ALGOMA CENTRAL RAILWAY

R.

STATEMENT OF ROLLING STOCK AND EQUIPMENT OF THE ALGOMA CENTRAL RAILWAY COMPANY.

List of Locomotives.

Eng. No.	Maker.	Size of Cylinder.	Weight of Engine.	No. of Drivers.	Engine Truck.
			lbs.		
1	Mason	17 x 24	80,000	6 (50 in.)	4 wheel
2	Mason	17 x 24	80,000	"	4 wheel
3	Mason	17 x 24	80,000	"	4 wheel
4	Mason	17 x 24	80,000	"	4 wheel
5	C. B. & Q	16 x 22	60,000	4 (50 in.)	None.
6	C. B. & Q	16 x 22	60,000	"	None.
7	C. B. & Q	16 x 22	60,000	"	None.
8	C. B. & Q	16 x 22	60,000	"	None.
9	C. B. & Q	16 x 22	60,000	"	None.
10	C. B. & Q	16 x 22	60,000	"	None.
11	C. B. & Q	16 x 22	60,000	"	None.
19	Kingston	18 x 26	122,600	6 (51 in.)	None.
20	Kingston	18 x 26	122,600	"	None.
21	Baldwin	21 x 30	174,890	8 (56 in.)	Pony.
22	Baldwin	21 x 30	174,890	"	Pony.
23	Baldwin	21 x 30	174,890	"	Pony.
24	Baldwin	26 x 30 / 15½ x 30	179,370	"	Compound.
25	Brooks	20 x 26	161,000	"	4 wheel
26	Brooks	20 x 26	161,000	"	4 wheel

List of Equipment.

(Corrected to January 30th, 1904.)

Freight.

Number.	Class.	Capacity.	Builder or former owner.	Date built or purchased.
100	[illegible]	80,000 lbs	Pullman	1900
85	Flat	40,000 lbs	F. M. Hicks, Chicago	1901
1	Flat	40,000 lbs	F. M. Hicks, Chicago	1900
17	Flat	50,000 lbs	South Eastern Line	1899
19	Flat	50,000 lbs	South Eastern Line	1900
219	Flat	30,000 lbs	A. C. Company	1902
11	Box	50,000 lbs	Torbet & Peckham	1900
25	Box	30,000 lbs	A. C. Company	1901
200	Steel Ore	100,000 lbs	Pressed Steel Car Co	1900
25	Gondola	50,000 lbs	A. C. Company	1903
[illegible]	[illegible]ooses	8-wheel	Crossen Car Mfg. Co	1900
[illegible]	[illegible]ooses	4-wheel	A. C. Company	1901
[illegible]	[illegible]	30,000 lbs	A. C. Company	1902

1904 ONTARIO Sessional Papers

PASSENGER.

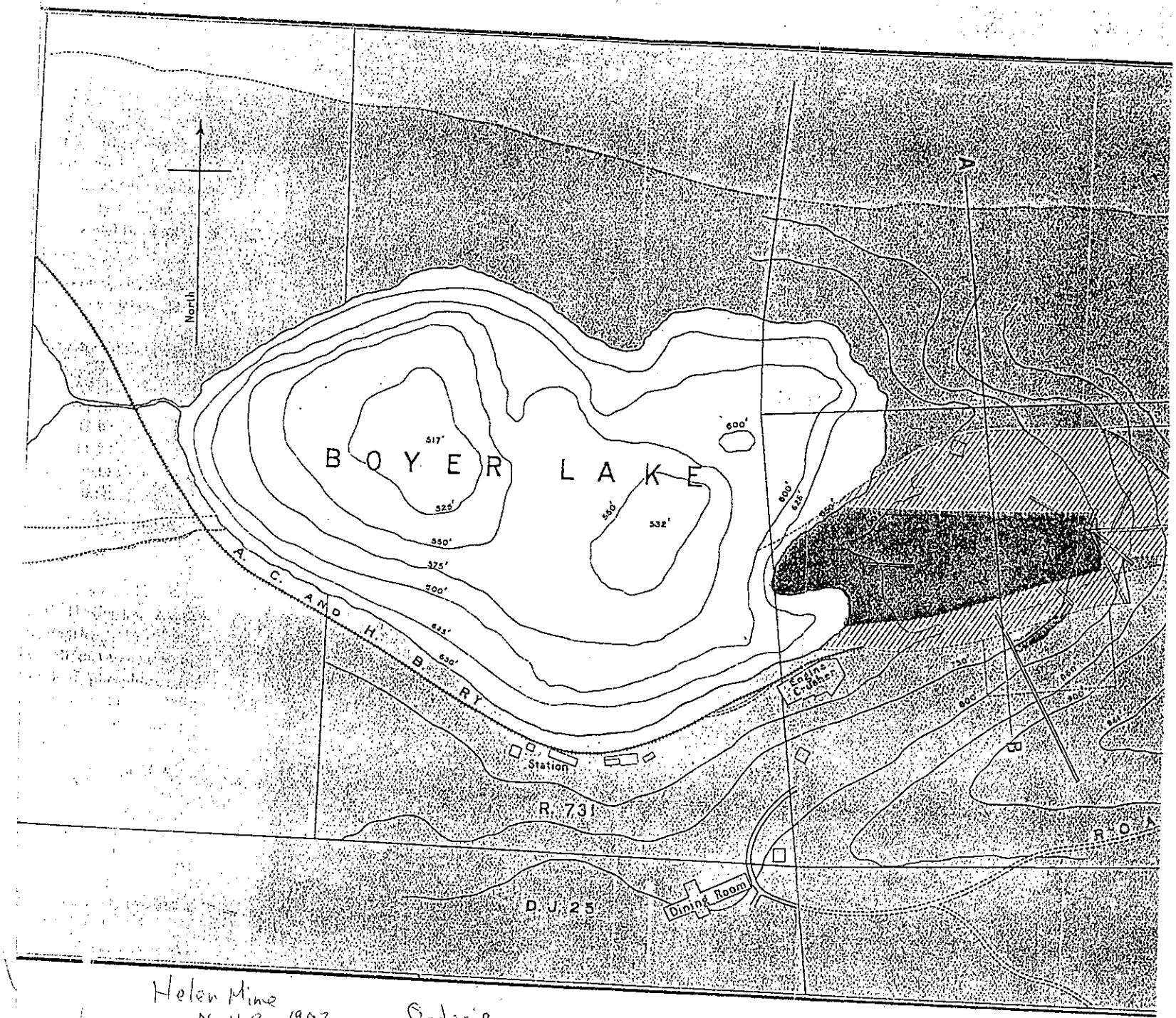
2	Comb. B. & S. C.		Illinois Central	1901
2	Comb. B. & S. C.		Illinois Central	1900
1	First Class		P. W. & B	1881
2	First Class		Pullman	1900
1	First Class		Penn. R. R.	1900
1	First Class		Illinois Central	1900
1	Official		Illinois Central	1901

WORK.

14	Boarding		Converted from flats	1900
2	Tool		Converted from flats	1901
2	Snow Plow		A. C. Company	1900
1	Snow Plow		Rhodes, Curry & Co	1899
2	Flangers		A. C. Company	1901
1	Steam Shovel		Bucyrus Company	1901
94	Dumps	4-wheel	Austin Mfg. Co	1901

(Sgd.) T. J. KENNEDY,
General Superintendent.

Sault Ste. Marie, Ont.,
January 30th, 1904.



Helen Mine
AC HB 1902 Ontario Sessional Paper 41 c

The Canadian Engineer

A Weekly Paper for Civil Engineers and Contractors

New Coal Storage Dock at Michipicoten

Algoma Central and Hudson Bay Railway Builds a 550-Ft. Coal Storage Dock Equipped With a 300-Ft. Span Rope Trolley Coal Bridge — Structure Designed to Unload, Stock, Reclaim, and Load Out Bituminous Coal at the Rate of 500 Tons Per Hour

By A. McD. WILSON

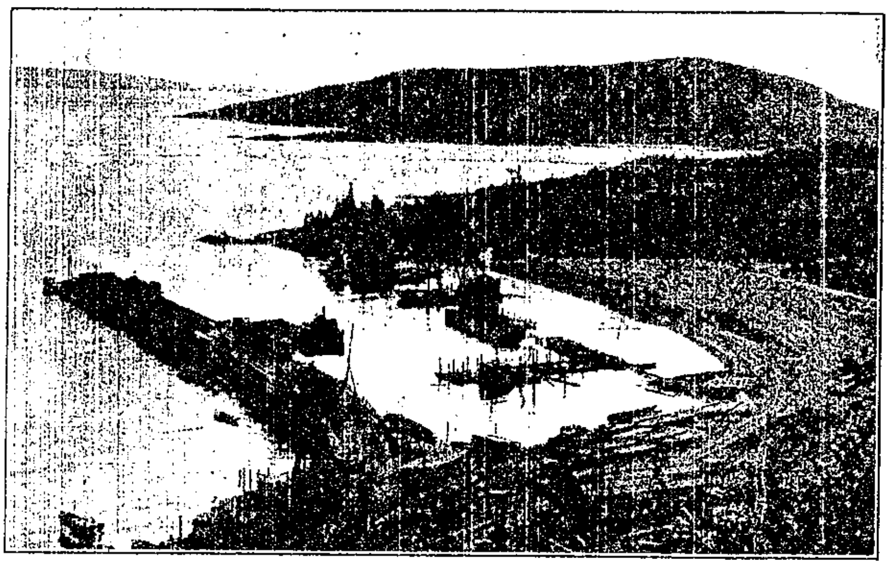
Assistant Engineer, Algoma Central and Hudson Bay Railway Co., Sault Ste. Marie, Ont.

[illegible]ANSPORTING coal from the mines in the north-[illegible]rn part of the United States into Northern Ontario [illegible] for use by railroads, pulp and paper industries, [illegible] operations, has entailed a costly rail haul of [illegible]ty, especially in that particular section made up [illegible] of Algoma, Cochrane and parts of Sudbury [illegible] Bay. To provide a cheaper delivery of coal, [illegible] Central Railway has utilized Michipicoten Har-[illegible] which is [illegible] on the [illegible] at the [illegible] corner [illegible] Superior. [illegible] for [illegible] coal, [illegible] cheaper [illegible] transportation [illegible] limit of its [illegible]

[illegible] is [illegible] very [illegible] the [illegible] coal [illegible] storage [illegible] com-[illegible] to [illegible] which [illegible] loading [illegible] in the old Helen Mine and later in other [illegible] ore dock was demolished as a new unit will [illegible] the ore shipping is resumed.

[illegible] was commenced immediately after the [illegible] spring of 1920 on approximately the same [illegible] ore dock. The tracks to serve the new coal [illegible] necessarily on the lower level so a new grade [illegible] a point on the old commercial dock track [illegible] new dock site. The grade used was 2.5 per [illegible] very excessive, but an improvement on the [illegible] The coal storage area covers the greater part [illegible] the western side of the harbor and was made by [illegible] gravel from a cut in the company's right-of-[illegible] miles distant where a high bank in a gravel [illegible] digging for a railway Bucyrus shovel.

[illegible] a day, each composed of ten Hart-Otis con-[illegible] cars, was the maximum haul and each train was handled in sections of five cars at the dock due to the excessive grade and the difficulty of operating the cable from Lidgerwood to the plow on the curved dump track. The Lidgerwood car and side plow which was always left on a spare car were attached to the first five cars, the cable stretched, and the train very quickly unloaded; the operation being repeated for the remaining five cars. Each car held approximately 30 cu. yd., so that the maximum day's fill amounted to about 1,500 cu. yd. and a period of 32 days was required to bring in the 45,000 cu. yd. necessary.



GENERAL VIEW SHOWING FILLING OPERATIONS

Cribs ready to be sunk on line of dock front

The gravel was a good type and was easily sidespread with a Jordan spreader. This fill on the rear parts averaged about 6 ft. in depth but attained a much greater depth as the neighborhood of the old ore dock was reached. This dock had been dismantled and the line of the front of the new dock cut across the old one, making it necessary to fill in a triangular area of the old dredged channel, which had an average depth of 22 ft. During this period the cribs for the front of the dock were being built and put in place. These cribs were 100 ft. by 26 ft. on the northern end and 100 ft. by 24 ft. on the southern end of the dock. This variation was due to the softer nature of the bottom at the northern end. The material composing the bottom of the harbor was generally a hard blue clay. The crib bottoms were framed on land and skidded into the water when about 6 ft. height was attained. Jacks were set behind the structure and if necessary lines were stretched from one of the dredges or to a tug, to start the structure down the greased skids.

A narrow channel was dredged and levelled to grade at elevation 575 ft. for the base of these cribs and a wide strip was dredged back of the cribs for the whole length to the same depth as the ultimate slip grade which was elevation 580.

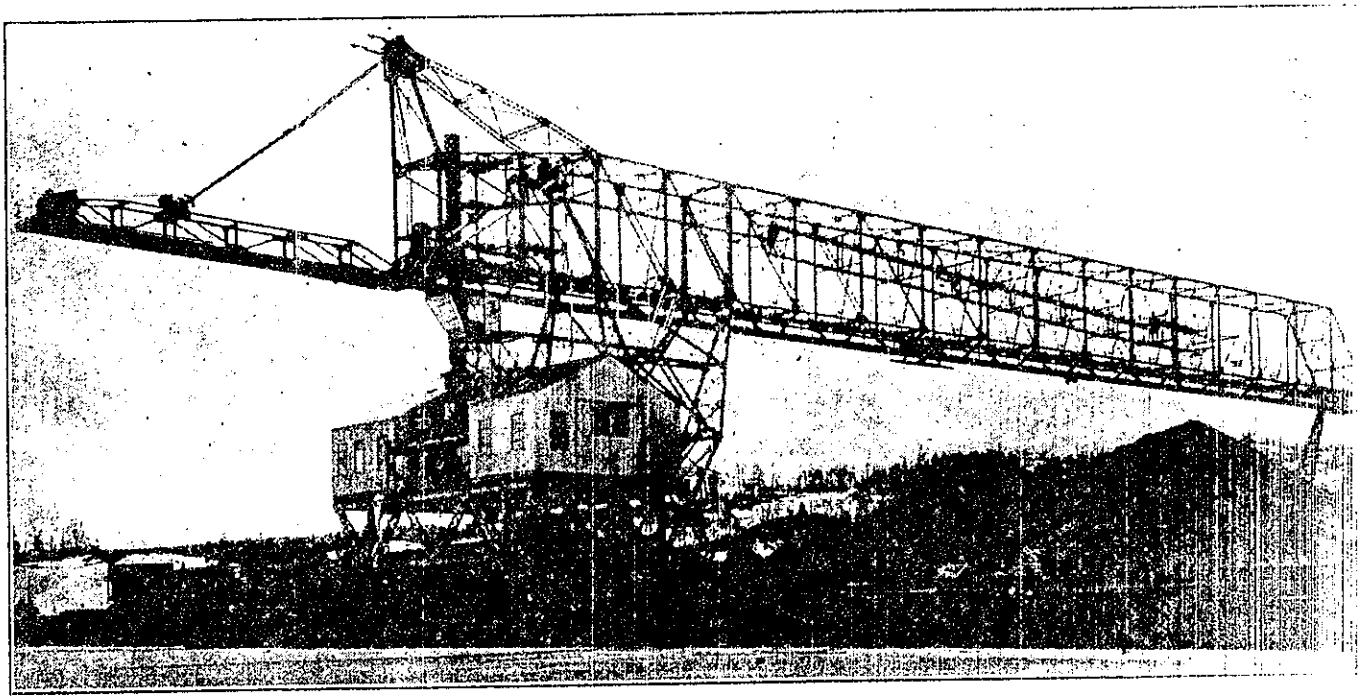
When a crib was built to its full height the front face was carefully lined by instrument and a derrick scow placed

k on temporary decks on the crib until it had settled evenly its proper position, when the pockets were filled with iron . This iron ore was obtained from a waste dump of proximately 22,000 cu. yd. at the old Helen Mine at Wawa. steam shovel was placed in the pile and the ore was brought wn by train and dumped in the water over the edge of the rvel fill which was stopped with the top of the fill approx-

this way due to its own stability would strengthen the of the cribs.

The dock top was built in continuous line along the of the cribs and tracks laid on the raised iron ore fill the dock face.

The runways of the coal bridge were laid on work built for the coal bridge. The falsework

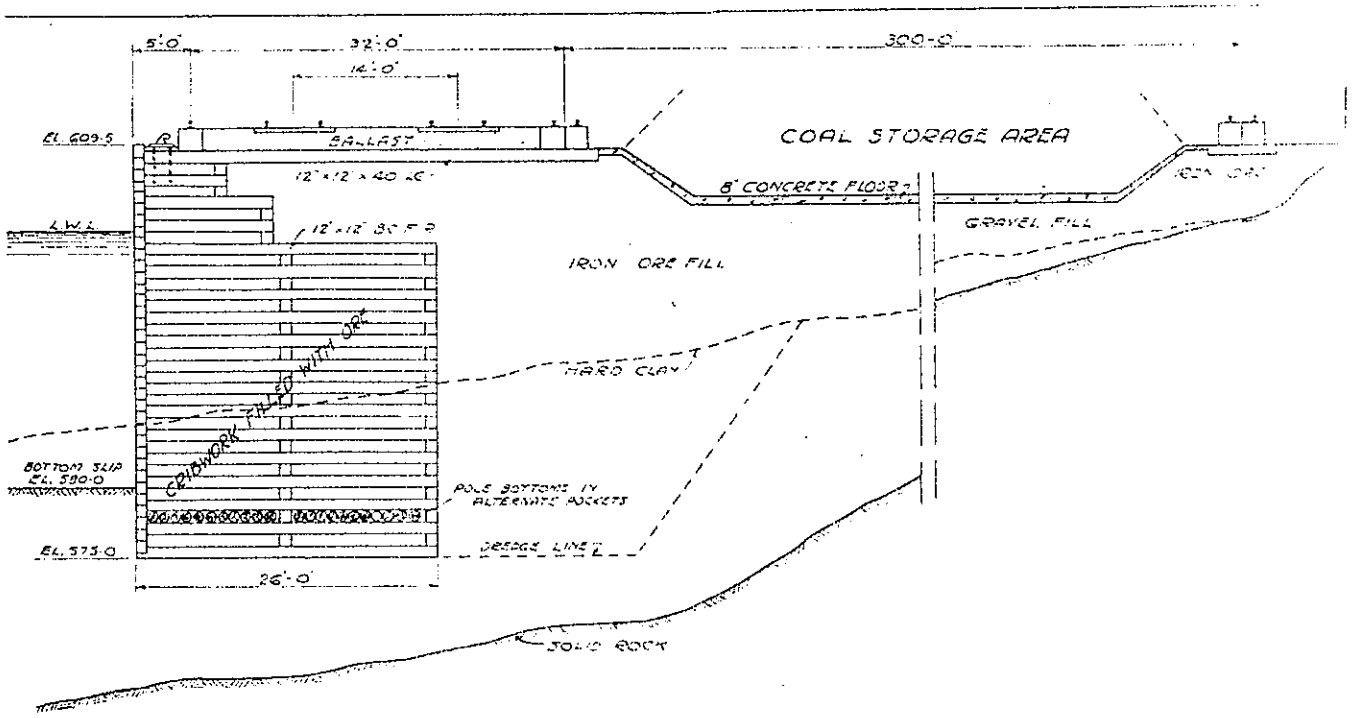


Coal Bridge at Michipicoten Completed

ately 75 ft. behind the face of the dock. A derrick scow rking in behind the cribs, picked up the iron ore which e dumped in the water and filled all the pockets to water rel. Each crib holds approximately 2,000 cu. yd.

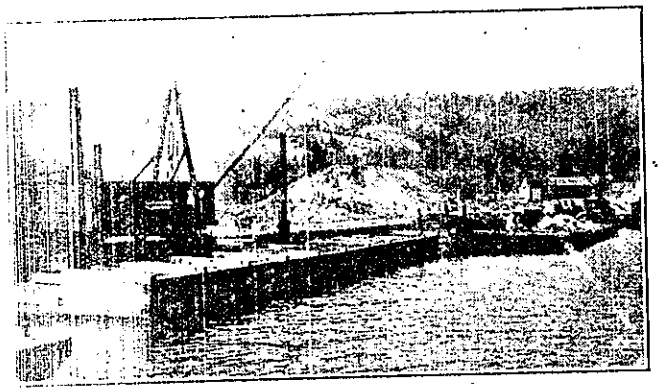
When all pockets were filled, the gap between the storage ea fill and the cribs was filled in solid with iron ore. This terial, from its nature, was not so apt to transmit the essure thrust from the coal pile on the storage area and in

300-ft. clear span to the shear leg being of 10 x and built of a series of towers at 20-ft. centres. motive crane, working on a track built parallel to the required a 110-ft. boom to lift the top chord of the into place and parts of the portal structure. The pile the apron members required special arrangement ing engine was set upon the dock front and hoisted bers into place by means of a cable through a



cantilever section of the bridge projection on the water ... the portal structure.

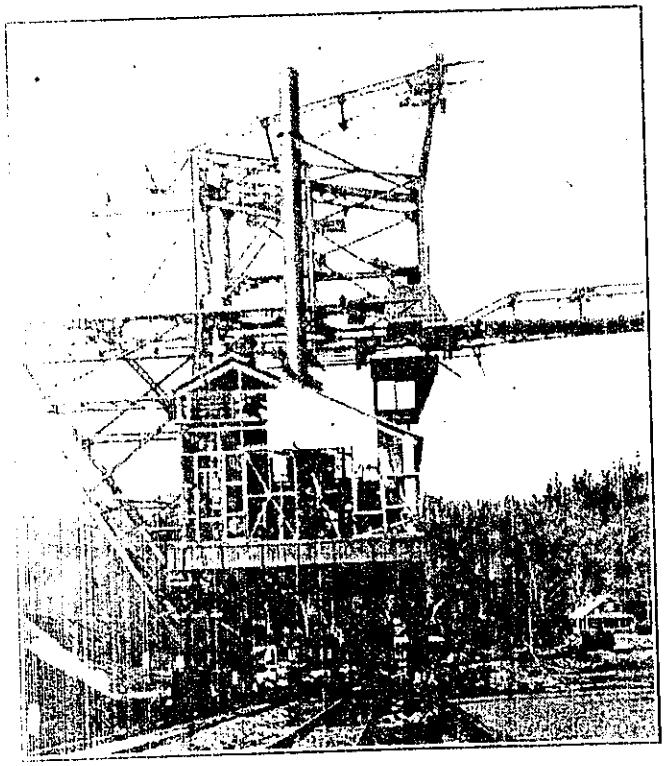
... coal bridge is a rope trolley steam-operated type ... ton coal digging grab and a 3-ton clean-up bucket ... a 24-ft. spread. Automatic self-tightening, steam ... coal clamps to provide breaking for movements of the ... a generator set in the engine room for lighting



A Crib Ready to be Sunk in Place

... operation and an 82-in. by 15-ft. vertical boiler ... heater were features of the machinery installation. ... of the bridge is of rugged steel construction, ... and A-frame bracing the truss on the portal side. ... A-shaped and pin connected to the trucks, which ... with equalizer bars to take up any irregularities ... rails of the bridge runways.

... are three engines in the engine room, which is ... from the boiler room by a 50-ton loading hopper.



... Structure also Showing Coal-Loading Tracks and Bridge Runways

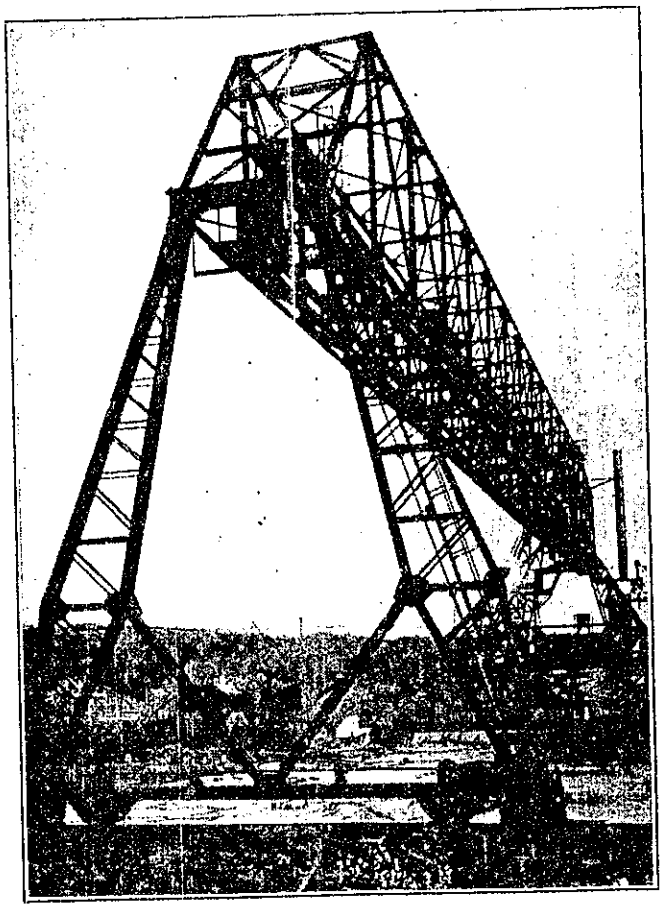
... hoisting engine is a 10-in. by 12-in. reversing type, ... hoisting engine a 16-in. by 24-in. direct-acting, while ... traversing engine is 12-in. by 15-in. single-drum, ... and reversing. The apron hoist is a 10-in. by ... reversing engine.

The operator's cab is high up in the structure and from ... point the hatches of a boat, the full reach of the truss ... coal pile are visible.

The structure is designed to unload, stock, reclaim and load out bituminous coal at the rate of 500 net tons per hour.

The relative cost of operating the bridge with electrical power and steam power was investigated and steam power was found to be the most economical under existing conditions.

When tracks were laid through the portal structure and the steel work was well advanced, a concrete plant was set up on the portal leg runways and the whole storage area was paved with an 8-in. slab of concrete after intense rolling and dragging to level and consolidate the storage area. The slab was laid to prevent the bucket picking up foreign matter with the coal. The slabs were poured in 50-ft. squares and the slopes from the storage area floor (which is 6 ft. lower than runways) to the runways on both the shear leg and



View Showing the 300-ft. Span on Coal Bridge

portal leg were laid in oblong strips 50 ft. long. The concrete was cured by continual wetting from a gravity supply.

The harbor entrance and slip grade was dredged to a depth of 22 ft. below the regulated low level of Lake Superior and a small quantity of rock in the harbor bottom and also in the foundation of one of the cribs was excavated. This was done by drilling from a drill scow after an orange-peel dredge had cleaned the rock and a diver had jetted the whole surface clean. Sixty per cent. "Northern" gelatin was used and when broken up this was cleared by the orange peel bucket.

The accompanying pictures and sketch show the details of the layout.

Three contracts were let to execute the work. R. Lang & Son, of Sault Ste. Marie, Ont., graded the approach track and excavated a small quantity of rock on the line of the shear leg. A. B. McLean & Son, of Sault Ste. Marie, Ont., had the contract for the building of the timber work and all the dredging, also the pulling of the piles in the old ore dock. This work was done under the direction of R. McLean. The Canadian Mead-Morrison Co. Ltd., Montreal, had the contract for the supplying of the coal-handling facilities, and with

ALGOMA CENTRAL & HUDSON BAY RY. CO.

GENERAL OFFICES, SAULT STE. MARIE, ONTARIO.

Algoma Central Ry. Express Dept. operates over this line. No sleeping cars operate over this line. Limit of load above marked capacity—Algoma Central cars stencilled with "Total Weight" must not be loaded in excess of the figure shown. Cars not so stencilled may be loaded in accordance with Notes A and B. Maximum gross weight of car and lading permitted to pass over this line, 110,000 pounds.

FREIGHT EQUIPMENT — Reporting Marks "A C"

The freight cars of this Company are marked "Algoma Central"—"A. C." and "Algoma Central and Hudson Bay" and are numbered and classified as follows:

Item Number	A.A.R. Mech. Designation	Markings and Kind of Cars	Numbers	Dimensions: Inside: Length	Inside: Width	Inside: Height	Outside: Length	Outside: Width: At Eaves or Top of Sides or Platform	Outside: Width: Extreme Width	Outside: Height from Rail: To Extreme Width	Outside: Height from Rail: To Eaves or Top of Sides or Platform	Outside: Height from Rail: To Top of Running Board	Outside: Height from Rail: To Extreme Height	Doors: Side: Width of Open'g	Doors: Side: Height of Open'g	Doors: End: Width of Open'g	Doors: End: Height of Open'g	Capacity: Cubic Feet Level Full	Capacity: Pounds or Gallons	Number of Cars
				ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.			
1	GS	Gondola, Steel, Fixed Sides, Drop Ends, Wood Floor. Note A	601 to 800	52 4	9 6	4	55	10 6	10 5	7 9	7 9	.....	7 9					1000	150000 lb	200
2	FM	Flat, Wood. Notes A, C	1501 to 1567	37 4	9 9	5 4	41	10 2	.....	4 2	.....	.....	12 0					.....	80000 lb	67
3	FM	" Stl. Underframe. Notes A, C	1701 to 1869	38 10	9 9	5 4	41 8	9 10	.....	4 2	.....	.....	12 6					.....	80000 lb	169
4	FM	" Stl. Underframe. Notes A, B	2201 to 2250	41	9 9	.....	43 9	9 8	10 9	10 9	8 8	.....	6 8					.....	100000 lb	47
5	XM	Box, Stl. Frame. Note A	3101 to 3300	40 6	8 8	9	43 6	9 8	10 9	.....	.....	.....	.....	6	8 7	.....	.....	3008	100000 lb	87
6	GS	Gondola, Steel, Fixed Sides, Drop Ends, Wood Floor. Note A	3501 to 3850	48 5	9 6	14	51	10 3	10 3	.....	.....	.....	7 9					1843	140000 lb	349
7	GS	Gondola, Steel Frame, Side Dump, Wood Floor. Note A	4201 to 4299	30 1	9 8	4 2	40	.....	10 6	.....	.....	.....	9					1564	100000 lb	99
11	GS	Gondola, Steel Frame, Side Dump, Wood Floor. Note A	4501 to 4550	36 6	9 8	3	40	.....	10 6	.....	.....	.....	9					905	100000 lb	50
12	GS	Gondola, All Steel, Fixed Ends, Wood Floor. Note A	4601 to 4802	39 5	8 11	4	40	.....	9 9	.....	.....	.....	8 8					1430	80000 lb	160
13	GS	Gondola, All Steel, Fixed Ends, Wood Floor. Note A	4804 to 4850	40 10	9	4	41 8	.....	9 10	.....	.....	.....	8 6					1470	80000 lb	93
14	GB	Gondola, Steel Underframe, Fixed Ends, Flat Bottom, Wood Floor. Note A	5101 to 5126	38 8	9 6	4 6	40 6	.....	9 8	.....	.....	.....	8 8					1400	80000 lb	26
16	GD	Gondola, Steel Underframe, Side Doors, Drop Ends, Wood Floor. Note A	5501 to 5550	40	8 9	3 6	42 8	.....	10	.....	.....	.....	7 10					1225	100000 lb	49
16	GB	Gondola, Steel Underframe, Fixed Ends, Flat Bottom, Wood Floor. Note A	5601 to 5634	42 8	9 4	4 1	44 4	9 4	10 2	.....	7 11	.....	7 11					1597	100000 lb	34
17	HM	Hopper, All Steel. Note A	6001 to 6192	30 5	9 6	7 5	32 8	10 2	.....	.....	10 2	.....	10 5					1580	100000 lb	150
21	HM	" Note A	6300 to 6449	33 10	9 5	7 5	34 3	10 2	10 4	.....	10	.....	10 6					1504	100000 lb	147
22	HM	" Note A	6601 to 6780	30 8	9 5	7 5	31 11	10 1	.....	.....	10 3	.....	10 8					1725	140000 lb	179
23	HM	" Note A	6801 to 6875	30 6	9 5	7 5	31 11	10 1	10 4	.....	10 3	.....	10 8					1725	140000 lb	75
		Total																		1320

Note A—The cars in this series may be loaded to axle carrying capacity in accordance with A. A. R. Rule 86.

