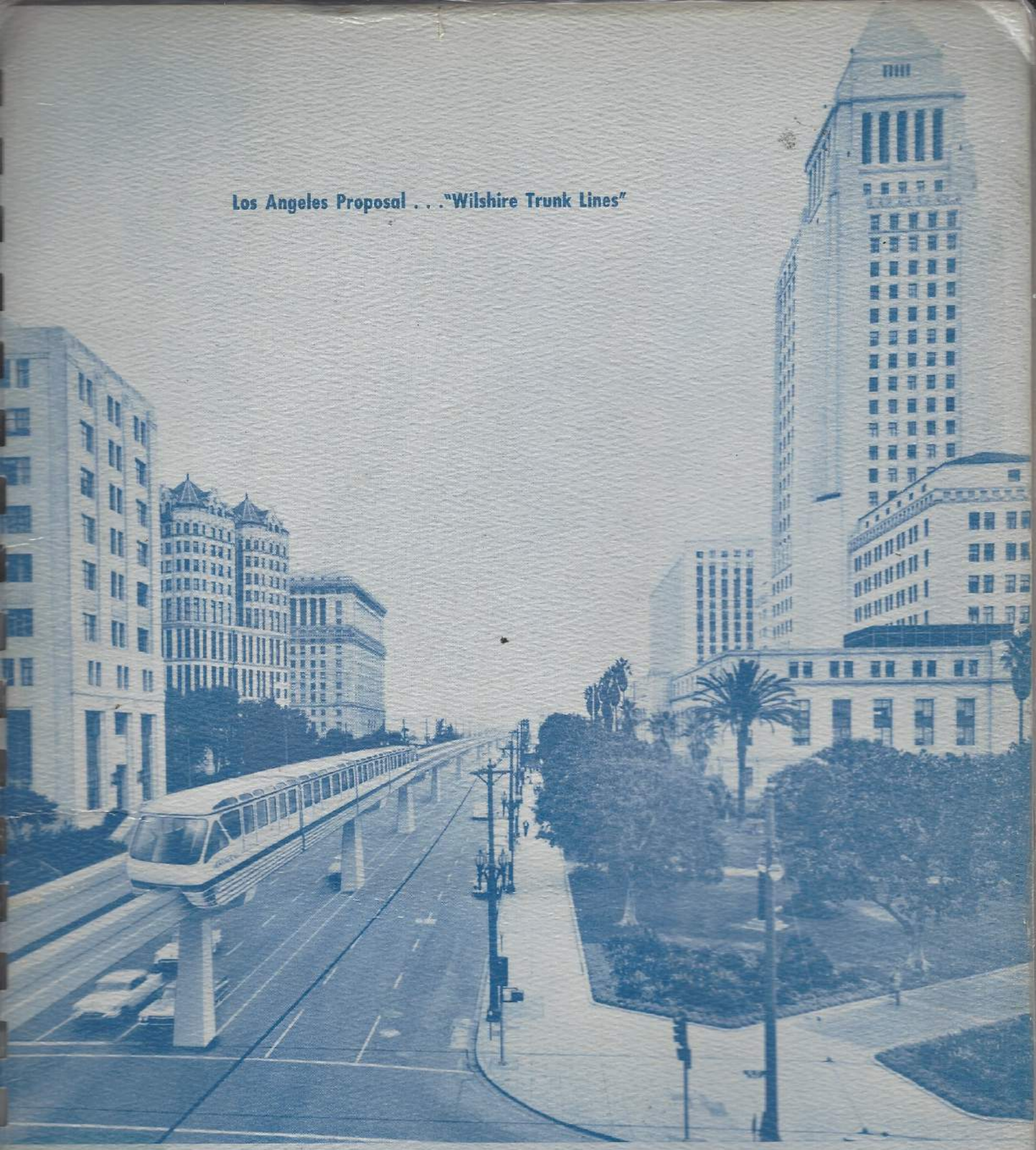
Los Angeles Proposal . . . "Wilshire Trunk Lines"



ALWEG

MONORAIL

ALWEG MONORAIL

WILSHIRE TRUNK LINE ROUTE

Presented By

ALWEG RAPID TRANSIT SYSTEMS OF CALIFORNIA, INC.

3275 WILSHIRE BOULEVARD, ROOM 207

LOS ANGELES 5, CALIFORNIA

DUnkirk 4-1205

A Division of

WEGEMATIC CORPORATION

660 MADISON AVENUE

NEW YORK 21, NEW YORK

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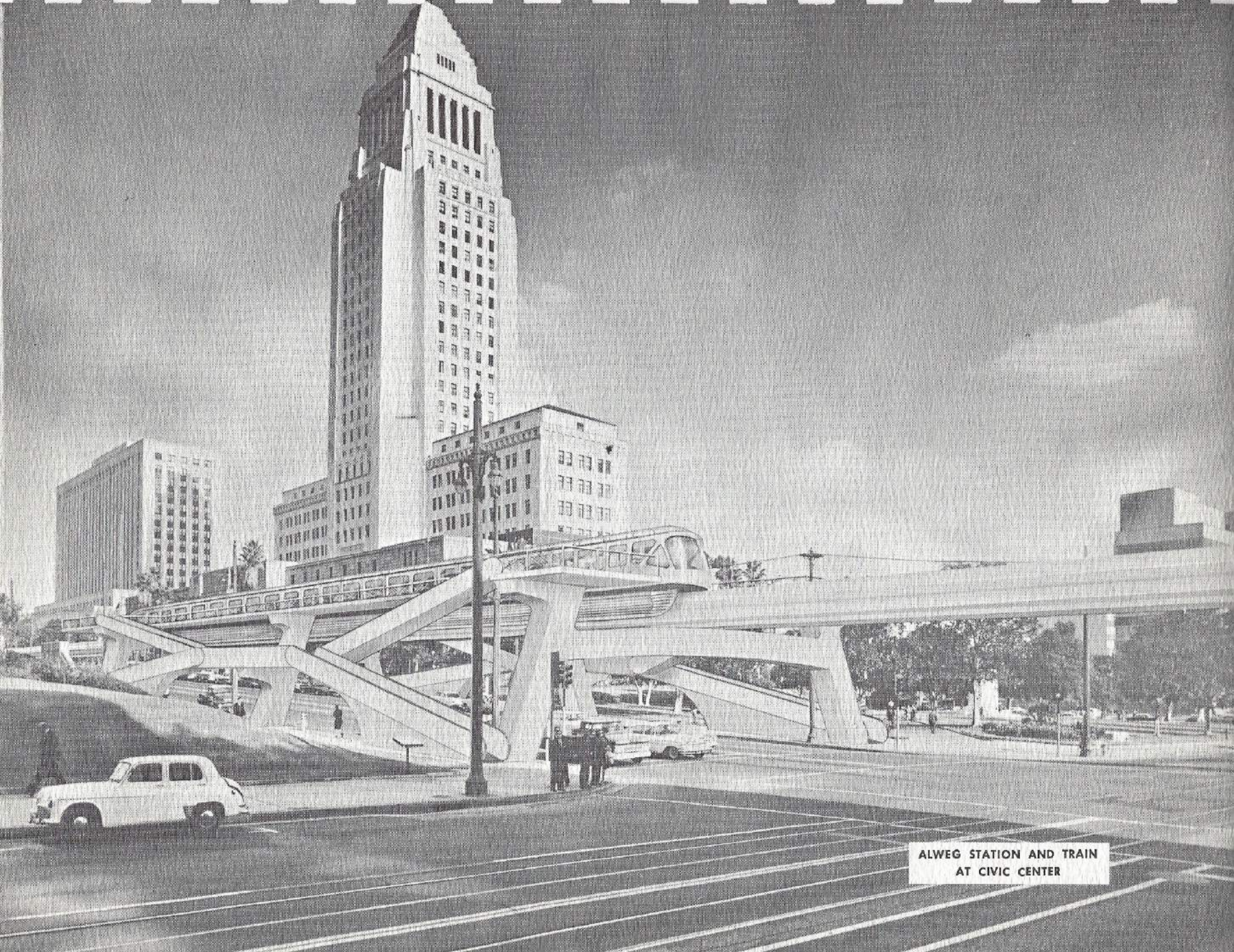


ALWEG STATION AND TRAIN
AT CIVIC CENTER

WILSHIRE TRUNK LINE

The appended proposal contemplates an Alweg double-beam monorail running above ground on a recommended route from Macy and Lyon Streets (just west of the Los Angeles River) through the Los Angeles Central Business District, and westward immediately adjacent to or on Wilshire Boulevard, and Santa Monica Boulevard to the San Diego Freeway. The route distance is approximately 14 miles. This proposal is a modification of the MTA "backbone route" which extended easterly to El Monte and westerly only to Century City.

(1) The San Bernardino corridor end of the "backbone route" was eliminated because our feasibility studies indicated that the volume of potential passengers as related to the capital cost was insufficient. According to our estimates, the backbone route and present MTA system would generate $8,380,000 for amortization whereas our less costly Wilshire trunk line proposal in conjunction with the present system would make $8,440,000 available for debt service.

(2) The easterly terminal station (and car storage yard) was located at Macy and Lyon Streets instead of using the present Metropolitan Transit Authority Macy Yard property east of the Los Angeles River because:

   (a) A river crossing and other expensive construction would be eliminated.

   (b) The Macy and Lyon Street site will provide automobile parking easily accessible from the San Bernardino and Santa Ana Freeways which are immediately adjacent to that site.

(3) The line was extended westward from Century City to Santa Monica Boulevard and the San Diego Freeway because of:

   (a) The greater feasibility of procuring off-street parking at that location than at Century City.

(b) A terminal and parking facilities immediately adjacent to the Freeway—designed to attract motorists from a 100% automobile trip to part automobile and part rapid transit.

(c) The additional potential passengers resulting from more direct service to the residential area traversed by this route extension.

Summarized route data

Length of Route (all above ground)		Miles 14
Number of Stations		19
Number of Cars Required (84 seats per car)		58
Motive Power		Volt DC 600
Annual Car Miles to be Operated (Estimated		4,250,000
Annual Passengers (Estimated		
From Present Transit	9,800,000	
From Automobiles	11,100,000	
Total		20,900,000
MTA System Estimated Operating Results for 1965 with Proposed Rapid Transit:		
Total Revenues		$48,930,000
Operating Expenses	$36,590,000	
Depreciation (a)	3,900,000	
Total Operating Expenses		40,490,000
Available for Total Debt Service (b)		$ 8,440,000

(a) 8% of gross revenue.

(b) Including bonds issued to refund present revenue bonds.

TYPICAL VIEW OF ALWEG TRAIN AND STRUCTURE ON WILSHIRE BOULEVARD

Description of Recommended Route

The proposed alignment for this recommended trunk line between Macy-Lyon Streets and San Diego Freeway-Santa Monica Boulevard, a distance of approximately 14 miles, is as follows:

WILSHIRE TRUNK ROUTE

From the proposed westerly terminal at San Diego Freeway and Santa Monica Boulevard the route follows the railroad right of way on Santa Monica to Wilshire Boulevard; then east on Wilshire to its terminus at Grand Avenue. Here the route continues on its own right of way, swinging north into Broadway, following it to Third Street where it moves to Spring Street and continues through the Civic Center to Sunset Boulevard, paralleling this thoroughfare easterly to the Macy-Lyon Street terminal, with its parking lots, maintenance shops and storage area.

