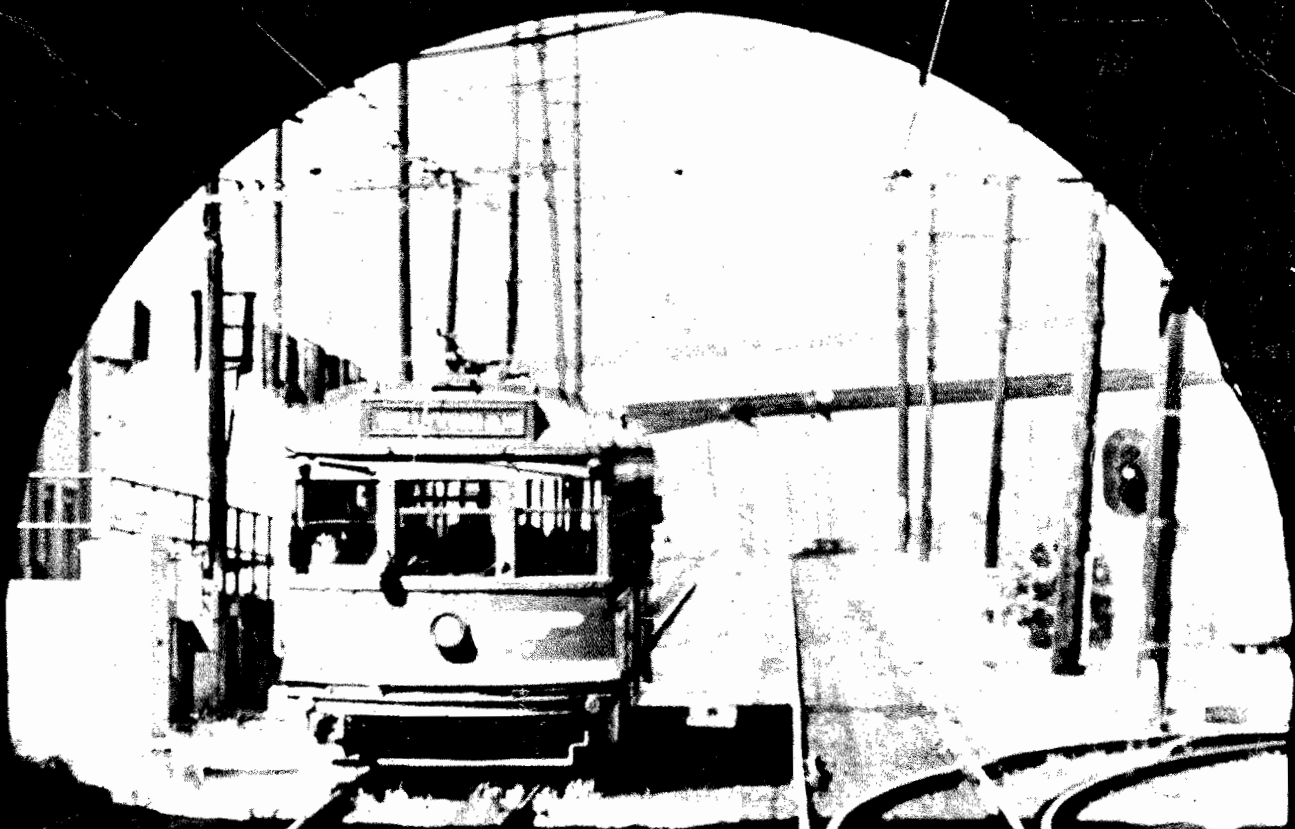


Lines of

PACIFIC COAST

Southern & Western Districts



Interurbans Special 60



THE PACIFIC ELECTRIC MAGAZINE



7

Vol. 10

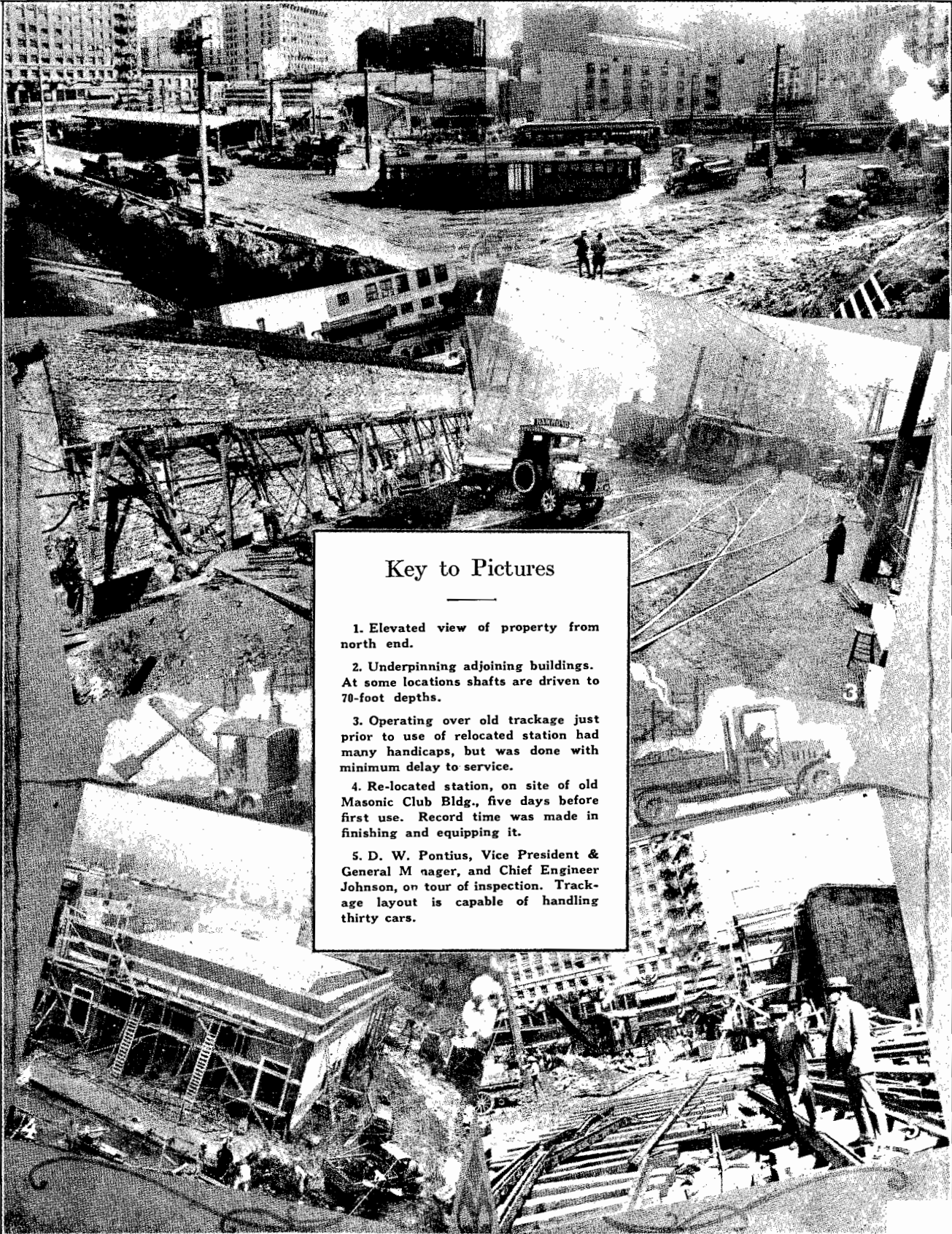
LOS ANGELES, CAL., JUNE 10, 1925

No. 1



Last Glimpse of old Hill Street Station Site.

