the requirements of commerce in this channel which is principally rafting. The placing of a draw would increase the piers and further obstruct the channel and not only increase the difficulty of raft navigation but would increase the ice-jambs. Washington investigated and found that a draw span was not needed in this part of the bridge.
Fifth: a drawbridge in a structure like this is a constant menace to life and property.
Sixth: In view of the large expense that has been forced upon the Company first in raising the bridge in obedience to the orders from your Department and second in a further raise in obedience to the orders of the Department in Washington and the increase in distance between the piers by the adoption of the three spans instead of four span system, any further change or increase in expanse would prove disasterous (sic).
The material for the superstructure is being rapidly turned out at the mills and a large force is now at work on the superstructure. Under these conditions I feel that we will not appeal to you in vain.

26 August 1897 Plan and profile approved by OIC. 1897-2518
Plan and profile as approved on file.
Original plan was for two cantilever bridges. South channel was changed to truss spans.

Specifications for the masonry of bridges.

8 Feb 1898 Petition from O&NY
The bridge will cost $750,000, greatly increased because of the changes from original plans required by Department.
Railway would be inadequate without the bridge because it could not be sustained by local traffic alone.
The railway between Ottawa and Cornwall cost more that anticipated because of the lateness of the season in which it was constructed.
Asks for $112,500 being 15% of $750,000.

8 Feb 1989 Blueprint of a bird's eye view of the bridge - very nice!

Plan and profile of the bridges
Plan of crossing of the Cornwall Canal

20 June 1898 OIC PC 1898-1202 is passed see data base.

9 Sept 1898 from O&NY to department
Request that you have a skilled Engineer make a most thorough investigation in regard to the causes of the collapse of two spans. Request he examine all piers and remaining superstructure in NY State and in Canadian territory so that there may not be any question hereafter in your mind or our own as to the perfect security of our bridge.
I am advised that Mr. Douglas has instructions to investigate only the cause of the collapse of the span. Will you kindly broaden his instructions to cover my suggestions above.

17 September 1898 From Thomas Mulvey, Barrister & Solicitor to department
I am acting for Patrick Murphy the father of Patrick Murphy who was killed in the recent disaster. The deceased was working on the structure and had not given his friends any information regarding who had employed him. Wants to know whether the investigation results will be made public etc.

22 Sept 1898 from W. G. Stearns Brooklyn to Chief Engineer
I agree to furnish machinery and tools as set forth in Schedule A and a thoroughly competent operator on following terms:
All necessary staging, lumber etc. to be provided and a guarantee against loss of machinery and tools through accident beyond our control or through action of the elements.
Necessary supplies such as fuel and new materials in the event of that supplied under schedule A becoming broken or worn out such as pipes, rope, bit blanks, core barrels, drill rods and corelifters are to be replaced so long as the work required to be done is not finished; but upon completion of the work all wear and tare (sic) and breakages and any damage whatsoever to the abovementioned material shall be at the loss of the contractor.
The setting of the bits will be done by the operator, the diamond to be furnished by the engineer.
The freight on machinery, the car fare of the operator and his expenses from Brooklyn to destination and the board of the operator while employed and the return of the machinery and the operator to Brooklyn when work is completed or other cause shall be paid by the Engineer.
The time of commencement of work will date from the date of the bill of lading in the Borough of Brooklyn, NY.
The price shall be $250 per month, $150 payable upon presentation of the bill of lading and $100 upon arrival of machinery at its destination and the monthly payments thereafter in advance dating from the bill of lading.
The contractor agrees to insure their plant from the date of shipment until it reaches its destination so as to relieve the engineer from all responsibility and liability in transit.
Schedule A contains a detailed list of machinery and value right down to wood chisel etc.

3 Oct 1898 from Town of Cornwall to Minister Blair
It is of the greatest importance that the wreckage be removed from the river before winter sets in; the south channel being the safety valve for the Town of Cornwall during the winter months.
If an ice jam should take place in consequence of the south channel being blocked by these iron spans nothing could prevent the town of Cornwall being flooded as it was in 1886 only to greater extent as it was brought about by natural causes.

12 Oct 1898 from Miller? To Jones Secretary of dept.
Acknowledges cheque for freight charges advanced on diamond drill, also cheque in favour of W.G. Stearns.