WILSHIRE TRUNK ALTERNATE ROUTE

The alternate route instead of following Wilshire Boulevard, runs on parallel streets and private right of way: otherwise, the alternate route is basically as above. Through Beverly Hills, the alternate route would occupy a transit right of way approximately 250 feet to the south of Wilshire Boulevard to San Vicente, thence on San Vicente to Del Valle, Del Valle east to 8th Street, curving northerly at Rimpau Boulevard to cross the front of Fremont Place, and curving southerly again to 8th Street, east on 8th Street to Norton, north on Norton across Wilshire to 6th Street, 6th Street to Valencia, curving south on Valencia to Wilshire at Witmer, and thence to downtown Los Angeles, utilizing a private right of way from Grand to Broadway and proceeding north as before.

Station Locations

The stations for the Wilshire trunk line and alternate are listed below:

San Diego Freeway and Santa Monica Boulevard
Santa Monica and Westwood
Beverly Glen
Beverly Drive
Robertson
Fairfax
Masselin
La Brea
Norton
Western
Normandie
Vermont
Alvarado
Lucas
Wilshire and Grand
5th and Broadway
1st and Spring (Civic Center)
Union Station
Macy and Lyon

Potential Rapid Transit Passengers

The estimates of potential passengers are predicated on the Alweg monorail route being constructed entirely above ground and with station locations within easy walking distances of the more concentrated commercial or residential developments. This would mean that the monorail structure be located either on Wilshire Boulevard or within a block of that artery. It is believed that either of these locations is feasible for an above ground structure. If other alignments are used or if the monorail is placed underground, these passenger estimates should be adjusted downward.

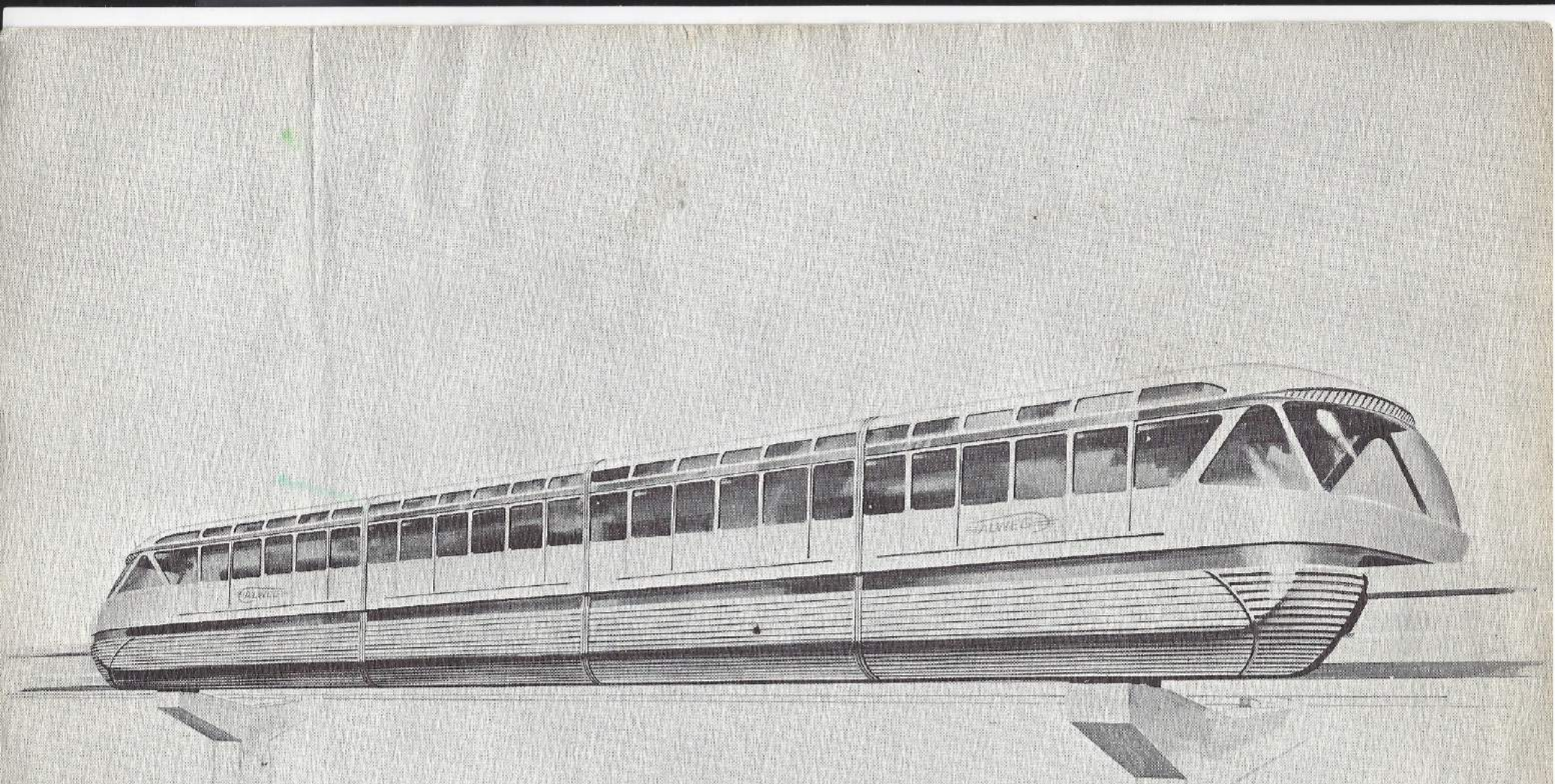
TRUNK LINE

ALTERNATE ROUTE

ALWEG MONORAIL — LOS ANGELES

WILSHIRE TRUNK LINE

WEGEMATIC CORPORATION NEW YORK, N. Y.



ARTISTS CONCEPTION OF A 2-CAR . . . FOUR
SECTION ALWEG TRAIN SEATING 168 PASSENGERS
WITH ADDED ROOM FOR STANDIES

TYPICAL OF ALTERNATE TRUNK LINE
. . . TRAIN RUNS ON EIGHTH STREET

The passenger assignments to the proposed rapid transit system were made initially on the basis of the 1958 "person-trip" data developed by Coverdale & Colpitts. These assignments were made on a zone to zone basis and predicated on judgment percentages selected after consideration of the geographical relationships between O-D zone centroids and rapid transit station locations, length of trip, paralleling present transit facilities and parallelling expressways or other superior highway facilities.

The assignments of 1958 person trips to the proposed Alweg system were then adjusted to 1965, to conform to MTA procedures for estimating and then annualized on the basis of 281 weekdays.

WILSHIRE TRUNK LINE	ANNUAL RAPID TRANSIT PASSENGERS — 1965
From Transit	9,800,000
From Automobiles	11,100,00*
Total	20,900,000

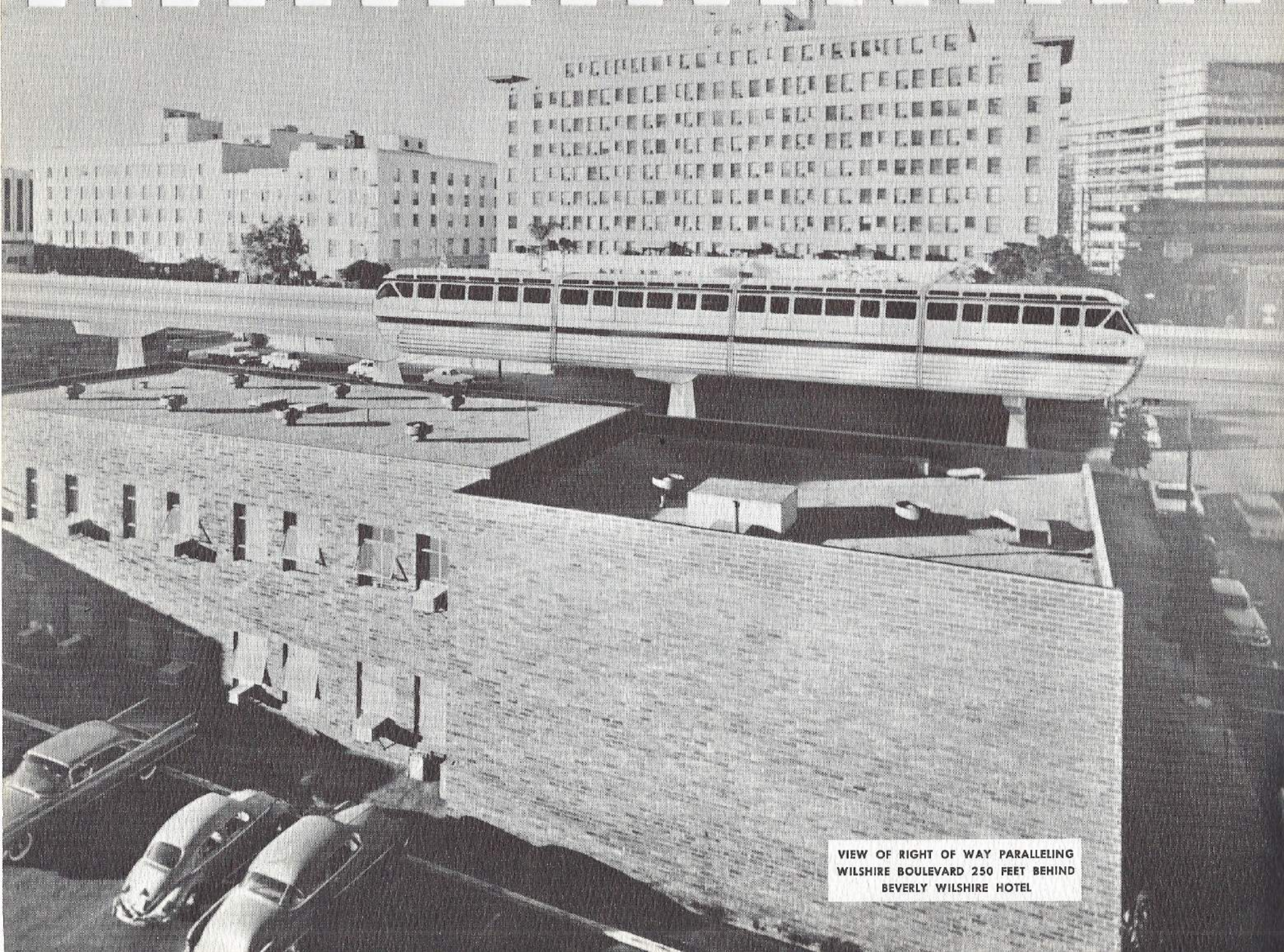
*Represents new revenue passengers to the MTA System.

The analyses and development of this data was prepared by W. C. Gilman & Co. of New York with the resulting figures:

Annual Additional MTA Revenue

The passenger assignments described above were made on a station to station basis. This permitted an analysis of these assignments on the basis of the proposed rapid transit fare zones traveled on the Alweg monorail. Predicated on a 25 cent base fare, and a 5 cent zone fare, applied to the indicated trips on the monorail of passengers diverted from automobile travel, overall average fares and estimated additional annual revenues to the MTA system were developed as follows:

From:	ESTIMATED ANNUAL PASSENGERS DIVERTED	ESTIMATED AVERAGE FARE (FOR ALWEG MONORAIL RIDE ONLY)	ESTIMATED ANNUAL ADDITIONAL REVENUE TO MTA — 1965
Automobiles	11,100,000	30.0¢	$3,330,000
Surface Transit	9,800,000	30.0¢	2,940,000
Total	20,900,000		$6,270,000



VIEW OF RIGHT OF WAY PARALLELING
WILSHIRE BOULEVARD 250 FEET BEHIND
BEVERLY WILSHIRE HOTEL

CAR AND TRAIN REQUIREMENTS

Based on the assignment of passengers by stations (or groups of stations representing fare areas) passenger load profiles were developed for 1965 depicting total weekday passengers volumes and maximum hour passenger volumes. These load profiles indicated the maximum load point to occur between the Alvarado and Vermont stations.