OUR NEW SUBWAY TERMINAL IN THE MAKING



Key to Pictures

1. Elevated view of property from north end.

2. Underpinning adjoining buildings. At some locations shafts are driven to 70-foot depths.

3. Operating over old trackage just prior to use of relocated station had many handicaps, but was done with minimum delay to service.

4. Re-located station, on site of old Masonic Club Bldg., five days before first use. Record time was made in finishing and equipping it.

5. D. W. Pontius, Vice President & General Manager, and Chief Engineer Johnson, on tour of inspection. Trackage layout is capable of handling thirty cars.

HOLLYWOOD SUBWAY

Los Angeles' first and, to date, only subway was a mile-long double track bore extending from Beverly & Glendale Blvds. into the basement of the Subway Terminal Building at 417 S. Hill St. It was the somewhat forlorn realization of Harriman's dream of 1907: a four-track subway west to Vermont Ave., branching then to Vineyard, Hollywood, Beverly Hills and elsewhere. Although the subway which PE built in 1925 was far from being the major trunk line envisioned by Harriman, its downtown terminus was crowned by a noteworthy station-office building and the stories of both the subway and the terminal proper are important parts of any Western District history.

Pacific Electric was ordered to build the so-called Hollywood Subway under Order No. 9928 of the California Railroad Commission, issued in connection with authorization to increase fares to Hollywood from 6¢ to two 6¢ zones with a through fare of 10¢, effective January 1, 1922. PE could think of other reasons for building this tunnel: (1) \$36,865 estimated savings yearly in operation, plus \$25,000 more due to less maintenance of tracks in city streets, congestion, injury claims, etc. (2) \$159,000 of the total cost of tracks and property would be used in the future subway to Vineyard. (3) Building the subway would forestall Los Angeles Railway's extending into Hollywood.

On February 11, 1924, plans were completed for the construction of the tunnel and its downtown terminal. This culminated many years of preparatory work, dating from the early 1906 plans of LAP through 1913-1914 when heavy expenditures for land were made for rights of way to Vineyard and to First & Beverly Blvds. Alignment maps and profiles were prepared on both projects; these were little changed when the time came to build the first subway tunnel.

The Hollywood-Glendale-Valley Subway extended from the westerly line of Hill St. in a northwesterly direction approximately parallel with Fourth St., under and across Olive, Grand, Hope, Flower and Figueroa, thence on a five-degree curve about 900' in length to the north, under and across Fremont and Beaudry Avenues and the intersection of Fourth & Boylston Sts., thence on a tangent in a northerly direction under and across Crown Hill Ave., Third St., Sapphire, Bixel and Emerald Sts., and to the intersection of First St. & Glendale Blvd. From the westerly portal of the tunnel to First St. & Glendale Blvd., about 500', open cut construction was used.

The tunnel as built turned out to be a double-track, concrete lined, semi-circular arch section with overhead trolley. Station facilities were provided at Hill St. in the basement and ground floor of a limit-height office building of heavy steel and concrete construction. Original plans called for a terminal at grade at Hill St. but these were later changed (see "Subway Terminal"). From Hill St. to a point 65' west of Olive St., where the station tracks converged into the two main line tracks, the grade was level. From a point 65' west of Olive St. to Flower St. the grade was plus .5%, and from Flower to First & Glendale Blvd. a plus 2.1%. The total length of the tunnel was 4,325 lineal feet; its width was 28 feet, and its height 21'3".

CONSTRUCTION: On February 13, 1924, final plans and specifications were placed in the hands of prospective bidders. Upon opening the bids submitted by six engineering contracting firms, it was interesting to note that several of the bids were within \$100,000 of the estimated \$1,250,000 cost of the tunnel. On April 16 of that year the tunnel contract was awarded to Twoby Brothers of Portland, Oregon. Ground was broken at 10:00 AM on Saturday, May 3, 1924, at First St. & Glendale Blvd. There were no official ceremonies, but PE was represented by D. W. Pontius, its Vice-president & General Manager, and a number

of the members of his official staff, including E. C. Johnson, Chief Engineer, who had direct supervision of construction. Also present were civic representatives from Los Angeles, Hollywood, Glendale, Van Nuys, San Fernando and Burbank.

Dirt from the first 500 feet of open cut at the western portal was removed by steam shovels and dump trucks. Lucas St. had to be realigned to avoid a grade crossing and this was done at that time. The first tunnel drift was commenced at the west portal on Friday, June 13th—possibly an omen of the subway's short service life.

The tunnel was excavated by the drift method; about 60% of the material excavated was loaded directly into dump cars without additional handling. A standard gauge spur track was built into the tunnel from the Glendale Line and with the construction of a trestle and bunkers, sufficient storage space was made for sand and gravel for use in the tunnel lining. A cement house and a small repair shop for emergency repairs were also constructed at that point.

Bunkers were also built on the southerly side of the open cut, with narrow gauge track running from these bunkers to the drifts. Dirt was removed from the drifts with the use of small gasoline locomotives and specially constructed steel dump cars. These cars were of one yard capacity and specially designed by the contractor for rapid dumping and were built by a local firm. Loaded dirt cars were hauled from the tunnel to the bunkers, which were at a height sufficient to permit dump trucks to load underneath; it was then hauled away to local dumps.

In addition to starting work at the west portal, the contractor also made an open cut between Figueroa and Flower Sts., a distance of about 300 feet, and from this open cut worked drifts in each direction in the same manner as at the west portal. Thus the work was greatly speeded, as shifts could be worked continuously at each of the three headings. As the bottom of this open cut was some forty feet below street level, it was necessary to install a hoist to raise the excavated dirt into bunkers. The same type of small gasoline locomotives and steel dump cars were used at this location.

