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THE NATIONAL TRANSCONTINENTAL RAILWAY

CANADIAN RAILWAY AND MARINE WORLD

C. H. RIFF

National Transcontinental Railway Construction.

The Minister of Railways stated in the House of Commons Dec. 4 that the total expenditure by the Government on construction to that date was $125,053,267.53, of which $15,545,118.29 had been paid to the G.T. Pacific Ry. in respect of the construction contracts which that company held.

We are officially advised that during the construction season of 1912, there were laid 361.15 miles of track distributed as follows: Mileage 109 to 153 east of Quebec Bridge, 34 miles; mileage 1 to 75 west of Quebec Bridge, 7.50 miles; mileage 288 and 419 west of Quebec Bridge at different points a total of 84.75 miles; mileage 168 west of Cochrane and mileage 102 east of Lake Superior Jct., Ont., at different points a total of 235.90 miles.

A train service was put in operation on the section of the line from Moncton to the New Brunswick-Quebec boundary, Nov. 20, the timetable providing for west-bound service to Edmundston, N.B., on Mondays, Wednesdays, and Fridays, and an east bound service to Moncton, Tuesdays, Thursdays and Saturdays. The passenger cars used have been hired from the Intercolonial Ry. and the locomotives and freight cars from the contractors, and the Intercolonial Ry. The operation of the line is under the charge of W. B. Cronk, General Superintendent, for the Commissioners at Ottawa, with E. P. Cronk as Superintendent at Edmundston.

The Minister of Railways stated in the House of Commons, Dec. 4, it was expected that the section of the line from the New Brunswick-Quebec boundary to Quebec city would be completed and ready for operation in Sept., 1913. It is reported that there are only about 12 miles of track remaining to be laid on this section of the line, and that the principal work to be done is the bridging, ballasting and levelling.

The whole question of the site of the terminals at Quebec, the Minister of Railways stated in the House of Commons Dec. 4, is still under the consideration of the Commission. The matters being considered include the question of the construction of a tunnel under Cape Diamond with the object of locating the terminals somewhere than on the Champlain market.

West of Quebec to 150 miles east of Cochrane, Ont., there remains only about [illegible] miles of steel to be laid. Track now extends from the last point named to a considerable distance west of Cochrane, and the Minister of Railways stated in the House of Commons, Dec. 2, that he expected to receive a report by Dec. 31, that the steel had been laid to Graham on Lake Superior Jct. At the last report there were only 48 miles unrailed. R. W. Leonard, K.C., Commissioner, is quoted as recently stating that the Cochrane-Lake Superior section of the line would not be in a condition for the operation of trains until September. The section of the line from Lake Superior Jct. to Transcona, four miles east of Winnipeg, is completed, and a train service is being given by the G.T. Pacific under an agreement. Negotiations for purchase of this section are in progress. The Commission will give the G.T.P. Ry. the opportunity of leasing the various sections of the line as they are taken over from the contractors, but the company is not committed," added Mr. Leonard, "to declare its policy until the entire line between Moncton and Winnipeg is completed." (Nov., 1912, pp. 562.)

Tenders will be received by the Commissioners, to Feb. 13, for the furnishing and delivery of machines, tools, appliances, motors, furnaces, cranes, etc., required for the equipment of the car department of the shops at Transcona, Man. Specifications and other information may be obtained from W. J. Press, Mechanical Engineer, Ottawa.

Grand Trunk Pacific Railway Construction.

The Dominion Parliament is being asked to authorize the company to make a further issue of perpetual or terminable debenture stock to an amount not exceeding $25,000,000, the same to rank with the debenture stock authorized to be issued by chap. 100 of the statutes of 1906. The proceeds of this issue are to be applied to the completion of the railway and for providing equipment.

The Minister of Finance is seeking power from the Dominion Parliament for the purpose of devoting part of the Dominion surplus for the financial year to the purchase of G.T.P. Ry. bonds, in order to offset any further calls on the Treasury by reason of the operation of the "implementing" clause in the guarantee given by the Government. About £6,500,000 of these bonds are as yet unissued.

Application is being made to the Dominion Parliament to confirm an agreement dated April 10, 1911, made with the Canadian Northern Ry., providing among other things for the joint use of a piece of line near Winnipeg, defining the rights of each company under the agreement, and declaring that the acquiring of these rights is a compliance with the schedule to chap. 71 of the statutes of 1903. It is also desired to secure confirmation of another agreement with the Canadian Northern Ry. made April 24, 1912, providing among other things for the joint use of a piece of line near Edmonton, Alta.

We are officially advised that during 1912 the following track was laid on the main line and branches:—Main line between Yellowhead and Prince Rupert, part westerly and part easterly, 128 miles; branch lines—Regina towards International boundary, 136 miles; Regina to Moose Jaw, 40 miles; Talmage towards Weyburn, 0.25 mile; Biggar towards Calgary, 104 miles; Oban to Battleford, 48.50 miles; Tofield towards Calgary, 92 miles; Bickerdike to Brazeau, 56 miles; a total of 609.75 miles.

The Minister of Railways stated in the House of Commons, Dec. 4, that the assistance granted by the Government to the company in respect of the building of the line from Winnipeg, Man., to Prince Rupert, B.C., was as follows: Implementing guarantee $4,994,416.66; loan under chap. 19, statutes of 1909, $10,000,000, guarantee of 5% bonds, $35,040,000, bonds pledged, $12,745,800.

The Board of Railway Commissioners has authorized the opening for traffic of the line from Fitzhugh, Alta., to Tete Jaune Cache, B.C., mileage 1027.8 to 1095.3.

J. W. Stewart, of the contracting firm of Foley, Welch and Stewart, on the occasion of his recent return to Vancouver from an inspection of construction in progress from Tete Jaune Cache to the end of steel near Hazleton, easterly from Prince Rupert, is quoted as stating that good progress is being made. While there has been a considerable decrease in the number of foreign laborers employed on account of the war in eastern Europe, their places have been taken by men from the prairies. The only stretch of the right of way on which construction is not being gone on with is between Fort George and Fraser lake. Subcontracts on this stretch of 140 miles were reported to have been let, Dec. 4, as follows:—Carleton Griffin; Burns and Jordan; John Bostock; Stewart Bros.; D. Ross; M.

National Transcontinental Railway Construction.

The main line of the N.T.R., which has been operated for freight purposes by the G.T. Pacific Ry. for some time, under an agreement with the Commission, from Winnipeg to Lake Superior Jct., was connected up with Cochrane, Ont., Dec. 28. A train load of wheat was started from Winnipeg Dec. 27, and was run over the line to Cochrane, Ont., there transferred to the Timiskaming and Northern Ontario Ry., over which the G.T.R. has running powers, transferred to the G.T.R. at North Bay, and thence run over the G.T.R. to Port Colborne, Ont., where the wheat was milled. The flour was then carried over the G.T.R. and Intercolonial Ry. to St. John, N.B., where it was shipped to South Africa.

The shops at Transcona, Man., were taken over by the G.T.P. Ry. from the N.T.R. Commission Jan. 20. (Jan., pg. 29.)

Grand Trunk Pacific Railway Construction.

Rupert, or mileage 1,403 from Winnipeg.

Of the branch lines the report sets out as follows:—Harte-Brandon—There are 10.8 miles out of the 25 ready for track laying; Regina boundary branch—track has been laid for 106 miles, and there are 19 miles yet to be completed; Talmage to Weyburn—under contract, with 39% of the grading completed; Regina-Moose Jaw—nearly completed, and terminal layout in Moose Jaw in progress; Moose Jaw northwesterly—grading practically completed, but no track laid; Oban-Battleford branch—18.5 miles completed; Cutknife branch—grading completed and four miles of track laid; Young to Prince Albert—track laid to Wicklaw, 67 miles, and grading completed into Prince Albert; but line will not be completed until bridge is built across Saskatchewan river; Biggar towards Calgary—grading completed to Saskatchewan-Alberta boundary, and a few miles of grading has yet to be completed, track has been laid for 37 miles out of Biggar; Tofield-Calgary branch—grading practically completed on the 202 miles, track laid to mileage 165.3, and trains are operated to mile-

A telegraph machine has been invented in Spain, which is claimed to be a distinct advance on the Hughes machine in use at present, in that it will transmit 1,820 words a minute, a speed three times greater than that obtainable on the Hughes machine.

A press report states that communication took place recently, between two wireless telegraph stations, situated at Nauen, Germany, and New York, and it is said that this is the first time that direct wireless communication has been established between Germany and the U.S.

A. B. Smith, Manager of Telegraphs, G.T. Pacific Ry., Winnipeg, has had his jurisdiction extended over the whole G.T.R. System, with office at Montreal. We are officially advised that no change will be made in the position of Superintendent of Telegraph, Montreal, held by W. W. Ashald.

During the storms in the early part of January, considerable damage was done to telegraph lines east of Toronto, the Great North Western Telegraph Co. losing nearly 700 poles. Communication was interrupted in the Brighton and Belleville district, for

Weight—on driving wheels	146,700	lbs.
" on truck, front	39,200	lbs.
" on truck, back	38,200	lbs.
" total engine	224,100	lbs.
" total engine and tender	375,000	lbs.
Tender—wheels, number	8.	
" wheels, diameter	34	ins.
" journals	5½ x 10	ins.
" tank capacity	8,000	gals.
" fuel capacity	10	tons.

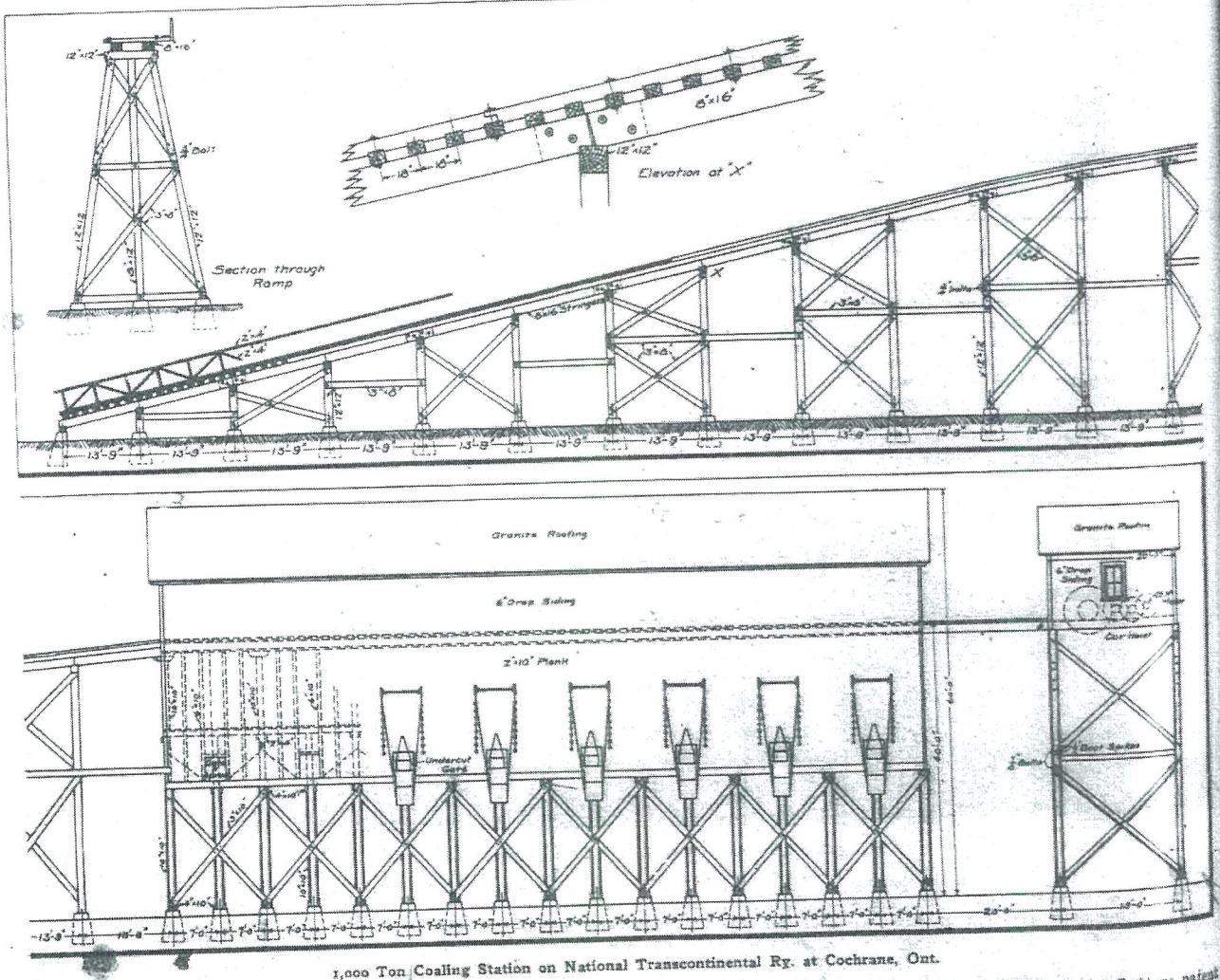
1,000 Ton Coaling Station on National Transcontinental Railway at Cochrane.

The National Transcontinental Ry.'s coaling station at Cochrane, Ont., is shown in elevation in the accompanying illustrations. It is typical of the coaling stations building and to be built on the eastern section of the transcontinental line, the type being built on the G.T.P.R. section having been described in Canadian Railway and Marine World last August. The two types differ essentially, the latter having a pusher ramp while the former operates by power. The N.T.R. one is roofed, and the G.T.P.R. one open. Other details of design differ, the principal difference being in the distribution of coal pockets.

The Cochrane plant is 112 by 30 ft., with a total height above ground of 60 ft., the coal car rail level being 40 ft. above ground. The structure is of wood throughout, and is supported on 10 by 10 in. posts, in sets of 4, at 7 ft. intervals the length of the building. The inner columns, 20 ft. long, are 14 ft. apart on concrete pedestals, 4½ ft. square at the base, calculated to support 62,560 lbs., and the other columns, 18 ft. long, on concrete pedestals 3½ ft. square at base, calculated to support 44,000 lbs. All piers are sunk to a depth of 5 ft. below the ground level. The inner two rows of columns slope together at the top directly under the two rails, with the outer ones forming the perpendicular sides of the coal pockets. The sides and ends of the coal pockets are sheathed with 2 by 10 in. planking, and the covered over top has 6 in. drop siding. The height to the under side of the coal pockets at the edge is 18 ft., rising in the centre on a slope of 1¼ to 1. The chutes along both sides are located 14 ft. apart, with a clear height above the rails of the coaling tracks of 14½ ft., 7½ ft. beyond the outer columns. The coaling tracks are 50 ft. centres.

The trestle approach ramp is supported on three rows of 12 by 12 in. wooden columns, the sets of three being 13¾ ft. centres. At the top of the ramp the outer column bases are 20 ft. 10 ins. apart, and at the lower end 7 ft. apart. All the piers are 3½ ft. square at the base. The ramp approach is steeper than in usual practice, which is made possible by the power hoist at the rear end of the plant. In a small cabin at this end of the plant there is housed a hoist, driven through gearing by a 25 h.p. electric motor. The coal cars are elevated on the platform up the steep ramp by this means.

The plant was designed by W. J. Press, Mechanical Engineer, N.T.R., from whom this information has been obtained. He claims for the plant the following advantages over the conventional design:—1. Elimination of liability of pushing locomotives or a string of cars over the trestle. 2. The building being under cover permits of the unloading of cars in all sorts of weather. 3. Man in charge can get any cars of coal that are on the track without awaiting the arrival of the switching locomotive and crew, and at times thus avoid running out of coal in the pockets, with the consequent delays in train movements. 4. More years of service for the trestle because it is not necessary to run a locomotive on it. 5. Saving of time and expense of switching locomotive and crew. 6. By having a hoist to move car when needed, it is unnecessary to lengthen the pocket beyond the length required for storage capacity, as is necessary with the standard design of coaling trestle in order to place a number of cars for unloading at one time, or at one visit of the switching locomotive and crew. 7. Saving of ground space by reducing the length of building and trestle by about 400 ft.



1,000 Ton Coaling Station on National Transcontinental Ry. at Cochrane, Ont.

Railway Lands Patented.—Letters patent were issued during December, in respect of Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Calgary and Edmonton Ry.	643.00
Canadian Pacific Ry.	6.77
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	1,214.59
Total	1,864.36

Changes in Gradients, and Temporary Structures, on the National Transcontinental Railway.

There has been considerable discussion in the daily press and at political meetings in regard to changes said to have been made in the N.T.R. construction by the present commission. A return presented to the House of Commons recently, giving the official correspondence on the subject, will prove of general interest to engineers, contractors, etc.

The correspondence opened with the following letter from E. J. Chamberlin, President, Grand Trunk Pacific Ry., to R. W. Leonard, Commissioner, National Transcontinental Ry., July 16, 1912:—

"I learn from our engineers that the standard of work on the portion of the N.T.R. between Lake Superior Jct. and Cochrane, which was at the outset adopted and has so far been complied with, is being departed from, and that instead of 0.4 grades and permanent structures, you have authorized grades up to 1% and the erection of temporary wooden structures. In regard to this, I would call your attention to clause 7 of the agreement of July 29, 1903, which provides that the construction of the Eastern Division shall be done according to the specifications approved by the company and shall be subject to the joint supervision, inspection and acceptance of our Chief Engineer and the Chief Engineer of the Commission. I beg to say that if this work is done in accordance with what I understand to be your recent instructions, it will not be in compliance with the agreement, nor satisfactory to this company, and cannot be accepted."

The Commissioner of the N.T.R. replied to Mr. Chamberlin on July 19, 1912, as follows:—"I find, on going over the profiles, that there are many places where a large expenditure may be saved and the line actually improved for operating purposes, and the time of completion considerably shortened, without in the least affecting the hauling capacity of locomotives, by making certain modifications, and I have given instructions to make such modifications accordingly. I am quite satisfied that the interests of the G.T. Pacific and the Government are identical in this matter, and I noted on my recent trip west that the modifications referred to are in accord with the practice of the G.T.P.R. Co. on the portions of the National Transcontinental Ry. built by that company, namely, from Winnipeg west, and from Fort William to Lake Superior Jct.

"In regard to wooden trestles, I may say that your engineers must be aware that it is absolutely necessary to put in wooden structures in some cases where the foundations are such that heavier structures, or solid embankments, cannot be constructed at present. There are points along the line where much money has been uselessly expended in futile attempts to make solid embankments, only, finally, to have to put in wooden structures, and I notice that the construction of such wooden trestles has been the practice of the G.T.P.R. on the portions of the N.T.R. above mentioned.

"I have carefully perused clause 7 of the agreement of July 29, 1903, and I fail to notice in this, or in any other agreement or act relating to the construction of the Eastern Division of the N.T.R. any provision relating to the gradients to which the line shall be built, or the nature of the structures, but it may be of satisfaction to you to have your Chief Engineer, or Assistant Chief Engineer, discuss with our Chief Engineer any proposed changes, and report to you in regard to same. It is not necessary for me to state that this Commission welcomes any criticism or assistance from your able staff of engineers on any or all matters affecting the economical construction and operation of the road."

Mr. Chamberlin wrote again to Mr. Leonard on July 23, 1912:—"I have yours of July 19, regarding changes in grade on the N.T.R., and note the reasons you offer for the modifications contemplated. Aside altogether from this company's strict rights, to which I called attention in my letter of the 18th inst. to you, I would ask you to furnish me with profiles showing the changes proposed, so that I may consider their effect. You will, I think, agree that it would be in the interests of both the Commission and this company that no work in connection with any changes of grade should be proceeded with until our approval has been given, and I would ask you to issue instructions to this effect. On receipt of the profiles, I will let you have my views with as little delay as possible."

Mr. Leonard replied to Mr. Chamberlin on Aug. 2, 1912, as follows:—"I beg to acknowledge receipt of your letter of July 23, expressing your apprehensions regarding the modifications referred to in my letter of the 18th ult. I note you refer to your company's 'strict rights,' to which you also referred in yours of the 18th ult., for which reference I can find no authority in the various acts and agreements relating to the construction of the Eastern Division.

"You have apparently been misinformed in regard to the reported changes in grade, as no change whatever in any of the ruling grades has been contemplated, but merely such trifles as slight local sags in the grades across soft swamps, which will not in any way affect the hauling capacity of locomotives, and which, if found desirable to lift out in the future for any unforeseen reason, can be effected more cheaply than at present contract prices, and will make a more solid road bed than is being made under similar circumstances today by using the peat for embankments.

"I suggested in my letter of July 19 that your Chief Engineer, or Assistant Chief Engineer, discuss with our Chief Engineer any proposed changes and report to you in regard to same, because, you will see from the above, these are simply details too trifling to occupy either your attention or mine, and the suggestion in my letter of July 19 should be quite sufficient for your purposes, or perhaps it would be still simpler and quite as efficient for you to get your information through your district engineers, after consultation with the district engineers of the Commission, in the usual way."

On Nov. 21, 1912, Mr. Leonard wrote to the Minister of Railways as follows:—"In reference to the charges made in the newspapers that the gradients on the N.T.R. have been injuriously altered, I beg to point out, that the only change in gradients made by the Commission since Sept. 30, 1911, was to allow a few sags to remain, where there have been subsidences and across soft muskegs, which it would be inadvisable, from an engineering point of view, to fill at present, to be operated temporarily or permanently as velocity grades. The presence of such sags in the railway does not injuriously affect the economical operation of the road. The same trains, carrying the same loads, making the same time, with the same expense and the same degree of safety and comfort, can be handled over a road in which such sags, or velocity grades, exist as on a road of the same ruling gradient in which there are no such sags or velocity grades.

"By introducing these sags, all of which are well within velocity grade limitation, the Commission will: 1. Save a large amount of money in the construction of the railway; 2. Expedite the completion of the road; 3. Should it become advisable, for any unforeseen reason in the future, to eliminate these sags, it can be done at one half the cost that the present contract prices call for; 4. In one case it has been found necessary to raise the grade in a cutting, the material in which is so soft and wet that it is impracticable to construct a line on the original grades, and in this instance the grade has been kept well within the limits of velocity grade practice, and the gradient can be reduced at any time, if it should ever be found desirable, by filling in the lower portion with suitable material; 5. The concensus of opinion of the following engineers, who have been in the employ of the Commission for years, in their sworn testimony before the Commission investigating the construction of the N.T.R., is that velocity grades are not only unobjectionable, but might have been introduced permanently into the railway, and would have greatly reduced the cost of the road:—G. Grant, Chief Engineer; C. O. Foss, District Engineer, District A.; A. E. Doucet, District Engineer, District B.; A. G. Macfarlane, District Engineer, District F.; G. L. Mattice, Assistant District Engineer, District D.; J. W. Porter, Assistant District Engineer, DistrictB.; A. N. Molesworth, ex District Engineer, District C. & D.; H. L. Bucke, Division Engineer, District D. & F.

"I find that the gradients on which the original Quebec bridge was partially built were 1% on either side, and the new bridge will necessarily be built to the same grades. I also find that the gradient approaching the Quebec bridge from the east side, including the Chaudiere bridge, was 1%, which cannot be altered. In New Brunswick I find in the middle of a division a grade 13 miles long of 1.10% against east bound traffic, and in Quebec, in the middle of another division, 11 miles of 1.10% grade against west bound traffic, each of which will limit the hauling capacity of locomotives over these divisions to the same extent as if the whole division had been located on these grades.

"I am sending, herewith, for your information, five blue print profiles, showing all the changes in gradients which have been effected since Sept., 1911.

"Mr. Grant's evidence is not yet in type, but from conversation I have had with him, which is confirmed by Mr. Staunton, I know his views to be as above stated."

The return states that there have been no departures from original instructions, as regards curves and bridges or other permanent structures.

In connection with the foregoing it will be of interest to note what W. F. Tye said in his recent presidential address before the Canadian Society of Civil Engineers, and which is given in full in this issue. His remarks on momentum grades will be found on pg. 107.

It was reported at a meeting of the Public Accounts Committee of the Manitoba Legislature, Jan. 5, that the amount of taxes paid to the Province by the C.P.R. was $100,000, and by the Canadian Northern Ry. $40,000. The Railway Taxation Act provides that 2% on the gross earnings of railways be levied, and a resolution asking the government to enforce the act in the case of the C.P.R. and the C.N.R. was lost on the casting vote of the chairman.

National Transcontinental Railway Construction.