The A.M. and P.M. one hour periods of peak travel have been estimated as 30% of the daily one-way travel passing the peak load point. Average hourly passengers for the midday base period — 10:00 A.M. to 4:00 P.M. — have been estimated as 5% of the one-way all-day passenger total. The number of trips required and the headways recommended are summarized below. An average rush hour loading of 150 passengers per car and an average midday hour loading of 44 passengers per car is anticipated with two-car trains, seating 84 passengers per car.

	WILSHIRE TRUNK LINE	
	MAXIMUM HOUR	AVERAGE HOUR MIDDAY BASE
One-Way Passengers at Peak Load Point	7,100	1,100
Indicated Train Trips Required Passing Maximum Load Point	24*	12
Approximate Indicated Headway—Minutes	2.5	5.0

The number of trains and cars for these indicated service frequencies are based on an average operating speed of 35 miles per hour terminal to terminal plus allowance for turn-around time at each terminal.

Maximum number of cars, including spares, required for this operation are shown below:

Maximum Cars required to Operate Service	52
Spare Car Allowance	6
Total Cars Required	58
Total Trains Required	29

On the basis of the proposed operation the annual car miles are estimated to be 4,250,000 for the Wilshire trunk line.

(INTERIOR OF SEATING)
INTERIOR VIEW TYPICAL ALWEG CAR WITH COMMUNICATING AISLES CONNECTING CARS

MTA EXPENSES AND REVENUES

(Estimated in Conjunction with Alweg Wilshire Trunk Line)

Rapid Transit Operating Expenses

The estimates of the various expenses related specifically to the operation and maintenance of the Alweg monorail structure and equipment cover such items as:

(a) Inspection and maintenance of beamway structure, and signal system, including painting of the structure every two years.

(b) Inspection and maintenance of monorail cars.

(c) Electric power requirements and substation maintenance and operating costs.

(d) Maintenance of stations and station equipment.

(e) Labor costs for train and station operation at present wage levels.

Total estimated annual operating and maintenance expenses are $1,790,000 or 42.2 cents per car mile.

Changes in MTA Present System Costs

The operation of the rapid transit route as an integral part of the present MTA System will result in certain changes in its present services and present operating costs, both of which will serve to reduce present System expenses. One of these changes is a net reduction in the number of surface vehicles which will be required for surface operation and a resulting reduction in annual motor bus miles. Another change is the conversion of some and probably all of the present five street car routes to motor bus operation. It is estimated that the net reduction in annual System expenses from these changes will be $3,000,000.

Depreciation

We have used a depreciation accrual of $3,900,000 corresponding to 8% of estimated revenues in conformity with MTA procedures.

Summary of Expenses

The adjustments outlined above summarize as follows:

	ESTIMATED SYSTEM OPERATING EXPENSES AND DEPRECIATION	
Present MTA Operating Expenses (a)	$37,800,000	
Plus estimated operating expenses of the proposed monorail	1,790,000	
Total	$39,590,000	
Less reduction in present System expenses due to operational changes resulting from the rapid transit	3,000,000	
Adjusted Annual System Operating Expenses	$36,590,000	
Depreciation Accrual—8% of Revenues	3,900,000	
Total System Operating Expenses and Depreciation with Rapid Transit		$40,490,000

(a) Estimated at twice the January 1 to June 30, 1961 actual.

MTA SYSTEM NET EARNINGS WITH RAPID TRANSIT

Combining revenue and expense figures produces an estimated net earning in 1965 for the combined surface and Alweg system (at present wage and material cost levels) as shown below:

	MTA ESTIMATED CONDENSED INCOME ACCOUNT — 1965 — WITH MONORAIL RAPID TRANSIT	
MTA Present System Revenues (a)	$42,660,000	
Estimated Additional revenues due to Proposed Rapid Transit (b)	6,270,000	
Total Estimated Revenues	48,930,000	
Estimated Annual Operating Expenses and Depreciation as Above	40,490,000	
Net Earnings Available for Debt Service		$ 8,440,000

(a) Estimated at twice the January 1 to June 30, 1961 actual less $2,940,000 included in rapid transit revenue.

(b) Includes $3,330,000 new revenues from diverted automobile trips and $2,940,000 from diverted transit trips.

FARE COLLECTION PROCEDURES

For the estimates of revenues it was assumed that the base fare would be 25 cents, the same as the present MTA fare. The recommended Alweg rapid transit line between its eastern terminal at Macy and Lyon Streets and its western terminal at the San Diego Freeway and Santa Monica Boulevard is divided into seven fare areas with a 25 cent basic fare entitling a passenger to a ride embracing three fare zones. For each additional fare area entered there would be a 5 cent zone charge corresponding to the present MTA 7 cent zone charge. The maximum fare for a ride the entire length of the recommended route would be 45 cents.

With such a zone fare setup, it will be necessary to identify each passenger to insure payment of the proper fare. This procedure is now followed by MTA on all of its present multi-zone routes.

Alweg monorail stations will be equipped with both entrance and exit turnstiles and an agent's booth. Actual fare payments can be handled in the following manner:

> Payment of the full required fare by all entering passengers with the entering turnstiles dispensing an identification token keyed to the length of ride which has been paid for. The identification token would be deposited in an exit turnstyle when leaving the Alweg monorail.

Briefly, the procedure would be:

A—100% Rapid Transit Passengers. Entering passengers would deposit in turnstiles the required total fare for their intended trip, namely 25 cents, 30 cents, 40 cents or 45 cents. The entering turnstile would dispense to the fare paying passenger a sensitized token which by sensitization (and probably color) would indicate the fare area to which the passenger had paid. There would be five varieties of these tokens.

On leaving the monorail station, the passenger would deposit this identification token in exiting turnstile. If the passenger has overridden, the turnstile would be released only when the passenger has paid the proper fare.

B—Transfer Passengers. There will be three types of transfer passengers:

(1) Rides originating on surface and terminating on the Alweg monorail.

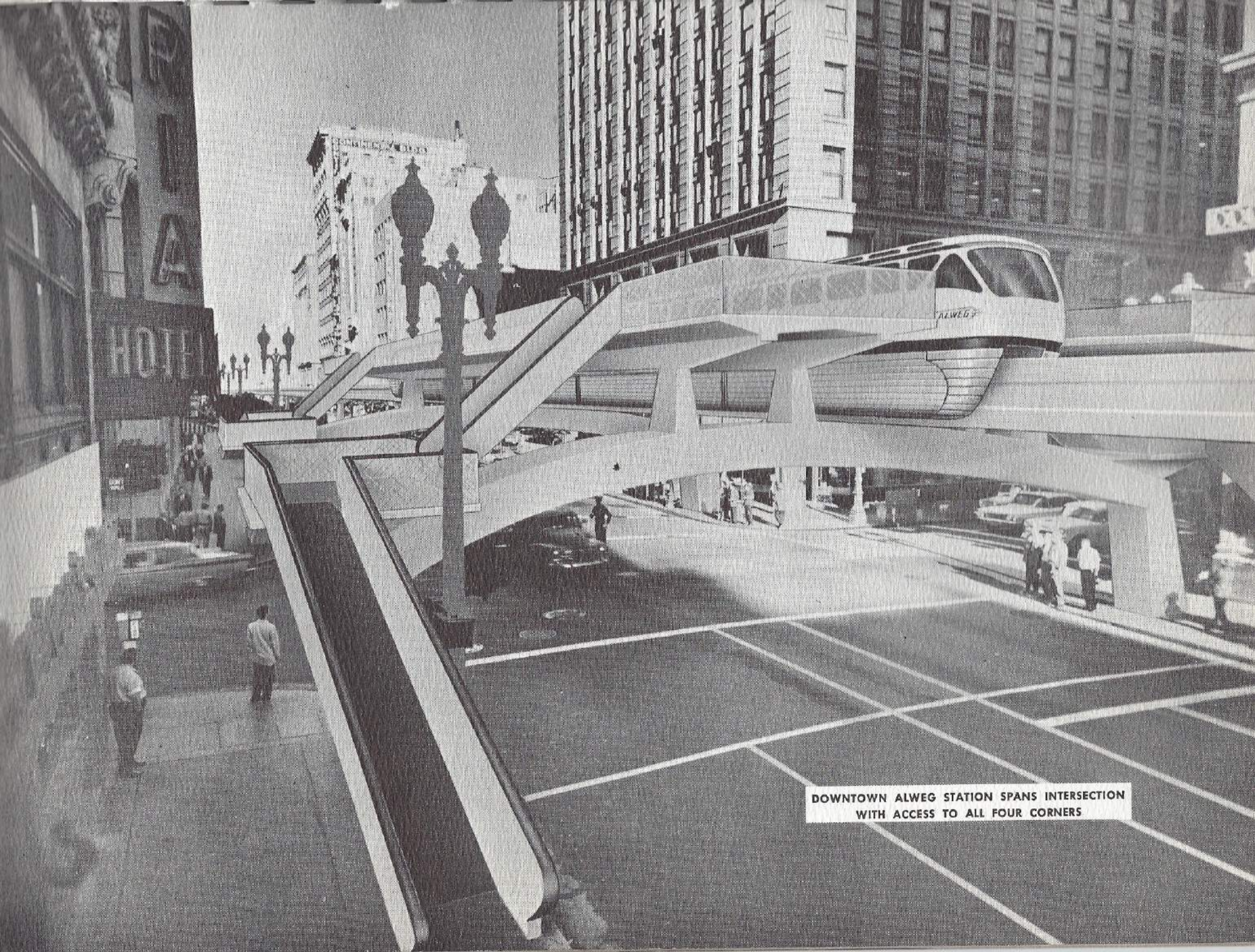
(2) Rides originating on the Alweg monorail and transferring to surface vehicle.

(3) Rides originating on a surface vehicle, transferring to the Alweg monorail, and completing the trip with a transfer to a second surface vehicle.

An entering passenger with a transfer would present it to the agent. The agent would retain the transfer, and after the passenger had deposited in a fare box any additional fare required for the intended rapid transit ride, would issue to the passenger the proper exiting identification token. This would take care of rides (1) above and the first phase of ride (3). On exiting a passenger would activate the exit turnstile by depositing the proper identification token. If desiring a transfer to a surface vehicle, he would secure one from a transfer issuing machine before passing through the exit turnstile. (Ride 2 above and last phase of ride 3).

Equipment Required

Our review of required equipment is predicated on the location of all equipment on the station mezzanine. Allowance is made for two mezzanines at certain of the heavier traffic stations, primarily in the downtown area.



DOWNTOWN ALWEG STATION SPANS INTERSECTION
WITH ACCESS TO ALL FOUR CORNERS

GENERAL DESCRIPTION OF ALWEG MONORAIL IN LOS ANGELES

The Alweg system operates a rubber tired, high speed, electrically powered train which straddles an elevated concrete beamway on which passengers can be transported completely free of interference with surface traffic.

Alweg Structure

The Alweg monorail train proposed for Los Angeles runs on prestressed concrete beams 3 feet wide, 5 feet deep. Beams are prefabricated and are pre and/or post tensioned. They are supported by T-shaped concrete columns, which could be spaced up to 100 feet apart for straight beams, and for curved beams up to 75 feet. At street level the column size is 4 feet by 4 feet, thus creating minimum interference with surface vehicular traffic. Average clearance under the beamway is 18 feet, with the exception of the Harbor Freeway overpass on Wilshire which is 15 feet. This type structure can be used for the entire length of the Wilshire trunk line with the single exception of Wilshire Boulevard crossing the Harbor Freeway. Here a special structure is needed. The line will consist of a double beamway, one beamway for operation each direction.

