1951

Toronto Subway Construction Progress

Excellent headway continues to be made on the construction of the north-south subway in Toronto, which on completion will be Canada's first subway rapid transit route.

The following account of progress on the construction of the subway following the line of Yonge Street, Toronto's main north-south thoroughfare, with a short westerly extension to the Toronto Union Station at the south end, is based on official advice of December 20. The limits of the individual subway construction contracts were specified in our issue of November last, pg. 619.

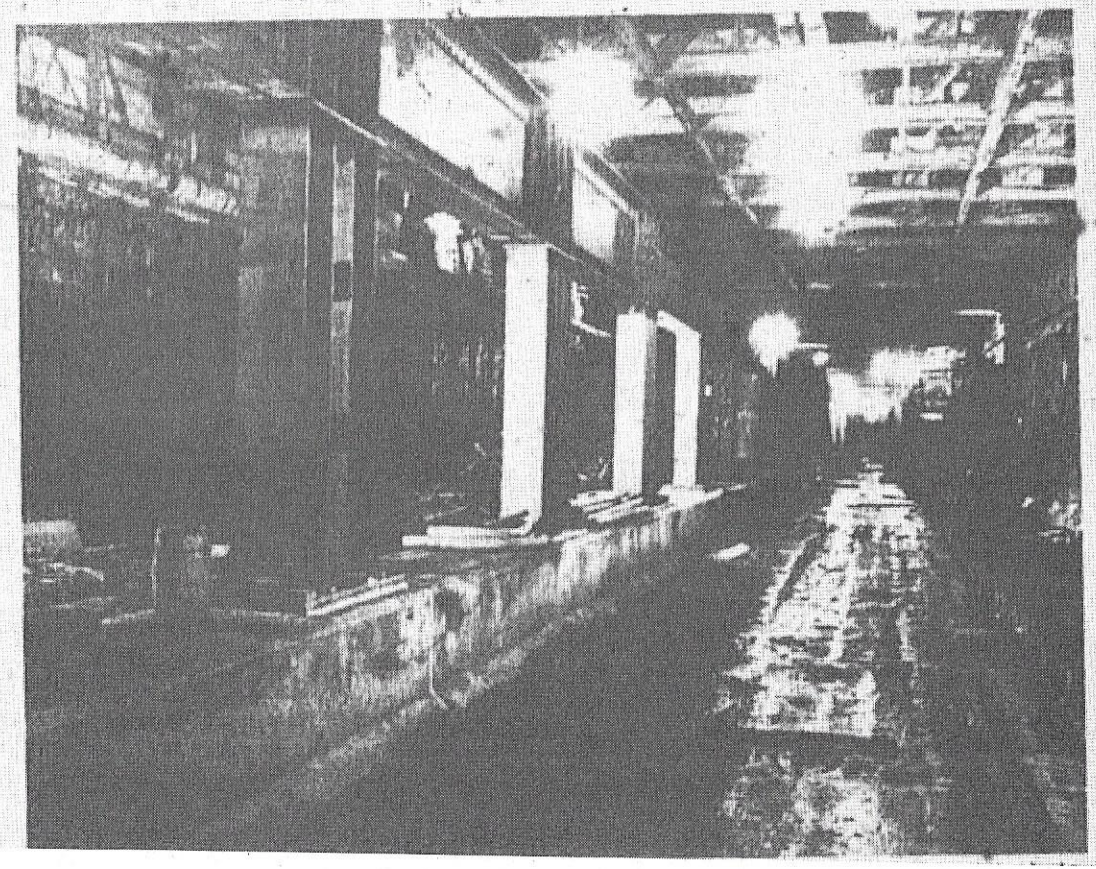
Contract S1.—At the date specified, the bottom lift excavation on this contract had been completed for a distance of 950 ft. on Front Street, from Yonge Street. Intermediate lift excavation continued on Front Street, in the area where the subway route curves on to Yonge Street, and 765 ft. of the invert slab and 329 ft of the walls had been poured under Front Street. The bottom lift excavation on Yonge Street had been completed to a point just south of Adelaide Street. Concrete was in place on this contract as follows:—Invert slab, 53%; walls, 31%; roof, 17%; capping, 7%.

Contract S2.—To December 20, the placing of temporary timber decking had been completed to the north side of Granby Street, and decking operations were discontinued in order to allow vehicular traffic to operate on Yonge Street during the month of December, with only 10% of the decking remaining to be completed. Bottom lift excavation was continuing

Contract S2A.—No decking operations on this contract were to be carried out until after the New Year.

Contract S3.—Bottom lift excavation had progressed to a point 160 ft. north of Maitland Street and intersection Street. The first concrete slabs had been poured at two sections north of Alexander Street.

Contract S4.—Removal of the top cut south of Jackes Avenue to a depth of six feet had been completed for a



fare, with a short westerly extension to the Toronto Union Station at the south end, is based on official advice of December 20. The limits of the individual subway construction contracts were specified in our issue of November last, pg. 619.

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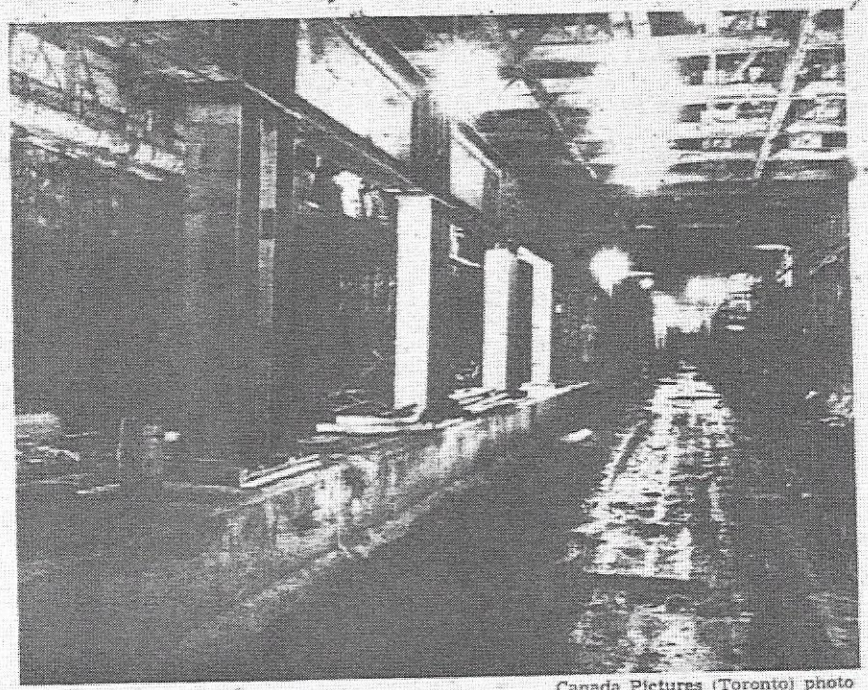
Contract S2.—To December 20, the placing of temporary timber decking had been completed to the north side of Granby Street, and decking operations were discontinued in order to allow vehicular traffic to operate on Yonge Street during the month of December, with only 10% of the decking remaining to be completed. Bottom lift excavation was continuing in the Queen station area, and the first sections of the invert slab on the Queen Street section of the Queen station had been begun. On this contract, concrete was in place to December 20 as follows:—Invert slab, 29%; walls, 28%; roof, 24%. Backfilling over the structure was 7.5% completed.

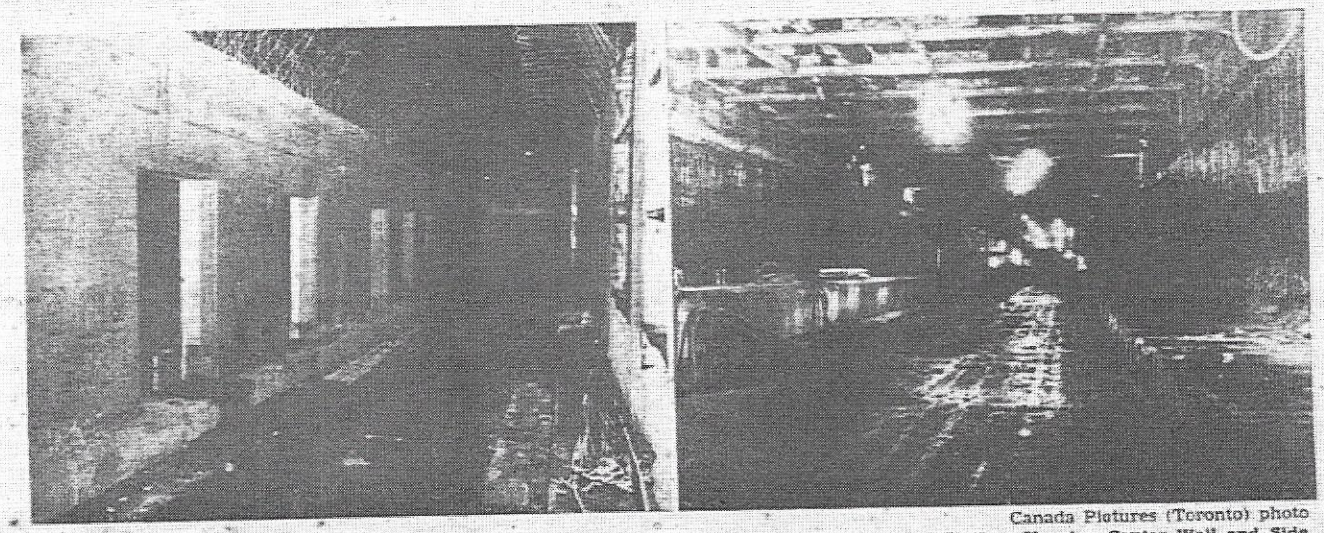
ft. north of Maitland Street and intermediate lift excavation had reached a point 160 ft. north of Dundonald Street. Pile driving had been completed to a point just north of Hayden

of six feet had been completed for a distance of 225 ft. North of Shaftesbury Avenue a trench had been excavated to a depth of 14 ft. and width of 30 ft. for a distance of 275 ft. Sewer



Canada Pictures (Toronto) photo

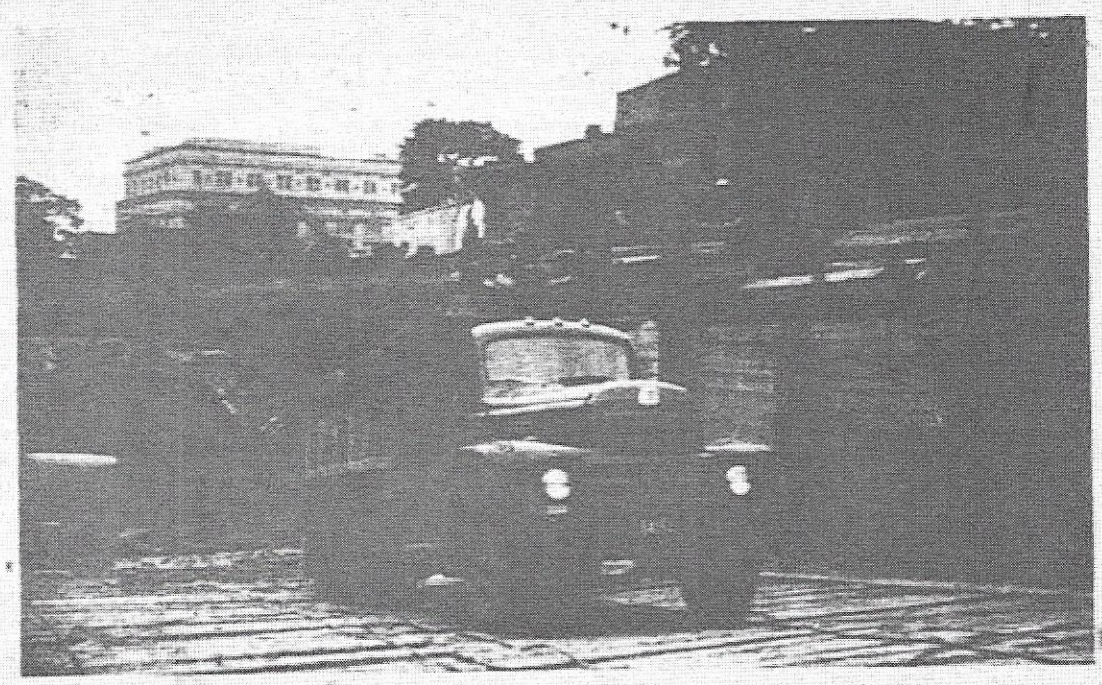
A View of the Yonge Street Subway in Toronto. Showing the Center Beams and Side Wall Reinforcing Steel in Place.



Canada Pictures (Toronto) photo

Left, Tunnel Section in Toronto's North-South Subway, Looking North from the Queen Street Station, Showing Center Wall and Side Wall Concrete Poured. Right, a View of the Subway in the Queen Street Station Vicinity on Yonge Street, Showing the Floor and Center Beam Completely Poured and the Side Wall Reinforcing Steel In Place.

In the background, in the view at the left, may be seen the movable steel form which is used in pouring the wall concrete.



An International Model LF-190 Truck, with 10-Yd. Dump Body. One of 20 Used by Rayner Construction Co., Ltd., in the Toronto Subway Construction Work.

construction continued to be a major portion of the work underway on this contract.

Contract S5.—To December 20, excavation and decking on Yonge Street north of Heath Street had been completed for a distance of 212 ft. The regular operation of Yonge route cars in this area had been resumed. Pile driving between Pleasant Blvd. and St. Clair Avenue had been completed, and sewer construction at various locations was in progress.

At December 20, demolition of the Alexander Muir Memorial Gardens was underway, and the excavation and pouring of the foundations at the new site in Lawrence Park was proceeding.

Large Earth-moving Job.—Rayner Construction Co., Ltd., contractor for the northern sections of the north-south subway, have over 800,000 cu. yd. of earth to move, and recently added 20 International model LF-190 trucks to its fleet, one of these units being shown in an accompanying illustration. These are trucks with tandem rear wheels and 10 cu. yd. dump bodies, and average 15 four-mile trips per day with 10-ton loads.

Mainly about Transit People

1952

Toronto Rapid Transit Progress

The work of constructing a rapid transit line in Toronto, along the line of Yonge Street, the city's chief north-south thoroughfare to Eglinton Avenue in north Toronto, northerly from Front Street, with a short westerly extension on Front Street to the Union Station, continues to proceed without delay, and work on the various contracts is going ahead in satisfactory manner. The contracts, in chronological order, cover sections of work beginning at the south and extending north. As explained in preceding issues, while most of this rapid transit line will be in subway, much of it will be in open cut.

About a year ago (in our issue of November, 1950) we published a plan and profile of the north-south rapid transit route, and to refresh the memories of readers, we present this again herewith. It will be seen that there are no open cut sections on the line at its south end, but that there are several at the north end; in fact there will be more open cut than subway between Bloor Street and Eglinton Avenue. As seen by the profile, grade is ascending to the north throughout.

Contracts SC1 and SC2.—The awarding of these contracts to Foundation Co. of Canada, Ltd., with approximately $4 million involved, was recorded in our November issue, pg. 626, where some description of the work involved was given, and where it was explained that the contracts cover the finishing of 11 of the 12 stations on the rapid transit line. The completion of all except the most northerly station, at Eglinton Avenue, the northern terminus, is involved; this station will be built as a part of contract S6, to cover the work from Imperial Street to the northern limits at Eglinton Avenue. Contract SC1 covers five stations in the section south of Alexander Street, while contract SC2 covers six in the section from Alexander Street to Imperial Street.