22 Oct 1898 from D'Arcy Scott for O&NY to Blair Minister
Mr. Douglas is at present at work inspecting the piers of the O&NY bridge. He has made two borings on the south side of pier No. 7 which is the pier next the Canadian shore but has not made any borings on the North side of that pier. O&NY are anxious to have a boring taken on the North side as well. While Mr. Douglas is on the ground with his plant it would be a very easy matter to have this boring taken. Would you kindly instruct him to do so?

O&NY would also be very much obliged if ASAP they could receive Mr. Douglas' report as if the piers are alright as they now stand the Company are anxious to put on the superstructure, and on the other hand, if a change has to be made they would like to know of it in order that it might be made at once.

18 Nov 1898 from O&NY to Collingwood Schrieber
Have ordered diamond drills in order to demonstrate to the satisfaction of the Department as well as ourselves the solidarity of our bridge foundations. I will be glad if you would send an officer to be present when the borings re being made.

We have also arranged to have the base of the piers thoroughly rip rapped at once, and that work is now under way.

Kindly advise whether the above proposed action will be sufficient to satisfy your Department.

24 Jan 1899 from Geo Parkes, O&NY President to Secretary Jones
Transmits blueprints of general masonry plans (seven).

Getting out stone for this masonry work at quarries on both sides of the river and expect to have it all quarried by the opening of spring. Our last general plan showed the location of all piers and height of the bridge and we propose to construct them to this. We want to begin on the Canal piers as soon as the water is let out of the Canal about 15th March.

29 Dec 1898 Petition from O&NY
1. Line of railway between Ottawa and Cornwall is now complete and two trains for the accommodation of passengers and freight are run daily each way.
2. Petitioners own and operate a line of railway in NY from the town of Hogansburg on the south side of the St. Lawrence River to Tupper Lake where connection is made with a direct line of railway to New York City.
3. Petitioners empowered to construct a bridge across the St. Lawrence at or near Cornwall.
4. Made application before the last session for subsidy to assist in the construction of the bridge.
5. No subsidies were granted by Parliament at its last session. Were strongly advised to commence the construction of their bridge on the assurance from authoritative sources that Parliament would at its next session be asked to grant a subsidy.
6. Feeling confident, petitioners commenced construction.
7. After obtaining approvals construction commenced on 28 August 1897.
8. Erection almost completed when two of the partially completed spans collapsed and fell to the bottom on 6 Sept 1898.
9. Accident has been the cause of financial loss to petitioners of $125,000, not including the great loss involved by the non completion of the bridge. The road from Ottawa to Cornwall having been in operation since July 29th last. As this road is now barely earning operating expenses the loss of interest on the money invested in the line and the bridge can be added to the total loss, $67,00 for one year.
10. Petitioners resources are now nearly exhausted and they do not have sufficient funds on hand to rebuild the bridge.
11. Governor General in Council should come to their relief.
12. Ontario has voted a subsidy of $35,000 provided that federal Government also provide a subsidy.
13. Corporation of City of Ottawa has granted $75,000 but on condition that the bridge be completed by July 1 1899.
14. Petitioners would, in the absence of favourable action also suffer the loss of $35,000 from the province and $75,000 from Ottawa.

Asks for a subsidy of $112,500, being 15% on $750,000 the cost valuation of the bridge.

10 Feb 1899 Report of Robert Douglas attached to this are isometric drawings of the piers and foundations etc.

Mr. C.L. Weller, Asst Engineer Cornwall Canal was under my direction. His familiarity of the river, manoeuvring of craft in rapid waters was most valuable.

Railway very cooperative.

The south, or raft channel is principally in US territory, and is about 1100 feet wide,The current before the erection of piers was about 6 mph.

The north or steam boat channel is some 800 feet wide, the current being about 4 mph and is wholly in Canadian territory.

Ten piers were constructed and they are numbered from the shore pier upon the US side.

South channel has 4 piers, two shore and two in the channel. 1,2 & 3 are in US, 4, on the south side of Cornwall island is the first pier on Canadian soil. The bridge was three spans, 370' each.

On the north channel are four cantilever piers, 5,6,7 & 8, anchor spans of 210½' and one centre span of 420½'.

Piers 9 & 10 are on each side of the canal supporting with pier 8 a swing span of 240'.