Most of the tunnel excavation was through soft shale and this material was loosened by using low per cent dynamite in small quantities and by use of pneumatic air drills. Excavating proceeded by making two advance drifts, one on the lower right and one on the lower left of the face of the tunnel running about three cubic yards per lineal foot, each. Timbering to support these drifts was placed so that the uprights were of sufficient distance apart to allow the passage of dump cars; the outside upright timber was placed at a sufficient distance from the outside excavation so that forms could be built and the concrete wall poured without disturbing these timbers. This timbering also formed the base for the timbering of the two following drifts immediately above the lower drifts, each of which contained about 2.3 cubic yards per lineal foot and also supported the inside forms for the concrete arch. All of these four drifts were excavated to the outside line of concrete and found support against the core or center portion, which measured about 16 feet wide and 17 feet high and ran approximately 9.3 cubic yards per lineal foot. The third operation in excavation was the removal of the wings and arch which in most cases was accomplished in one operation, running approximately 4.8 cubic yards per lineal foot. Each drift as it progressed was decked over with lagging and the necessary portion of lagging removed to permit excavated material to drop into dump cars in the lower drifts by gravity.

Dynamiting was generally done during the noon hour or at the time of shift changes. No blasts were set off without warning, and

a watchman was left to prevent workmen from passing into the danger zone.

At no time did the gasoline locomotives enter the drifts. Empty cars were brought to within about 300 feet of the face of the drifts and were dropped into the lower drifts either by gravity or pushed in by workmen. Loaded cars were pulled from the lower drifts by a cable leading to a hoist driven by an electric motor some 300 feet back from the drifts.

As the concrete lining was poured, set and stripped of form lumber, before the earth core was removed, the core was used for supporting the arch segments upon which the concrete form lumber was placed. In very heavy and swelling ground, concreting always followed closely behind the wing and arch excavation.

Grades and lines were checked daily from substantial monuments which were established on the lines of the lower drifts at intervals of about 600 feet on tangent and about 150 feet on the curve. A daily drift record was kept by the engineer and computations made at the end of each month for payments to the contractor. These payments were based on the lineal feet of drift progress.

The concrete lining in the tunnel section had an inside clear opening at the top of rail of 28 feet and the spring line was 5'9" above top of rail. The arch had a radius of 14 feet with a minimum thickness of 24 inches and was reinforced with square deformed bars. The footings had a minimum width of 3'2" and extended 36" below the top of rail with an additional depth of 12 inches where wet ground was encountered. Four-foot fiber ducts were provided in the side walls on each side for feeder and tension lines in connection with electrical operation, telephones, signals, etc. At 50-foot intervals along each side wall, a refuge recess was provided.

This section extended from the western portal to a point 65 feet west of Olive St. From that point to the west line of Olive St. the tunnel was flared by flattening the arch and from the west line of Olive Street heavy type steel construction was used, all footings, columns and girders designed to take the weight of a limit height building.

All concrete in the tunnel section was composed of one part Portland Cement, three parts washed sand to five parts washed river gravel. Six-inch air lines were laid in the tunnel from large compressors and concrete was mixed and placed through these lines in one operation. A piece of rubber and cotton fabric, ten feet in length, was used as a depositing nozzle and it was an easy matter to deposit the concrete at any point in the forms.

The total length of the tunnel section was 4,325 lineal feet. The concrete lining contained 26,203 yards of concrete, and the tunnel excavation was 135,000 cubic yards.

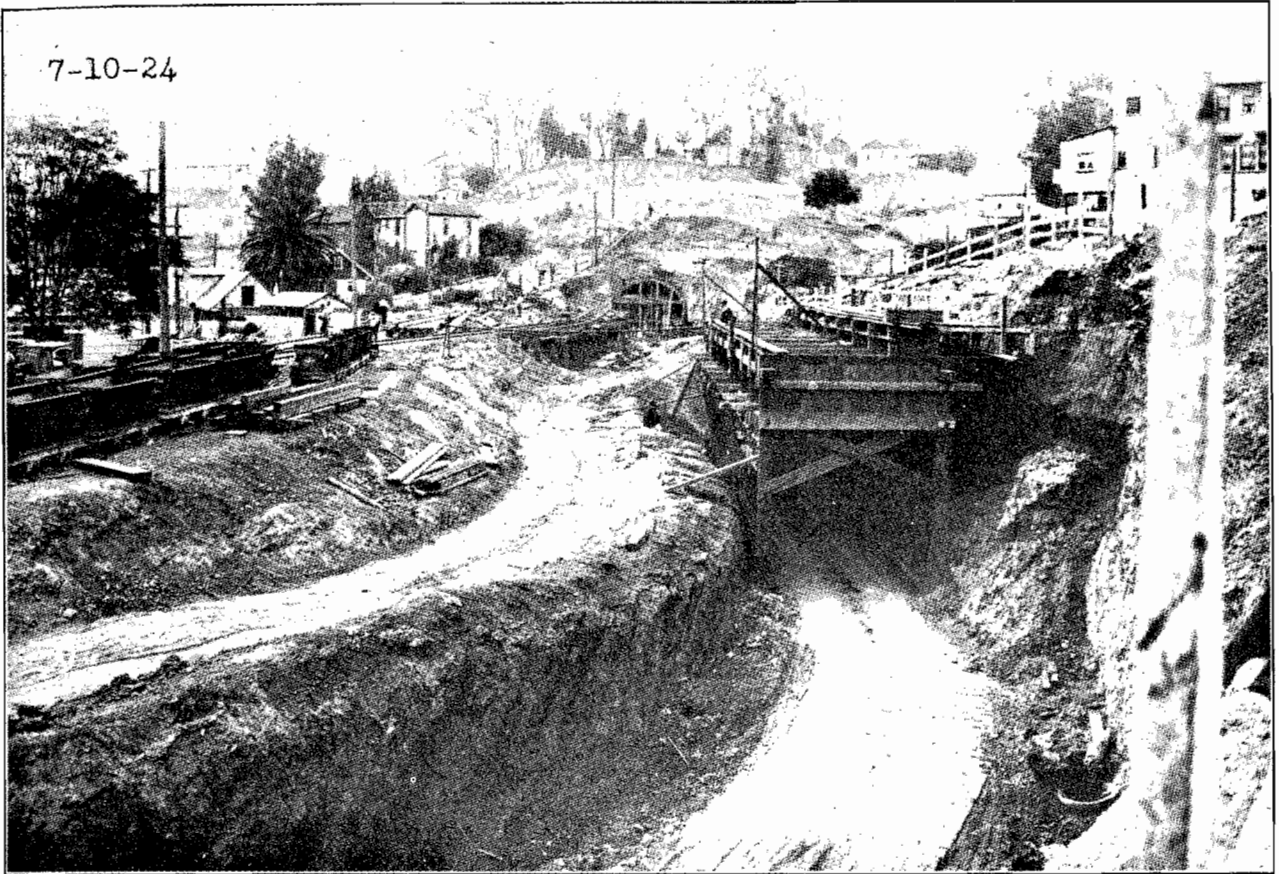
The contractor worked three shifts at each heading and daily total number of men employed amounted to about 650. The report of October, 1924, shows an average of approximately 24 lineal feet of completed tunnel daily.

Walls and arch were poured together, making a monolithic mass, except in one or two exceptional cases such as the open cut at Figueroa St., at which point the walls were poured first. Pacific Electric furnished rock, sand and cement for the concrete lining; two spur tracks were used for delivery of these materials: at the west portal and at the Figueroa St. open cut.