As noted hereinafter, a start has already been made on the station work involved in both of these Foundation Co. of Caanda, Ltd., con-

the subway structure at the curve at Front and Yonge streets was under way.

Contract S2.—Concrete placement was under way at the Queen station, Dundas station and College station. Invert slab work was completed on this contract.

Contract S3.—Concrete placement continued at the Bloor and Wellesley stations and grading of the Wellesley Station bus loop was proceeding.

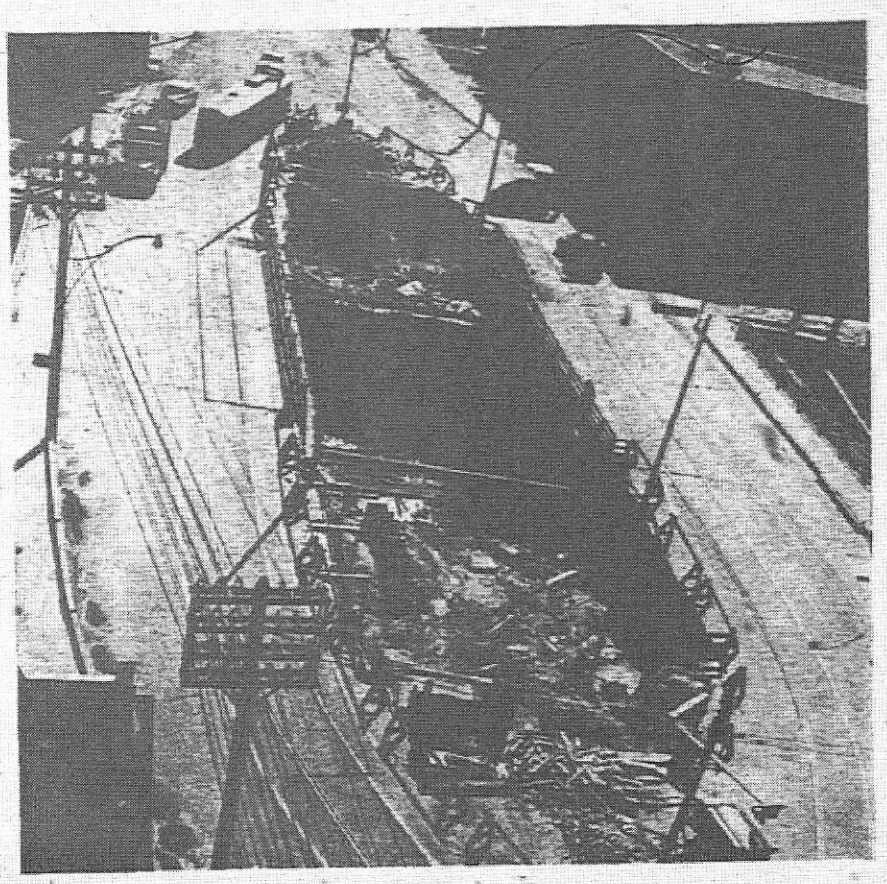
Contract S4.—Excavation was completed from the Summerhill portal to the north embankment of the C.P.R. Bridge and in the Davisville Station area was continuing.

Contract S5.—Work on this new contract began December 17, south of Eglinton Avenue, on construction of fire protection lines and sewers.

Station Contracts Sc1 and Sc2.—Work on these contracts began Dec. 10.

Contract for Final Section (S6)

It was noted briefly in our December issue, pg. 684, that a contract for the final or most northerly section of the rapid transit work had been awarded Pitts, Johnson, Drake and Perini, at a price of approximately



Subway Work in the Bloor Station Area

This view showing work on contract S3, was prepared from a photograph taken looking east along Bloor Street, and shows the decking on the north and south sides of the street itself, with excavation proceeding for the transfer platform.

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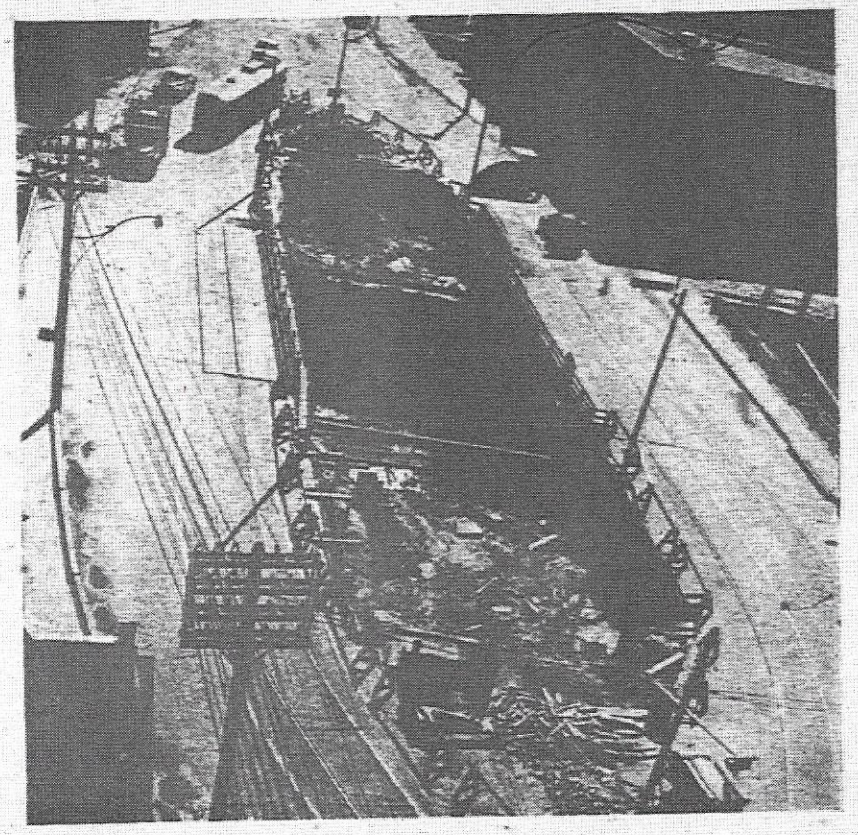
As noted hereinafter, a start has already been made on the station work involved in both of these Foundation Co. of Caanda, Ltd., contracts. Also, the contract (S6) involving the construction of the Eglinton (northern terminus) station has been awarded, and station construction will begin in due course.

In the subway construction work, progress to December 19 was as described in the following, with the contracts numbered from south to north:—

Contract S1.—Placing of sand backfill, gravel and paving was in progress westerly on Front Street from the Bay-Front intersection. Excavation of the King Station tunnel was nearly completed. Excavation of a pedestrian tunnel connecting the Union Station with the Royal York Hotel was about one-quarter completed. Placing of sand backfill over tracks. Of the eight bridges between Bloor Street and St. Clair Avenue on this open cut section, five had been completed, viz., at Aylmer, Roxborough, Woodlawn, Jakes and Rosehill avenues.



Subway Work in the Bloor Station Area

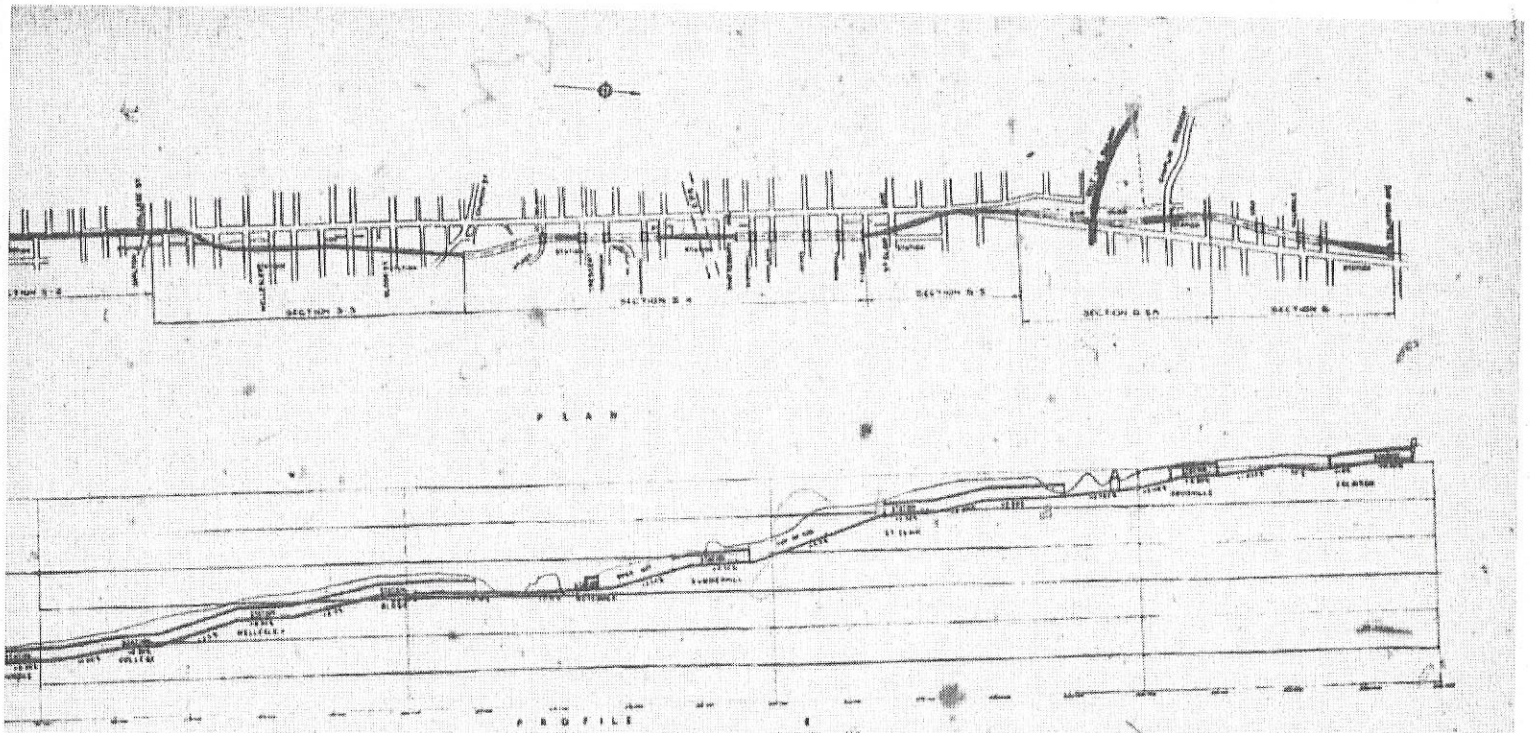
This view showing work on contract S3, was prepared from a photograph taken looking east along Bloor Street, and shows the decking on the north and south sides of the street itself, with excavation proceeding for the transfer platform.

Contract S5. — Underpinning of buildings, north of St. Clair Avenue, was continuing, as was laying of the substructure drain from Heath Street to the Muir Portal, and work was continuing on the St. Clair Avenue street car and bus station.

Contract S5A.—Work was continuing on the open cut excavation north of Chaplin Crescent Bridge. Construction of retaining walls north of the Muir Portal, south of the Belt Line $3,200,000. Official advice in regard to this contract was furnished by the Commission immediately following its award. The advice stated:—"The Toronto Transportation Commission has awarded a contract for the last section of the Yonge Street Subway to Pitts, Johnson, Drake & Perini, at a price of approximately $3,200,000.00 — the lowest tender submitted.

"The successful contractor is the same syndicate of Canadian and American contractors who are now constructing the first two sections of the subway between the Union Station and College Street, which is nearly completed.

"The syndicate is headed by a To-



The North-South Rapid Transit Route in Toronto, in Plan and Profile.

ne of Yonge Street at its south end, and is quite close to the line of Yonge Street over the remainder of the distance, is not all subway, as there l open cut sections. In the plan drawing, the subway portions are shown by heavy black line, and the open cut sections by light lines.

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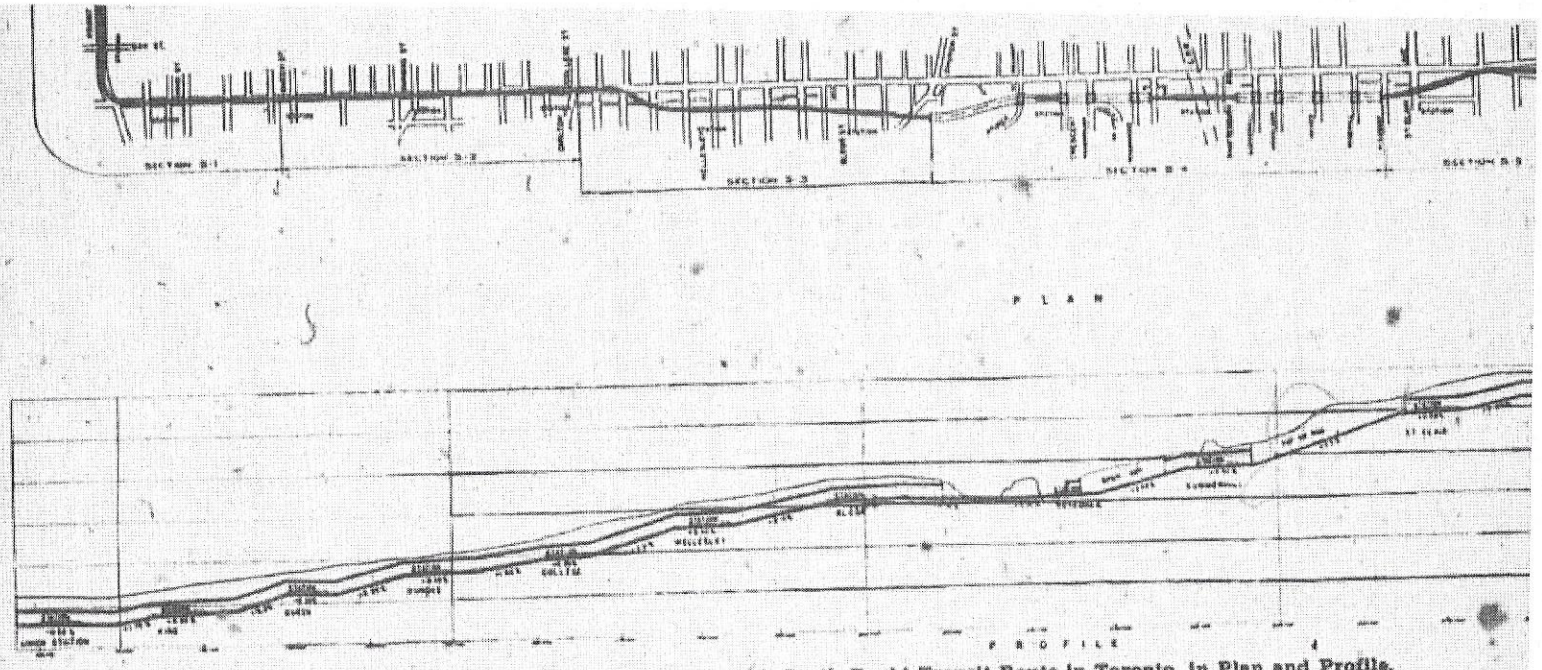
minimized by reason of the fact that it will be carried out on a private off-street right-of-way. There will, however, be a number of diversions and closure of streets where the subway crosses public thoroughfares. Every effort will be made by the Commission and the contractor to reduce such inconvenience to a minimum.