Note B—Cars numbered 2231 to 2250 inclusive are equipped with permanent end racks suitable for the handling of wood in four foot lengths.

Note C—The cars in this series are all equipped with permanent end racks suitable for the handling of wood in four foot lengths, ties, etc.

For balances remit to W. H. Evans, Treasurer, Sault Ste. Marie, Ont., draw on Comptroller, A. C. & H. Bay Ry. Co., through the Bank of Montreal, Sault Ste. Marie, Ont.

FREIGHT CONNECTIONS AND JUNCTION POINTS

Canadian National—
Hearst, Ont.
Oba, Ont.

Canadian Pacific—
Franz, Ont.
Sault Ste. Marie, Ont.

Duluth, South Shore & Atlantic—
Sault Ste. Marie, Ont. (via Can. Pac. Ry., Sault Ste. Marie, Ont.).

Minn., St. Paul & Sault Ste. Marie—
Sault Ste. Marie, Ont. (via Can. Pac. Ry., Sault Ste. Marie, Ont.).

June, 1960

THE ALMA & JONQUIERES RAILWAY COMPANY.

GENERAL OFFICERS.

B. A. Walker, Vice-President & Manager.....Isle Maligne, Lake St. John, P. Q., Canada.

Miles of road operated, 11.4. Gauge, 4 ft. 8½ in. Locomotives (diesel-electric), 2.

FREIGHT EQUIPMENT—Reporting Marks, "A. J."

The freight cars of this Company are marked "Alma & Jonquieres Ry." and "A. J." and are numbered and classified as follows:

Item Number	A.A.R. Mech. Designation	Markings and Kind of Cars	Numbers	Dimensions: Inside: Length	Inside: Width	Inside: Height	Outside: Length	Outside: Width: At Eaves or Top of Sides or Platform	Outside: Width: Extreme Width	Outside: Height from Rail: To Extreme Width	Outside: Height from Rail: To Eaves or Top of Sides or Platform	Outside: Height from Rail: To Top of Running Board	Outside: Height from Rail: To Extreme Height	Doors: Side: Width of Open'g	Doors: Side: Height of Open'g	Doors: End: Width of Open'g	Doors: End: Height of Open'g	Capacity: Cubic Feet Level Full	Capacity: Pounds or Gallons	Number of Cars
				ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.			
31	LO	Covered Hopper, Steel, Self-Clearing	3003 to 3006	36	10 6	1	42 6	10 1	10 7	12 3	12 10	13 6	15 7					2700	150000 lb	4

ment owned consisting of 3 flat cars not used in commercial

FREIGHT CONNECTIONS AND JUNCTION POINTS

Canadian National—
Saguenay Power Junction, Que.

...raw on or remit to B. A. Walker, Manager, Isle Maligne, ... Canada.

July, 1959

THE ALGOMA CENTRAL AND HUDSON BAY RAILWAY.

GENERAL OFFICERS.

C. D. WARREN, President.....Sault Ste. Marie, Ont.
J. T. TERRY, Secretary.....100 B'way, New York, N. Y.
A. H. CHITTY, Asst. Secretary & Asst. Treasurer.....Sault Ste. Marie, Ont.
W. N. SAWYER, Gen. Manager.....

T. J. KENNEDY, Gen. Supt. & Traf. Mgr.....Sault Ste. Marie, Ont.
G. A. MONTGOMERY, Superintendent (M. & N. S. Ry.).....Sudbury, Ont.
J. S. WYNN, Gen. Auditor.....Sault Ste. Marie, Ont.

JAS. BOURKE, Auditor Freight & Passenger Receipts.....Sault Ste. Marie, Ont.
W. H. COWELL, Purchasing Agt... " "
C. L. VAUGHN, Car Accountant & Train Master..... " "

GENERAL OFFICES, SAULT STE. MARIE, ONTARIO.

Miles of road operated, 116. Under construction, 229. Gauge, 4 ft. 8½ in. Locomotives, 20.
Limit of load allowed to pass over this line in excess of marked capacity: In cars 40000 lb. capacity and over, 10 per cent.

FREIGHT EQUIPMENT.

The freight cars of this Company are marked "Algoma Central" and "Algoma Central and Hudson Bay" and numbered and classified as follows:

KIND OF CARS.	NUMBERS.	DIMENSIONS. Inside. Length	Inside. Width	Inside. Height	Outside. Length	Outside. Width at Eaves or Platform.	Outside. Height from Rail. To Eaves.	To Top of Platform or Runn'g Board.	To over all	Doors. Side. Width	Side. Height	End. Width	End. Height	Capacity. Cubic Feet.	Capacity. Pounds	No.
		ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.			
Flat, consecutive Nos.	1001 to 1319	.....	.....	.....	40	8 10	.....	.....	.....	.....	.....	.....	.....		80000	319
" wood racks, consec. Nos.	1801 to 1842	40	8 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		80000	42
" " " "	1901 to 1912	34	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		40000	12
" " " "	1951 to 1963	35 8	8 8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		50000	13
" consecutive Nos.	2001 to 2061	.....	.....	.....	34	8 8	.....	.....	.....	.....	.....	.....	.....		40000	61
" "	2101 to 2121	.....	.....	.....	35 8	8 5	.....	.....	.....	.....	.....	.....	.....		50000	21
" chip cars, "	5201 to 5215	40	8 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		80000	15
Box, consecutive Nos.	3401 to 3411	33 4½	8 1½	7 4¾	34 2	8 10	11 3½	11 10	12	.....	.....	.....	.....		50000	11
" "	3001 to 3025	36	8 6	8	36 8	9 1½	.....	.....	.....	.....	.....	.....	.....		80000	23
Ore, Steel, Consecutive Nos.	4001 to 4200	20 6½	.....	.....	22	8 1½	.....	.....	9 6	.....	.....	.....	.....		100000	200
Gondola, "	5001 to 5025	34 7½	8 7	3 3½	36 8	9 5	.....	.....	7 5¼	.....	.....	.....	.....		60000	25
" "	5101	39 4	8 6	4	40 2	.....	.....	.....	.....	.....	.....	.....	.....		80000	1
Charcoal, " ...*†	6001 to 6025	39 4	8 6	8	40 2	9 7	.....	.....	14 1½	6 / 5 6	8 / 4	.....	.....		80000	19
" ...*†	6051 to 6070	38 8	8 8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		50000	17
Dump, "	1 to 94	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		.....	94
Caboose, 8-wheel, "	9500 to 9507	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		.....	8
" 4-wheel, "	9550 to 9553	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		.....	4
Boarding, "	10500 to 10513	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		.....	13
Total																902

MISCELLANEOUS EQUIPMENT.

Tool—10000, 10001	2	Steam Shovel—10100	1
Snow Plow—10100 to 10102	3	Pile Driver—10150	1
Flanger—10150, 10151	2	Lidgerwood Rapid Unloader—10425	1
Total			10

PASSENGER EQUIPMENT.

Passenger	5
Combination	4
Official—"Michipicoten"	1
Total	10

No freight cars fitted with end doors. Total number of freight cars fitted with air brakes, 680. Total number of freight cars fitted with M.C.B. automatic couplers, 792.

Cars of this Company are equipped with couplers as follows: Passenger—M. C. B. Freight—M. C. B.

* The following numbers are blank: Nos. 6001, 6003, 6005, 6015, 6024, 6055, 6064, 6068.

† On charcoal cars, 3 doors on each side; centre door 6 ft. wide, 8 ft. high; other two, 5 ft. 6 in. wide, 4 ft. high.

Report movements and mileage or per diem to C. L. Vaughn, Car Accountant, Sault St. Marie, Ont.

For balances remit to or draw on J. S. Wynn, Gen. Auditor, Sault Ste. Marie, Ont.

Send bills for repairs to cars to J. S. Wynn, Gen. Aud, Sault Ste. Marie, Ont.

FREIGHT CONNECTIONS AND JUNCTION POINTS.

Canadian Pacific—Sault Ste. Marie, Ont.; Sudbury, Ont.
Duluth, South Shore & Atlantic—Sault Ste. Marie, Mich.
Minneapolis, St. Paul & Sault Ste. Marie—Sault Ste. Marie, Mich.

April, 1905.

Quebec & Lake St. John Railway.

GENERAL OFFICERS.

GASPARD LEMOINE, Pres...Quebec, Que.
J. G. Scott, Sec. & Gen. Man. "
ALEX. HARDY, Gen. Frt. & Pass. Agt. "
S. S. OLIVER, Auditor.....Quebec, Que.
J. BAIN, Superintendent..... "
J. CLARK, Master Mech..... "

GENERAL OFFICES, QUEBEC, QUE.

Miles of road operated, 241. Gauge, 4 ft. 8½ in. Locomotives, 22. Canadian Express Co. operates over this line. Q. & L. St. J. sleeping cars operate over this line.

FREIGHT EQUIPMENT.

The freight cars of this Company are numbered and classified as follows:

KIND OF CARS.	NUMBERS.	INSIDE DIMENSIONS. Length	Width	Height	CAPACITY.	No.
Flat	301 to 481	.....	.....	.....	A	183
"	501 to 550	.....	.....	.....	70000	50
"	601 to 669	.....	.....	.....	B	69
Coal	701 to 722	.....	.....	.....	40 & 50000	22
Scock	801 to 843	C	8 2	7	50 & 60000	43
Box	844 to 898	D	.....	.....	40000	55
"	1101 to 1103	34	7 10	6 2	50000	33
"	1201 to 1350	35	8 3	7 6	70000	150
Total						665

A—30000, 40000 and 60000 pounds capacity. B—30000, 40000, 50000 and 60000 pounds capacity. C—Nos. 801 to 823, 31 ft. in length 50000 pounds capacity; Nos. 824 to 843, 35 ft. in length, 60000 pounds capacity. D—33 and 34 ft. in length.

FRANK & GRASSEY MOUNTAIN R. R

O. E. S. WHITESIDE, Manager.....Blairmore, Alberta.

Miles of road operated, 10; gauge, 4 ft. 8½ in. *Equipment*—Locomotives, 2; total, 27 cars. *February, 1906.*

GALT, PRESTON & HESPELER RY.

P. CLEMENS, Superintendent.....Preston, Ont.

Miles of road operated, 20; gauge, 4 ft. 8½ in. *Equipment*—Locomotives, 3, total, 12 cars. *October, 1905.*

ARKANSAS SOUTHEASTERN RY.

A. E. SILVERSTONE, Gen. Manager.....Upland, Ark.

Miles of road operated, 39; gauge, 4 ft. 8½ in. *Equipment*—Locomotives, 4; total, 50 cars. *Februar , 19 6.*

TEXAS & GULF RY.

M. H. LILLIARD, Gen. Superintendent.....Longview, Tex.

Miles of road operated, 60; gauge, 4 ft. 8½ in. *Equipment*—Locomotives, 5; total 24 cars. *April, 1905.*

SYLVANIA CENTRAL RY.

W. M. HOBBY, Superintendent.....Sylvania, Ga.

Miles of road operated, 15; gauge, 4 ft. 9 in. *Equipment*—Locomotives, 2; total, 4

ALGOMA EASTERN RAILWAY

Manitoulin and North Shore Ry. Contract.

The contract for the construction of the section from Crean Hill to Whitefish, about 46 miles, including the loop, tenders for which were recently invited through the Railway and Marine World's advertising columns, has been awarded to the Superior Construction Co., of which T. J. Kennedy, heretofore General Superintendent of the Algoma Central and Hudson Bay Railway is President, and J. D. McArthur, Winnipeg, Vice President. Considerable progress has been made in the preliminary work necessary for the organization under the contract and to get outfits on the ground, and the work will be pushed through as rapidly as possible. The Superior Construction Company has its head office at Sault Ste. Marie, Ont., but the operating head office, at which Mr. Kennedy is located, is at Espanola, Ont., where the M. & N.S.R. connects with the C.P.R.

MARCH 1911

The Main Nickel Range.

The main nickel range of the Sudbury region is incorrectly shown on the geographical map of the region prepared by Dr. Bell and on all later geologically colored maps, which are largely copies of his; since the norite or gabbro associated with the ore bodies is not separated in the coloring from adjoining greenstones and hornblende porphyrites. The most important p[illegible]cal improvement in the map now under preparation by Dr. Barlow will probably be this separation; for it is now very probable that all important ore bodies occur at the edge of the norite, no matter what the adjoining rock may be, granite, quartzite or hornblende porphyrite; or on dike-like extensions of norite into the others. Until Dr. Barlow's map appears the exact location of this boundary will be somewhat uncertain, but the following statement drawn from his work may be of service in the meantime:—

"The most important and famous band of norite, however, is the southern belt, which, starting in more or less isolated patches and areas in the township of Drury, coalesces into one large band in the eastern part of this township. It then extends in unbroken continuity in a northeasterly direction as far as lot 3, concession III, of Garson, a distance of over thirty two miles. The basic or norite portions of this band would average nearly two miles in width throughout its length. In the township of Denison, the basic rocks extend over the greater part of the third, fourth, fifth and sixth concessions. About lot two, the band attains its maximum width of nearly four miles, but a short distance east it is divided up into two belts by the intrusion of a mass of coarse "augen" granitite-gneiss. The northerly, which is the more important of these two belts, has a course of NN.E. through the northeastern part of the township of Denison and the southeastern corner of the township of Fairbank. Thence it extends across the Vermilion river, covering part of the township of Graham and portions of the township of Creighton. From thence it runs across the central part of Snider, through the northwestern corner of McKim and the southeastern part of Blezard and, with the exception of lots 1 and 2, extends continuously across concession III. of Garson. Through Creighton and Graham, this belt is over two miles in width, while near the old Dominion mine it is almost three miles from north to south across the norite. The southern branch of this great belt runs across the Vermilion river, covering parts of Graham, and thence on through Waters past Copper Cliff, where it rejoins the other branch. The lenticular mass of granitite gneiss which divides this southern belt into two portions, thus occupies a strip of country one and a half to two miles wide through Graham and Snider, terminating at or near the Copper Cliff mines. It is newer than the norite, piercing and altering the basic rock."[17]

The account of the main range just quoted must of course be looked on as provisional and subject to revision when Dr. Barlow's final report appears. The portion of the account referring to the division of the range, does not entirely tally with my own observations, as will be s[illegible]ter, the outcrops of gabbro to the south of the main range appearing to be very narrow and scattered, not at all to be compared to the solid band two or three miles wide on the north. It is doubtful also whether the granite between the north and the south parts of the range is all later than the norite, though some of it certainly is.

The best view of the arrangement, so far as my own examination goes, is to suppose that the ore deposits of what Dr. Barlow calls the southern branch of the range are connected with more or less dike-like projections from various points on the northern range. If this is correct we can divide the mines into those situated on the south or southeastern edge of the norite band, such as the Gertrude, Creighton, North Star, Elsie, Murray and Blezard; and those situated on narrow offshoots to the south or southeast, including perhaps the Worthington, the Evans and Copper Cliff, the Frood and Stobie.

It will probably be best to take up in detail a typical mine of each class and refer to the others less fully. As good examples of each the Creighton may be chosen from the main range and the Copper Cliff from the southern off-shoots.

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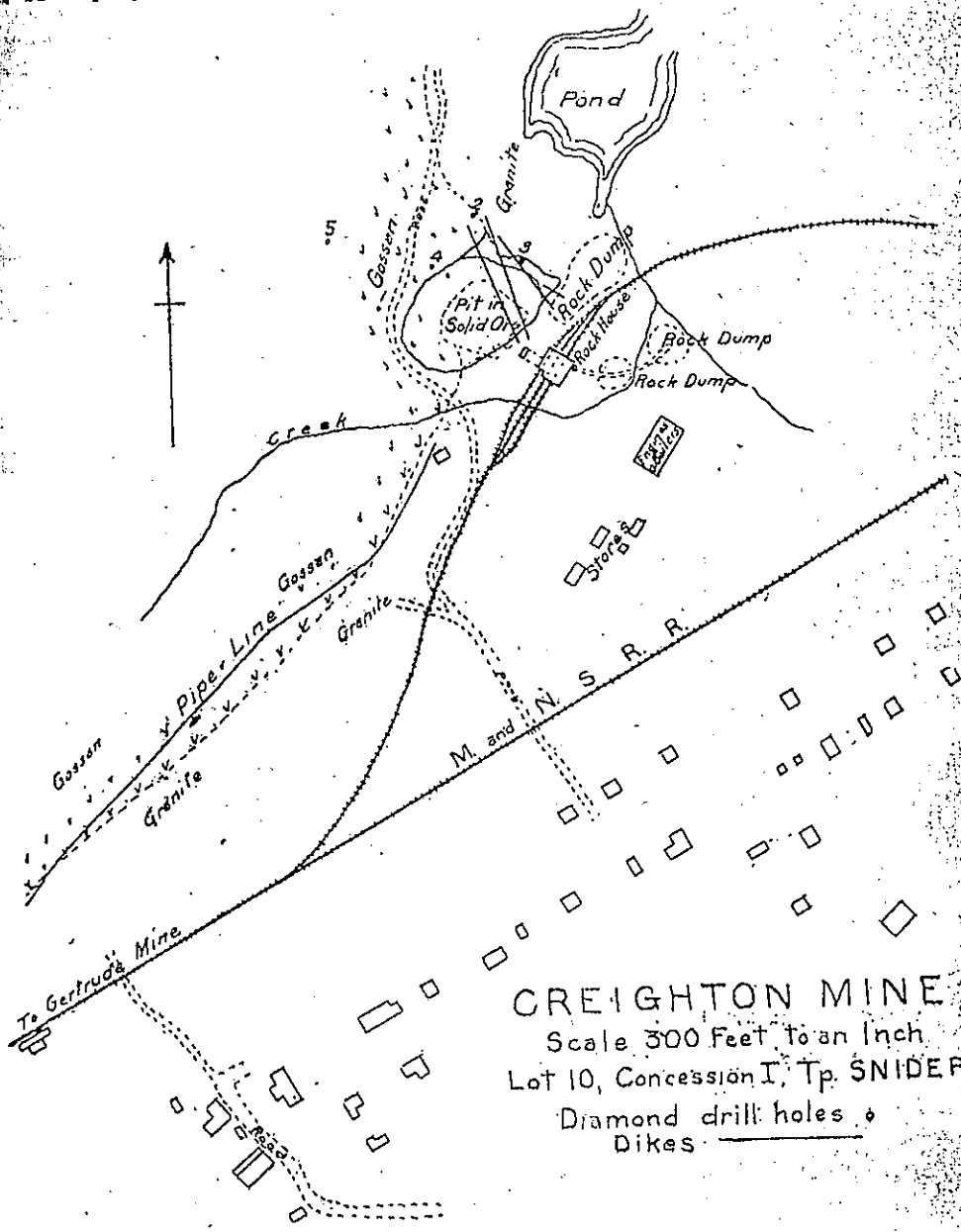
[17] Sum. Rep. Geol. Sur. 1901, pp. 144-5.

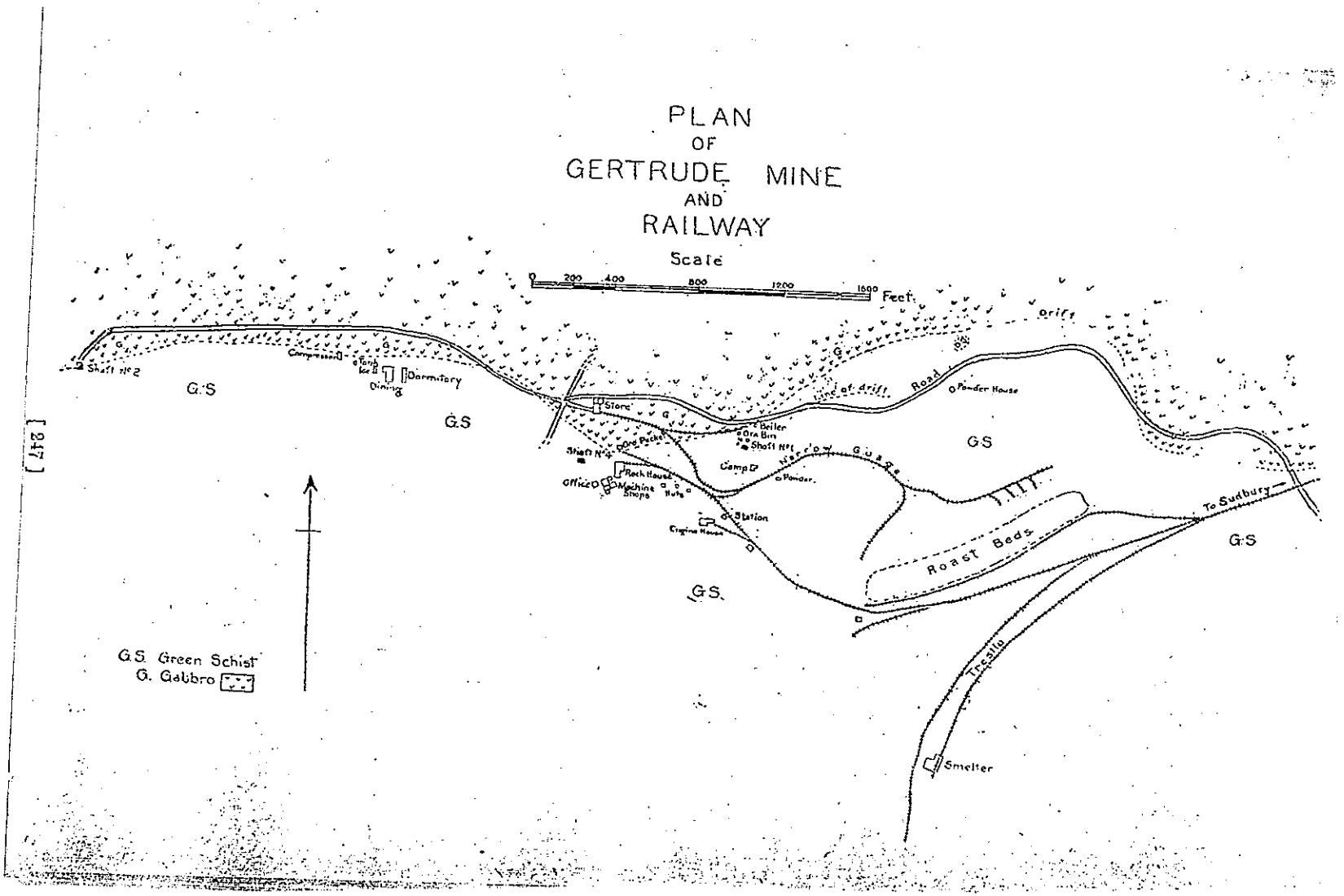
The Creighton Mine.

The Creighton mine is situated at the southern end of the line between Creighton and Snider townships, in lot 10 of the first concession of the latter township, about eleven miles west of Sudbury by the Manitoulin and North Shore railway. One of the Salter's old meridian



lines runs close to it or through it, and the ore body was really discovered by Murray in 1855, forty-five years before it was opened up as a mine.[18] Salter had found great magnetic disturbance at a point on his line about five miles north of Whitefish lake; and Murray examined

[18] Geol. Sur. Can., 1853-56, p. 180. (Prof. Miller has been good enough to call my attention to this reference in Murray's report).


PLAN
OF
GERTRUDE MINE
AND
RAILWAY
Scale
0 200 400 800 1200 1600 Feet
[847]
Shaft No 2
Compressor
Pump
Dining
Dormitory
G.S
Store
Line of drift
Road
Powder House
Boiler
Ore Bin
Shaft No 1
Ore Packer
Shaft No 3
Office
Rock House
Machine Shops
Huts
Camp
Powder
Narrow Gauge
Station
Engine House
Roast Beds
To Sudbury
Trestle
Smelter
G.S Green Schist
G. Gabbro

latter are often somewhat fractured, the fissures being filled with the sulphides. The appearance almost suggests that the fused sulphides had penetrated fissures in the already cold porphyrite; but no doubt the deposition of the pyrrhotite and chalcopyrite was from aqueous solutions after the somewhat rapid cooling and cracking of the surface of the eruptive. There has been a certain amount of faulting since the dikes occupied their places, for they are somewhat broken and slickensided, and fissures opened thus in the ore body must have provided channels in which solutions could circulate. Occasionally thin films of the sulphides lie between the slickensided surfaces. It is likely that the brecciated norite and also granitoid gneiss with sulphides cementing the fragments have been crushed in such earth movements; perhaps, however, at the time the fissures were opened to allow the molten porphyrite to ascend as dikes, and not in later times when the dike rocks themselves were fractured.

The granite sometimes has drusy holes with fairly large feldspar crystals, quartz, fluorite and copper pyrites. The purple fluorite in the pegmatitic streaks of the granite is suggestive of active mineral-forming agents as in ore-bearing veins. How the sulphides became disseminated through the ordinary granitoid gneiss is not clear, unless by replacement of part of the minerals of the granite when the norite with its sulphides came in contact with it. That the gneiss was present in a cold and solid state before the eruption of norite and ore, seems proved by the facts that the norite grows finer-grained against the gneiss, and that in places solid pyrrhotite rests against a clean foot wall of gneiss without evidence of infiltration.

The gneiss forms an irregular cavity or pocket for the ore mass. As the map indicates, there is a sharp bend of about 100° in the boundary of the granite where it meets the ore, and about 100 feet northwest of the angle a projection of gneiss pushes southwest, still further hemming in the sulphides. The contact of the two is not far from vertical in some places, but in others the walls of the pit show a dip of about 45° in the surface of the gneiss, as may be seen on the southwest side.

Drill holes sunk at various points give some additional information regarding the shape of the trough enclosing the ore. Drill hole No. 3 near the northwest side of the stripping shows 40 feet of ore followed by granite; No. 2 shows only 20 feet of mixed ore before granite is reached. No. 4, which is near the edge of the pit just opposite the foot of the inclined shaft, penetrated 177 feet of ore before entering granite. No. 1, which is about 100 feet southwest of No. 4, showed 250 feet of ore; and No. 5, about 160 feet northwest of No. 4, had gone through 15 feet of "capping" and 111 feet into ore at the time of my examination on 8th July.

The drill holes indicate that the floor of gneiss (or granite as reported by the drillers) slopes toward the west at an average rate of about 40°. Further work will of course give much fuller information regarding the shape of the immense ore body and its relations to the adjoining rocks. There is a good probability in favor of the opinion of experienced prospectors that large ore bodies are more likely to occur at sharp angles of the granite or gneiss than elsewhere. It will be shown later that this arrangement occurs at other points.

The ore at the Creighton mine is richer than usual, containing, it is said, from 6 to 10 per cent. of nickel and copper with much more of the former metal than of the latter.

The Gertrude Mine.

About 400 yards west of Creighton station, the gossan hill extending southwest of the mine dips down into a low swampy region and is lost. About 20 paces farther west the contact of the norite or gabbro with the Laurentian crosses the track, having a direction of 60° west of south, as seen on a small exposure of rock rising out of a muskeg. Beyond this, about 120 yards, a low ridge of gabbro is cut by the railway, but the next outcrop of rock, at the pumping station, is not gabbro, and no more is seen until the Gertrude mine is reached a little beyond mile 12 on the line.

PASSENGER AND FREIGHT CRASH ON ALGOMA EASTERN

Two Veterans of the Road Lose Their Lives

The most serious wreck in the history of the Algoma Eastern Railway, which connects Sudbury with Little Current on Georgian Bay, occurred Monday morning last, at 12.30, when No. 1 the regular westbound passenger train met in a headon collision with freight train No. 54, eastbound at mileage 77, two miles west of Birch Island and about eleven miles east of Little Current. The trains were on a curve, travelling at from 20 to 25 miles an hour, which is scheduled running speed at this point, and the engine crews had only a moment's warning—less than a pole length sway—when the crash came. Four of the six who were riding in the cabins of the respective locomotives at the time of the collision escaped their doom by jumping. The two who remained, or hesitated, or were unable to find an opening in time to jump, were killed. These with the list of injured, are

Dead

WILLIAM DOIG, Sudbury, conductor on the passenger.

ARNOLD J. NOBLE, formerly of Sudbury, section foreman at Birch Island.

Injured

JOHN M. WRIGHT, Sudbury, engineer on the passenger, collar bone broken, shoulder dislocated.

NICHOLAS WILLIAMS, Little Current, engineer on the freight, shoulder dislocated.

J. ADAMS, Little Current, fireman on the freight, cut about head, not serious.

LEONARD PAUL, Sudbury, fireman on passenger, shoulder dislocated.

AL. HARRIS, despatcher, Sudbury, shoulder dislocated.

This is the first accident to a train on the Algoma Eastern Railway that has resulted in the death of an employee, or injury to a passenger, in twenty-five years of railroading. The accident is quite most regrettable, was avoidable. The human element failed, in that one of the crews overran their orders, and the forthcoming investigation is expected to disclose. A feature of the wreck is that no passengers were seriously injured, and that the fatalities and injured are confined to company employees.

The engines were manned by senior men of long experience. Engineer Wright has been at the throttle for twelve years and Engineer Williams for twenty-four years.

The loss to rolling stock is expected to reach $100,000. This loss is confined solely to the engines, tenders, baggage car and freight equipment. The day

(Continued on Page 3)

THE ALGOMA EASTERN RAILWAY.

REPORTING MARKS—"A E R"

GENERAL OFFICERS.

G. A. MONTGOMERY, President.. } Sault Ste Marie,
W. C. FRANE, Vice-President.... } Ont.
E. B. BARBER, Comptroller..... "
R. E. KING, Assistant Comptroller. "
ALEX TAYLOR, Secretary.....Toronto, Ont.

J. M. ALTON, Treasurer..... { Sault Ste. Marie,
H. HOODLESS, Auditor Traffic } Ont.
Accounts..... "
H. P. McKEOWN, Purchasing Agent..Sudbury, Ont.

J. P. MADER, Gen. Freight & Passenger Agent.....Sudbury, Ont.
F. M. DONEGAN, Superintendent.... "
W. M. HUGILL, Superintendent Car Service.....Sault Ste. Marie, Ont.

GENERAL OFFICES, SUDBURY, ONT.