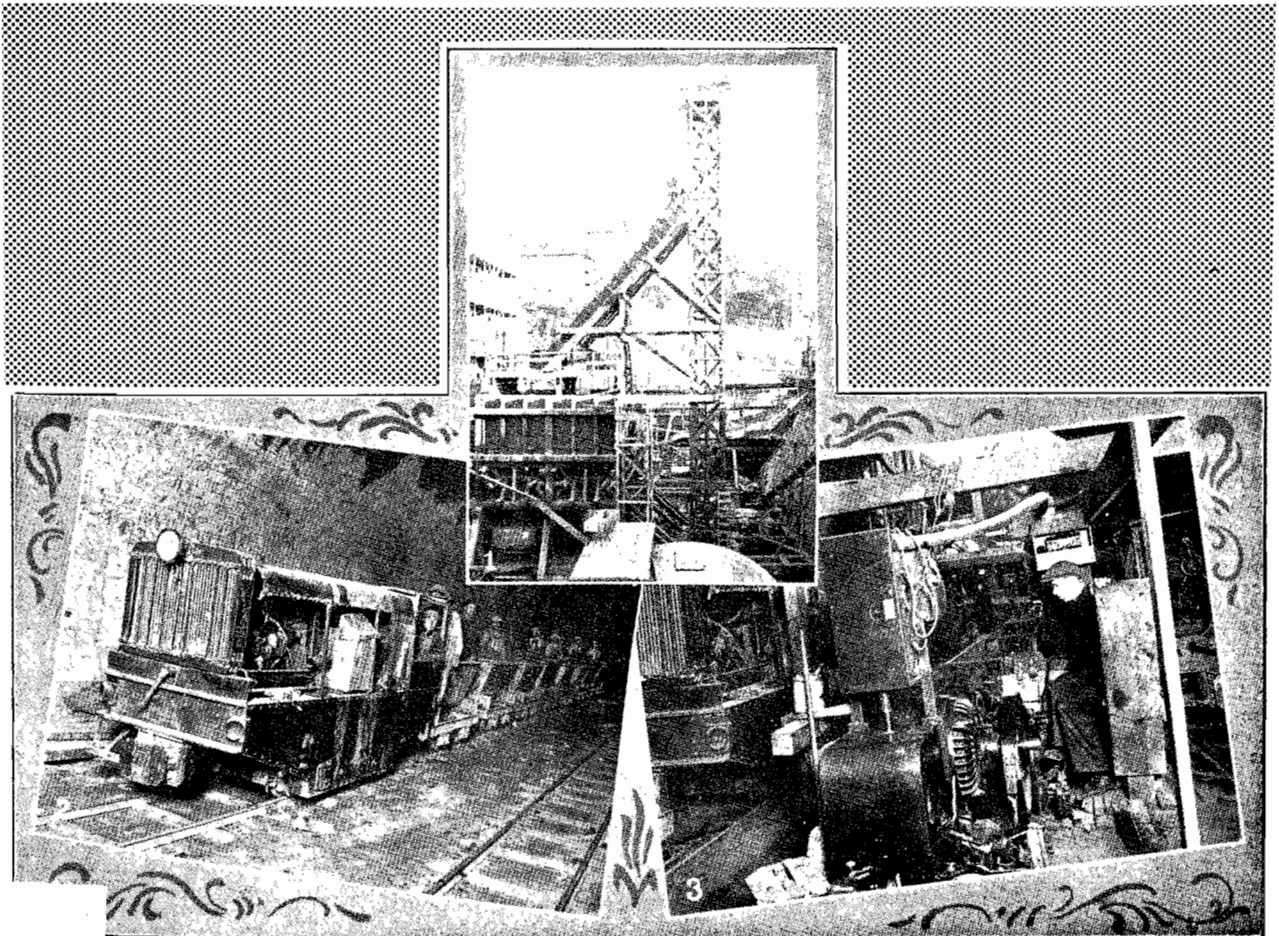
Water seepage into the tunnel which rose to about 24,000 gallons daily during the excavation period, gradually decreased to a flow of about 15,000 gallons daily. This heavy seepage puzzled the contractor and

RAPID PROGRESS BEING MADE ON TUNNEL

7-10-24

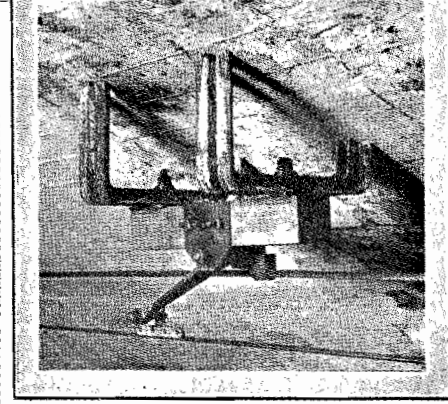
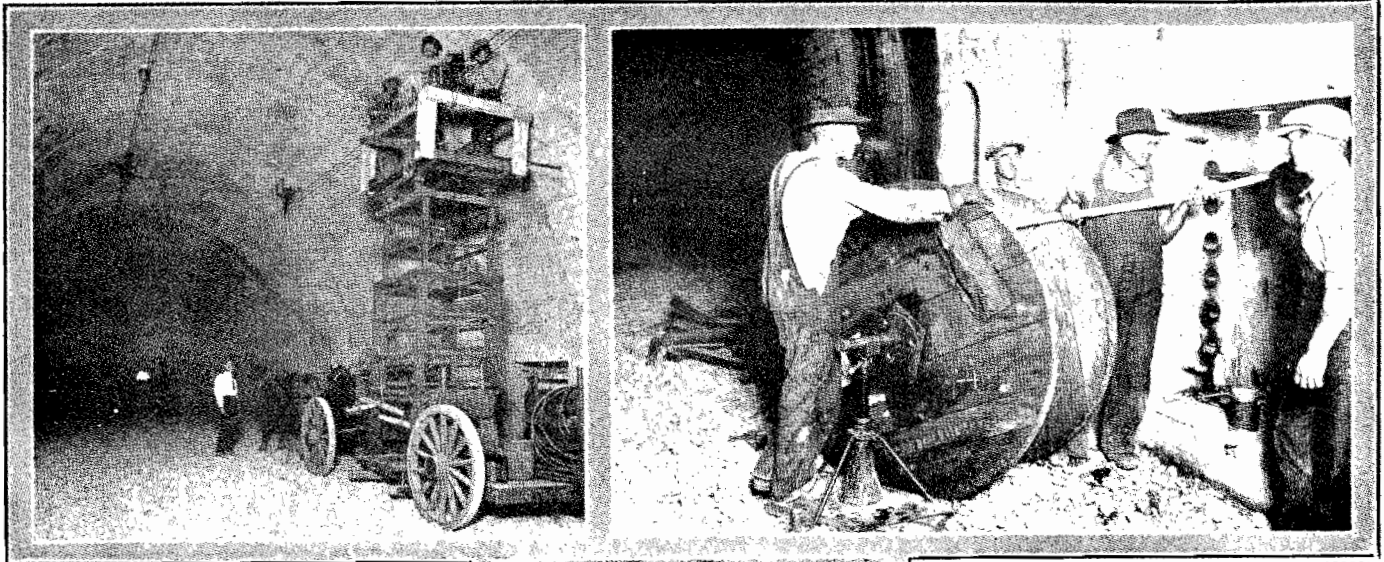


Progress on the new tunnel continues at a good pace. The first drift was started June 13 and another on July 19th. A total of 133 feet of excavation had been removed on July 1st.