The Dominion Parliament has passed an act extending for one year, the time within which the line is to be completed. It is also being asked to vote $19,000,000 on account of construction and $3,000,000 on account of the building of the bridge over the St. Lawrence at Quebec.

A contract is reported to have been let by M. P. and J. T. Davis, general contractors, for the Levis-New Brunswick boundary section, 130 miles, to W. Daly, Montreal, for the completion of work on the section. There is about nine miles of track to be laid, and some bridging is to be done, and there is also a good deal of ballasting and the general finishing up. It is expected that the work will be completed by Sept. 30.

Tenders are under consideration for the supply of 1,732 long tons of 80 lb. steel rails for delivery, June 1 at St. Anselme, Que., and 4,349 long tons of 80 lb. steel rails for delivery June 1 at Harvey Jct., Que. (Feb., pg. 82.)

Changes in National Transcontinental Railway Gradients.

The Minister of Railways, Hon. F. Cochrane, gave the following answers in the House of Commons, Mar. 19, to questions asked by the ex-Minister, Hon. G. P. Graham:—

No temporary trestles on the eastern division of the National Transcontinental Ry., originally intended to have been permanently filled, have been substituted for permanent structures.

No temporary or wooden bridges have been substituted where concrete and steel or permanent bridges were to have been constructed.

None of the momentum grades, or any portion of them, are on trestles.

The changes in gradients, bridges and trestles were suggested and recommended by the Commission's Chief Engineer. The estimated saving in cost to date is $27,797, the estimate having been made by H. M. Balkam, District Engineer.

No yards or divisional points have been reduced from the original plans in area, trackage, buildings or efficiency.

In addressing the Quebec Board of Trade, Feb. 21, referring to the correspondence published in Canadian Railway and Marine World for February, the Minister of Railways is reported to have said:—"At two points on the line, viz.:—near mileage 395, and near mileage 397, west from Quebec, gradients eastbound of 4.1%, and westbound 6.1%. have, for economy of construction and operation, been adopted for the present. These are what are known as velocity gradients and do not injuriously affect the operation of the road. Should it become advisable for any reason in the future to eliminate these sags, it can be done at one half the cost that the present contract prices call for." (March, pg. 118.)

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MAY 1913

National Transcontinental Ry. Construction.

In the House of Commons, Mar. 31, when a vote on account of construction came up, the Minister of Railways made a statement as to the work done on the line. He said:—"In respect of district A, comprising approximately 256 miles from Moncton to the New Brunswick and Quebec boundary, grading is completed and the track all laid. The telegraph line and about 99% of the bridges have been completed. With regard to district B, comprising 562.54 miles, 15 miles of the western end of which have recently been transferred to district C-D, grading is completed, and track laid for 500 miles. The telegraph line is completed for 357 miles, and 98% of the bridges have been constructed. In the next district, C-D, the length of which is 412 miles, grading has been completed to the extent of 395 miles, or 95%, and 391 miles of track have been laid. On the main line 82.9% of siding and yards have been laid, of the telegraph line, 242 miles, and, of the bridges, 42% have been completed, in district C and 98% in district D. In district E, the length of which is 195 miles, 150 miles of grading have been completed, and 195 miles of track laid. That is the section between Cochrane and Graham, 400 miles. We have laid the track over that route, but grading is not fully completed. District F is over 376 miles long. Grading has been completed, and 382 miles of track have been laid, including double track from Transcona to Winnipeg: 132 miles of sidings have been laid, 304 miles of telegraph lines have been completed, and 93% of the bridges have been constructed. A recapitulation of these figures is as follows:—Total length of line from Moncton to Winnipeg, 1,804 miles; grading completed, 1,695 miles, or 94%, in 21 contracts; track laid, 1,720 miles; sidings, 383 miles; telegraph lines, 1,170 miles; bridges, 85% completed. It is expected that the road will be running into Quebec before Sept. 1."

With respect to the terminals in Quebec the Minister said the matter had not moved along as satisfactorily as had been expected, but he hoped to make a definite announcement when the estimates were discussed in detail. It was intended to lay down a track to the Champlain Market, where it would probably be necessary to build a small station. He did not think it a good place for the main terminal of the line, as the means of access were not sufficient for the probable traffic. The line from Moncton to Quebec will be completed by Sept. 1, but the car ferry, which is to operate between Levis and Quebec will not be ready until the spring of 1914. It is being built in Great Britain, on the most up-to-date lines, and will be provided with a mechanical contrivance by which the car deck can be raised or lowered according to the tide. The through traffic will be handled where the railway crosses the bridge, but the Commission, under which the Quebec Bridge is being built, had informed him that the bridge would not be ready before the end of 1917. All the right of way, except one small piece, for the terminal site at Quebec, had been purchased, and the Commission had also bought about 5,000 ft. frontage on the shore between Wolfe's Cove and Champlain market for deep water terminals.

A further sum of $3,166,666.67 was voted by the House of Commons, April 1, on account of the construction of this railway.

Tenders are under consideration for the building of a 12-stall locomotive house, without machine shop, at O'Brien, Que., about 113 miles east of Cochrane, Ont.

(April, pg. 179, and pg. 182.)

JUNE 1913

National Transcontinental Railway Construction.

The Dominion Parliament, at its recent session, voted $19,000,000 on account of the construction of this railway from Moncton, N.B., to Winnipeg, Man. In reporting on the state of construction the Minister of Railways stated that on District A the 256 mile section from Moncton to the New Brunswick-Quebec boundary, the line is completed, with the exception of the painting of some of the bridges. On District B 509 miles of grading has been done, leaving about 10% to be finished; track has been laid for 500 miles, and 74 miles of sidings have been laid; 357 miles of telegraph lines have been strung, and a few of the bridges require painting. On District C.D., which extends from 204 miles east to 208 miles west of Cochrane, Ont., 395 miles of grading have been finished; track has been laid for 391 miles, and 82 miles of sidings have been put in; 240 miles of telegraph lines have been strung, and the bridge work is 42% completed on the C. portion of the section, and 98% on the D. portion. On District E, 195 miles, grading and track laying has been nearly completed; 17 miles of sidings have been laid, 18 miles of telegraph lines strung, and 25% of the bridge work is done. On District F, 376 miles, extending to Water St., Winnipeg, grading is fully completed and track laid, including six miles of second track from Transcona to Winnipeg and 132 miles of sidings and yards; 304 miles of telegraph lines have been strung, and the bridge work is 93% completed. The amount expended on the work to Dec. 31, 1912, was $127,219,863, and it is estimated that $34,087,937 will be required to complete the work. It is expected to have the track all laid, and the line completed easterly into Cochrane this year, and into Quebec early in 1914. It is hoped to have the car ferry in operation between Levis and Quebec by that time.

The time limit for the completion of the car ferry at Levis, Que., is May, 1914, and if this is observed it is expected to have the line in operation from Moncton to Winnipeg by the end of the summer of 1914. The Quebec City Council was informed, June 13, that the contract for the terminal station and the workshops at Quebec was being prepared, and would be submitted for signature as soon as ready. This matter has been under discussion for a considerable time, and several inspections of the sites have been made by the Commission's engineers in company with the representatives of the G.T.R. and the city council. The Minister of Railways, during the discussion of the matter in the House of Commons, May 29, said the Champlain Market St., would be retained, where a small station would be put up. The Harbor Commissioners had agreed to run a line to connect that with the St. Charles River. The main points as to the terminals proper had been agreed upon. Until the traffic warranted the building of a tunnel under the city from Wolfe's Cove, it is proposed to run over the C.P.R., and have a union station. In regard to the shops it had been arranged to locate them at St. Malo.

It is expected that the 30 miles necessary to complete the line easterly from Winnipeg to Cochrane, Ont., will be completed in September, when a train service will be put on. At Cochrane the traffic will be taken over by the G.T.R., which has running rights over the Timiskaming and Northern Ontario Ry., and thence will be carried over its own line from Nipissing Jct. to Toronto, Montreal and other ports. The through train service from Winnipeg to Fort William was inaugurated June 6. The first section of the journey is over the N.T.R. to Superior Jct., and the second over the G.T. Pacific Ry. line from Superior Jct. to Fort William. (June, pg. 277.)

Grand Trunk Pacific Railway Construction.

The Dominion Parliament has passed an act authorizing an advance from the Consolidated Fund not exceeding $15,000,000 to assist the company in completing the line from Winnipeg to Prince Rupert; such advance to be repayable with 4% interest by July 1, 1913, and to be secured by debentures charged upon the company's property and ranking next after the securities issued under chap. 100 of the Acts of 1906, and to be guaranteed by the G.T.R. The Act also provides that the $15,000,000 is in addition to any sums now remaining unborrowed and negotiable of the loans heretofore authorized.

The Minister of Finance, in explaining the proposals, said the object was to provide funds to complete the line so far as the proceeds of the funds already provided were insufficient. "The cost of construction of the prairie section up to April 30, as estimated by the chief engineer, was $35,438,230.31. To meet this estimated outlay there has been available, from the three sources mentioned, $30,737,409.21, leaving a balance of $4,700,821.10 on the prairie section, plus some additions for trestle work, $2,700,000; for additions including building additional elevator tracks and extending some of those already built, constructing new stations, section houses, tank houses, etc., of $3,600,000, making a total of $10,230,821 required to complete the prairie section. Then on the mountain section the estimated cost, which will be exceeded according to the latest available estimates of the Chief Engineer, is $61,509,500. Call this $70,000,000. Of this 25% is to be furnished by the G.T.P. This amounts to $17,500,000. The proceeds of the series B bonds were $9,000,000. This leaves a balance to be furnished from other sources—including this loan which affords $15,000,000—of $8,500,000. So, according to this estimate an additional $10,000,000 is required to complete and fully equip the prairie section, and a balance of $8,000,000 to complete the mountain section, making a total of $18,000,000. This will be exceeded, so call it $20,000,000. We are providing $15,000,000, which will be available pro tanto for the work."

Collingwood Schreiber, C.M.G., returned to Vancouver, May 22, from an inspection of the line easterly from Prince Rupert, B.C., and subsequently inspected the construction in progress westerly as far are Fort George. He reports that the grading easterly has been completed to Bulkeley Summit, and it is expected to have track laid to that point by Sept. 1. A considerable amount of grading has been done east of Bulkeley Summit towards Fort George, 160 miles distant. Work is well advanced from the present rail head, 60 miles west of Tete Jaune towards Fort George, 100 miles further west, and it is expected to have the track laid to that point by the end of the year. It is expected to be able to drive the last spike early in the summer of 1914, at a point between Fort George and Fraser Lake, B.C. (June, pg. 277.)

The Master Boiler Makers' Association's annual convention was held at Chicago, Ill., May 26 to 29. The subjects which came up for discussion covered practically the whole ground which comes within the purview of master boiler makers in connection with the design and manufacture of locomotive boilers.

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August 1913

National Transcontinental Railway Construction.

We are officially advised that a contract has been let to J. Gosselin, Levis, Que., for the erection of machine and other shops for the N T R. at St. Malo, Que. The estimated cost of the shops is $1,500,000. A description of the several buildings covered by the contract appeared in Canadian Railway and Marine World for Sept., pg. 409.

The Minister of Railways returned to Ottawa, Sept. 12, from a trip of inspection over the line westerly from Cochrane, On. He is reported as saying that while the section of the line from Cochrane to Lake Superior Junction, to which point it is already in operation easterly from Winnipeg, would not be entirely completed until early in 1914, it can be utilized to prevent a grain blockade if one is threatened. A few sink holes are giving trouble and some bridges to replace temporary structures, have yet to be erected. The Minister made the trip to Winnipeg over the line in company with E. J. Chamberlin, President, and other officers of the Grand Trunk Pacific Ry. At Winnipeg, Sept. 4, Mr. Chamberlin said there were yet about 275 miles of the line between Cochrane and Lake Superior Jct. to be completed, so far as ballasting was concerned. (Sept., pg. 430.)

Canadian Northern Ry., Toronto, born at Smiths Falls, Ont., Nov. 25, 1859.

F. M. Spaidal, General Manager, Cana- [illegible] Winnipeg, born at Morris, N.Y., Nov. 21, 1887.

National Transcontinental Railway Standard Locomotive House.

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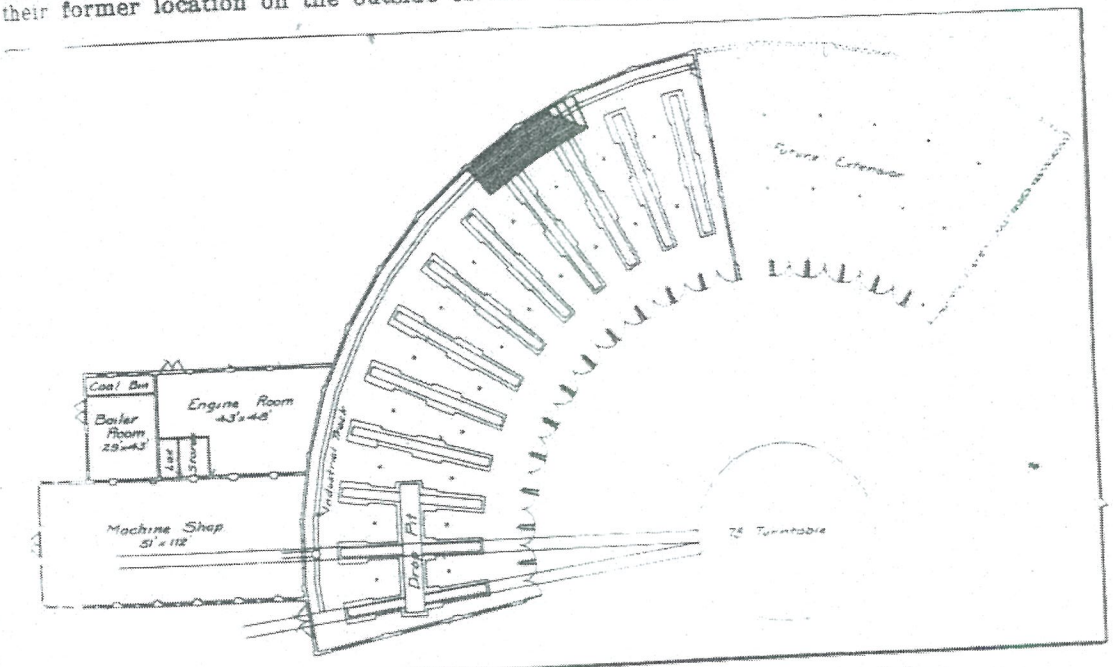
In general arrangement, the new design is similar to the former, the principal point of variation being in the shifting of the machine shop and auxiliary buildings from their former location on the outside of the locomotive house, so as to leave the outside track clear for a through connection, the idea being that when a crippled locomotive is brought into the terminal, it may be run on the through track alongside the machine shop by the yard crew, where it may be picked up when convenient by the mechanical department and run in on the pit. In the former arrangement, the dropping off of a crippled locomotive on the turntable side of the locomotive house left the latter blocked, necessitating the immediate removal of the locomotive, which would not always be convenient. The normal handling of the motive power will not be disturbed in the new arrangement.

The new design is for a 12 stall house, so designed with the auxiliary buildings to one end that future pit extensions may be added without in any way interfering with the original plans, the auxiliary buildings being made of sufficient size to meet the demands of future enlargements to the motive power accommodation. The main building has the stalls, forming chords of a circle, on a central angle of 7 degs. 46 mins., the inside radius of the building to the centre line of the door posts being 114 ft. 5¼ ins., and the outside radius, 205 ft. 5¼ ins., giving a locomotive house depth of 91 ft. In the centre of the circle is a 75½ ft. turntable.

At the lower end of the locomotive house are three drop pits, communicating with each other through a cross pit. The lower one of the three drop pits is on the through track provided in the new arrangement for the reasons explained. The central drop pit track runs through into the machine shop to the rear, a 112 by 56½ ft. building. Adjoining the machine shop are the engine and boiler rooms, 48 and 29 ft. long respectively by 43 ft. wide. All these buildings are to be on concrete foundations up to 4 ft. above the base of the rail, with the remainder of the walls of red brick. The roof of the locomotive house will be supported on wooden columns, girders and beams, with brick walls at the rear and side, and steel columns at the door posts. The roof of the machine shop and engine and boiler rooms will be supported on steel trusses. Over the drop pits and machine shop there will also be skylights.

The pits are to be 60 ft. long, 3¾ ft. wide, and 2ft. 11 ins. deep at the rear, rising to 2¼ ft. at the front from the base of rail to a 3 in. crowning in the bottom of the pit. depression at the rear of the pit will drain off the pit water through a 4 in. cast iron pipe. The pit construction will be concrete throughout, the top of the pit walls being surmounted by two, and in places three, 8 by 12 in. timbers, spiked on rods bedded in the concrete walls, the 80 lb. rails resting on the timbers. The locomotive house will have a 4 in. cinder floor, except around



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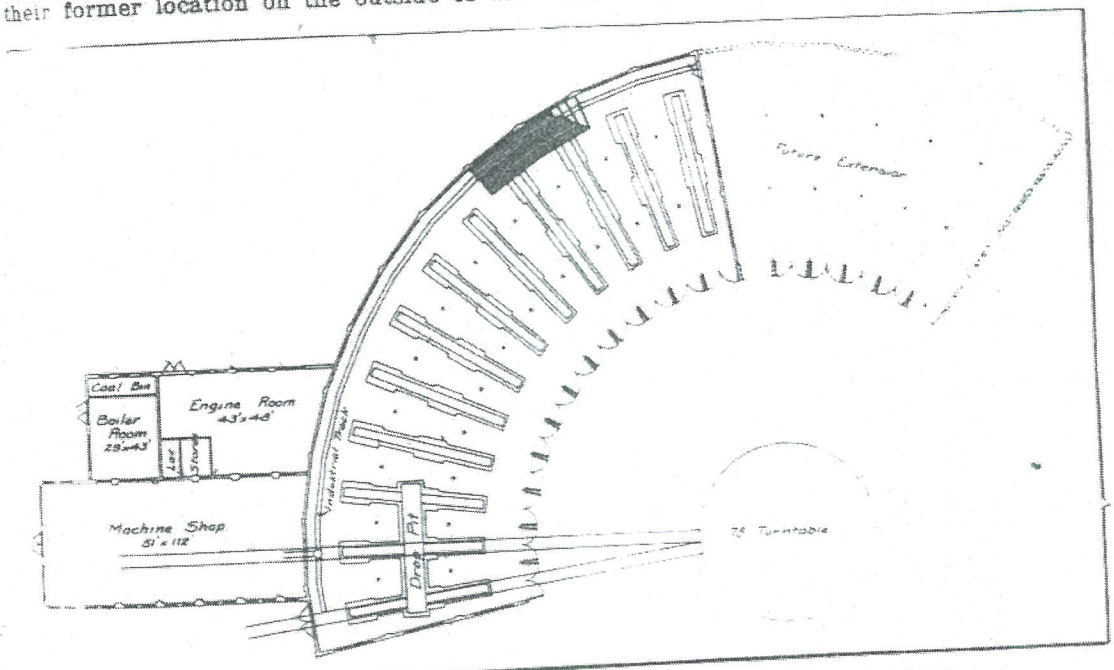

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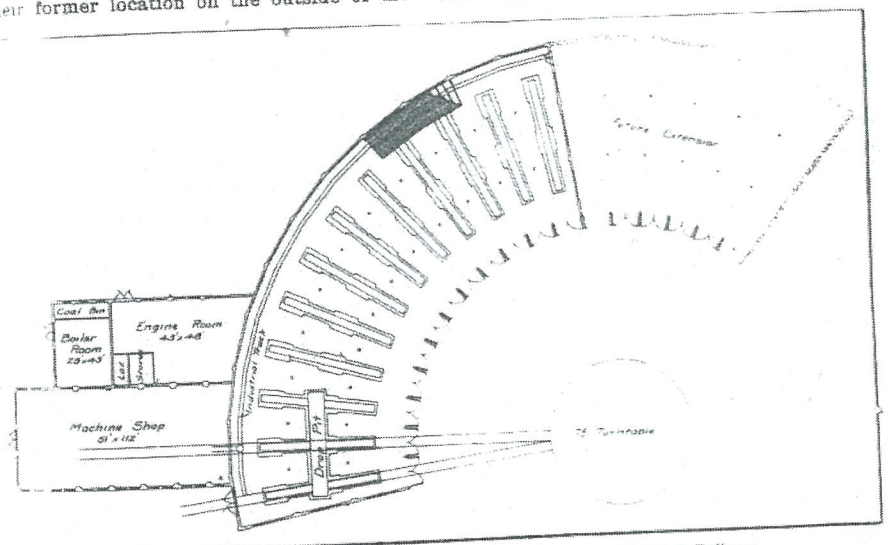

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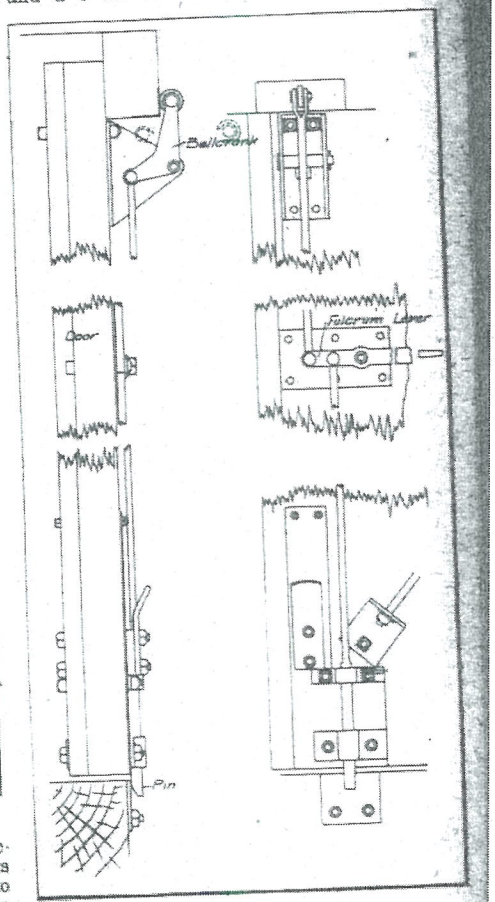
Around the inner wall, at the end of the pits, there will be a concrete heating duct of varying size, largest at the engine room end, where connection with the heating fans is made. At the end of each pit there will be a 9 in. heating opening, and from the heating duct for each pit there will be a heating pipe running alongside the pit, with three 9 in. openings leading in along one side at equidistant points along the pit length. The drainage of the buildings will be provided for by an 8 in. tile pipe outside the outer wall of the locomotive house, with a 4 in. cast iron connection from each pit, and a 6 in. connection from each end of



Door Fastening Device for N.T.R. Locomotive House.

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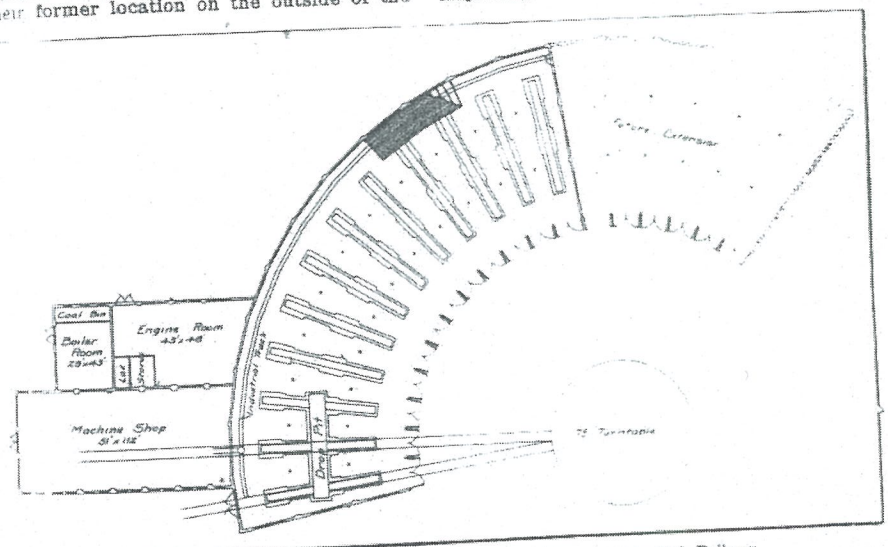

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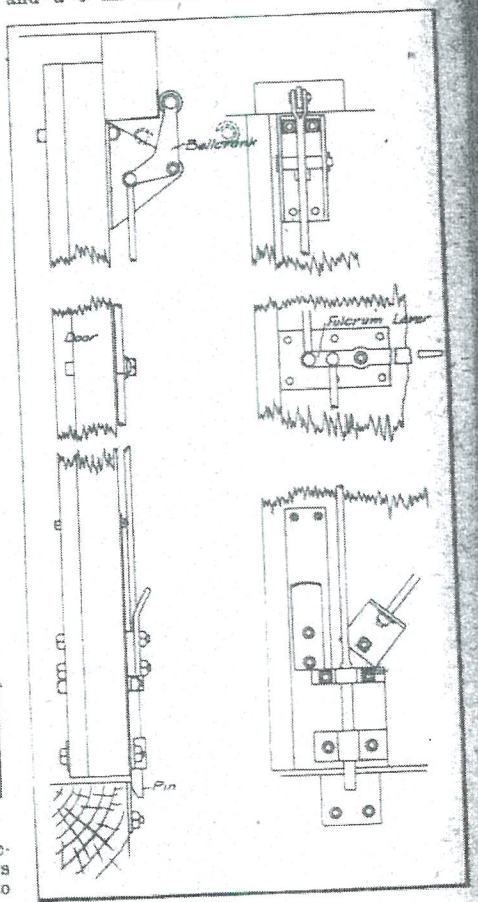

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The machine shop will have the usual

National Transcontinental Railway Construction.