Pier No. 1

Built a short distance from the water. Foundation in a bed of hard pan, the footing course, of concrete was deposited dry. One end of a fallen span rested upon the pier, it has no apparent marks of injury.

Pier No. 2

This was the pier which failed. The pier under water was a bottomless crib or caisson with triangular ends filled with concrete deposited through the water in buckets dumped at the bottom.

Details of crib work.

After difficulty on account of the rapid current the crib was sunk in 28 feet of water. The bottom was uneven. The crib was not in proper position, the masonry was started nearer to the timbers of crib upon the south side than had been intended. There was considerable space, at places, between the bottom timbers and the river bed, these were closed by a sort of sheet piling and bags of concrete packed in by a diver; whether the bottom concrete was free from the action of the current it is difficult to say. When the crib was filled to within 3 feet of low water the masonry was commenced, which consisted of stone facing with a hearting or backing of concrete. The pier was completed in late 1897 but was not protected from scour by rip-rap.

At the date of the disaster, 6 Sep 1898, two spans of the superstructure were about completed and the false works completed. The third span had been erected and rivetting was progressing, some parts of the structure still being secured by the erection bolts. This span, a few days previous had been lowered to its bearings upon the piers and was not resting on the false works. Suddenly, without warning, and in such short space of time that a cool experienced foreman looking directly at the bridge could give no satisfactory account of what occurred the pier and middle span disappeared beneath the river the shore span and false works became an entangle wreck the greater part beneath the water. This collapse resulted in the death of 15 men and injury to 18 other men.

Previous to our investigation the theory had been advanced that the pier had been overturned by the span, still incompleted, having fallen there being no gale of wind at the time, to anyone conversant with bridge erection this theory appeared improbable.

To determine the cause of the failure a scow with the necessary appliances was anchored over he site of the fallen pier, the operations were tedious and difficult on account of the rapidity of the current which had been increased by the wreckage, its velocity was such that neither the departmental diver nor an experienced diver procured by the railway company could go down.

Several days operation were sufficient to convince us of the cause of the failure, subsequently the railway, at their own expense, made all further investigations in the south channel.

The results showed that the crib or pier was founded upon a river bottom of a crust, some one to two feet of thickness, of probably cemented sand, gravel, clay and some boulders, beneath the crust was from 12 to 20 feet of soft blue clay, so soft that n iron pipe could be pushed down by hand without much difficulty. The same formation of clay is seen in the adjoining banks of the river and a few miles above the site of the bridge where a water power canal is being constructed.

Whether this clay was soft previous to the breaking of the crust it is difficult to determine. The probabilities are that the crust would have held the weight upon it for some time and probably the pier would have collapsed in another manner if it had not been undermined.

The scour which took place previous to erection of the false works cannot be known. It is stated that the columns or posts of the bents of the false works adjacent to the pier broke through the crust and settled, so much so they had to be withdrawn and lengthened; they eventually took a bearing each carrying a heavy load. The first bents were set close to the pier, the current strikes the pier at an angle. The swift flow of water, between the crib and the posts at the bottom acting as jet upon the disturbed state of the river bed through settlement of bents, might have set up so decided an erosive or scouring action upon the soft clay that in no length of time some part of the caisson would be undermined. If such were the case this scour would probably take place upon the south side.
It wold appear that the crib and pier fell to the south, the crib striking at an angle towards the north into the soft material.
Another cause of failure which might be advanced was the character of the concrete in the caisson or that the current was not entirely staunched at the bottom of the caisson the cement and sand washing out leaving only broken stone. If the timbers of the crib were not torn apart by the pressure of broken stone or bad concrete the failure would not have been without warning there would have been some indication by cracks or settlement of the masonry. The cribs appear to have been strong enough to withstand the pressure of the weight of very poorly cemented concrete and the masonry pier and superstructure at least until the impact of the live load had been added.

Pier No. 3

This pier being in the US I assume the Department takes no responsibility. Borings taken around the piers show that the caisson rests on a layer of compact sand underlaid by carious strata. Plumbing the pier shows that it is about 2" out of plumb leaning to the south.
The action of one end of a fallen span in being wrenched from the coping would have the tendency to give a set to the south.
The railway company surrounded this pier with rip rap last autumn but have since condemned it and have determined to build a new pier.

Pier No. 4

This is a land pier, the first in Canadian territory. The foundation of concrete was laid dry and according to the "Engineer" it was founded upon hard pan.