"While the progress of the subway work has been delayed to some extent by shortage of steel and other critical materials, the Commission is confident that, providing such materials can be obtained, the subway will be completed according to schedule."

Progress to January 18

Since the foregoing was prepared, we have received official advice on progress of the work to January 18. On contract S1, at that date, concrete placement was continuing at King station, and backfilling and removal of piling at the Yonge-Front curve has been carried out. On contract S2, concrete placement of roof sections at Hayter Street and College Station were under way. On contract S2A, bottom lift excavation had reached the College Street area and inverts were being placed near Alexander Street. On contract S3, concrete placement of roof sections at Bloor Station was under way, and finish work at Wellesley Station was progressing. On contract S4, excavation was continued at Rowanwood Avenue and under the C.P.R. tracks, and work had begun on the temporary pedestrian bridge over the open cut at Rowanwood Avenue. On contract S5, excavation was continuing in the St. Clair Station area, and inverts were being placed south of Muir Memorial portal. Underpinning work on this contract was 94% complete. On contract S5A, open cut excavation was progressing north of Chaplin Crescent Bridge and work was continuing on the retaining walls north of Muir portal, south of the Belt Line Bridge and at Davisville Station. On the recently-awarded contract S6, clearing of the right-of-way at the south end of Eglinton Station had commenced, and sewers and watermains were being laid. On station contract SC1, the field office at King Mezzanine was nearly complete, and concrete stair tread was placed at the southwest entrance stairs at Queen Station. On contract SC2, preparatory work was under way at Wellesley Station.



The North-South Rapid Transit Route in Toronto, in Plan and Profile.

The route, which follows the line of Yonge Street at its south end, and is quite close to the line of Yonge Street over the remainder will be several open cut sections. In the plan drawing, the subway portions are shown by heavy black line, and the ope

ronto contracting firm C. A. Pitts, General Contractor Limited, associated with which are the Arthur A. Johnson Corporation of New York, Johnson, Drake & Piper Incorporated of Minneapolis, and B. Perini & Sons Incorporated of Framingham, Mass.

"The work covered by this contract comprises the construction of the open cut section from Imperial Street to Berwick Avenue, and the concrete subway section from Berwick Avenue to Eglinton Avenue. It includes an underground terminal station at Eglinton and Yonge with passenger facilities and transfer platforms on the surface for the bus and trolley coach traffic which will radiate from this terminal.

In the work, the disturbance to local residents and business will be minimized by reason of the fact that it will be carried out on a private off-street right-of-way. There will, however, be a number of diversions and closure of streets where the subway crosses public thoroughfares. Every effort will be made by the Commission and the contractor to reduce such inconvenience to a minimum.

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Toronto Subway Progress

Excellent progress continues to be made on the Toronto rapid transit construction job, along the line of Yonge Street, with a short westerly extension at the south end along Front Street to the Union Station. The route was shown in plan and profile in our February issue, pg. 90, where it was explained that while all of the south end of the route is in subway, much of the north end is in open cut; the exact locations of the subway and open cut sections were shown in the plan drawing. Contracts are numbered from south to north, and construction progress to March 21 is detailed in the following.

Contract S1.—Concrete placement was continuing at the date mentioned at Union and King stations. Concrete invert, walls, roof, capping and platforms on this contract were completed. Entrance stairways and passageways were being placed.

Contract S2.—Concrete placement was continuing at the Queen and College stations.

Contract S2A.—Invert on this contract was complete and walls were 42% completed.

Contract S3.—Roof, stairs and platform were being placed at Bloor Station. Invert and walls on this contract were complete and roof 97.8% so.

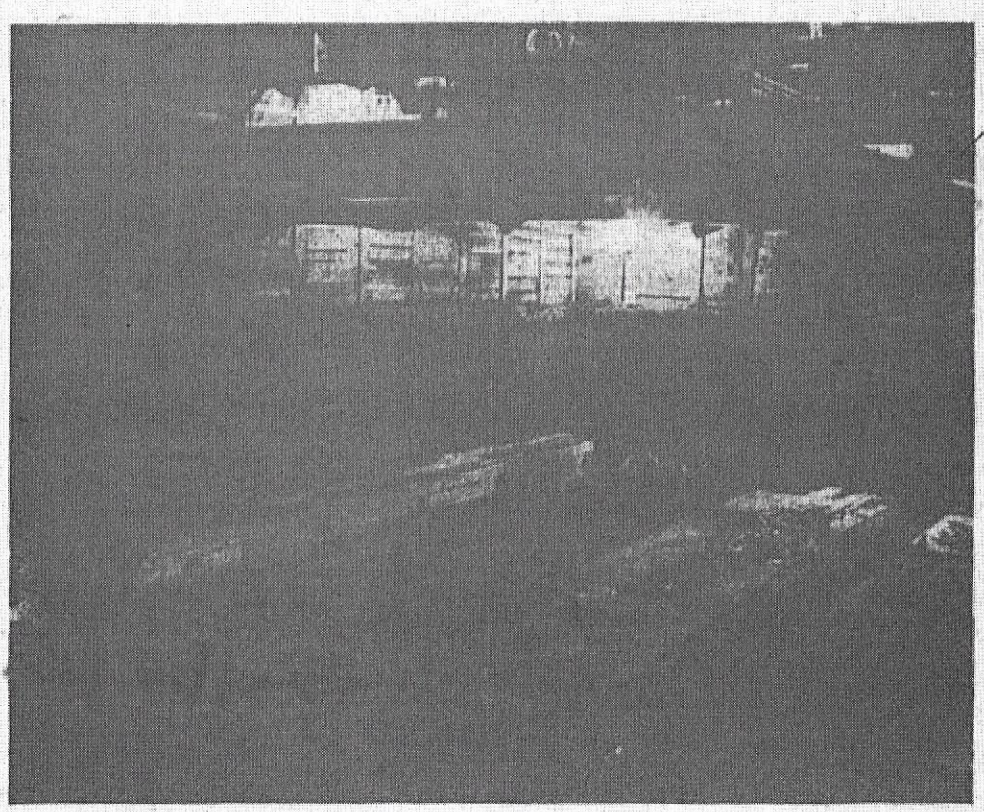
Contract S4.—Open cut excavation was 89% complete. Excavation was continuing at Summerhill station and placing of wall and roof sections was under way at Rosedale station. Invert, walls and roof on this contract were 37% complete.

Contract S5.—Placing of concrete invert north of St. Clair Avenue was in progress and the invert was 70% complete on this contract.

preparation of the platforms for the terrazzo floor had been begun, temporary and permanent wiring was being installed, and the partitions were being erected. At the Dundas station, work had started on bases and walls for concession areas and electrical service rooms.

On station contract SC2, the main steel structure had been erected at the Wellesley station, and excavation for the west retaining wall was under way. At the Rosedale station, con-

the Eglinton station, at the north end of the route, there will be street entrances on Yonge Street and at the west side of the terminal, on Eglinton Avenue. There will be a terminal building here, several stories high, accommodating stores on the street floor and offices on the upper floors. Terminal facilities, including garages for the maintenance and storage of motor buses and trolley coaches, are being provided, and motor buses and trolley coaches will operate north, east and west from the Eglinton station.



Looking West to the Bulkhead at the End of the Yonge Street Subway, Southerly Portion. Showing the First Section of Invert Slab Poured. This is on the Original Contract, S1.

Wages and Fares In

1952

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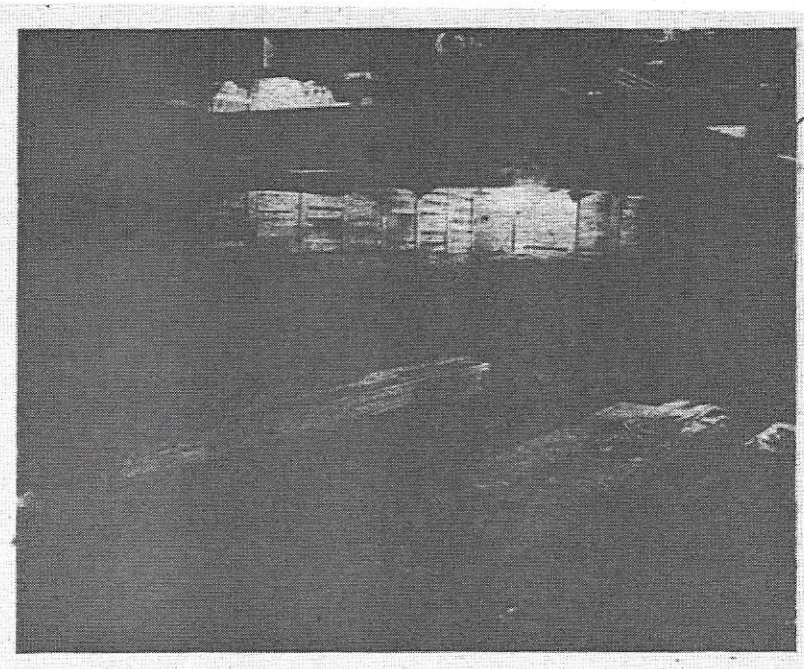
Contract S4.—Open cut excavation was 89% complete. Excavation was continuing at Summerhill station and placing of wall and roof sections was under way at Rosedale station. Invert, walls and roof on this contract were 37% complete.

Contract S5.—Placing of concrete invert north of St. Clair Avenue was in progress and the invert was 70% complete on this contract.

Contract S5A.—Erection of structural steel for the Chaplin Crescent bridge was continuing, and excavation and underpinning north of Chaplin Crescent were in progress. Erection of the Davisville station, shop and boiler house were continuing.

Contract S6.—Top lift excavation between Lola Road and north of Imperial Street were continuing, and bottom lift excavation was in progress between Hillsdale and Berwick. A start was made on excavation for retaining walls between Manor Road and Hillsdale Avenue.

Station Contracts.—Work is proceeding on the two station contracts which the Toronto Transportation Commission has awarded, as detailed in preceding issues. On contract SC1, at the King station, the terrazzo base was complete on the west platform and 300 ft. of terrazzo floor had been installed. There will be two 500 ft. platforms at this station. Construction of hollow tile walls in the mezzanine floor was under way, as was also rough plumbing. At the Queen station, for the west retaining wall was under way. At the Rosedale station, concrete form work in the control area was under way. At the Davisville station, the placing of steel and erection of wall forms had been started on the intermediate level, and steel pipe columns for the west bus platform canopy were set in position.



Looking West to the Bulkhead at the End of the Yonge Street Subway, Southerly Portion. Showing the First Section of Invert Slab Poured. This Is on the Original Contract, S1.

All told, there will be 12 stations on Toronto's new north-south rapid transit route. From south to north these will be:—Union (near steam railway Union Station), King, Queen, Dundas, College, Wellesley, Bloor, Rosedale, Summerhill (at crossing of Canadian Pacific Ry. tracks), St. Clair, Davisville (just north of steam railway belt line tracks) and Eglinton (north terminus). The five southerly stations will be on the line of Yonge Street; the next five going north will be east of Yonge Street, and the Davisville and Eglinton stations will be west of Yonge Street. At the Union station, at the south end, there will be four entrances from the sidewalks and another inside the station. At

Wages and Fares In Hamilton, Ontario

Mention was made in our February issue, pg. 82, of the negotiations between the Hamilton Street Ry. Co. management and its employees in regard to wages, and it was explained that an agreement tentatively arrived at was dependent upon the company being able to secure authority from the Ontario Municipal Board to increase its adult fare to 10c cash, with a five-cent cash fare for children. It was recorded that the company had applied to the Board for authority to so increase its fares.

Official advice of March 12 was that the Board had acceded to the company's request, and had authorized it to charge an adult fare of 10c cash, with five tickets for 50c, with a 5c cash fare and a ticket rate of six for 25c for children up to 12 years old, and for students up to 17 years on presentation of certificate. The new fares became effective Saturday, March 15.

Upon the company securing authority to thus increase its fares, it

sents a handsome appearance with its knotty pine paneling and five-foot walnut dado.

As indicated, the upper floor of the building is used entirely by the Commission's motor bus and trolley coach operators. The rest and recreation room is very spacious, and the locker room contains 95 lockers.

The restaurant in the east wing on the main floor, known as the "Signet Restaurant" is operated by Commercial Caterers, Ltd. The snack bar provides seating accommodation for 14 persons, and the main dining room has accommodation for 66.

Adjoining the waiting room, at the west side on the main floor, is a ticket office with two windows, one opening on the waiting room and the other on a hall used by operators, this being adjacent to the coin office and sorting room, frequency standardization offices, and the rooms mentioned above as used by the restaurant staff. To the east of the waiting room are the switchboard, general transportation office and office of the transportation superintendent.

A public address system, operated from the ticket office, is employed primarily to announce arriving and departing times of trolley coaches and buses. Occasionally, musical programmes are presented, and dance music is available for groups using the auditorium. The cloak and wash room facilities on the main floor and basement provide ample accommodation for at least 400 persons.

The new building is situated at the east end of the Commission's trolley coach route, providing service along the main artery between Waterloo and Kitchener, a distance of 4½ miles. It is also on the fringe of the new annexation area, Kingsdale, which now has a population of some 3,000, making Kitchener a city with a population of over 50,000. At the beginning of this year, the Commission's bus service was expanded to the Kingsdale boundary, east along ton and Galt. There is direct access to the waiting room from the large loading platform on the south side of the building.

Transit Revenues, Expenses, Etc.