A press dispatch from Cochrane, Ont., Nov. 17, states that the last section of track has been laid easterly from that point, connecting with the track laid westerly from Quebec, thus completing track laying on the entire line of the N.T.R. from Moncton to Winnipeg, 1804 miles. The last of the steel was laid near Nellie Lake, about 15 miles east of Sunday River, and about 200 miles east of Cochrane. This does not mean that the line is completed, for the bridge work is yet to be finished and the ballasting, etc., to be done. The most important bridge work yet to be done is the building of the bridge across the Megiskan River valley, about 190 miles east of Cochrane. This bridge will be 500 ft. long. The abutments are in place and the steel will be put in position during the winter. The valley is at present spanned by a temporary trestle.

West of Cochrane the line is reported to be in excellent shape as far as Superior Jct., whence the G.T. Pacific Ry. branch line is in operation to Fort William. The trestle work on this section is now reported to be filled in and the bridge work practically completed. It is expected that the entire line will be ready for operation by the end of next summer.

Work is being proceeded with on the car ferry slips at Quebec and Levis, Que., and these are expected to be ready about the same time.

The section of the line from Cap Rouge, Que., for 50 miles west, was finally completed Oct. 30, and is ready for traffic. The section from Levis to the boundary of New Brunswick is expected to be finally completed in July. G. Grant, Chief Engineer, completed a trip of inspection over the section south of the St. Lawrence River to the New Brunswick boundary, Nov. 9. The contract on both these sections has been carried out by M. P. and J. T. Davis.

In connection with the terminal plans at Quebec a terminal is to be built from Lampson's cove to St. Malo, near the site of the shops. This tunnel will obviate the original plan of building a line along the already congested water front.

Tenders will be received by the Commissioners to Nov. 4 for the installation of an electric wiring system for the car shops at Transcona, Man. (Oct., pg. 479.)

Grand Trunk Pacific Railway Construction.

December 1913

National Transcontinental Railway Construction.

We are officially advised that track was laid during 1913, on 88.26 miles in the Province of Quebec, and on 2.22 miles in Manitoba. The line is now completed so far as track laying is concerned, and G. Grant, Chief Engineer, is said to have recently stated that the entire line will be ready for handing over to the G.T. Pacific Ry. for operation, by the end of this year. On the line east of Quebec to the boundary between Quebec and New Brunswick, there is stated to be only about 10 miles of ballasting to be completed. The work of finishing up the line west of Quebec is being pushed forward with all speed. In regard to the velocity grades, which were established east of Bell River, the Chief Engineer is reported as stating that they will be eliminated before long.

The steel bridge work is not yet finished, contracts for four bridges to replace temporary trestle work having just been let to the Canadian Bridge Co. (Dec., 1913, pg 578.)

reported to have been laid to Mawer, 10 miles west of Eyebrow.

Track laying has been completed to the banks of the South Saskatchewan River, on the Young-Prince Albert branch, and sidings laid out. Preparations are being made for the building of a bridge across the river. It is expected that the piers and abutments will be put in during the winter.

The Board of Railway Commissioners has authorized the opening for traffic of the Mountain Park Coal branch, mileage 0 to 30.24. (Dec., 1913, pg. 578.)

The Legislature is further being asked to guarantee the company's 4½% bonds for $15,000 a mile in respect of the construction of the following additional lines:—From a point on the Biggar-Calgary branch to the west bank of the South Saskatchewan River opposite Riverside, 60 miles; from the main line in tp. 36, range 8, west of the third meridian, southwesterly from Saskatoon, 50 miles; from Talmage on the Regina-Boundary branch northwesterly towards Moosomin, 70 miles; and for a 90 mile extension of the Watrous-Swift Current line authorized to be built by par. 2 of the schedule to chap. 14 of the statutes of 1912.

ing the provision of a carload rating of 4th class on peanut butter in the Canadian Freight Classification. It is ordered that the Canadian Freight Classification be amended by the addition of a rating of 4th Class for peanut butter in carloads, and that the said amendment be included in the proposed Supplement 2 to Canadian Freight Classification 16 submitted by the Canadian Freight Association for the Board's approval.

Demurrage On Coal Shipments.

21011. Dec. 15. Re complaint of Vanguard Co-Operative Supply Co., Ltd., Vanguard, complaining that the C.P.R. wrongfully collected $34 from it as demurrage on two cars of coal consigned to Canadian Coal and Commission Co., Bienfait, and shipped on Dec. 11 and 12, 1912. It is declared that the said charge for demurrage was illegal.

Steam Shovel Track Connection.—Every shovel man knows that much time is needlessly lost in moving up. This loss is sometimes due to the poor organization of the crew, but more often to derailment and other delays due to soft ground and poor track laying. Many methods have been devised for cutting down these accidents by the introduction of various devices for con-

National Transcontinental Railway Bridges.

Between Moncton and Winnipeg there are 200 bridges having an aggregate length of 11 miles and a weight of 61,000 tons of steel; they cost more than $6,000,000. Some of the most interesting structures were mentioned by R. F. Uniacke, Bridge Engineer, N.T.R., in an address at the Canadian Railway Club recently.

Many of the bridges are plate girder viaducts, among which is the one over Little Salmon River. It is 100 ft. high, 4,000 ft. long and contains 7,000 tons of steel. In the Bostonnais River bridge, where the deck plate girders are supported on comparatively low concrete piers, the spans are tilted out of a horizontal plane so that the girder webs are slightly inclined to the vertical and provide without shimming for the superelevation of the outer rail on a curve.

Falsework for the erection of the Bush River bridge truss spans and for the preliminary temporary support of a contractor's service track was made with the main bents capped at the proper elevation to support the chamber blocks for the trusses, and surmounted by centre pony bents to carry track stringers and rails and provide for a construction track in advance of the bridge erection.

The 80 ft. deck plate girder approach span of the Okekodaski River bridge was supported at the shore end on a concrete pier that was wrecked by transverse displacement. The sub soil was found to be unable to support the 15 ft. fill that had been retained by the abutment pier. Temporary repairs were effected by supporting the end of the span on timber cribbing until a permanent low steel trestle could be built to replace the embankment.—Engineering Record.

January 1914

Canadian Railway and Marine World

February, 1914.

National Transcontinental Railway Car Shops at Transcona.

The locomotive department buildings of the main repair shops which the National Transcontinental Ry. Commission is building at Transcona, Man., were described in Canadian Railway and Marine World for Feb., 1912, previous to which there appeared several progress articles. The locomotive buildings have since been placed in service by the Grand Trunk Pacific Ry. The development of the plans for the car department buildings was delayed for some little time on the change in Government in 1911, and in consequence, while the plans for the buildings themselves were prepared some time ago, and in most cases the buildings completed, it was only quite recently that the interior arrangement, including the machinery installation, was completely decided on prior to calling for machinery tenders. The plans as originally prepared were revised by W. J. Press, Mechanical Engineer, N. T.R., which involved considerable rearrangement and the selection and installation of machinery, was also carried out under his supervision.

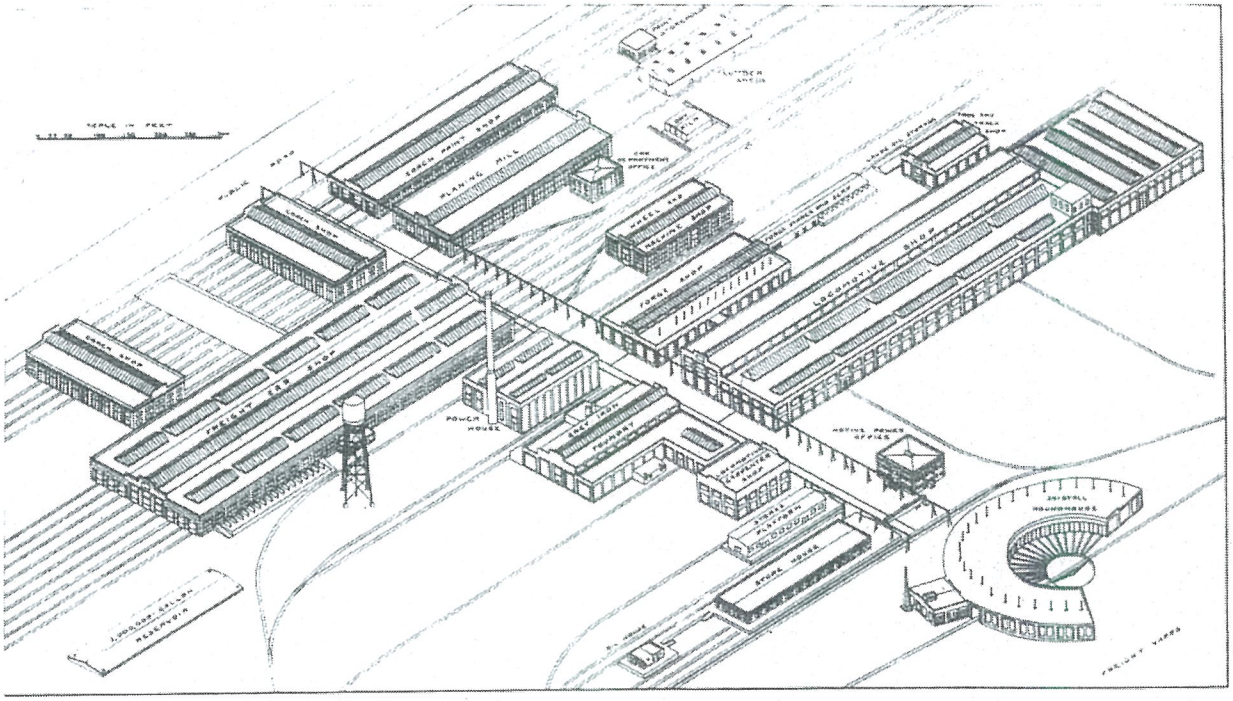

Fig. 1. Isometric Projection of Locomotive and Car Department Buildings, National Transcontinental Railway

The shops are located in Transcona, six miles east of Winnipeg, on the N.T.R. main line. In conjunction with the shops being built by the Commission at Quebec, a preliminary description of which appeared in Canadian Railway and Marine World for Sept., 1913, they were designed to handle the repairs on the whole 1,800 miles of line from Moncton to Winnipeg. The G.T.P.R., in the construction of its section of the transcontinental line from Winnipeg westerly, did not build any shops, and will use the Transcona shops for the additional service of handling all repairs on the western lines for a considerable time to come at least. The G.T.P.R. took possession of the locomotive department buildings early last year, and is handling at Transcona all the repairs on its lines now in operation.

The site of the shops is on the open prairie, and in order to avoid trouble from flooding by spring freshets, and to secure a better surfacing than that afforded by the prairie soil, the site level has been raised about 4 ft. over the entire area occupied by the buildings, by a heavy gravel fill.

The various buildings have been grouped together as closely as possible to facilitate intercommunication during the severe winter, the intervening distances being made as short as practicable, bearing in mind the advisability of future extensions. The accompanying isometric projection, fig. 1, shows that this feature has been very successfully developed, when it is remembered that the designers had in mind the future extension of the majority of the buildings upwards of 100%, without disturbing the general scheme. The total area of the combined shops will be about 17 acres.

The main buildings are arranged along a midway, which runs across the shop site from the public road to the locomotive house and freight yard adjoining the main line, and are served by a series of standard gauge and industrial tracks, the former connecting through the rear of the buildings to a ladder track at each end of the grounds and thence to the yards, and the latter with industrial tracks along the central midway. Additional intercommunication is obtained through an overhead 10 ton electric travelling crane, which runs the full length of the midway, connecting the front ends of all the main buildings. This crane is electrically operated, and the operator's cage is electrically heated by a heater of the street car type. All exposed parts of the crane are projected by hoods in the usual manner. Wherever possible, the steel runways are carried on abutments from the shop buildings, and the intervening steel columns are carried on concrete piers.

As shown in the isometric projection, the car department buildings are to the north, and the locomotive department to the south, the midway passing through each group of buildings. The divisional line is the through running track to the north of the power house, the latter being as centrally located as possible to reduce power and heat transmission losses to a minimum, as will be shown later in the article. The foundry and forge shop, being common to both groups, are located in a midway position, with the distinctively departmental buildings to the north and south.

The larger buildings of both groups are of steel construction, with self supporting steel frames on concrete foundations, with concrete walls carried up to the window level. The balance of the superstructure masonry is brick, carried up into a parapet wall all around the building, and capped with concrete coping. The roof drainage is carried down inside the building from re-

ceiving hoppers in the roof, and through running traps to the sewers. All the large buildings are covered with a built up roofing, composed of felt and asphalt, covered with gravel. All windows throughout the plant have ⅛ in. thick ribbed glass, and the skylights are glazed with ⅜ in. wire glass. As additional protection against heavy snow loads on the roof, the skylights are carried on steel ribs, with rolled copper sheathing to carry the glass. Copper is used throughout for all flushing gutters and ventilators.

Mercury arc lights are being used for the principal interior shop illumination, with lamps and reflectors hung high in the shops. This form of illumination is satisfactory, giving an easy, even light, with no sharp shadows. In addition, there will be plug receptacles in all the buildings, at frequent intervals, for the attachment of cable lights. Daylight illumination is especially well provided for by ample window areas, and wide skylights, giving a maximum interior light distribution. The interior of all the shops will be finished in white, enhancing the interior lighting arrangements.

High and low pressure steam, and water, compressed air, and drinking water are distributed about the plant, as explained in an article descriptive of the power house in Canadian Railway and Marine World, Oct., 1913. A tunnel extends the length of the midway, carried on the wall of which are all the mains from the power house, with connections leading from the tunnel to the various shops. On entering the buildings, the piping is carried on the trusses and steel work of the shop. Fuel oil is distributed in piping to such shops as require it. An extensive fire protective system is in use, comprising yard piping, with fire hydrants and hose houses at convenient intervals throughout the grounds. All the electric travelling cranes throughout the shops are operated on 3 phase alternating current, which is transmitted directly from the power house.

The Passenger Car Shop differs from the arrangement in the initial layout, which comprised one building, 115 by 260 ft., on the west side at the north end of the midway, and had four working tracks the length of the shop, each of which could accommodate four cars, making a capacity of 16 cars. There were also to be two service tracks, one between each pair of shop tracks, and along each side, a 16 ft. gallery. In the scheme now under construction, the transfer table type of construction has been adopted, located on the west side of the midway, at the north end, with the easterly of the two shops adjoining the midway. The two shops will each be 120 by 200 ft., with an intervening 75 ft. transfer table, and 100 ft. approach tracks to the buildings, which are therefore 275 ft. apart. Each shop will have 9 working tracks, in as many bays, at 20 ft. centres, with an additional empty bay at the north end of the building.

The shops are the standard construction, of concrete lower wall, carrying a brick upper wall, spanned by steel trusses in the divisional line of each bay. Each bay is entered by double doors from both sides, through 12½ by 16½ ft. openings. Both ends of the buildings have galleries, that at the north end, 14 ft. above floor level, and extending over one bay, and that at the south end 24 ft. 8 ins. above the floor, extending over two bays. Both platforms are carried on the walls and 5 steel columns in the line of the truss above, and are composed of 4 in. reinforced concrete flooring carried on steel I beams. The ground flooring comprises a bed of 6 ins. of bituminous concrete, surfaced with 3 in. yellow pine.

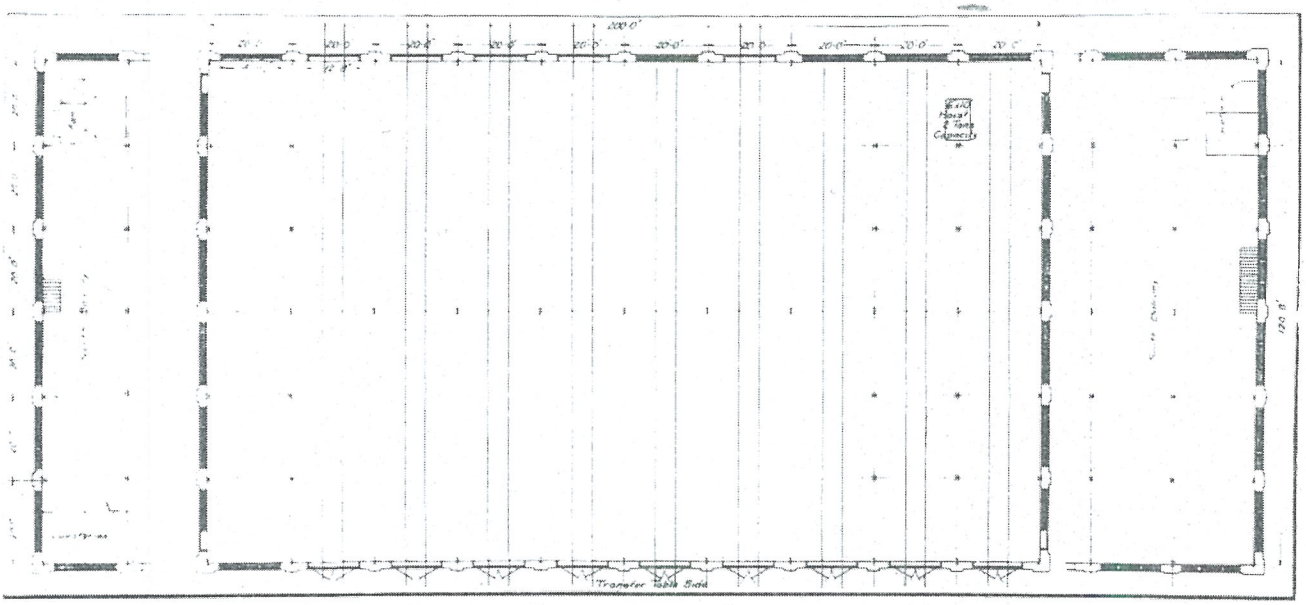

Fig. 2. Plan of Main Floor and Galleries of One of the Two Passenger Car Buildings.

Under all but the south two bays, the side walls are carried to a height of 46 ft. 4 ins., with a clear height under the trusses of 24 ft. 8 ins., which gives a 10 ft. 8 in. headroom on the north end balcony. The walls in the two south end bays are carried to a height of 55 ft. 10 ins., with a height to bottom of trusses of 37 ft., which with the gallery at a level of 24 ft. 8 ins. above the floor, gives a clearance on the latter of 10 ft. The gallery at the north end is low, as there is no working track beneath, but at the south end, greater elevation is required to clear the cars below. The steel roof trusses, at 20 ft. centres, are carried on the walls, and on central columns, of which there is a row down the centre of the shop between the working tracks. These truss columns also act as the central columns of the end galleries. The central depth of the trusses is 8¼ ft., dropping to 4 ft. 5 ins. at the side walls. Down the centre of the roof is a monitor, 29 ft. wide, and 10 ft. high, surmounted by a row of 24 in. copper ventilators, one over each bay.

The east end of the north balconies carries a 12 ft. heating fan, the discharge duct from which leads down to a 5 ft. square concrete heating duct under the floor, extending across the north end of the shop, with longitudinal ducts of similar construction, leading off along each side wall, and along the central row of columns, all under the floor. In the side walls, between each of the doors, there is an outlet moulded in the concrete wall, and along the central row of columns, between each bay, there is a double discharge head. The north balcony also contains the lavatory, which is located on the west end. Both galleries are reached by stairs, centrally located in the end walls, but the south balconies in addition have a 6 by 10 ft. lift, of 2 tons capacity, situated between the two end bays, near the east side. The natural illumination of the shops is good, as in addition to the skylights, there is ample window accommodation in the doors and end walls.

Cars are brought into the shop over the transfer table, which operates the length of the shops, and extends beyond the north end to a through track along the north side of the grounds, over which the passenger cars may be brought from either end of the yard. The transfer table is electrically operated, and the trolley arrangement has been ingeniously devised so as to minimize danger from accidental contact. This feed wire is carried in a channel in one of the walls, the contact shoe being so arranged that it bears upward against the feed wire, the latter carried in the top of the channel.

The Freight Car Shop is immediately to the south of the passenger car shop, abutting on the midway. It is of standard construction, concrete lower wall, surmounted by brick, and spanned by steel trusses, and is 195 by 600 ft., making it second only to the locomotive shop in size. It is divided through its length into three 65 ft. bays, by two rows of columns, supporting the roof trusses, which divide the shop crosswise into 24 ft. sections.

The side bays have a clear height from the floor to the lower chord of the roof truss of 20 ft., the truss itself having a depth of 9 ft. over the row of columns, sloping off to 5 ft. along the wall. In the central bay, there is a clearance of 30 ft., the truss having a depth at centre of 7 ft., sloping in both directions to a depth of 5 ft. over the

columns. Down the centre of each of the bays, there is a 25 ft. wide peaked roof skylight, surmounted by a row of 24 in. copper ventilators, one over each section. The central bay is spanned by a 20 ton travelling crane, which has a 5 ton auxiliary, and which operates the length of the shop. The height to base of crane rail is 22 ft., which is approximately the clearance below the crane itself. The locker rooms and lavatories are contained in 20 by 49 ft. brick annexes, one on the north and the other on the south side, centrally located. The heating

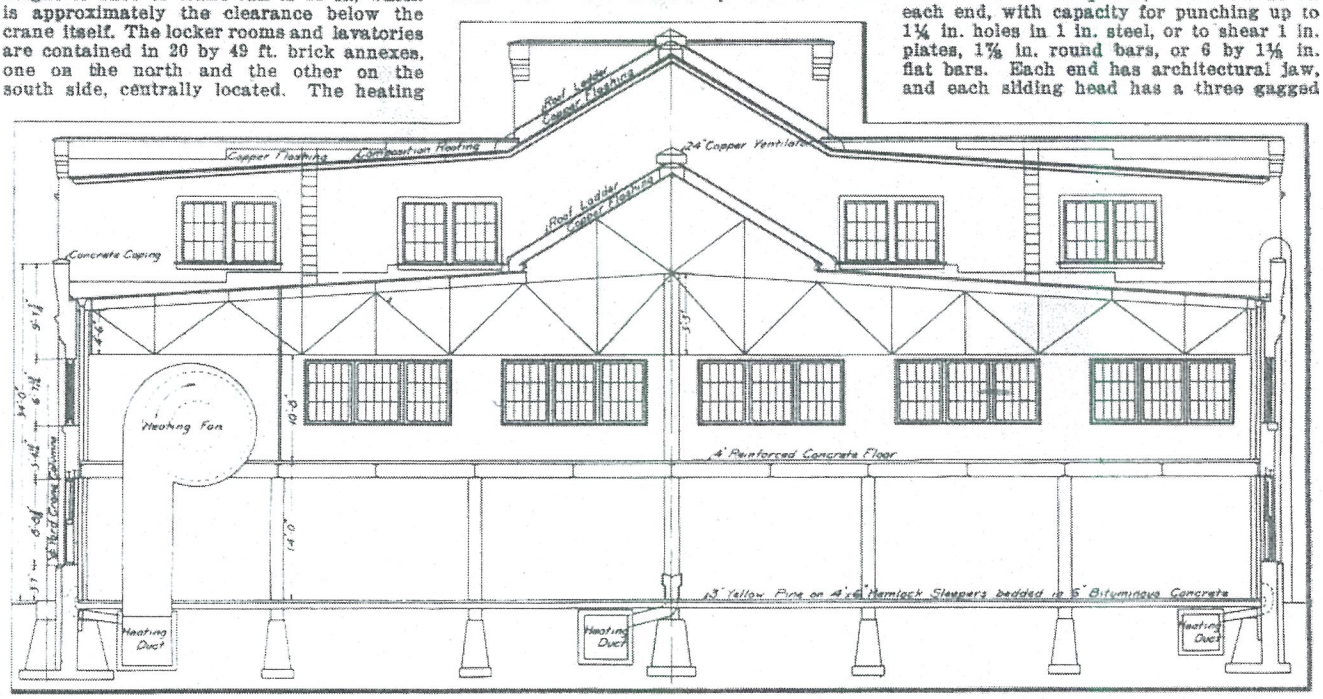

Fig. 3. Cross Section of One of the Passenger Car Buildings, looking towards High End.

plants are contained in two 22 by 25 ft. annexes on the north side, 60 ft. from each end. In each of these annexes, there is a 16 ft. fan, connecting with a concrete duct across the shop under the floor, with similar ducts branching off along the side walls, and along the row of columns, with outlet heads at each column.