Pier No 5

Situated on the north shore of Cornwall Island and the under pier of the cantilever. The foundation bed of concrete was put in dry. The excavation was made dry and excavated to hard pan pilled with large boulders concrete made of Rathburn "Star" Portland Cement 1, sand 3, stone 6.

Pier No. 6

This is the first in the Canadian Channel and rests upon the river bottom some 15' below the water level. Such soundings, borings and examinations were made on this and pier No. 7 that would determine the character of their foundations and their probable stability.
A boring was made close to the east end of the crib to a depth of 12' the material washed up was one to two feet of sand on top, the rest clay and gravel not particularly hard. Late last autumn the pier was surrounded by a rip-rap of boulders.
Diver reports hard pan bottom filled with large boulders. The crib touching the bottom generally except south west shoulder where it rested upon a large boulder.
Concrete 1 cement 3 sand 6 stone
Sealing 1 1/4 cement 3 sand 5 stone.

Pier No. 7

River bed is 27" below the surface of the water. A number of borings and soundings were made by the Department and by the railway. The pier was rip-rapped this autumn.
Divers reported hard bottom filled with large boulders and nothing of any size loose on the bottom, in fact could not secure anything from the bottom without a bar when he brought up a boulder 6 to 8 inches in diameter north west of shoulder resting on crib, the shoulders held in position by "spuds". Concrete in the proportions of that in no. 6.

Pier No. 8

This is an anchor pier of the cantilever and acts as a rest pier for one arm of the swing span over the canal. To put in foundation a coffer dam was used and kept the pit moderately dry, It is stated the material upon which the pier rest is hard pan.

Piers Nos. 9 & 10

Pier No. 9 is the first pier of the swing bridge and is situated on the south side of the canal. Pier No. 10 is the rest pier upon the North side. These piers were built when the water was out of the canal and it is stated rest upon hard pan.

General
The River bottom of the North and South channel show a different character of material. The banks indicate it. Upon the south side there was a settlement of columns of false works nearly the whole distance across the channel; upon the north channel in the two spans where false works were erected no such settlement occurred, neither do the soundings so far obtained discover material similar in character to that in the south channel
At the locations of the channel piers no borings or soundings were made previous to construction; when the cribs were sunk and the still water inside rendered it easy to test the character of river bed, no tests were made of any extent. A divers examination, it was considered, would give sufficient indication of the character of the river bottom and the material underlying it.

Signed Robert C. Douglas.

4 Nov 1899 from O&NY to Collingwood Schrieber
Soundings made in the material on which piers 1, 4 & 5 stand show they rest on compact clay or hard pan of a reliable character and no additional work is needed at these points.
At pier 6 the pier of ashlar masonry stands on a base of concrete about ten feet in height enclosed in a 12"x12" timber crib 18' wide which rests on the gravel and boulder formation at the bed of the river. We believe this pier abundantly safe but for protection from the ice it is proposed to surround it with heavy rip rap to be made of large quarry stones the interstices being filled with stones of smaller size.
At pier 7 the conditions are similar to those at pier 6 except that the crib is about 24' high. It is proposed to enclose this crib and the base of the pier with a massive structure of steel and concrete which will form at once a continuous buttress entirely around the pier and will serve as protection against the ice. This enclosing structure will be a steel caisson sunk by pneumatic process filled with concrete in close contact with the existing work. This caisson will be enclosed of heavy steel frames about 3/8" thick the whole being tightly rivetted together. The concrete filling between the frames will be brought into immediate contact with the material of the crib and pier and three substantial ties will be passed through the old crib and anchored into the concrete of the caisson. The metal work of the caisson will weigh about 200 tons and the concrete about 3000 tons, and the caisson will be sunk at least two feet into the bed of the river.
Pier 8 is the anchor pier of the north arm of the cantilever and the rest pier for the south end of the draw span when closed. It is located at the foot of the slope wall of the Cornwall Canal which is also the north bank of the river. This pier is founded on a concrete base about three feet thick the top of which is about low water. Because of the character of the material below the base of this pier it has been decided to take it down and rebuild it on a pile and timber foundation.

Asks for approval of amended plan of construction. Encloses blue print (on file) showing general scheme of work.