Miles of road operated, 87. Gauge, 4 ft. 8½ in. Locomotives (coal burning), 8. No sleeping cars operate over this line. British America Express Company operates over this line. Limit of load and marked capacity—Algoma Eastern cars stencilled with "Total Weight," must not be loaded in excess of the figure shown. Cars not so stencilled may be loaded in accordance with notes "A" and "B." Maximum gross weight of car and lading permitted to pass over this line, 200,000 pounds.

FREIGHT EQUIPMENT.

Reporting Marks—"A E R"

The freight cars of this Company are marked "Algoma Eastern," and numbered and classified as follows:

M. C. B. Designation.	Markings and Kind of Cars.	Numbers.	Dimensions. Inside. Length	Inside. Width	Inside. Height	Outside. Length	Outside. Width. At Eaves or Top of Sides or Platform	Outside. Width. Extreme Width.	Outside. Height from Rail. To Extreme Width.	Outside. Height from Rail. To Eaves or Top of Sides or Platform	Outside. Height from Rail. To Top of Running Board.	Outside. Height from Rail. To Extreme Height.	Doors. Side. Width of Open'g	Doors. Side. Height of Open'g	Doors. End. Width of Open'g	Doors. End. Height of Open'g	Capacity. Cubic Feet Level Full.	Capacity. Pounds or Gallons.	Number of Cars.
			ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.			
XM	Box, Steel Frame, Note A	351 to 375	36	8 6	8	36 8	9 7¾	.....	.....	12 7½	13 4¾	14	6	7 6	1 11	8	2448	80000 lb.	18
XM	Flat, Wooden, Note B	601 to 648	40	9	.....	40	10	.....	.....	4 0¾	.....	.....	.....	.....	.....	.....	.....	80000 lb.	40
XM	" Wooden, Note B	728	40	9	.....	40	10	.....	.....	4 1¾	.....	.....	.....	.....	.....	.....	.....	80000 lb.	1
XM	" Steel Underframe, Note A	901 to 924	40	8 11	.....	40	8 11	.....	.....	4 2¾	.....	.....	.....	.....	.....	.....	.....	80000 lb.	22
XM	Ore, Steel, Note A	2201 to 2214	20 6½	7 5	7 6	22 6	8	.....	.....	9 9	.....	9 9	.....	.....	.....	.....	618	100000 lb.	14
GA	Gondola, Steel Frame.. Note A	2301 to 2370	36 5	9 7	4 6	38 9	9 6	.....	.....	.....	.....	8 11	.....	.....	.....	.....	1584	100000 lb.	44
...	Gond.. Steel Frame, Permanent Coke Racks, Notes A, C	" "	"	"	.....	"	"	.....	.....	.....	.....	"	.....	.....	.....	.....	.....	"	25
GA	Gondola, Steel, Note A	2801 to 2925	22 5	9 6	5	24 4½	9 11	.....	.....	.....	.....	9 5	.....	.....	.....	.....	1020	100000 lb.	125
GD	" Wood, Note B	5103, 5104	38 10	8 8	4	40	10 1	.....	.....	.....	.....	8 10	.....	.....	.....	.....	1334	80000 lb.	2
HM	Ore, Wood..Note B	1603 to 1607	19 ...	7 11	7	21 4	9	.....	.....	9	.....	9	.....	.....	.....	.....	587	100000 lb.	2
	Total.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	293

RECAPITULATION OF CAR EQUIPMENT.

FREIGHT.

Plain Box (XM)— Cars of 80,000 lbs. capacity..	18	Total Open Top Cars (Includes all Class G and H Cars)— Cars of 80,000 lbs. capacity..	2
Total Box (All Class X and Class V cars, except XT)— Cars of 80,000 lbs. capacity..	18	Cars of 100,000 lbs. " ..	210
Gondola, Flat Bottom (GB, GK, GM, GT)— Cars of 80,000 lbs. capacity..	2	Flat (All Class F cars)— Cars of 80,000 lbs. capacity..	63
Gondola, Side Dump (GD, GS— Cars of 100,000 lbs. capacity..	194	Total Revenue Freight Equipment— Cars of 80,000 lbs. capacity..	83
Hopper (HD, HM, HT)— Cars of 100,000 lbs. capacity..	16	Cars of 100,000 lbs. " ..	210
		Non-Revenue Freight Equipment— Caboose.....	8
		Miscellaneous Maint. of Way	10
Total Freight Equipment Cars.....	311		

PASSENGER.

Coaches.....	3	Baggage.....	1
Comb. Passenger & Baggage....	1		
Total Passenger Equipment Cars.....	5		

GRAND TOTAL Freight and Passenger Equipment Cars 316

POUNDS CAPACITY OF FREIGHT CARS—AGGREGATE AND AVERAGE.

Box Cars.

	No. of Cars.	Aggregate Capacity.
80,000 lb.	18	1,440,000 lb.
Total.....	18	1,440,000 lb.

Average Capacity per Box Car..... 80,000 lb.

Open Top Cars.

	No. of Cars.	Aggregate Capacity.
80,000 lb.	2	160,000 lb.
100,000 lb.	210	21,000,000 lb.
Total.....	212	21,160,000 lb.

Average Capacity per Car..... 99,811 lb.

Other Cars.

	No. of Cars.	Aggregate Capacity.
80,000 lb.	63	5,040,000 lb.
Total.....	63	5,040,000 lb.

Average Capacity per Car..... 80,000 lb.

Total Revenue Freight Cars

	No. of Cars.	Aggregate Capacity.
80,000 lb.	83	6,640,000 lb.
100,000 lb.	210	21,000,000 lb.
Total.....	293	27,640,000 lb.

Average Capacity per Car..... 94,335 lb.

FREIGHT CONNECTIONS AND JUNCTION POINTS.

Canadian National— Sudbury Junction, Ont.

Canadian Pacific— Espanola, Ont. Sudbury, Ont.

PASSENGER EQUIPMENT.

M. C. B. Designation.	Kind	Series of Numbers.	Seating Capacity	Length of Car.	No.
PA	Passenger.....	71, 72	Under 70	60 ft. & under 70 ft.	2
PB	" 2d-Class	81	70 to 86	.....	1
CA	Combination.....	52	Under 70	60 ft. & under 70 ft.	1
.....	Baggage.....	151	.....	60 ft. & under 70 ft.	1
	Total.....				5

Note A—The cars in this series may be loaded to axle carrying capacity in accordance with A. R. A. Rule 86.

Note B—The cars in this series must not be loaded in excess of 10 per cent above the marked nominal capacity.

Note C—Individual numbers of cars in series 2301 to 2370 equipped with permanent coke racks:

2303 2313 2317 2332 2337 2341 2345 2352 2357 2362 2366 2370
2305 2316 2321 2336 2339 2342 2347 2353 to 2360 2363 2367

Do not confuse cars of this Company with those of the Arizona Eastern R. R. Co.

DETAILED INSTRUCTIONS FOR RENDERING REPORTS AND FOR SETTLING MILEAGE OR PER DIEM AND REPAIR ACCOUNTS.

REPORTS OF MOVEMENTS.

Report movements to W. M. Hugill, Superintendent Car Service, Sault Ste Marie, Ont.

MILEAGE OR PER DIEM REPORTS.

Send mileage or per diem reports to W. M. Hugill, Supt. Car Service, Sault Ste Marie, Ont.

BALANCES.

For balances remit to J. M. Alton, Treasurer, Sault Ste. Marie, Ont.
Draw on E. B. Barber Comptroller, through Bank of Montreal, Sault Ste Marie, Ont.

REPAIR BILLS.

Send bills for repairs to cars to W. M. Hugill, Supt. Car Service, Sault Ste Marie, Ont.

REQUISITIONS FOR MATERIAL TO REPAIR.

Send requisitions for material to repair to F. M. Donegan, Superintendent, Sudbury, Ont.

CARS RE-WEIGHED ON FOREIGN ROADS.

All reports of cars re-weighed and stencilled on foreign roads should be sent to W. M. Hugill, Supt. Car Service, Sault Ste Marie, Ont.

EMBARGOES.

For application of embargoes under Per Diem Rule 16 see Embargo Regulations and instructions issued by American Railway Association.
Address embargo notices, embargo reclaims and notices of cars held under Per Diem Rules to J. P. Mader, Gen. Freight and Passenger Agent, Sudbury, Ont.

Ontario Sessional Papers

cent. This is partly due to the fact that the ores of Mond Nickel Company are lower in sulphur, and partly to the fact that this company carries out a modified pyritic smelting.

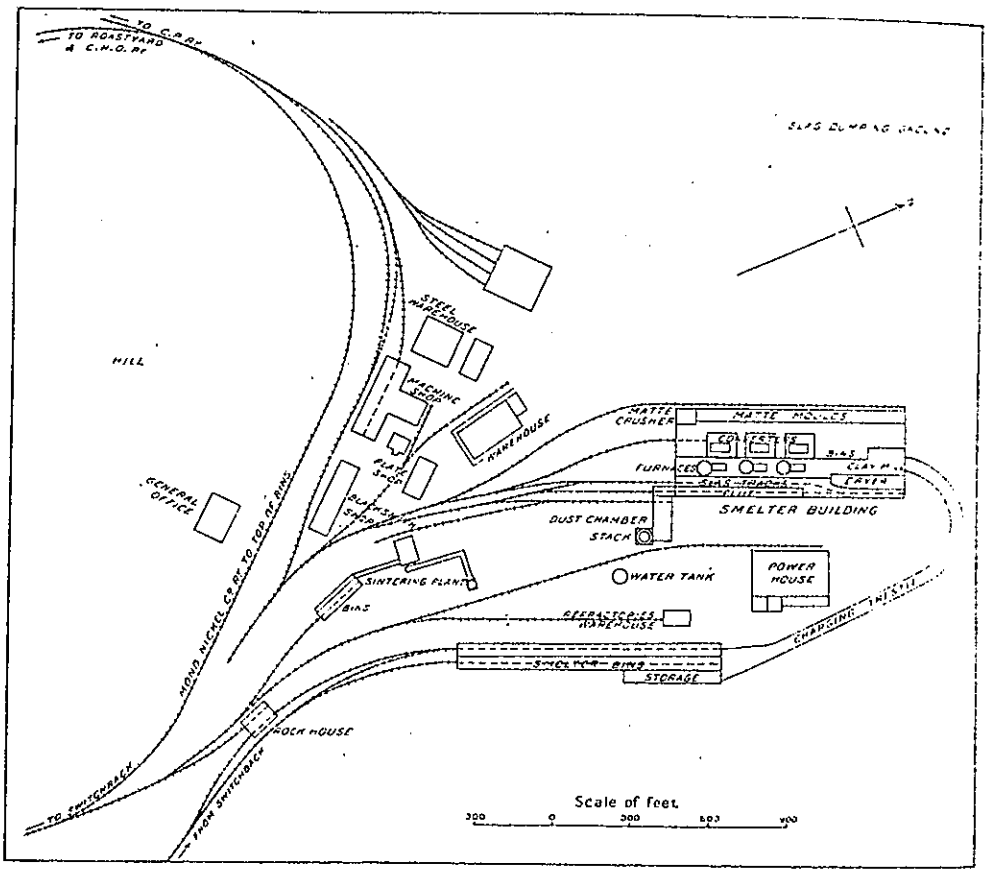
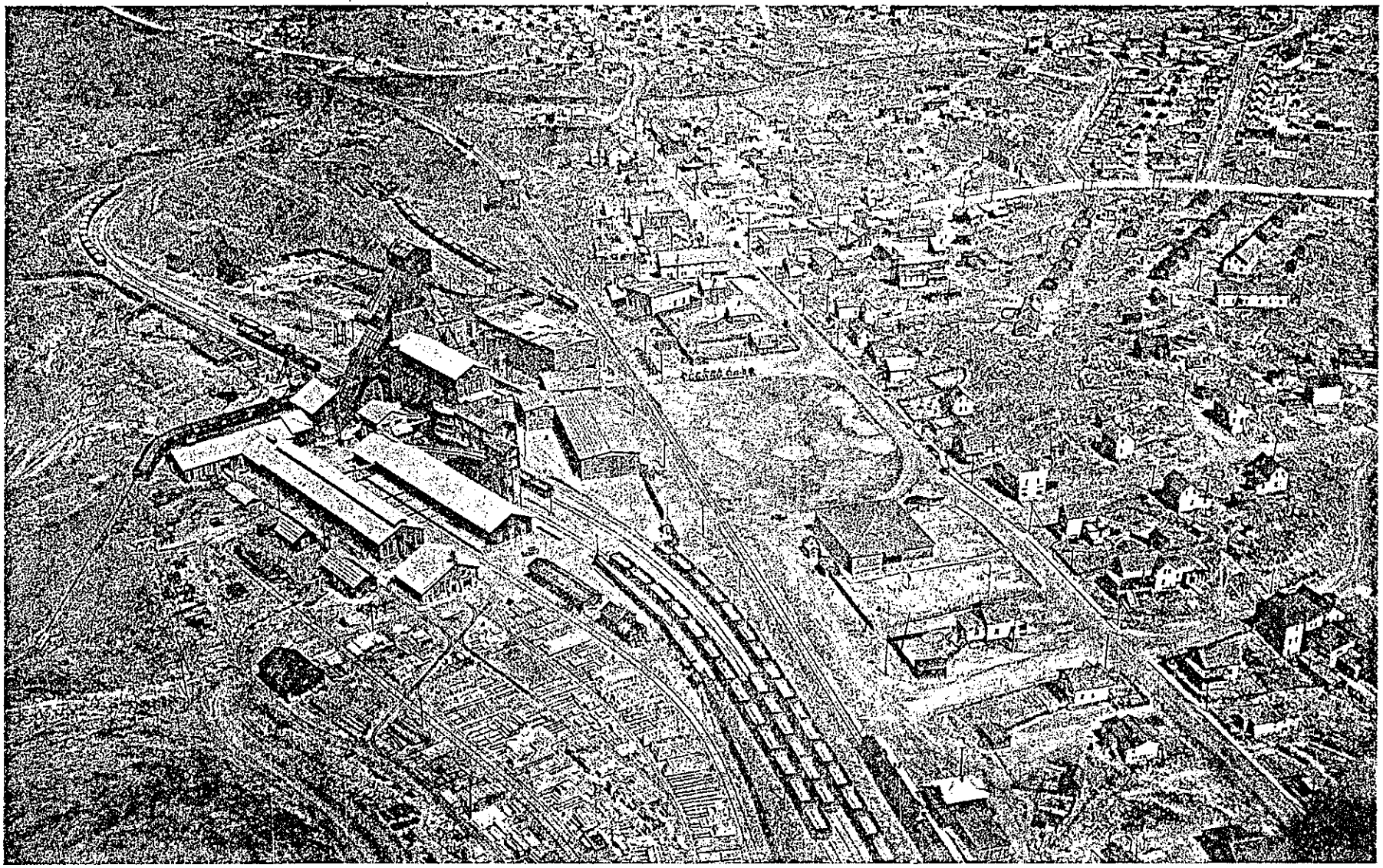


Fig. 79—Plan of Smelter and Adjacent Buildings, Mond Nickel Company, Coniston, Ontario.

A typical charge at Coniston would be:—

Roasted ore and sinter	10,000 lbs.
Raw ore	8,000 "
Scrap	2,000 "
Limestone	2,200 "
Total	22,200 "
Coke	2,200 "
	24,400 "



Creighton mine.

Ontario Sessional Paper

The converter slag, averaging 1 per cent. copper and 3 per cent. nickel, was formerly re-smelted in the blast furnace, but is now merely poured into the settlers. Since the slag going to the dump only carries 0.16 per cent. copper and 0.32 per cent. nickel, the efficiency of the settling process is obvious.

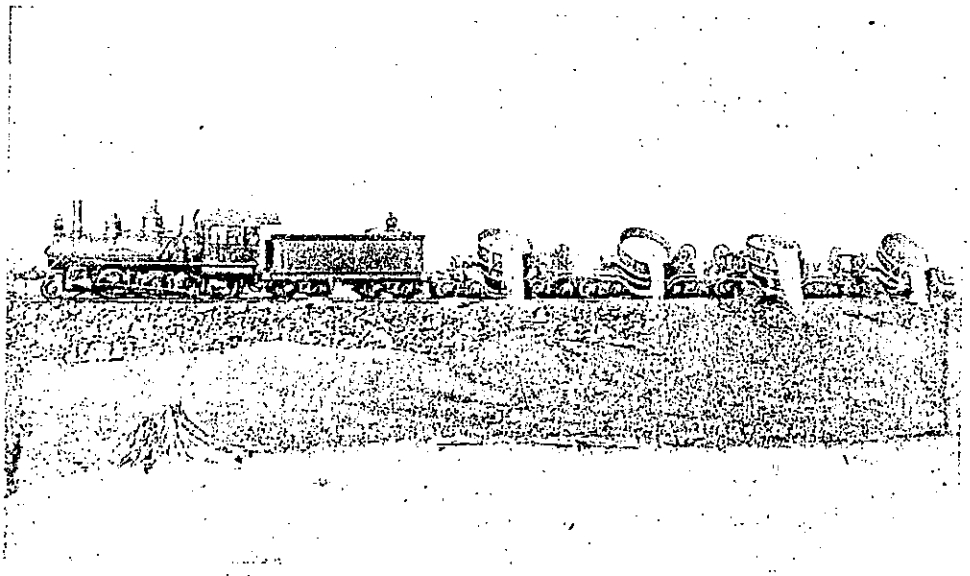


Fig. 76—Pouring Slag on Dump, Canadian Copper Company, Copper Cliff, Ontario.

MAGDALENE RIVER RAILWAY

The Magdalene River Ry. was originally projected in 1907, when the Quebec Legislature incorporated the company to build a railway from near Cap a la Ours to the Little Falls of the Magdalene River, and thence to a connection with the Atlantic, Quebec & Western Ry.'s projected inland extension. In 1916 the legislature passed an act confirming the original charter powers. The legislature last session authorized the company to build a line from the prevailing authorized line to the Great Falls on the Magdalene River, and by the valley of the Dartmouth River to deep water in Gaspe Basin, and to connect there with the Atlantic, Quebec & Western Ry. This line of railway need not be completed until 1929, and in connection with its completion, is authorized to operate its line on all wharves, piers or other constructions to deep water in Gaspe Basin, and to build and maintain, if necessary, its own wharves, piers and deep water facilities. The provisional directors were: C. W. Mullin, S. H. Boardman, Bangor, Me.; T. B. Lauring, Boston, Mass.; J. O. Drouin, E. Brassard, Montreal. The notices in connection with the recent application were signed by F. Murphy, New Carlisle, Que., as Secretary of the company. (Jan., p. 12.)

JUNE 1918

Magdalene River Valley Ry.—In order to allow of the reduction of the gradient on the location of the present projected line of this railway on lot 37 of St. Maxime du Mont Louis, the Quebec Legislature is being asked to authorize a change of location on about 4,500 ft., of which 2,500 ft. are in the Magdalene River Seigniory, northly to a location at least 250 ft. from the east bank of the Magdalene River. (Feb., pg. 79.)

MARCH 1919

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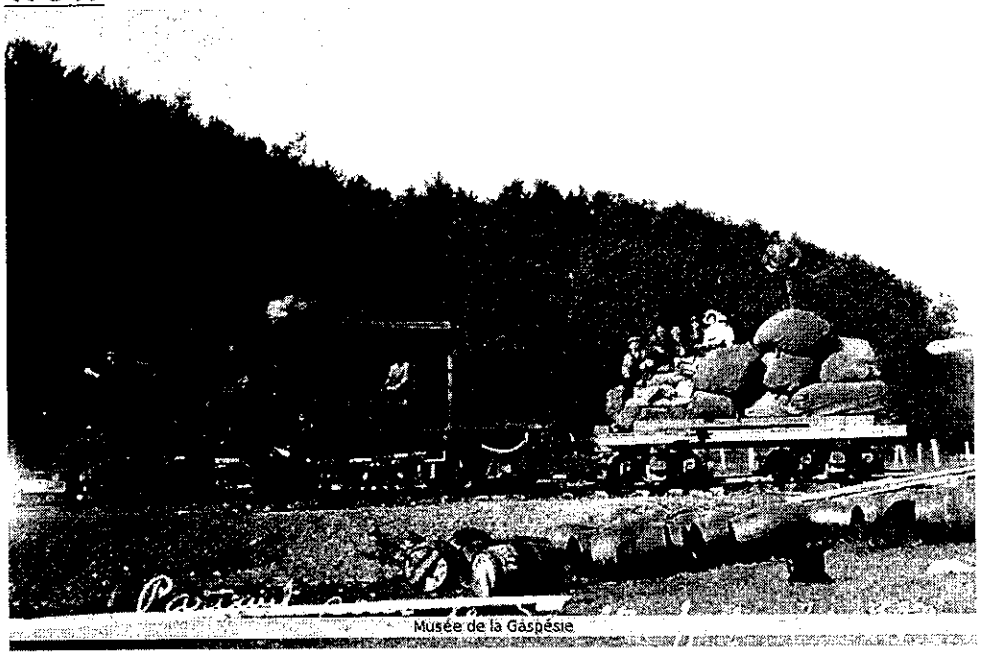

Tags

- 192-
- wood
- railway
- company
- Cotnoirs
- economy
- Plant Fund of Grand Falls from Rivière-la-Madeleine
- Forestry
- industrialization
- industry
- locomotive
- Madeleine
- mill
- MRC Haute-Gaspésie
- negative
- Pulp and paper

- pulp
- Rivière-la-Madeleine
- Rivière-Madeleine
- train
- transport
- land transportation
- factory

Description

. 7 July 1920. - Photography representing the train carrying goods for the factory of the Great Falls of Rivière-la-Madeleine According to historian Jean-Marie Pallu, the photograph was taken by Dr. Cotnoirs. Mandatory Reference: Museum Gaspésie. P33 Fund of the Grand Falls mill in Rivière Madeleine. P33 / 2/10. For more information: PLAMONDON Marcel csc. "Historical Notes on the parish Ste-Marie-Madeleine Madeleine". Madeleine, sd, 144 pages. ROY. Jean-Louis. "The plant in Grand Falls, unalterable disappointment." Gaspésie Review, September 1983, Vol. XXI, No. 3 (83), p. 8-15. Irenaeus Richard, "A dream aborted (The company Madeleine)", Revue d'histoire de la Gaspésie, 1964, no. 6, p. 73. Sébastien Lévesque. "Electrification of Riviere-Madeleine, an industrial question?" Gaspésie Magazine, Fall 2008, p. 22-25.

Statistics

- Dimensions: 879 x 588
- Visited: 2422 times
- Posted on: Friday, January 16, 2015
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CANADIAN ELECTRIC RAILWAYS

Electric Railway Department

Passenger Terminal, Niagara, St. Catharines and Toronto Railway.

The Niagara St. Catharines & Toronto Ry. is building a passenger terminal station in St. Catharines, Ont., which is part of a general plan for improving the railway's service, full details of which were given in a preceding issue of Canadian Railway and Marine World. The station is being built between Balfour St. and Welland Ave., facing Geneva St., and, as it is set back about 30 ft. from the street line, the intervening space will be laid out with grass plots and shrubs between the walks leading to the entrances. The elevation to Geneva St. has been designed to combine the best artistic effect with the greatest possible economy and usefulness. The entrances will be placed so that passengers, going from the city, can enter the waiting rooms directly by the nearest, i.e., south, entrances, and be immediately in touch with the enquiry and ticket offices and news stand. Balance in the front elevation has been obtained by placing the general office entrance near the north end.

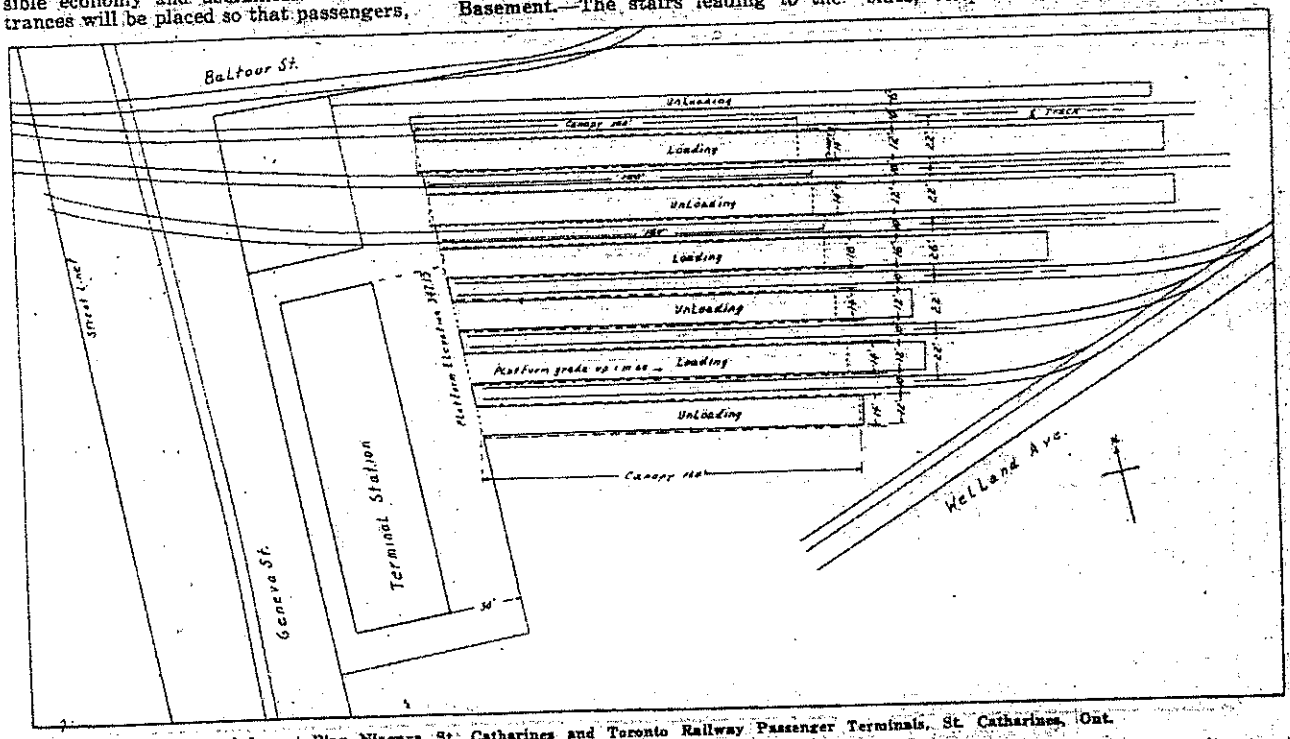
The station will be served by 6 tracks, and all interurban cars to and from St. Catharines will enter and leave the terminal. As shown by the location and layout plan, the 3 north tracks are through, and the 3 south ones come to a dead end, the latter 3 connecting at the east end with a lead at the south side of the terminal area. There will be a platform, or concourse, 30 ft. wide, at the east or track side of the station platforms of varying lengths serving all 6 tracks. The concourse and all track platforms will be covered by butterfly canopies designed to afford maximum protection from the weather. All platforms will be of concrete; the north track platform [illegible] ft. wide, and the other five 12 ft. Track centre distances and the amount of canopy overhang are shown in the location and layout plan.

The station building, of unusually artistic design, will be of rough texture varicolor brick, with concrete foundations of 15 in. prevailing thickness, and cut stone base and trim. It will be 145 ft. 10 in. x 40 ft. 10 in., and will have 2 floors, and a basement 81 ft. 7 in. x 40 ft. 4 in. under the north portion. The basement floor will be 9 ft. 8 in. below the ground floor level, which in turn will be 14 ft. below the upper floor level. The basement floor will be of concrete, also the basement division walls, the latter varying in thickness from 12 to 15 in.

Basement.—The stairs leading to the basement will be about 25 ft. from the north end of the building and toward the Geneva St. side, and will be 4 ft. 2 in. wide. They will open on to a basement corridor, 4 ft. 10 in. wide, running north and south, and extending to the basement end wall adjacent to the unexcavated area. Near the foot of the stairs, and on the street side, of the corridor will be the janitor's office, 6½ ft. x 12 ft., and to the north of the stairs will be a record room 15 ft. 1½ in. x 21 ft. 6½ in., and, adjacent thereto, an examination room 15 ft. 1½ in. x 16 ft. 1 in. On the track, or east, side of the corridor there will be, from north to south, a storage room 21 ft. 3 in. x 15 ft. 7 in., boiler room 24 ft. 8 in. x 15 ft. 7 in., and ticket cutting machine room 14 ft. 11½ in. x 15 ft. 7 in., and on the Geneva St. or west side of the corridor there will be, from north to south, a stationery room 18¾ ft. x 15 ft. 5 in., a ticket vault 15 ft. 2 in. x 14¾ ft., and another record room 15 ft. 5 in. x 14 ft. 10½ in. There will be 4 bays or lighting areas, 3 ft. 2 in. x 5 ft. 4 in., with 8 in. concrete walls, opening into the basement, two into the boiler room, two into the examination room, and one into each of the following: storage room at track side, record room at north end, stationery room, and ticket vault. The building will be heated by steam, the boiler being fitted with oil-burning equipment.

On the ground floor, the general waiting room, 79 ft. 1½ in. x 37 ft. 10 in., containing the ticket office and news agent's store, will occupy the southern portion. It will have terrazzo flooring, and will be equipped with 9 commodious seats in the centre and others along the sides, telephone booths, drinking fountain, etc. The ticket office, at the street side of the waiting room, will be 8 ft. 4 in. x 29 ft. 8 in., and will have 4 ticket wickets fronted by 2 in. brass railings, with counter. There will also be a conductors' wicket, and a feature of the ticket office will be a farebox hoist, by which fareboxes will be elevated directly to the general audit office on the top floor. The news agent's stall will be at the southwest corner of the general waiting room, and will be 8 ft. 4 in. x 1[illegible] ft. 6 in., these dimensions including the counter space.

Opening off the general waiting r[illegible] at the track side, will be the men's [illegible] tory, 16 x 12 ft., which will hav[illegible] razzo flooring and metal stalls. [illegible] street side of the building, and [illegible] off the general waiting room, [illegible] the women's waiting room, 15 f[illegible] 4 in. and opening off this, w[illegible] women's lavatory, 8 ft. 2 in. [illegible] in., both waiting room and [illegible] have terrazzo flooring. [illegible] men's lavatory and the [illegible]



Location and Layout Plan Niagara, St. Catharines and Toronto Railway Passenger Terminals, St. Catharines, Ont.

ing room will be a janitor's office and store-room, 5 ft. 1 in. x 12 ft. North of the men's lavatory, and on the track side, will be the trainmen's room, 21 ft. 5 in. x 20 ft. 5 in., with 13/16 in. tongued and grooved maple flooring, and between it and the street side of the building will be the trainmen's lavatory, 15 ft. 11 in. x 10 ft. 5½ in., which will have metal stalls and terrazzo flooring. North of the trainmen's room, and on the track side, will be an office for the assistant superintendent, and inspectors, 13½ ft. x 21 ft. 5 in. and, at the north end of the building, the baggage room, 15 ft. 1½ in. x 12 ft. 2 in., will occupy the track side, and the roadmaster's and electrical foreman's office, 13 ft. 2 in. x 15 ft. 1½ in. will be on the street side. The office for assistant superintendent and inspectors, the baggage room, and the roadmaster's and electrical foreman's office will have hardwood floors.