Stations

Elevated stations will be erected over street intersections with access to all four corners. They also may be located with access into large parking garages. The length of the station over the street intersection is 125 feet. Station platforms with a width from 12 to 15 feet are positioned on the outer side of the beamways. Result is that no building is hidden by a station structure and there is ample light and air to the street below. The station platforms and the monorail beamway are supported by bents with no structural supports in the street intersection to interfere with traffic movements. A feature of this station construction is that passengers can cross over from one platform to another via a mezzanine without descending to the sidewalks and street below. Moving stairways, known as speed ramps, transport passengers

between street level and station platforms. An exception to the above is a specially designed station, architecturally in keeping with the Civic Center, located across First Street just to the north of Spring Street. At the two terminal stations space has been provided for parking 1,000 automobiles at the San Diego Freeway and Santa Monica terminal, and 500 automobiles at the Macy-Lyon terminal.

Automatic Train Operation

The Alweg monorail system for the Wilshire trunk line will incorporate Automatic Train Operation. It has been developed by the General Railway Signal Company, Rochester, New York, for this proposed installation.

A train attendant acts as an information officer, and can take over manual operation in case of emergency. One advantage of the system is a more consistent "on time" operation.

In accordance with the ATO system the train will operate in a pre-determined cycle. Leaving the station, it will accelerate to normal running speed, and then cruise at this speed; approaching the next station it will decelerate, first to 20 miles per hour, then to six miles per hour, come to a stop at the station, unload and load passengers, and then repeat the cycle.

Since most of the stations are less than a mile apart, station to station blocking will be used for train protection. There are, however, six station blocks which will be over a mile long. To ensure the maintenance of the established headway, these blocks will be divided and "dummy" stations introduced.

Provisions will be made in the cab of the train for the cutout of the ATO system. To do this a master lever will be turned to the "MANUAL" position by the attendant, and the monorail trains will proceed at six miles per hour maximum unless a higher speed code is received.

Electrical Power Transmission and Distribution

Power to propel the trains will be obtained from the contact rails mounted on the side of the beamway.

MEDIAN STRIP RETAINS PLANTING
AND SUPPORTS ALWEG STRUCTURE
ON WILSHIRE MIRACLE MILE

The 600 volt DC power necessary for the operation will be obtained from eight sub-stations spaced approximately two miles apart. The AC power, 16½ KV, 60 cycle, will be transmitted to the sub-stations from two existing public utility sub-stations.

Service and Storage Yard

For the purposes of maintenance and storage, 156,000 square feet of space will have to be provided at the Macy-Lyon terminal. A maintenance building, 92 feet by 395 feet, will house equipment and facilities for the daily servicing of the trains and for repairs.

The storage area will accommodate 30 trains or 60 cars. Switching is provided for movement of trains within this area, and out onto the trunk line.

The possibility exists for using the space under the train storage area for auxiliary parking of automobiles.

Car and Train Equipment

The Alweg cars straddle the concrete running beams, with dual pneumatic drive wheels on top of the beam. Horizontal guide wheels, also pneumatic, press against the beam sides, and stabilize the cars. (Solid rubber wheels are arranged to take over in the unlikely case of tire deflation, with no noticeable effect on passenger comfort.) The car body is made of aluminum, and drapes over the track beam. Thus it screens the running gear from view and also reduces to a minimum any noise from it or the electric motors. Easy pedestrian movement from one car to another is provided.

The car is 63 feet long, 10 feet 3 inches wide, and 14 feet high. Each of the cars is powered by 125 HP electrical motors, capable of a maximum service speed of 70 miles per hour and allowing an acceleration of 3.0 miles per hour per second. Normal service braking is at 3.5 miles per hour per second. Both dynamic and mechanical braking is provided. The dynamic braking will operate from top speed down to 10 miles per hour where the mechanical braking takes over to bring the train to a stop.

The mechanical brake will be a fail-safe type. It incorporates an additional safety feature so that in case of loss of air pressure the brakes will come on automatically, providing an emergency deceleration rate.

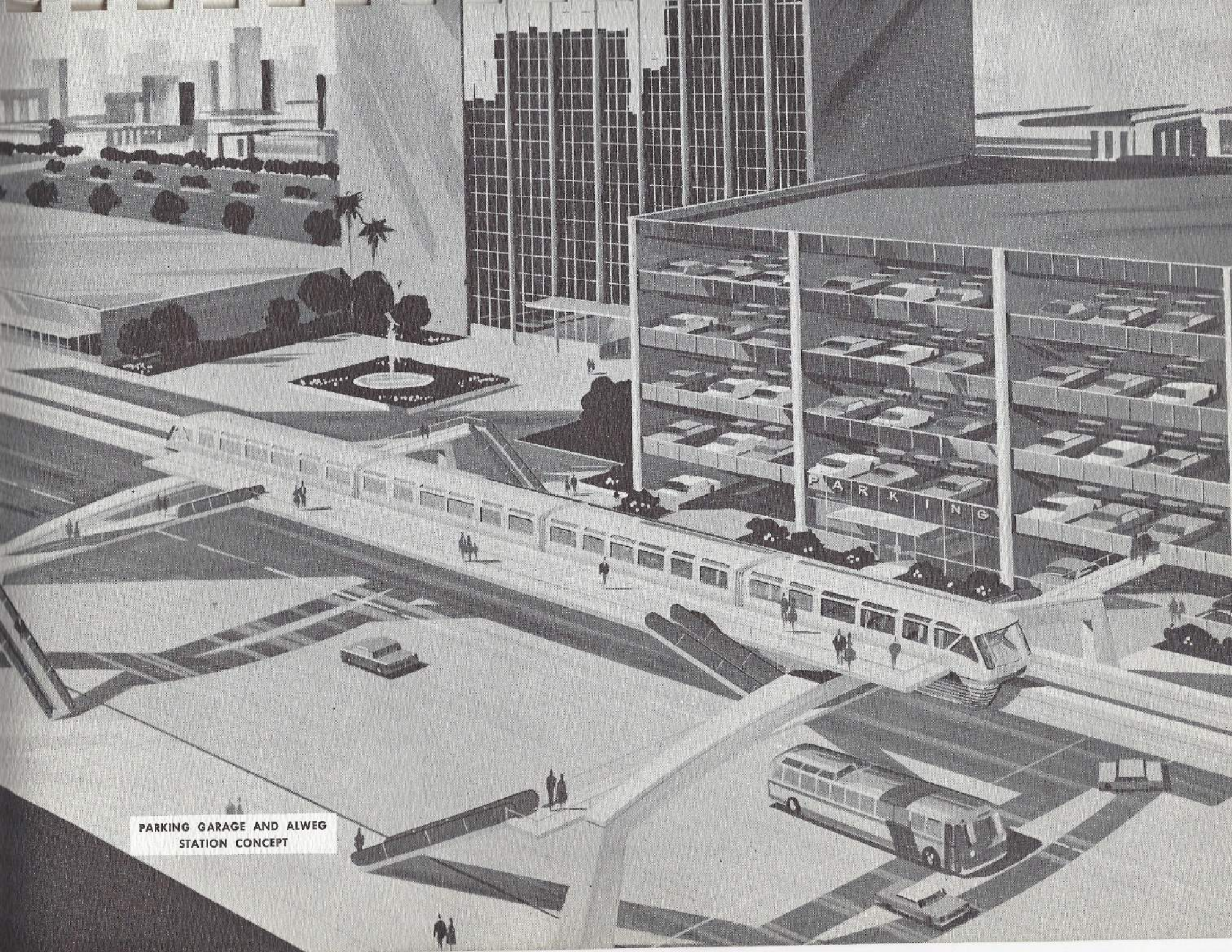
The proposed cars incorporate the same design features as the trains now being built for Seattle. A small diameter duplex tire developed by Firestone permits the Alweg car to have a completely flat floor. These new Firestone tires are of a tubeless nylon type built to meet the specific requirments of monorail operation.

Unobstructed view, light, and air are provided by windows at the sides and in the ceiling. The windows will be made of tinted safety glass to minimize solar heat and glare. High capacity air ventilating units will replace the interior air volume 35 times each hour. Heaters of required capacity also will be provided. Lighting is provided by ceiling mounted flourescent tubes.

For easy loading and unloading, the car has four doors on each side with a 40 inch clear entrance. These doors will be equipped with soft rubber pressure-sensitive edges, and will be interlocked with the train controller making train movements impossible until all doors are properly closed. In case of emergency, the doors can be operated manually.

The proposed car seats 84 passengers with adequate space for easy passenger movement within and between cars. During peak hours the cars also will accommodate 70 standees, but with high speeds and short headways, no passengers will have to stand for long.

The cars are equipped with an advanced suspension system, including both vertical and horizontal spring arrangement, to ensure a smooth ride. Seats are upholstered to add to passenger comfort.



PARKING GARAGE AND ALWEG
STATION CONCEPT

CONSTRUCTION PROCEDURE AND TIME REQUIRMENT

As has been clearly demonstrated in Seattle, Washington, construction of an Alweg monorail is accomplished with a minimum of interference with normal flow of traffic and business activity along the selected route.

Normal construction procedure is to work a few street blocks at a time, and to maintain constant traffic movement as construction progresses. During the construction in Seattle, traffic was kept open even while precasting the columns in the street.

First the drilling rig would occupy the center of the street, drill the foundation to a depth sufficient to support the structure, and the reinforced foundation of steel and concrete would be prepared. The precast T-shaped columns were then transported to their respective locations and bolted in place on the foundations. Finally the precast concrete beams were brought into their locations and placed on top of the columns, one on each side of the T-head, to create the overhead monorail beamway for the double track system. During the entire procedure, construction operation and equipment have been confined to the center of the street.

This highly rationalized method of construction makes it possible to construct an Alweg monorail in a relatively short time. The limiting factor is one of delivery of the cars and not completion of the structure. Estimated delivery of the Alweg cars sufficient for the Wilshire trunk line is 24 months from placement of the order.