15 Mar 1900 Letter form NY&O to Superintending Engineer of Canals Cornwall
Contractors who re to do the work are Degnon-McLean Construction.
Asks for permission to unload and handle and store materials between the Canal and the River including the building of a storage shed. Work will require setting up of derricks etc.

21 Apr 1900 from Fitch, Pringle & Cameron to Collingwood Schrieber
Union Bridge Company have the contract for placing the iron work for the bridge over the south channel. False work will extend out possibly one half the distance across the channel within one month. There is very little navigation in the south channel only the steamer Algoma, the captain of which is fully aware of what is being done. We do not know of any other parties who will be using the channel for navigation other than the Collins Bay Rafting and Forwarding Co and we have written to them. We can, no doubt make arrangements with them similar to the one that we made with the Phoenix Bridge Co. for putting the ironwork on the bridge.

28 May 1900 from H.W. Gays President O&NY
Renews appeal for subsidy. Ontario $35,000 contingent upon subsidy from Federal government and Ottawa $75,000 but Ottawa not until bridge finished and by 31 Dec this year.
Company is on the verge of serious financial trouble. The total cost of the bridge will be about $800,000 the portion of it in Canada being $600,000. Begs for a subsidy of $90,000 being 15% on $600,000.

21 June 1900 From Stormont, Dundas and Glengarry
Resolution supporting a subsidy.

11 June 1900 From Town of Cornwall
Resolution supporting subsidy.

18 July 1900 from NY&O to Collingwood Schrieber
The work is now in a condition in which it might be of interest for you to see it.
The Anchor pier at the foot of the Canal Bank has been removed and the excavation made and piles driven for the foundation of the new pier. The piles are now being cut off and the grillage will be laid and the rebuilding of the pier masonry begun in a few days.
At pier 7 the steel caisson is just finished and is floating around the pier. Filling it with concrete above the working chamber will begin at once and be continued until the caisson is landed on the river bed.

Reply 8 August 1900
Chief Engineer hopes to be in Cornwall early next week.

24 Sep 1900 From D'Arcy Scott to Jones Secretary
The railway bridge is now completed and I beg to ask that you send your engineer to inspect the bridge both for traffic and subsidy purposes at the earliest moment convenient.

25 Sep 1900 R.C. Douglas was asked to go.

9 Oct 1900 from D'Arcy Scott
Bridge is now entirely completed and the ballasting across Cornwall island between the two bridges is also finished. Beg to send an engineer to inspect the ballasting in order that the road may be opened to traffic and a Bridge Engineer to inspect the bridge for subsidy and operating purposes.

9 Oct 1900 PC 2393 including contract, specifications and blueprints.

11 Oct 1900 Report from R.C. Douglas
Examinations and tests of the character of the work have been made by me and subsequently by F.D. Fisher appointed in charge of the work by the railway. Frequent inspections and information supplied by the engineer enable me to be conversant with the character of the work done.
Pier 1
Shore pier south side of channel soundings were made 7½' below foundation bed a satisfactory bottom of hard clay was found.
Pier 2
New pier built upon a caisson 22' x 62' sunk by pneumatic process through the debris of the old cribwork and concrete foundation, also through soft clay at the east end and through 12 feet of hard pan at the west end; the caisson over its whole area rests upon a satisfactory foundation bed of hard pan at about 50' below surface and about 24' below the original bottom.
Pier 3
This pier was taken down, the old foundation removed and the pier rebuilt on a caisson similar to pier 2 sunk by the pneumatic process 15 feet below the bed of river chiefly through hard pan.
Pier 4
Soundings were made 10 feet below foundation bed through hard clay and boulders.
Pier 5
Soundings and borings 10' to 13' below foundation bed showed hard material throughout.