On the top floor, to the east of the stairway, which will open into a corridor 5 ft. wide and running parallel to Geneva St., there will be, from north to south, the following division: Manager's office, 23 ft. 5 in. x 13 ft. 10 in.; Superintendent's office, 16 ft. x 16 ft. 1 in.; Superintendent's staff's office, 16 ft. x 31 ft. 8 in., with a space with railing, counter and seat for the public; claims agent's office, 16 ft. x 9¾ ft.; dispatcher's office, 16 ft. x 11½ ft.; auditor's office, 16 ft. x 15 ft. 4 in., and cashier and

Street elevation, Niagara, St. Catherines and Toronto Railway Passenger Station, St. Catherines, Ont.

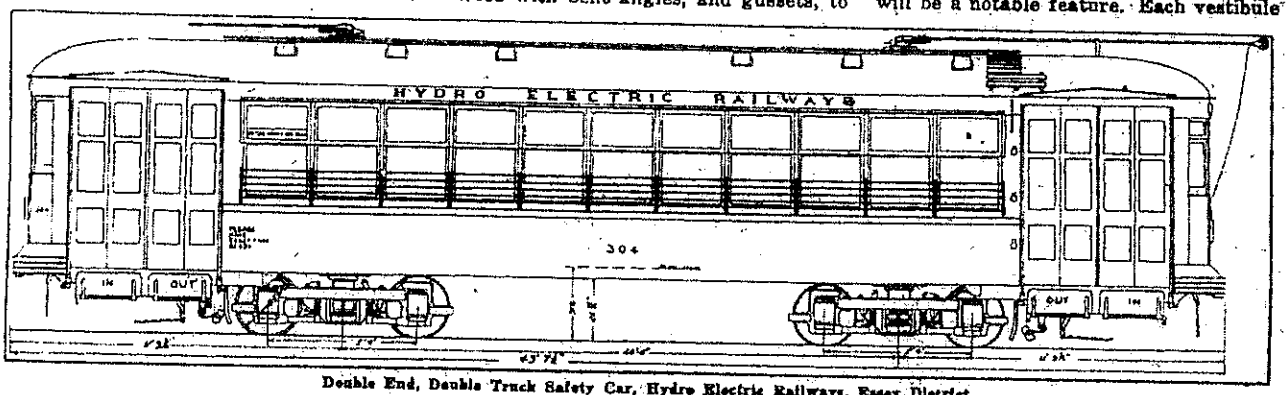
fare box department, 17 ft. x 33 ft. 7 in. In the hall, where the stairway opens into the corridor, will be the switchboard and enquiry desk. The corridor will open, at the south end, into the general audit office, which will be 79 ft. 1½ in. x 20 ft. 10 in., and which will occupy the southwest quarter of the building on this floor. It will be fitted with a railed off space, with counter and seats, for the public. Adjacent to the general audit office, and on the street side of the corridor, will be the vaults, one 15 ft. 4 in. x 6½ ft., and the other 15 ft. 4 in. x 7 ft. 11 in., and adjacent to the vaults will be the women's lavatory, 16 ft. x 8¾ ft., and the men's lavatory, 9 ft. 10½ in. x 16 ft. 9½ in. To the north of the stairway will be the engineer's office, 15 ft. x 9⅛ ft., and separated therefrom by a glazed glass partition will be the drafting room, 13 ft. 10 in. x 15 ft. 1½ in. All rooms on the top floor will have maple flooring, of 13/16 in. tongued and grooved material, with the exception of the vaults and lavatories, which will have terrazzo flooring. The roof will have felt, pitch and gravel covering.

The contractors for the station are Frid... ction Co., Hamilton, Ont. It is to be completed at the end of February. The ... was laid out under the general ... of E. W. Oliver, Manager, ... T. Ry., and the station build... signed by J. Schofield, Archi... of Standard's Office, Can... Rys.

Double End Safety Cars, Hydro Electric Railways, Essex District.

The Hydro Electric Power Commission of Ontario Railways Department has ordered for the Hydro Electric Railways, Essex District, 4 double end, double truck, one-man, two-man safety cars, of steel construction, an elevation of one of which is given herewith. They will have the following general dimensions:

Length	over all	48 ft. 7½ in.
"	" end vestibules	42 ft. 6 in.
"	" end of car body	28 ft. 0 in.



Double End, Double Truck Safety Car, Hydro Electric Railways, Essex District.

Width	over all	8 ft. 5 in.
"	" sheathing	8 ft. 3 in.
Height	from top of rail to top of roof	10 ft. ¾ in.
Height	from rail to top of floor in body	2 ft. 7 1/16 in.
Seat spacing		2 ft. 6 in.
Post spacing		2 ft. 6 in.
Truck centers		20 ft.
Approximate weight,	car body	25,000 lb.
"	" control equipment	1,200 lb.
"	" air brake equipment	1,040 lb.
"	" motors, gears and cases	8,000 lb.
"	" trucks	12,000 lb.
"	" total	88,240 lb.

The car underframing will include side sills of 8 x 8 x 5/16 in. angles, extending in one piece from body corner post to vestibule corner post, and the platform side sills, 6 in. 15.5 lb. channels, will be connected to form an extension of the side sills, the connection being proportioned so as to develop the full strength of the side and platform sills. The cross sills will be 8 in. 6 lb. channels, rolled steel, and will be connected to the side sills with angle connections and gussets. The bolsters, of built up type, with 12 x ¼ in. top plate, and 12 x ⅜ in. bottom plate, will have the top and bottom cover plates securely riveted to the diaphragms and malleable iron bolster center braces. The bumpers, of 5 in. 6.5 lb. channels, will be bent to shape, and will extend the full width of the car, and around the sides, so as to form protection for the corner posts, and diagonal braces, extending from the side sills and platform side sills to the bumpers, will be connected with bent angles, and gussets, to bumpers and sills, and bolted to the crown.

The side framing will include posts, 1½ x 1½ x 3/16 in., rolled steel T section members, extending from side sill to side sill, bent to form carlines, and riveted to the side sills, side sheets, belt rail and letter board. The belt rail, of 3 x ⅜ in. material, will extend in one continuous piece from the body corner post to the vestibule corner post, and the letter board, of 3/32 in. sheet steel, will have its lower edge set off to form a drip. The letter board will be spliced on the posts, the splices being soldered and filed, so as to present a smooth even surface. The vestibule corner posts will be of ash.

The roof, to be built in place on the car, will have t. and g. grooved poplar roof boards, 7/16 in. thick, covered with no. 8, 18 oz. canvas.

The floor will be laid in 2 courses, the bottom one to be of 7/16 in. t. and g. white pine, nailed and screwed to the floor supports. The top floor will be of 13/16 in. maple, grooved in the aisle to form a floor mat. Between the 2 floor courses will be 2 layers of waterproof paper. The floor will be framed to provide trap doors over the motors. In the aisle, at each end of the car, the floor will be ramped 1 in. and on the platform it will be ramped 1 in. to both sides of the car. The top floor will be fastened in place with screws.

The vestibules and door arrangement will be a notable feature. Each vestibule will be fitted with 2 pair of folding doors, this new arrangement, with its wide door opening area, providing for quick loading and unloading of passengers. Each pair of doors will be hung on ball bearing shafts, and joined with ball bearing hinges, and will be arranged to operate independently, from door operating engines supplied in connection with the air brake equipment, and located in a pocket over the doors. The steps will be arranged to operate in conjunction with the doors and the door and step engines will be operated from the door selector valve, a portion of the brake valve. The steps will be of 1¼ in. ash, supported on ball bearing hinges and provided with counterbalance springs. The edge of each door will have a rubber strip, extending in a loop, 2 in. wide, and screwed securely to each side of the door. The front dash of the vestibules will be in 3 pieces, one piece extending from corner post to center post, one from center post to center post and the third from center post to corner post. The inside lining of

Electric Railway Department

The Toronto Suburban Railway's Line to Guelph Opened

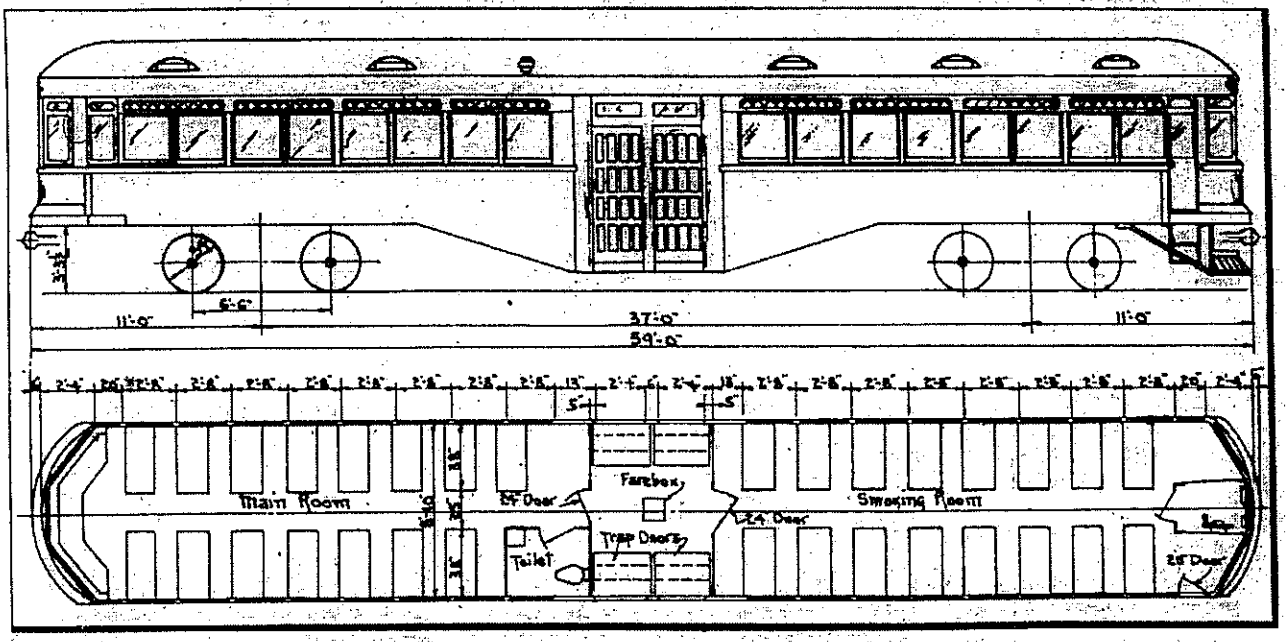
The official inspection of the extension of the Toronto Suburban Ry. from Lambton to Guelph, by th eOntario Railway and Municipal Board, took place April 12. A car was run through from Lambton on the previous day and the official party joined it at Guelph. The car left Guelph about 10 a.m., April 12, and arrived at Lambton about 2 p.m. The party included A. B. Ingram, Deputy Chairman, and H. W. Middlemist, Chief Engineer, Ontario Railway and Municipal Board. Lt. Col. G. C. Royce, General Manager, H. T. Hazen, M.Can.Soc.C.E., Chief Engineer, E. T. Wilkie and T. Malm of the Toronto Suburban Ry.'s engineering staff. A. F. Stewart, M.Can.Soc.C.E., Chief Engineer, Eastern Lines, Canadian Northern Ry., and Ewen Mackenzie, General Contractor for the line.

A temporary service was commenced over the line, April 14, two cars being operated, each making a round trip daily, except Sunday. It is expected that a complete service will be put on during May, but the company has to a certain extent been handicapped owing to a fire which destroyed a number of cars intended for this service, at the Preston Car and Coach Co.'s works, a few weeks ago.

This extension, which is 43.29 miles long, starts from Lambton, the end of the original line, and running through Lambton Park, crosses the Humber River by a trestle and girder bridge, a little south of the C.P.R., and following the Toronto Niagara Power Co.'s right of way for a short distance, it swerves to the south in order to curve under the C.P.R. tracks at the crossing of Mimico Creek. The location is then practically parallel with Dundas St., partly south and partly north through Summerville and Dixie, turning south again a little west of Dixie station, and paralleling the C.P.R. to Cooksville station, where it crosses Dundas St., and turns northwesterly, proceeding in almost a straight line to Meadowvale, crossing the Credit River and passing under the C.P.R. near Churchville, thence proceeding through Huttonville and Norval to Georgetown. From the latter place the line parallels the G.T.R. to Acton and runs through Eden Mills nearly direct to Guelph. Surveys for the extension were completed to Georgetown, 25.5 miles, in 1911, and through to Guelph and Berlin in the following year. Construction was started in July, 1912, and grading was completed in 1913, but no track was laid until 1914, when 41.50 miles were laid westerly from Islington, the remaining mileage westerly to Guelph and easterly from Islington to Lambton being laid in 1915. The line is, for the most part laid on private right of way, and is of standard gauge ,single track with turnouts, and the rail used is 60 lb.

The overhead equipment work is of the catenary suspension type, and power is received from the Toronto Niagara Power Co.'s line at 25,000 volts, a.c. 3 phase, 25 cycle and stepped down and passed through 500 k.w. rotary converters which deliver it to the line at 1,500 volts d.c. There are three substations on the line, one each at Islington, Georgetown and Guelph, the last mentioned being at the corner of Dundas and Bay Sts. The Georgetown station has 1,000 k.w. capacity, in two 500 k.w. units, while each of the other two have a single 500 k.w. unit, with provision for the addition of a similar unit in the future. The three stations are brick and concrete construction. The Islington station is provided with living accommodation for the operator and the Georgetown and Guelph stations contain waiting, baggage and express rooms and dispatching offices, providing railway station facilities.

The Lambton car barn, which was fully described and illustrated in Canadian Railway and Marine World for May, 1916, consists of inspection, repair, machine, paint, and blacksmith shops, boiler room, coal store and men's lavatory, in addition to the administrative offices, the whole occupying a space 184½ x 128 ft. The repair shop has three tracks and the inspection shop four tracks, each to accommodate two cars. The machine shop is equipped with all the necessary tools for the repair and upkeep of the equipment. The boiler house is equipped with a 75 h.p. boiler of the locomotive type and the coal storage is conveniently arranged for handling coal direct from the tracks. The administrative offices are arranged over the store and lavatory, and consist of five offices with a public waiting space. The buildings are heated by a low pressure vacuum steam heating system for about 4,500 sq. ft. of radiation.



Centre Entrance Interurban Car, Toronto Suburban Railway.

The cars, probably the first of this type to be operated on suburban service in Canada, with the possible exception of some on the British Columbia Electric Ry., are of the centre entrance type. The principal dimensions are:

Length over buffers	59 ft.
Length over ends	52 ft.
Width over steel sheathing	8 ft. 10 in.
Width overall	9 ft.
Height from top of rail to underside of side sill at bolster	3 ft. 2½ in.
Height from rail to top of first step	1 ft. 4¼ in.
Height of step risers	10½ in.

The car is divided into two sections, the forward compartment being for smokers and the rear compartment for general use, including lavatory accommodation. They are provided for through ser-

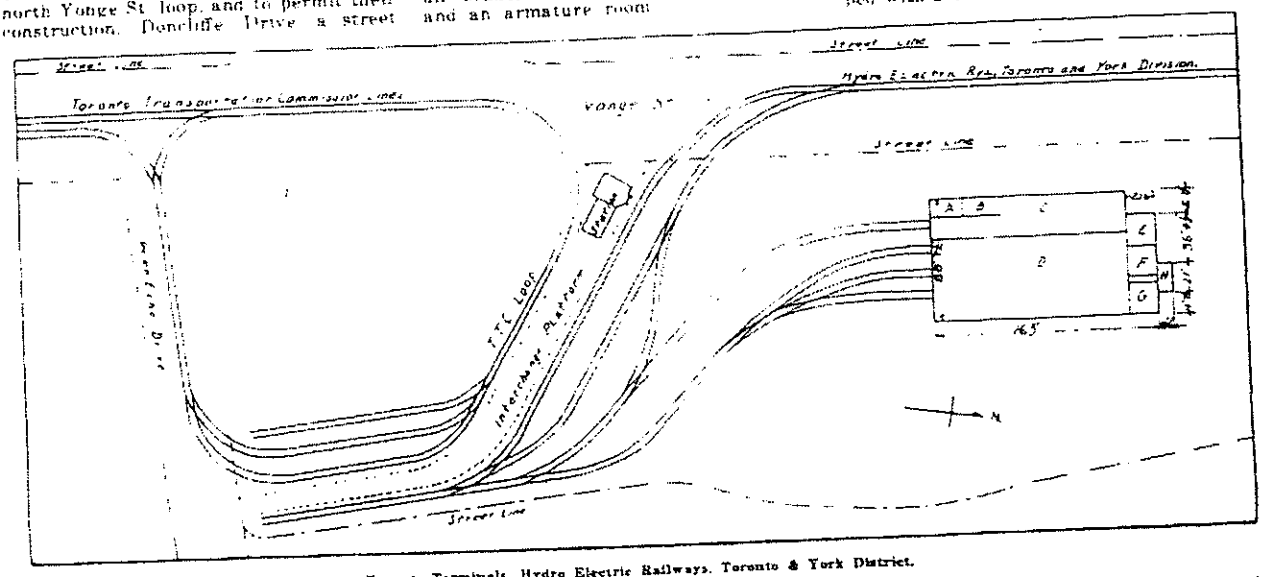
Electric Railway Department

Toronto Terminals, Hydro Electric Railways, Toronto & York District.

The Toronto & York Radial Ry is now being operated by the Hydro Electric Power Commission of Ontario, and the old Metropolitan Division, running north from Toronto's north boundary, is designated the Hydro Electric Railways, Toronto & York District, Metropolitan Division. Consequent upon the Toronto Transportation Commission's lines on Yonge St being extended to the north city limits, the radial railway single track line on Yonge St., between the former southern terminal and the north city limits, was taken up, and a new radial line terminal at the north city limits became necessary.

As stated in Canadian Railway and Marine World for February, terminal facilities have been provided near the Toronto Transportation Commission's north Yonge St. loop, and to permit their construction, Deneliffe Drive, a street formerly running east from Yonge St., one block north of Glenecho Drive, was closed. Some of the terminal construction work was done jointly by the Hydro Electric Railways and the Toronto Transportation Commission; and the construction of facilities for use by the radial line alone, was done under contract from the Hydro Electric Power Commission's Railways Department.

The accompanying plan shows the layout of the new terminal and the arrangement of its facilities. Toronto Transportation Commission cars, from the downtown portion of the city, turn at the loop shown, while radial cars from north of the city proceed to the station and interchange platform, between the loop track and the radial track, where the passengers change from one line to the other. The interchange platform, a joint facility, follows the loop tracks all the way around from Yonge St. to the former street line of Glenecho Drive. This platform was the first unit of the new facilities to be completed, having been finished early in the winter of 1922-23. The station is a purely radial railway facility. The tracks to the north of the station and interchange platform are exclusively those of the radial line, and consist of a main track, run-around track, a track leading to the freight house portion of the main building at the north end of the property, a connection between the two latter tracks, and a lead branching into three tracks entering the car barn. The building at the north end, also exclusively a radial line facility, is divided as follows, with reference to the lettering on the plan: A, office; B, perishable freight storage; C, freight house; D, car barn; E, blacksmith shop; F, machine shop; G, carpenter shop; H, lavatory and wash room. The portion of the building occupied by the carpenter shop and machine shop has a basement below it, in which are the boiler room and coal storage, and also has a second story, divided into an air brake, controller etc., repair room, and an armature room.



Toronto Terminals, Hydro Electric Railways, Toronto & York District.

The station, which is also a purely radial line facility, is of buff colored brick and hollow tile construction, with concrete foundations and Spanish tile roofing. The length over all is 50 ft. The one story or eastern portion is 22 ft. wide and the two story or western portion is 28 ft. wide. The height to eaves of the two story portion is 18½ ft., and of the one story portion, 10 ft. The west side is provided with a canopy, 9 ft. above the ground level. The interior is divided into a waiting room, 20 x 34 ft.; lavatories; a ticket office, 11 x 8 ft.; an annex for conductors, 5 ft. 5 in. x 3 ft., and a baggage room 14¼ x 15 ft. On the second floor are the Superintendent's office, 14 x 13 ft., and the dispatcher's office 14 x 13 ft. The interior is finished in lath and plaster; the floor downstairs is of tile, which also extends to the windows, and the partitions between the rooms are of tile. The building is heated by hot water and electrically lighted.

The interchange platform is 352 ft. long, and ranges in width from 27 to 36 ft. It is of concrete, and is covered in part by an umbrella roof, which adjoins the station building, and extends for 150 ft. east. The roof eaves are 8 ft. above the platform, and the roof is 18 ft. wide and slopes to the eaves at an angle of 30 deg. to the horizontal. It is carried by steel I beam and angle supports, at 12 ft. centers, and is of steel truss construction, with wood rafters, and covered with wood and Spanish metal tiling.

The car barn, repair shop and freight house building is of steel truss and brick construction, with concrete foundations, and is divided as mentioned above. It is 173⅓ ft. long over all, and 88 ft. 7½ in. wide. The car barn portion is 141 ft. 1½ in. x 54 ft. One concrete pit, with 5 in. concrete floor on 8 in. cinder fill, extends underneath all three tracks, the bottom of the pit being 4 ft. 8 in. below the top of rail, and the tracks being supported on reinforced concrete piers. The track on the east side of the building is equipped with a 40-ton 4-screw hoist. Two sets of stairs lead into the pit at the north end of the building and one at the south. Sand storage space of 60 tons capacity is provided at the east side, the sand being dried by steam coils.

The freight storage portion of this building, 31 ft. 1⅓ in. x 141 ft. 1½ in., includes the perishable freight room, 14 ft. x 23¼ ft., and an office, 14 ft. x 23 ft. 10½ in. The freight shed is served by the most westerly track entering the building. The flooring in the freight shed and perishable freight room is of 2 in. plank, with a top flooring of 1 in. white pine. The office portion has 1 in. maple flooring.

The shop portion of the building is of heavy mill type construction, and the various shops, the locations of which are given above, have the following dimensions: blacksmith shop, 21½ ft. x 19 ft. 10½ in.; machine shop, 20 ft. x 21½ ft.; carpenter shop, 21 ft. x 21½ ft.; boiler room and coal storage, equal in area to the machine shop and carpenter shop, under which they are located; armature shop and air brake repair shop, equal in area to the machine shop and carpenter shop respectively, over which they are

located. The blacksmith shop, machine shop and carpenter shop are fitted up to take care adequately of running repairs on electric car bodies and trucks, and the armature and air brake repair shops are equipped to take care of the motor and air brake work. A feature of the construction is that a hoist has been installed to lift armatures, motors, etc., out of the car barn portion of the building and to transfer them into the armature shop in the one straight line movement. Stairs leading to the boiler room and coal storage space in the basement, and leading to the armature shop and air brake repair shop in the second story, are located between the machine shop and carpenter shop. The building is heated by steam, with the low pressure system.

The interchange platform, provided jointly by the Hydro Electric Power Commission of Ontario's Railways Department and the Toronto Transportation Commission, was built by Toronto Transportation Commission forces, and the umbrella shelter, also provided jointly, was built by the Metallic Roofing Co., Toronto. The contractors for the station, and car barn, repair shop and freight house building, were Sullivan & Fried, Toronto. The buildings were designed by J. C. Cramm, Designing Engineer, Railways Department, Hydro Electric Power Commission of Ontario. Construction was in charge of T. U. Fairlie, Engineer, Railways Department, H.E.P.C., and the design and construction were carried on under the supervision of F. A. Gaby, Chief Engineer, H.E.P.C. Construction was begun about Nov. 1, 1922; all trackage and overhead work were completed Jan. 15, 1923, and the station and car barn and freight shed building were completed and placed in operation March 15.

The new facilities will serve the Hydro Electric Railways' Toronto and York District, Metropolitan Division, including the branch line from Aurora to Schomberg, formerly the Schomberg & Aurora Ry.

Street Car Traffic Conditions in Montreal.

Lt.-Col. J. E. Hutcheson, General Manager, Montreal Tramways Co., is reported to have said, in a recent interview:—"At two points the limit of density has practically been reached, so that it would not be possible to add additional cars during the rush hour. These points are Bleury St. and St. James St. from Place d'Armes to McGill St. The matter is receiving earnest study by the company and the commission. During the rush hour period we are operating 760 cars, a greater number than ever before. The week-day average of revenue passengers carried numbers approximately 500,000, with an additional 200,000 carried on transfers. Yet, despite that large number, the average number of passengers carried per mile is only 8.5, so that there are periods when travel is very light. Our car mileage is greater than ever before.

"One of the causes of trouble arises from the fact that the winter peak load is carried in a briefer period, between 5.30 and 6.30 p.m. In the summer the load is carried over a longer period, beginning at 4 p.m. As a matter of fact, there are no complaints in the summer, it is only in winter that complaints of overcrowding and delays occur. There are several causes for this. The effort to carry the people by putting more cars

TRAFFIC BLOCKED BY DERAILED CARS

Seven of Them Leave the Tracks on C.N.R.

PASSENGERS ON RADIAL

Accident at Richmond Causes Cancellation of One Passenger Train, and Demoralizes the Schedule of Other.

Seven freight cars were derailed, passenger traffic blocked for several hours and the rails torn up on the Canadian Northern line yesterday at Richmond Hill. The train crew escaped injured. Defective roadbed is attributed as the cause of the accident. Several officials, when seen last night, declined to make reference to the wreck in any shape or form, save the fact that the rails would be replaced during the night to prevent further interruption of through traffic.

The accident happened shortly before 5 o'clock within a short distance north of Richmond Hill. The freight was southbound and the cars which left the rails were empty. When it was found that traffic would be blocked for some time the passenger train from Parry Sound, due to reach the Union Depot at 2.15 p.m. was cancelled. The passenger train from Ruel, due here at 5 p.m. got as far as the wreck. The passengers were transferred to cars on the Metropolitan Radial line and brought to North Toronto.

The passenger train which leaves here at 5.15 p.m. for Parry Sound went as far as Richmond Hill, where the passengers were transferred to the train which was "stalled" to the north of the wrecked train and the journey was resumed. The train which left here brought in the baggage and express freight to the Union Station, arriving at 11.10 o'clock last night. Owing to the congested condition at the station the latter train was held at the Yonge street crossing for almost an hour.

Sir William Mackenzie, whose private car was attached to the G.T.R. Montreal express leaving here at midnight, when seen was reticent about the affair, except to say that he understood the wreck was not serious in any sense of the word.

CANADIAN NATIONAL RAILWAYS TORONTO-SPADINA TERMINAL

C. H. RIFF

Canadian Railway and Marine World

November, 1928

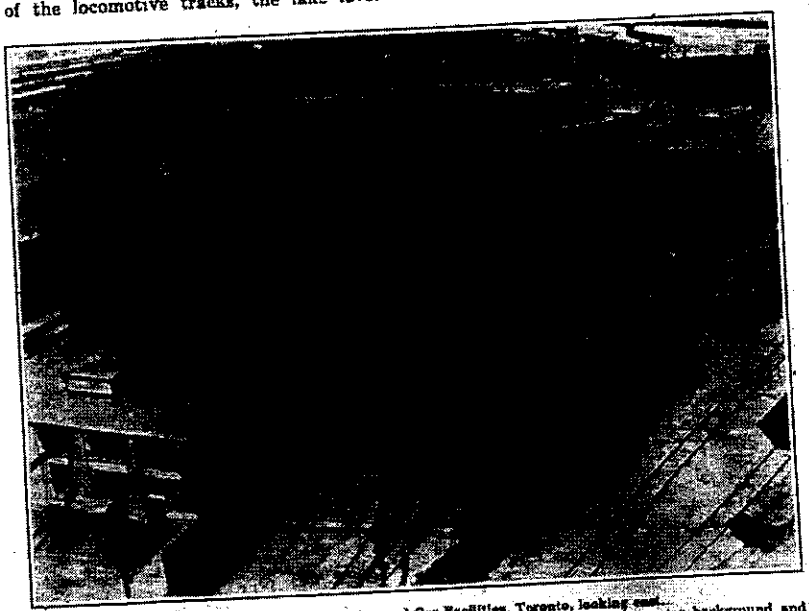
Locomotive and Car Facilities at Toronto, Canadian National Railway.

By S. B. Wass, Terminal Engineer, Canadian National Railway.

Owing to the Toronto waterfront grade separation work now going on railway facilities along the waterfront are undergoing almost complete re-arrangement. Among these the Canadian National Ry. have built facilities for its locomotives and passenger cars, the runs of which terminate in the vicinity of the union station. The site available for these lies east of Bathurst St. and west of the city water works, south of the main elevated tracks and north of Fleet St., the boulevard drive which parallels the waterfront. The general arrangement of the facilities is shown in the accompanying general layout plan, from which it will be seen that Spadina Ave., one of the main north and south thoroughfares of the city, crosses near the center of the site. This avenue intersects Fleet St. on the south at the low level and joins Front St. on the north about 18 ft. above the C.N.R. tracks, passing over the main viaduct tracks north of the locomotive facilities. To provide for this street, with its descending grade from high to low level across the center of the yard, and yet preserve an efficient working layout for locomotives and cars, together with the run-around loop tracks for turning of locomotives and passenger trains, and the through freight tracks on the south of the site, presented a rather difficult problem in yard design, but has been overcome by the arrangement shown. The site is on filled ground which had been reclaimed from Toronto Bay some years previous to construction of the grade elevation. Ledge rock lies from 20 to 24 ft. below the level of the locomotive tracks, the lake level being about 10 ft. above the rock. These conditions rendered the use of concrete piling much more efficient than any other type of foundation for such structures as those required for locomotive terminal and were used throughout. For the locomotives, the ordinary sequence of service has been provided, viz., coaling, ash cleaning, water, and washing and housing.

Canadian National Ry. Locomotive Terminal, Toronto. Layout of tracks to and from turntable.

Coaling and Sand Plant.—A 600-ton reinforced concrete coal and sand plant, with six 100-ton circular bins, supplying coal to locomotives on 4 tracks, has been provided. Locomotive sand is supplied from the spaces between the circular bins, into which sand is hoisted by compressed air from the concrete sand drying and storage house adjacent to the coaling plant. Coal is hoisted to the bins from the hopper under the single unloading track by a continuous chain and bucket conveyor, which has become almost the standard practice for Canadian railway coaling plants. Attention is drawn to the compact arrangement and small space occupied by this plant, which is, I believe, the largest locomotive coaling plant on the Canadian National system.



Canadian National Ry. Locomotive and Car Facilities, Toronto, looking east. Stores building in foreground with machine shop adjoining; locomotive house in center background and wheel shop at right.

The cinder handling plant is of special design, and is the second of its type to be built in Canada, the first being at the Canadian National Ry. Neebing terminal near Fort William, Ont., built in 1923. The cinders are conveyed on a continuous chain conveyor, which passes under the hoppers placed in each of 5 locomotive tracks, then up an incline of about 45 deg., discharging over cars on the cinder track. The units of this conveyor are carried on small wheels which run on light rail (20 lb. to the yard) and each unit is interlocked into that before and after. They are of heavy cast iron construction, so as to resist the wear and the corrosive effect of the acids in solution from water coming off hot cinders. The conveyor is driven by a motor and gears housed at the upper end of the incline over the top of the cinder cars.

Water is supplied by 3 standpipes serving 6 locomotive tracks, from a 150,000-gall. storage tank, located close to the pipes. The water is pumped to this tank from the bay by the railway's pumping plant, or may be supplied from the city water system.