SUGGESTED EXTENSIONS

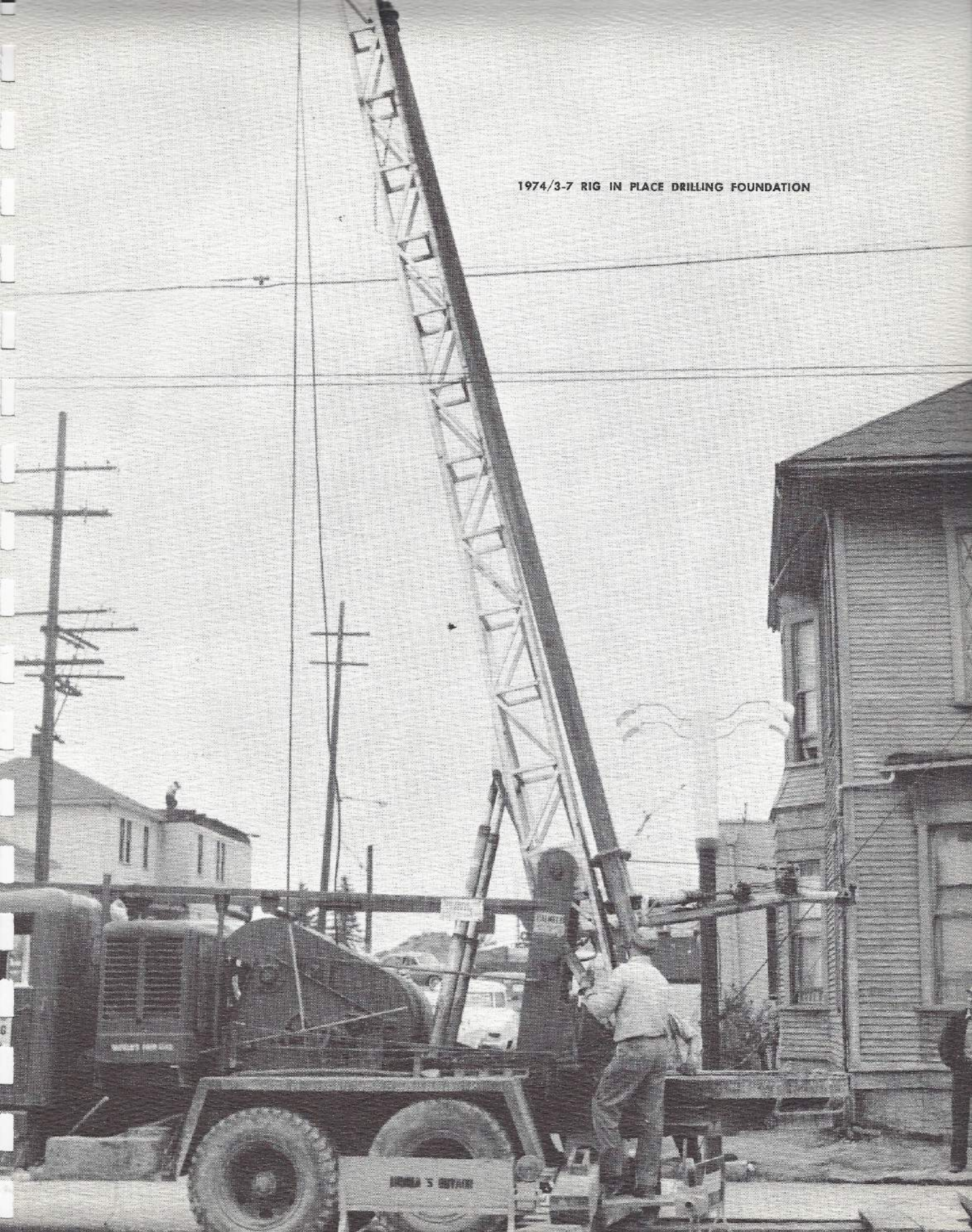
Alweg is willing to increase its financial commitment to serve other sections of the Los Angeles Metropolitan Area, providing that the proper authorities so request and that our consequent studies confirm that the routes proposed are economically feasible.

The following are suggested for consideration:

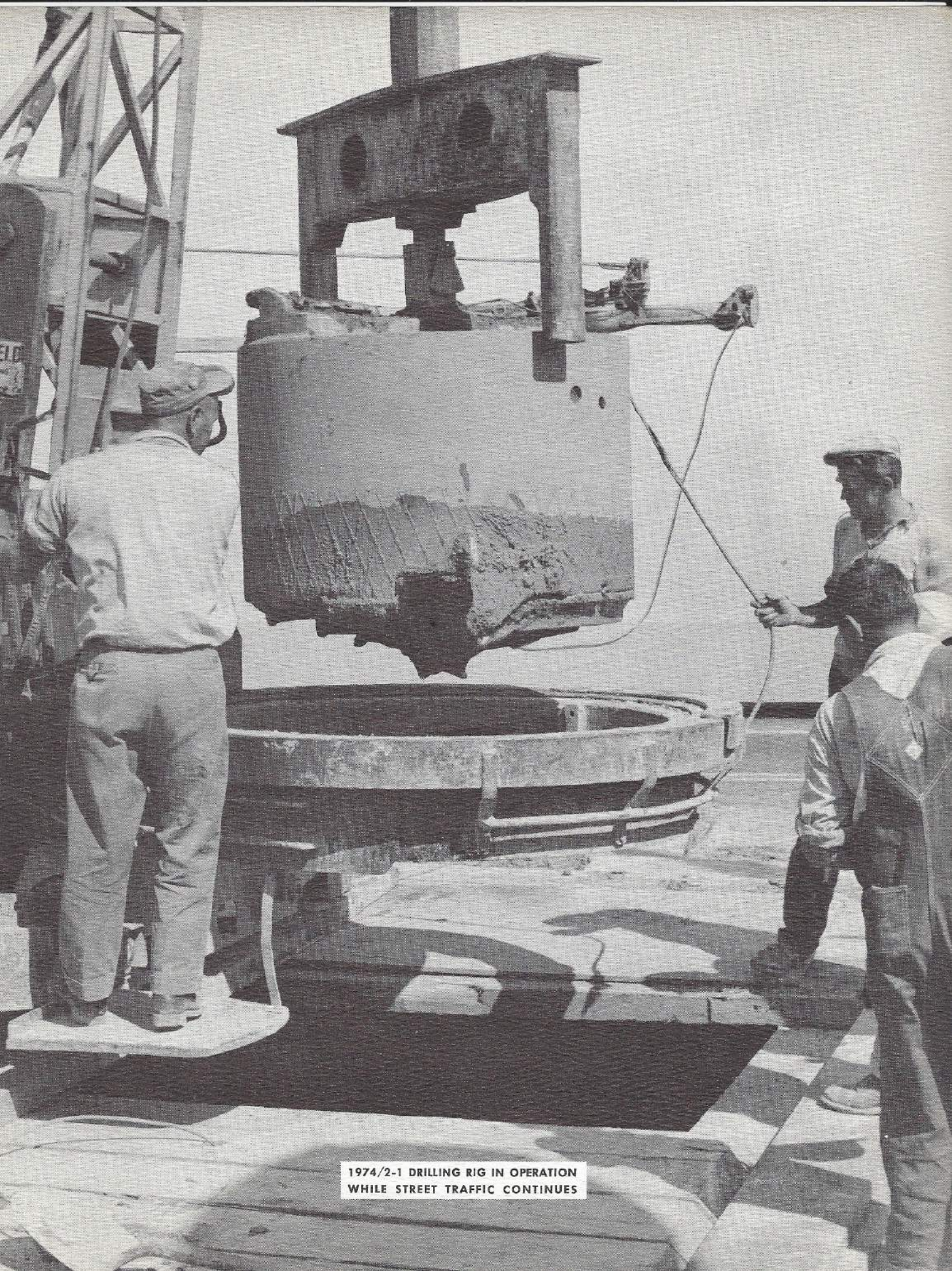
1. VALLEY: A route starting in Van Nuys at approximately Van Nuys and Victory Boulevards, moving easterly to Lankershim, then southeast to Cahuenga Pass and Ventura Boulevard, south on Ventura to Highland, continuing south to Santa Monica Boulevard, turning east on Santa Monica to Western, and south on Western to Sixth Street, joining the Wilshire Trunk Line.

2. AIRPORT AND SOUTH CENTRAL: Starting at the Airport and Century Boulevard and east on Century to Broadway, and north to downtown Los Angeles; with the southern leg starting at about Artesia and Avalon, north on Avalon to Century, west on Century to Broadway and joining the Airport leg to downtown.

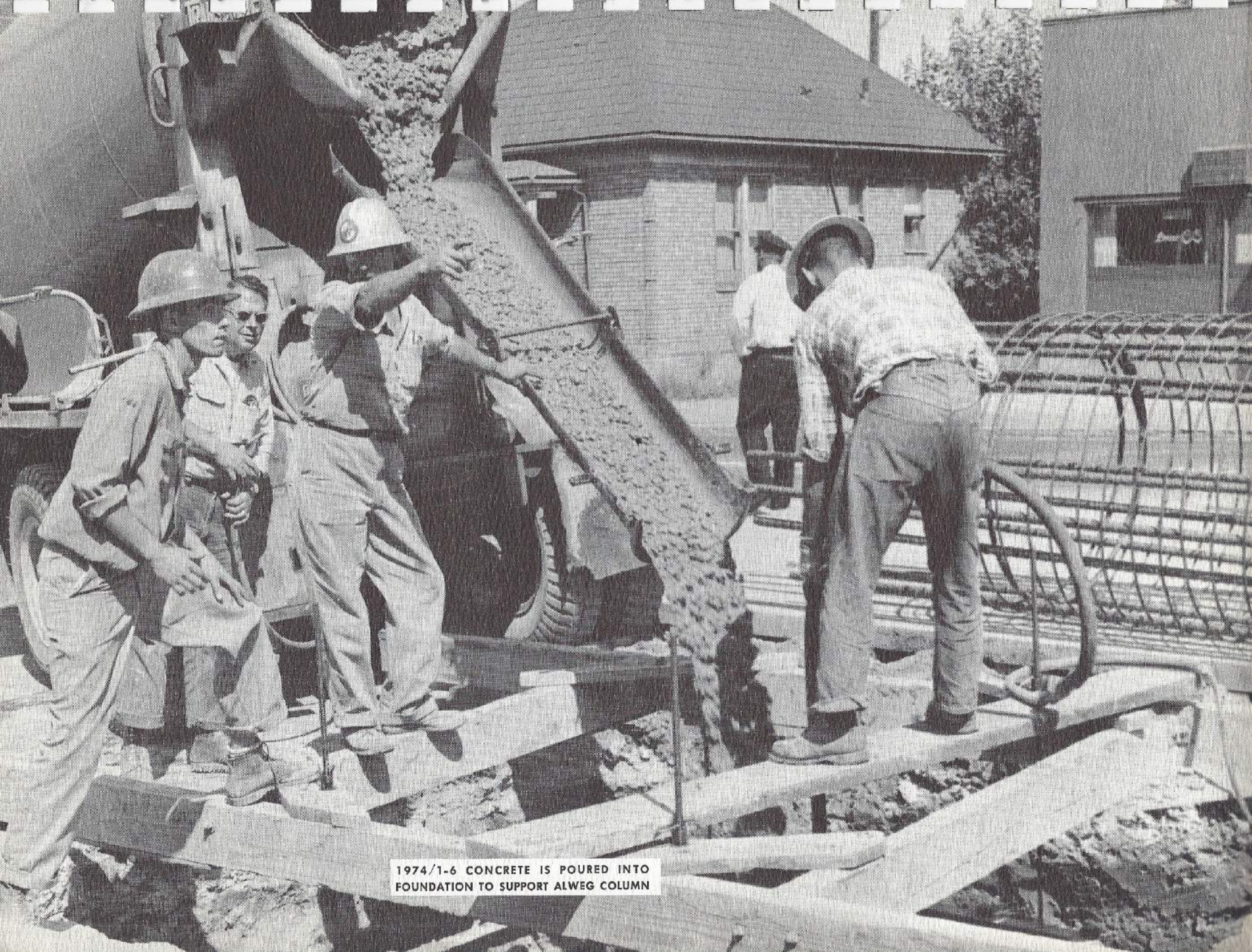
3. EAST LOS ANGELES - MONTEBELLO: Commencing at about Rosemead and Whittier Boulevards in Montebello, moving west on Whittier to Boyle Avenue, north on Boyle to a selected thoroughfare, and across the river to downtown.