The northerly and central bays contain three working tracks each, at 21 ft. centres, extending through the shop, and between these tracks in each bay, there is a 2 ft. gauge service track, with cross connections at nearly equidistant intervals along the shop length. The working track doors are 12¾ ft. wide, and the service track doors, 5 ft. The working tracks are laid on 7 by 8 in. by 8 ft. sleepers, and the service tracks, on 4 by 6 in. by 4 ft. sleepers. The flooring is of 3 in. yellow pine, on 4 by 6 in. hemlock sleepers, which, in common with the rail sleepers, are bedded in a 6 in. base of bituminous concrete.

The southerly bay is for the steel car shop layout, containing a full equipment of machinery for the handling of repairs to this rapidly increasing type of rolling stock. From the west end, there are three entrance tracks as in the other bays, the central one of which extends through the shop, the outer ones cutting off at 125 ft. through the first five sections of the shop. On each side of the through track is located the machine equipment, which it will be observed is arranged in such a manner that the material on entering from the east end of the shop, passes in a natural path along a sequence of machines, depending on the particular member being fabricated, reaching the other end of the shop completely machined and ready for fitting to the car under repair. The two stub end tracks at the west end, will each hold three cars, giving a normal steel car shop capacity of 6 cars, but it is obvious that the nearby tracks of the other two bays are quite accessible for steel car work. The tendency in modern rolling stock construction appears to be to get away from wooden construction, so that it is not too visionary to forcast the day, after the present stock of wooden equipment has been scrapped, when nothing but steel equipment will be in use. This shop has been laid out with that day in view, as while it meets all present requirements admirably, it at the same time is capable of expansion to the full size of the shop.

The shop equipment is as follows:

S1 Double angle shear, with shearing capacity up to 6 by 6 by 1 in. angles either square off or at an angle. Knives rectangular with four cutting edges. Mounted on a 6 ft. diameter turntable. Motor driven.

S2 Double end punch, 24 in. throat on each end, with capacity for punching up to 1¼ in. holes in 1 in. steel, or to shear 1 in. plates, 1⅞ in. round bars, or 6 by 1⅛ in. flat bars. Each end has architectural jaw, and each sliding head has a three gagged punching attachment. Motor driven.

S3 Combination high speed cutting off saw, for structural shapes such as I beams, T and girder rails, and round and square stock. The table is so arranged as to facilitate the mitring of beams, etc. Equipped with two saws. Motor driven.

S4 Gate shear, 120 in. between housings, with capacity up to 1 in. plates. Housing throat depth of 25 ins. 134½ in. knives, with four cutting edges. Counterbalanced

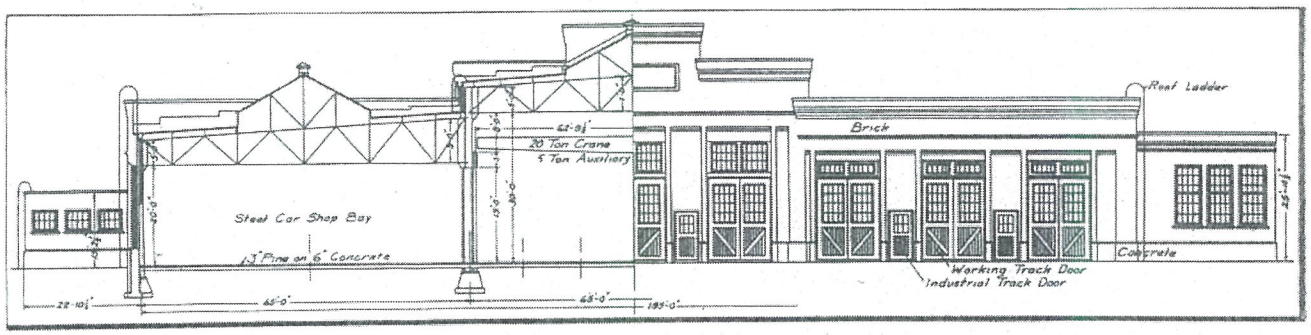

Fig. 5. Cross Section and End Elevation of Freight Car Shop.

S5 Horizontal Punch. 36 in. throat, with capacity for ⅞ in. holes in ⅞ in. stock, with 3 gag punching attachment. Equipped with 40 ft. overhead runway, extending 20 ft. in either direction, and provided with two hand operated hoists. Motor driven.

S6 Plate planer. Capacity of ⅛ in. feed on ¾ in. plate at 40 ft. per min. 32 ft. cut at one setting, pneumatic clamps, holding up to 1 in. plate. Cuts in both directions.

Overhanging housings to permit of planing plate edges in successive settings. Motor driven.

S7 Plate straightening rolls. Capacity ⅝ in. plates. Distance between housings, 4 ft. 2 ins. Six 10 in. rolls arranged in two tiers, equal number above and below. Independent vertical and horizontal hand adjustment. One upper roll central with bottom roll, with others intermediate. Lower rolls at 10½ in. centres. Motor driven.

S8 Horizontal punch. 24 in. throat, with capacity for 1 in. hole in 1 in. stock, and having 3 gag punching attachment. Similar runway to that with S5. Motor driven.

S9 Structural steel punch. Capacity for 1 in. holes in 1 in. steel. Maximum c. to c. distance of outside punches is 38 ins., with depth of throat to centre of cast steel sliding head, 24 ins. Beam coping attachment so arranged that a beam coped at one end can be passed through without turning beam in the shop. Fitted with 8 complete gagged punching attachments. Main frame of partial steel. Spacing table arranged to handle beams from 10 to 20 ins. for both flange and web punching, and for 24 in plates. Equipped with adjustable rollers for supporting beams and plates, and with guide rollers on the punching fixtures to align the work. Carriage moved by hand carrying a pawl which drops into a notched strip along side of bed. Table length suitable for 40 ft. carriage travel. Weight about 64,000 lbs. Motor driven.

S10 Double end punch and shear. 18 in throat on each side, and with a capacity to punch 3 in. hole in 2 in. steel, or shear 10 by 2½ in. bars, or 4½ in. rounds. Main frame partial steel. 5 in. stroke. Weight about 100,000 lbs. Motor driven.

S11 Plate bending rolls. Capacity for bending 10 ft. width of 5-16 in. plate. Pyramid arrangement of rolls, upper one 8 ins., and lower ones 6 ins. Top roll with solid extension for balancing, and back housing hinged for removal of plates rolled to complete circles. Lower rolls 7¾ ins. c. to c. Motor driven.

S12 Horizontal bending and straightening machine. For 15 in. I beams and channels, either way. Jaw, 51½ ins. wide, 26 ins. deep, and 16½ ins. high. Weight about 30,000 lbs. Bending ram to operate continuously when in use, and fed up to the work by a heavy screw and revolving nut, with a total adjustment of 4½ ins. Main frame of steel. Motor driven.

S13. Rivetting machine. 72 in. reach, 18 in. gap, and capacity of 1 in. rivets with 80 lb. air. Equipped with four overhead electric hoists, each with capacity for 5,000 lbs., on a runway over centre line of pit. Runway is 160 ft. long, and bracketed to columns to give a clearance of 10 ft. for the hook in its highest position. 100 ft. pit.

S14 Metal cutting band saw. 36 in. wheels. Motor driven.

S15 Eight spindle arch bar drill. 10 ft. long. Three step cone drive geared 1 to 4. Motor driven.

S16 Double end punch and coping machine. Capacity for punching 1¼ in. holes in 1 in. steel, and for shearing 1 in. plates, 1⅞ in. round bars, 6 by 1⅛ in. flat bars, and 4 by 4 by ⅝ in. angle bars. Throat, 25 ins. Motor driven.

S17 Bulldozer. Crosshead face, 89½ by 16 in., with 24 in. stroke. Die space with crosshead forward, 44 ins. Motor driven.

S18 Bulldozer. Crosshead face, 63 by 12 ins., with 20 in. stroke. Die space, 38 ins. Motor driven.

S19 Rapid action punch. Capacity for ⅞ in. holes in ⅝ in. steel at rate of 65 strokes per min. Throat, 16 ins. Motor driven.

S20 Draw bench. 50 ft. long, with pulling capacity of 10 tons. Motor driven.

S21 4 ft. radial drill. High speed type. Capacity, 1 in. hole, 8 ft. 1½ in. drill radius, and greatest height from base to nose of spindle, 4 ft. 10½ ins. Spindle traverse, 15 ins., and head traverse, 3 ft. 4¼ ins. Motor driven.

S22 Double emery grinder. 24 in. wheel, 3 in. face. Motor driven.

S26 Two stationary rivet furnaces. Oil fuel.

S29 Air compressor. Capacity, 1,000 cu. ft., at 110 lbs. pressure. Two cranks, two stage, double acting, motor driven.

S30 Double furnace. 8 ft. wide by 6 ft. deep by 2½ ft. high per chamber.

S31 Double furnace. 9 ft. wide by 3 ft. high by 12 ft. deep per chamber.

In addition to the foregoing stationary equipment, there are other machines in the shop as follows:

Pipe bending machine complete.

Oxygen welding outfit, complete with tanks, 3 welding torches, 1 cutting torch, 8 welding tips, reducing valves and pressure gauges for oxygen or blaugas. Four 50 ft. lengths of hose for the torches.

Six portable rivet furnaces, complete with oil burners, oil reservoir, fan, and flexible compressed air connection. Mounted on wheels.

Triplex 3 by 8 in. hydraulic pump, with capacity of 35 gallons a minute against 1,500 lbs. pressure. Motor driven.

Thus, the parts enter the shop from the east, the sills and large plates, etc., passing along through the plate planer and beam punch, etc., to the rivetter, while the smaller parts pass down on the other side through the punches and shears, etc., to the rivetter. Forgings are made alongside, and such parts as can be so handled, are here assembled, before final assembling on the car. The cold working machinery is in the early part of the path, then the hot working machinery, and then the final assembly of the parts on the car. The routing is excellent, with no retrograde steps.

Along the south wall of the freight car shop, extending from the midway to the lavatory annex near the centre of the building, there is a storage platform, 288 by 21 ft. on the level of the ground. Centrally down this platform, there is a 2 ft. service track, with two turntable connections into the building, as well as connections at the front end of the platform. This platform is surfaced with 3 in. planking.

Along the outside of the platform, there is also a light shed on the platform, 170 by 8 ft., with a height in front of 8 ft., sloping to the rear to 7 ft. This shed contains storage bins for the freight car shop.

There is a similar platform along the north side from the fan annex to the midway, with service track midway down its length, with connections into the building. The platform has a 50 ft. long stock bin shed.

This article will be continued in our next issue.

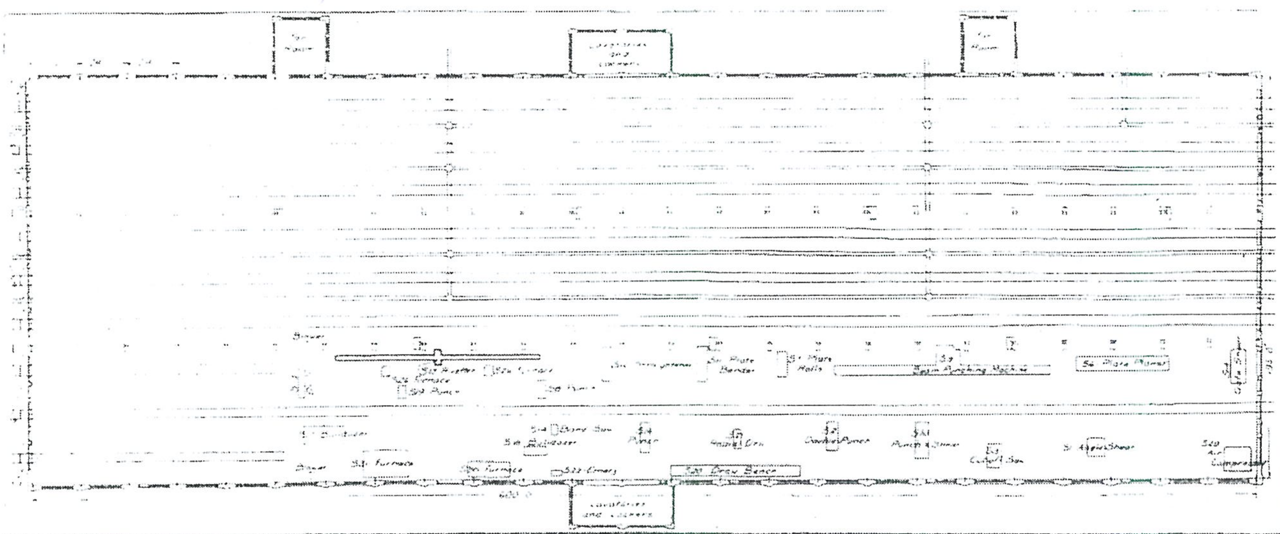

Fig. 4. Plan of Freight Car Shop, showing Machine Tool Layout in the Steel Car Shop Section.

National Transcontinental Railway Construction.

The ninth annual report of the Commissioners of the N. T. R. shows that the expenditure for the year ended Mar. 31, 1913, was $13,729,461.44, making a total of $130,247,152.95 since construction was started. The total grading done was 1,739 miles, on which 1,720.36 miles of main line track had been laid, and 384.73 miles of sidings, yard tracks, and second track. Since that date the grading on the line has been completed and track laid on the entire 1,804 miles between Moncton and Winnipeg.

An interim report of the commissioners presented to the House of Commons, Feb. 18, shows that the total expenditure on the line to Dec. 31, 1913, was $140,562,147, of which $10,314,944 was expended since Mar. 31, 1913. Track laying had been completed over the entire line, and the bridges were 95.3% completed. At the date of the report trains were being operated on 1,160 miles of the total 1,804 miles between Moncton and Winnipeg, and the report stated that trains could be run on the remaining mileage if there was any immediate necessity therefor.

The line from Moncton to Edmunston, N. B., 230 miles, was put in operation Nov. 20, 1912, and the result of the operation shows, a revenue of $13,557.76, with operating expenses of $36,146.97, and expenditure on equipment of $7,009.38, and $3,006.95 net on stores. The deficit is $32,605.54, against which is placed $3,577.37 of uncollected earnings, and $10,016.33, value of equipment and stores on hand. In addition to this section there is a considerable mileage east and west of Cochrane, Ont., being operated by the contractors, and the section from Winnipeg, east to Superior Jct., is being operated by the G. T. Pacific Ry.

It was reported Feb. 6, that the entire line from Moncton to Winnipeg will be ready for operation by Sept. 1. (Feb., pg 72.)

Grand Trunk Pacific Railway Construction Notes.

tracklaying to be completed. The grading on this section is well advanced and it is expected to have tracklaying completed during next summer.

The question of the location of the station at Fort George, B.C., has been finally decided on an appeal to the Governor in Council, judgment being given Feb. 8. The Board of Railway Commissioners after two hearings directed in May, 1913, that the company should build its station within 3,000 ft. of the eastern boundary of Firt George. The company appealed, and it has now been decided that the station must be built as ordered by the Board.

Considerable progress has been made with the wharves, dry dock and other facilities which are being constructed at Prince Rupert for use on the opening of the line right across the continent.

The annual report of the Minister of Railways for Alberta shows that to Dec. 31, 1913, the Province had guaranteed the company's bonds at the rate of $15,000 a mile for the building of 201.5 miles of line from Tofield to Calgary, and at the rate of $20,000 a mile for 58 miles from Bickerdike southwesterly. These lines are now practically completed. Guarantees of bonds were voted for some other lines, but up to the end of 1913, the construction of them had not been arranged for.

The arbitrator appointed to fix the value of the R. N. W. M. Police barracks site at Calgary, Alta., which the G. T. P. Ry. had required for terminal purposes, decided on $210,000. The Dominion Government in reviewing the proceedings increased the price to $250,000, which the company has agreed to pay. An order in council was signed Jan. 27 granting the site to the company at that figure subject to the company donating a right of way 25 ft. wide on the south and west sides of the property so as to widen 9th Ave. and 6th St. East, and to erecting on the site a station having the same character and accommodation as that to be erected at Regina. (Feb., pg. 72.)

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port and cooperation.

National Transcontinental Railway Coaling Stations.

A contract has been let by the N.T.R. Commission for 200-ton mechanical coaling plants at Monk, Quebec, Fitzpatrick, Parent, Doucet and O'Brien, to the Roberts and Schaefer Co., Chicago, Ill. A condition of the contract is that all the structural work possible must be fabricated in Canada.

The first standard coaling plants on the N.T.R. were of the inclined dock type, that at Cochrane, Ont., being described in Canadian Railway and Marine World for March, 1913. Since then, the standard has been changed to the mechanical type, the plants just contracted for being of this type, which consists of an elevated concrete box structure, 22 ft. square, supported on 6 columns, the box being divided into two sections. The bottom of the box structure slopes towards the track side, with two coaling tracks, one along that side and the other underneath, with a chute to each. To the rear, there is a pit, over which the coal car is run, coal being elevated from the pit into the concrete hopper above by an elevator system. A corrugated iron sand box is attached to the side of the coal box.

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the drawbar strains to the sills over such a length and in such a manner as to make the use of the key block unnecessary.

This type of end reinforcement is to be applied to all cars where the centre sill is but slightly damaged, and it is anticipated that a considerable saving will result. We are indebted to J. Cowley, Car Foreman, C. P.R., West Toronto, for the information on which this article is based.

The National Transcontinental Railway Terminals at Quebec.

In response to a motion by Hon. G. P. Graham, ex Minister of Railways, there was recently submitted to the House of Commons a return showing what changes have been made in the original scheme for N.T. R. terminals at Quebec, the estimated cost of the former and the estimated cost of the terminals under the present scheme. The return, which was prepared by R. W. Leonard, Commissioner, N.T.R., is as follows:—

The original scheme included the erection of a large and expensive passenger station on the Champlain Market site, at the south easterly extremity of the city, in connection with which there would be freight sheds, immigrant sheds, power house, etc., etc. This scheme also included the construction of a revetment wall or wharf 1,930 ft. long in front of the Champlain Market site. Under this scheme the Champlain terminal was to be connected with the Quebec Bridge Co.'s line, already constructed to Pointe a Pizeau, by a double track railway over an ordinary 100 ft. right of way. This scheme also included the erection of a locomotive house at Wolfe's Cove, together with a very limited yard, and yard accessories. Under this scheme several houses were also purchased adjacent to the Champlain Market site. Locomotive and car repair shops were to be constructed in the division yard at the north end of the Quebec Bridge, about six miles from the city, without any existing water, sewer, or street railway connections.

The new Commission, after fully considering its predecessor's scheme for the erection of a $1,000,000 passenger station on the Champlain Market site, came to the conclusion that it would be unwise to go on with the erection of such an expensive structure, as the passenger business, in and out of Quebec, that will be tributary to the N.T.R., would not, and could not, warrant this expenditure on a station building.

The new Commission, after going into the question of the proposed $1,000,000 revetment wall at the Champlain Market site, came to the conclusion that as such an expenditure on this wharf would only result in adding about 100 ft. in width to the present available wharf space, the expenditure would be unwise.

From Pointe a Pizeau to Lampson's Cove the original scheme only provided a right of way 100 ft. wide, except as shown on a map submitted with the return and the lots which the tracks ran through were not acquired out to the deep water line.

The new Commission, consequently, cancelled the old Commission's agreements with the lot owners and made new agreements with them, and I am glad to be able to say that we have acquired all the land, except one small piece, out to deep water, as well as the original right of way, from Pointe a Pizeau to Lampson's Cove, about 3 miles, at a less cost to the Commission than what was originally agreed upon for the right of way only, so that the Government now owns the whole water front from the Champlain Market to Pointe a Pizeau, except one small lot.

The new Commission cancelled the instructions given by its predecessors for the erection of a locomotive house at Wolfe's Cove, on the ground that as there is an 18 stall locomotive house erected at the north end of the Quebec Bridge, a second round house in the same locality was unnecessary, and more so as filling in Wolfe's Cove for the necessary yard tracks, subsidiary buildings, etc., etc., would add greatly to the cost.

The new Commission is of opinion that the public interest and the convenience of the travelling public would be best served by a union passenger and joint terminals, situated near the centre of the business section of Quebec. An agreement to that effect has been concluded with the C.P.R., and a union passenger station will be built on the Palais site, and for the convenience of river traffic a suitable station will be erected on the Champlain site. The advantages of a union passenger, express and local freight station in any city require no comment. This arrangement with the C.P.R. is necessary in order that the N.T.R. may obtain access to the present harbor at the mouth of the St. Charles River, now being extended by the Government, with magnificent grain elevator, immigrant buildings, etc. This arrangement also gives the N. T.R. rights over the C.P.R.'s Dalhousie St. tracks, so that communication may in future be established, if necessary, between the two new stations.

The Commission decided to move the shops site from Neilsonville, near the Quebec Bridge, to St. Malo, for the following reasons:—The new site is immediately adjacent to the labor centre of Quebec city, and reached by the electric railway. Economical sewerage disposal, free water and freedom from taxation have been obtained for 20 years, and also a large and favorable site at a reasonable price.

ESTIMATED COST OF QUEBEC TERMINALS, OLD SCHEME.

Cost of work done and right of way taken over from Quebec Bridge Co. between Quebec Bridge site and Pointe a Pizeau (including track material)	$ 287,169.90	
Estimated cost of completing above	213,400.00	
		$ 500,569.90
Estimated cost of grading, including track, Pointe a Pizeau to Lampson's Cove	$ 392,625.00	
Estimated cost of land, Point a Pizeau to Lampson's Cove (right of way only)	285,772.21	
		678,397.21
Estimated cost of grading, Lampson's Cove to Champlain Market, including 1930 ft. of revetment wall	$1,872,643.00	
Estimated cost of land, Lampson's Cove to Champlain Market	2,155,642.21	
		4,028,285.81
Estimated cost of Wolfe's Cove locomotive house		90,000.00
Estimated cost of Wolfe's Cove yard		108,700.00
Estimated cost of passenger station at Champlain Market (including terminals)		1,100,000.00
Total		$6,406,152.93

ESTIMATED COST OF QUEBEC TERMINALS, PRESENT PLANS.

Cost of work done and right of way taken over from Quebec Bridge Co. between Pointe a Pizeau and Quebec Bridge (including track material)	$ 287,169.90	
Cost of grading to date, Quebec Bridge to Champlain Market	513,000.00	
Estimated cost of completing grading, Quebec Bridge to Champlain Market	57,000.00	
Cost of track material, Pointe a Pizeau to Champlain Market	40,000.00	
Cost of land, Pointe a Pizeau to Champlain Market (includes to deep water line	1,308,050.00	
Estimated cost of station and terminals at Champlain Market	60,000.00	
		$2,355,219.90
JOINT TERMINALS. Estimated cost of joint teaminals on which the Government pays as annual rental a sum equal to 3½%:—		
C.P.R. property at Quebec	$3,300,000.00	
Additional land to be purchased for joint terminals	800,000.00	
Terminal station and yards to be built by C.P.R.	1,500,000.00	
	$5,700,000.00	
Annual rental to be capitalized at 3½		3,200,250.00
Leonard Shops, plant and right of way		284,780.00
		$5,847,250.00

April 1914

National Transcontinental Railway Construction.