(Management Figures)

Calgary Transit System

December:—	1951	1950
Revenue	$195,352.34	$176,154.29
Expenditure	155,389.88	160,435.23
Operation surplus	39,962.46	15,719.06
Total surplus	11,937.18	4,255.61
Revenue passengers	2,623,558	2,839,488
Year Ending December 31:—		
Revenue	$2,185,305.97	$2,034,182.49
Expenditure	1,721,210.26	1,645,932.08
Operation surplus	464,095.71	388,250.44
Total surplus	50,215.57	
Revenue passengers	29,965,777	30,787,625
January:—	1952	1951
Revenue	$210,689.14	$184,809.27
Expenditure	132,847.02	111,227.33
Operation surplus	77,842.12	73,581.90
Total surplus	41,275.21	38,533.67
Revenue passengers	2,737,409	2,760,500

Edmonton Transit System

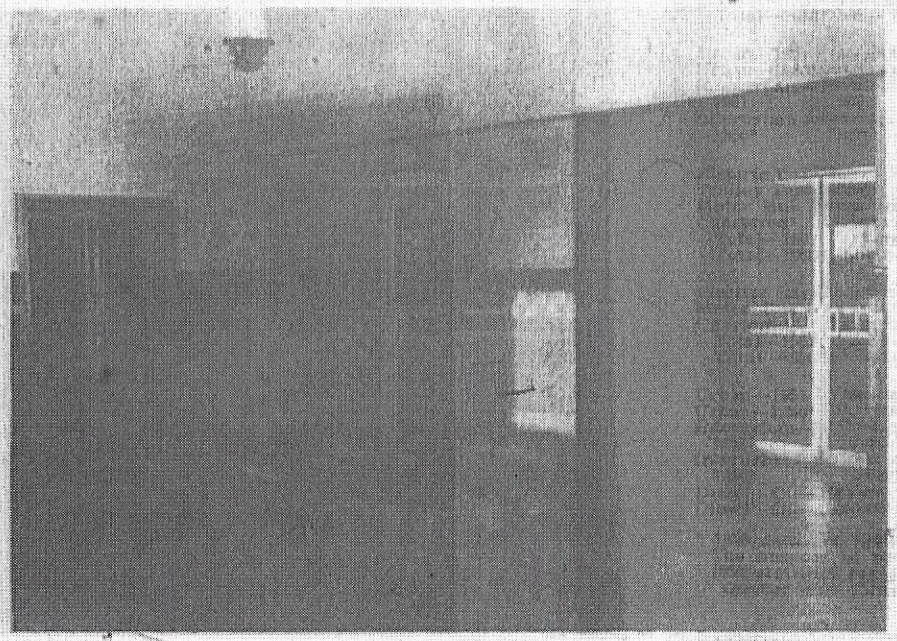
December:—	1951	1950
Revenue	$257,484.62	$243,704.99
Expenditure	308,406.28	190,769.04
Operation surplus	*50,921.66	52,935.95
Total surplus	*108,602.90	4,932.01
Revenue passengers	3,211,737	3,398,603
December:—	1951	1950
Revenue	$ 64,190.96	$ 55,521.00
Expenditure	35,760.43	40,336.65
Operation surplus	28,430.53	15,184.35
Total surplus	16,640.91	2,234.12
Revenue passengers	1,013,329	948,603
Year Ending December 31:—		
Revenue	$617,060.97	$584,574.17
Expenditure	439,728.04	440,270.52
Operation surplus	177,332.93	144,303.25
Total surplus	49,620.23	*2,942.93
Revenue passengers	9,866,927	10,042,563
January:—	1952	1951
Revenue	$ 67,857.33	$ 65,641.84
Expenditure	40,615.29	43,008.47
Operation surplus	27,242.40	22,633.37
Total surplus	13,414.64	11,226.75
Revenue passengers	1,076,914	1,039,298

B.C.E.R. Co. Traffic

In February, the British Columbia Electric Ry. Co. carried revenue passengers on its various urban lines as follows:—

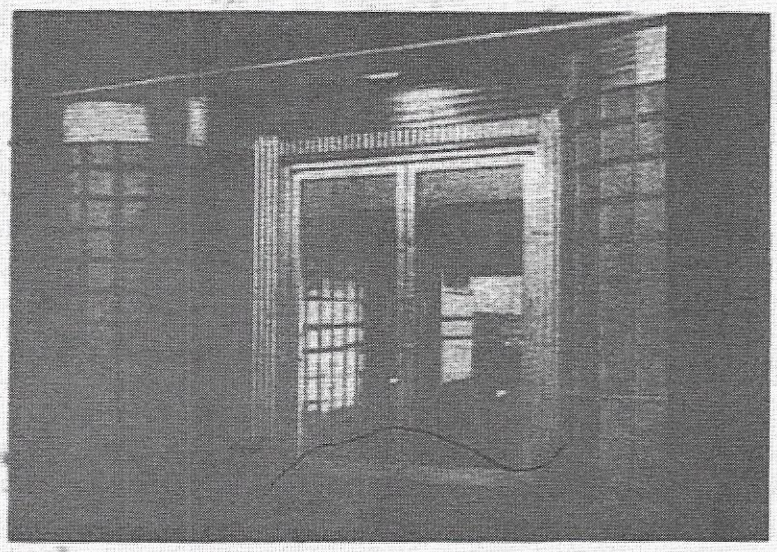
Vancouver	7,081,141
North Vancouver	397,712
New Westminster	714,322
Victoria	1,397,864

In interurban service, on the British Columbia lower mainland, 459,642 revenue passengers were carried in February.



Waiting room in Kitchener's New Transportation Terminal Building

persons. This auditorium is provided with a platform for the accommodation of a band, and forms an ideal place for the holding of conventions and social gatherings. The room is 68 ft. long by 40 ft. wide, and pre-



Imposing Entrance to New Terminal Building

sents a handsome appearance with its knotty pine paneling and five-foot walnut dado.

As indicated, the upper floor of the building is used entirely by the Commission's motor bus and trolley coach operators. The rest and recreation room is very spacious, and the locker room contains 95 lockers.

The restaurant in the east wing on the main floor, known as the "Signet Restaurant" is operated by Commercial Caterers, Ltd. The snack bar provides seating accommodation for 14 persons, and the main dining room has accommodation for 66.

Adjoining the waiting room, at the west side on the main floor, is a ticket office with two windows, one opening on the waiting room and the other on a hall used by operators, this being adjacent to the coin office and sorting room, frequency standardization offices, and the rooms mentioned above as used by the restaurant staff. To the east of the waiting room are the switchboard, general transportation office and office of the trans-

King Street for 1¼ miles, on No. 8 highway. The building and parking area are available for interurban service, and are being employed by the C.P.R. line providing transit service to Centerville, Freeport, Preston and Galt. There is direct access to the waiting room from the large loading platform on the south side of the building.

Transit Revenues, Expenses, Etc.

(Management Figures)

Calgary Transit System		
December:—	1951	1950
Revenue	$195,352.34	$176,154.29
Expenditure	155,389.88	160,435.23
Operation surplus	39,962.46	15,719.06
Total surplus	11,937.18	4,255.61
Revenue passengers	2,823,558	2,839,488
Year Ending December 31:—		
Revenue	$2,185,305.97	$2,034,182.49
Expenditure	1,721,210.26	1,645,932.05
Operation surplus	464,095.71	388,250.44
Total surplus	50,215.57	
Revenue passengers	29,965,777	30,767,685
January:—	1952	1951
Revenue	$210,689.14	$184,809.27
Expenditure	132,847.02	111,227.37
Operation surplus	77,842.12	73,581.90
Total surplus	41,275.21	38,533.67
Revenue passengers	2,737,409	2,760,900

Edmonton Transit System		
December:—	1951	1950
Revenue	$257,484.62	$243,704.99
Expenditure	308,406.28	190,766.04
Operation surplus	*50,921.66	52,938.95
Total surplus	*108,602.90	4,952.01
Revenue passengers	3,211,737	3,398,603

railway car and trolley coach mileage. The increase in traffic on the interurban routes was accompanied by a moderate increase in the interurban vehicle mileage, up from 8,734,532 in November, 1950, to 8,781,476 in the 1951 month.

Accompanying the vehicle mileage increases were small increases in gasoline consumed, the gallonage of gasoline consumed by motor buses in urban service having been up from 1,759,159 in November, 1950, to 1,766,055 in the 1951 month; the gallonage consumed by buses in interurban service was up from 1,307,-069 in the 1950 month to 1,312,780. Also, a quite substantial increase in Diesel oil consumed, in combined urban and interurban service, is noted, the total gallonage having been up from 231,664 in November, 1950, to 279,548 in the month last year.

An item of interest to which attention is directed by the Bureau of Statistics is that in the Edmonton public transportation service more propane than gasoline was used in November last year; the propane substantial decrease.

In the first 11 months of 1951, exclusive of the Newfoundland, 1951,

fice at Brantford for the Canadian Pacific Express Co., at estimated cost of $60,000.

Toronto Rapid Transit

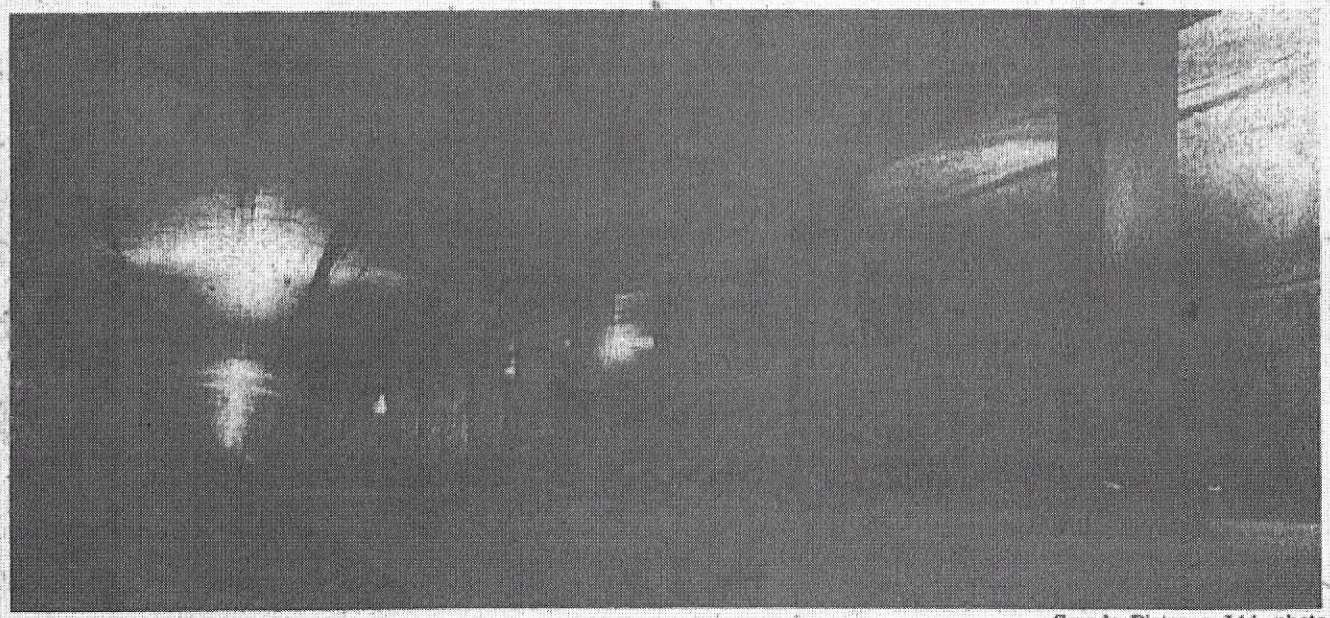
In the following we review the progress to April 21 in the construction work on Toronto's (and Canada's) first rapid transit line, following the north-south line of Yonge Street in Toronto, with a short westerly extension from the south end to Toronto's Union Station. As explained previously, while most of the route is in subway, some of it, in the northerly portion, is in open cut; the portions in subway and open cut were shown by plan and profile drawings in our February issue, pg. 90. The various contracts are numbered from south to north, with two separate contracts for the construction and finishing of stations, designated contracts SC1 and SC2, covering the stations for the whole route.

Contract S1.—The situation at April 21 was that concrete placement was continuing at the Union Station. Decking and beams had been removed at the intersection of King and Yonge streets, and street pavement was being restored.

Contract S2.—To the date mentioned, concrete placement on this contract had been almost completed, the invert being completed, the walls 98% completed and the roof 97% completed.

Contract S2A.—The invert was completed on this contract and the walls and roof nearly so.

Contract S3.—Columns for the roof at the Bloor Station had been placed, and cement finishers were working on the station walls and roof.



Canada Pictures, Ltd. photo

The Union Station Platform, at the Extreme Southwest End of the Route, Looking West to Tail Track Section

Contract S4.—Grading was underway at the south end of Summerhill Station; work was continuing on the retaining walls at Summerhill and Rowanwood, and placing of steel for the north overpass at Rosedale Station was proceeding.

Contract S5.—Concrete placement on this contract had progressed as follows:—Invert, 90%; walls, 60%; roof, 30%.

Contract S5A.—Work was continuing on the erection of formwork and placing of reinforcing steel for the Chaplin Crescent Bridge. The formwork for the east retaining wall north of Chaplin Crescent had been completed. Work was continuing on the Davisville shop.

Contract S6.—Intermediate lift excavation was continuing between Imperial Street and Glebe Road. Excavation was continuing for the west retaining wall south of Glebe Road.

Station Contract SC1.—Tile walls for service rooms at the Union Station were nearing completion, and terrazzo flooring was being installed. At King Station, 80% of the terrazzo flooring had been installed, and the hollow tile partitions were nearly completed. At Queen Station, 85% of the terrazzo flooring had been placed, and at Dundas Station 50% of the terrazzo flooring was placed.

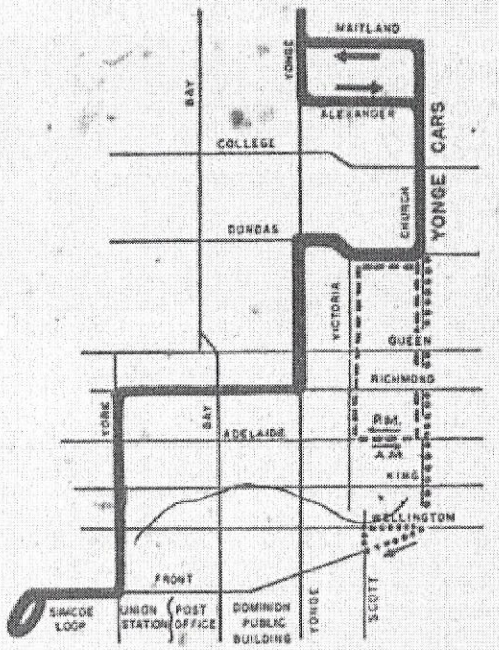
Station Contract SC2.—At Wellesley Station, the structural steel of the main structure was nearing completion. About 95% of the terrazzo floor had been placed at platform level. Piles were being driven at Rosedale Station. At Davisville Station, concrete columns for the west bus platform had been placed.

Trolley Coaches to Connect with Subway North End

Recent announcement by the Toronto Transportation Commission is that trolley coaches will replace the electric railway cars on Yonge Street, north of Eglinton Avenue, the north terminus of the rapid transit route, when the rapid transit construction work is nearing completion. Trolley coaches will operate from the rapid transit terminal at Eglinton Avenue to the Glen Echo terminal at the north city limits. Also, there will be a trolley coach route extending westerly from the Eglinton Avenue terminal, and another trolley coach route extending easterly from that terminal. The trolley coach services are expected to be commenced before the end of 1953, in preparation for the beginning of the rapid transit service early in 1954.

Diverted Routes of Electric Railway Cars of Yonge Street Route

(Details Explained in Article)



Tenders for Lighting Fixtures

The Toronto Transportation Commission has invited tenders, receivable until May 22, for lighting fixtures for the rapid transit route.

Ontario Legislature Members Inspect Subway

On April 2, some 50 members of the Ontario Legislature, chiefly representing constituencies outside of Toronto, were conducted on an inspection tour of the subway and open cut portions of the rapid transit route, covering the 4.54 miles from King Street to the T.T.C. Chaplin Crescent yards.

Advantageous Financing

By way of securing funds for subway construction, the City of Toronto sold a $15 million bond issue in New York in 1950, for which $16,500,000 in Canadians funds was received, and a $20 million issue in 1951, for which $21,400,000 in Canadian funds was received. Under the terms of these bond issues, the bonds can be redeemed on 30 day's notice.