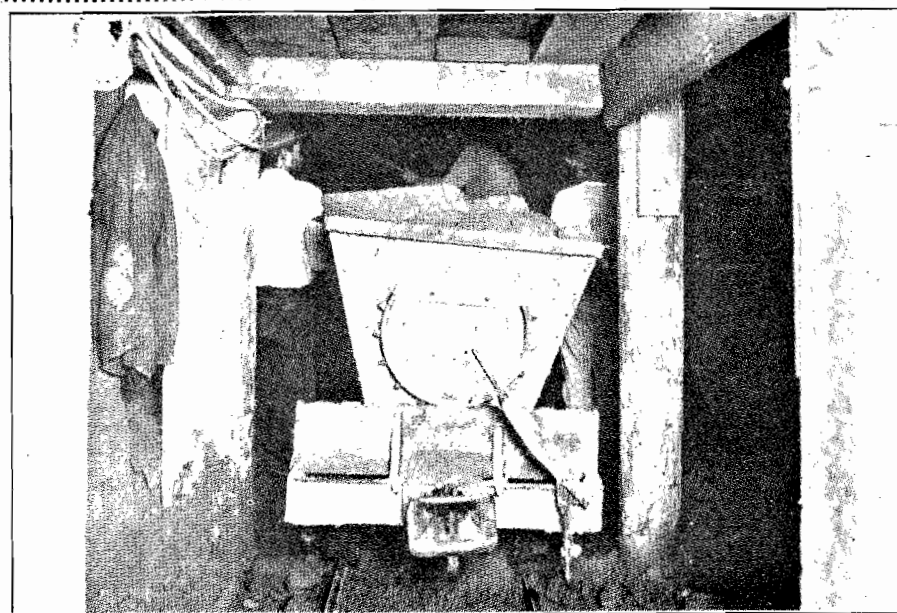


Hoist and earth bunkers, through which excavated material is brought to surface and fed into trucks, one of which can be seen in picture at lower left-hand corner. 2—Gasoline locomotive and dump trains used in bringing material from tunnel to bunkers. 3—Hoist machinery used in connection with removal of material at the Figueroa Street shaft.

TUNNEL WIRING IS FINISHED IN RECORD TIME



Stringing overhead and running cable in conduits in tunnel early last month, another task that was completed with dispatch by our working forces. Below is a new type of "stead-brace" employed in the curve section of the tunnel, so designed as to permit trolley wire to raise with pressure of poles. It eliminates span wires and consequences attendant with wandering trolley poles.



Lower drift excavation and method employed in removing. Note that supporting posts are sufficiently spaced to permit operation of dump cars between them.

the most plausible explanation came from an old-timer: the water seeped down from the Echo Park Lake, about half a mile above the west portal on the Glendale Line. To get easy drainage an eight-inch main of concrete pipe with closed joints was placed for the full length of the tunnel on the center line between tracks and about a foot below the sub-grade. Along each side of the tunnel 2 feet in from the walls a six-inch concrete pipe was placed with open bell joints, and at intervals of 25 feet cross drains were laid of six-inch concrete pipe with open bell joints connecting the outside lines of pipe with the eight-inch main in the center between tracks. Over the top of all these drains for a depth of from twelve to eighteen inches, three inches of crushed granite was placed to bring the floor of the tunnel up to the track sub-grade. The eight-inch main led to sumps constructed under the sub-grade at Olive St. and at Flower St.; these sumps were equipped with electric automatic pumps which lifted water from the sumps to storm drains at these two points.

It took less than a year to drive the tunnel through to Hill St. Ground was broken at the west portal on May 3, 1924, and the bore was completed on April 16, 1925. Then began the work of laying rail and installing trolley wire.

The double track in the tunnel section was built on twelve-foot centers. Ninety-pound rail was used with standard tie plates and rail anti-creeper. Redwood ties of 6" by 8" were used and eight inches of crushed rock ballast was placed beneath the ties.

Electrification of the new tunnel involved some unusual features. Underground cables, running lengthwise through the tunnel walls, were first to be installed. A crew of "overhead" men was made over into a crew of "underground" men with much success; as this was a new line of work for them, it was necessary to obtain considerable new equipment. A standard cable-pulling winch was assembled in Torrance Shops, a steel pulling cable was salvaged from elevator cables discarded at Sixth & Main Station; duct rods and other paraphernalia obtained and actual work started on June 25, 1925. By July 3rd a total of 24,000 feet of No. 14 rubber covered wire had been installed for the lighting system; 4,000 feet of 1,000,000 CM lead covered feeder cable, 4,000 feet of No. 3 conductor, lead covered, 2,200 volt cable, and 8,000 feet of ten pair lead covered telephone cable had been pulled into their respective ducts, ready for the cable splicers.

The trolley contact system was of catenary construction, and presented several interesting features. The supporting messengers were 300,000 c.m. copper cables, which also acted as auxiliary feeders. They were attached to the tunnel roof at 15 ft. intervals by means of porcelain suspension insulators of standard design. The trolley contact conductors were of 4/0 copper, hung to the supporting messengers at 15 ft. intervals, midway between the messenger insulators, by means of 6 inch type C.S. catenary hangers.

At intervals of 600 feet, taps were run up through the tunnel proper, the trolleys being held in alignment in the curve by the use of a new type of steady brace, developed in the electrical department of PE and made in the Torrance Shops. This permitted the trolley wire to raise with the pressure of trolley poles, but prevented it from moving sideways. It consisted of a maple block fastened to the roof brackets by insulated bolts, with an iron arm, swiveled at each end, running down at an angle to a standard trolley ear. An iron plate was bolted on one side with a hook to carry the supporting messenger.

Lights in the tunnel were spaced at fifty foot intervals on both sides. They were put in the refuge pockets where men could step back in a recess built into the wall. Every thousand feet a specially built refuge pocket housed a subway telephone connected direct to the terminal; colored lights designated these so they could be reached quickly in case of an emergency. The lighting system was fed at 1,500 foot intervals from transformers which also fed the signals. These

transformers were tapped from the 2,200 volt cable by means of subway type terminal boxes which provided proper protection from failure.