The turntable, shown in one of the accompanying illustrations, is 100 ft. long, and of the twin-span type, which eliminates the necessity of balancing the load over the center of the table, thus reducing to a minimum the turning time. This feature is especially advantageous in turning dead locomotives or equipment which does not propel itself. The table is also equipped with an electric drum for hand-

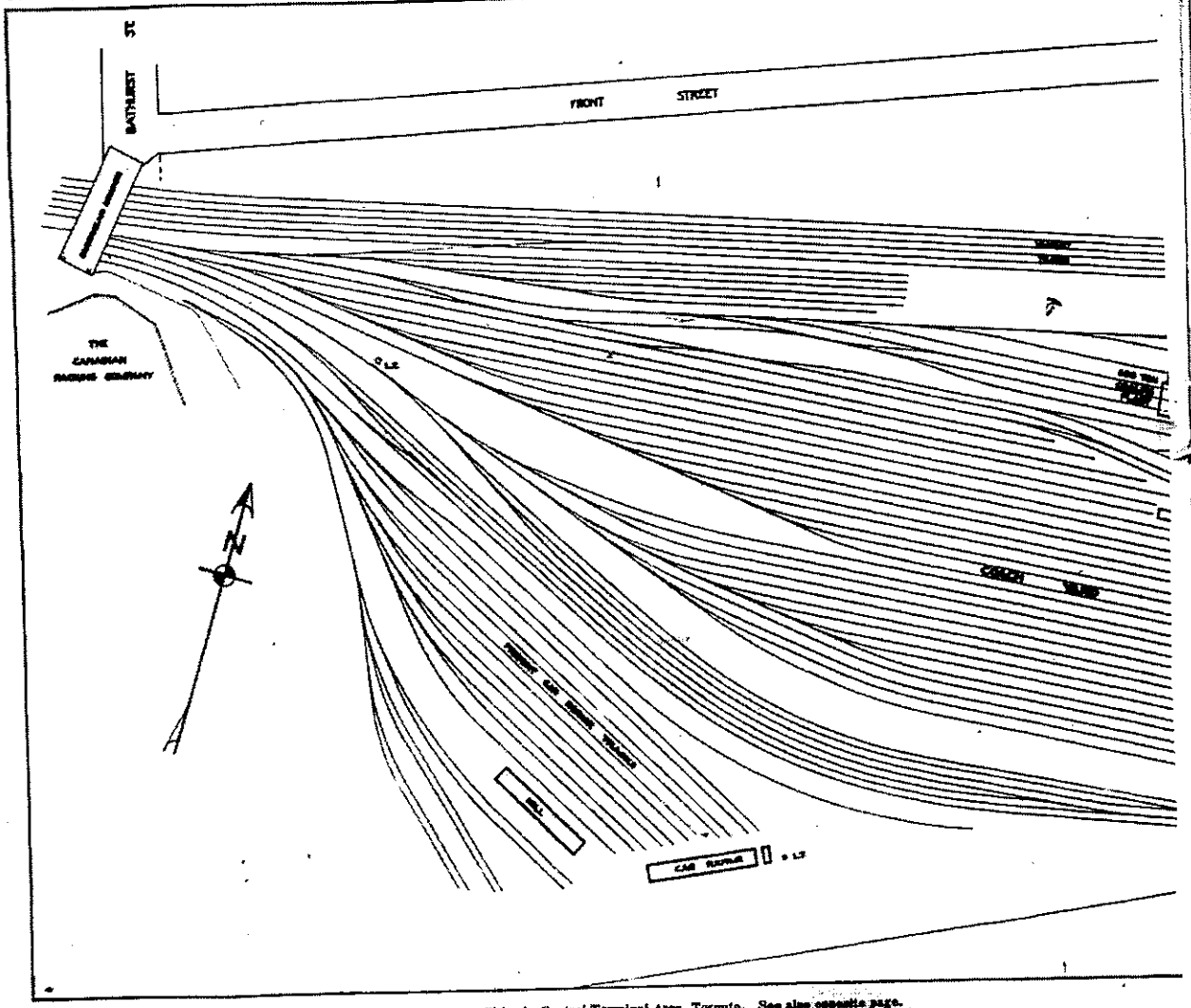
(*Continued on page 540.*)

Locomotive and Car Facilities at Toronto, Canadian National Railway.

(*Continued from page 633.*)

ling dead equipment. It is approached by 50 tracks, 5 of which are for running tracks and the remainder for locomotive house and storage tracks.

The locomotive house has a capacity of 36 stalls, 8 of which, shop stalls, are 130 ft. long, the other 28 being 110 ft. long. There is an additional space for 9 stalls to complete the circle when required. An accompanying illustration shows the cross section of the house. The clear story is provided with windows which give excellent lighting in the center of the house and provides good head room for exhaust system, duct, piping, etc. The building has brick walls and a wooden frame, with mill type roof covered with tar and gravel roofing, which construction has become practically standard for locomotive houses on Canadian National lines. It has been found that this type of construction is particularly suitable to our cold Canadian winters, there being little, if any, condensation on the inside of this roof in cold weather, while concrete or tile roofs, unless insulated, collect large amounts of condensation, and with the presence of exhaust gases, the present type is more durable and requires less maintenance than steel construction.



General Layout, Canadian National Ry. Facilities in Central Terminal Area, Toronto. See also opposite page.

A number of special features have been introduced into this building.

A new design of door with structural steel frame, the outside members of which are small 4-in. I beams with welded joints, has been applied. This 4-in. thickness provides opportunity for double sheathing and air space, and is also sufficiently stiff to resist warping, but is much lighter than many other steel doors which have been designed. Hinges with adjustable pins have been provided, which assures proper swinging of the doors.

The service piping inside the locomotive house, consisting of pipes for hot and cold water, compressed air, fire protection, etc., has been installed in leadized pipe, the leadizing being placed on the pipes after special fittings had been placed. This assures a protection against the acid-bearing gases, and is, I believe, the first installation of leadized pipe in a locomotive house in Canada.

In the shop section, drop wheel pits have been provided with electro-pneumatic jacks, which are sufficiently powerful to compress the springs of the locomotives so that bearing nuts can be taken off without laborious work in blocking up the equalizing system. Three jacks have been provided—one each for drivers, trailing and pony trucks, and for tender wheels; so that with this equipment any wheel on any of the company's locomotives may be placed over one or other of these jacks to be changed.

Cardwell spring tracks have been installed on locomotive tracks. These consist of manganese castings from which an

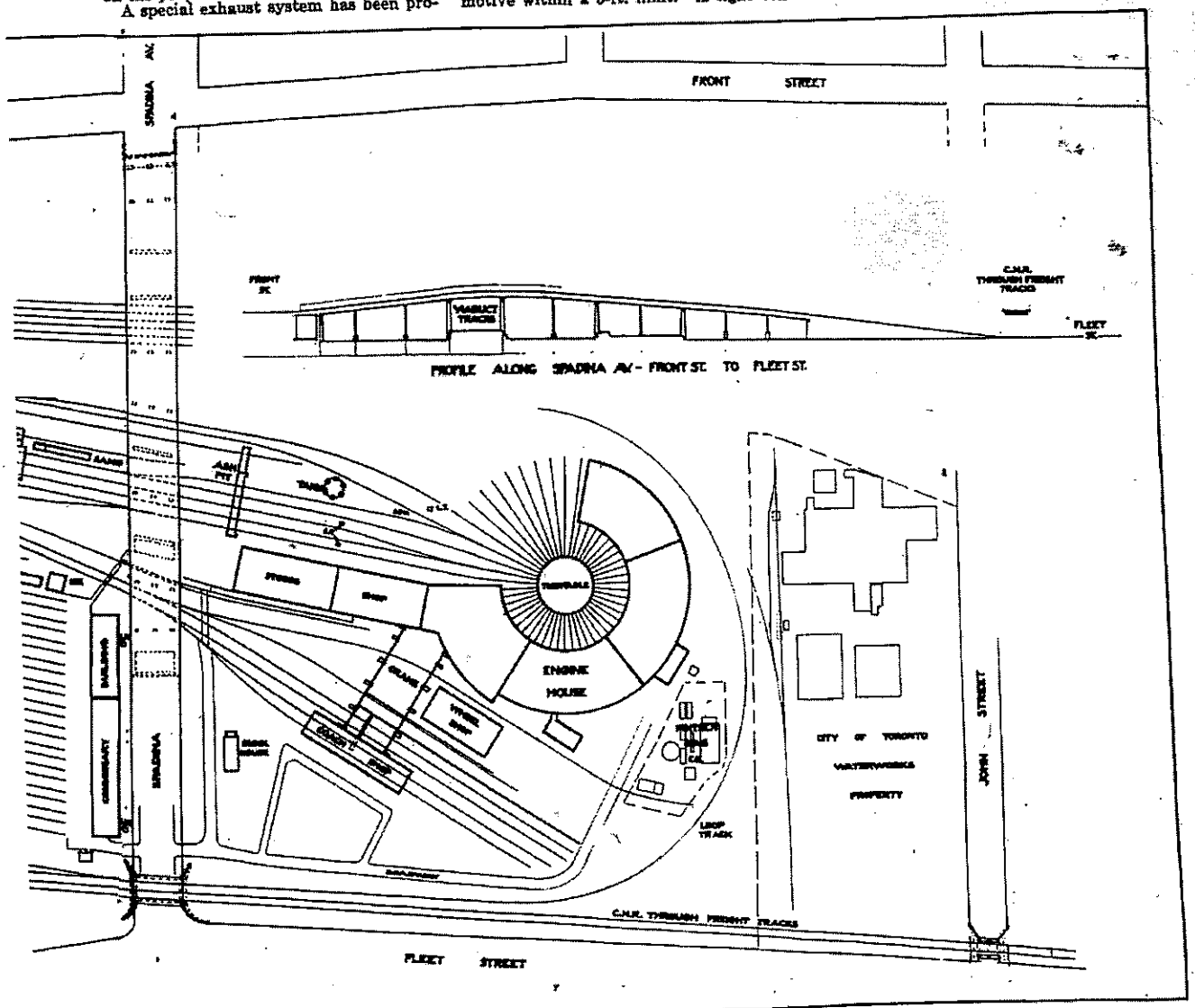
insert may be taken from the top of the rail, permitting the wheel over which the spring is to be replaced to drop down sufficiently to release the spring. These spring tracks have been located so that any spring may be removed from any of the company's locomotives by placing it on the proper track.

A special exhaust system has been provided, by which the smoke from locomotives is collected and driven up a tall chimney, rather than escaping through the usual smoke jack. To accomplish this, a rectangular duct of asbestos board, attached to a wooden frame, has been constructed around the house, above the locomotive stacks, and the stack connected to it by a special adjustable jack, which makes a fairly air-tight connection between the locomotive stack and the duct. The air is exhausted from this duct by a fan installed on the upper story of the fan room, and is driven up a chimney 185 ft. high, with inside diameter of 7½ ft. This apparatus provides draught for firing up, and removes the necessity of the steam blower usually used for this purpose.

The jack was designed specially for this house. It is constructed of aluminum, to reduce the weight and to resist corrosion due to exhaust gases. By means of a single universal joint just below the duct, it adjusts itself to any position of the locomotive within a 5-ft. limit. A tight connection to the stack is obtained, without a moving joint, by means of a spherical bowl. The vertical motion required to apply and remove the jack from the locomotive and to make it adaptable to the varying heights of locomotives is obtained by a telescopic joint between the upper and lower sections. The operation of this joint is effected by 2 supporting ropes which carry counter weights to reduce the manual effort required. The equal movement of these ropes moves the jack up or down, and the unequal movement of them swings the jack back or forward to adjust it to the position of the locomotive. Combining the above features we have a rather unique apparatus, which has solved a rather difficult feature encountered in connection with the smoke exhaust system. This is the first exhaust system which has been installed in a locomotive house in Canada, although several of various designs are in use in the United States.

According to the usual C.N.R. practice, the window opening at the back of each stall is of the same size as the entrance door, so that in case a locomotive fails to stop in the house, as it sometimes does on the best managed roads, it passes through the window, knocking out the window with the wooden wainscoting below the sill, without breaking down the wall.

Heat is provided by indirect radiation. Hot air is distributed from the fans by underground ducts which connect with 3 openings in each pit. The air is mostly recirculated from the house, it being found that ample ventilation is obtained by opening doors and windows, which are all supplied with a swing section. Economy has been effected in the fan room by plac-



General Layout, Canadian National Ry. Facilities in Central Terminal Area, Toronto. See also opposite page.

ing the heating fans on the ground floor, and the exhaust fan at the upper floor of the same building. A runway is provided around the windows in the clear story, which permits adjustment of windows to suit weather conditions, and to give easy access so that they can be kept clean and repaired. These runways also provide access to the pipe lines and air duct.

Ample lighting is provided at night by 14-in. reflectors, with 200 or 300 watt lamps, placed at the front and back of each locomotive. They are provided with individual control, or control by sections.

electric cranes of 3,000 lb. capacity. Wash-out pumps with two 15,000-gall. hot water storage tanks, in which the hot water from the boilers is retained for refilling the boiler after it has been washed out, occupy one corner of the shop.

Canadian National Ry. Yard, Toronto, looking west.

Stores Building.—Adjoining the machine shop is a 3-story stores building, 174 x 80 ft., which serves as stores for the shops, car facilities, and also district storehouse. Space in the upper story of this building and adjoining the machine shop is provided for the locomotive foreman's office, locomotivemen's booking rooms, etc., as well as a lunch room for machine shop employes. The locomotive foreman's private office is situated so that he can from his window see the locomotive tracks from where they leave the main line to the turntable, and through a window in the shop wall he has a view over the whole machine shop, thus affording an opportunity for intensive supervision. The district stores offices are at the west end of the upper story.

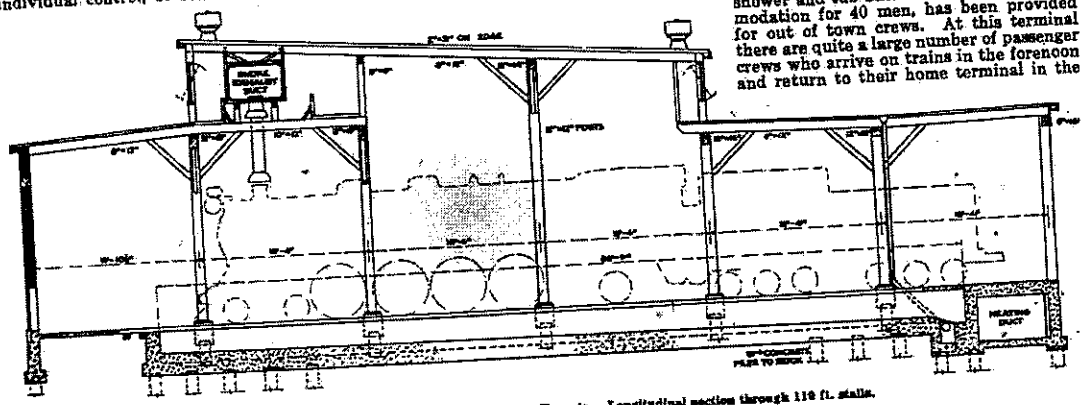
The building is of reinforced concrete, fireproof construction with brick walls, elevators serving all floors, and ramp to basement and ground floor. The location is central, as shown in an accompanying illustration, making it easy of access from the locomotive tracks on the north, the machine shop on the east, the service track on the south, and truck and vehicular access on the west.

Wheel Shop.—Special arrangements have been made for the rapid efficient repair of car wheels in a shop 133 x 62 ft., just south of the locomotive house. In it have been placed the most up-to-date wheel lathes, presses, axle turning machines, etc. The wheels are loaded and unloaded by a 10-tons overhead electric travelling crane situated so that it serves the wheel shop, storage yard, drop wheel pit for the passenger car shop, and the loading and unloading of locomotive wheels or other heavy material for the machine shop.

Passenger Car Shop.—South of the wheel shop and its storage yard, a passenger car shop, 202 x 46 ft., with capacity for 4 passenger cars, has been provided for cars requiring extensive repairs. Two tracks adjoining the passenger car shop are provided with drop wheel pits for re-wheeling cars. The drop wheel pit is served by the 10-tons electric crane.

The three shops, i.e., machine, wheel and passenger car, are heated by indirect radiation by Featherweight unit heaters which are installed near the ceiling of each building. They consist of a copper steam coil, through which air is forced by an electric fan, and diverted by vanes which distribute it throughout the areas to be heated. These heaters have proved quite satisfactory, and are claimed to be more economical in the use of steam than the usual direct radiation by means of radiators, and are especially suited to heating large unobstructed spaces, such as are found in shops. So far, we have no actual tests on the efficiency of these heaters, but we do know that the cost of installation is less than the usual direct radiation from radiators.

Bunk Houses.—A 2-story brick bunk house, with lunch room, reading room, shower and tub baths and sleeping accommodation for 40 men, has been provided for out of town crews. At this terminal there are quite a large number of passenger crews who arrive on trains in the forenoon and return to their home terminal in the late afternoon. This building gives them an opportunity of spending their intervening hours in comfortable and restful surroundings.



Canadian National Ry. Locomotive House, Toronto. Longitudinal section through 110 ft. stalls.

Machine Shop.—Adjoining the shop section of the locomotive house is a machine shop 160 x 80 ft., in which machines specially adapted for making running repairs to locomotives are provided. The driving wheel lathe is located just inside the locomotive house door, so that pairs of wheels are carried from the drop wheel pit to the lathe by an overhead electric travelling crane of 3-tons capacity supported on an overhead monorail. The handling of other wheels and heavy parts in the house and shop is performed by storage battery

Passenger Car Facilities.—West of Spadina Ave. and south of the locomotive tracks is a stub end yard with capacity for 256 passenger cars on tracks varying in length from 7 to 16 cars. An accompanying illustration shows a few of these tracks, with concrete platforms between each, and on which are provided the usual services, steam heat, compressed air, vacuum

cleaners, electric charging, Pintsch gas, etc. Across the ends of the tracks the commissary and car building, 386 x 50 ft., is placed, with a common roadway on the track side for delivery trucks, and platform trucks for transferring supplies to and from cars.

The south end of the building is assigned to the sleeping and dining car department, and the north end to the car repairing department. At the south end, the upper story provides sleeping quarters for the away from home sleeping and dining car employes, as well as store room for bedding and light supplies, while the ground floor is used for storing and issuing of provisions and heavier goods. Mechanical refrigeration has been provided for meats and other perishable goods.

The ground floor of the north end of the building is divided into shops for the various trades, as well as a battery charging room; the upstairs is used for offices, lunch room, lavatories, etc. A separate building, 69 x 36 ft., is located nearby for storage, washing and repairing of storm sash and window screens.

Freight Car Repairs.—At the southwest corner of the site a stub end yard for repairs of freight cars released in the terminal requiring repairs has been laid out with capacity for 176 cars. The same general layout as that used for passenger car yard has been adopted, with shops at the ends of the tracks and mill and lumber storage on the side.

Heating.—Steam for the heat required for the whole plant is supplied from the boiler room of the Toronto waterworks pumping station directly to the east of the site through a steam main 12 in. in diameter at the waterworks end, and this is distributed throughout the whole area, building connections being taken off and pressure reduced where required at each building. The main steam pipe has been acetylene welded. Bends, tees and special fittings have been fabricated, rather than using the ordinary special parts.

Lighting.—For outside lighting a flood light system has been installed which uses five 120 ft. steel towers set at points shown on the accompanying general layout plan, so that the light is distributed throughout the whole area. On these towers are mounted 4 to 7 lights, with reflectors varying from 14 to 23 in. diameter, and lamps from 780 to 1,000 watt capacity as required, the lamps in each tower being controlled by a switch at the base of the tower. With this system the yard is well lighted at all working points, and the cost of installation, maintenance and current consumed is less than that required by the very large number of small lights which would otherwise have been used, and the effect of the flood lighting is very pleasing, due to the absence of dark corners, shadows and glare.

Run-around Tracks.—Adjacent to Fleet St. a concrete wall has been built to support the embankment of the through freight run-around tracks.

The above referred to facilities were designed by the Canadian National Ry. engineering staff, to meet the railway's requirements in Toronto, and have been carried out partly by the railway's forces, and partly by contract, all under the direct supervision of the railway's engineers.

The foregoing paper was read by Mr. Wass before the Engineering Institute of Canada's Montreal Branch. Another article, describing these facilities, prepared in Canadian Railway and Marine World's office from information supplied by Mr. Wass, and containing illustrations of the commissary and car department building, the freight car shop, the passenger car shop, and the coaling plant and sand house, in addition to a general plan showing the extent of terminal development as carried out to that time, was given in Canadian Railway and Marine World for April, 1927, beginning on pg. 179.

November Transportation Events in Previous Years.

1. Great Western Ry. opened from Hamilton to Niagara. 1853.

1. Buffalo and Lake Huron Ry., connecting Buffalo, N.Y., with Great Western Ry. at Paris, Ont., opened for traffic. 1856.

2. First Canadian Pacific through passenger train left Dalhousie Square station, Montreal, for Winnipeg. 1886.

3. Steamboat Accommodation, built at Montreal, by John Molson, arrived at Quebec from Montreal in 36 hours. She was the first steamboat on the river, and burned wood. 1809.

3. Toronto, Grey & Bruce Ry. opened from Toronto to Arthur, Ont. 1871.

4. Steamship Pacific wrecked off Cape Flattery, B.C., during a storm, over 380 lives being lost. 1875.

4. Canadian Pacific Railway Co.'s Telegraph opened its first office in Winnipeg, for communication with Eastern Canada. 1885.

5. Steamship North Britain wrecked off Nova Scotia coast, with heavy loss of life. 1861.

7. Canadian Pacific Ry. transcontinental line completed by driving of last spike at Craigellachie, B.C., by Donald A. Smith, afterwards Lord Strathcona. 1885.

10. Great Western Ry. from Hamilton to Suspension Bridge, Ont., opened. 1853.

10. Steamship City of Montreal wrecked in Bay of Fundy, N.S., 33 lives being lost. 1900.

11. Sable Island, off the Nova Scotia coast, equipped with life-saving boats for the first time. 1854.

12. Great Western Ry. train robbed of $150,000 near Hamilton, Ont. 1874.

13. Opening of Grand Trunk Ry. celebrated in Montreal. 1856.

14. Railway car ferry service started between Cobourg, Ont. and Charlotte, N.Y. 1907.

15. Ship L'August wrecked on Cape Breton coast and 114 lives lost. 1761.

15. Canada Southern Ry. opened between Fort Erie and Amherstburg, Ont. 1873.

17. Grand Trunk Ry. opened from Guelph to Stratford, Ont. 1856.

18. Standard time adopted in Canada and the United States. 1883.

18. George B. Reeve appointed General Manager, Grand Trunk Ry. 1900.

19. Treaty of amity, commerce and navigation, known as Jay's Treaty, signed between Great Britain and the United States. 1794.

19. Grand Trunk Ry. opened between Montreal and Brockville, Ont. 1855.

19. Canadian Northern Ry. opened from Toronto to Parry Sound, Ont. 1906.

21. Great Western Ry. opened from Hamilton to Windsor, Ont. 1857.

22. First through freight train from Eastern Canada arrived at Port Moody, B.C. over Canadian Pacific Ry. 1885.

22. Steamboat Waubuno, owned by Great Northern Transit Co., wrecked at the Hay Stacks, a group of islands on east shore of Georgian Bay, all on board, upwards of 70 persons, being lost. 1879.

23. Railway opened from Haliburton to Lindsay, Ont. 1878.

23. Steamboat J. H. Jones wrecked in storm on Georgian Bay, Ont., 40 lives being lost. 1906.

23. Strike of street car employes at Hamilton, Ont., provoked serious rioting, necessitating calling out the militia. 1906.

24. Cape Breton extension of Intercolonial Ry. opened. 1890.

24. C. M. Hays resigned General Managership of Grand Trunk Ry. to become Vice President Southern Pacific Ry. 1901.

25. Railway opened from Montreal to Lachine, Que. 1847.

25. Grand Trunk Ry. opened for traffic from London, Ont. to Detroit. Mich. 1859.

26. Railway opened between Galt and Preston, Ont. 1855.

26. Railway from Toronto to Coboconk, Ont., opened. 1872.

27. Grand Trunk Ry. opened from Montreal to Point Levi, Que. 1854.

28. Capt. Manley, inventor of life-saving apparatus for shipwrecks, born. 1795.

28. Manitoba & Northwestern Ry. opened from Portage la Prairie to Minnedosa, Man., 78.6 miles. 1882.

28. Kingston, Ont., drydock first used. 1891.

30. First sod of Welland Canal turned by Geo. Keefer. 1824.

30. First ship, the Annie and Jane, passed through Welland Canal from Lake Ontario to Lake Erie. 1830.

30. First mail from Hongkong and other oriental points carried from Vancouver, B.C. by Canadian Pacific Ry. and transferred to Allan Line steamship at Halifax, N.S. 1892.

30. Baron Mount Stephen, first President, Canadian Pacific Ry. Co., died in England. 1921.

Freight Car Loading Performance.

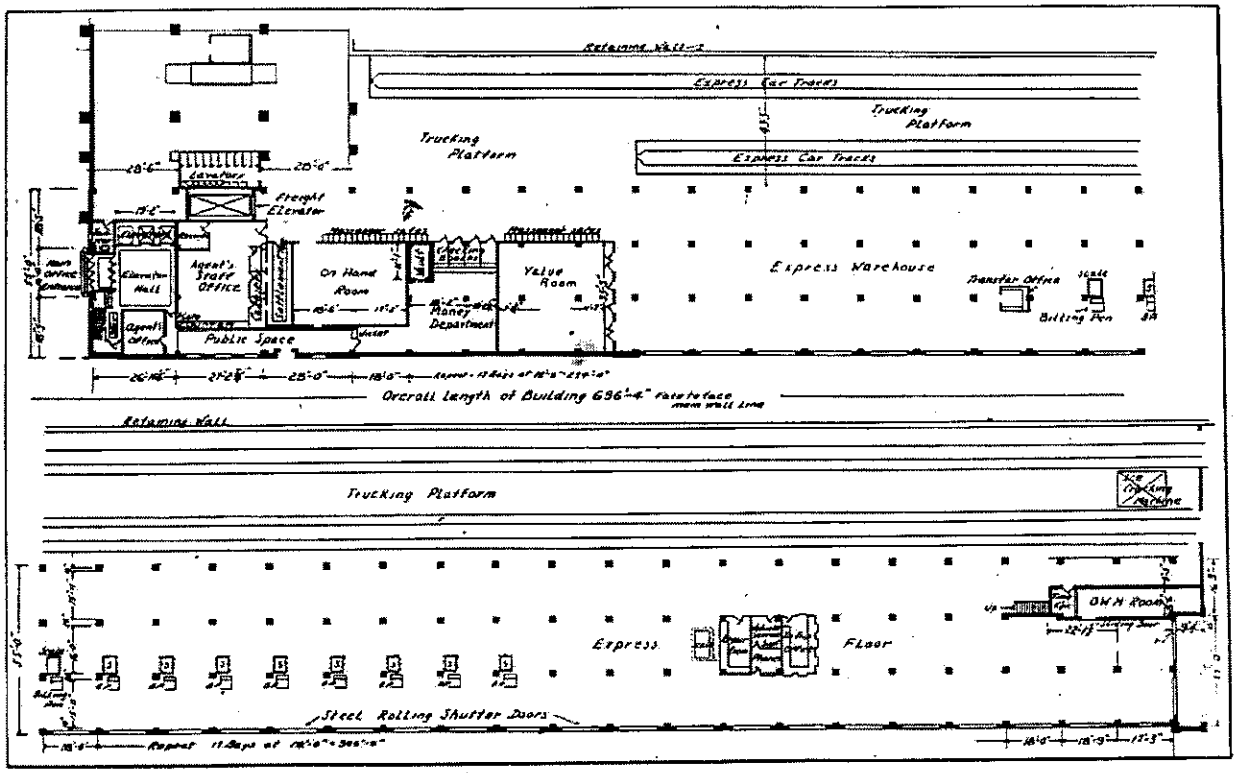
The Railway Association of Canada reports railway freight car loading in July as follows:—

Railway	Loaded car miles	Freight ton miles	Tons per car
Algoma Central	294,064	10,890,256	37.03
A. Que. & W. & Q.O.R.	78,231	1,767,464	22.59
Can. National	66,065,442	1,514,105,761	22.92
Can. Pacific	50,461,160	1,273,251,461	25.23
Michigan Central	6,874,878	94,792,342	16.14
New York Central	146,230	3,783,263	26.05
Pere Marquette	1,986,514	32,930,402	16.60
Quebec Central	348,377	7,207,556	20.69
T.H. & B.	302,225	8,335,396	27.55
T. & N.O.	1,088,835	20,925,485	19.22
Temiscouata	44,033	869,848	19.75
Total	126,688,789	2,968,860,223	23.43
Comparison:			
July, 1927	110,180,530	2,514,945,975	22.88
" 1926	110,906,208	2,525,152,432	22.77
" 1925	101,622,166	2,367,667,373	23.20
" 1924	95,184,781	2,258,410,616	23.71
" 1923	100,560,305	2,388,949,385	23.75

Alberta Coal Transportation Costs.—The Secretary of the Board of Railway Commissioners wrote the railway companies interested on Oct. 10, as follows:—"I am directed to point out that, under the provisions of order in council 439, the Board must certify to the Minister the amount over and above the rate fixed by the order in council, which the railway companies are entitled to receive as a fair compensation for the services performed in the test movement of coal, in time to enable the Minister to have an item put in his estimates; that all the interested parties have been written to requesting them to submit to the Board their detailed report of their checking of the cost of the movement during the season of 1928, but that the information has not been received, and I am directed to ask you to state when this material can be received by the Board, and to urge you to expedite the preparation of these details as much as possible. I am further directed to ask you to show cause before Oct. 20 why this matter should not be set down for hearing before the full Board at Ottawa on Nov. 6, 1928." The order in council was published in full in Canadian Railway and Marine World for April, pg. 207.

Toronto Express and Office Building, Canadian National Railway.

The combined express and office building for the Canadian National Ry. at Toronto, a preliminary description of which was given in Canadian Railway and Marine World for June, pg. 330, and the contract for the construction of which was given by Toronto Terminals Ry. Co. to P. Lyall and Sons Construction Co., Montreal, is being built on York St. opposite the new union station and south of Station St., the site including that of the former Canadian National express facilities and a portion of that of the old union station, the southerly portion of which has been demolished. The building will be four stories high, of concrete, steel, brick and stone construction, and fireproof throughout, and the express car tracks to be carried on a steel and concrete structure. The north or teamway side of the building will be equipped with large doors through which express matter will be handled; the south or track side wall will be a series of archways. As the track space will be covered, and as large doors will enclose the track space at the west end, the whole layout, including trucking platform and track space, will be heated in cold weather. The construction of the building will be such that additional stories may be added whenever it may become necessary. The building will be heated by steam, piped from the central heating plant now being constructed in the central terminal area near the Toronto waterfront, by a combination heating system, employing unit heaters in the warehouse portion of the building and steam radiators in the office portions.