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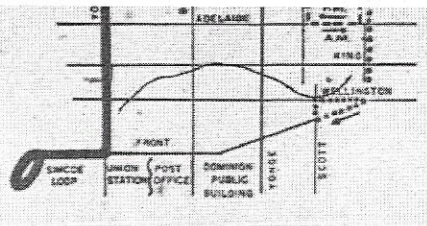

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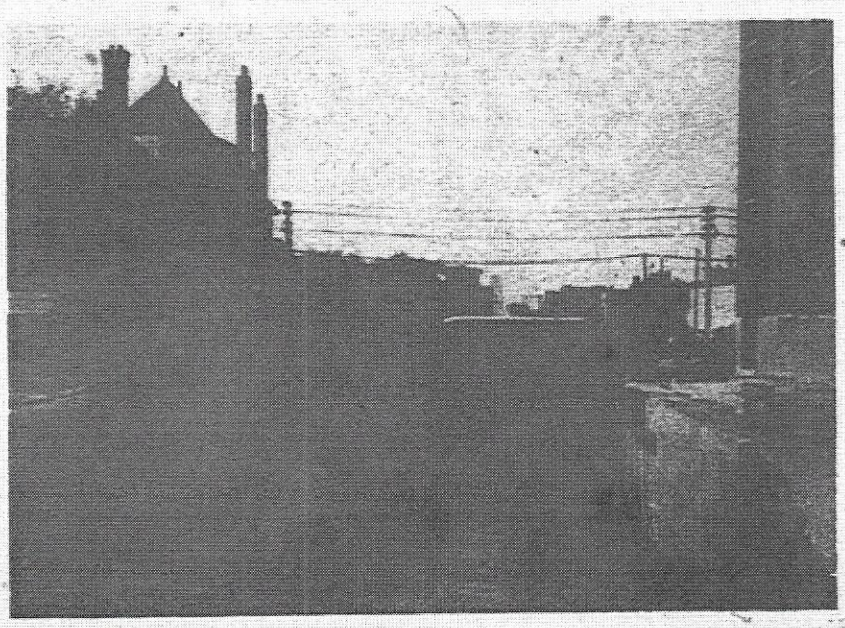
Street Car Diversions

From time to time, as the subway construction work progresses, it becomes necessary to make relatively slight changes in the routing of electric railway cars, particularly those on the Yonge Street route. The Commission spares no effort to acquaint the public with the diversions required, and in regard to the length of the period during which the re-routing is to be in effect. A recent example of re-routing made necessary is shown in the accompanying sketch map. Ordinarily, the cars on the Yonge Street route proceed straight south on Yonge Street to Front Street and then westerly to a loop a short distance



A View of Subway Contract S3, Looking South Across Bloor Street, a Main East-West Intersecting Street, and Showing Intermediate Excavation Proceeding

Toronto Subway Progress

The following account covers progress on construction of the Toronto rapid transit project to July 21. Contracts are numbered from south to north. The line, mostly subway but with some open cut, extends for a short distance easterly along the line of Front Street from Toronto's Union Station to Yonge Street, and thence northerly along the line of Yonge Street to a terminus at Eglinton Avenue.

Contract S5A. — Work had been begun on the excavation for the footings for the Imperial Street bridge. The chimney stack of the boiler house was completed. Concrete placement for the platforms at Davisville station was progressing.

An Early Stage in the Construction of the Wellesley Station on the Toronto Rapid Transit Route

The superstructure work is being carried out by Foundation Co. of Canada, Ltd.

Station Contract SC1. — This contract covers the stations on the south end of the route. At Union Station, non-slip tile was being laid at the platform edges; glass-faced masonry was being set along the north platform wall, and terrazzo floor was being placed in the mezzanine.

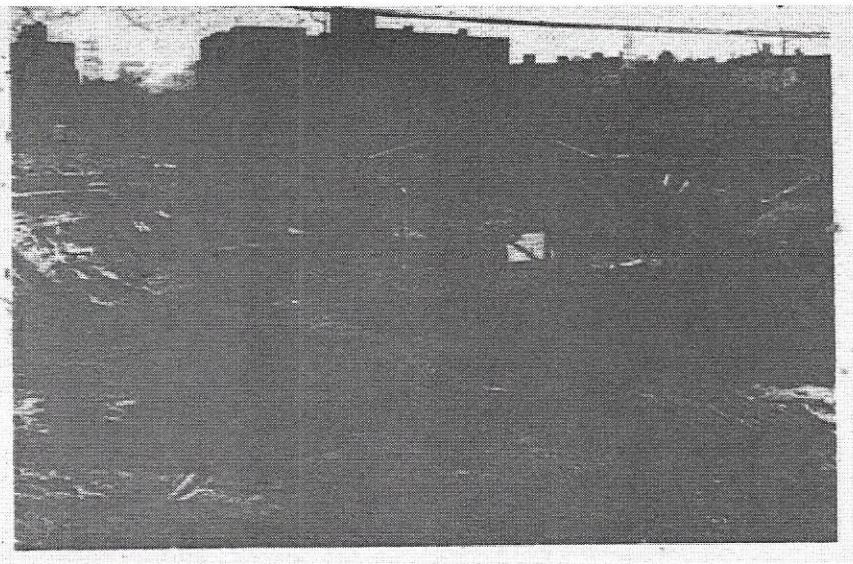
At King Station, on July 21, glass-faced masonry was being set on the platform walls below the control area. At Queen Station, an escalator was being installed in the southwest section of the mezzanine. At Dundas Station, the terrazzo floor in the east control area had been placed, and at College Station, concrete bases in the mezzanine area had been placed.

Station Contract SC2. — In this contract, covering stations toward the north, terrazzo flooring and cement floor finish in the service room was being placed at the Wellesley Station. Glass-faced masonry had been delivered at the Bloor Station. At the Rosedale Station, backfill of bus platform sections was in progress, and at Davisville Station, brick veneer for the signal tower was being placed.

More Free-Wheel Operation In Winnipeg

On the night of July 1, Winnipeg Electric Co. discontinued electric railway car operation on the St. Mary's Road and St. Anne's Road routes, and motor buses took over the service on the morning of July 2. At time of writing, at mid-July, work is proceeding with the installation of trolley coach overhead on the St. Mary's Road route, and the company plans to inaugurate trolley coach service on St. Mary's Road in the near future, with the St. Anne's Road service supplied by motor buses connecting with the St. Mary's Road trolley coaches at the intersection of St. Mary's Road

(Continued on page 462)



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with some open cut, extends for a short distance easterly along the line of Front Street from Toronto's Union Station to Yonge Street, and thence northerly along the line of Yonge Street to a terminus at Eglinton Avenue.

Contract S1. — Station work was continuing at the Union and King Stations at the date specified.

Contract S2. — Sand backfill and paving were being placed at the Yonge-Queen intersection, and pit run gravel was being placed north of Queen Street and from the Dundas Street intersection to Terauley Street.

Contract S2A. — Backfill was completed and paving placed and the street was restored for traffic.

Contract S3. — Decking had been removed on the south side of Bloor Street, and all concrete work on this contract had been completed.

Contract S4. — Backfill at Rowanwood Bridge had been commenced, as had also final grading from Shaftesbury to Summerhill. Concrete work at Summerhill Station was continuing.

Contract S5. — Concrete work at St. Clair Station was under way. Placing of backfill at Yonge Street between Lawton Blvd. and the Lawton loop was completed. Temporary tracks were being laid on the west side of Yonge Street north of Heath Street, to enable the contractor to backfill the east side on Yonge Street north of Heath. This diversion commenced July 19.

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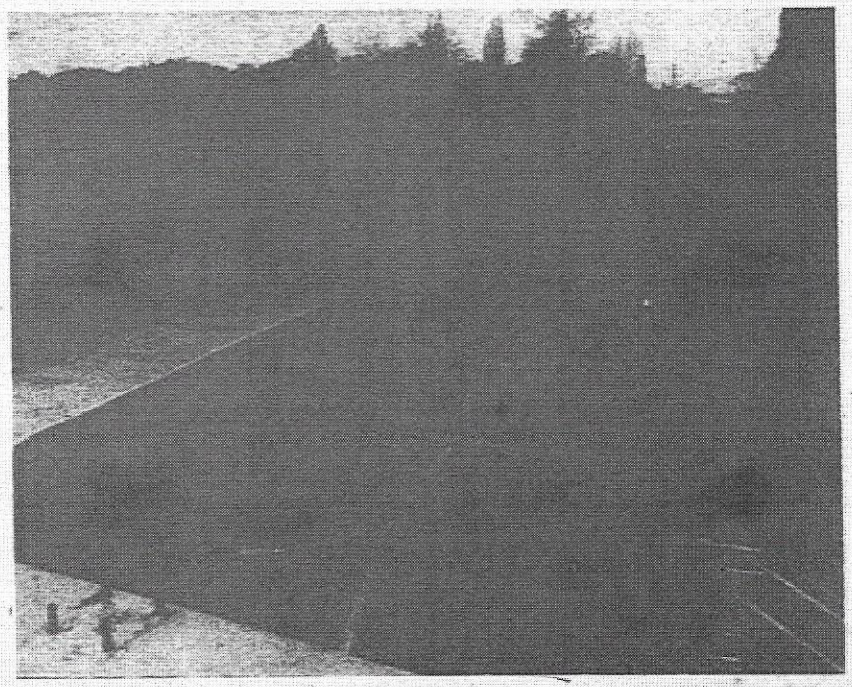
(Continued on page 462)



A Construction View of the Toronto Rapid Transit Rosedale Station, Showing Platform

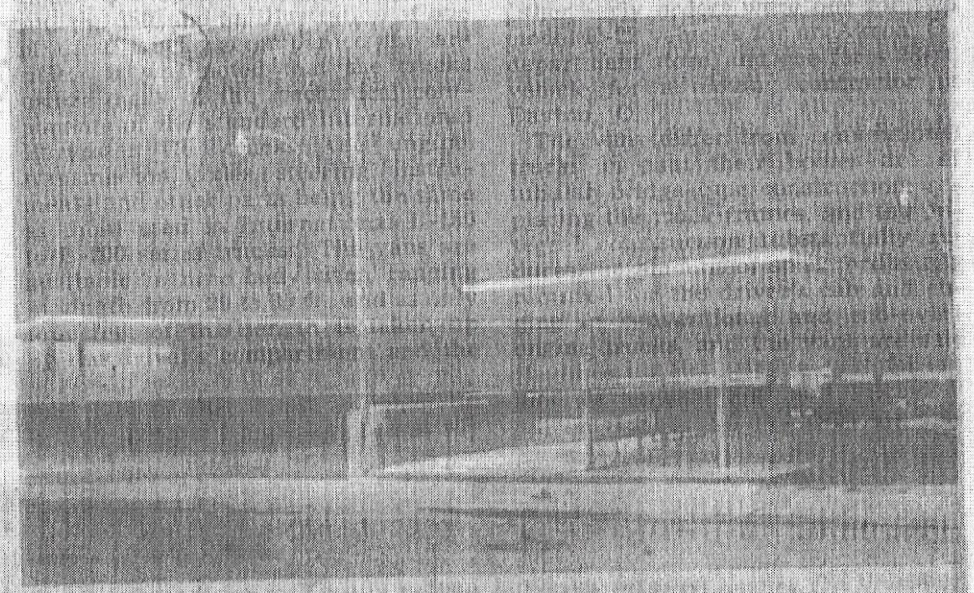
Toronto Coach Terminal

Particulars were given in our issue of October last of the plans for a new motor coach terminal in the Toronto downtown area, to be provided by the Toronto Transportation Commission for its motor coach subsidiary, Gray Coach Lines, Ltd. The latter operates the Mount Pleasant and Beach extra fare motor coach services in Toronto, among others, and it was explained that the new terminal was designed to provide off-street loading and unloading of passengers on these motor coach routes, in the downtown area. The new terminal, an illustration of which appears herewith, is between Richmond Street East and Lombard Street, east of Victoria Street, and the layout is such as to permit at least four coaches to load and unload simultaneously. The new terminal not only replaces the curb loading of coaches, which had to be resorted to previously, but also relieves congestion at the Adelaide motor coach terminal, which has been taxed to capacity during rush periods. Guide rails, which have proven very successful in the queuing of passengers at the Adelaide terminal, have been installed on the platform at the new Lombard terminal. In the operation of the new facility, the coaches enter the terminal area southbound from Richmond Street, via a private driveway between the Victoria Theatre on the west and a new automatic electrical substation which the T.T.C. completed recently on the east. Coaches leave the terminal via Lombard Street.

Modern Cattle Handling Equipment

An accompanying illustration shows a model WF64 White Freightliner, powered by a 300 h.p. model NHRBS-600 Cummins Diesel engine, together with trailer, recently added to the fleet of A. and F. Freitas, in business [illegible]

miles per gal. The two brothers report that the engine employed is the best obtainable for their business; hauling cattle, they say, requires rugged equipment, in view of the fact that they operate off the highway to pick up and unload live stock.



The New Motor Coach Terminal in Toronto, to Provide Off-street Loading and Unloading for Mount Pleasant and Beach Coaches in Downtown Area

Fageol Vans Enter Service

A description of the new line of van-type trucks, designated as "Fageol Vans", in honour of their designer, L. J. Fageol, Twin Coach Co. President, and manufactured by Twin Coach Co., appeared in our June issue, pg. 380, and an illustration of one of these trucks accompanied the article. It was noted that the trucks utilize many of the mechanical components of the standard International Harvester Co. trucks, the engine, transmission, axles, steering, instruments and other parts being the same as those used in International L-150 to L-200 series trucks. The vans are [illegible] engine, a large percentage of the space is available for payload.

During June, demonstration tours throughout the United States were undertaken by Twin Coach Co. representatives, and a number of orders for the new vehicles resulted. [illegible]

One of the first obtained was one from United Parcel Service for 20 vehicles; this was placed in New York by W. D. Bixby, United Parcel Service Vice President, and is for 10 each of the model FV-22 and model FV-24 vans, these having 22 ft. and 24 ft. bodies respectively. These vehicles are to be placed in service in Chicago. Other early orders were one for two model F-22 vehicles for an Akron, O. department store, and one for a 28-ft. vehicle for a moving contractor in Dayton, O.