The expenditure on the eastern division, to Dec. 31, 1913, exclusive of interest, was stated by the acting Minister of Railways in the House of Commons recently to have been $140,562,147, and the estimated cost of completing the line is $20,745,653. The cost to the Government of the old Quebec Bridge was $6,424,781; the cost of the Royal Commission as to the bridge was $31,765.44; the expenditure to date on the reconstruction of the bridge is $4,889,318.03, and the estimated cost of the completion of the same is $12,000,000. On account of the N. T. Ry., $41,966,890 has been paid out of borrowings, and the remainder out of revenue. The whole cost is a charge to capital account irrespective of the source from whence derived.

A few days previously, the acting Minister of Railways, in giving similar figures, added that $2,448,867 was due to contractors on account of work done. The estimated amount required to complete the line is $18,296,786. The cost of locomotive and freight car shops, but not passenger car shops, at Winnipeg, 16 roundhouses, seven being with machine shops, at different points on the line, was $3,489,166.31. This amount includes what has already been expended and the amount required to complete the work.

A train service was put in operation, Mar. 3, on the section of the line between Levis, Que., and the Quebec-New Brunswick boundary, from St. Anselme to Monk, Que., 80 miles, by the Quebec Central Ry., under an arrangement with the Commission. The Q.C.R. is supplying the rolling stock and is furnishing the train crews. This is a temporary arrangement, and is expected to continue only until the entire section from Levis to the provincial boundary is taken over by the Commission, when it will be operated in connection with the Moncton-Edmundston section.

Tenders are under consideration for the supply of a shavings and sawdust exhaust system for the car shops plant at Transcona, Man. (Mar., pg. 124.)

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Quebec Central operation St Alselme to Monk

see Quebec Central Diary TIT

National Transcontinental Railway Construction.

The acting Minister of Railways in presenting the annual report of the department to the House of Commons recently said ,the total expenditure from the inception of construction between Moncton, N. B., and Winnipeg, up to Dec. 31, 1913, was $140,562,147. Of that amount $10,314,904.05 was expended during the first nine months of the current financial year. It is estimated it will cost $20,745,653 to complete the line, so that the total cost will be $161,307,800. A statement was prepared showing the capital cost of the line by the time the Grand Trunk Pacific Ry. is obliged to commence to pay interest. This shows a capital cost to Jan. 1, 1923, and includes interest during construction to Jan. 1, 1915, and the interest for seven years thereafter capitalized, and makes up a total of $223,514,092.28. The rental at 3% on this would be $6,705,422.79. If the line did not earn 3% in excess of working expenses then the interest would be added to capital for a further period of three years. No allowance was made in the statement for betterments, but should any have been made their cost would have to be added to the total cost for rental purposes. The line is costing the country interest at the rate of 3½%, but under the agreement, only 3% can be capitalized, and only 3% can be claimed as rental. This means that on the expenditure to Dec. 31, 1914, there has been a clear cost to the country of $3,893,230.33, and it is estimated that during the 50 years of the lease the loss will amount to $908,687 a year, or a total of $45,433,900.

As to the condition of the railway. The rails have all been laid and about 460.4 miles has been taken over from the contractors. The remaining 1,344 miles are nearing completion. It requires some ballasting, the placing in position of a number of steel bridges, the building of some station houses and other works, but it is expected that all these will be completed and the line ready for operation in its entirety during this year.

The amount expended on the Quebec Bridge, which was not originally part of the N. T. Ry., to Jan. 1, was $4,889,000 and it is estimated that the total cost of the bridge when completed will be about $17,000,000. There is also $6,456,546.44 which was expended on the bridge which collapsed, and which is a total loss. The contract for the substructure was awarded to M. P. and J. T. Davis, Jan. 10, 1910. The contractors practically completed the work last autumn. Some little work, such as painting, cleaning the stones, and clearing up the site, remains to be done, and will be completed during this year. The contract for the superstructure of the bridge was awarded to the St. Lawrence Bridge Co., April 4, 1911. Shops for the manufacture of the bridge were completed, and a start was made in Jan., 1913, on fabrication. During 1913 the shops made good progress on the preparation of final plans and have fabricated and shipped to the site some 9,000 tons of bridge material. They have erected a large part of their plant at the bridge site, and have also erected approach spans on the north shore of the river, thus making a start on the erection of the bridge proper. It is expected that during this year the company will fabricate and erect the major portion of the north anchor arm. The weight of this portion is estimated at 15,930 tons, and it is estimated that its cost when erected will be $2,870,000. The information the department has from the supervising board is to the effect that the bridge will be completed by the end of 1917.

Until the completion of the Quebec Bridge the connection between the two sections of the line will be maintained by a car ferry. The piers for the operation of the ferry are under construction, and will be completed during this year. The ferry steamer is expected to be delivered at Quebec about the middle of the summer.

Tenders are being received to June 2, for the erection of a station with covered platform on the Champlain market site, Quebec. The question of the erection of a Union station at the Palais, Quebec, is reported to have been practically settled, and it is said that tenders for its erection will shortly be invited. The plans for the station have been deposited in the Quebec registry office. They are practically the same as those drafted and accepted in 1913, one exception being the changes decided in regard to the right of way along Prince Edward St.

In connection with the erection of mechanical coaling plants at Monk, Bridge, Fitzpatrick, Doucet, and O'Brien, the acting Minister of Railways informed the House of Commons, recently, that the contract was let to Roberts and Schaefer Co., Chicago, Ill., for $107,931. The contract calls for a plant of an elevating capacity of 2½ tons. The price for piles delivered and driven is $2.50 a lineal foot. One of the plants is in course of erection at O'Brien, the first divisional point east of Cochrane, Ont., on which the following subcontracts have been let:—Structural steel work to Dominion Bridge Co.; electrical work to Canadian General Electric Co.

The Dominion Parliament has voted $1,333,333.34 on account of the construction of the line, and $500,000 on account of the construction of the Quebec Bridge. (April, pg. 172.)

Grand Trunk Pacific Railway Construction.

A press report states that a contract has been let to the Great Lakes Dredging Co., for driving piles for the foundation of a coal dok on G.T.P. Ry. property at Fort William, Ont., at the mouth of Mission River. It is stated that the dock and plant will have a capacity of over 200,000 tons.

The Dominion Parliament has under consideration a bill confirming an agreement between the G.T.P. Ry. and the Canadian Northern Ry., dated April 10, 1913, for the use by the former of the latter's terminals in Winnipeg, the Crown being a party to the agreement as a guarantor of G.T.P. Ry. bonds. Section 2 of the bill confirms the use of the property mentioned in the agreement to the G.T.P. Ry. notwithstanding any default made by the C.N. Ry. in meeting any mortgages or charges at present existing or hereafter to be made. The agreement which is attached as a schedule describes the property to be utilized for joint terminal purposes, and defines the rights of each thereto, and as to the use of any other tracks hereafter to be laid by either of them. The joint section is to be maintained and operated under the terms and provisions of the agreement dated Nov. 1, 1907, so far as applicable. The value of the property included in the joint section under the agreement is placed at $1,200,000, and the G.T.P. Ry. is to pay a rental of 5% a year upon one-half of that amount, and 5% a year on any future capital expenditures, and on certain other specified expenditures. The business of the Great Northern Ry., the Northern Pacific Ry., and their allied company the Midland Ry., is to be handled as C.N. Ry. business for two years, pending the completion of their own freight terminals. The agreement came in force July 1, 1913, and is to continue for 999 years.

Morley Donaldson, Vice President and General Manager, is reported to have stated after his return to Winnipeg, from an inspection trip over the line, that a regular train service would be put in operation from Edmonton to Fort George on July 1, to replace the present partial and temporary service, and that it was hoped to be able to run traffic through to Prince Rupert by September. There are about 300 miles of track on which ballasting has to be completed, and a lot of finishing up work to be done. The telegraph line has been completed, and the bridge work is expected to be completed by June 30. Locomotive sheds are being built at Fort George and Endaco, B.C., and the other buildings west of Fort George are being erected.

Work is reported to have been stopped on the branch from Harte to Brandon, Man. Grading is said to have been completed to within a mile of Brandon, and the substructure for the bridge across the Assiniboine River erected. Two matters are delaying the completion of the branch, viz:—the high prices asked for the right of way, and the insistence of the Brandon City Council that a Union station be built with the Canadian Northern Ry.

Press reports state that work will be started on an early date on the 15 mile branch line from Talmage, on the Regina-Boundary branch, into Weyburn, Sask.

A train service will be put in operation on the line from Regina to Mawer, Sask., June 1.

The Board of Railway Commissioners has approved revised location plans for the Moose Jaw Northwest branch, mileage 73.34 to 77.99, authorized the opening for traffic of the Young-Prince Albert branch from mileage 67 to 87; approved of the revised location plans for the Battleford branch, through northwest ¼ sec. 4-43-16 west of the third meridian.

The Northwest Mounted Police finally vacated the barracks in Calgary, May 5, and the G.T.P. Ry. entered into possession. The clearing of the site for station and other terminal purposes has been started. The first building to be erected will be a freight shed 500 by 40 ft. at the corner of Ninth Ave. and Sixth St. E. It is expected that work will be started on the passenger station in the autumn.

A regular train service will be put in operation on the Tofield-Calgary branch, June 4, replacing the present temporary services. (May, pg. 220.)

JUNE 1914

National Transcontinental Railway Construction.

The Dominion Parliament has passed an act amending sec. 9, chap. 71, of the statutes of 1903, as amended by sec. 1, chap. 39, of the statutes of 1912, constituting the National Transcontinental Railway Commission, providing that the Minister of Railways shall be eligible to be appointed to discharge the duties of such commissioner, and that after the completion of the line and before its being leased to the G.T. Pacific Ry., the Minister shall have power to operate the line in whole or in part, as a Government railway under the provisions of chap. 36, of the Revised Statutes of 1906.

The House of Commons, on June 5, voted $6,666,666.66 on account of construction of the line, and on June 8, a further sum of $1,000,000 was voted on construction account. In the course of the discussion on these votes, the acting Minister of Railways stated that the "sags" on the line, about which complaint had been made, were to be found between 200 miles east and 100 miles west of Cochrane, Ont.; there are 32 "sags" in all, and $200,000, according to the estimate of the Chief Engineer, will be sufficient to remove them all. The two east of Cochrane could yet be removed by the contractors, and those west could be removed either by contract or by the G.T. Pacific Ry. after the line is taken over for operation. The "sags," or momentum gradients, were left in the line in order to accelerate its completion, with the intention of removing them at a later date. It was subsequently announced that the Government intended to remove them, so that the line will have the original gradient all through.

A vote of $1,000,000 was made towards the construction of a branch line into Montreal. It is the intention of the Government, the Minister of Railways stated, to have surveys made at once, and some construction may be undertaken. The Premier added that the line will be about 300 miles long, and will have to be built through a pretty rough country. A subsidy had been voted for a line from Montreal to the N. T. R., but it had not been possible for the private owners to carry out the plan. As a matter of fact two lines have been projected to give this connection, one the Joliette and Lake Manuan Colonization Ry., and the other tha North Ry., which, projected to a point on Hudson Bay, would cross the N.T.R. at Belle River.

It is expected that an early start will be made upon the building of a railway station and a covered platform on the Champlain market site, Quebec. The tenders for this work are under consideration by the Government.

A further sum of $1,000,000 has been voted by the Dominion Parliament on account of the construction of the Quebec Bridge. (June, pg. 274.)

August 1914

Coaling Plants on the National Transcontinental Railway.

The National Transcontinental Ry. Commission placed a contract recently for six coaling stations at Monk, Bridge, Fitzpatrick, Parent, Doucet and O'Brien, Que. The plants will be of the mechanical type, as illustrated herewith, which has been adopted as a standard on the N.T.R., displacing the previously accepted standard coaling plant, of the ramp type, which was described and illustrated in Canadian Railway and Marine World for March, 1913.

Fig. 1 shows the coaling station as it will be actually built, the completed structure to a slightly different design being shown in fig. 2, which shows a U.S. installation built by the same contractors. The structure is entirely of reinforced concrete, the intention being to make them absolutely fireproof. The coal pockets are 23 ft. square, with an average depth of coal of 17 ft., the capacity being 200 tons of run of mine coal, without trimming. The coal pocket is a concrete shell, the floor of which slopes at an angle of about 30 degrees to the horizontal, towards the outer side, and with the top covered with a steel framing sheathed galvanized iron. The 6 supporting columns for this pocket are also of reinforced concrete, at 21 ft. 5 in. centres across the tracks, and 10 ft. 10 in. centres parallel with the track. The coal pocket spans one delivery track, the other delivery track being along the depressed side of the coal pocket bottom. The delivery spouts are in either end of the pocket depression.

At the back of the pocket is located the receiving hopper, consisting of a concrete lined, sloping floor hopper, the slope of which corresponds with that in the upper hopper. The coal intended for the coaling plant is delivered on cars, which are run over top of the receiving hopper, on tracks supported on I beams, and dumped into it. This hopper is 20 ft. long and 15 ft. wide, the slope of the bottom being in three directions, all tending to throw the coal towards an opening at the front. Immediately in front of this opening in the receiving hopper there is located a large steel revolving feeder, which is in reality a gate, a chute and a feeder. This feeder delivers coal in measured quantities automatically to a 2½ ton bucket. The bucket is 5 ft. square and has an apron or folding chute on the front side, to prevent the accidental opening of which there is a roller attached to it, which bears against a guide extending from the bottom of the pit to the dumping point over the bin. As the bucket descends into the pit in front of the revolving hopper, it engages a bar which operates the revolving feeder, causing the feeder to cut off the flow of coal from the receiving hopper and discharge its contents into the bucket. As the bucket rises in the hoistway it revolves the feeder, allowing the coal to flow into it from the receiving hopper.

The hoistway is a structural steel frame, entirely enclosed in galvanized sheathing, and has a total height of 70 ft. above the ground, as well as extending to the bottom

Fig. 3.—Sand Drying Auxiliary to Coaling Plant, N.T.R.

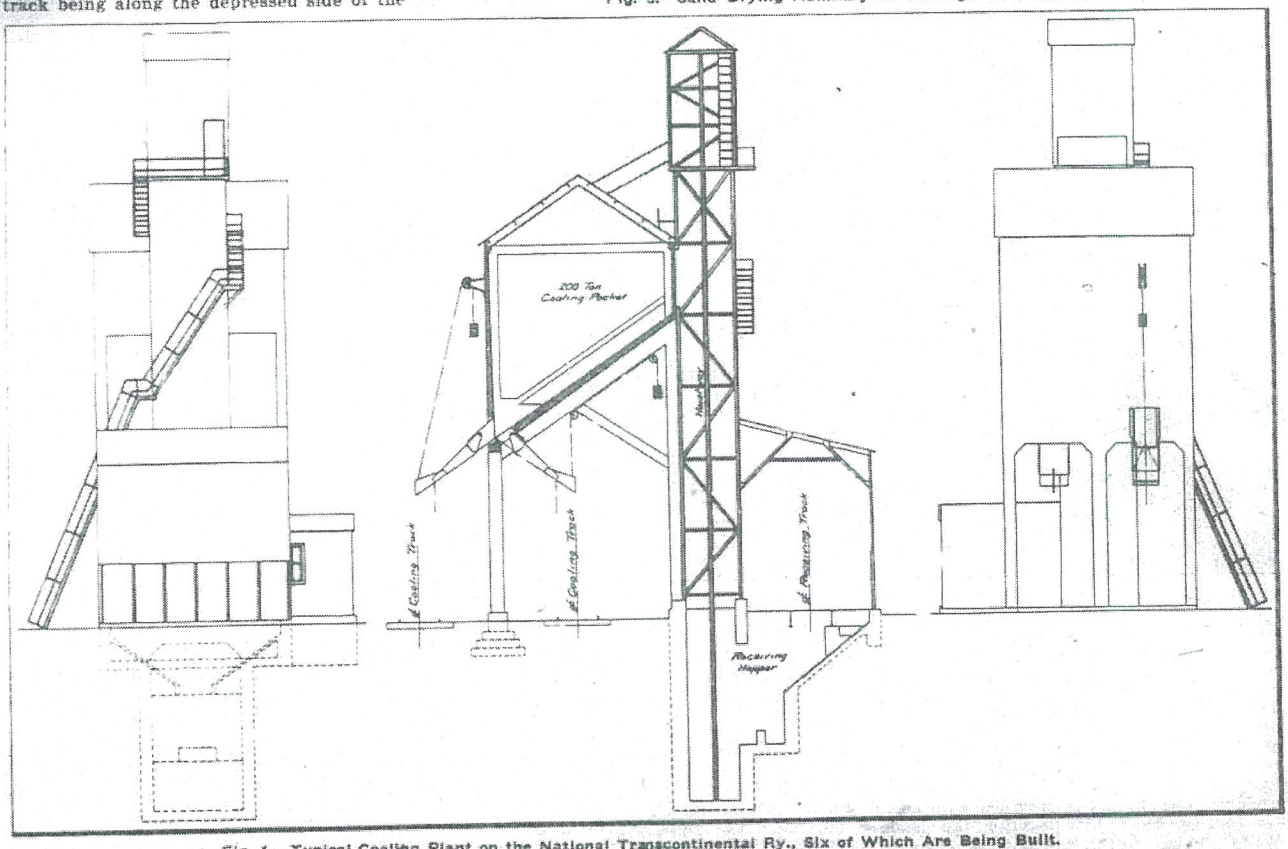


Fig. 1.—Typical Coaling Plant on the National Transcontinental Ry., Six of Which Are Being Built.

of the receiving hopper pit. The bucket travels in this hoistway, between vertical steel guides, and as it reaches the top of the pocket the folding apron opens out over the bin, and the load of coal is discharged down a chute into the bin. The hoist cable is a ⅞ in. steel rope, running over sheaves.

The power used is electrical, derived from a hoist motor of heavy construction, which has on one end an electrically operated or solenoid brake, and on the other end a cut cast steel pinion of the herring-bone type, which reduces noise at high speed, and eliminates end motion in the motor. The motor is automatically operated and reversed by means of a special automatic skip hoist controller. This makes the operation of the hoist continuous for as long a period as it is desired to hoist coal, once the controller has been thrown into engagement, thereby leaving the operator free to work about the plant while the coal is being elevated, reducing the operating cost. This equipment is all contained in a reinforced concrete house.

Beneath the lower edge of the upper hopper there are two undercut gates and steel aprons, one to the under track, and the

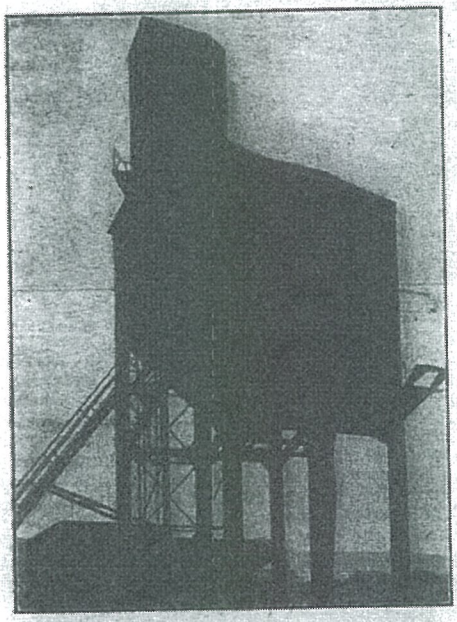


Fig. 2.—Coaling Plant Similar to N.T.R. Design.

other to the outer track, one at each end of the hopper. These aprons are both counterweighted for ease in handling, and are provided with hoods so that the coal may be deflected downward into the centre of the tender.

Each coaling plant has a sand drying equipment, similar to that shown in fig. 3. This equipment consists of a wet sand storage, drying building, and dry sand storage. The wet sand storage bin is made of heavy posts and planking, cross braced with tie rods, and will hold 50 tons of wet sand. Adjacent to the wet sand bin there is a reinforced concrete sand drying house, equipped with a sand dryer, into which the wet sand is shovelled. The dryer has a capacity of about 10 tons a day. After drying, the sand is shovelled into a steel air drum, of about one cubic foot capacity, from which it is forced up through a 2½ in. pipe by compressed air at from 80 to 100 lbs. pressure, into a concrete pocket, formed by cutting off one corner of the coal pocket.

We are indebted to W. J. Press, Mechanical Engineer, N.T.R., for the information on which this article is based.

National Transcontinental Railway Construction.

The work of completing the N. T. R. has, owing to the resignation of R. W. Leonard, who has been the sole commissioner in charge of construction since 1912, passed under the control of the Minister of Railways, as provided for by the act passed last session of the Dominion Parliament. The various officers of the commission are being retained by the Department.

The filling, ballasting, bridgework, station building and other finishing up work is expected to be completed by Sept. 30, when the entire line will be ready for taking over by the Grand Trunk Pacific Ry. It is reported that arrangements for this are under discussion, and that a board of arbitration will be appointed to definitely fix the capital cost of the line, on which the rental to be paid by the G. T. P. R. is to be fixed. The Department of Railways has power to operate the line in whole or in part up to the time of the transfer. The only part of the line at present operated by the G. T. P. R. is that from Winnipeg to Lake Superior Jct., Ont., where connection is made with the branch G. T. P. R. line running to Fort William.

Pending the completion of the Quebec Bridge connection will be made between Lévis and Quebec, by means of a car ferry. The ships and the connecting lines for this are practically completed. The car ferry, which has been named Leonard, had her trial trips at Liverpool, Eng., July 20, and it is expected she will be delivered at Quebec by the end of August.

Construction is being steadily progressed with on the Quebec Bridge. The substructure work is completed, and the contractors for the steel work have the approach spans erected, and are erecting the anchor spans. The construction of the different members for the two cantilevers, and the connecting link for the 1,800 ft. central span, is being proceeded with. The laying out of the yards, and other work at the bridge site is being done by M. P. and J. T. Davis.

A contract is reported to have been let to W. J. Gosselin, Levis, Que., for the erection of a station building and covered platform on the Champlain Market site, Quebec, at an estimated cost of $46,000. It was originally intended to build the main station on this site, but it was subsequently decided to use the site for a station for local traffic only, and to have the main terminals elsewhere.

In connection with the projected line from Montreal to the N. T. Ry., we are officially advised that it is expected surveys will be commenced this year, although it may not be possible to do any construction. The total cost of the line is put at about $15,000,000. No definite ideas have been formed as to the possible route, but reports state it is not impossible that the one laid out from Montreal to Belle River, partly surveyed by the North Ry., will be utilized.

Tenders will be received to Aug. 4 for building of a Y track at Cap Rouge, about 2.5 miles westerly from Quebec bridge, and for the repair and completion of the line to the St. Malo shops.

Grand Trunk Pacific Railway Construction.

Collingwood Schreiber, General Consulting Engineer to the Dominion Government, arrived in Vancouver, July 4, from Prince Rupert, having completed a trip of inspection over the line. He is reported to have stated that he found the line to be in excellent shape between Winnipeg and Edmonton; in fair shape between Edmonton and McBride, and rapidly assuming a finished condition on the other sections to Priestley, whence a train service is being operated to Prince Rupert, 337 miles, over a good roadbed. A train service is in operation westerly from Winnipeg to McBride, 342 miles west of Edmonton; and several trains are in operation thence to Fort George, 144 miles further west. The intervening distance to Priestley, 140 miles is being ballasted, and only work trains are being operated over it. The line, he added, is expected to be in good running order throughout by the middle of August.

The bridge over the Fraser River was reported completed July 3, sometime after Mr. Schreiber's visit, and it is reported that trains are now being run through from Winnipeg to Fort George, 1,729 miles.

M. Donaldson, Vice President and General Manager, who returned to Winnipeg, July 3, from Montreal, is reported as stating that the line would be ready for freight traffic, right through, Aug. 1, and that arrangements were being made for starting through traffic on that day.

Grand Trunk Pacific Branch Lines.—The question of the entry of the line from Harte into Brandon, Man., was recently before the Board of Railway Commissioners, when the Brandon Board of Trade asked for an order to compel the company to use the Canadian Northern Ry. line and terminals. The C. N. R. objected, on the ground that it was acquiring additional land to enlarge its terminal for accommodation of its own traffic, and the G. T. P. Ry. objected on the ground that it had an agreement to use the Great Northern Ry. terminals, and the transfer track. The city objected to the use of this track. The Commissioners subsequently went over the ground and deferred judgment.

A train service has been put in operation from Talmage into Weyburn, Sask.

The Mayor of Moose Jaw, Sask., received a cheque for $30,000, July 6, from the company for six acres of the exhibition grounds for terminal purposes.

Work is in progress in clearing the site of the North West Mounted Police Barracks in Calgary, Alta., and it was expected that the whole of the grading of the cleared area would be completed by July 30. Track laying is to be started at once in the yards. (July, pg. 336.)