Canadian National Railway Express and Office Building, Toronto, Ground Floor Layout.

On account of the extreme length of the building, 696 1/3 ft., the plan is shown in two sections, the easterly half of the building in the upper one and the westerly half in the lower one.

The exterior has been designed to harmonize with and to form a part of the new group of terminal buildings in the vicinity. The ground floor will be used for express terminal purposes, and the three upper floors for Canadian National Ry. offices. The teamway will be on Station St., and two low level tracks to be provided at the south side of the building, for spotting express cars, will descend from west to east, from the main line tracks, the latter to be elevated in accordance with the scheme of railway and street grade separation now being carried out along the Toronto waterfront.

The building will be 696 ft. 4 in. long, east and west, and 55 ft. wide, north and south, and the two tracks on which express cars will be spotted, at the south side, will be about 500 ft. long. At the south side of these tracks, a retaining wall will be built, behind which will be confined the earth fill supporting the elevated tracks, the elevated tracks directly over

Main Floor Layout.—From the main office entrance, 16 ft. wide, at the east end of the building, the vestibule will open into an elevator hall, with terazzo floor, with the passenger elevators at the south side of the hall. The stair hall and stairs will be at the north, or at the right on entering through the vestibule. The agent's office, which will have linoleum covered floor, will be to the north of, and adjoining, the elevator hall. A large office for the agent's staff will be provided, with counter and public space, cashier's wickets, and a room for records and statistical matter, arranged as shown on the accompanying floor plan. A large freight elevator will be provided at the south of the agent's staff's office, with a lavatory, having terazzo floor, adjoining. The express warehouse space proper will begin at the freight elevator, and extend to the west end of the building, with the settlement room, messenger safes, on hand room, vault, checking booths, money department room, value room, transfer office, scales, billing pens, repair room, vehicle service superintendent's office, intrip office, timekeeper's office and o.w.m. room as shown on the first floor plan. There will be linoleum covered floors in the on hand room, and in the public space and money department room. The floor in the express warehouse space will be of the wood block type, also that in the value room. The doors along the sides of the building, through which express matter will be handled, will be of lifting mill type. An ice-cracking machine will be installed at the extreme west end of the building. The express trucking platform, adjoining the tracks, will be of concrete construction

The layout of the building and tracks will be such that the top of rail of the depressed tracks on which the express cars will be spotted will be 4 ft. below the level of the first floor, while the elevated main line tracks will be at the level of the second floor, main line or station tracks nos. 1 and 2 being almost directly over the low level tracks. The

CANADIAN NATIONAL RAILWAYS

TORONTO LEASIDE YARD

Canadian Railway and Marine World

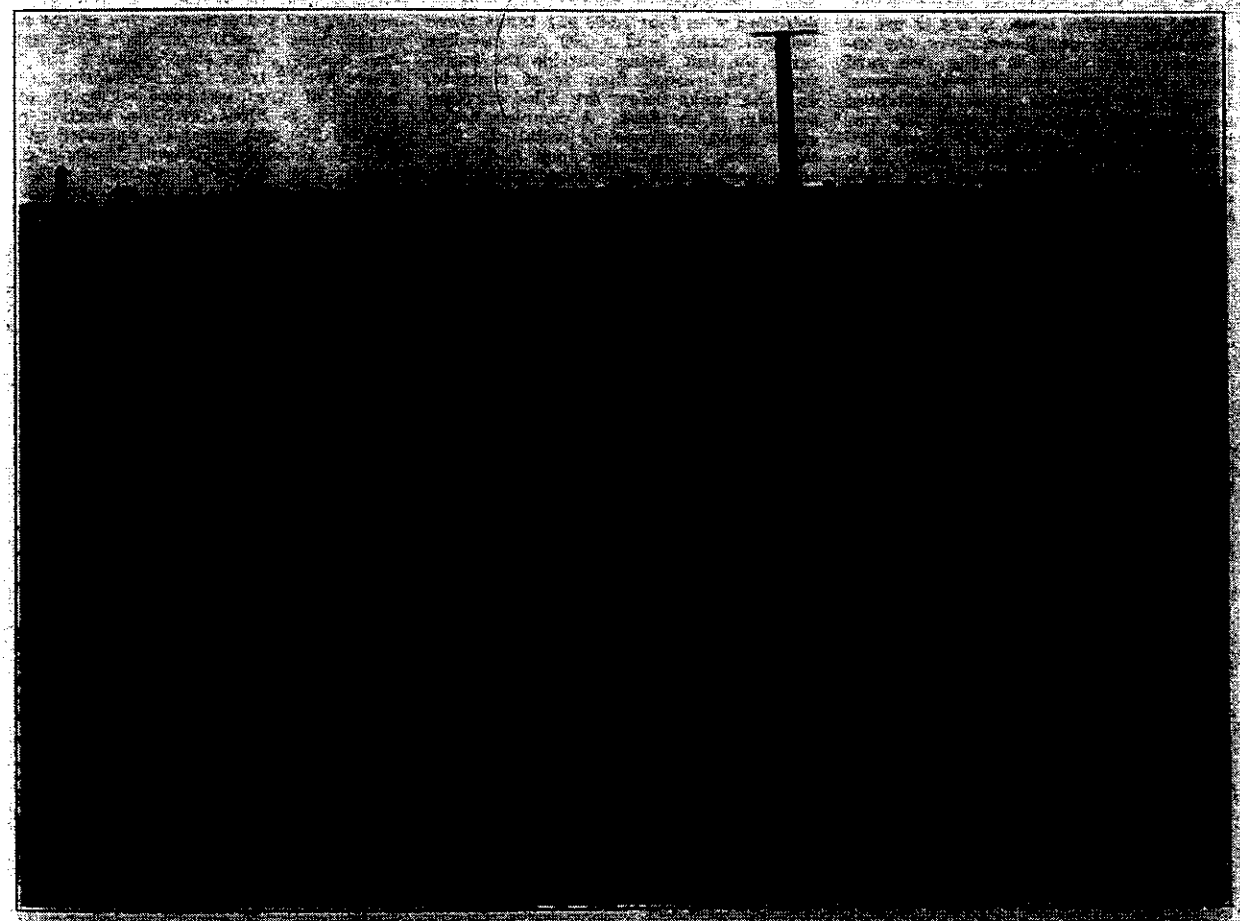
March, 1921

Leaside Shops, Canadian National Railways.

The Canadian National Rys. shops in Leaside, a town adjoining Toronto on the northeast, occupy a portion of a large area of land acquired by Canadian Northern Ry. interests in 1911, and are situated immediately north of Leaside station, C.P.R., on the latter's Toronto-Montreal line. Connection with the double track C.P.R. line is had by a track from Duncan, on the C.N.R. Toronto-Sudbury line, 11.1 miles from Toronto Union station to a point on the C.P.R. line some 1,200 yards east of the new shops. There is not as yet a connection between Leaside shops and the C.N.R. Toronto-Ottawa line, although authority has been given to build a track to connect the latter line with the C.P.R. near the same junction point as is made by the Duncan connection. The C.N.R. has running rights over the C.P.R. tracks to a point west of North Toronto station.

The general arrangement of the shops is shown by the accompanying plan. To the northwest of, and immediately adjoining the C.P.R. yards east end of the C.P.R. Leaside station, provision has been made for a 15 track freight classification yard, with capacity for over 800 cars, a feature of this yard being that the north lead will extend directly as an inward track to the locomotive house. The passenger car yard ladder track will also extend direct to the turntable, and from this track will be branch tracks to the stores platform, scrap docks, and both ends of the transfer table, while a well arranged layout of switches and cross-overs will provide for facility of movement within the yards.

A most important point in the layout of any repair shops concerns the distribution of material to all portions of them, and in this respect the Leaside shops are well planned. The main stores, and the platform adjoining, provided for the storage of castings, are convenient to the locomotive house, power house, locomotive shop, car shop and blacksmith shop, and plank flooring between the locomotive shop and stores building fits this area for the storage of wheels. Bar iron and smaller materials are stored between the blacksmith shop and locomotive shop, and the east portion of the stores platform, nearest the car shop, is utilized for storage of car parts and castings. At the north side of the car repair yard, the heavier grades of car castings are stored. There also is the lumber storage area, which parallels the track leading to the north end of the transfer table. A series of petty



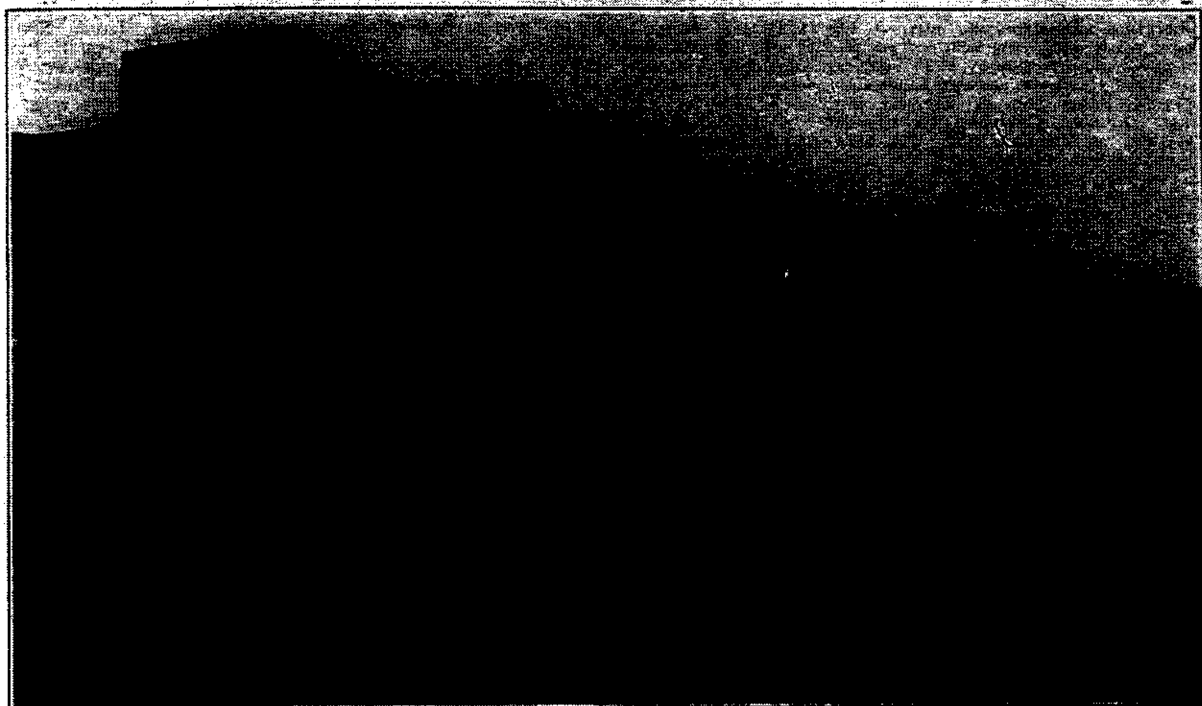
Passenger Car Shop and Transfer Table, Leaside Canadian National Railways.

[illegible] stores and tool [illegible] with the [illegible] and [illegible]

[illegible] locomotive house and [illegible] blacksmith shop, locomotive shop and passenger car shop, the two last being served by the same transfer table. There are numerous auxiliary buildings, the functions of which will be mentioned further on in this article. All buildings are equipped with steel lockers for employees use, and modern sanitary accessories.

The locomotive house, of which the first unit of 18 stalls is completed, is of solid brick construction, and concrete foundations and walls are used throughout.

tendance. It is equipped with furniture, electric heaters, etc., and a complete supply of medical and surgical necessities are kept on hand. It is the headquarters for these supplies for the Ontario District, and the first aid kits are made up here.



Locomotive Shop, London, Canadian National Railways.

[illegible] Locomotive Shop, London, Canadian National Railways.

[illegible]
Superintendent of London Shops, Canadian National Railways.

Wheel Shop, Etc.—The frame construction building shown on the plan as a wheel shop is not at present used as such. The east portion of it contains a complete waste reclaiming plant which is very efficient in operation. The west portion is used for storage of passenger car storm sash.

The ice house is of 2,000 tons capacity, but is not all being used for ice storage, a portion of it being used for storage of other material.

Additions, Enlargements, etc.—In so far as future additions and enlargements are concerned, the accompanying plan shows the ultimate capacity of the classification yard, and shows the area the locomotive house would occupy if it were enlarged to 45 stalls. The location of the proposed planing mill and freight car shop is also shown, but at the time of writing, information was not available as to when this work will be undertaken. It is expected that several of the passenger car yard tracks are to be covered. New machinery for the different shops is being received and installed from time to time, and it is [illegible] and enlargements [illegible] existing plant, to keep pace with the de-

vel roofing. The stalls are 100 ft. long, 14 ft. wide in front, and 30 ft. wide at the rear. All tracks have concrete lined pits, with end drainage, and steam heating coils at the side. The house is equipped with three drop pits, for driving, locomotive truck and tender truck wheels. A concrete floor, 20 ft. wide, extends the length of the house, adjoining the outer wall. The large windows ensure the interior being well lighted, and electric lights are used for artificial illumination. The arrangement of the lighting causes a good light to be thrown into cab interiors, a desirable feature in locomotive house work. The house is piped for compressed air, water and steam; the air compressors and water pumps being located in the boiler house, and the steam being piped from there also. A Hancock boiler testing apparatus is also being installed.

This locomotive house is not in use as a terminal for road locomotives, the only power now using it being two yard locomotives doing transfer work between Leaside and Rosedale, general switching and handling the special train for employes between Leaside and North Toronto station three times a day. It is also being used for the repair of work equipment, principally hoists and steam shovels. The C.N.R. freight and passenger locomotives running out of Toronto are being taken care of at the G.T.R. locomotive house at York, 5.44 miles from the Union Station, on the Toronto line.

The turntable, 90 ft. long, is to have an air motor installed.

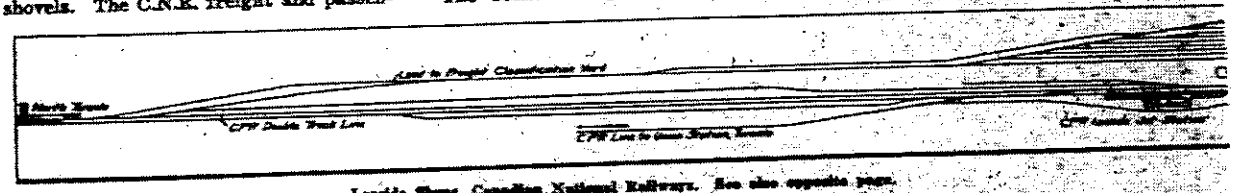
In connection with the locomotive house is a small machine shop, equipped with lathes, planer, radial drill, power hack saw, etc., all driven off a line shaft by one motor. The accompanying cross-section of the house furnishes further details of construction.

Coal, Sand, Water, etc.—The coaling plant, a Fairbanks-Morse installation, is of 200 tons capacity, of the endless chain bucket conveyor type, and electrically operated. The coal is unloaded into a hopper on the center track, there being two chutes for each track on both sides. The sand house is in connection with the coaling plant, the steam coil drying system being used. The water tank, of 60,000 gal. capacity, is of wood on concrete foundations, and the ash plant, on the north inward track, will be mechanically operated on completion.

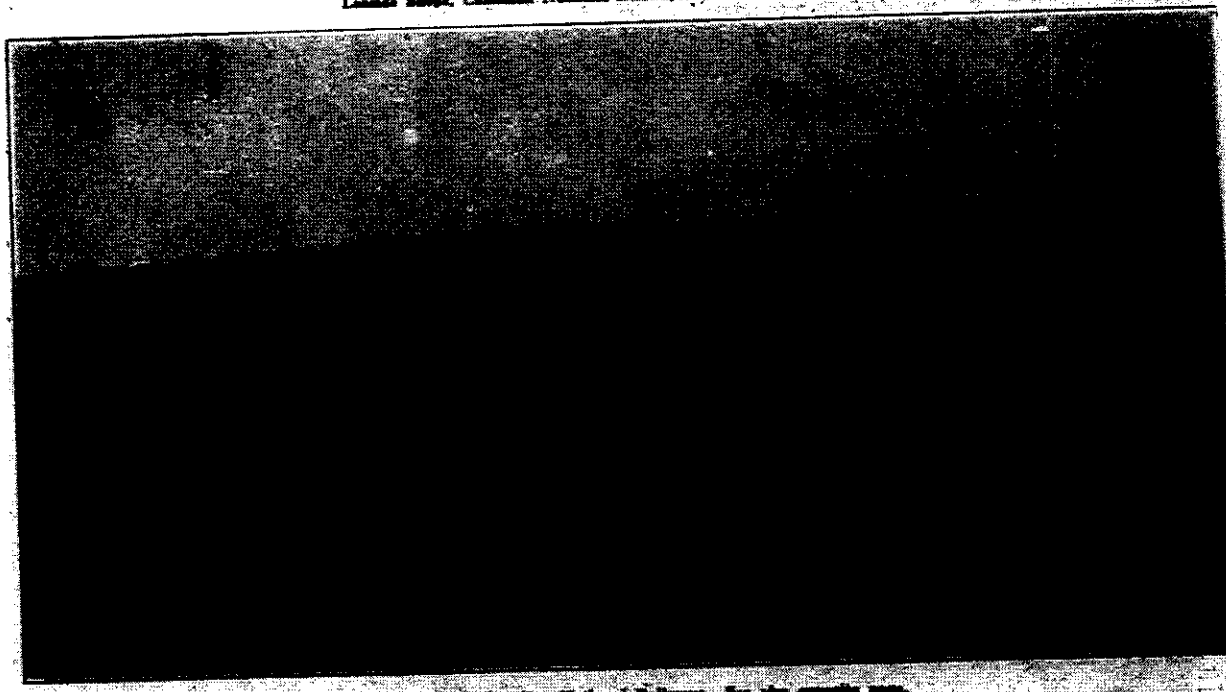
Oil Storage.—Auxiliary to the locomotive house is the oil house, also of brick on concrete foundations. It is equipped with four 1,000 gal. tanks, three 500 gal. tanks, and a 200 gal. gasoline tank, the last being outside the building. The ground floor is of concrete, and the tanks below are filled through openings in the floor. A complete set of eight Bowser pumps is installed. The tank room, beneath the floor, is of concrete construction and heated with steam coils.

The boiler and power house, of the same type of construction as the locomotive house, is equipped with four 200 h.p. Babcock & Wilcox boilers, hand fired, with coal storage at the north side. These boilers supply steam for heating the entire plant, the automatic steam trap principle being employed. The power house portion of the building is equipped with a Canadian Ingersoll-Rand compressor, and three boiler feed pumps, condenser and fire pump. Power for the entire plant is received here from the Toronto & Niagara Power Co. at 13,200 volts, and the main transformer, which is water cooled, steps it down to 550 volts, for the use of machine motors. Auxiliary transformers take the current at 550 volts, and step it down to 110 for lighting purposes. Two generators, the capacity of each being 375 k.v.a., are held in reserve. The switchboard was made by the Northern Electric Co., and the high tension instruments by the Canadian General Electric Co., the main transformer by the Maloney Electric Co., and the auxiliary transformers by the Ferranti Co.

The locomotive shop is to the north of the locomotive house, and is of transverse type, built of brick, on concrete foundations, with felt, tar and gravel roofing, and plank floor. One of the accompanying illustrations shows the general design. This shop is 300 x 151 ft. There are 12 tracks in the erecting shop portion of it, all equipped with pits, one of which is fitted with an electric pit jack of 200 tons capacity, operated by a 25 h.p. Canadian General Electric a.c. motor, and having a maximum lift of 90 in. At present, two tracks are used exclusively for tender work, which, not



Leaside Shops, Canadian National Railways. See also opposite page.



Leaside Shops, Canadian National Railways. See also opposite page.

counting the drop pit track, houses nine tracks for locomotive repairs.

The large number of windows ensures excellent lighting, and natural ventilation is by monitors. The shop is heated by steam coils, the steam being piped from the boiler house. Ventilation is provided by windows in both sides of a large hood extending the length of the

roof, these also providing an additional source of light.

In addition to the machines on the ground floor, which occupy the west half of the shop, a second floor, or gallery, extends along the west side of the shop, and on this floor are located the air brake repair department, the department for repairing injectors, lubricators and other brass parts, and the tool repair and tool making rooms.

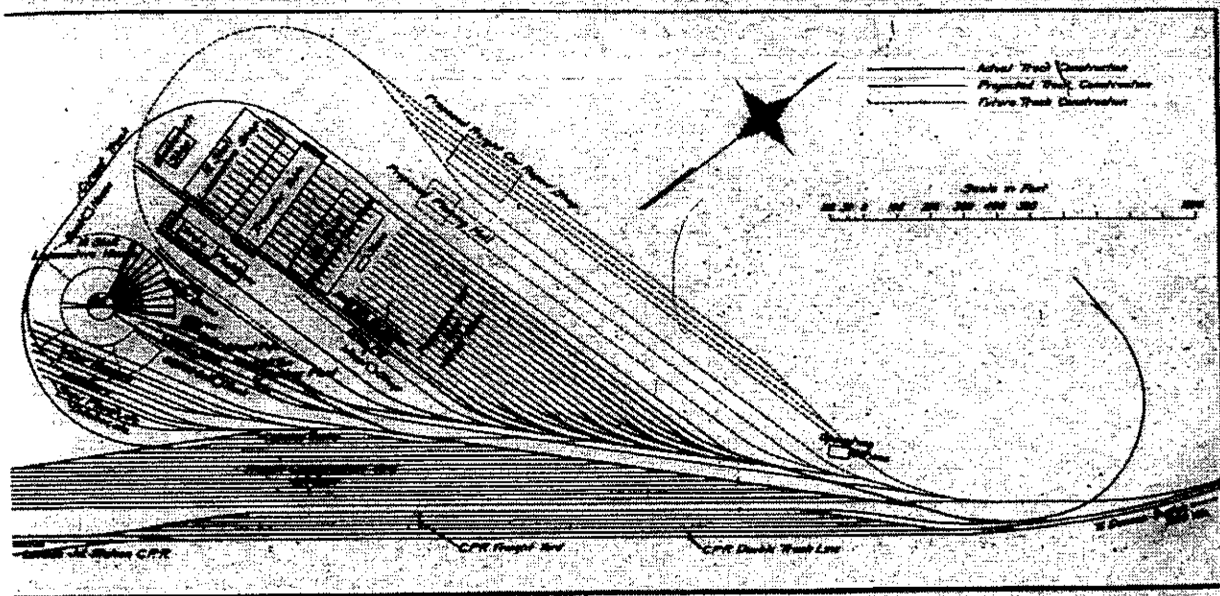
All machinery is electrically driven, the larger machines by individual motor, the smaller from a line shaft. The shop is equipped with two Northern cranes, of 10 and 25 tons capacity, the runways for which extend the total length of the shop. The average number of locomotives repaired at present is eight a month; in 1920, 97 were repaired there.

Transfer Table.—As shown by the accompanying plan, the transfer table is located to serve both the locomotive shop and the passenger car shop. It is of 80 ft. span, and operates on 5 rails laid on concrete supports. The pit is of concrete construction and 872 ft. long. The table is electrically operated, current being taken from an overhead trolley wire, supported on arms extending from poles embedded in concrete at the west side of the pit, and used with a 50 h.p. Fairbanks-Morse motor. One track at the north end, and two at the south, provide for movements on and off the table.

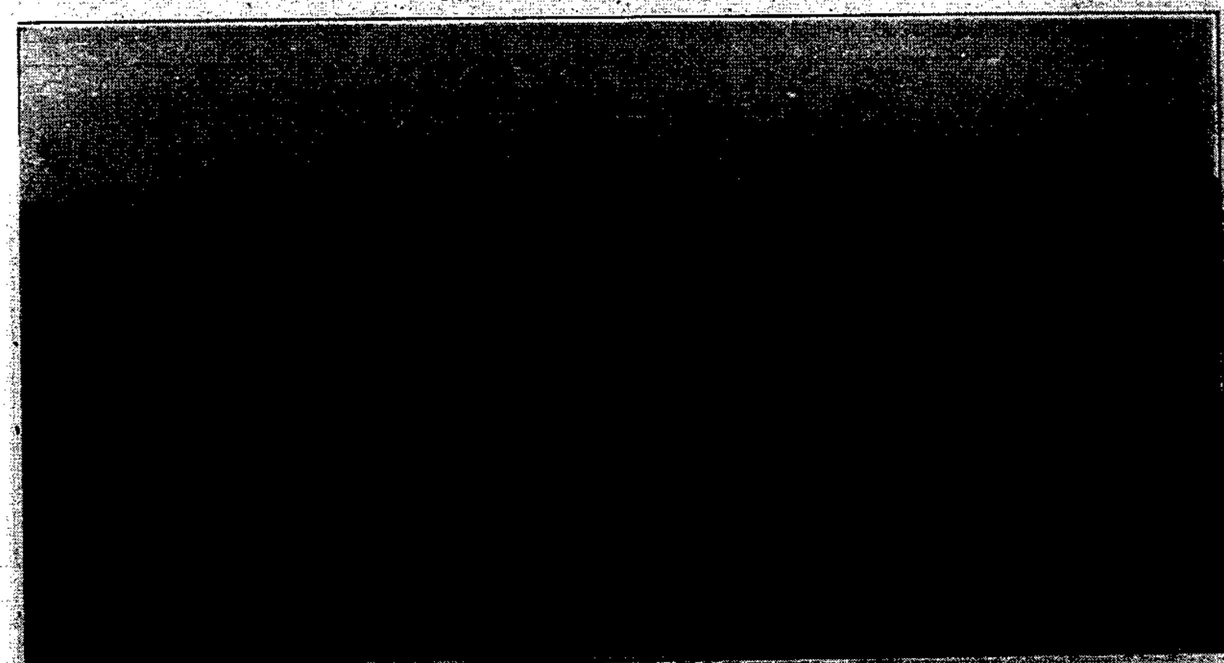
The passenger car shop, also of transverse type, and of brick on concrete foundations, is 283 x 140 ft. It has plank flooring. Ample light is furnished by large windows, and also through windows through hoods in the roof, 12 in number, which extend across the building and are located vertically over each track. Artificial illumination is by means of electricity, and heating is by steam coils, the steam being piped from the boiler house.

The shop contains 12 repair tracks, 10 of which are being used for passenger car repair work. The space for two tracks at the north end of the shop is used for a wood working plant, where benches, planers, band saws and boring machines are in operation, pending the completion of the proposed planing mill [illegible] by the [illegible].

A gallery, 25 ft. wide, access to which



Leaside Shops, Canadian National Railways. See also opposite page.



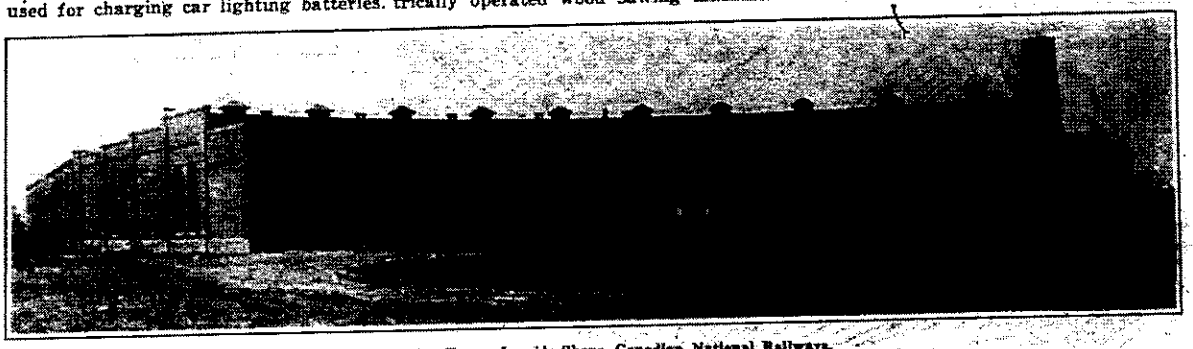
Leaside Shops, Canadian National Railways. See also opposite page.

is had by three different flights of stairs, extends across the east side of the shop. At the north end of this gallery is the pattern making shop; the next section contains the cabinet making department; then follows the upholstering department, and at the south end is the tinsmithing department.

On the ground floor, at the south end, below the gallery, is the paint shop. Also, adjoining, is a 35 k.w. Westinghouse generator, direct coupled to a 92 h.p. Lancashire motor, this set being used for charging car lighting batteries. along the same side runs a service 3-rail track, standard and narrow gauge. Another 3-rail track divides the yard transversely. For each set of two repair tracks, a longitudinal, narrow gauge, service track is provided, and at the point of intersection of these service tracks and the transverse track, small turntables are installed.

In connection with freight car repairs, the building at the north side of the yard houses a blacksmith shop, equipped with steam hammer, a pipe shop, and an electrically operated wood sawing machine. long. This platform is used for storage of castings and the heavier grades of locomotive car and track material, level with the car floor, facilitating loading and unloading of material.

Scrap Handling Facilities.—A notable feature is the scrap storage platform, adjoining the east end of the ice house. This platform is 40 x 200 ft., is equipped with a standard gauge track which runs from end to end, a track on each side, and a travelling crane to handle scrap to and from cars. This facility, in addition to taking care of scrap from

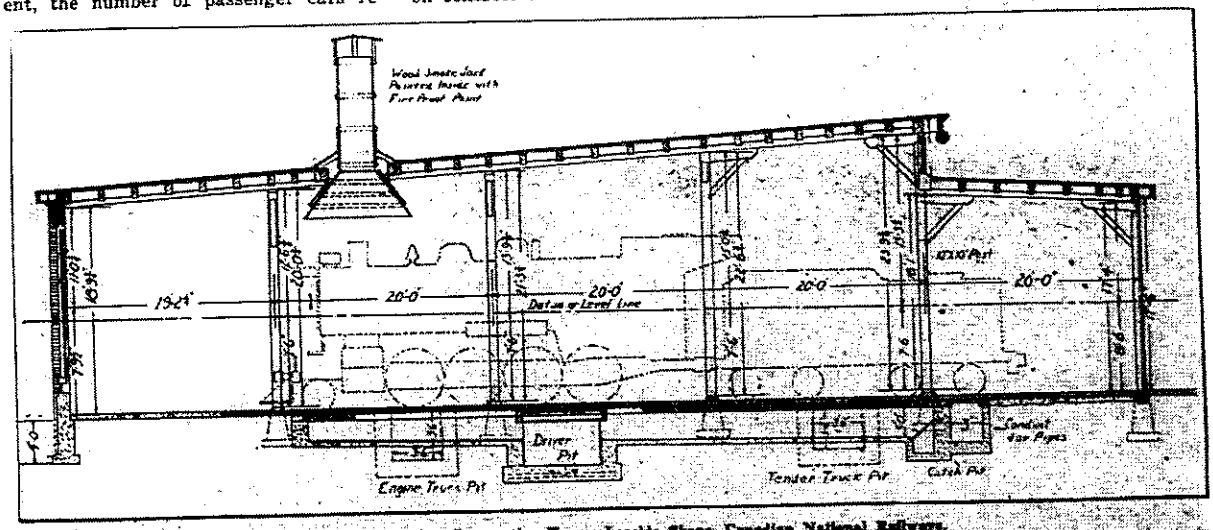


Locomotive House, Leaside Shops, Canadian National Railways.