A feature of the use of the new type of "stead brace" described above was that it permitted complete elimination of trolley span wires, always a source of trouble when trolley poles wander.

The five-track terminal beneath the Subway Terminal Building employed a type of direct suspension, it being a slow speed zone. The 4/0 copper trolley wire was fastened by means of special spring type barn hangers spaced every 15 feet on tangents, 7 feet on curves, to 2x12 inch planking, which in turn was suitably attached to the concrete beams of the ceiling. More than 2,000 lineal feet of Oregon pine planking were used. Trolley wire when installed was stretched to a tension of 2500 pounds, thereby providing a perfectly horizontal under-run, even under the maximum pressure of the trolley wheel.

A new substation, Toluca No. 51, was constructed adjacent to the west portal to provide most of the power needed for tunnel and terminal operation. This new unit, in addition to carrying the major portion of the tunnel-terminal load, also distributed all of the electrical energy required for operating the entire railway facilities in the relocated Hill St. Station. Due to its location, the Toluca Substation relieved the existing heavy load on the Olive Substation and materially improved voltage conditions on the Hollywood and Glendale Lines.

Toluca Sub was automatic, and was equipped with a 1500 kw., 600 volt DC, 6 phase, 50 cycle, 600 RPM compound wound synchronous converter, with complete automatic equipment, all of the most modern type and incorporating the latest developments in the industry. The building was of concrete construction and absolutely fireproof. Its exterior design was considerably more attractive than the usual PE utilitarian design for such structures.

Toluca Substation was interconnected by means of feeders with the Maple Avenue, Olive and Ivanhoe Substations. Suitable switching equipment was installed for operating the feeders, singly or collectively, thus providing a unified system and flexible electrical energy supply to meet the varying demand of an exceedingly diversified load.

In addition to the relays and other devices required for starting and shutting down the station machine under normal conditions, there were protective relays for limiting overloads and overspeeding; for disconnecting the machine in case of power failure, single phase operation and reversed polarity.

Toluca Substation cost \$120,000 and first went in service on June 15, 1925.

Across the two main line tracks from the new substation was Toluca Yard, built in late 1925. The yard contained four passenger car storage tracks with a total capacity of 22 cars. It had 1700 lineal feet of track, one inspection pit and miscellaneous maintenance facilities and storage sheds.

Safety was insured by 21 block signals, automatic train stops, and an interlocker plant at the throat of the terminal; this interlocker was located in a tower four stories below Olive Street. The automatic block signals were arranged to handle one train every 25 seconds.

The first work train operated through the tunnel and into the terminal on September 10, 1925.

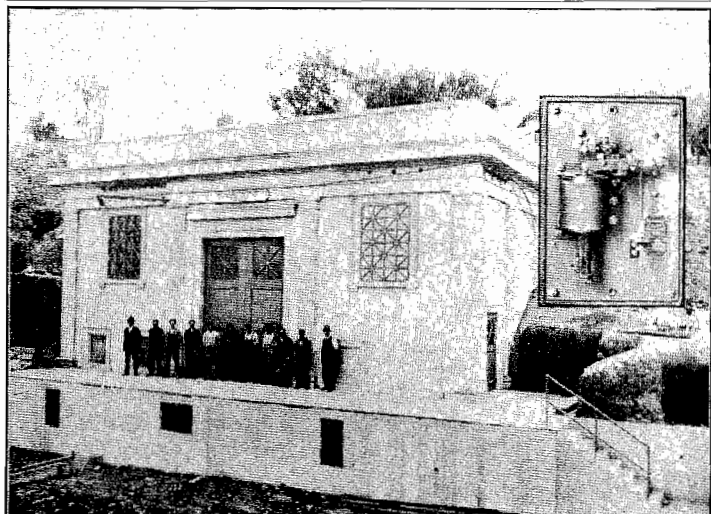
Now we leave the tunnel and turn our attention to the great Subway Terminal.

CHRONOLOGICAL HISTORY OF CONSTRUCTION:

Showing an elapsed time of but 18 months and 27 days from the date of breaking of ground to operation of first scheduled passenger train, the following is a chronological table of important events in the construction of the tunnel and terminal:

Feb. 11, 1924	Plans completed for construction of tunnel and terminal.
Feb. 18, 1924	Bids asked.
Mar. 18, 1924	Bids submitted by prospective contractors.
Apr. 16, 1924	Tunnel contract awarded.
May 3, 1924	First ground broken.
June 13, 1924	First tunnel drift begun.
Jan. 2, 1925	Work on Toluca Substation begun.
Mar. 1, 1925	Completion of first drift.
Apr. 16, 1925	Tunnel bore completed.
May 13, 1925	Excavation for terminal building begun.
June 23, 1925	Wiring of tunnel begun.
July 4, 1925	Toluca Sub in service.
July 7, 1925	Structural steel erection begun.
Aug. 23, 1925	Building excavation finished.
Aug. 31, 1925	Track laying in tunnel begun.
Sep. 10, 1925	Operation of first work train through to terminal.
Oct. 15, 1925	Laying of track finished.
Oct. 24, 1925	Structural steel erection finished.
Nov. 24, 1925	Wiring of tunnel finished.
Nov. 30, 1925	Official ceremonies and inspection by public.
Dec. 1, 1925	Operation of first scheduled passenger train.