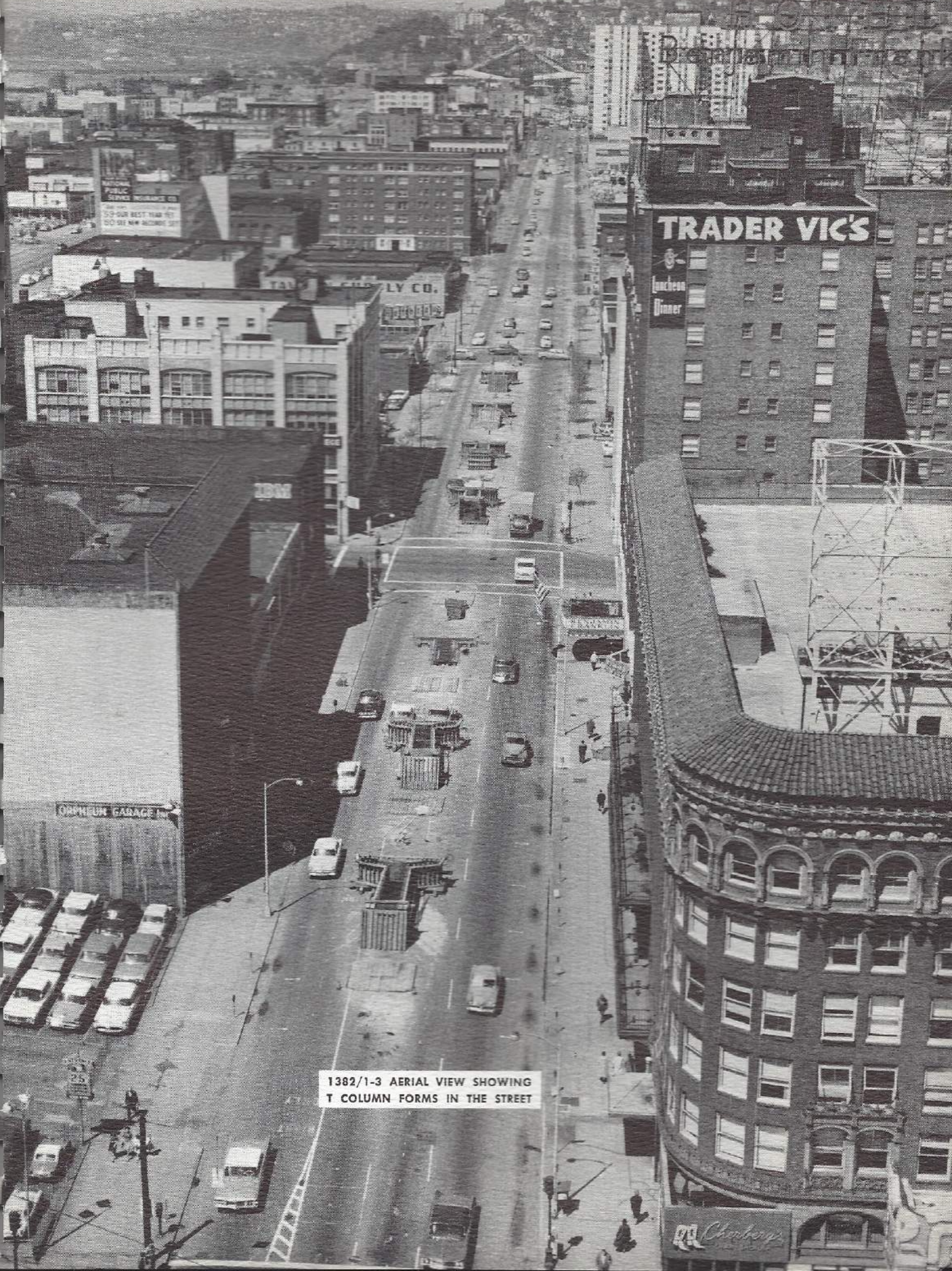
1974/3-7 RIG IN PLACE DRILLING FOUNDATION