The whole shop is so wired that batteries may be charged at any track at which a car is standing. Also, below the gallery, and at the center of the east side of the shop, is the general car foreman's office. The petty stores adjoin the office, and north of them are the quarters for pipe fitters. Modern lavatory facilities are provided at the northeast corner, on both floors, and all departments are furnished with steel lockers for employes. At present, the number of passenger cars re- Further material storage space is provided at the rear of this building. At present, about 125 cars a month are being equipped with Bradford and Universal steel draft gear, in addition to the regular repair work. Provision for a freight car repair shop and planing mill has been made as shown on the plan.

The stores department building, 60 x 180 ft., located between the locomotive house and locomotive shop, is of brick, on concrete foundations. The west end the Leaside plant, also receives and classifies the discarded material from the Ontario District lines. The crane operates on the track on the platform, and the arrangement is such that the scrap material can be unloaded, classified, and piled up, or reloaded in another car, as the case may be, in one handling.

The blacksmith shop is of the same type of construction and materials as the locomotive and passenger car shops, and lies to the west of the locomotive



Longitudinal Section, Locomotive House, Leaside Shops, Canadian National Railways.

ceiving general repairs at this shop runs from 15 to 19 a month.

Freight Car Repairs.—The yard east of the passenger car shop, shown on the plan as a passenger car yard, is being used for freight car repairs. There are 15 tracks, of which one is used for scrap, and three for storage purposes as required, the remaining 11 being used for freight car repairs continuously. The repair tracks are 20 ft. c. to c., and the yard capacity is about 280 cars.

Along the north side of the yard, lumber and heavy castings are stored, and of this building, three stories high, contains the offices. The first floor offices are occupied by the General Storekeeper and the Storekeeper, and staffs, those on the second floor by the Superintendent of Shops, and the Supervisor of Work Equipment, Ontario and Quebec lines, and staffs, and the third floor offices are occupied by the stores and mechanical accounting department staff. The east end of the building contains the stores, and adjoining it is the stores platform, which is as wide as the stores building itself, and approximately as shop, the area between the two buildings being used as a storage space for locomotive tires, castings, and heavy iron and steel material. This shop is 70 x 100 ft., is well lighted, and equipped with modern machinery. Outside the shop is a concrete oil storage tank, divided into four compartments, from which oil is forced by pumps, through pipes, to the oil fires in the shops.

The first aid building is a notable feature of the shops. It is fitted up as a combined rest room for the office staff, and a place for medical and surgical at-

GREAT NORTHERN RAILWAY VANCOUVER TERMINAL

Great Northern Railway Terminals in Vancouver.

The accompanying illustrations show the passenger and freight stations which have been completed recently in Vancouver, B.C., by the Vancouver, Victoria and Eastern Ry., a subsidiary of the Great Northern Ry., and which are being used jointly by the company last mentioned and by the Northern Pacific Ry.

The Passenger Station, which is L shaped, the main front facing west, is about 275 ft. east of Main St. As the whole property is a fill, the building is

the plastering of the end walls for placing oil paintings showing the Glacier and Yellowstone National Parks. The lighting fixtures are of special design, and are executed in plaster. Alcoves off the main waiting room are fitted with seats and tables for the public. The ticket office is in the centre of the east wall, opposite the two main entrances. There are two principal entrances to the main waiting room from the west, directly opposite to which are

[illegible]

trees.

A hundred and fifty feet east of the baggage room wing, and in a direct line

Union Passenger Station, Great Northern and Northern Pacific Railways, Vancouver, B.C.

supported on a pile foundation, cluster piles being driven and cut off below the line of perpetual saturation. Upon these, concrete piers were poured, which support reinforced concrete beams, which in turn carry the exterior walls, columns and floors. The skeleton of the building is reinforced concrete, hollow tile, and concrete floors and roof. The exterior has a granite base, carrying up and around all exterior doors terracotta surbase, and red brick above, with terracotta trimmings and cornice.

two entrances leading to a glass covered concourse, running the full length of the building, which in turn leads to 11 tracks, the platforms being covered by umbrella roofs, 780 ft. long. Off the main waiting room in the south wing are located the smoking room, which has access to the concourse, women's retiring room and lavatories. In the south wing are an immigrants' room and lavatories, but having no connection with the main waiting room. A corridor, 12 ft. wide, runs down the centre of the north wing to a

is the power house, 50 ft. x 42 ft., with a brick stack at the side and 90 ft. high. [illegible]

Freight Station, G.N.R. and N.P.R., Vancouver, B.C.

[illegible]

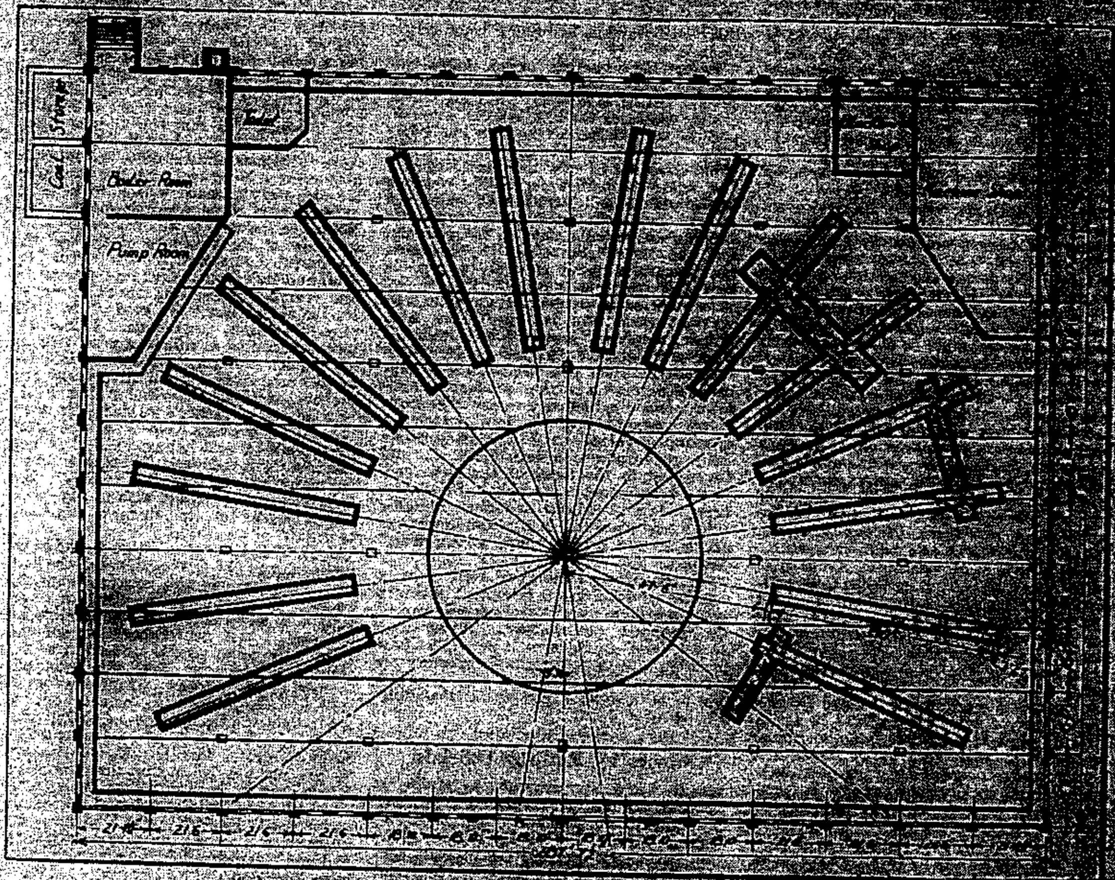
CANADIAN NATIONAL RAILWAYS

HORNRPAYNE ENCLOSED LOCOMOTIVE HOUSE

Locomotive House at Hornepayne, Canadian National [illegible]

Hornepayne is an important division point on the Canadian Northern Ry., 731 miles west of Montreal on the main transcontinental line running via Port Arthur. [illegible] Algoma Central & Hudson Bay Ry. crosses the Canadian Northern 33 miles east of Hornepayne, at Oba, and Hornepayne is almost due north of White River, on the C.P.R. main transcontinental line.

Locomotives used in transcontinental freight and passenger [illegible] winter climate [illegible] usually severe, [illegible] tained in a state of high efficiency, and as the locomotives [illegible] play [illegible]

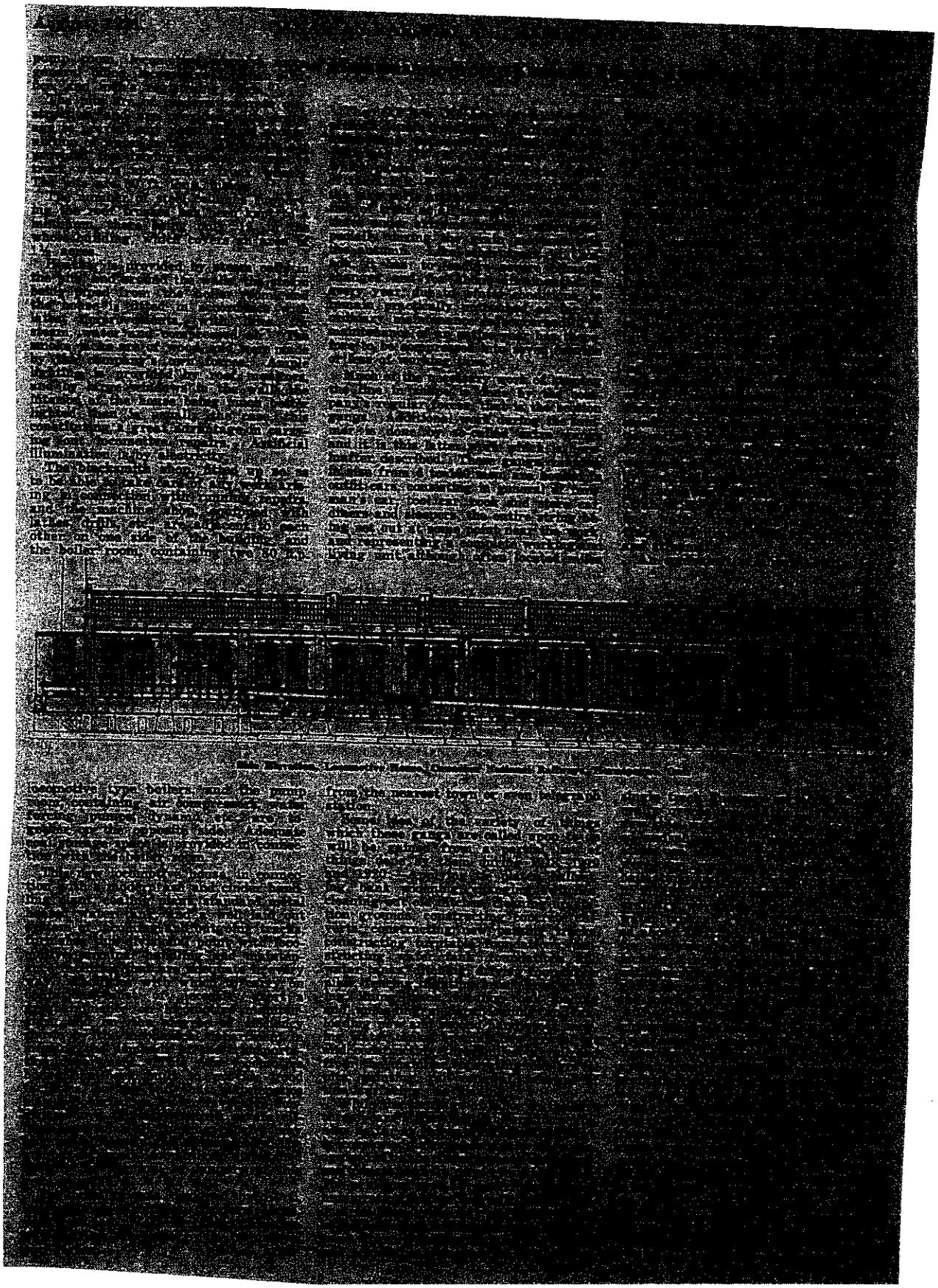


Ground plan, Locomotive House, Canadian National Railways, [illegible]

[illegible]

AUGUST 1921

August 1928



CANADIAN NATIONAL RAILWAYS

NEEBLING YARD

Neebing Terminal, Canadian National Railways.

It is axiomatic in the science of railway operation that congested and inadequate terminal facilities render impossible the handling of traffic with the maximum efficiency and economy, and, conversely, that well planned and adequate terminal facilities go a long way in promoting the variety of railroading which is successful in reducing transportation costs to the public.

Owing to the development in the western provinces and the annual increase in the acreage seeded in the prairie provinces, the traffic passing through the gateway at the head of Lake Superior has been steadily growing larger each year, with the result that railway and terminal facilities at Port Arthur and Fort William would soon be heavily taxed to properly meet the traffic requirements, particularly during the busy autumn months. In the case of the Canadian National Rys., it became evident to the management that larger and improved terminal facilities would soon be required to efficiently and expeditiously handle the heavy grain and general traffic passing through the twin ports, through which, in addition to a large westbound traffic in coal and merchandise, the great bulk of the prairie grain passes on its way to eastern and European markets. Realization of the impending need for enlarged terminal facilities resulted in the C.N.R. management undertaking the construction of a large terminal near West Fort William, location and layout plans of which are given herewith.

The Canadian National Rys. have two routes from the head of Lake Superior to western Canada. The southern route, via the original Canadian Northern line, has Port Arthur for its eastern terminus, the terminal facilities consisting of yards, locomotive maintenance facilities for somewhat more extensive locomotive repairs than those commonly classed as running repairs, a large terminal elevator, coal and ore dock, freight sheds for interchange of freight with steamship lines, and trackage serving these facilities. The northern route is by what was formerly the Grand Trunk Pacific Ry., Fort William Branch, from Fort William to Sioux Lookout on the National Transcontinental Ry., and thence via the latter railway to Winnipeg. The G.T.P. Fort William Branch had its eastern terminus, known as the [illegible] [illegible] at West Fort William [illegible]

[illegible]

tions taken by the two routes in leaving Fort William. The former Grand Trunk Pacific line from Mission terminal to Sioux Lookout is now known as the Graham Subdivision, Fort William Division, Manitoba District, Canadian National Rys., while the Canadian Northern line from Port Arthur to Atikokan, the first divisional point west of Port Arthur on the way to Winnipeg, is known as the Kashabowie Subdivision, Rainy River Division, Manitoba District, Canadian National Rys. From Mission terminal to Sioux Lookout is 189.4 miles, and from Port Arthur to Atikokan 142.6 miles. From Mission terminal to Winnipeg, via Sioux Lookout, is 441.5 miles, and from Port Arthur to Winnipeg, via Atikokan, is 438.7 miles.

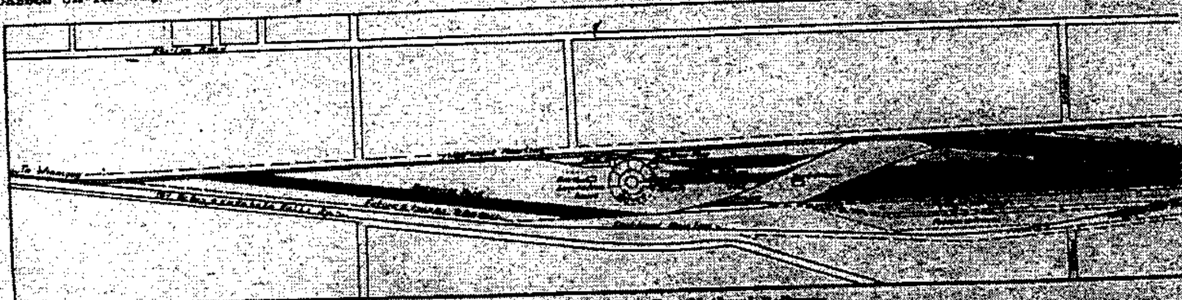
As stated in Canadian Railway and Marine World for Oct., 1922, p. 518, the Canadian National Rys. are building a line diversion on the Kashabowie Subdivision between mile 35.65 and 38.59 west of Port Arthur, and also a connection between the Graham and Kashabowie Subdivisions, the latter connection leaving the Graham Subdivision at mile 30.52 west of Fort William and entering the revised Kashabowie Subdivision line 4,589 ft. west of mile 35.65 west of Port Arthur. The connection will be 0.66 mile long, and will be carried over the Mattawin River, and the C.P.R. double track line to Winnipeg, which parallels the river between the Canadian National Graham and Kashabowie Subdivisions at that point, on a plate girder bridge, 290 ft. long. This connection is intimately related to the terminal development scheme at West Fort William, as when the connection and the terminal development are both completed, westbound traffic on the Graham Subdivision will be diverted to the Kashabowie Subdivision, via the new connection, and operated via the Kashabowie [illegible] the head of the lakes, [illegible] traffic destined for [illegible] Graham Subdivision [illegible] over the [illegible] connection [illegible]

[illegible]

to build the new terminal and the con- [illegible]

[illegible] The land secured for the new terminal, which will be known as the Neebing terminals, is [illegible] feet wide. All streets and road allowances were closed upon acquisition of the property by the railway. On the location plan the new facilities are shown at the northwest side, between the diverging [illegible] of the Canadian National Kashabowie Subdivision line with the C.P.R. double track line, and Twin City Jct., where the Canadian National Rys. North Lake Subdivision line leaves the Kashabowie Subdivision. The new terminals are shown in larger scale on the layout plan, on reference to which it will be seen that in the immediate future there will be provided an eastbound receiving yard with 8 tracks, each track having capacity for 80 cars, making a total capacity of 640 cars; an eastbound classification yard with 20 tracks, 50 to 75 cars capacity each, making the total capacity 1,250 cars, and a westbound departure yard of 13 tracks, each having capacity for 80 cars, making a total capacity of 1,040 cars. There will also be a car repair yard [illegible]

[illegible]



Layout Plan, Neebing Terminal, Canadian National Railways.

will be arranged [illegible] house will be equipped [illegible] for wheels, [illegible] and the [illegible] equipped with [illegible] tive [illegible]. [illegible] made for [illegible] for the installation of [illegible] carrying an [illegible]. It is anticipated that [illegible] their running repairs will be [illegible] due to the proximity of the [illegible] facilities at Port Arthur. The [illegible] serving the locomotive house will be [illegible] ft. long, twin span, the concrete [illegible] table pit being on piling, and the table will be operated by electric motor.

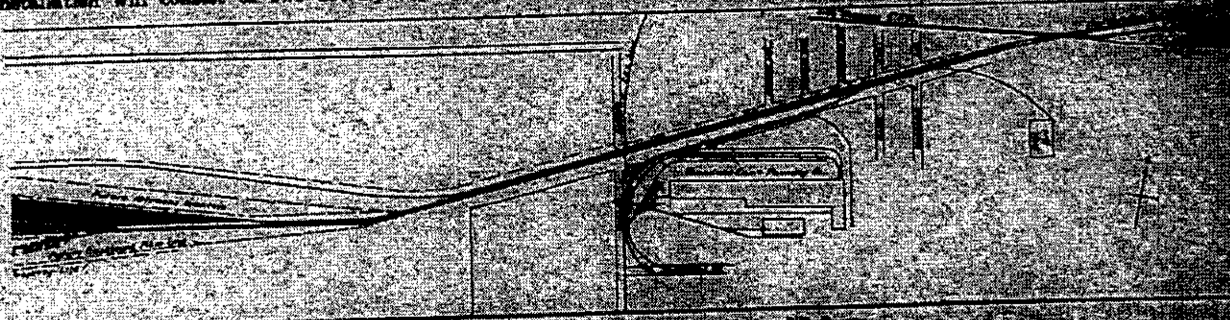
The machine shop, at the north side of the locomotive house, and connected thereto, will be of the same type of construction as the locomotive house, and will be 80 x 50 ft. It will be equipped with the usual machinery necessary for the efficient handling of running repairs, with modern sanitary arrangements, and will contain a thoroughly equipped first aid room.

The power house, of similar construction to the locomotive house, and connected thereto as shown, will be 80 x 40 ft. The boiler room portion will be 40 x 40 ft., and will have its floor depressed 5 ft. below the base of rail level in the locomotive house. The primary installation will consist of two 150-h.p.

[illegible] will also contain [illegible] room [illegible].

A bunk house, with [illegible] accommodation for [illegible] the west side of the locomotive house.

Water for the [illegible] will be supplied by the City of Fort William [illegible] water of exceptionally [illegible] supply is piped [illegible] by [illegible] long [illegible] will be [illegible] serve the locomotive [illegible] purposes, and to serve fire hydrants,



Layout Plan, Neebing Terminal, [illegible]

locomotive type boilers, and provision will be made for doubling the boiler plant capacity when necessary. The power house will have a [illegible] capacity coal hopper in the rear, served by [illegible] age as shown in the layout plan, the hopper track to be [illegible] ft. above the boiler room floor. The power house [illegible] room will be [illegible] x [illegible] ft., and the [illegible] installation will be an [illegible] air compressor of [illegible] meet the locomotive house [illegible] and other requirements. The [illegible] system for the power house [illegible] house and machine shop will [illegible] [illegible] along the walls in the locomotive house [illegible]

standpipes, [illegible]

[illegible]

Neebing Terminal, Canadian National Railways.

It is axiomatic in the science of railway operation that congested and inadequate terminal facilities render impossible the handling of traffic with the maximum efficiency and economy, and, conversely, that well planned and adequate terminal facilities go a long way in promoting the variety of railroading which is successful in reducing transportation costs to the public.

Owing to the development in the western provinces and the annual increase in the acreage seeded in the prairie provinces, the traffic passing through the gateway at the head of Lake Superior has been steadily growing larger each year, with the result that railway and terminal facilities at Port Arthur and Fort William would soon be heavily taxed to properly meet the traffic requirements, particularly during the busy autumn months. In the case of the Canadian National Rys., it became evident to the management that larger and improved terminal facilities would soon be required to efficiently and expeditiously handle the heavy grain and general traffic passing through the twin ports, through which, in addition to a large westbound traffic in coal and merchandise, the great bulk of the prairie grain passes on its way to eastern and European markets. Realization of the impending need for enlarged terminal facilities resulted in the C.N.R. management undertaking the construction of a large terminal near West Fort William, location and layout plans of which are given herewith.

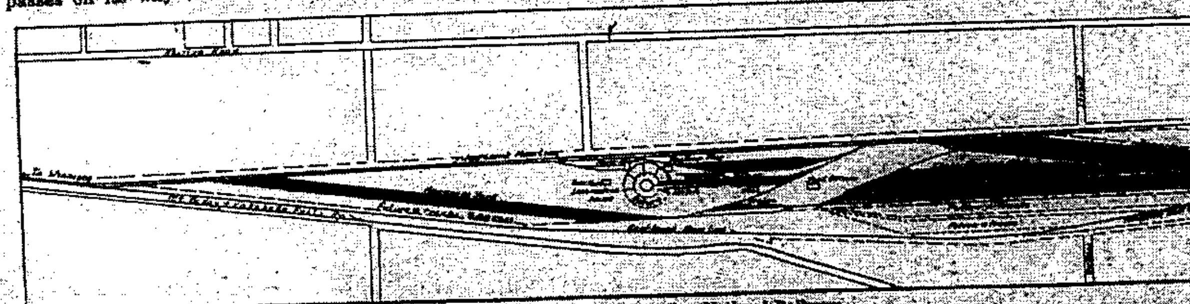
The Canadian National Rys. have two routes from the head of Lake Superior to western Canada. The southern route, via the original Canadian Northern line, has Port Arthur for its eastern terminus, the terminal facilities consisting of yards, locomotive maintenance facilities for somewhat more extensive locomotive repairs than those commonly classed as running repairs, a large terminal elevator, coal and ore dock, freight sheds for interchange of freight with steamship lines, and trackage serving these facilities. The northern route is by what was formerly the Grand Trunk Pacific Ry., Fort William Branch, from Fort William to Sioux Lookout on the National Transcontinental Ry., and thence via the latter railway to Winnipeg. This G.T.P. Fort William Branch has its eastern terminus, known as the Mission terminal, at West Fort William, [illegible] tions taken by the two routes in leaving Fort William. The former Grand Trunk Pacific line from Mission terminal to Sioux Lookout is now known as the Graham Subdivision, Fort William Division, Manitoba District, Canadian National Rys., while the Canadian Northern line from Port Arthur to Atikokan, the first divisional point west of Port Arthur on the way to Winnipeg, is known as the Kashabowie Subdivision, Rainy River Division, Manitoba District, Canadian National Rys. From Mission terminal to Sioux Lookout is 189.4 miles, and from Port Arthur to Atikokan 142.6 miles. From Mission terminal to Winnipeg, via Sioux Lookout, is 441.5 miles, and from Port Arthur to Winnipeg, via Atikokan, is 438.7 miles.

As stated in Canadian Railway and Marine World for Oct., 1922, p. 516, the Canadian National Rys. are building a line diversion on the Kashabowie Subdivision between mile 35.65 and 38.59 west of Port Arthur, and also a connection between the Graham and Kashabowie Subdivisions, the latter connection leaving the Graham Subdivision at mile 30.52 west of Fort William and entering the revised Kashabowie Subdivision line 4,589 ft. west of mile 35.65 west of Port Arthur. The connection will be 0.66 mile long, and will be carried over the Mattawin River, and the C.P.R. double track line to Winnipeg, which parallels the river between the Canadian National Graham and Kashabowie Subdivisions at that point, on a plate girder bridge 700 ft. long. This connection is intimately related to the terminal development scheme at West Fort William, as, when the connection and the terminal development are both completed, eastbound traffic on the Graham Subdivision will be diverted to the Kashabowie Subdivision, via the new connection, and operated via the Kashabowie Subdivision to the head of the lakes, while westbound traffic destined for movement via the Graham Subdivision will be operated over the Kashabowie Subdivision to the connection. The Graham [illegible] mileage between Fort William and the point of the new connection [illegible] which are several temporary [illegible] will be abandoned.

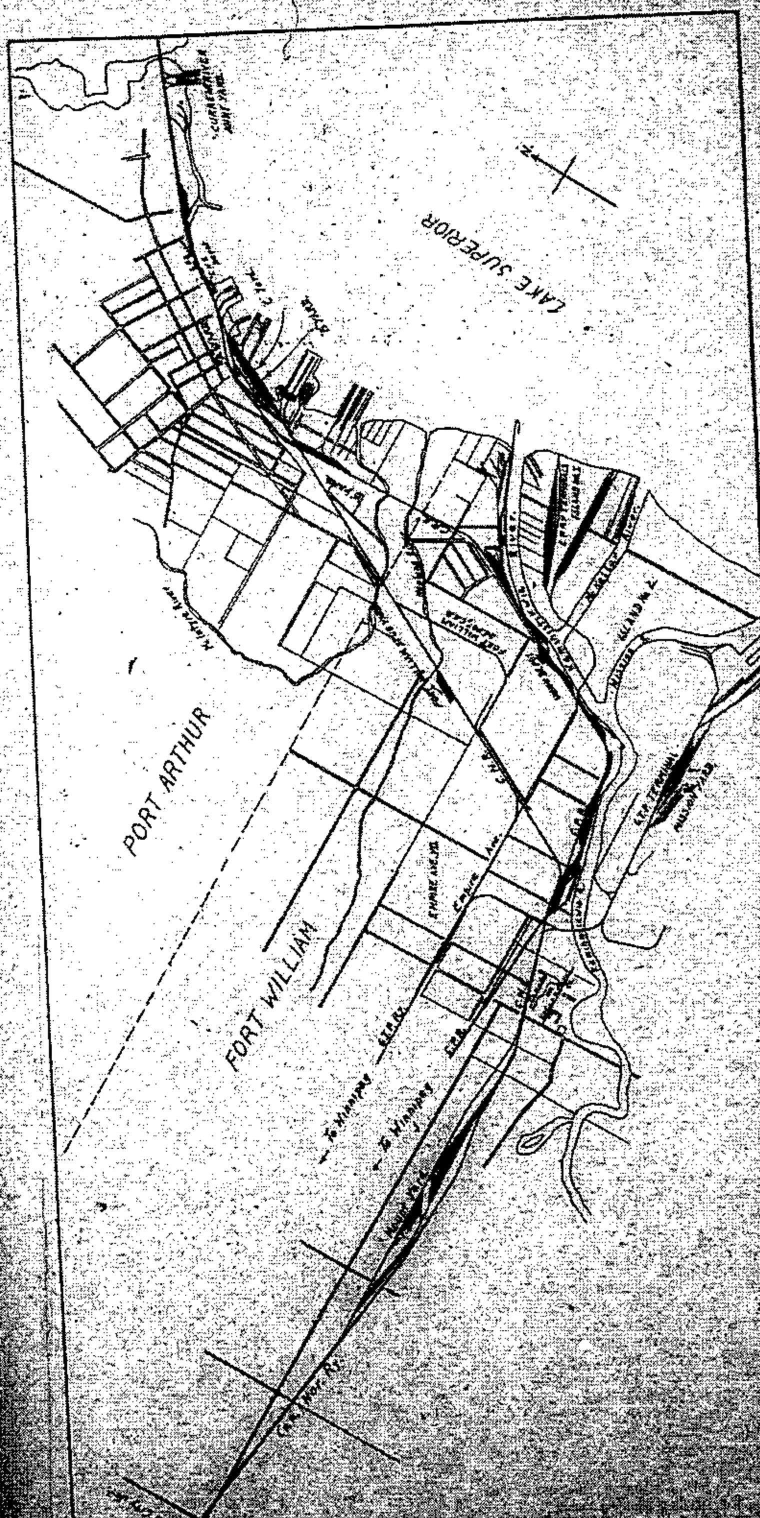
The two [illegible] by the original Canadian Northern [illegible] [illegible]

to build the new terminal and the connection as outlined above, and it is felt that this disposition of the problem will result in future traffic being handled with maximum efficiency and economy.

The land secured for the new facilities, which will be known as the Neebing terminals, is in Neebing Township, the area being about 3 miles long and ¼ mile wide. All street and road allowances were closed upon acquisition of the property by the railway. On the location plan the new facilities are shown at the northwest side, between the diamond crossing made by the intersection of the Canadian National Kashabowie Subdivision line with the C.P.R. double track line, and Twin City Jct., where the Canadian National Rys. North Lake Subdivision line leaves the Kashabowie Subdivision. The new terminals are shown in larger scale on the layout plan, on reference to which it will be seen that in the immediate future there will be provided an eastbound receiving yard with 8 tracks, each track having capacity for 80 cars, making a total capacity of 640 cars; an eastbound classification yard with 20 tracks, 50 to 75 cars capacity each, making the total capacity 1,250 cars, and a westbound departure yard of 13 tracks, each having capacity for 80 cars, making a total capacity of 1,040 cars. There will also be a car repair yard with 5 tracks, and a total capacity of 195 cars, so that the total standing capacity of the yardage to be constructed immediately will be a little over 3,000 cars. Provision for future extension of the yard facilities is shown in the layout plan. [illegible]



Layout Plan, Neebing Terminal, Canadian National Railways.