Pier 6
Founded upon hard clay and gravel. The river is not deep at the site there being about 10 feet in depth of concrete in the foundation cribs.
The concrete in this pier and pier 7 was found to be of poor character; it was apprehended that the ice may tear away the timber of cribs and expose the concrete to its action. For the protection of the crib and to provide against any possible scour 600 cu yards in addition to the 200 cu yards of stone rip rap previously deposited of stone rip rap was placed around pier. The rip rap is practically solid consisting of large quarried stone, the interstices filled with small stone and gravel and slopes up to five feet above base of masonry.
Pier 7
This pier has good foundation bed, concrete in crib is about 21' in depth. To reinforce and protect the crib an annular caisson of steel with a pneumatic chamber 7' wide was sunk 3' below the bed of the river and entirely around the old foundation crib. The caisson was seated on hard pan at all points. Borings showed hard clay except at the downstream and there were pockets of sand. The steel caisson, some 190 feet long around the pier was filled with concrete, a space of some 2 feet between crib and caisson was also filled with concrete and the top rounded up to about 6 feet above the base of the masonry, Steel cables passing through the crib and concrete filling were securely fastened to the steel framework of caisson, the cables were placed in tension by 70 ton jacks before being secured. There are three groups, four in each group of 2 1/4" diameter suspension steel cable placed about 11 feet below water surface and 5 feet below top of old crib.
The steel caisson sunk below the bed of the river and the cables, together with the concrete filling, would prevent any bulging of the crib foundation even if the concrete were of very poor character.
Pier 8
Determined by borings and soundings that the foundation bed was unsatisfactory, there was also leaning of the pier to the south showing unequal settlement. The anchor arm of the steel superstructure was supported upon a heavy timber tower and the masonry of the pier taken down.
Excavation for new foundation showed at the river edge soft material for about 1½' below original level of foundation where compact clay and sand were found. The new foundation was of piles driven three feet centres over the entire base with a platform of two layers of 12" by 12" timbers placed closed and drift bolted. Piles were driven to an average depth of 12 to 15 feet and to refusal. The ashlar masonry was rebuilt and the anchor arm resecured.

To recapitulate the construction company has built two new piers on pneumatic caissons in the south channel. In the north channel it has protected one pier with heavy rip rap, another with a very expensive and large steel caisson and taken down another pier and re-erected it upon a pile foundation. In my opinion the company has spared no effort to ensure the stability of the substructure.

The masonry in the rebuilt structures is of better class than the original and general character of all work done is good. The structure is perfectly safe for the operation of a railway.

The steel superstructure in Canada consisting of the greater part of one span in the south channel and the cantilever over the north channel has been examined by an engineer of the Pittsburg Testing Laboratory. He reports entire agreement.

The floor of the bridge has a pathway on each side with an inner guard rail of steel rails and an outer rail of timber 8"x6".

I can certify that the bridge has been completed according to the approved plans.

Cheque for $90,000 sent October 1900.

24 May 1929 Letter from National Toll Bridge Company
Wish to construct a roadway across Cornwall Island and two short highways, one connecting with Roosevelt Highway and the other connecting with provincial highway #2. We will also construct a floor over the bridges and install suitable safety devices so that vehicular traffic will be adequately protected.

Charges $1.00 per vehicle, $1.50 for trucks 50c for horse drawn vehicles and 10c for pedestrians. At a later date may sell coupons reducing the tolls considerably for frequent users.

Statutory History of Ontario Pacific O&NY etc.

Bill 32 to permit the O&NY to enter into an agreement with a toll bridge company giving them the right to construct a passage or floor for vehicles and foot passengers over the railway bridge.

Memorandum in respect of Bill 32 by Cornwall Bridge Company

Changes already under consideration - Ottawa Branch of the NYC is to be diverted to a crossing adjacent to the Grasse River lock as in the combined navigation and power development.
In order that road and pedestrian traffic may be allowed to use the bridges a highway wil require to be constructed crossing the Raquette and possibly the Grasse River in New York state and on the Ontario side a high trestle will require to be constructed to permit motors to descend from the railway track which is at this point at a considerable height. The railway track has a swing bridge over the Cornwall canal which further complicated traffic.
Neither large trucks nor busses could pass each other on any highway bridge which might be constructed over the present single track bridge. It will be dangerous because of trains, swing bridge and narrowness.
If O&NY permitted to go ahead and the company will be entitled to greater damages as it will have in addition to the single track a roadway which will be destroyed.

Chapter 60 22-23 George V assented to 26 May 1932.

7 Dec 1932 OIC PC 1932-2688 is passed see data base for details.

Statutory history verified against data base.

3 May 1934 Order 50983
29 May 1934 Order 51068

22 Apr 1955 St. Lawrence Seaway Plan of relocation options

Detailed legal history prepared by US Embassy 8 Aug 1955.

Much correspondence as to whether the NYC should apply for permission to rebuild or whether authority still existed - also should the government build it.