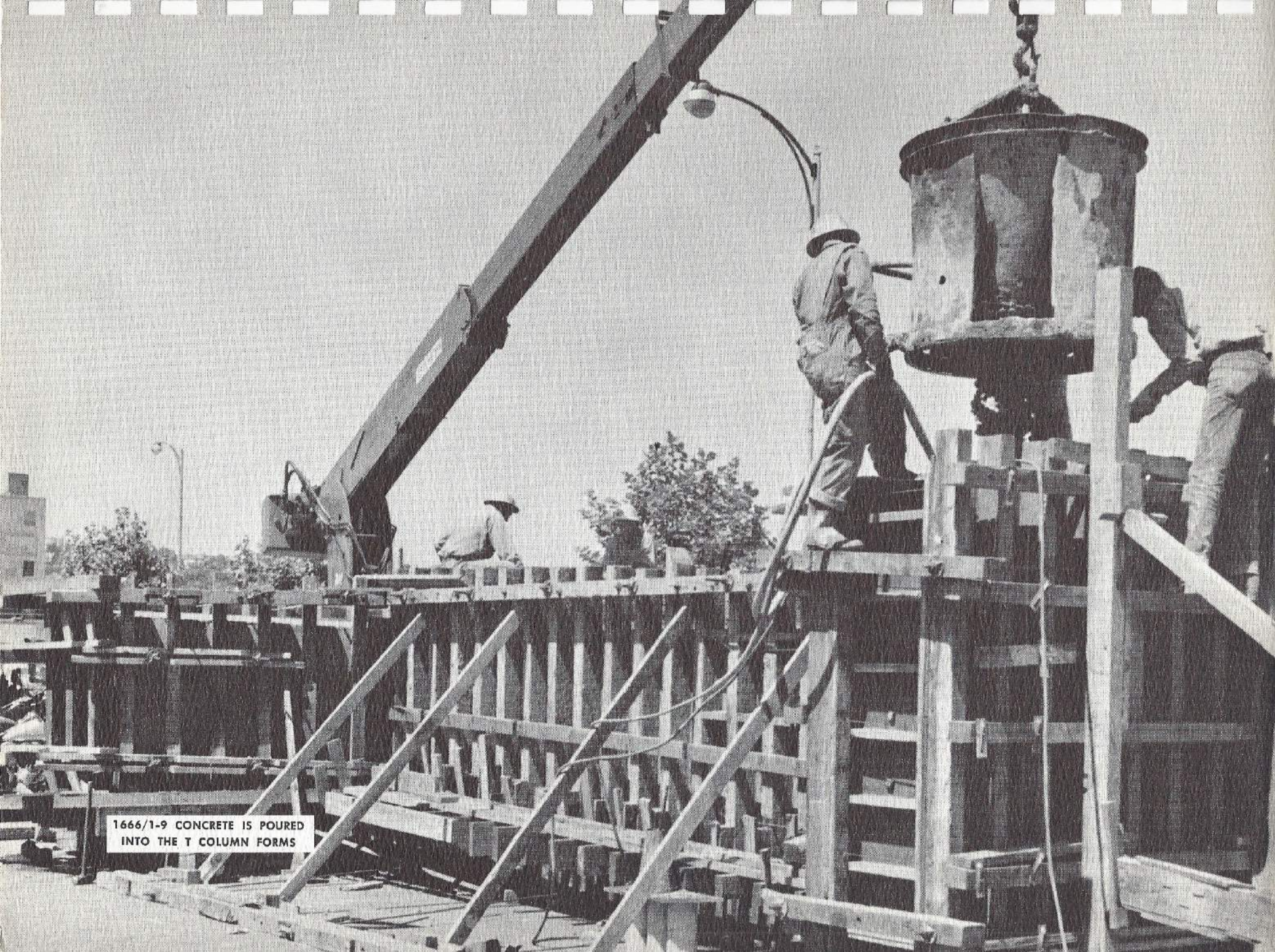
1974/2-1 DRILLING RIG IN OPERATION
WHILE STREET TRAFFIC CONTINUES



1974/1-6 CONCRETE IS POURED INTO FOUNDATION TO SUPPORT ALWEG COLUMN



1382/1-3 AERIAL VIEW SHOWING T COLUMN FORMS IN THE STREET



1666/1-9 CONCRETE IS POURED INTO THE T COLUMN FORMS

ALWEG

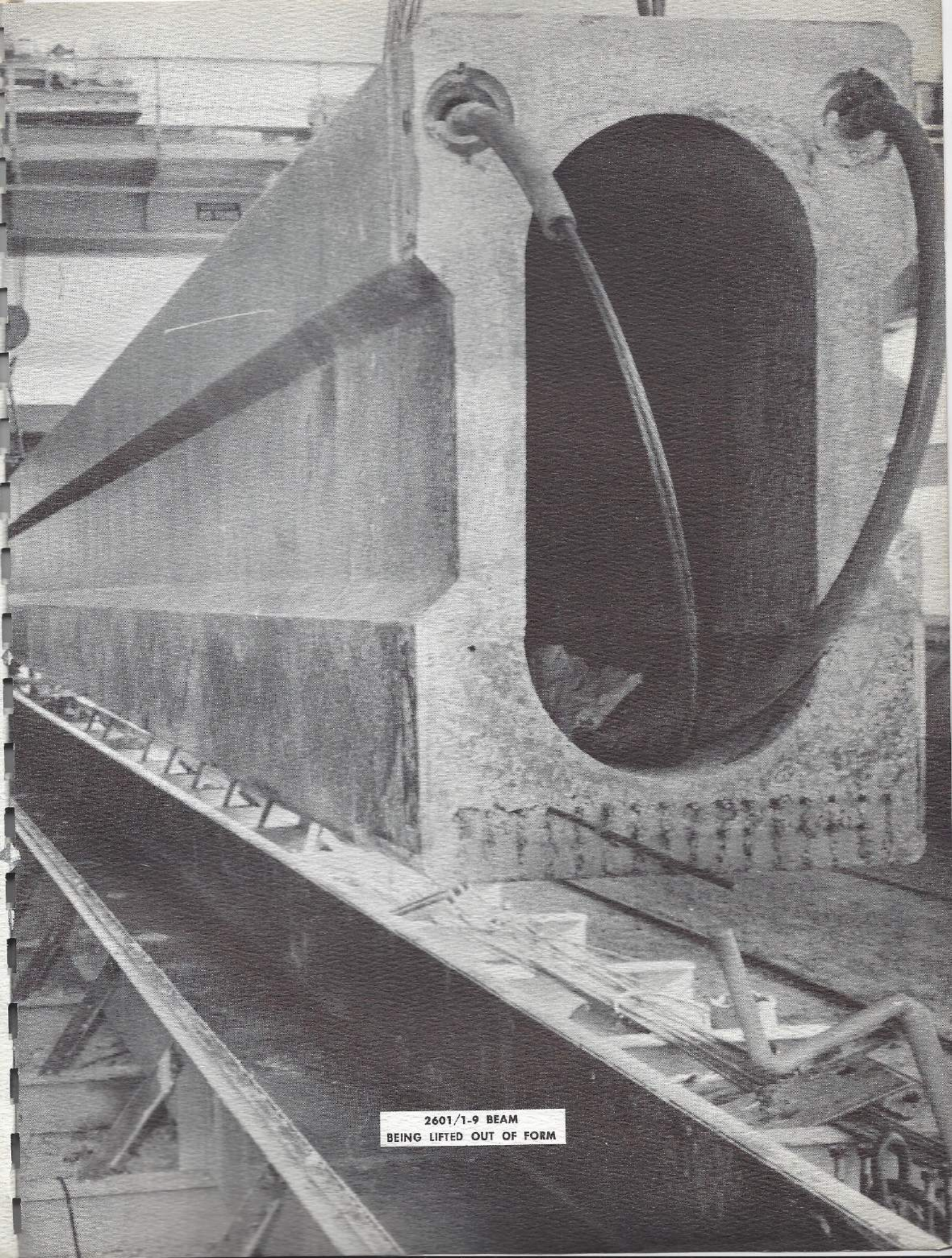
CONSTRUCTION PROGRESS PHOTOS

SEATTLE, WASHINGTON

1615/55 LIFTING AND
SETTING COLUMNS IN PLACE

ROW OF T COLUMNS AFTER
BOLTING ON TO FOUNDATIONS

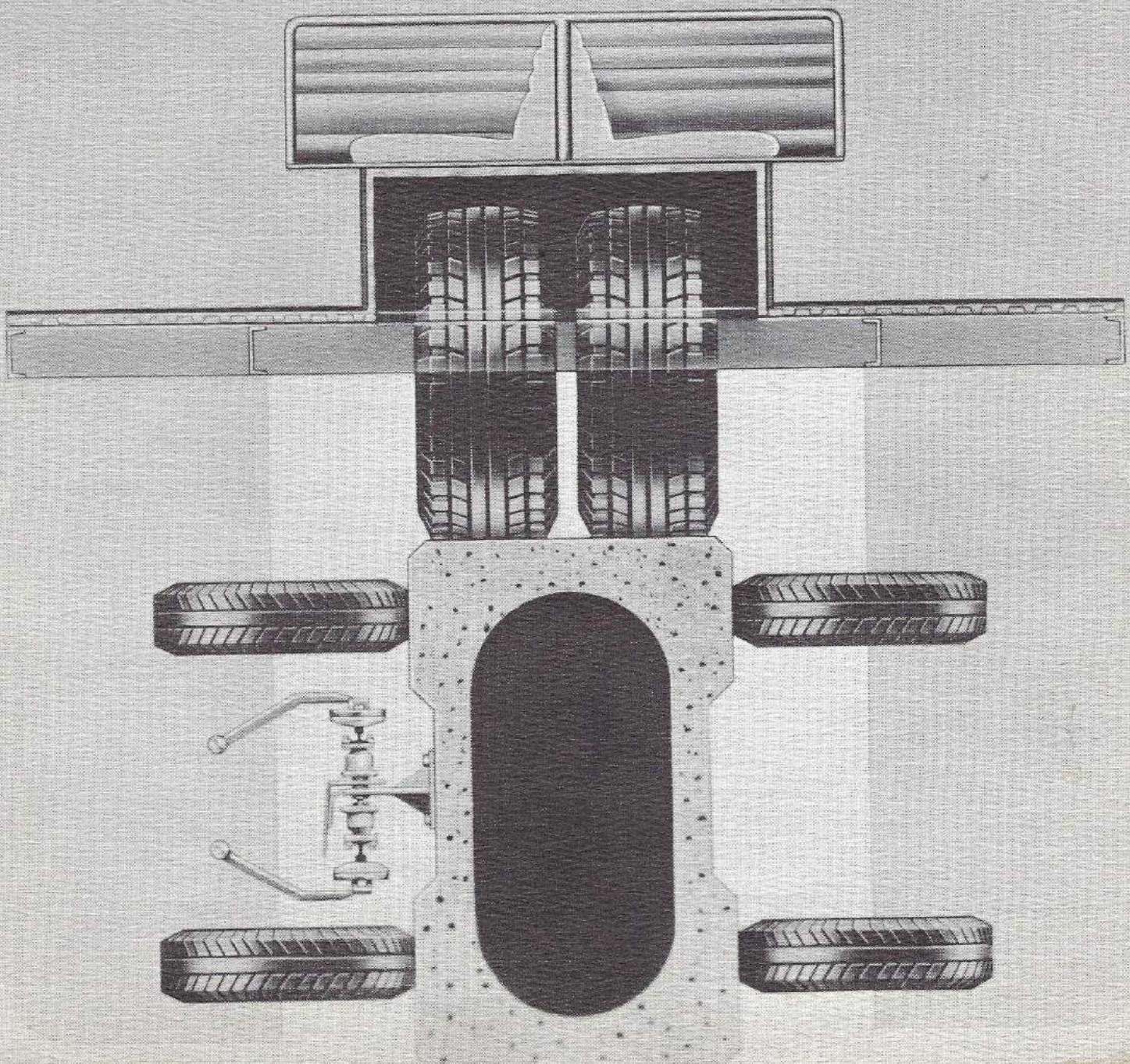
2931/2-3 FORM HOLDING CURVED BEAM



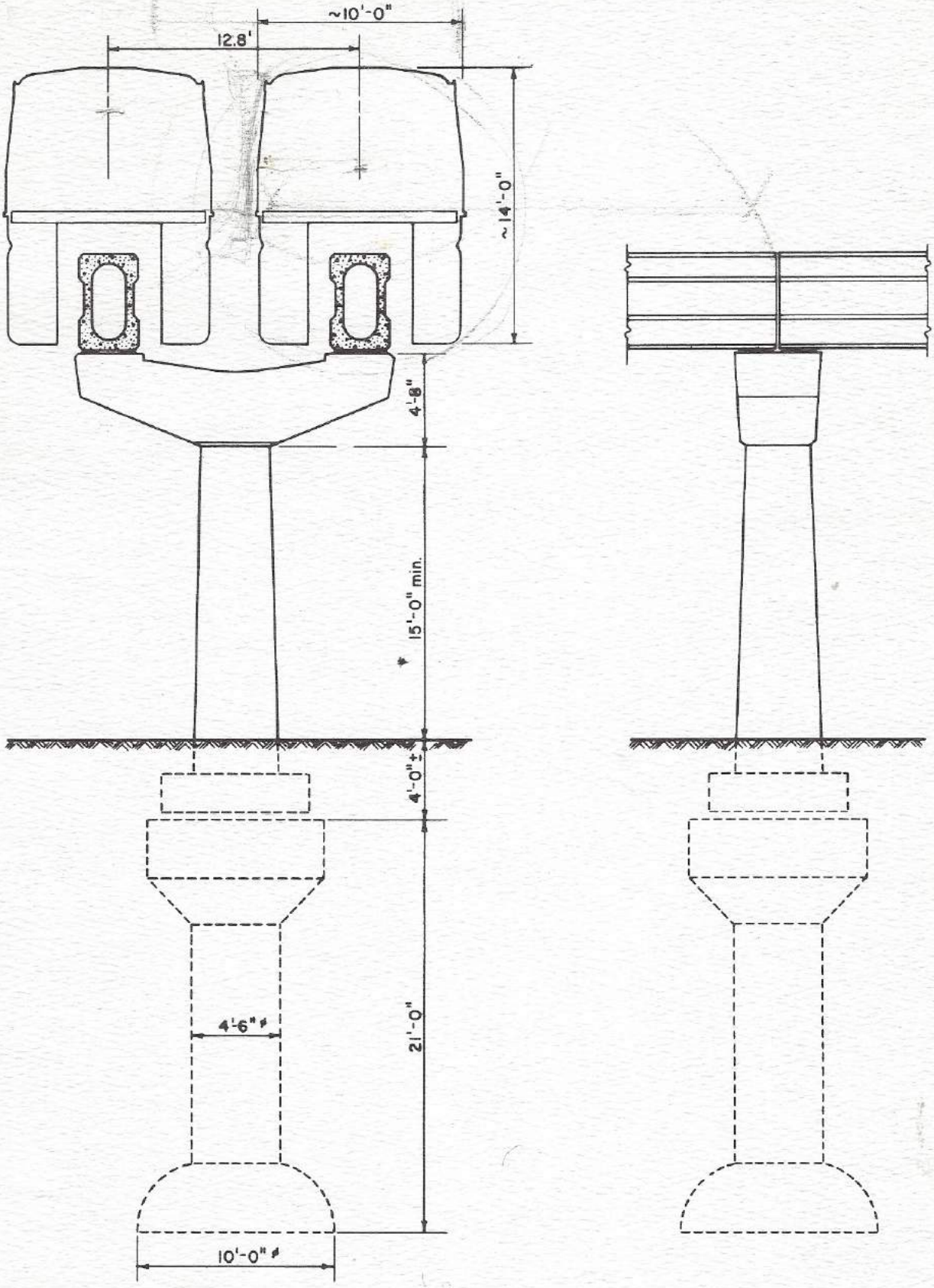
2601/1-9 BEAM
BEING LIFTED OUT OF FORM

2247/113 BEAM IS TRANSPORTED
TO SIDE OF T COLUMNS

SCHEMATICS OF ALWEG SYSTEM



TYPICAL CONCRETE "T" COLUMN WITH PIER TYPE FOUNDATION

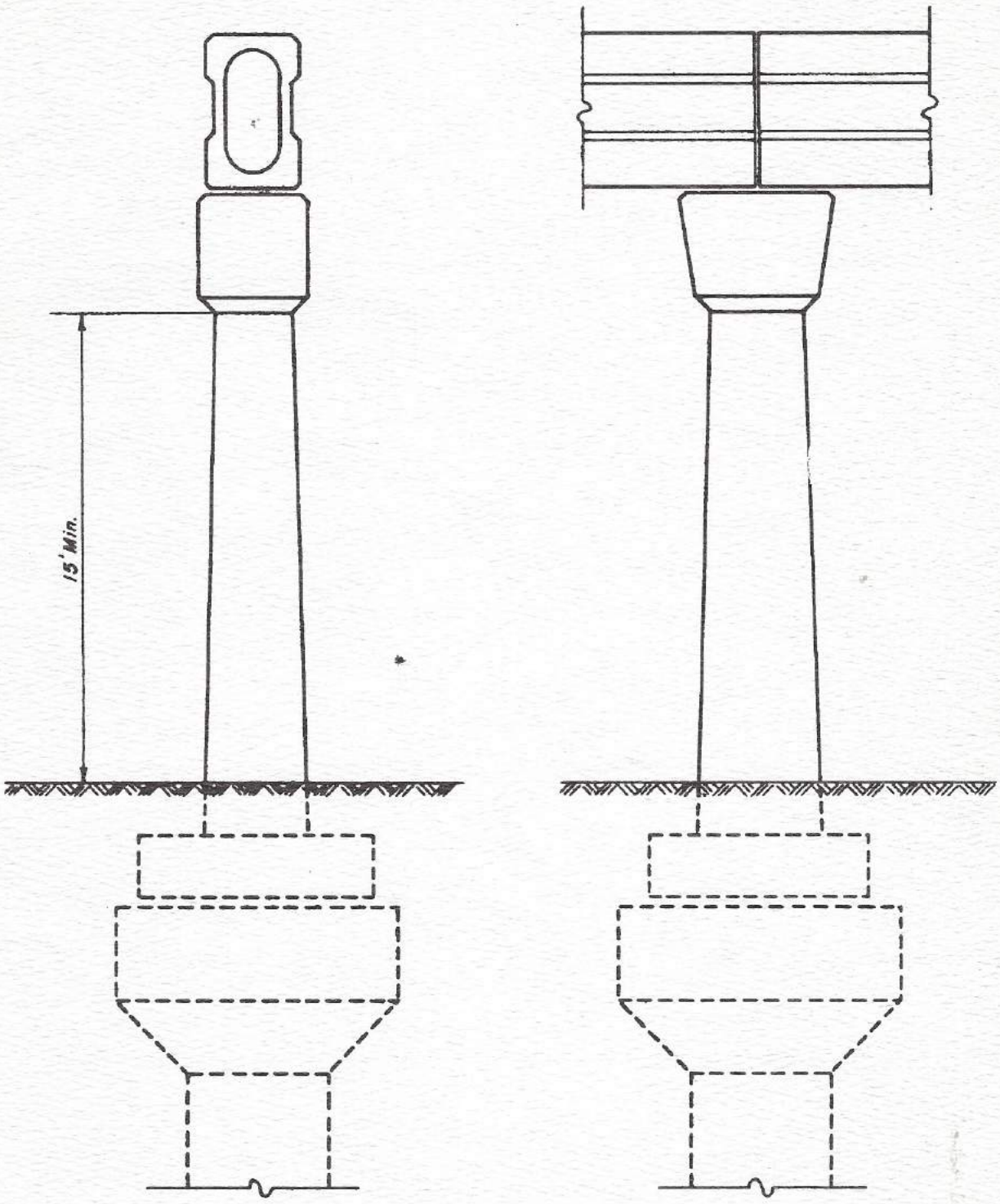


ALWEG MONORAIL

LOS ANGELES

WEGEMATIC CORPORATION NEW YORK, N.Y.