August 1914

The Minaki Inn, built by the Grand Trunk Pacific Ry. at the crossing of the Winnipeg River by the National Transcontinental Ry. main line, 115 miles east of Winnipeg and 334 miles west of Fort William, was opened July 2. It is under the Canada News Co.'s management and has accommodation for 350 guests. Morley Donaldson, Vice President and General Manager, G.T.P.R., presided at the opening dinner, and there were also present J. E. Dalrymple, Vice President, G.T.P.R. (traffic), and W. P. Hinton, Assistant Passenger Traffic Manager, G.T.P.R., who, in speaking, said that the hotel was built to supply a holiday home for Winnipeg business men and their families. A feature of the opening was an exhibition of moving pictures, depicting scenes during the construction of the G.T.P.R., and the linking up of the track on the Mountain Division last spring.

National Transcontinental Railway Construction.

The Minister of Railways returned to Ottawa, Oct. 14, after a trip of inspection over the line from Quebec to Lake Superior Jct., Ont. He is reported to have said that it would be ready for operation Nov 1. With regard to the taking over of the operation of the railway by the G.T.P.R., he said arrangements had not been finally made, and an announcement as to this would be made later.

November 1914

An Ottawa press dispatch says there will be a limited train service this winter between Moncton, N.B., and Levis, Que., and probably also from Hearst, Ont., eastward. The line is already in operation, under the Intercolonial Ry. management, from Moncton to Escourt, Que., 286.3 miles, so the probability is that the operation to Levis will be under the same management. No intimation has been given as to how the line will be operated eastward from Hearst, Ont., which is the junction point with the Algoma Central and Hudson Bay Ry. (Oct., pg. 469.)

Power House Equipment for Leonard Shops, Quebec. National Transcontinental Railway.

Tenders were received up to Dec 1 for the power equipment for the N T R. Leonard shops power house, Quebec. There were four separate specifications, viz., water tube boilers and chain grate stokers, feed water heater, engines or turbines, and generators, switchboard and wiring.

There are to be five 500 b.h.p. high pressure (200 lb.) water tube boilers, arranged in 2½ batteries, fed with chain grate mechanical stokers. Each stoker will be capable of burning sufficient semi bituminous slack coal or crushed run of mine coal to develop 150% of the rated capacity for 2 hours, and 165% for shorter periods. The combined efficiency of each stoker and boiler will be at least 70%. The fifth boiler will be arranged so that the stoker will satisfactorily burn either coal or refuse from the mill or carpenter shop, from which the refuse will be brought to the furnace by an exhaust system. The economy of each boiler at its normal rated capacity will not be less than an equivalent evaporation of 9½ lbs. of water from and at 212 degrees Fahr. per lb. of run of mine bituminous coal, containing approximately 12,000 b.t.u., with due allowance for moisture in the coal and ash. The steam must not contain more than 2% moisture 5 ft. from the main stop valve. The boilers will carry a guarantee that when properly operated they will be smokeless at least 95% of the time. Each boiler will have a superheater that under normal working conditions will give a superheat of at least 100 degrees Fahr. It will be so arranged as to be capable of being hooded when getting up steam. All exposed parts of the boiler will be protected by a 4 in. layer of non conducting material, in the form of blocks of plastic cement. Each boiler will be equipped with a full set of gauges and tools. There will be a feed water heater of sufficient capacity to heat 50,000 lbs. of water per hour from 60 to 210 degrees Fahr., and capable of standing a hydrostatic pressure test of 15 lbs. per sq. in. It will be of the sectional built up type, with doors through which the trays may be removed. It will have a baffle plate oil separator, a balanced feed valve operated by a copper float to maintain a constant level of water, an automatic overflow relief valve to relieve the water when it rises too high, and a filter so arranged that the sludge may be blown off.

Alternative proposals were invited for reciprocating engines and horizontal steam turbines for the main power, the latter of the bleeding type, to operate at 3,600 r.p.m. The engines specified are to be two vertical 3 cylinder, 3 crank, compound non condensing forced lubrication, to develop continuously 750 h.p. at full normal load at 360 r.p.m. with 200 lbs. steam at the throttle, when exhausting against 5 lbs. back pressure in the exhaust pipe. They are to be capable of carrying a 25% overload. Each of these will be direct connected to a 500 k.w., 360 r.p.m., 3 phase, 60 cycle, 600 volt, engine type, revolving field, a.c. generator. The alternative specification for the turbine called for a generator to meet the different requirements of the higher speed. Each generator will have, direct connected, a 20 kw., 250 volt, 360 r.p.m., d.c. compound interpole exciter generator.

There will also be a compound engine similar to the above, but of the 2 crank, 2 cylinder type, to develop 150 h.p. at 450 r.p.m., with a reserve overload capacity of 25%. This engine will drive a combination unit consisting of a 75 k.w. a.c., and a 75 k.w. d.c., generator mounted on the same shaft. The a.c. generator will have the

December 1914

National Transcontinental Railway Construction.

We were officially advised, Nov. 17, that the Intercolonial Ry. expected to begin operating the entire section of the National Transcontinental Ry. between Moncton, N. B., and St. Jean Chrysostome, Que., the point of junction with the Intercolonial near Levis, Nov. 23. The distance is 457.7 miles.

The service previously given extended from Moncton to St. Eleuthere, Que., 290.8 miles. No definite arrangements have been made for the operation of any other part of the line, except as at present. It is expected, however, that arrangements for the permanent operation of the whole line will be concluded at an early date.

Tenders are under consideration for the supply of boilers and stokers, feed water heater, steam engines and stokers, generators, switchboard and wiring, at the Leonard shops, St. Malo, Que.

Tenders will be received to Dec. 8 for the supply of 150,000 ties, to be delivered at Belair and La Tuque, Que. (Nov., pg. 501.)

December 1914

Railway Lands Patented.—Letters patent were issued during September in respect of

Canadian Railway and Marine World

January, 1915.

Champlain Market Station at Quebec, for the National Transcontinental Railway.

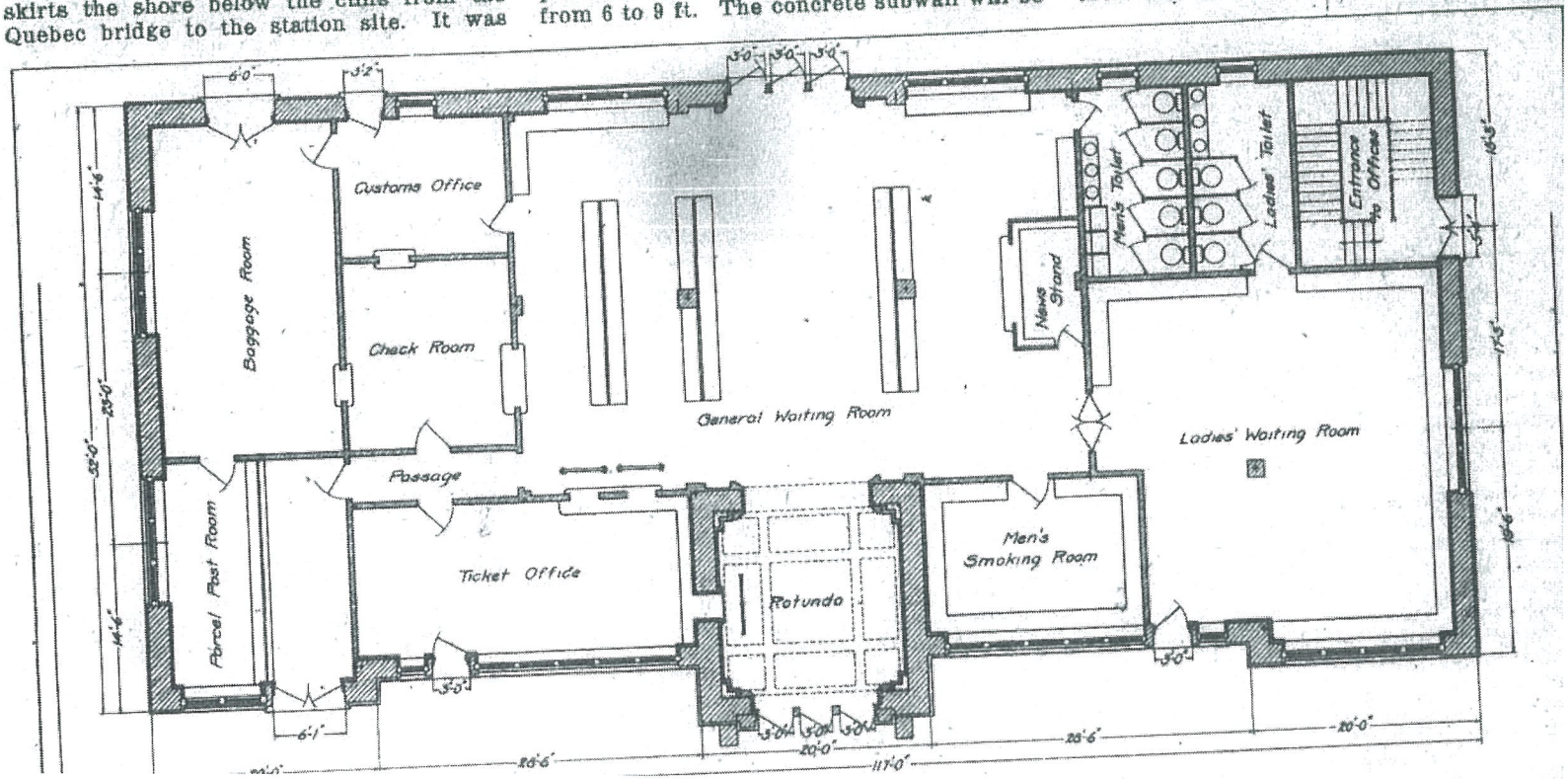
Plans were prepared by N. T. R. engineers in the early part of the year for a station building and platforms in Quebec, and a contract was let to W. J. Gosselin, Levis, Que., for the construction work shown in the accompanying plans. The work is in progress, and is expected to be completed at an early date.

The station is being built on the Champlain Market site, on Champlain St., directly below the Dufferin Terrace, near the Levis ferry, and adjoining King's wharf, and will be reached by a line from the west, which skirts the shore below the cliffs from the Quebec bridge to the station site. It was of a platform being at 26 ft. 8½ in. centres, with a central distance of 16 ft. between adjoining tracks between platforms. A power house will be located in the north west corner of the site.

The building will be a composite structure of concrete, stone and brick. At each of the corners, at a point midway in each end, at four intermediate points along the back wall, at two points in the front wall, and at the four corners of the rotunda tower, there will be concrete foundation piers, carried down to solid bearing ground. Each of these piers will be 4 ft. thick, varying in length from 6 to 9 ft. The concrete subwall will be

in the front of the building, there will be a chain suspended canopy projecting 8 ft., and 17 ft. wide. It will be of wired glass on a metal frame, with an ornamental iron edging.

The entrance rotunda, 16 ft. square, will lead directly into the general waiting room. Along the left side of the rotunda, there will be a ticket wicket from the ticket office. The general waiting room will be 33 by 50 ft. with a composition floor, and wainscotted to a height of 4 ft. It will contain three double benches, 18 ft. long. To the left of the entrance way in the general waiting room there will be a double ticket wicket from th



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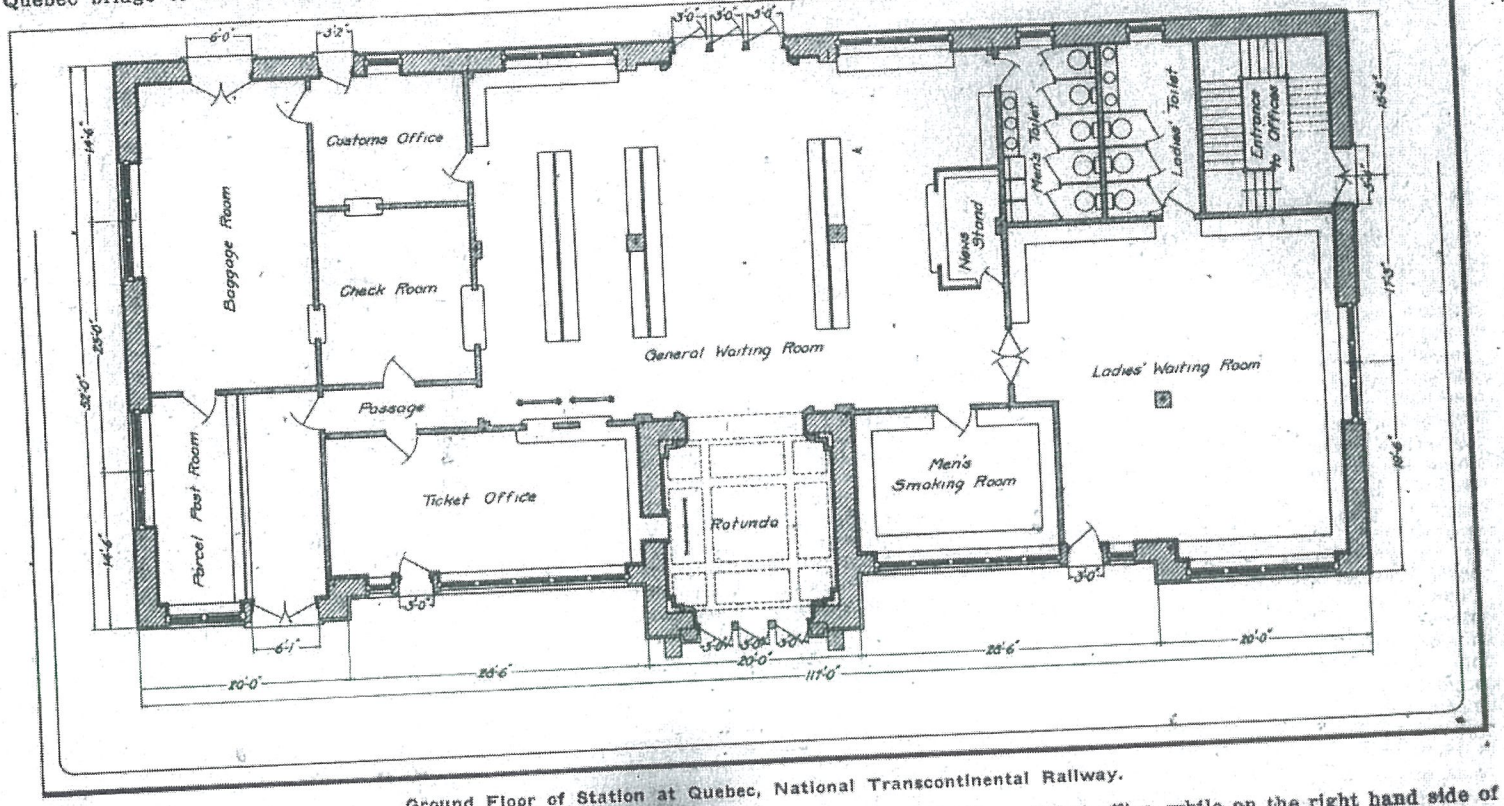


Ground Floor of Station at Quebec, National Transcontinental Railway.

originally intended to build the main station on this site, but it was subsequently decided to utilize the site for the station now being erected, which will be used for local traffic only, and the main freight and passenger terminal will be a joint one with the C. P. R. about the site of the latter's present Palais station.

From the small volume of traffic that it is anticipated will be handled locally through the Champlain Market station, it was not necessary to erect a large building. In consequence, it will measure only 52 by 117 ft., and will be parallel with the river, on the east side of the site, with the front facing the river. Immediately back of the station will be the concourse, with a 40 ft. platform at the rear end of the stub tracks, with four platforms 15½ ft. wide leading off from this back platform, each 250 ft. long. The station will have 7 tracks, 6 of which will come in alongside the platforms, those each side 2 ft. 8 ins. thick, carried by these piers, the wall between the piers being spanned by three 18 in. I beams bedded in the concrete. The concrete wall is to be carried up to the ground level. The principal walls will be built from the top of the concrete foundations to a height of 4 ft. from the ground level, and will be 18 ins. thick. They will be of Beauport, or Chateau Richer, limestone, with headers, and the outer facing of this wall will be Riviere a Pierre granite. Above this line, the walls will be of brick, except for the outside face, which will be of Citadel shale brick. The brick will be entirely kiln run common. All of it will be laid in stretcher courses, with every fifth course a header course. The window sills and caps will be of Deschambault dressed stone. The porch or main entrance, comprising the columns, base blocks and cornice, will also be of Deschambault dressed stone. The inner columns will be false. Over the porch ticket office, while on the right hand side of the room, there will be a news stand, 6 by 11 ft., entered from the general waiting room. The men's smoking room, entered from the general waiting room, will adjoin the rotunda on the right, and will be 13 by 13 ft. It will have a wall seat extending clear around the room, and will also have a composition floor. The entrance to the women's waiting room will adjoin that of the men's smoking room, which will be approximately 30 ft. square, also with a composition floor, and with a wall seat extending around the room. Back of the women's waiting room, there will be two lavatories for men and women, respectively, each 9 by 16 ft., and tiled with a mosaic floor. The women's will be entered from the women's waiting room, and the men's from the general waiting room.

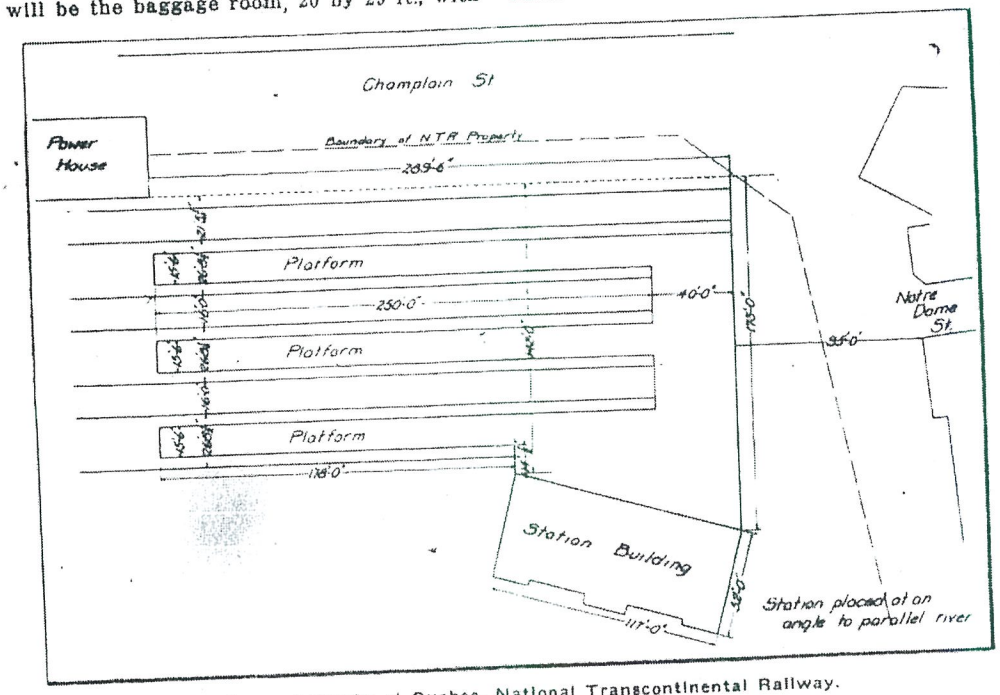
To the left of the rotunda, will be located the ticket office, 13 by 30 ft., floored in hard-

wood. There will be three ticket windows and two entrances, one from a passageway from the general waiting room, and the other from the front of the building. The passage from the general waiting room will be 4 ft. wide, leading to the parcel post office, which will be 16 by 20 ft. Back of this room, and connecting with it through a door, will be the baggage room, 20 by 29 ft., with a mastic floor. This will have a double swing door at the rear, connecting with the outside for the baggage entrance way. There will be a door on the right, leading into the customs room, 12 by 15 ft., which will be floored in hardwood. This room will also connect with the general waiting room. The check room adjoining will be 15 by 16 ft., with hardwood floor. It will be entered from the passage, and will have counter windows on the other three sides into the baggage room, customs office and general waiting room. The rear of the general waiting room will open out on the train concourse through three doors.

The street corner of the main floor will be entered through a door on that side to a stairway, leading to the offices on the first [illegible] This will lead into a central 8 ft.

with three windows on the rear, and six on the front sides. There will be a room under the tower, with a stairway leading up into the tower from it. The height of rooms on the three floors will vary, the ground floor rooms being 15 ft., first floor, 12 ft., and the second floor, 9 ft.

The tower will have a total height of 68 ft., surmounted by a flagpole. On the four sides of the tower, at a height of 57 ft., there will be clock faces. The flat top of the building will be surmounted by an ornamental iron border.



Station and Tracks at Quebec, National Transcontinental Railway.

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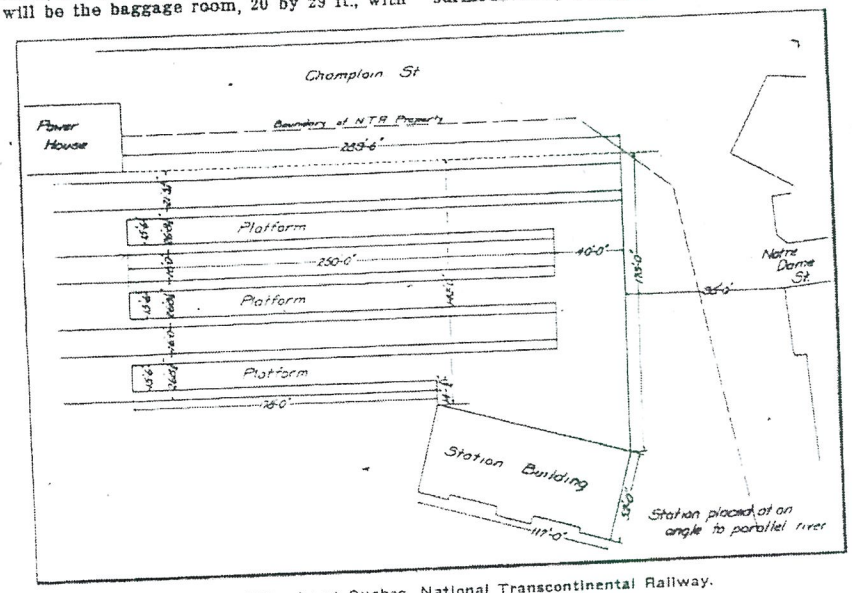
The street corner of the main floor will be entered through a door on that side to a stairway, leading to the offices on the first floor. This will lead into a central 8 ft. corridor, extending the full length of the building, with offices on either side. The first room on the right will be a lavatory, 11 by 19 ft., tiled in mosaic. Next in order will be an office, 17 by 19 ft. The next room, in the centre of the rear of the building, will be the train dispatcher's office, 19 by 29½ ft., with a counter extending around the doorway, and an operator's desk along a 10 ft. window at the rear. The remainder of that side of the corridor will be divided off into three offices, two 12 by 19 ft. each, and the third, 17 by 19 ft.

Opposite the stairway on the front side of the building there will be a conductors' and trainmen's room, 17 by 21 ft., followed by two offices, 15 by 19 ft. and 14 by 19 ft. respectively. Under the tower there will also be an office, 15½ by 16 ft., the balance of that side containing three more offices, 14 by 19 ft., 15 by 19 ft., and 17 by 21 ft., respectively.

The second, or top, storey will form one large room, the corner stairway leading directly into it. On account of the sloping sides to the roof, it will be 40 by 105 ft., slightly smaller than the other floor areas,

the tower from it. The height of [illegible] the three floors will vary, the ground floor rooms being 15 ft., first floor, 12 ft., and the second floor, 9 ft.

The tower will have a total height of 68 ft., surmounted by a flagpole. On the four sides of the tower, at a height of 57 ft., there will be clock faces. The flat top of the building will be surmounted by an ornamental iron border.



Station and Tracks at Quebec, National Transcontinental Railway.

National Transcontinental Railway Construction.

The Minister of Railways made an inspection of the N.T.R. from Quebec to Lake Superior Jct., Ont., early in December. The section of the line from Moncton to Levis is being operated under the Canadian Government Railway's management, and the section between Lake Superior Jct. and Winnipeg is being operated by the G.T. Pacific Ry., under an arrangement with the Department. The intervening mileage from Quebec to Lake Superior Jct. is practically completed, and local services are being given over the various sections. It is expected that arrangements will be completed for the operation of through traffic in the spring. (Dec., 1914. pg. 548.)

Grand Trunk Pacific Railway Construction.