The vans differ from conventional trucks in that their bodies are of tubular bridge-type construction, replacing the truck frames, and this integral construction substantially re-

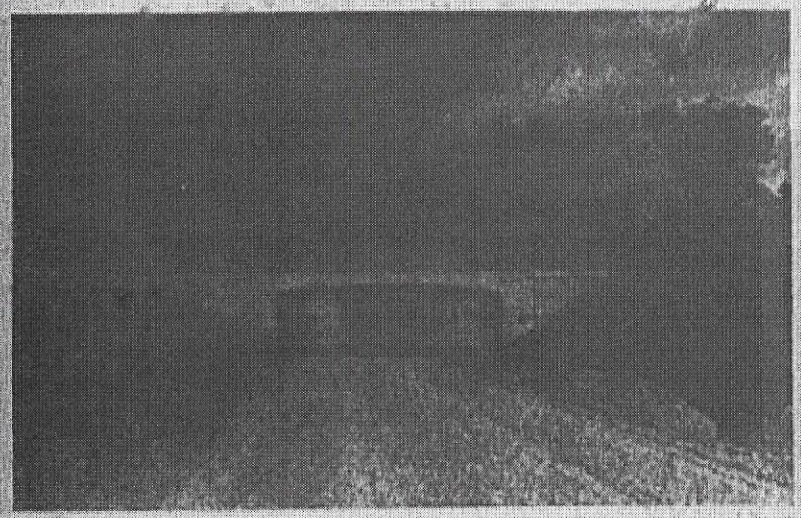
tickets at four for 75c, and with a weekly pass sold at $1.25, enabling patrons showing pass to travel for five cents per ride; Los Angeles, 15c cash, with tickets at two for 25c; Milwaukee, 15c cash; Minneapolis, 15c cash; New York subways, elevated and municipal surface lines, 10c cash, and Fifth Avenue Coach Lines, 12c cash; Philadelphia, 15c cash, with tickets at three for 40c; Pittsburgh, 17c cash, with tickets at three for 50c; Rochester, 12c cash, with tickets at eight for 95c; St. Louis, 17c cash, with tickets at three for 50c, and with a weekly pass sold at 65c, enabling bearer to ride for 10c; San Francisco, 15c cash, no tickets; Seattle, 15c cash with tickets at seven for $1.00; Toledo, 12c cash, with tickets at

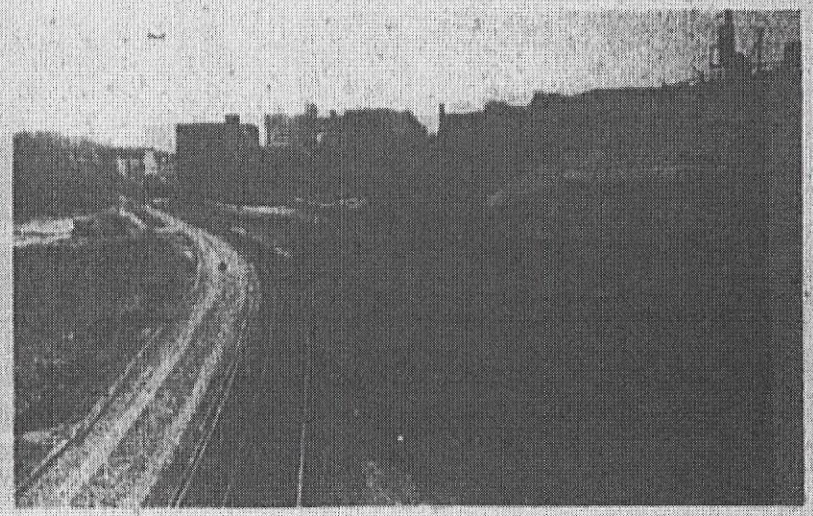
Sigmundson, Manager, Transportation Operations; John F. Intihar, General Superintendent of Vancouver and Intercity Lines, and Colin Dobell Director of Transportation Safety and Training. As explained in the September issue article, all of this biographical information was designed to accompany the article in our June issue describing the B.C.E.R. Co. property, the B.C.E.R. Co. having been the host organization for the Canadian Transit Association 1952 annual meeting, at Vancouver. The biographical information in regard to the B.C.E.R. Co. personnel was omitted from the June issue article on account of lack of space.

was appointed Safety Intsructor in 1940, and Supervisor of the Accident Prevention Department in 1943, and subsequently to his present position.

Toronto Subway Track Laying

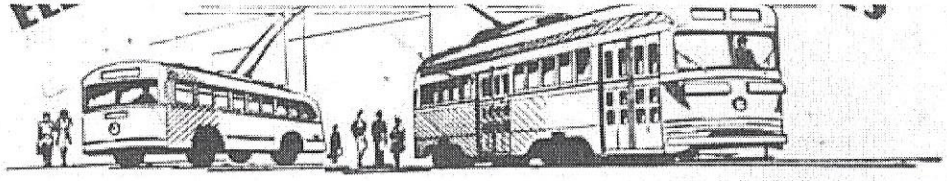
During October, great progress was made in the laying of track on the Toronto rapid transit north-south route, being built along the line of Yonge Street and involving both subway and open cut construction. To October 22, about 25% of the total tangent track had been laid, and track-laying continued to proceed at a fast pace.





Progress on Open Cut Sections of Toronto Rapid Transit Route

Both of the photographs reproduced in the above illustration were taken on contract S4 of the work. The view at the left is as the line appears looking north through the Aylmer Bridge, and that at the right shows the line as seen looking south from Aylmer Street to the Ellis Portal.



1953

Toronto Subway Job Nearing Completion

First operation of a two-car train on the Toronto rapid transit route, which extends partly in subway and partly in open cut along the line of Yonge Street, the city's main north-south thoroughfare, took place on Sunday, September 20, when a train was operated south from Davisville yard to Bloor station. Power to the third rail was not on at all locations, and it was therefore necessary to use a temporary line in certain areas, with the result that the movement of a little over two miles was at comparatively slow speed.

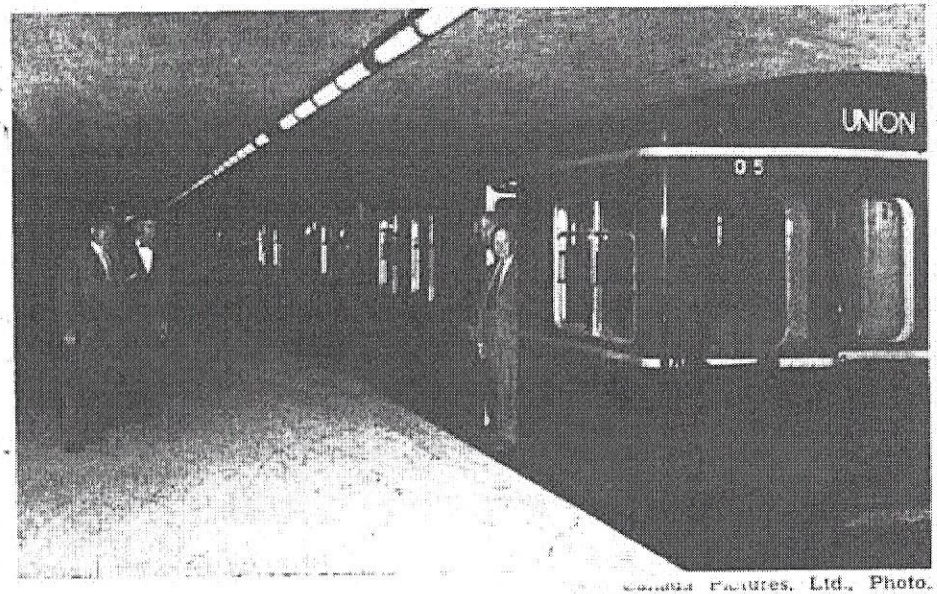
The Toronto Transportation Commission members, and many Commission officers, were on hand for the event. At time of writing, the train is being held at Bloor Station for running and clearance tests in the south portion of the subway, which extends south following Yonge Street as far as Front Street, and thence westerly under Front Street to the Toronto Union Station.

As before explained, the contracts covering the rapid transit work are numbered from south to north. During the month preceding time of writing, September 21, no work of consequence proceeded on contracts S1, S2 and S2A. On Contract S3, at time of writing, relocation of a sewer between Alexandria Street and Maitland Street is proceeding. The location of this sewer is being altered to allow construction of a building on property immediately adjacent to the rapid transit right-of-way.

On Contract S4, top soil is being placed on the side-slopes of the open cut between Severn and Price streets, with landscaping in progress south of Aylmer Street and north of Roxborough Avenue.

On contract S5, sodding is in progress on the surface south of Muir Portal. On contract S5A, the sprinkler system has been installed in the Davisville Shops, and painting is in progress.

On contract S6, the north end of No. 10 platform roof canopy at Eglinton Station, at the north end of the route, has been placed, this having been the last major structural concrete pour on the rapid transit job. The right-of-way on this contract has been



Canada Pictures, Ltd., Photo.

Subway Train at St. Clair Station Platform

In the left foreground are W. Forsyth, Superintendent of Equipment, and J. G. Inglis, Assistant Manager i/c Equipment, T.T.C.; in the front doorway appear Chairman William C. McBrien and Vice Chairman W. G. Russell, T.T.C., while those in the center doorway include Commissioner C. A. Walton and H. W. Tate, Consulting Engineer and Assistant General Manager, T.T.C.

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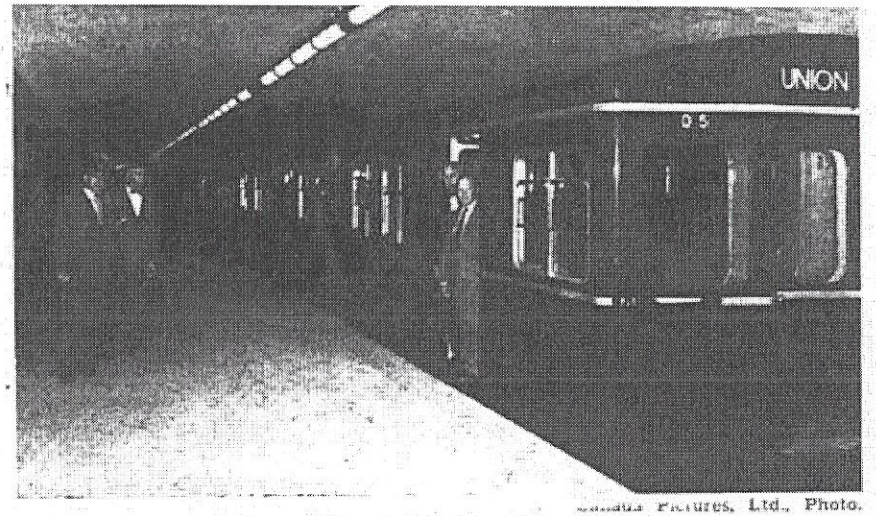
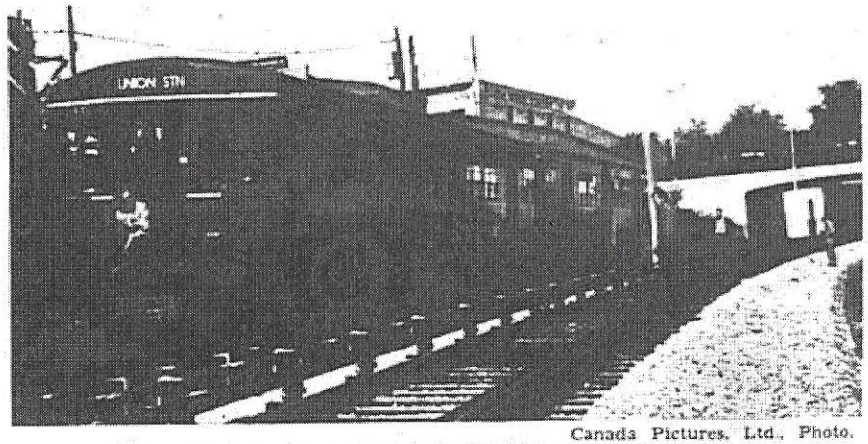


Canada Pictures, Ltd., Photo.

Subway Train at St. Clair Station Platform

In the left foreground are W. Forsyth, Superintendent of Equipment, and J. G. Inglis, Assistant Manager i/c Equipment, T.T.C.; in the front doorway appear Chairman William C. McBrien and Vice Chairman W. G. Russell, T.T.C., while those in the center doorway include Commissioner C. A. Walton and H. W. Tate, Consulting Engineer and Assistant General Manager, T.T.C.



Canada Pictures, Ltd., Photo.

Subway Train in Open Cut Section of Toronto Rapid Transit Route

Davisville Shops, and painting is in progress.

On contract S6, the north end of No. 10 platform roof canopy at Eglinton Station, at the north end of the route, has been placed, this having been the last major structural concrete pour on the rapid transit job. The right-of-way on this contract has been fenced and sidewalk paving on the east side of Manor Road bridge has been completed.

On station contract SC1, covering the provision of stations on the south half of the route, work was moving forward at time of writing as detailed in the following.

Union Station—Installing fluorescent tubes in passageway fixtures; King Station, installing stainless steel advertising frames on central columns; Queen Station, constructing entrance to subway from building at northwest corner of Yonge and Albert Streets; Dundas Station, finishing acoustic tile ceiling and installing fixtures in entrance passageways; Col-

lege Station, installing acoustic insulation for telephone booth.

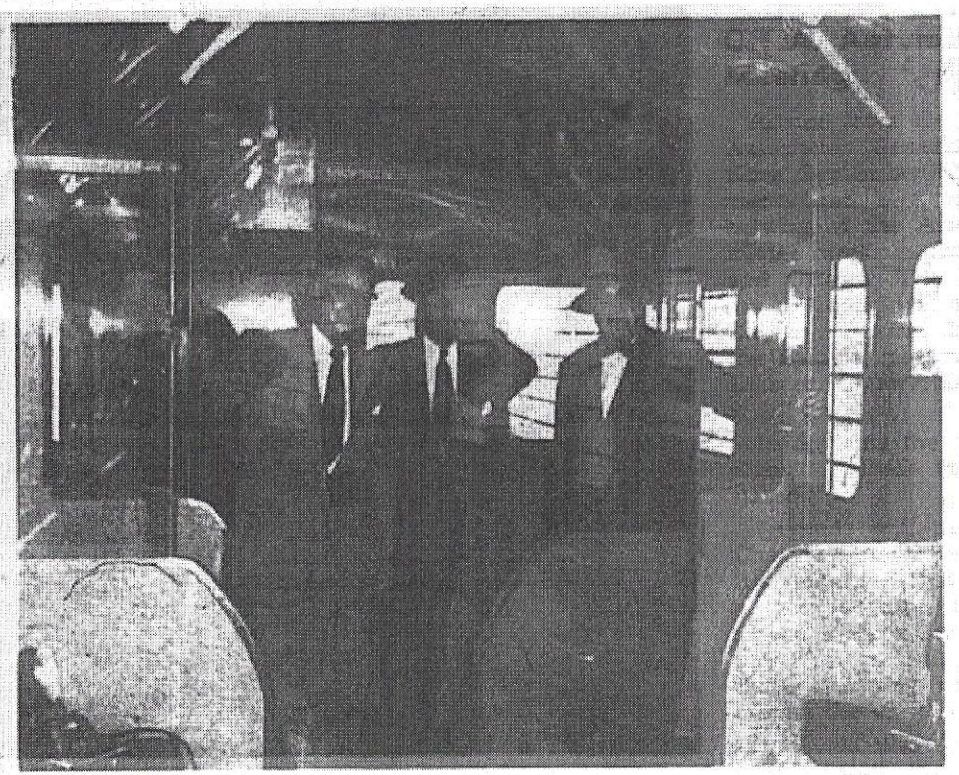
On contract SC2, covering provision of stations on the north half of the route, work was proceeding as follows on September 21:—Wellesley Station, placing base for ticket booth; Bloor Station, giving terrazzo platforms final grind; Rosedale Station, bus loop being constructed by paving contractor; Summerhill Station, installing door hardware and preparing for ticket booth installation; St. Clair Station, providing sidewalks and paving to Pleasant Boulevard; Davisville Station, installing light tubes and [illegible]. At this station the control

18,000 ft. involved, or 26% of total.

