

**RG 30 vol. 9337 file 1046-61-25**

**South Nation River**

31 October 1906 from Resident Engineer to Ruel

Three blue prints (not on file) of Canada Foundry strain sheets for South Nation River crossing. Need approval from Ottawa as want to order the steel.

6 November 1906 from CNOR to Board

Request approval, needs an order in council - 23.6 from Hawkesbury

4 December 1906 from Department of Public Works to Ruel

The portion of the river which you intend to cross is navigable from its mouth to a point about 2,500 ft. above the proposed bridge. At that place there is a saw mill and wharves for shipping the products of the mill by barge to Montreal and other ports. A freight steamer, also tugs and barges, use this part of the river. The sawlogs of the Rideau Lumber Co. are towed upwards from the Ottawa River to the mill mentioned, and the products as sawn lumber, is shipped by barges to Montreal and elsewhere, so that ample provision should be made for the free and uninterrupted passage of the "bands" or "pockets" of sawlogs, when being towed up to the mill, as well as for the tugs and barges, and the steamboat carrying freight to and from the wharves above the bridge site.

In order, therefore, to provide sufficient space for the passage of sawlogs etc., upwards to the mill it is suggested that you so amend your plan that the span between piers 3 and 4 over the steamboat channel be increased from 100 ft., as at present proposed, to 150 ft. centre to centre of piers. Will you, in consequence, send me another set of three copies of plan of proposed bridge showing the amendments suggested? On receipt of this amended plan the department will be in a position to make the necessary recommendation to council for its approval.

8 December 1906 from CNOR Ruel to Department of Public Works

Engineers have reported that a span of 150 ft. in length is, in their opinion, unnecessary at this point, and that at the outside the span should not exceed 120 ft. They claim they have examined carefully all the conditions in respect of the crossing and have satisfied themselves upon this point, I would be glad if the matter could be further considered.

9 January 1907 from CNOR Ruel to Department of Public Works

Encloses three white prints on linen (not on file) dated January 8, 1907 showing variation of the crossing by providing for two deck girder spans of 100 ft., three deck girder spans of 90 ft. and one through girder span over the channel of 120 ft. Would be glad to receive an order in council ASAP.

The order in council was lost in the department.

18 February 1907 from resident engineer to Ruel

Encloses revised strain sheets for approval.

2 February 1907 order in council is issued.

3 April 1907 order 2764 is issued.

22 July 1908 from Acting DM of Marine and Fisheries

Complaints have reached the Department that a cement pier built by your company in the South Nation River last year has fallen directly across the channel of navigation and that a serious interruption to the navigation of the river is caused thereby.

I have to call upon you to remove the wrecked pier as promptly as possible.

24 July 1908 from Stewart to Ruel

I measured the depth of water over the fallen pier last week and there was a minimum of 14 ft. The ordinary depth of channel at low water is from 12 to 15 ft. and as far as I could learn on the spot, the deepest draught boat that goes up the South Nation river draws only 9 feet. The base of the pier does lean a little into the channel, but it is marked by a bush securely fastened to it and does not, I think, offer any menace to navigation.

We will have the obstruction caused by the fallen pier removed at an early date, before low water.

27 July 1908 from Ruel to Marine and Fisheries.

19 August 1908 from Rideau Lumber to Marine and Fisheries

We beg to advise that at the present time this pier is showing above the water and we that we cannot take in a tow of logs.

26 August 1908 from Department to CNOR

Encloses a communication from Rideau Lumber. Unless your company removes any obstruction they have caused to the channel, this Department will be obliged to send an engineer to remove it at your company's expense.

18 September 1908 from Ruel to C.H. Rust, City Engineer, Toronto

In building the line between Hawkesbury and Ottawa, our contractors, Schell and Kennedy, constructed either by themselves or by some sub-contractors, the piers of a bridge over the South Nation River. Shortly after construction two of these piers were reported out of line and subsequently, before the steel work was contracted for, one of the piers fell over into the river and another was found so much out of line as to be useless. A recent examination by our Engineering Department has led to the condemnation of all of the piers, seven in number. If the railway is to be built on the same location they will have to be removed and reconstructed.

Before destroying the piers, our Engineering department wishes to have the work examined by competent independent engineers and they have requested our department to apply to you to act in this capacity and to name another independent Engineer, or other qualified person who could be present with you when examination is made.

19 September 1908 from Rust to Ruel

Can get away provided I can set my own time. Would suggest Mr. E.H. Keating or Mr. C.B. Smith.

26 September 1908 from Rush to Ruel

Mr. Kerry and myself yesterday examined the concrete piers constructed by your company on the Ottawa and Hawkesbury line, crossing the Nation River, and as a result of the examination we are of the opinion that your Engineering Department were quite justified in condemning the piers.

1 October 1908 from CNOR to Department of Public Works

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The substructure of the bridge was duly constructed in accordance with this Order in Council, but owing to defective concrete work on the part of our contractors, our Engineering department, after obtaining competent independent engineering inspection and advice, has decided to condemn all piers as unfit for railway service, and it is consequently proposed to remove the old piers and construct new piers on the same alignment but shifted westerly towards Ottawa. The same span is shown on the proposed revised plan as was shown on the plan originally approved, the channel span being 120 ft. as specified in the Order in Council referred to.

Asks for a new Order in Council.

7 October 1908 detailed report from Rush.

One of the main piers had fallen over and was completely under water. The other river piers had settled materially out of their original positions: these settlements could be immediately detected by the eye.

Have examined the material in the piers themselves.

This concrete was built, as is customary, with an outside facing four or five inches in thickness of higher class material and an interior, which is the mass of the pier, of a cheaper mixture. The concrete deposited under water appears to have been of the same quality as that used in the interior of the piers.