We are officially advised that during 1914 grading was practically confined to the main line, and even this was completed by the spring of the year. Tracklaying was continued on the main line and several of the branches, and in all about 190 miles were laid, exclusive of second track, sidings, ballast pits, etc. A short resurvey of a portion of the Wattsview Boundary Branch was made.

Main Line.—The entire grade was completed in the early part of the year. Track was laid westerly from mile 1265 to 1374. On April 7 connection was made with track laid easterly from mile 324 east of Prince Rupert to mile 372. The entire line was also ballasted, and is in operation throughout. The grading for Prince Rupert terminals has been practically completed, and the construction of roundhouse and divisional point facilities is under way at Prince George, Endako, Smithers and Pacific. The divisional point at McBride has been installed with a very modern equipment. This completes the terminals on the line, with the exception of Prince Rupert, for which immediate plans are under consideration. Fuel oil facilities in lieu of coal are being prepared for at the divisional points in British Columbia. The following steel bridges were completed during the year:—

Little Shuswap crossing, mile 1101—one span.
3rd crossing Fraser River, mile 1231—950 ft.
Willow River, mile 1262—450 ft.
4th crossing Fraser River at Prince George (combination railway and highway bridge—2650 ft.
Mud River, mile 1292—160 ft.
Upper Nechaco crossing, mile 1373—575 ft.
Endako River crossing, mile 1386—one span.
Endako River crossing, mile 1403—one span.
Bulkley River crossing, mile 1481—one span.
Bulkley River crossing, mile 1486—350 ft.
Also 12 bridges each consisting of one span over fast mountain streams running into the Skeena River east of Prince Rupert.

Harte-Brandon Branch—Length 25 miles. No work was done during the year. Grading is completed to mile 21.85. The substructure for the steel bridge, consisting of two spans (450 ft.) was completed, but steel not yet erected, although on the ground.

Talmage-Weyburn Branch — Length 15 miles. Track was laid during the year, and the branch put in operation.

Prince Albert Branch—Length 111.5 miles. Grade is completed throughout, and track laid to mile 87.2, this being at the southern approach to the bridge over the South Saskatchewan River, which will be 1,200 ft. long and will consist of six spans. The substructure has recently been completed, ready for erection of steel. The branch is in operation to mile 87.2.

Cutknife Branch — Length 50 miles. Tracklaying was completed from mile 33

National Transcontinental Railway Construction.

The total track mileage of the N.T.R. is as follows:—Main line, Moncton, N.B., to Winnipeg, Man., 1,803.42 miles; second track and line from Quebec to site of Quebec bridge, 20.79 miles; sidings and yards, 423.26 miles; total track mileage, 2,247.47. The total cost of the line, to Mar. 31, 1914, as stated in the ninth annual report of the Commissioners, was $142,967,999.02, which does not include interest on capital expenditure, nor any expenditure made by the Government on the approaches to the Quebec bridge, before that work was taken over as a part of the N.T.R. undertaking. At that date the steel bridges on the line were 97.2% completed, the Quebec bridge being regarded as a separate undertaking. Since the date of the report, the bridge work has been practically finished, and the other finishing up work has been practically completed. The fitting up of the shops and the provision of other equipment for operation is being proceeded with.

We are officially advised that the contract for the erection of nine travelling cranes for the Leonard shops, Quebec, has been awarded to the Dominion Bridge Co., Montreal.

The estimates for this year, which have been laid before the House of Commons, include the following items:—N.T.R. construction, $5.000,000; Quebec Bridge construction, $3,500,000, and towards the construction of a railway to connect Montreal with the National Transcontinental Railway, $750,000 (revote). (Jan., pg. 19.)

MARCH 1915

dock is already completed. (Jan., pg. 19)

National Transcontinental Railway Construction.

Replying to a question in the House of Commons, Mar. 1, the Minister of Railways said that on June 5, 1914, the Government bought for $175,000 a piece of line, 5.5 miles long, for use in connection with the N.T.R. This line connected with the N.T.R. only at the east end near Cape Rouge, Que., and in order to facilitate operation an additional Y connection, 2,481 ft. long, is being constructed at the Cape Rouge end. At the west end a connection 2.3 miles long has been built in order to effect connection with the Leonard shops. The east end of the line is in Cape Rouge parish and the west in St. Malo parish. On Mar. 3 another question elicited from the Minster the fact that $11,000 is being expended upon repairing the line purchased.

The Minister of Railways informed the House of Commons, Mar. 3, that work had been started on the N.T.R. terminals in the city of Quebec. There had been expended by the commission $372,514.86 for lands, and by the C.P.R. $154,293.83 on tracks and buildings.

The Minister of Railways, replying to questions in the House of Commons recently, said the expenditure on the Quebec bridge since Mar. 12, 1912, had been:—1912-13, $1,512,825.96; 1913-14, $2,604,105.61; and to Jan. 31, 1915, $2,964,911.40. Total, $7,081,842.97.

In reply to questions in the Senate, Mar. 2, Senator Lougheed stated the N.T.R. was operated from Dec. 1, 1913, to May 1, 1914, from Hervey Jct., mileage 72 west of Quebec, to the divisional point at Parent, mileage 245 west of Quebec; and during this winter it is being operated from Cochrane, Ont., east to Peter Brown Creek, 143 miles. These are the mileages between Quebec and Cochrane, which have been operated.

In the Senate, Mar. 11, on a motion for the submission to Parliament of copies of all petitions for traffic on the N.T.R. between Abitibi and Hervey Jct., Senator Lougheed stated that the contractors for the building of the line between these points were operating a bi-weekly service for which they were receiving $12,000 from the Government. The contractors had pointed out that no revenue was being made from this operation. The Minister of Railways made a personal investigation of the situation in the

April 1915

late autumn. The line was being operated also between Hearst and Amos, 270 miles west of Cochrane. As to further operation it will be necessary almost immediately for the Government to operate in a limited way the entire system for the purpose of maintenance. Whatever difficulties settlers along the line might experience at present, there was a possibility of these being overcome at a very early date, as the line would have to be operated to prevent the decay into which it would necessarily fall except it becomes a going concern. He continued:—"Immediately the contractors completed their contracts between Quebec and Cochrane the Government took the necessary steps to notify the Grand Trunk Pacific of the completion of the road and of the necessity of their carrying out or fulfilling the obligations which fall upon them under the contract between the Crown and the company. The company has not responded with that alacrity which the Government would very much like to see. They have not pointed out wherein the road is incomplete in any particular respect, but they rely upon a general objection, which is a very favorite objection, in special pleading. What the result of this may be I cannot say. The probabilities are that negotiations between the G.T.P. and the Government may be extended over some period of time, but in the meantime the perplexities which must necessarily attend the handling of so important a matter will be thrown upon the shoulders of the Government." (Mar., pg. 102.)

Senator Lougheed stated in the Senate, Mar. 12, that the G.T. Pacific Ry. had filed "omnibus objections" to the taking over of the line from Moncton, N.B., to Winnipeg, in respect to which there would have to be negotiations between the company and the Government. Under the terms of the agreement entered into in 1903, the G.T. Pacific Ry. Co. undertook to take over the line when completed, on lease for 50 years at a rental of 3% upon the total cost, after the first seven years.

APRIL 1915

The Bridging of the St. John River Between St. Leonard, N. B., and VanBuren, Me.

An event of international importance is expected to take place on May 1, when a new gateway will be opened for traffic between Canada and the northernmost tip of the eastern United States, where the Van Buren Bridge Co. has just completed the building of its short line of railway, including a bridge over the St. John River, between the Bangor and Aroostook Rd. system in VanBuren, Maine, and the National Transcontinental Ry. and Intercolonial Ry. in St. Leonards, N.B.

The length of the new line is 1.36 miles, of which 1.19 miles is the property of the bridge company, extending from the United States bank of the St. John River to a connection with and crossing of the National Transcontinental Ry., thence to a crossing of a branch line of the C.P.R., and thence to a junction with the International Branch of the Intercolonial Ry., the two grade railway crossings being protected by electric power interlocking signals controlled from a signal tower at the N.T.R.

The river, which at this point measures from bank to bank 970 ft., is crossed by a bridge consisting of 5 single track steel riveted lattice through spans of 160 ft. each (skew 77°), supported on two concrete abutments and four concrete piers, with approach embankments thoroughly protected by riprap. The distance from base of rail to extreme high water is 9.7 ft., and to low water 45.7 ft., the range between these two water stages being 36 ft. The depth of water at normal stage in the thread of the stream varies from 15 to 20 ft. The abutments are of the usual splay-wing type, placed on concrete piles, 20 to 23 ft. long, driven with considerable resistance in a soil consisting of clay mixed with sand and gravel. The piers are built with rounded downstream ends and moulded inclined starkwaters, the bridge seat or upper of the two top courses being 8 ft. wide and 31 ft. long, and the width under the corbel course 6½ ft. The batter of the sides and downstream ends is ¾ in. per foot, and of the upstream end or starkwater 4 ins. per foot. Two of the piers are 52 ft. and the other two 48 ft. from the bottom of footing course to top of the bridge seat. The piers are each founded on from 104 to 106 spruce piles, approximately 20 ft. long below cutoff, driven in the hard, gravelly clay that underlies the bed of the stream. All piers have their bases well protected with riprap. The spans are designed for E-50 Cooper loading (2 consolidated locomotives, with 50,000 lbs. on each driving axle, followed by a trainload of 5,000 lbs. per lineal foot), equivalent to the "heavy" class loading prescribed in the specifications of the Department of Railways and Canals of Canada, and complying with the requirements of the 1911 bridge specifications of the American Railway Engineering Association.

Perhaps the most marked feature of this work has been the rapidity of its construction, 7½ months only having elapsed from its commencement to its completion. Started in the middle of Sept., 1914, excavation and the laying of concrete were vigorously prosecuted throughout the winter, although the temperature usually hovered around zero, and at times very much lower. This was made possible by enclosing the piers in housings, heated with steam pipes and salamanders, so as to afford the concrete an opportunity to become thoroughly set prior to exposure to low temperatures. Steel erection from the Canadian shore was started in January, and followed closely on the heels of the substructure, the last pier, on the U.S. side, having been finished early in April. Through the employment of the cantilever method of erection, all risk of serious damage or interruption from a premature breakup in the river was obviated.

The principal contractors were Cyr Brothers Co. of Waterville, Me., for the substructure; the Dominion Bridge Co., Montreal, for the superstructure; Hill & Hammond, Woodstock, N.B., for the roadbed, tracklaying, ballasting, fencing and telephone line, and the General Railway Signal Company of Canada, Lachine, for the interlocking plant.

Percy R. Todd, of Bangor, Me., President of the Bangor and Aroostook Rd., is also President of the VanBuren Bridge Company; W. J. Wilgus, New York, was consulting engineer, and T. A. Lang, Resident Engineer, on the bridge construction.

The VanBuren Bridge Co. has given out the following statement: "The establishing of this route will mean a great deal to a large section of New Brunswick and Quebec, and to the portion of northern Maine known as Aroostook County, embracing an area nearly as great as the entire State of Massachusetts. New Brunswick will be benefited by having a new and direct line to the markets of central and southern New England, the distance to Boston from the timber lands, lumber mills, fisheries and pleasure resorts centring at Campbellton, on the Bay of Chaleur, being over 200 miles shorter than via the old routes through Levis and Sherbrooke. Towns and shipping points located upon the portion of the National Transcontinental Ry. between Moncton, N.B., and Levis, Que., will profit by this short line to the same New England territory, and another outlet will be offered to the products of the virgin country tributary to the recently completed National Transcontinental Ry. west of Quebec. Viewed from the other standpoint, Aroostook County will be able to tap the Cana-

The Bridging of the St. John River Between St. Leonard, N. B., and VanBuren, Me.

An event of international importance is expected to take place on May 1, when a new gateway will be opened for traffic between Canada and the northernmost tip of the eastern United States, where the Van Buren Bridge Co. has just completed the building of its short line of railway, including a bridge over the St. John River, between the Bangor and Aroostook Rd. system in VanBuren, Maine, and the National Transcontinental Ry. and Intercolonial Ry. in St. Leonards, N.B.

The length of the new line is 1.36 miles, of which 1.19 miles is the property of the bridge company, extending from the United States bank of the St. John River to a connection with and crossing of the National Transcontinental Ry., thence to a crossing of a branch line of the C.P.R., and thence to a junction with the International Branch of the Intercolonial Ry., the two grade railway crossings being protected by electric power interlocking signals controlled from a signal tower at the N.T.R.

The river, which at this point measures from bank to bank 970 ft., is crossed by a bridge consisting of 5 single track steel riveted lattice through spans of 160 ft. each (skew 77°), supported on two concrete abutments and four concrete piers, with approach embankments thoroughly protected by riprap. The distance from base of rail to extreme high water is 9.7 ft., and to low water 45.7 ft., the range between these two water stages being 36 ft. The depth of water at normal stage in the thread of the stream varies from 15 to 20 ft. The abutments are of the usual splay-wing type, placed on concrete piles, 20 to 23 ft. long, driven with considerable resistance in a soil consisting of clay mixed with sand and gravel. The piers are built with rounded downstream ends and moulded inclined starkwaters, the bridge seat or upper of the two top courses being 8 ft. wide and 31 ft. long, and the width under the corbel courde 6½ ft. The batter of the sides and downstream ends is ¾ in. per foot, and of the upstream end or starkwater 4 ins. per foot. Two of the piers are 53 ft. and the other two 48 ft. from the bottom of footing course to top of the bridge seat. The piers are each founded on from 164 to 108 spruce piles, approximately 20 ft. long below cutoff, driven in the hard, gravelly clay that underlies the bed of the stream. All piers have their bases well protected with riprap. The spans are designed for E-60 Cooper loading (2 consolidated locomotives, with 50,000 lbs. on each driving axle, followed by a trainload of 5,000 lbs. per lineal foot), equivalent to the "heavy" class loading prescribed in the specifications of the Department of Railways and Canals of Canada, and complying with the requirements of the 1911 bridge specifications of the American Railway Engineering Association.

Perhaps the most marked feature of this work has been the rapidity of its construction, 7½ months only having elapsed from its commencement to its completion. Started in the middle of Sept., 1914, excavation and the laying of concrete were vigorously prosecuted throughout the winter, although the temperature usually hovered around zero, and at times very much lower. This was made possible by enclosing the piers in housings, heated with steam pipes and salamanders, so as to afford the concrete an opportunity to become thoroughly set prior to exposure to low temperatures. Steel erection from the Canadian shore was started in January, and followed closely on the heels of the substructure, the last pier, on the U.S. side, having been finished early in April. Through the employment of the cantilever method of erection, all risk of serious damage or interruption from a premature breakup in the river was obviated.

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MAY 1915

MAY 1915

dian supply of raw materials, and will be in closer touch with the grain, flour and provision supplies of the west, as the distance from Chicago to the VanBuren gateway, via the G.T.R. and the National Transcontinental Ry. is identical with the distance via the old route to the southern end of the Bangor and Aroostook system at Northern Maine Jct. The opening of the VanBuren bridge route promises much for the people of both countries, heretofore separated for some 350 miles along the International Boundary neighboring the St. John River."

National Transcontinental Railway Construction.

The Dominion Government has obtained power from the Dominion Parliament to operate the National Transcontinental Ry., from Moncton, N.B., to Winnipeg, pending the completion of negotiations with the Grand Trunk Pacific Ry., for the taking over of the line under the terms of the agreement of 1903, and its operation with the G.T.P. Ry. as a complete unit from Moncton, to Prince Rupert, B.C. This agreement provided for the taking over of the Moncton-Winnipeg line at a rental of 3% upon its actual cost. The negotiations in progress have to do with the ascertaining of the actual cost upon which the rental of 3% is to be paid, and the interpretation of other sections of the agreement. From time to time something is said in the daily press as to the stage which these negotiations have reached but there is no official statement on either side, consequently no importance can be attached to the press despatches. It is, however, admitted by the Minister of Railways, which admission is concurred in by Hon. G. P. Graham, ex-Minister of Railways, that the line is not completed in all its details as contemplated in the agreement, so that the G.T.P. Ry. is justified in not taking it over. Until these negotiations are completed the Railways Department has the power to operate the entire line, either as a complete unit, or in sections, for the benefit of the Dominion.

Parliament has also granted the Department authority to acquire from the G.T.P.R., the branch line from Lake Superior Jct. to Fort William, Ont., 190 miles, with the terminals, facilities and accommodation works, by purchase, lease or otherwise, of the G.T.P.R. or any other company, and of including the same in the N.T.R., so that in the event of the G.T.P.R. failing to agree with the Government, the entire line east of Winnipeg may be operated in connection with existing Government lines. This is being operated by the G.T.P.R. in connection with the section of the N.T.R. between Lake Superior Jct. and Winnipeg, 258 miles, as its Lake Superior Division, with a total mileage of 448. The 258 mile section of the N.T.R. is operated under a special agreement, independently of the general agreement for the whole line contemplated by the act of 1903.

In the House of Commons, April 1, the Minister of Railways said work was commenced upon the building of the station on the site of the Champlain Market, Quebec, June 18, 1914, and was suspended Dec. 20, 1914, because it was considered inadvisable

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May 1915

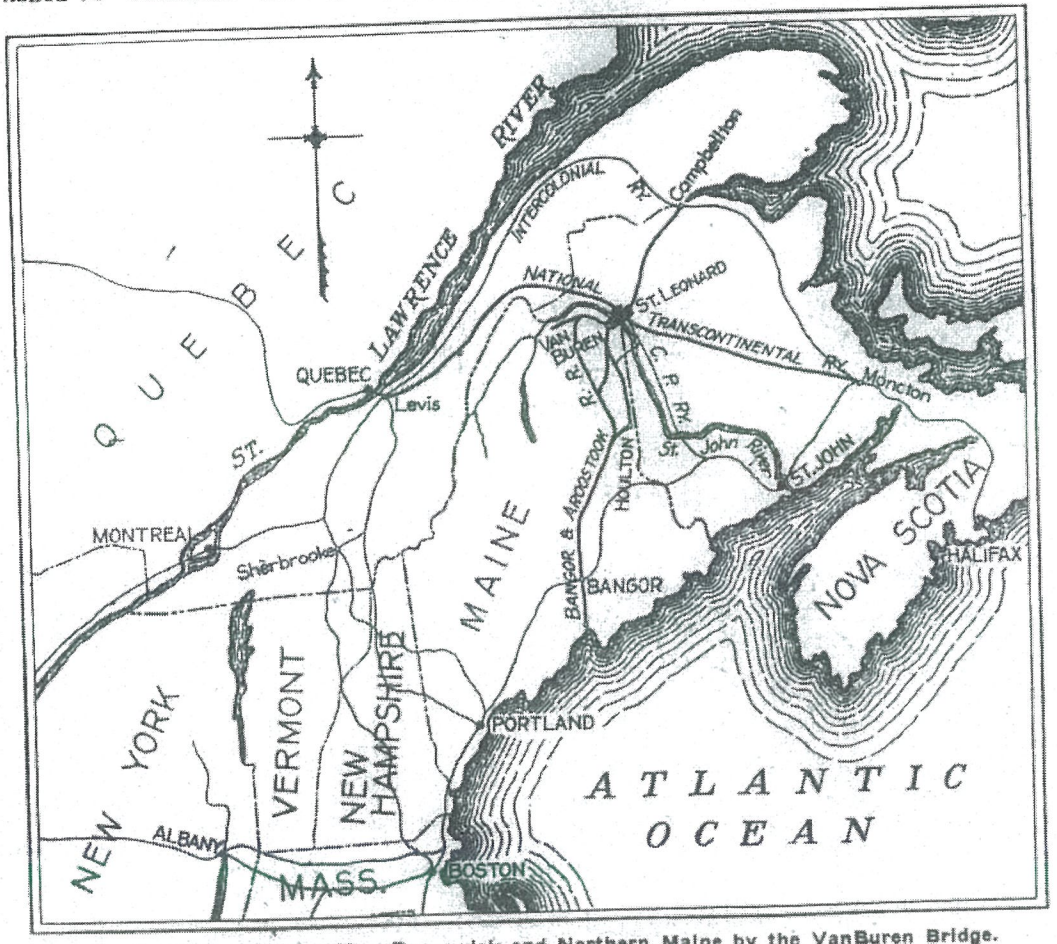
The Bridging of the St. John River between St. Leonard, N.B., and Van Buren, Me.

An article on the bridge which has been built recently across the St. John River to connect the Bangor and Aroostook Rd. with the Intercolonial Ry. and the National Transcontinental Ry., and which was published in Canadian Railway and Marine World for May was received such a short time before publication date that it was impossible to have illustrations made to accompany it. We therefore give herewith plans showing the location of the bridge and the connecting railways.

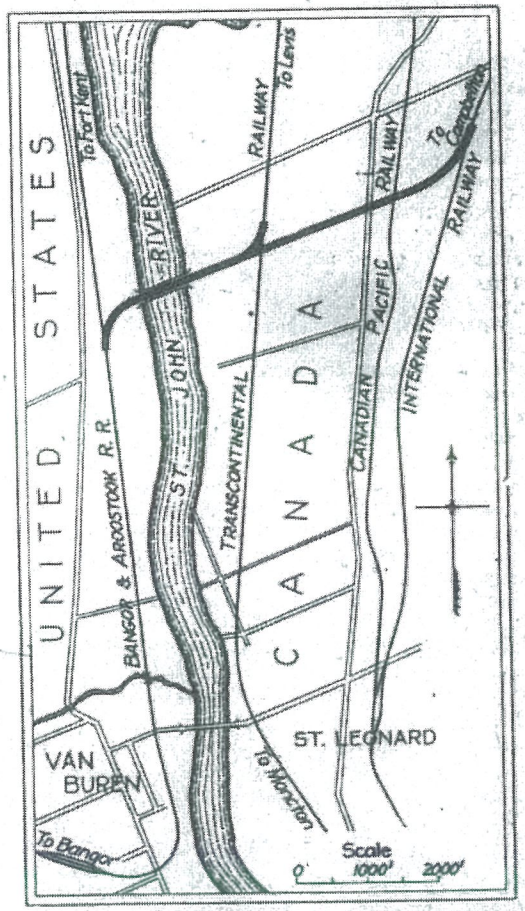
As stated in our May issue, the connecting line which has been built is 1.36 miles long, of which 1.19 miles is the property of the VanBuren Bridge Co., extending from the United States bank of the St. John River to a connection with and crossing of the National Transcontinental Ry., thence to a crossing of a C. P. R. branch line, and thence to a junction with the International Branch of the Intercolonial Ry., the two grade railway crossings being protected by electric power interlocking signals controlled from a signal tower at the N. T. R.

The river, which measures from bank to bank 970 ft., is crossed by a bridge consisting of 5 single track steel riveted lattice through spans of 160 ft. each (skew 77°), supported on two concrete abutments and four concrete piers, with approach embankments thoroughly protected by riprap.

The railway shown on the larger of the two accompanying plans as extending from St. Leonard to Campbellton, N. B., was built as the International Ry. of New Brunswick, by Thos. Malcolm, of Campbellton. It was acquired last year by the Canadian Government Railways, and is being operated as an Intercolonial branch line.



The connection between New Brunswick and Northern Maine by the VanBuren Bridge.



Line between St. Leonard and VanBuren, showing Connections and Crossings.

June 1915

The Dominion Government Operates the National Transcontinental Railway.

The Canadian Government Railways having taken over, on May 1, the operation of the National Transcontinental Ry. from Moncton, N.B., to Winnipeg, and the Grand Trunk Pacific Ry.'s Lake Superior Branch from Fort William to Superior Jct., Ont., the jurisdiction of the heads of departments of the C.G.R. at Moncton, has been extended over these lines.

F. P. BRADY, heretofore General Superintendent, Canadian Government Rys., Moncton, has been appointed General Superintendent, National Transcontinental Ry. between Quebec and Winnipeg, and the Grand Trunk Pacific Ry.'s Lake Superior Branch between Fort William and Superior Jct. Office, Cochrane, Ont.

J. K. McNEILLIE, heretofore Superintendent, District 3, Eastern Division, C.P.R., who has been appointed to succeed F. P. Brady as General Superintendent at Moncton, N.B., will have jurisdiction over the N.T.R. east of Quebec as well as the I.C.R. and P.E.I.R.

A. J. GORRIE, at one time General Superintendent, Canadian Northern Quebec Ry., and subsequently receiver Quebec & Lake St. John Ry., has been appointed Superintendent, District 1, N.T.R., Quebec to O'Brien, Ont. Office, Quebec, Que.