TYPICAL COLUMN FOR SINGLE STRAIGHT TRACK

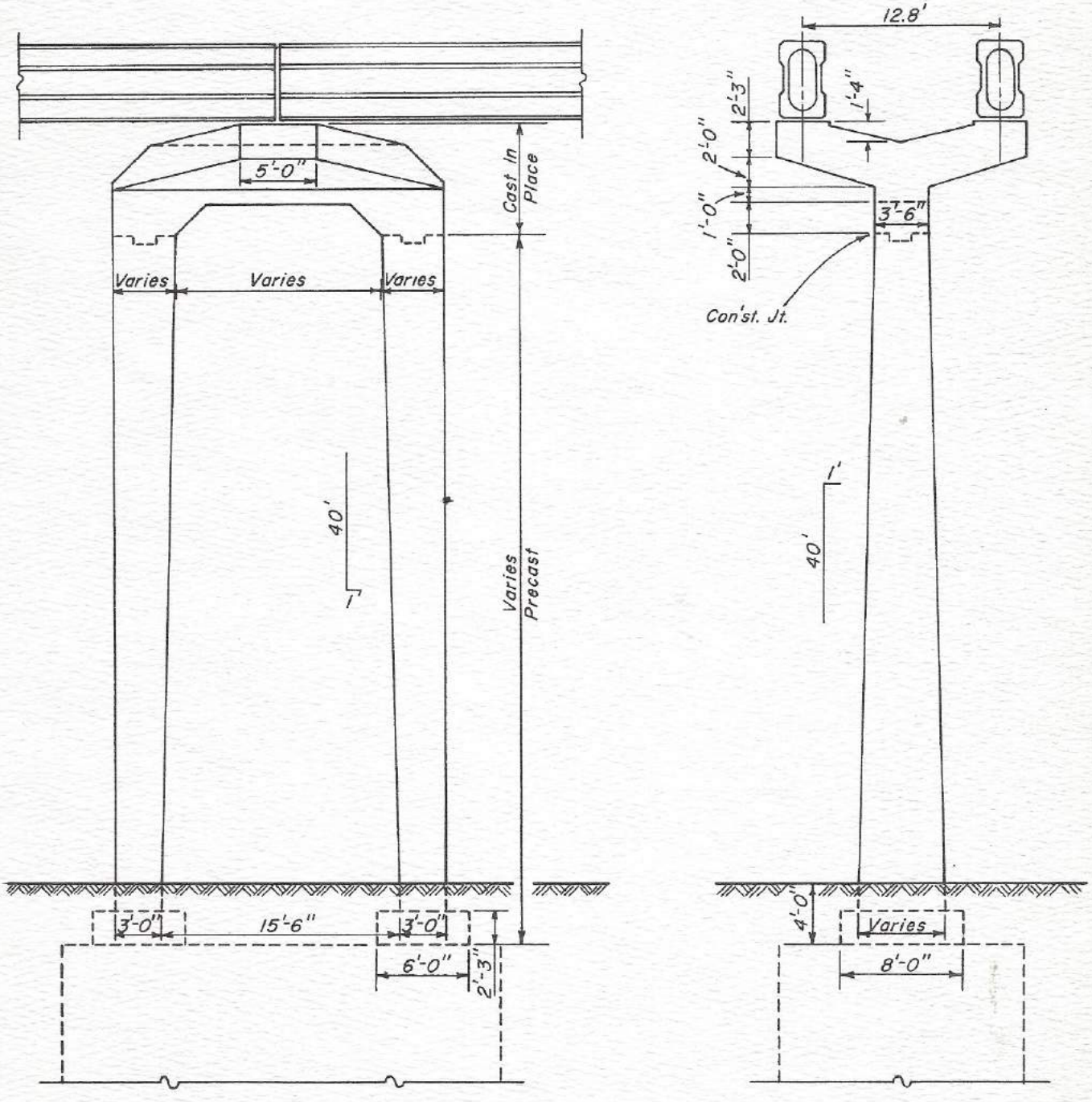


ALWEG MONORAIL

LOS ANGELES

WEGEMATIC CORPORATION NEW YORK, N.Y.

CONCRETE BENT FOR HEIGHTS OVER THIRTY FEET

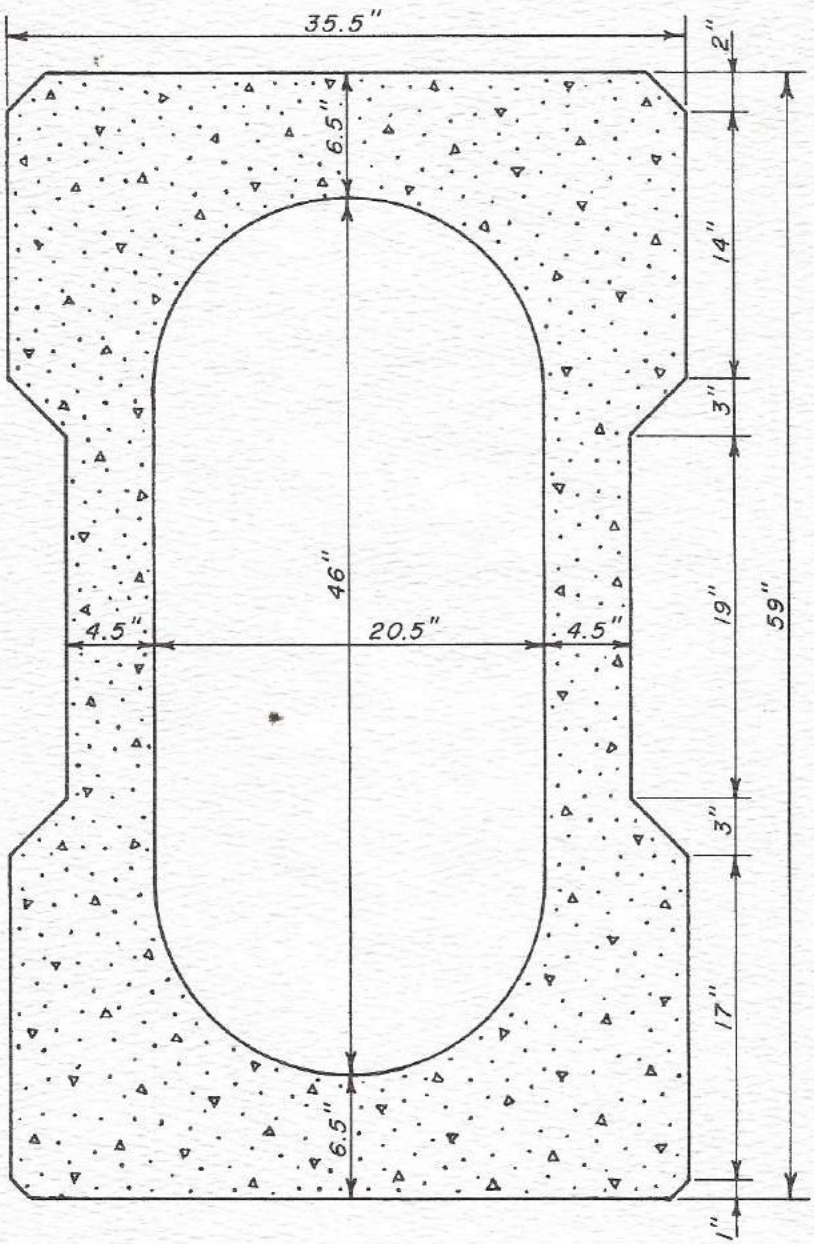


ALWEG MONORAIL

LOS ANGELES

WEGEMATIC CORPORATION NEW YORK, N.Y.

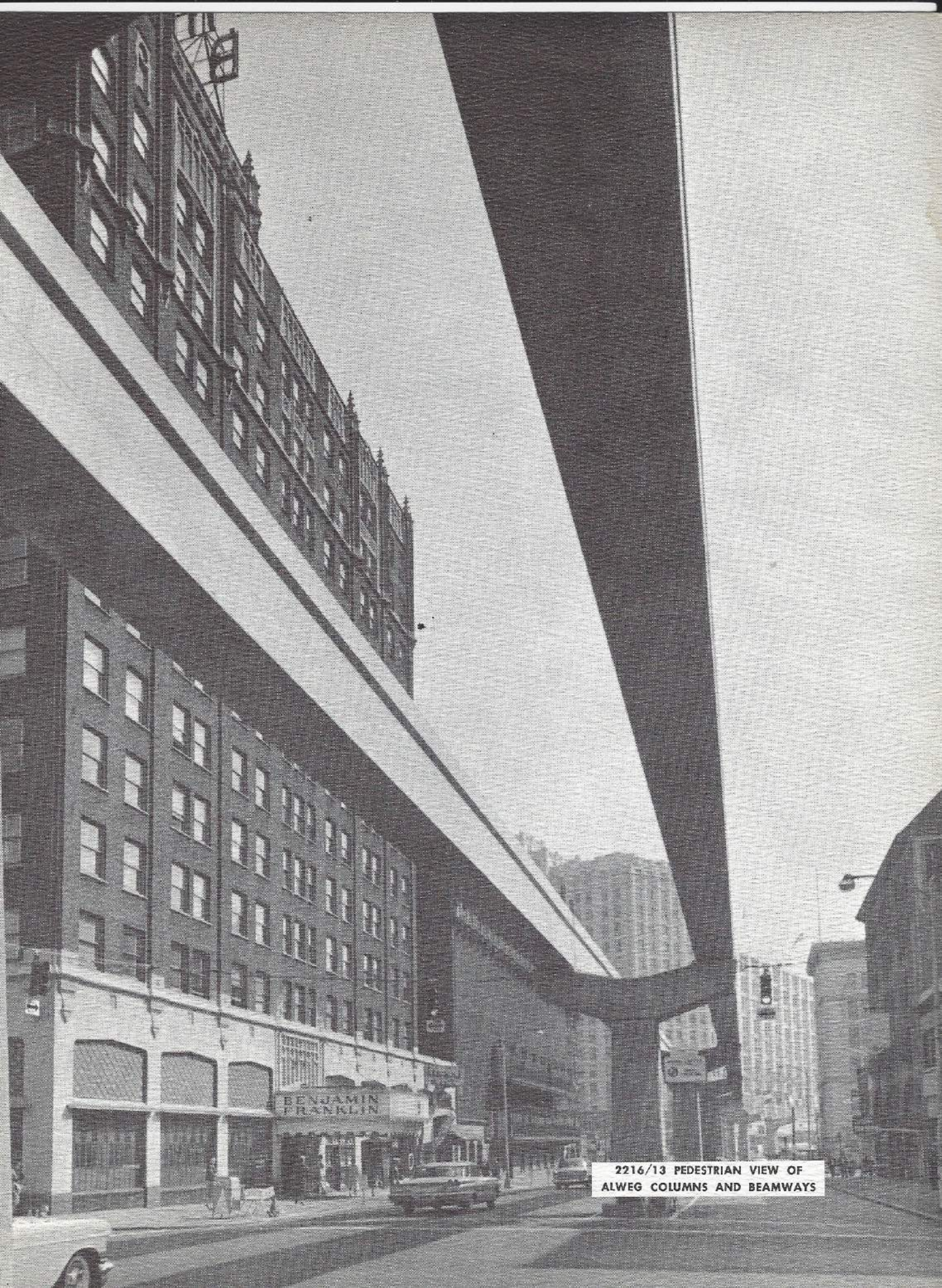
CROSS SECTION OF TYPICAL STRAIGHT BEAM



ALWEG MONORAIL

LOS ANGELES

WEGEMATIC CORPORATION NEW YORK, N. Y.



2216/13 PEDESTRIAN VIEW OF
ALWEG COLUMNS AND BEAMWAYS


2340/81 VIEW OF BEAMS IN PLACE ON TOP OF T COLUMNS . . . READY FOR MONORAIL USE
2000 FIFTH AVE. BUILDING
MOTEL
AUTOMOTIVE SERVICE
AUTOMOTIVE
AUTO RADIOS
James Joseph