It was evident to us that the concrete neat the water line was simply dissolving away under the action of the water of the river.

We therefore made openings at various points in an endeavour to ascertain the cause of this peculiar and unusual disintegration.

We found that the outer, or face concrete, was fairly well mixed, homogeneous in character and able to withstand weathering influences. It varied in quality being better in some piers than in others, but, in general it was so much below the standard usually required for this class of work that we question whether the materials were of the proper quality and whether they were used in the proper proportions. We also question whether the proper and usual precautions that should be taken when laying concrete in winter, were taken in this case, and we understand that it was a piece of winter construction. To pass a final opinion upon this face concrete, we will require to study the evidence that we

refer to further on in this report. The face concrete is certainly not the cause of the failure of the structure.

The interior concrete we found to be altogether defective and we question whether any of it would withstand the action of water. We could, of course, only examine the interior concrete at a few points as it was necessary to break through the facing to get at it and this proved to be a work of some difficulty. We have no hesitation in describing the interior concrete at the points where we made entry as the worst concrete, if it can be so called, that we ever saw. Much of it was unset and could be readily pried out with a lumberman's peavy and the cement mortar in the mixture was not nearly sufficient to fill the voids between the stones, it being a criterion of good concrete that the mortar must be present in such quantities that it will more than completely fill these voids. There has evidently been some reason for economizing in the use of both cement and sand and in places we found the so called concrete to consist of nothing but a mixture of stone and clay, the latter being the one common material which should be carefully excluded from concrete. At such points the whole interior was, of course, loose and wet.

It was inevitable that such a mixture would disintegrate under exposure to water and its use justifies the condemnation of the piers.

As the result of our examination, we desire to say that we fully approve of the action of Mr. Stewart in absolutely condemning the concrete masonry in this bridge as unfit for railroad service.

We made entry into the west abutment and into two of the river piers with the same result in each case. If it is desired to obtain legal evidence of the quality of the concrete it should be examined by a competent inspector during the entire progress of demolition.

We noted some waste broken stone on the work but no waste sand and throughout the concrete there is evidence of a scarcity of this important material.

In case of a law suit, we imagine that the defence will be that the piers are falling because they are resting upon insufficient foundation, and there is insufficient truth in this claim to make it necessary for us to study all the circumstances connected with the construction very carefully. The foundation according to our present information is insufficient and although we do not hesitate to condemn the masonry on account of its character we are now prepared to say that a defective foundation is not accelerating the fall of the piers.

If therefore you consider it probable that a law suit may be entered into and if you wish us to be prepared to give definite evidence in this connection, kindly furnish us with the following information, the bearing of which on the question at issue is very plain.

1. Contract and specifications covering the work.
2. Plans of the piers as built.
3. Record of all foundation borings.
4. Record of orders for piles and particulars of pile driving.

5. Record of tests of materials.
6. Statement of engineer or inspector covering methods proportioning quantities and of mixing, weather conditions, precautions taken to overcome effects of temperature, sources of supply of material and methods of handling and depositing together with any comments he may desire to make.
7. Copy of any orders issued to the contractor about this work.
8. Some samples of both the face and the interior concrete for testing.
9. Record of the movements of the piers as determined by CNORy engineers.

We would also suggest that when the piers are demolished an inspector representing us should be on the ground to make a further examination of the material.

Yours truly,

Signed by Rust and Kerry

6 November 1908 PC 2327 is passed.  
21 November 1908 order 5659 is issued.

23 July 1909 from Rideau Lumber

The South Nation River between the two piers through which navigation enters there is, and has been since last Fall Coffor Dam obstructions which has cost us a lot of money. Each time we send a tow through there, the extra expense is something like \$25.00. This we are sending you a statement and bill of.

Your engineering department has been requested for months to take this away. At the present time we doubt if a tow can be gotten in at all, which will be a serious matter if our mill is obliged to stop for this reason.

Several additional bills from Rideau Lumber

13 October 1909 from F. Stratton, Jessops Falls to A.F. Stewart

I am in receipt of your of yesterday's date and hear with the time taken by tug getting booms through the piers on Nation River, since I came here, The first I saw was on sept. 5<sup>th</sup> when it arrived at bridge at 1.40 p.m. and was all through a few minutes before six, just over four hours. The next was on December 3<sup>rd</sup>, when it commenced pulling through at 1/15 and was all through at 5 p.m. 3 3/4 hours.

I have made inquiries of one who knows something of it and he tells me they are charging up a longer time for detention than is strictly right and that you will be able to see it is so by comparing the times I here give you by the time charged. I can vouch personally for the time I give being correct. As I sat on the bridge and watched them through, it being Sunday each time.

My informant does not want his name mentioned, I am sure you can safely rely upon what he says.

There is no question but the delay was caused by the booms getting caught by planks that were driven outside the cribs. If I obtain any further information will report to you at once.

15 October 1909 from Stewart.

I herewith attach letter from our timekeeper, Mr. Stratton.

5 October 1909 from Stratton

The S.S. Ida passed through the mill Friday night, I had a conversation with a man on board named Beaton, father to the captain. He says "We have never had any difficulty in passing through with the Ida, the difficulty has been with the booms, and even that might have been considerably obviated.

"On or about August the 30<sup>th</sup> we towed down a string of booms, only one driver was sent, which was not sufficient to handle them when passing under the bridge, he (the driver) hung around some hours and finally left them on the north side, I made the offer to Mr. Anderson to get them all through myself for \$2.00 by cutting the booms, there was fresh favourable wind and I claim they could have been got through in an hour".

There is general opinion around here that there has been needless delays, and a longer time than actually taken by delay at the bridge.

19 October 1909 from Stewart

Further letter from timekeeper Stratton.

End of file.