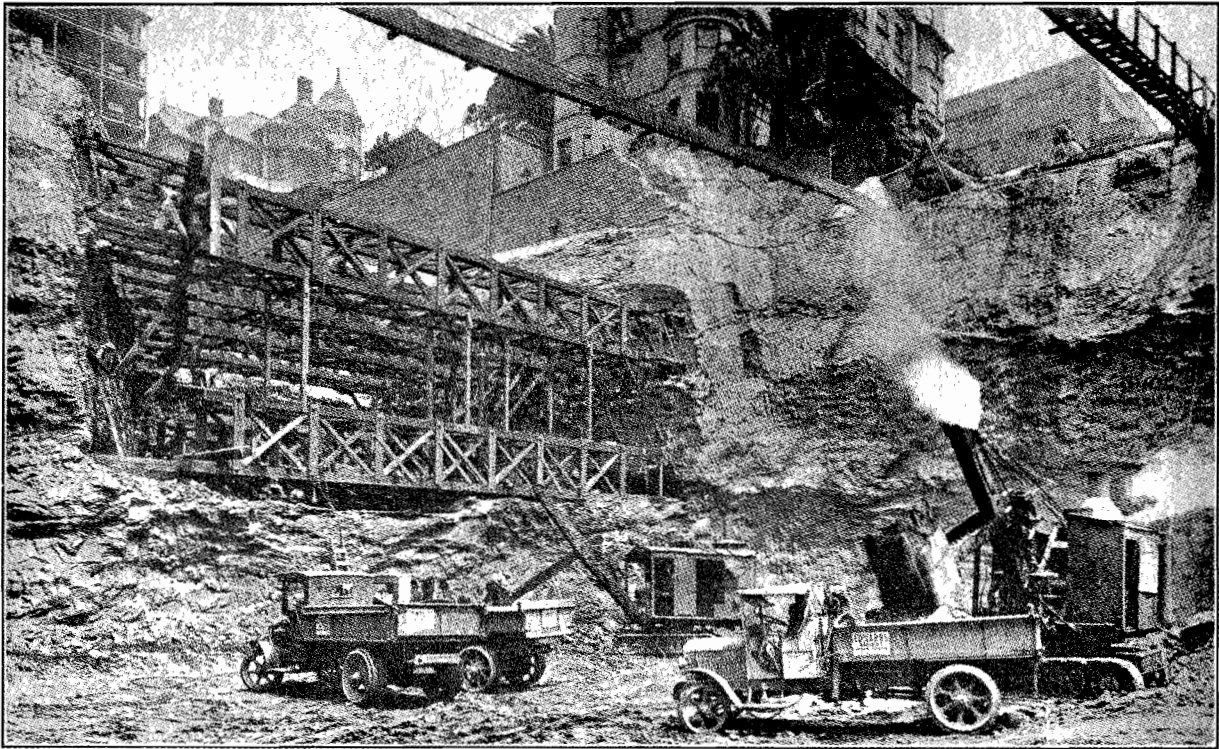
POWER UNIT COMPLETE FOR SUBWAY SERVICE



Toluca Substation in 1925. Automatic equipment consisted chiefly of relays; insert photo shows an under voltage relay.

(Material used, both data and photos, are from Pacific Electric Magazine contemporary issues, now in Magna Collection.)

RAPID PACE CONTINUES AT TERMINAL SITE



Progress on Hill Street terminal continues at rapid pace, 75% of excavation on site having been completed on July 10th. Picture herewith shows extent of excavation being made, the timbering being temporary support insuring permanency of side walls pending completion of structure.

NEW TERMINAL STILL PROGRESSES RAPIDLY



Structural steel workers are maintaining the same dizzy pace that has characterized the progress of other crews on terminal and tunnel project. Vice-President Pontius and Chief Engineer Johnson are seen on a tour of inspection.