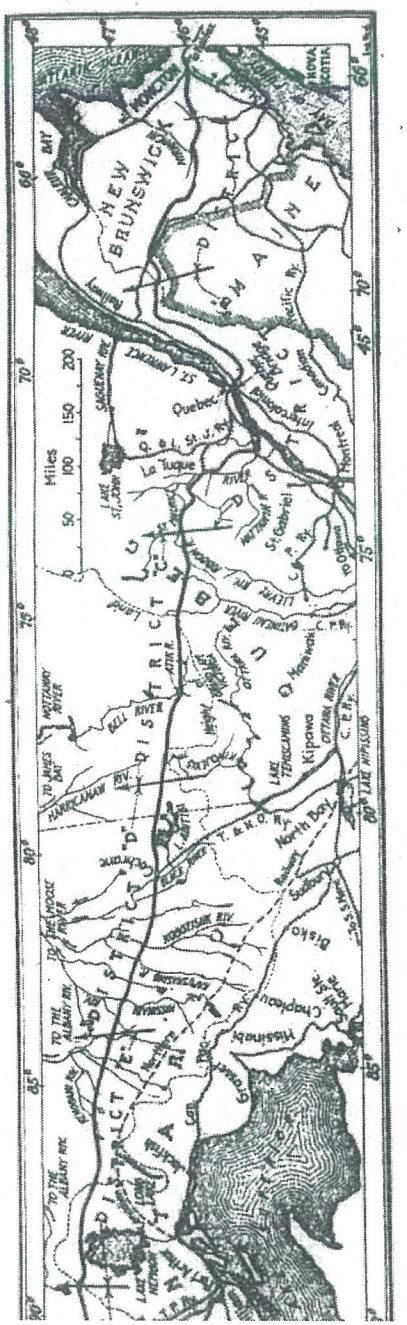
J. J. McMANUS has been appointed Assistant Superintendent, District 1, Quebec to O'Brien, Ont. Office, Quebec, Que.

W. B. WAY, heretofore Inspector of Transportation, Eastern Lines, C.P.R., Montreal, has been appointed Superintendent, District 2, N.T.R., O'Brien to Armstrong, Ont., excluding O'Brien. Office, Cochrane, Ont.

H. A. RYAN, heretofore Assistant Superintendent, N.T.R., between Edmundston, N. B., and St. Chrysostome, Que., at Monk, Que., has been appointed Assistant Superintendent, N.T.R., District 2, O'Brien to Armstrong, Ont., excluding O'Brien. Office, Cochrane, Ont.

R. S. RICHARDSON, heretofore Assistant Superintendent, District 3, I.R.C., Moncton, N.B., has been appointed Superintendent, District 3, N.T.R., Armstrong, Ont., to Winnipeg, excluding Armstrong and Superior Jct. to Fort William, Ont. Office, Winnipeg.

Quebec Press Dispatch, May 23.—" The first through train over the N.T.R. from Winnipeg reached here at 9.30 p.m. yesterday consisting of two cars, carrying officials, including: F. P. Gutelius, General Manager Canadian Government Railways; F. P Brady, General Superintendent; C. A. Hayes, General Traffic Manager; H. H. Melanson, General Passenger Agent; C. B. Brown, Chief Engineer; W. A. Cowan, Divisional Engineer; Gordon Grant, Chief Engineer N.T.R., and others. The train left Win-



ap and Profile, National Transcontinental Railway, Moncton, N.B., to Winnipeg, Man., 1804.5 miles.

JUNE
1915

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An act was passed by the Dominion Parliament in 1903 providing for the building of the National Transcontinental Ry. This act provided that the Dominion would build a line from Moncton, N.B., to Winnipeg, Man., while the Grand Trunk Pacific Ry. Co., incorporated by another act, was to build a line from Winnipeg to the Pacific Coast, the Dominion guaranteeing the company's bonds upon certain conditions. The line was to be laid out with 0.4% gradient against east bound traffic and 0.6% against west bound traffic, and the construction throughout was to be upon the most modern lines. The specifications for the eastern division to be built under the charge of the

Map and Profile, National

June 1915

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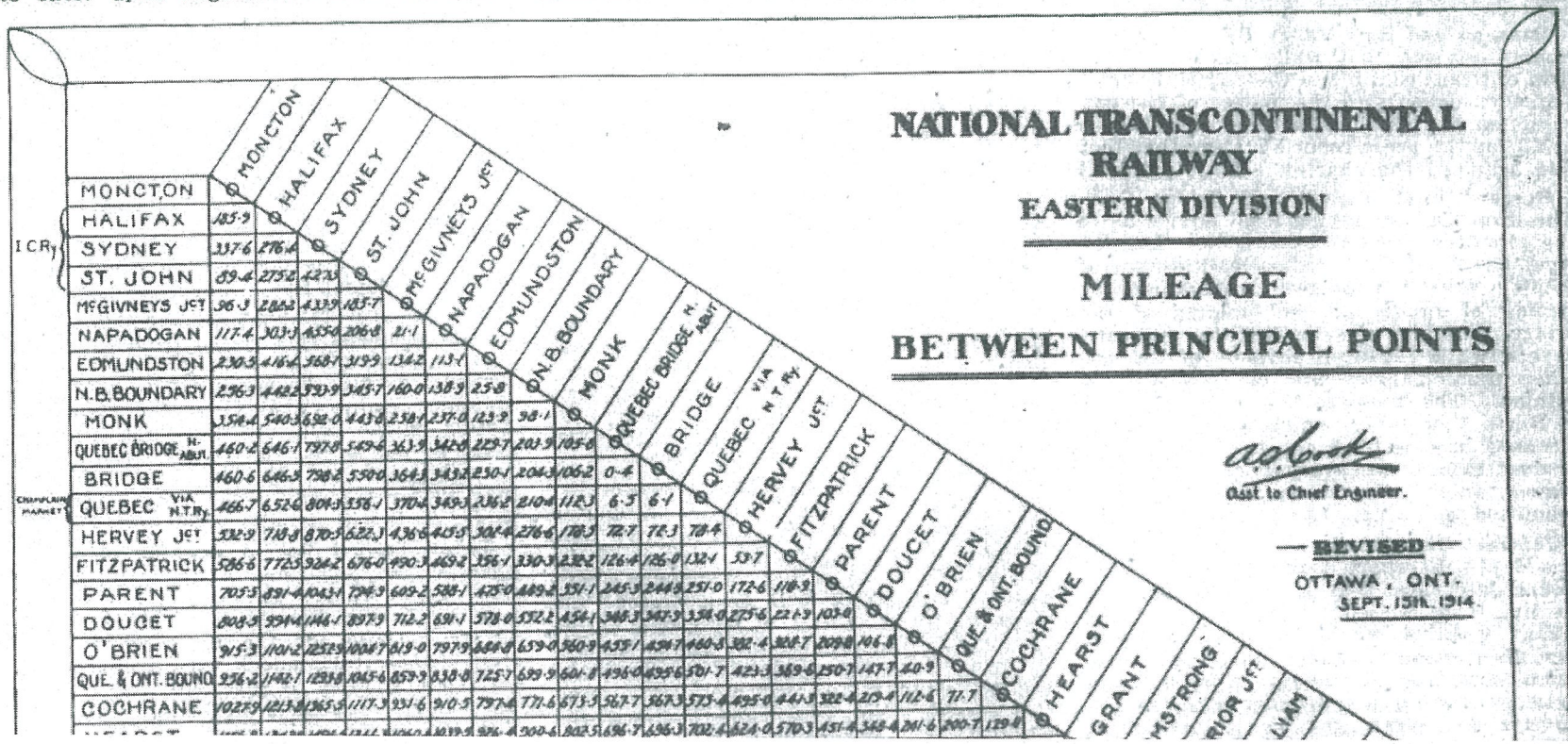
Commissioners of the National Transcontinental Ry., were to be subject to the approval of the Grand Trunk Pacific engineers, while the Western Division was to be built by the G.T. Pacific Ry. under the inspection of an engineer appointed by the Dominion Government. The act further provided that when the Eastern Division was completed it was to be operated in conjunction with the Western Division, as one through line by the G.T.P.R., the rental to be paid being 3% a year upon the actual cost of the line. No rental was to be payable during the first seven years of the 50-year period for which the lease was to run.

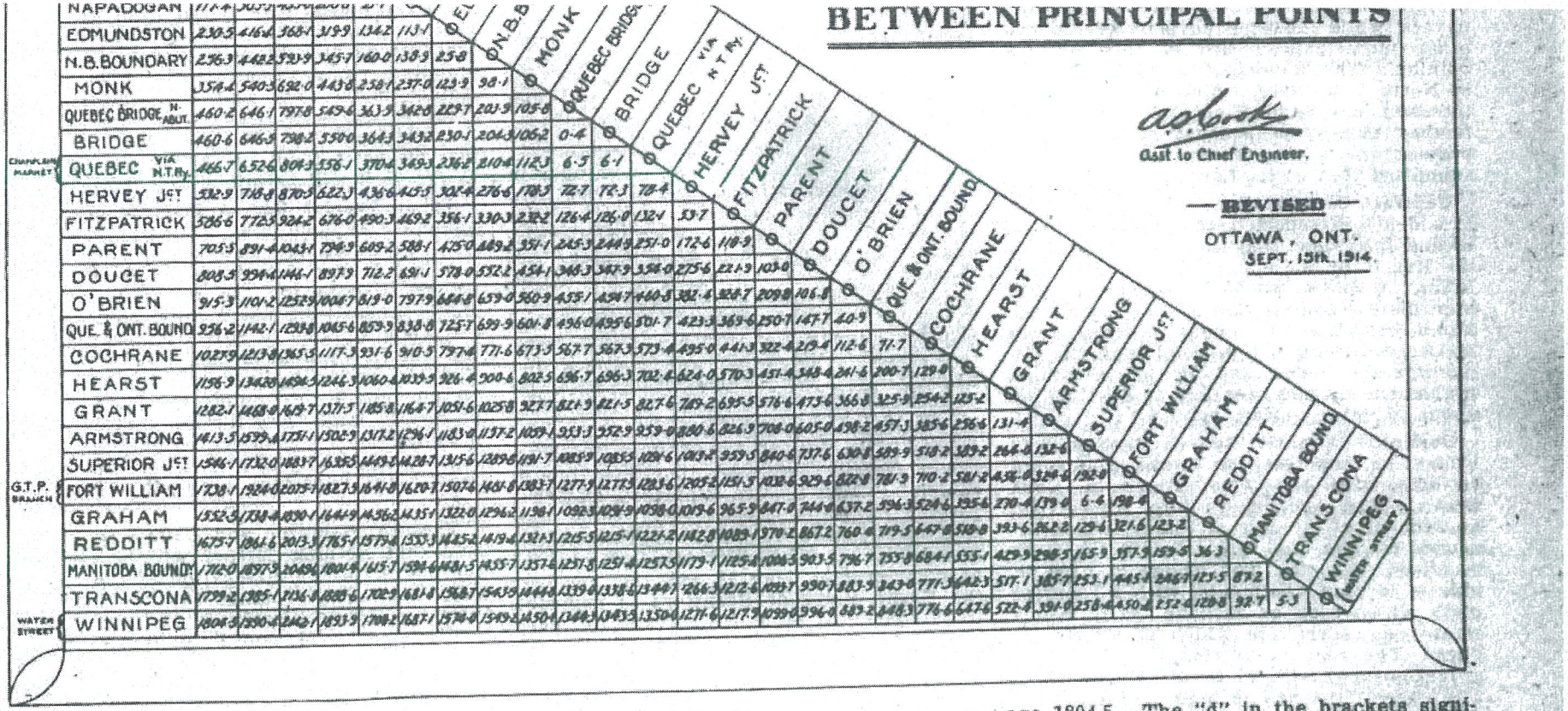
Track laying on the Eastern Division was finished by the end of 1913, but the line was not sufficiently completed until the autumn of 1914, to enable the Government to enter upon negotiations with the com-

Manager, Canadian Government Railways, announced that effective May 1, the jurisdiction of the heads of departments of the Canadian Government Railways at Moncton, had been extended over National Transcontinental Ry. and the G.T.P R.'s Lake Superior Branch.

The G.T.P.R.'s Lake Superior Branch from Fort William to Lake Superior Jct., 190 miles, has been operated by that company for some time, together with the 258 mile section of the N.T.R., from Lake Superior Jct. to Winnipeg, as the G.T.P.R. Lake Superior Division. Power to acquire this line by lease or otherwise for five years, together with its terminal facilities and accommodation works, was given at the Dominion Parliament's last session. The lease is to be ratified by Parliament, and the provisions of the Government Railways Act are

The principal points on the main line, Moncton being the starting point, are: McGivins Jct., mileage 56.3; Napadogan, mileage 117.4 (d); Edmondston, mileage 250.5 (d); New Brunswick boundary mileage, 256.3; Monk, Que., mileage 354.4 (d); Quebec Bridge, mileage 360.2; Quebec, general shops and terminals; Hervey Jct., mileage 532.9; Fitzpatrick, mileage 566.6 (d); Parent, mileage 705.5 (d); Doucet, mileage 808-5 (d); O'Brien, mileage 905.3 (d); Quebec, Ontario boundary, mileage 956.2; Cochrane, mileage 1027.9 (d); Hearst, mileage 1156.9 (d); Grant, mileage 1282.4 (d); Armstrong, mileage 1413.5 (d); Superior Jct., mileage 1546.1; Graham, mileage 1552.5 (d); Redditt, mileage 1675.7 (d); Ontario, Manitoba boundary, mileage 1712.00; Transcona, Man., terminal yards and general shops, mileage 1779.2; Water St., Winnipeg, mile-





pany respecting the taking of it over under the terms of the contract. The company filed what Senator Lougheed told the Senate were "omnibus objections" to entering upon this contract, and subsequently the Government decided to undertake the operation of the Eastern Division as part of the Canadian Government Railway's system. An order-in-council providing for this was passed, and upon the G.T.P.R. Co finally deciding not to take a lease of the line, an official announcement was made, April 30, as follows:

"As the G.T.P.R. Co. has declined to take out a lease, the Government will to-morrow, May 1, take over for operation the National Transcontinental Ry., Eastern Division, from Moncton to Winnipeg. At the same time the Government will also take over and operate the Lake Superior Division of the Grand Trunk Pacific lying between Superior Junction and Fort William, including the terminals at the latter place."

Following this, F. P. Gutelius, General to apply to the branch.

The total mileage of the line from Moncton, N.B., to the west side of Water St., Winnipeg, is 1,804.5, to which is to be added the mileage of the Lake Superior Branch, 190 miles, making a total of 1,994.05 miles of new main line to be operated by the Dominion Government. Of this mileage, 457.7 miles from Moncton, N.B., to St. Jean Chrysostome, Que., has been operated by the Government Railways officials since Nov. 22, 1914, and certain other mileages on the line between Quebec and Lake Superior Jct. have been operated by the contractors under a special arrangement with the Railways Department.

In addition to the main line, on which there is a small amount of second track, and a line from Quebec to the site of the Quebec Bridge, together 20.79 miles, there are 423.26 miles of track in yards and sidings.

age 1804.5. The "d" in the brackets signifies divisional points.

Rolling stock is being supplied from the Intercolonial Ry., but the Minister of Railways has power to purchase whatever rolling stock is necessary out of the consolidated funds. A number of locomotives and cars have been sent out from Moncton, for distribution along the line, having been taken across the St. Lawrence River at Quebec by the car ferry Leonard.

The Dominion Government took over last autumn the North Ry.'s charter rights to build a railway from Montreal to the N.T. Ry. at the crossing of the Bell River, Que., paying therefor $250,000.

Railway track has increased in weight 37% during the last 20 years, and during the same period the unit load hauled has increased, in some instances, over 300%.

JUNE 1915

June 1915

NATIONAL TRANSCONTINENTAL RAILWAY

EASTERN DIVISION

MILEAGE

BETWEEN PRINCIPAL POINTS

a.o.Cook
Asst. to Chief Engineer.

— REVISED —
OTTAWA, ONT.
SEPT. 15th. 1914.

		MONCTON	HALIFAX	SYDNEY	ST. JOHN	McGIVNEYS Jct	NAPADOGAN	EDMUNDSTON	N.B. BOUNDARY	MONK	QUEBEC BRIDGE N. ABUT.	BRIDGE	QUEBEC VIA N.T.Ry.	HERVEY Jct.	FITZPATRICK	PARENT	DOUCET	O'BRIEN	QUE. & ONT. BOUND.	COCHRANE	HEARST	GRANT	ARMSTRONG	SUPERIOR Jct	FORT WILLIAM	GRAHAM	REDDITT	MANITOBA BOUND.	TRANSCONA	WINNIPEG (WATER STREET)
	MONCTON																													
I.C.Ry.	HALIFAX	185·9																												
	SYDNEY	337·6	276·4																											
	ST. JOHN	89·4	275·2	427·5																										
	McGIVNEYS Jct	96·3	282·8	433·9	185·7																									
	NAPADOGAN	117·4	303·3	455·0	206·8	21·1																								
	EDMUNDSTON	230·5	416·4	568·1	319·9	134·2	113·1																							
	N.B. BOUNDARY	296·3	448·2	593·9	345·7	160·0	138·9	25·8																						
	MONK	354·4	540·3	692·0	443·8	258·1	237·0	123·9	98·1																					
	QUEBEC BRIDGE N. ABUT.	460·2	646·1	797·8	549·6	363·9	342·8	229·7	203·9	105·8																				
	BRIDGE	460·6	646·5	798·2	550·0	364·3	343·2	230·1	204·3	106·2	0·4																			
CHAMPLAIN MARKET	QUEBEC VIA N.T.Ry.	466·7	652·6	804·3	556·1	370·4	349·3	236·1	210·4	112·3	6·5	6·1																		
	HERVEY Jct	532·9	718·8	870·5	622·3	436·6	415·5	302·4	276·6	178·5	72·7	72·3	78·4																	
	FITZPATRICK	586·6	772·5	924·2	676·0	490·3	469·2	356·1	330·3	232·2	126·4	126·0	132·1	53·7																
	PARENT	705·5	891·4	1043·1	794·9	609·2	588·1	475·0	449·2	351·1	245·3	244·9	251·0	172·6	118·9															
	DOUCET	808·5	994·4	1146·1	897·9	712·2	691·1	578·0	552·2	454·1	348·3	347·9	354·0	275·6	221·9	103·0														
	O'BRIEN	915·3	1101·2	1252·9	1004·7	819·0	797·9	684·8	659·0	560·9	455·1	454·7	460·8	382·4	328·7	209·8	106·8													
	QUE. & ONT. BOUND.	956·2	1142·1	1293·8	1045·6	859·9	838·8	725·7	699·9	601·8	496·0	495·6	501·7	423·3	369·6	250·7	147·7	40·9												
	COCHRANE	1027·9	1213·8	1365·5	1117·3	931·6	910·5	797·4	771·6	673·5	567·7	567·3	573·4	495·0	441·3	322·4	219·4	112·6	71·7											
	HEARST	1136·9	1322·8	1474·5	1226·3	1040·6	1019·5	906·4	880·6	782·5	676·7	676·3	682·4	604·0	550·3	431·4	328·4	241·6	200·7	129·0										
	GRANT	1282·1	1468·0	1619·7	1371·5	1185·8	1164·7	1051·6	1025·8	927·7	821·9	821·5	827·6	749·2	695·5	576·6	473·6	386·8	345·9	274·2	145·2									
	ARMSTRONG	1413·5	1599·4	1751·1	1502·9	1317·2	1296·1	1183·0	1157·2	1059·1	953·3	952·9	959·0	880·6	826·9	708·0	605·0	518·2	477·3	385·6	256·6	131·4								
	SUPERIOR Jct	1546·1	1732·0	1883·7	1635·5	1449·8	1428·7	1315·6	1289·8	1191·7	1085·9	1085·5	1091·6	1013·2	959·5	840·6	737·6	650·8	609·9	518·2	389·2	264·0	132·6							
G.T.P. BRANCH	FORT WILLIAM	1738·1	1924·0	2075·7	1827·5	1641·8	1620·7	1507·6	1481·8	1383·7	1277·9	1277·5	1283·6	1205·2	1151·5	1032·6	929·6	842·8	781·9	710·2	581·2	456·0	324·6	192·0						
	GRAHAM	1552·5	1738·4	1890·1	1641·9	1456·2	1435·1	1322·0	1296·2	1198·1	1092·3	1091·9	1098·0	1019·6	965·9	847·0	744·0	657·2	596·3	524·6	395·6	270·4	139·0	6·4	198·4					
	REDDITT	1675·7	1861·6	2013·3	1765·1	1579·4	1558·3	1445·2	1419·4	1321·3	1215·5	1215·1	1221·2	1142·8	1089·1	970·2	867·2	780·4	719·5	647·8	518·8	393·6	262·2	129·4	321·6	123·2				
	MANITOBA BOUND.	1772·0	1897·9	2049·6	1801·4	1615·7	1594·6	1481·5	1455·7	1357·6	1251·8	1251·4	1257·5	1179·1	1125·4	1006·5	903·5	796·7	755·8	684·1	555·1	429·9	298·5	165·9	357·5	159·5	36·3			
	TRANSCONA	1799·2	1985·1	2136·8	1888·6	1702·9	1681·8	1568·7	1543·0	1444·8	1339·0	1338·6	1344·7	1266·3	1212·6	1093·7	990·7	883·9	843·0	771·3	642·3	517·1	385·7	253·1	445·4	246·9	123·5	87·2		
WATER STREET	WINNIPEG	1808·5	1994·4	2146·1	1897·9	1712·2	1691·1	1578·0	1552·2	1453·1	1348·3	1347·9	1354·0	1274·6	1221·9	1099·0	996·0	889·2	848·3	776·6	647·6	522·4	391·0	258·4	450·8	252·4	129·8	92·7	5·3	

National Transcontinental Railway Operation.

The most important feature of the operation of the National Transcontinental Ry. by the Dominion Government as part of the Canadian Government Railways, has been the starting of a tri-weekly through passenger service between Toronto and Winnipeg. The first train left Toronto Tuesday, July 13, at 10.45 p.m., for Winnipeg, arriving there on Thursday, July 15, about two hours late, the schedule time for arrival being 3.50 p.m. The first eastbound train left Winnipeg Sunday, July 18, at 5.15 p.m., and arrived in Toronto July 19 at 12.05 p.m. Westbound trains leave Toronto, Tuesdays, Thursdays and Saturdays. Eastbound trains leave Winnipeg, Sundays, Tuesdays and Thursdays.

The service is given by a combination of the G.T.R., the Ontario Government railway (the Timiskaming and Northern Ontario) and the National Transcontinental Ry. The total distance covered by the service is 1,257 miles, distributed as follows: G.T.R., Toronto to North Bay, 227 miles; Timiskaming and Northern Ontario Ry., North Bay to Cochrane, 253 miles; National Transcontinental Ry., Cochrane to Winnipeg, 777 miles. The points on the N.T.R. west of Cochrane at which the train stops, including flag stops, are: Jacksonboro, 512 miles; Fauquier, 530; MacPherson, 550; Mattice, 591; Hearst, 609 (junction with Algoma Central and Hudson Bay Ry.); Kabina, 631; Wilgar, 694; Grant, 734; KowKash, 777; Willett, 842; Armstrong, 866; McDougall's Mill, 987; Lake Superior Jct., 999; Graham, 1,005; Pyrites, 1,012; Quibell, 1,081; Redditt, 1,129; Minaki, 1,143; Dugald, 1,244; Winnipeg, 1,257, all these mileages being calculated from Toronto. The distance from Toronto to Winnipeg, on the C.P.R. via Sudbury, is 1,231.17 miles, and by the Canadian Northern Ry., now nearly ready for operation, it will be 1,229 miles.

The trains being operated in the new service consist of colonist sleeping cars, electric lighted first class coaches, tourist sleeping cars, dining car and standard sleeping cars. The rolling stock is being supplied for the present by the Canadian Government Railways and the Grand Trunk Pacific Railways, and Pullman sleepers are being used until the Government can provide its own.

The new service, which is named the National, is operated in conjunction with the Intercolonial Ry. Ocean Limited from Halifax to Montreal, the G.T.R. International Limited from Montreal to Toronto, and at the Fort Garry Station, Winnipeg, with the G.T. Pacific Ry. to Prince Rupert.

On the line in Quebec and Ontario, not previously operated over, except by contractors' trains, suitable services are being operated, new schedules having been put in operation July 11. Two trains a week each

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