To September 21, out of the total of 104 cars being furnished by the builder in England, Gloucester Railway Carriage and Wagon Co., Ltd., 14 had been received in Toronto and another 10 were in transit. It is expected that deliveries will proceed at the rate of about four cars per week until the order is completed, with the exception of the final four cars, the bodies of which are to be of aluminum. To acquaint the public with the type of equipment to be operated, two of the rapid transit cars were placed on display at this year's Canadian National Exhibition in

August issue, pg. 468, this being designated the Bedford Loop, and being located at the northwest corner of Bloor Street and Bedford Road.

Construction of this new facility was completed September 12. It is to be used by a new Danforth-Bloor street car route extending from it to the Luttrell loop, at the east end of Toronto, and operated for the convenience of passengers in the area served, wishing to travel to and from downtown Toronto, using the Yonge Street rapid transit line.



Canada Pictures Ltd. Photo

T.T.C. Group in Subway Car On Initial Run

At extreme left facing door is W. H. Paterson, Chief Engineer, and in the foreground, from left to right, are H. E. Pettett, Secretary and Director of Public Relations; Commissioner Walton and Vice Chairman Russell

C.T.A. Autumn Committee Meetings

Advice from the Canadian Transit Association General Secretary, H. E. King, September 4, was that arrangements had been completed for the holding of the Association fall committee meetings this year in Calgary and Ottawa. The Western meetings are to be held at the Hotel Palliser, Calgary, October 19, 20 and 21, and the Eastern meetings at the Chateau Laurier, Ottawa, December 7, 8 and 9.

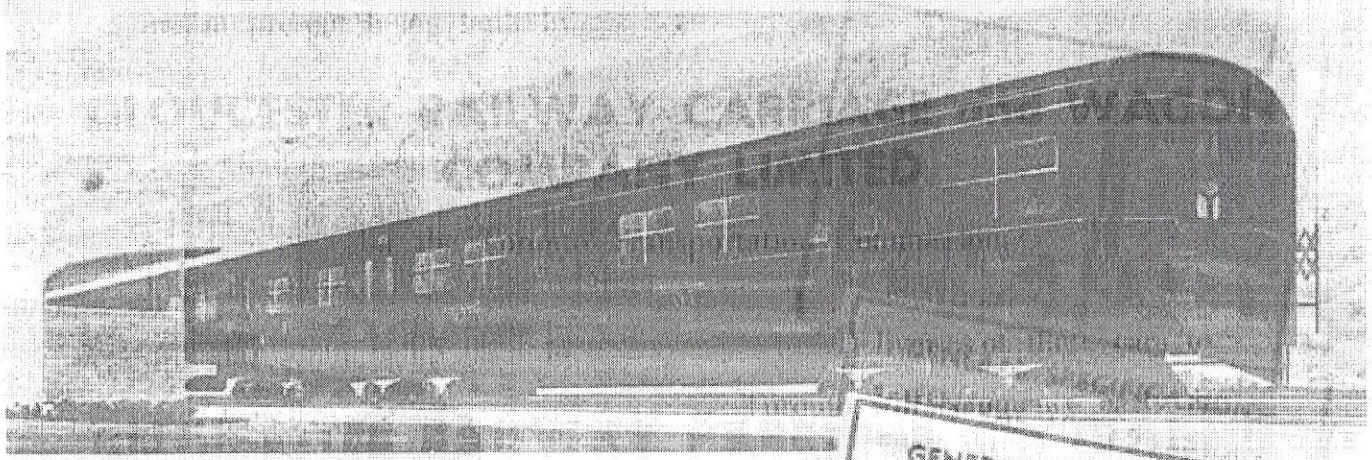
In advising the membership of the plans for these meetings, Mr. King stated:

"Agenda will be prepared by the Chairmen to cover both meetings. It is expected that these agenda will be completed in time to be mailed to you a week or two in advance of the Western Fall Meetings so that those attending will be prepared to discuss the various items to be covered.

"To assist the Chairmen in the preparation of agenda and to insure the inclusion of items of interest to all committee members, attached is a form for your use in submitting suggested topics to be considered. It would be appreciated if these forms could be returned to this office by the 15th of September.

RAPID TRANSIT CARS

for Canada's First Subway

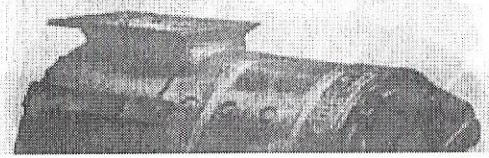


GENERAL SPECIFICATIONS	
Seating Cap.	62 Passengers
Length	57'
Height	12'
Width	10'
No. Cars in train	2, 4, 6 or 8
No. Motors per car	4

104 Modern Rapid Transit Cars, equipped throughout with husky, high speed Bepco Traction Motors are at present being built by

GLOUCESTER RAILWAY CARRIAGE and WAGON COMPANY LIMITED

for the Toronto Transportation Commission.

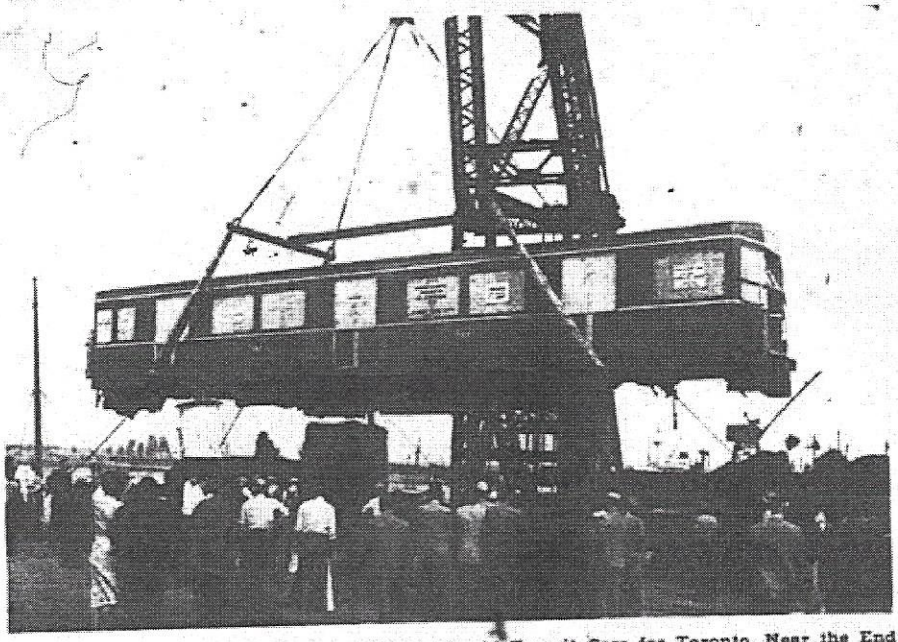


Deliveries of these cars to Toronto will commence early in

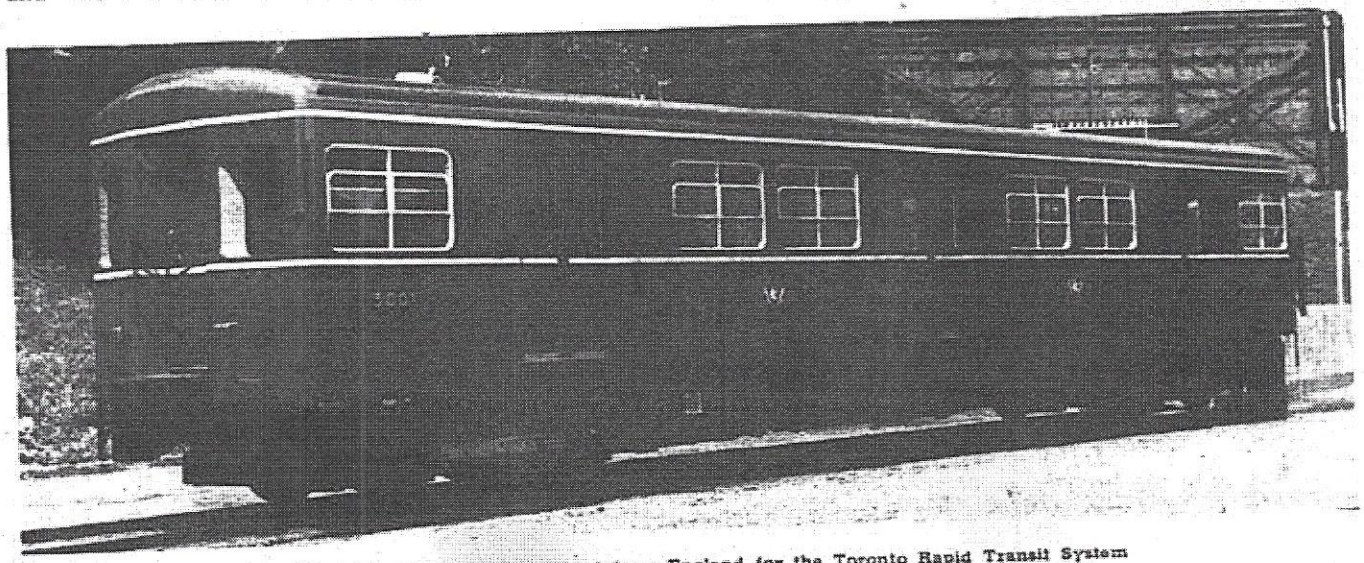
Toronto Receives First Rapid Transit Cars

It was recorded in these columns early last year that the Toronto Transportation Commission had awarded a contract for the construction of 104 cars, required for the Yonge Street rapid transit line in Toronto, to Gloucester Railway Carriage and Wagon Co., Ltd., Gloucester, England, represented in Canada by Bepco Canada Ltd., with these cars having motor equipment manufactured by Crompton Parkinson and Co., and control equipment provided by British Thomson Houston Co. It was mentioned that the cars would cost the Commission $7,800,000, or about $75,000 each. Elevation and floor plan drawings of one of the cars appeared in our March, 1952, issue, pg. 139.

The first two of the cars to be received in Canada arrived in Montreal near the end of July, aboard the Bristol City Line ss. New York City, and were transferred by National Harbours Board crane on July 27 to Canadian National Rys. flat cars which had been specially equipped to receive them. Eighty-pound rails were laid on the flat car decking and 1¼ in. steel tie rods were fastened to tie plates at the base of the side stake pockets. Metal chocks shaped to contour were placed on each side of the car wheels and

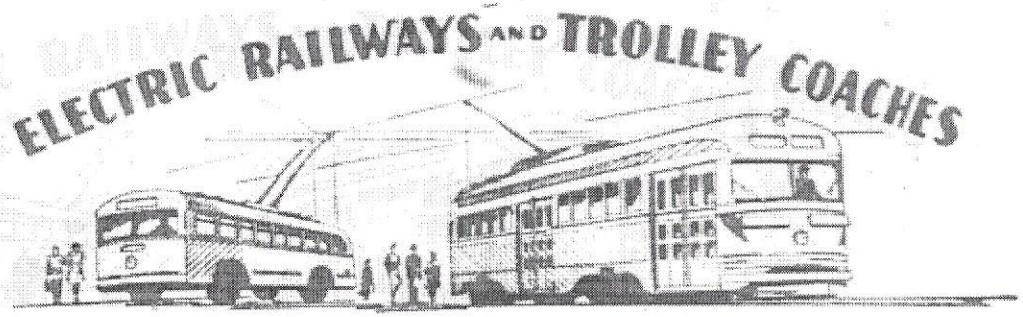


Unloading One of the First Two of the 104 Rapid Transit Cars for Toronto, Near the End of July, from the Ss. New York City, in Montreal.



One of the First Two Cars Received from England for the Toronto Rapid Transit System

1953 - partial - specifications



Rapid Transit Service Nears in Toronto

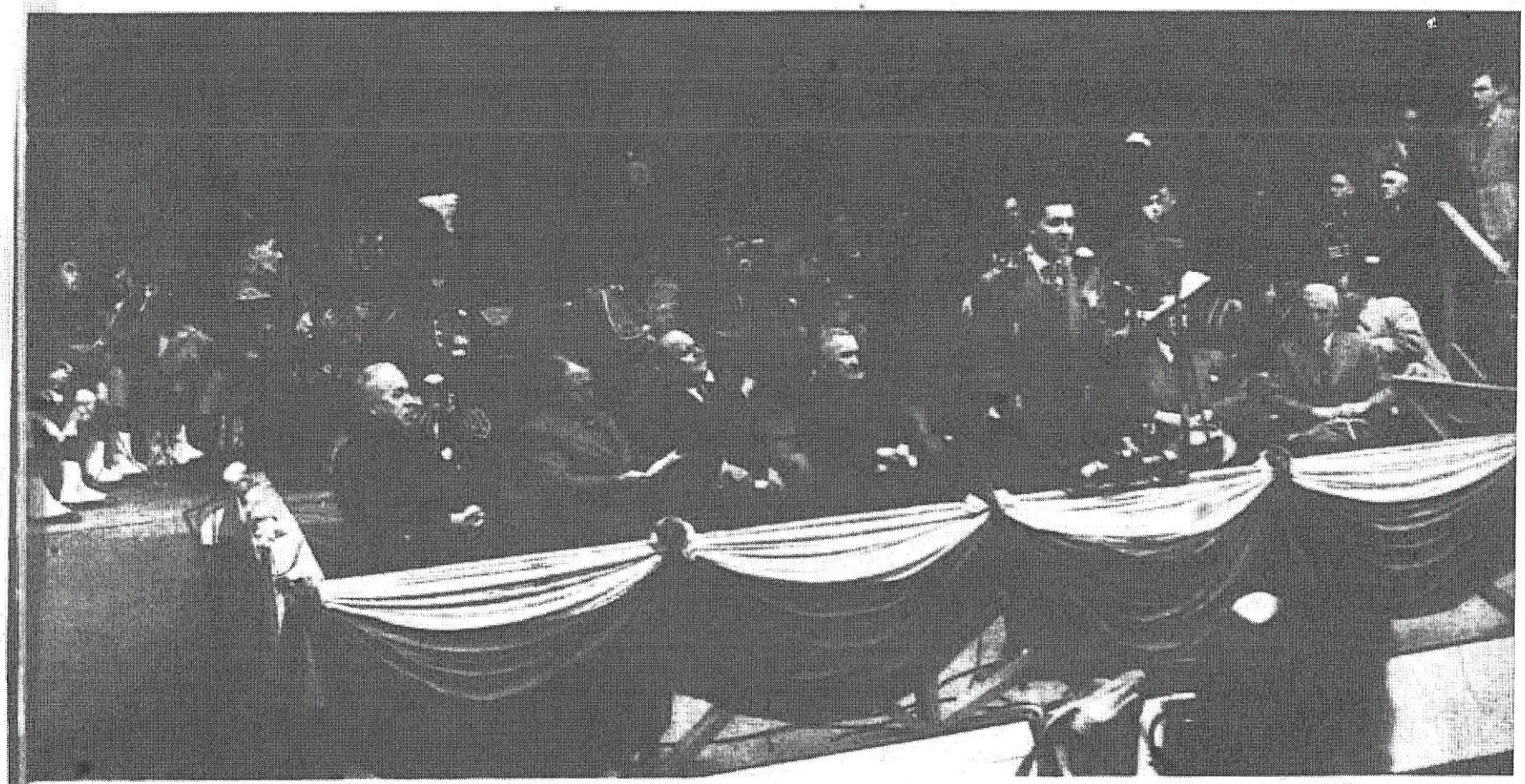
With only finishing-up work in the provision of rapid transit facilities remaining to be done, with deliveries of cars from England proceeding at a good pace, and with plans complete for the training of operating crews, the citizens of Toronto are about to witness introduction of a new period in public passenger transportation in their city. The operation of speedy rapid transit cars, on a route largely in subway but with considerable open cut, affords striking contrast with conditions in the omnibus and horse-car periods of a century ago, and the new development ranks in importance with the introduction of electrically-operated cars in 1891. The splendidly co-ordinated system of public transportation which has so well served the city and the many adjoining municipalities, since the Toronto Transportation Commission began operation in 1921, has found it increasingly difficult to operate efficiently under the conditions of traffic congestion produced by motor vehicles in their thousands, and the new rapid transit system will, it is confidently expected, produce a vast improvement in traffic conditions in the city.