Location Plan, Neebing Terminal, Canadian National Railways.

motives will be handled by the locomotive terminal facilities at Port Arthur. Fast freight trains will be handled at Port Arthur, as will also the way freights, and the locomotives for these trains will be handled at the Port Arthur locomotive house. The locomotive terminal facilities at Mission terminal will be abandoned, and the equipment transferred to the new locomotive house, machine shop and power house. The present yards at Mission terminal and Port Arthur will remain practically as they are, for handling business at these points.

The location plan shows clearly the relationship of the new terminals to those existing at Port Arthur and Fort William, and the strategic location obtained for the new facilities is evident. It is also evident that the new yards will round out the terminal system, and by serving as a large primary classification area for cars destined for the numerous elevators along the water front, for those containing freight other than grain for lake furtherance, and for those for industrial tracks in Port Arthur and Fort William, will create smooth and efficient handling of eastbound traffic. Similarly, for westbound traffic, the new terminal will serve as a large final classification area for empty cars, and cars containing coal and other freight from lake steamships, which moves through these ports in large volume. The construction of these large yards, together with the provision of adequate locomotive handling facilities, constitutes an assurance that the rapidly growing traffic through Fort William and Port Arthur will not bring about a state of terminal congestion, and is thus an assurance that the inefficiency and expensiveness invariably caused by terminal congestion will be avoided.

As stated above, the construction of these terminal facilities is directly corelated to the building of the cut-off connecting the Graham and Kashabowie Subdivisions, and it is evident that this work, which will obviate the necessity for operating the portion of the Graham Subdivision to be abandoned, and which will consolidate the terminal handling work for both the southern and northern routes, will produce important operating economies. The co-ordination of [illegible] terminal facilities, which [illegible] originally to operate [illegible] constitutes a problem, which [illegible] solution in the very [illegible] but there can be [illegible] tion worked out [illegible]

[illegible]

CANADIAN PACIFIC RAILWAY

VANCOUVER TUNNEL

Vancouver Tunnel, Canadian Pacific Railway.

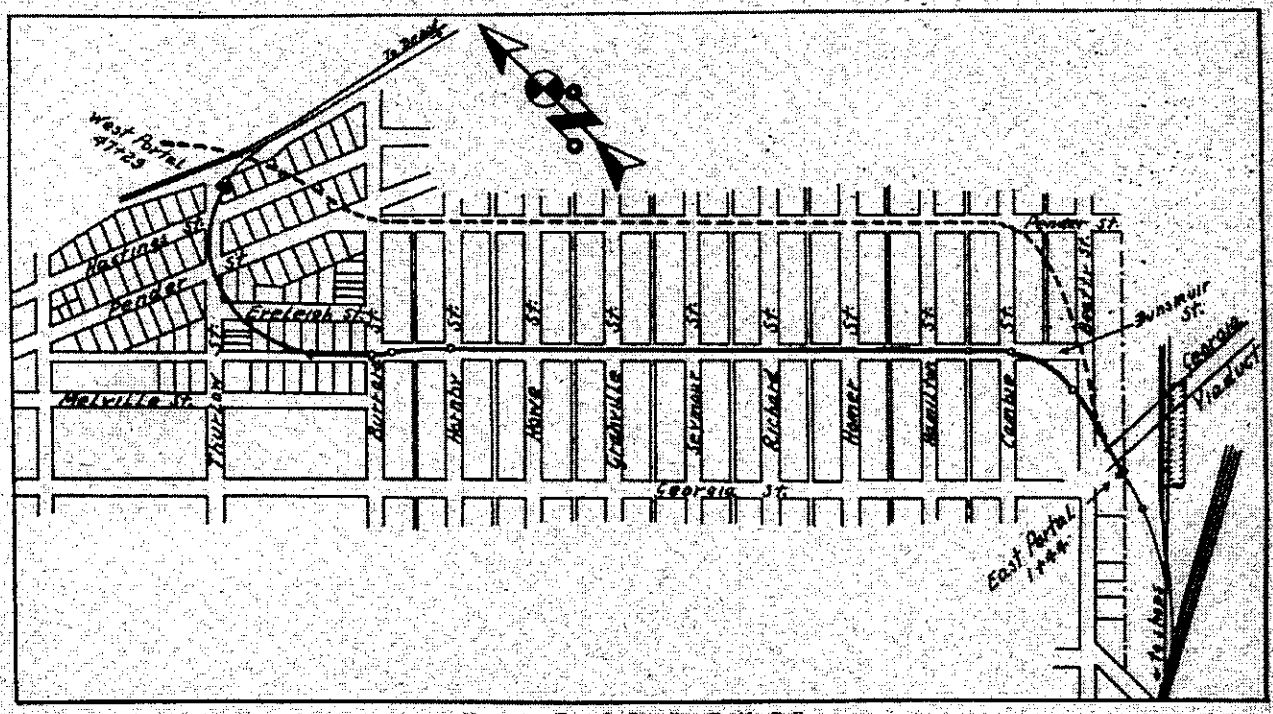
The tunnel completed recently at Vancouver, by Canadian Pacific Ry., was built as a diversion of the English Bay Branch, which connects the front yard along Burrard Inlet with the False Creek yard, the latter containing the freight sheds, shops, locomotive house, stores, and other terminal facilities. The motive for the diversion was the elimination of crossing at grade over seven busy streets, Alexander, Columbia, Powell, Cordova, Carrall, Hastings and Pender.

The first survey for a feasible route, with an estimate of cost of same, was made by the Canadian Pacific in Aug., 1911. The proposed route was for a double track tunnel, starting from the front yard, near the end of Thurlow St., passing along under the center of Pender St. and emerging in False Creek yard at the west end of the Georgia St. viaduct. The discussion of these plans between the C.P.R. and the City of Vancouver developed a number of difficulties which made it apparent that a further investigation would be necessary. It was finally agreed between the C.P.R. and the city to have an engineer, not connected with either, make a thorough investigation into grade crossing elimination. His recommendation was for a single track tunnel starting from the front yard at the end of Thurlow St., passing along under the center line of Dunsmuir St. and emerging in False Creek yard at the west end of Georgia St. viaduct. This recommendation proved satisfactory to the C.P.R. and the city and was approved by the Board of Railway Commissioners, the order issued by which authorized the C.P.R. to complete the work in 15 months.

In order to determine the nature of the material that would be encountered, the C.P.R. had 10 diamond drill borings made at intervals along the route, cores being taken out, and seven of the holes cased well down into the tunnel section. The other three holes, being merely to determine the rock surface, were not cased. The cased holes were located accurately with reference to the street lines and, as the work progressed, were used as a check on the alignment within the tunnel by lowering a plumbline to the floor.

On Oct. 23, 1930, contractors were invited to submit tenders for the construction of a single track tunnel, 4,600 ft. long, to be concrete lined throughout. The widths between walls specified were:—on tangents, 16 ft.; on curves to 4°30'—17½ ft., on sharper curves, 19 ft., with the standard height of 22½ ft., the concrete lining to be 2 ft. thick in walls and arch, plain through rock sections, and reinforced with 45 lb. rails at 2 ft. centers through earth sections. Ten contractors submitted tenders, the Northern Construction Co. and J. W. Stewart, Limited, of Vancouver, being awarded the contract, and allowed 18 months to complete the work. They chose to drive the entire tunnel from the False Creek yard end, and started erecting their buildings there on Jan. 5, 1931, the buildings consisting of a compressor room and machine shop, a tool shed, a dry shed, a blacksmith shop, contractors' office and C.P.R. Engineer's office. Excavation was started on Jan. 13, with a caterpillar mounted Diesel operated shovel. The face of the hillside was squared up, and an open cut made sufficient for the portal, 25 ft. in length, to be built. The material was all earth and compacted clay, which was dug without the use of explosives. The excavation for the portal was completed Jan. 26.

The forming for the portal, a section 25 ft. long, was all done in the open and concrete was poured on Feb. 4. Tunnelling was started Feb. 10. Two wall plate drifts, 5 x 6 ft., were started with their floors at the spring line. The earth was broken loose, with air spades or chisels, wheeled to the entrance of the drifts and dumped over the face. When the drifts were excavated to a length of 20 ft. a wall plate 12 in. x 12 in. x 20 ft. was placed. The engineers gave line and grade at the inner end of each wall plate. The wall plates were wedged securely in position. The inner faces of the plates are the outer surface of the concrete lining. As soon as a plate on each side was set, the excavation of the remainder of the heading above the spring line was started. As the excavation advanced a seven segment arch of 8 x 8 in. timber, set close, was erected. All the spaces between the outer surface of the timber segments and the unexcavated surface were driven full of blocks or wedges of wood. When the drifts and heading had advanced 160 ft., the excavation of the bench, i.e., all the tunnel section below the spring line, was commenced. As the bench excavation advanced, 10 x 12 in. posts were set under the wall plates at 4½ ft. centers and supported on mud sills at grade firmly wedged. The spoil was loaded by an electric mine mucking machine into two cubic yard all steel dump cars, hauled to the portal by storage battery locomotives and dumped over the side of a high trestle. The first 535 ft. of the tunnel was all earth, driven without the use of any explosives, and in the general manner described



Vancouver Tunnel, Canadian Pacific Railway.

Broken line, practically along Pender St., shows location of tunnel as projected originally; solid line, practically along Dunsmuir St., shows location as built.

above. At the point argillaceous shale rock was encountered on the floor and rose rapidly until the whole tunnel section was rock. The air spades or chisels were then changed for augurs. In each wall plate drift 12 or 13 holes were bored, 6 ft. to 8 ft. deep. In the balance of the heading eight to 10 holes were bored the same depth, and in the bench 20 to 22 holes were bored 10 to 12 ft. deep.

On July 2 the mine mucking machine was taken out and an air operated shovel, with a one cubic yard dipper, was put on. The shovel worked the bench to a vertical face, which necessitated other changes in the working system. For the working of the drifts and heading, a platform, 12 ft. long, was built between the wall plates. Holes were bored in the faces of the wall plates, into which were inserted short lengths of 2 in. pipe supporting the platform. As the heading advanced the platform was moved forward. On each side of the platform, 2 ft. from the wall plate, an air drum with steel cable, was placed. Slip scrapers were introduced to haul the muck out of the drifts. The men pulled the scrapers into the drifts by hand, and the air operated drums hauled them out to the face of the bench over which they were dumped. The platform served to store tools and segment timber. It was also used by the engineers to give line and grade at the inner end of the drifts.

In order to limit as far as possible annoyance by the blasting, shooting was prohibited between 23 o'clock and 8 o'clock. The work was carried on in three shifts per day, from midnight Sunday to midnight Saturday. The drifts and heading were shot at 8, 12, 16 and 23 o'clock, and the bench at 8 and 16 o'clock. All dynamite used was 40% and fired by fuse. The amount of dynamite used per hole of drifts and heading was seven sticks. The shooting in the drifts and heading caused practically all the vibration noticeable on the surface and adjacent buildings, the most noticeable being when more than one shot would go together. The shooting of the bench with 11 sticks per hole caused very slight vibration. The powder fumes were drawn out through a 24 in. wire wound wooden pipe, by a fan located at the portal. The pipe was hung on the wall about 10 ft. above grade. Ten minutes after shooting the workmen could return to the face. As soon as the fumes were gone the damper system in the pipe was reversed and fresh air blown in through the pipe. Well in advance of the shooting in the tunnel, about two city blocks, two men, one from the C.P.R. and one from the city, made a thorough inspection of all buildings along the route and for at least a block on each side. Notes and sketches were made of all defects in the buildings, so that if any claims were made for damages it could be determined whether they were new defects.

Vancouver Tunnel. Air shovel used for mucking, and small cars into which muck was dumped.

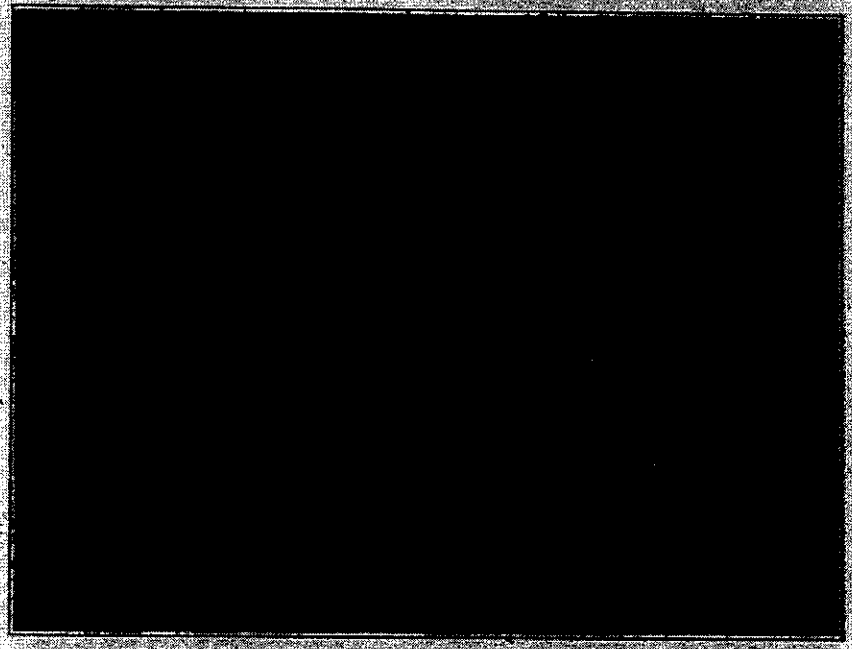
Vancouver Tunnel. Heading, with shovel moved away so that photograph could be taken. At the top on either side are shown the drifts which were carried ahead for the wall plates.

From the point at which rock was first encountered, to the front yard end, the tunnel is all in rock, either shale or sandstone. The depth from the street level to the outer surface of the concrete arch is from 20 to 60 ft. Through practically all the rock section the cover is about half rock and half earth. The same system of timbering as described for the earth section obtained throughout. The average rate of progress through the rock section was 16 ft. per day.

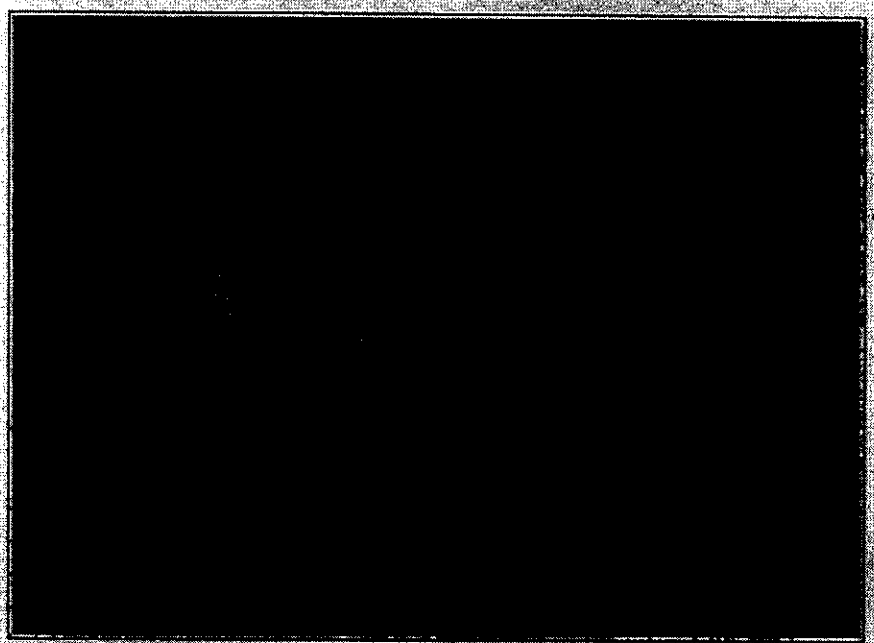
In advance of the concrete lining, inch boards were spiked to the inner faces of the wall posts, up to 2 ft. below the wall plates. The spaces between the posts and outside of them were filled with tunnel spoil. A concrete footing was also poured, 2½ ft. wide and to the level of subgrade. In the footings were inserted 16-in. lengths of 45 lb. railway rails at 3½ ft. centers and projecting 8 in. out of the concrete. They were put in to increase the bond and strength between the footings and the side walls when the latter were poured. Six inches of the footings projected inside the inner surface of the concrete walls. The side walls of the concrete lining form rested on the 6 in. projections when in position for pouring. The form was a wooden structure 52 ft. long and permitted a 50-ft. length of tunnel to be concreted when set in position. The form was collapsible, so that it could be withdrawn from the concrete and moved ahead. Each side wall could be extended or withdrawn 6 in. by a number of heavy bolts top and bottom working

through channels. The stadding moved in or out in slots in sill timbers. When extended they were held in position by hardwood wedges driven into the slots. The arch section of the form was 4 x 6 in. lagging on steel ribs; the structure was carried on jacks and could be raised or lowered 6 in. When in position it was also supported on hardwood wedges driven between it and the wall section. The whole form was moved forward on a system of wheels running on rails supported on 12 x 12 in. timbers outset 4 ft. on each side of center line.

The concreting was started when the tunnel excavation had advanced about 300 ft. It was carried forward as the excavation advanced, and at about the above mentioned distance behind the excavation. The concreting was all done on the shift starting at midnight. At that time all the muck from the 16 o'clock shooting was cleaned out, so the locomotives and cars were available for concreting. All the concrete was taken to the tunnel, ready mixed, in 2½ cubic yard dump trucks. It was dumped into a hopper, holding two truck loads, over the portal. From the hopper it was trapped through a chute in the top of the tunnel lining into the truck cars within the tunnel. A storage battery electric locomotive hauled the cars to the working point, where they were dumped into a hopper holding two cars. From the hopper the concrete was discharged on to an electric driven belt conveyor and discharged into a hopper over a Webb concrete gun of half a cubic yard capacity. The gun discharged the concrete through a 6 in. steel pipe, set at an angle of 45 degrees to the horizontal, and along a horizontal pipe hung 12 in. below the center segment timber, to within 14 ft. of the inner end of the lining form. In that initial position the gun would continue discharging at the rate of about 45 cubic yards an hour, until the concrete commenced to choke the end of the discharge pipe. Usually about 200 cubic yards could be discharged before that occurred. At that stage the hopper, gun and trestle carrying the discharge pipe, which were built as a unit, on wheels running on a track similar to the form, were moved forward by a locomotive pulling on a table through sheave for a distance of 12 ft. That process was repeated until the end of the discharge pipe reached the bulkhead, and then the form was blown full. During the pouring of the concrete, two air hammers were continually at work, hammering the outside of the lagging as the concrete built up within. That produced a smooth surface without any pebbles showing. Twenty-four hours were allowed from the completion of a section until starting to loosen up the form preparatory to moving it forward.



Vancouver Tunnel. Cement gun in left foreground, with pipe in position for filling the form which had not then been bulkheaded, so that the space between the form and the timbering in which the concrete lining was placed can be seen clearly. The concrete lining is 2 ft. thick.



Completed Vancouver tunnel, at a point under Burrard St., on the day it was opened for service.

At 25-ft. intervals along the walls there are weep holes 4 in. wide, 12 in. high, set 12 in. above the level of the footing. From footing to footing across the tunnel there are reinforced concrete struts, 3 ft. by 2 ft. deep in the earth section, and 2 ft. by 1 ft. in the rock section.

The contents of a typical cubic yard of the concrete used was:—fine sand wet, 232 lb.; coarse sand wet, 1,160 lb.; pea gravel wet, 556 lb.; coarse gravel wet, 1,292 lb.; cement, 255 lb.; water, 108 lb.; total, 3,603 lb. per cubic yard. This gave a concrete with an average compressive strength of 1,650 lb. at seven days, and 2,750 lb. at 28 days.

Four refuge bays were built into the north wall, into which the trackmen can place their handcar while engaged in track work. There will be a telephone in each bay, connected with the yard office.

The earth section is drained to the False Creek portal by two perforated corrugated 12 in. steel pipes, laid 2 ft. from the footings and under the struts. The rock section is drained to the front yard portal by two 8 in. vitrified pipes placed similarly. Over these, to the level of the struts, and the whole area between the footings, coarse washed gravel and broken stone is spread ensuring free drainage. Above the level of the struts there is a standard ballast section of broken stone. The track is 100 lb. rail, laid on creosoted ties fully tie-plated.

For all the excavation, concreting and track work the tunnel was electric lighted. For the excavation there were two 1000-watt flood lights bracketed on the wall points about 50 ft. from the bench. For all the other work 75-watt lights were strung along the tunnel at

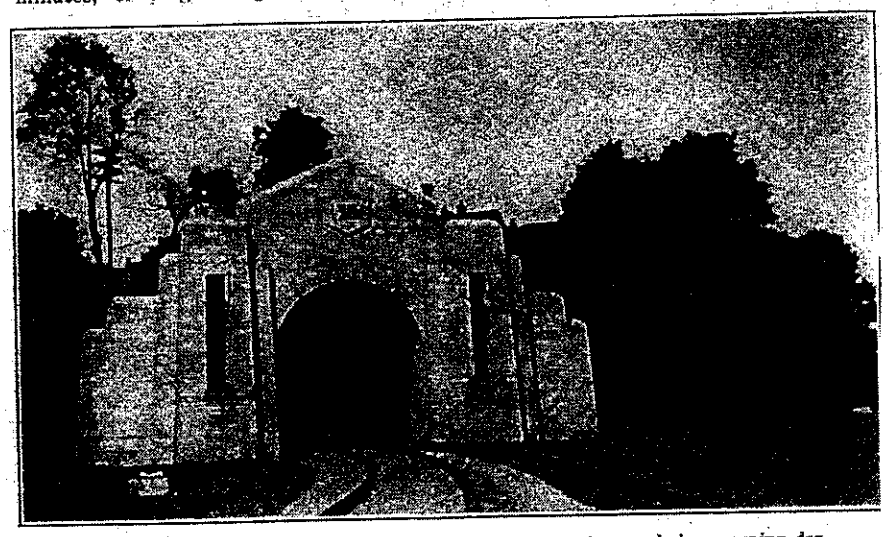
about 100-ft. intervals. In the duct carrying the signal, telephone and lighting cables there is a light outlet every 100 ft. Trackmen, when doing work in the tunnel, will have a floodlight, and will plug into the most convenient one of the outlets.

The traffic through the tunnel will be controlled by automatic absolute block signals placed 190 ft. from the portals. The tunnel is ventilated by two double width, double inlet, full housed, Silentvane blowers, equipped with SKF roller bearings, operating at 360 r.p.m., housed on opposite sides of the tunnel at the front yard portal. The fans are driven by two 80 h.p. 2,200-volt, three-phase, 60-cycle horizontal revolving field synchronous motors with direct connected exciters. The blowers and motors are connected by a magnetic clutch. This equipment starts automatically by a train coming within the circuit about a minute before it enters the tunnel, and is adjusted to operate for six minutes, or long enough to clear the tunnel after the slowest train has passed through. The equipment is designed so that when the blowers are operating at full speed they have a capacity sufficient to produce a velocity of air in the empty tunnel of 10 m.p.h. without abnormal wind or barometric conditions at either end.

The tunnel was built with practically no damage to adjacent property and with no really serious accident to any workman. The most serious was a broken leg, which happened outside the tunnel on the trestle off which the spoil was dumped. The spoil was all utilized in building a city street along the bank of False Creek, and filling up railway property adjacent to that street.

The contractors completed their work well within the time specified in the contract. The tunnel was opened on July 17, by authority of the Board of Railway Commissioners and was put in operation immediately.

The foregoing information was furnished by Thomas Martin, who was transferred from the position of Division Engineer, Portage Division, Manitoba District, at Winnipeg, to supervise the construction of the tunnel, and who returned to his former position at Winnipeg, July 1.

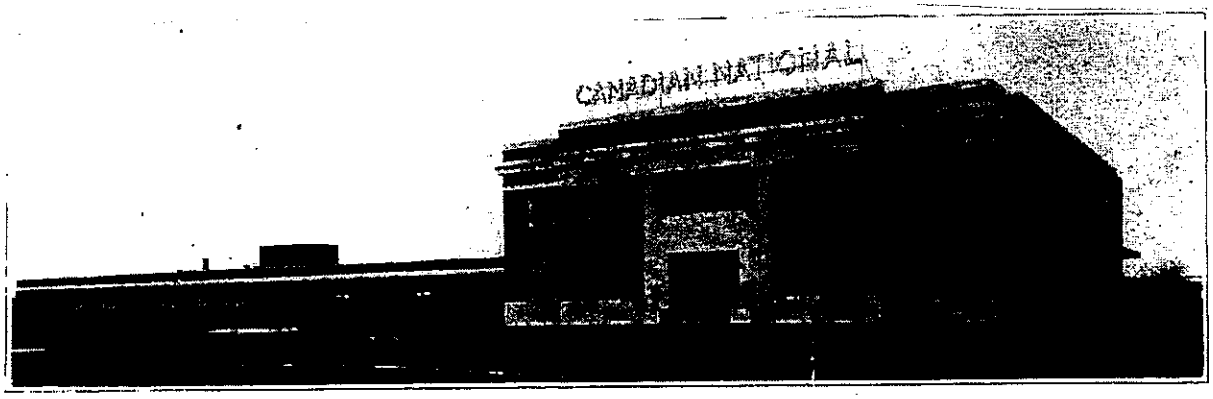


Vancouver Tunnel. Combined fan house and west portal, photographed on opening day.

CANADIAN NATIONAL RAILWAYS

EDMONTON STATION

C. H. RIFF



Edmonton, Alta., Station, Canadian National Railways.

Edmonton Station.—The original date set for the opening of the new station at Edmonton, Alta., Feb. 10, had to be postponed for various reasons, and it was then fixed for March 17, when the formal

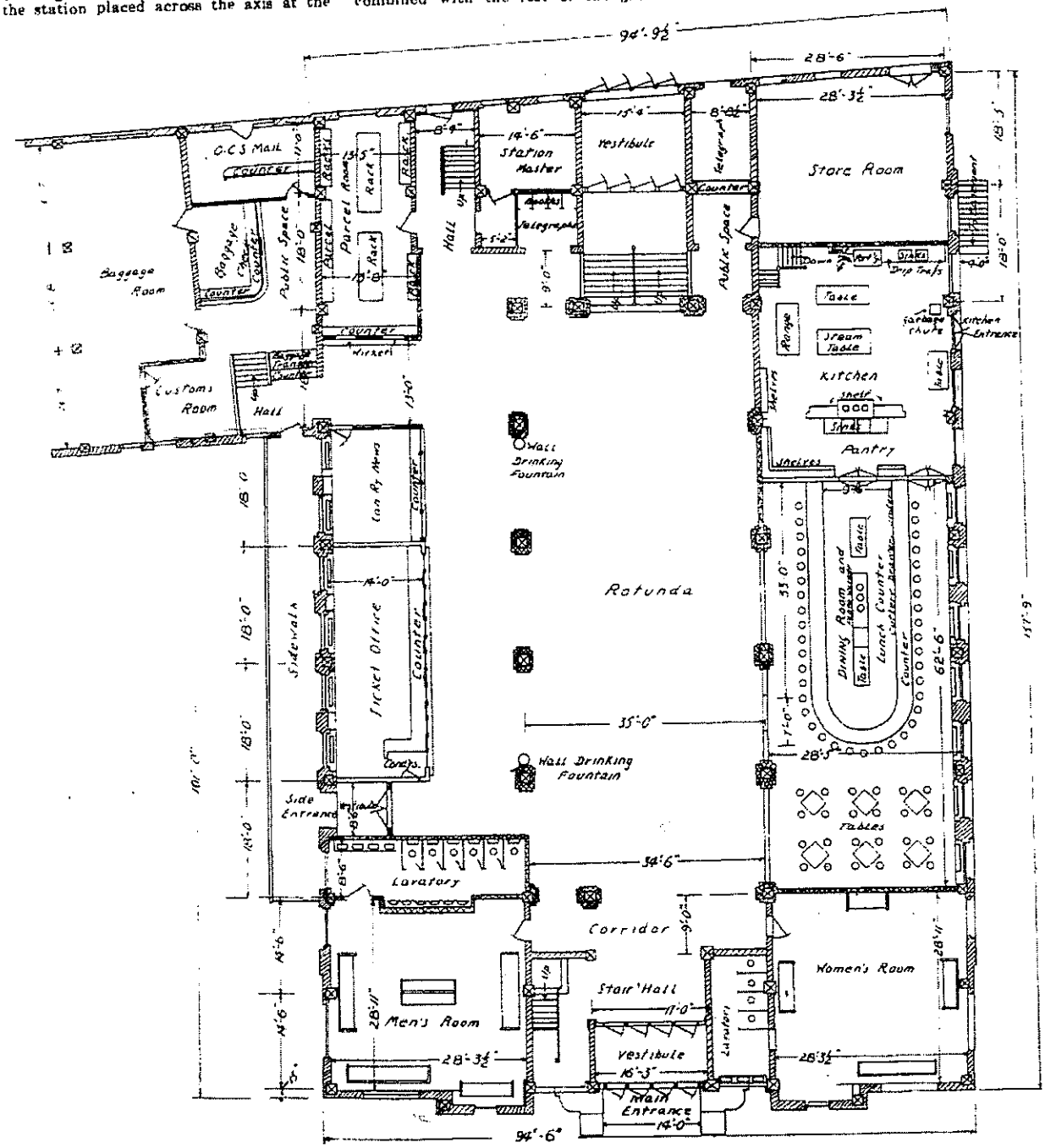
Edmonton, Alta., Station, Canadian National Railways.

opening ceremonies took place. Sir Henry Thornton, Chairman and President, was unable to be present, having to attend meetings of the House of Commons' special committee on Canadian National affairs, which began its sittings March 12, and he was represented by S. J. Hungerford, Vice President, Operation and Construction Departments. Others present were the Lieutenant-Governor and the Premier of Alberta, the Mayor of Edmonton, W. A. Kingsland, General Manager,

Western Region, and W. A. Brown, General Superintendent, Alberta District. After the formal ceremonies the entire building was thrown open for public inspection, and in the evening the Canadian National Social and Athletic Association held a social gathering and dance.

The station has been built at the junction of 100th Street and 104th Ave.; the site is approximately 770 ft. long in that direction by about 210 ft. deep. The selection of the site was influenced by the thought that 100th Street, with the Macdonald Hotel at one end, public buildings at the sides along its length and the station placed across the axis at the other end, would form a fine civic center. The vista along this street, culminating in a dignified station front, will have a very fine effect. In planning the various facilities, and in order to allow as much space as possible along the tracks for baggage and express, and still keep the station on the axis of 100th Street, the main building has been placed end on to the tracks instead of parallel to them. This arrangement gives not only a fine entrance effect, but will allow the grounds at each side and in front to be developed to advantage for teamways, automobile parking spaces, street cars, etc., and those facilities, combined with the rest of the grounds which will be planted with trees and shrubs and grassed, will form a pleasing setting to the station and be a distinct asset to the city from both practical and aesthetic standpoints.

The station buildings are brick and stone adaptation of Grecian doric. The main front is designed in a simple, dignified manner, the entrance doorways being framed by heavy stone columns which with the flanking pavilions are bonded together by a stone plinth and entablature. The side elevations, which are in keeping with the front, are arranged so as to allow a maximum amount of lighting for the interior. The main building is arranged on



Edmonton, Alta., Station, Canadian National Railway.