Readers who have perused the articles appearing in this journal from time to time, describing the work in Canada, is an engineering work of first magnitude. In past issues we have explained the considerations physical facilities, including the cars for the rapid transit operation, is nearing completion, and the expecta-

that city's main north-south thoroughfare, must be convinced that this undertaking, the first of its kind in

was begun September, 8, 1949, has been reported from month to month. Now, the work of providing the

There will thus be embarked upon what may be referred to as the fifth phase of public passenger transporta-



At the Ceremony on Yonge Street, in Toronto, September 8, 1949, Marking Beginning of Work on the Toronto Rapid Transit System. In the foreground, from left to right, are Vice Chairman W. G. Russell of the Toronto Transportation Commission; the then Mayor of Toronto, Hiram McCallum; the then Lt.-Governor of Ontario, Hon. Albert Matthews; Chairman William C. McBrien of the Toronto Transportation Commission; the radio announcer; Toronto Transportation Commissioner William C. Croft (since deceased); and then General Manager of the T.T.C., H. C. Patten. In the background appear members of the 48th Highlanders Band.

16% and shale in the rock section. These were described more fully previously.

Excavation in the off-street sections was taken out in three lifts using access ramps in the cut between the cross streets. The top lift was removed by back hoe and shovel with truck haul to dumps. Intermediate and bottom lifts were loaded with back hoe and some clean-up work was done by clam shell operating from the top of the excavation.

Ground water encountered in the section under the Canadian Pacific tracks and in the section between St. Clair Avenue and Heath Street made it necessary it use well points to lower the water prior to removing the bottom lift.

Subway Structure.—The subway in station sections is a rigid frame reinforced concrete structure with the 54 foot width supported in the centre on wide flange steel columns and a longitudinal structural steel beam. This design was selected to give clear vision between side located platforms in the 10 intermediate stations and because of less obstruction to passenger movement at the two centre platform terminal stations.

Between station sections are entirely reinforced concrete with the 32' width supported between tracks with a reinforced concrete wall.

Portable steel forms were used for walls and roof in both subway sections and plywod forms in control areas, passageways and entrances.

The steel forms were built in 20 ft. sections mounted on a frame which

inforcing steel was also carried through this joint into the roof of the structure.

The portable roof forms were then run into place and the roof concrete poured and struck off to the required thickness.

All concrete was supplied by transit mix trucks from central batching plants and placed from the street surface using "elephant trunks" to discharge the load into the forms. Consolidation was by pneumatic vibrators operated in the concrete.

Membrane waterproofing was applied to the lagging and plywood outside forms before the concrete was placed and the wall membrane was lapped into the roof membrane which was mopped in place on the finished concrete.

No provision for expansion was made in the structure except that space between monoliths which was caused by shrinkage in each pour during the setting period. Joints between monoliths were keyed but the temperature steel terminated at each joint.

Street and Utility Restoration.—As construction was completed in each traffic diversion section, a progressive program of street and utility restoration was scheduled. The street car diversions used for deck construction were again utilized for deck removal, backfill and the construction of temporary pavement, walks and curbs.

Sand backfill was placed through openings in the timber deck to the underside of the deck steel without

of crushed gravel and a 2" asphaltic concrete surface.

Temporary 6" x 12" wood curbs were laid and held in position by staking until the road surface was completed.

Sidewalks which were removed by construction were replaced with a 4" base of crushed gravel and 2" of asphaltic concrete.

Before the beginning of construction in September of 1949, all work necessary to complete the subway was scheduled and the final completion date was established as October 1st, 1953.

All contracts were awarded according to this schedule and work on each contract commenced within two weeks of the scheduled starting date, except station finish contracts which were delayed two months because of revisions to contract plans.

During progress of the work, further revisions were necessary to provide for the construction of large office buildings over Bloor and Eglinton Stations. Bloor transfer platforms were doubled in length, an Entrance was added into Toronto Terminals building and the Car House at Davisville was increased in length to accommodate the cars purchased in England.

Despite delays caused by material shortages, and additional time required because of revisions and added work, the completion date was extended only 90 days past the original schedule.

Components and Layouts

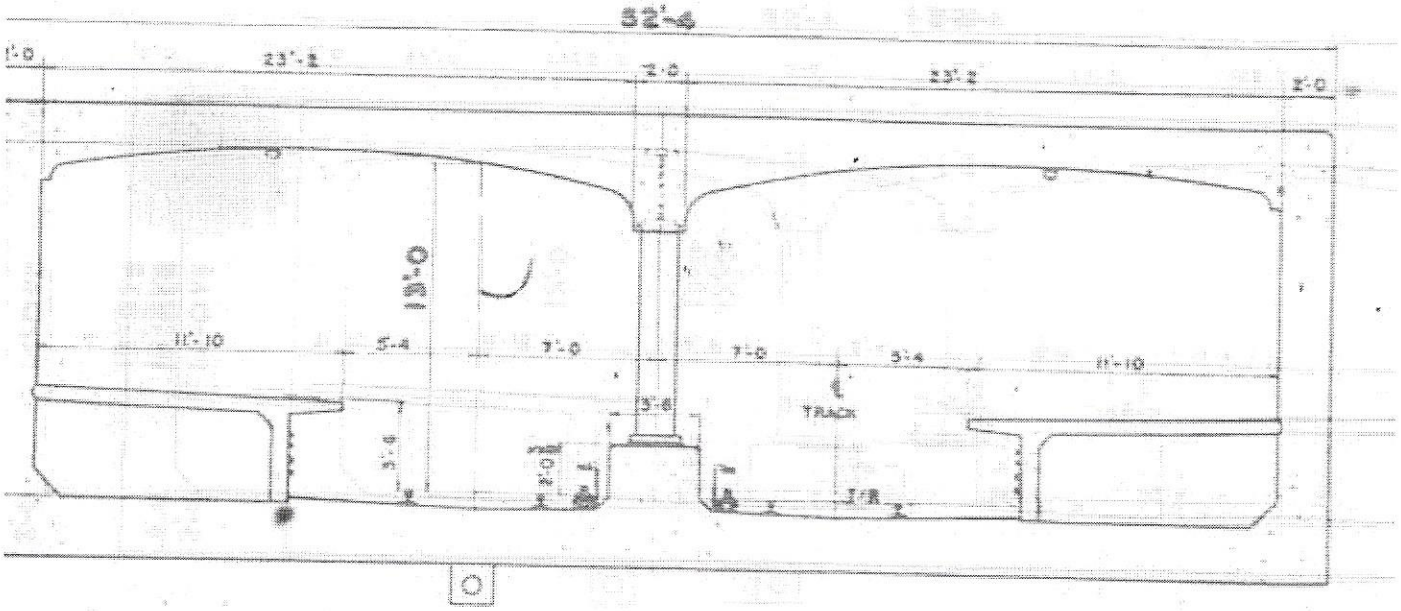
The design and construction of the

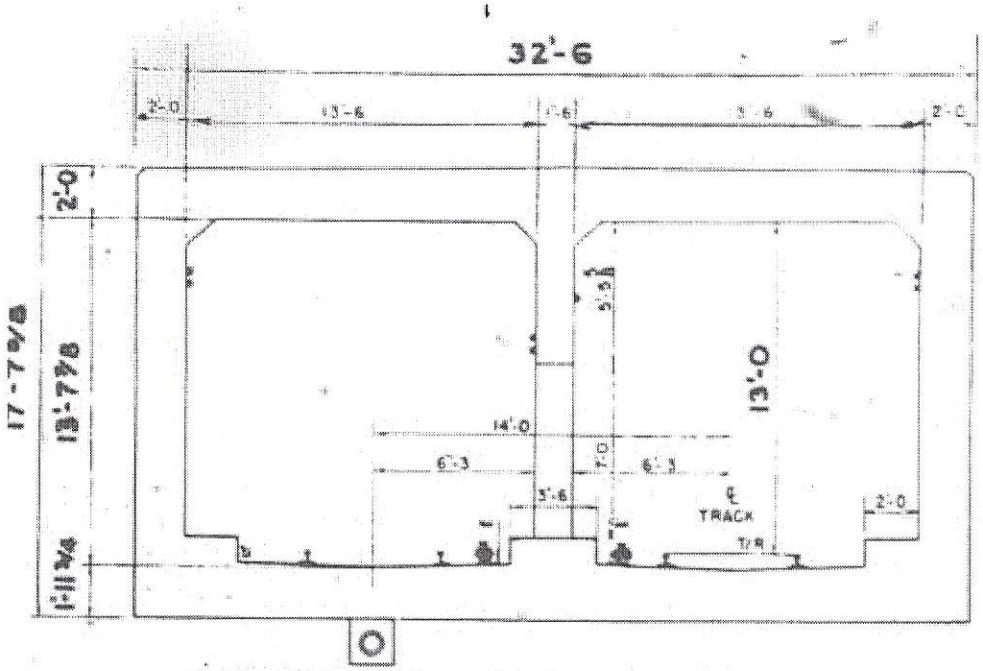
on the walls in accordance with European practice.

Station Design. — To provide adequate and economic service with reasonable room for future expansion it was decided that the subway would be designed for the operation of thirty trains an hour with maximum length of trains being 500 feet. The train length of 500 feet was based on a probable train of ten cars of 50 feet or eight cars of approximately 60 feet in length. All station platforms, therefore, are 500 feet long. Investigation of platforms in use on other properties showed that platforms varying in width from eight to sixteen feet are regularly in use. In many cases the useful width of the platforms is reduced by columns which support the structure above, being located on the platform. By adopting contemporary design practice both in the permanent structure and in the construction methods, the Yonge Street Subway stations are provided with platforms 500 feet long and 12 feet wide without column encroachment. Encroachments for stairways and escalators were permitted because these facilities could not be crowded into a sixty-six foot street without giving up some of the platform width.

In designing the stations the structural designers paid particular attention to the interior appearance of the strucure. A parabolic arch was developed which conformed very

per cent of the people the old city limits was a great set- said that while the construction dif-





Section Through Toronto Subway, Between Stations

ion in Toronto. Beginning in 1849 lived within easy walking distance of

back for any logical expansion of the transportation facilities of Toronto, and an opportunity was undoubtedly lost of building up a real transportation system. There were substantially no automobiles except in the last four or five years of this period.

Period of Co-ordinated Public Transportation. — From 1921, when the Toronto Transportation Commission assumed control of public transportation in Toronto, to 1941, there was developed in the city and adjacent municipalities, a truly co-ordinated public transportation system, using street cars and buses and coaches, which for the first time in the city's history fully met its rapidly developing requirements. The length of ride from the business district expanded to 5 or 6 miles, the longest ride for a single fare to 12 miles. Every part of the city could be readily reached from every other section.

The development of this system is familiar to everyone of the present

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Seating Cap.	62 Passengers
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Height	12'
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No. Motors per car	4

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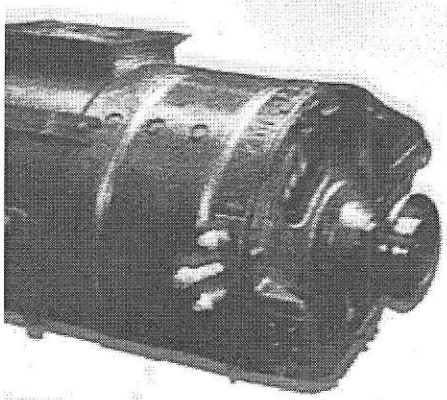

Bepco Motor as for Rapid Cars.

Deliveries of these cars to Toronto will commence early in the coming Summer and be completed sometime in the late Fall.

Canadian Representatives for Gloucester Railway Carriage and Wagon Company Limited

BEPCO CANADA LIMITED

MONTREAL TORONTO WINNIPEG VANCOUVER

Chairman William C. McBrien and Vice Chairman William G. Russell of Toronto Transportation Commission, and Others, in One of the New Rapid Transit Cars in Toronto

secured to the rails. The flat cars were handled between Montreal and Toronto in daylight hours only, and at speed not exceeding 25 m.p.h. The new cars are of 4 ft. 10⅞ in. gauge, that of the surface electric railway lines and rapid transit line in Toronto, a little wider than the 4 ft. 8½ in. standard.

These cars for the Toronto rapid transit system are 57 ft. 1½ in. long over bumpers, with length over body of 54 ft. 1½ in. Width over doors is 10 ft. 4 in., height, 12 ft., and distance between truck centres, 40 ft. Truck wheelbase is 7 ft. Wheels are 30 in. diameter. There are three door openings on each side, with door opening width of 3 ft. 9 in., door height being 6 ft. 6 in. Each car provides seats for 62 passengers, and car weight empty is 60,900 lb.

In the car body construction, the underframe, body and roof are of steel, with the side panels welded to the structure with countersunk rivets, giving a smooth appearance. The floor, of rubber, is laid on cork fastened to a dovetailed steel subfloor, to provide excellent sound-deadening qualities. Also, special sound-deadening material is applied to the inner side of the exterior body

114 feet long, with a cab at each end. This arrangement provides for double end operation, which is less expensive than it would be to provide underground turning facilities.

The operator can control a train of two to eight cars from one cab. The doors can be controlled from any cab not used for operating the train. The guard will have two door switches, one to operate the doors on each side of his position. By means of a full-drop window in the side of the cab, and a step on its floor, the guard can view the platform in both directions over the heads of station platform passengers.

The motors are supplied by Crompton Parkinson Ltd., of Chelmsford. There are four motors per car of 68 h.p. each, the motors being wound for 300-volt operation with two in series. They are ventilated by natural means, from their own individual armature shaft fans, using clean air drawn in through ducts.

The drive is by propeller shaft to a hypoid gear on each axle, similar to automotive practice and the P.C.C. car. This reduces the unsprung truck weight, thereby reducing noise and vibration.

Automatic acceleration is provided with a choice of three rates under control of the operator. There are also three running positions, switching series (½ speed) and parallel (full speed). The maximum speed of an empty train on level track will be approximately 50 m.p.h.

The control is type PCM (Pneumatic Cam Magnetic), manufactured by the British Thomson-Houston Company of Rugby, and is almost identical with that used exclusively by the London Underground for many years. Its predominant characteristics are its compactness, simplicity and extreme reliability. The car increases in speed from standstill by cutting out resistance placed in series with the motors. This is done by rotating a cam shaft automatically by pneumatic pressure, the various cams operating electrical contactors. The control, and various low voltage devices, are operated from a battery charged from a motor generator set.