THE PACIFIC ELECTRIC MAGAZINE

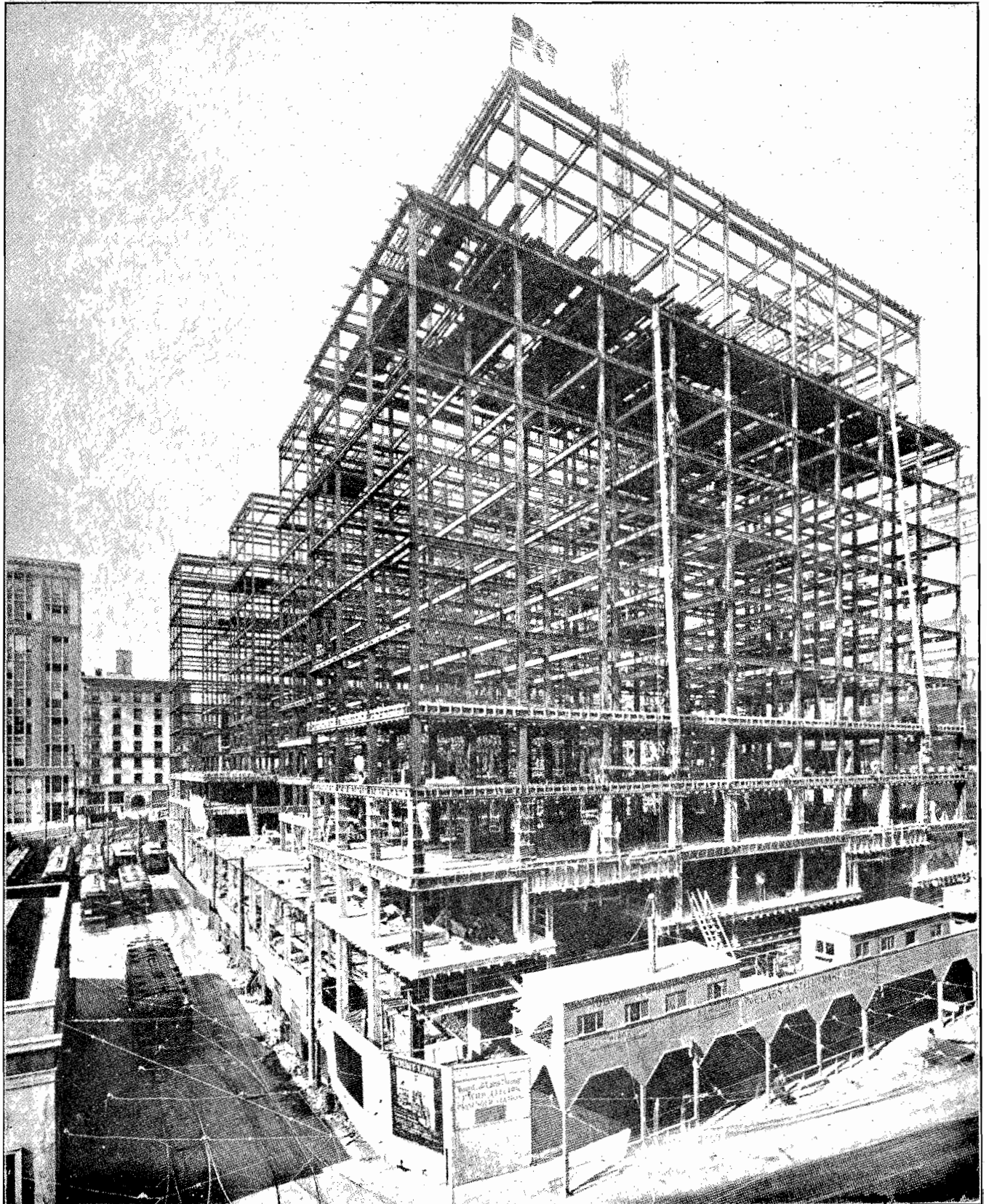


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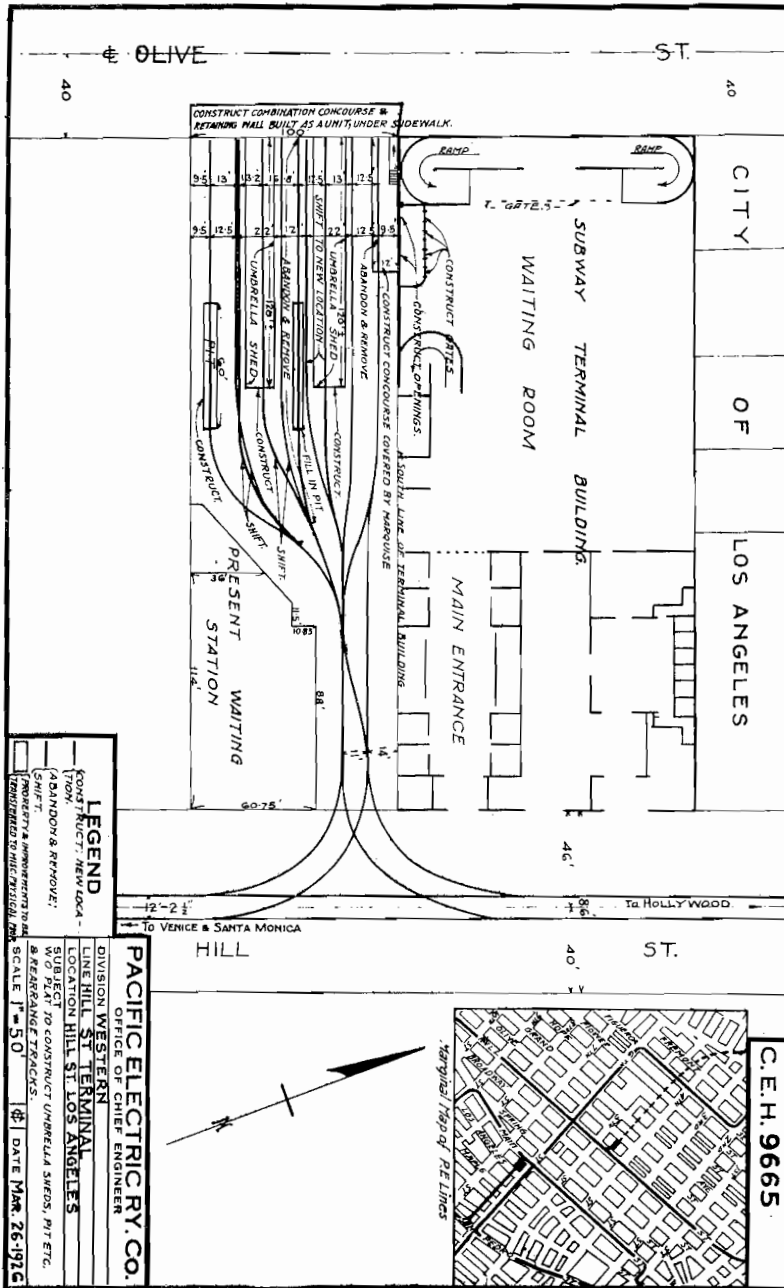
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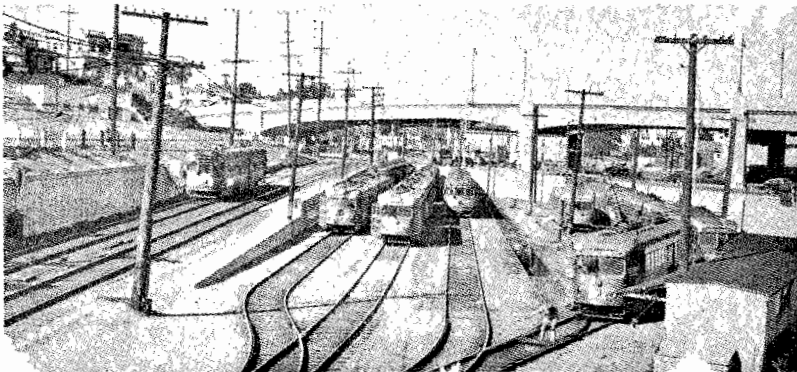
No. 6



Old Glory Crowns Fabric of Terminal Steel



Above: The 1926 plan for integrating Hill Street Station with Subway Terminal, which was carried out as shown; compare with plans on page 42-E. (Right) Announcement carried in all cars of changes effective 7 Feb 26 which brought Valley and many Hollywood cars into Subway. (Below) Toluca Yard, circa 1944; car storage tracks at right. Car at left is about to enter subway. (all, Magna Collection)



Improved Service

**Hollywood Boulevard Line
Santa Monica Boulevard Line
Van Nuys Line**

Effective Sunday, February 7, 1926

In connection with the commencement of operation into the Subway Terminal, following routings, schedules, etc., will be in effect for service to the Hollywood and San Fernando Valley districts.

Hollywood Boulevard Line

All Hollywood Boulevard cars (except Hollywood-Vineyard and Hollywood-Santa Monica cars) will be operated into and out of the Subway Terminal.

Hollywood Vineyard Line

No change will be made in this service, same to be operated under ten-minute headway as at present via Hill Street.

Santa Monica Boulevard Line

All Santa Monica Boulevard cars will be operated into and out of the Subway Terminal (except Western and Franklin Avenue Line).

Western and Franklin Ave. Line

Western and Franklin Avenue cars will be operated as at present along Hill Street to and from Twelfth and Hill.

Echo Park Avenue Line

Echo Park Avenue cars will be operated as at present along Hill Street to and from Twelfth and Hill.

Van Nuys Line

All Van Nuys Line trains will be operated into and out of the Subway Terminal (except train leaving Van Nuys at 11:44 p.m. and train leaving Los Angeles at 4:15 a. m., which trains will be operated via Hill Street to and from Hill Street Station).

Hollywood-Santa Monica-Venice Line

All through Hollywood-Santa Monica-Venice Line trains will operate as at present to and from Hill Street Station via Hill Street.

Fare Collection Plan for Local Cars Through Subway

Fare collectors will be placed at head of ramp in main waiting room in Subway Terminal, to whom passengers will pay fares instead of to conductors on cars. Such collectors will issue identification checks (if going beyond Inner Zone), also transfers, etc.

PACIFIC ELECTRIC RAILWAY

February 2, 1926

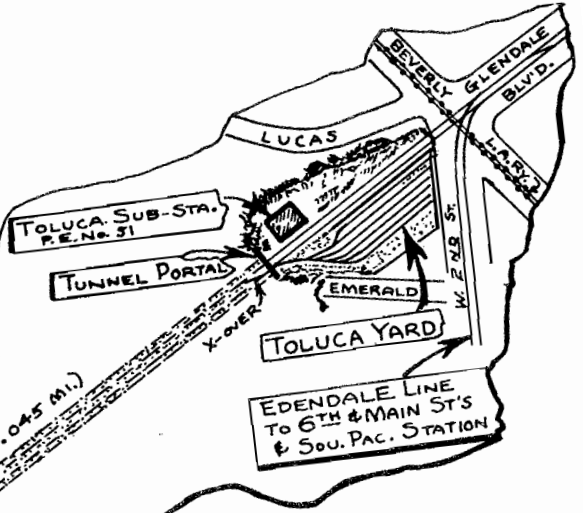


5012 and train bring a capacity load in from Glendale, circa 1945. (MC)



PACIFIC ELECTRIC RAILWAY HOLLYWOOD - GLENDALE SUBWAY - 1925-1955

DRAWN BY R.E. YOUNGSHANS
NO SCALE



(TUNNEL LENGTH - 1.045 MI.)

HILL STREET STATION (SURFACE TRACKS)

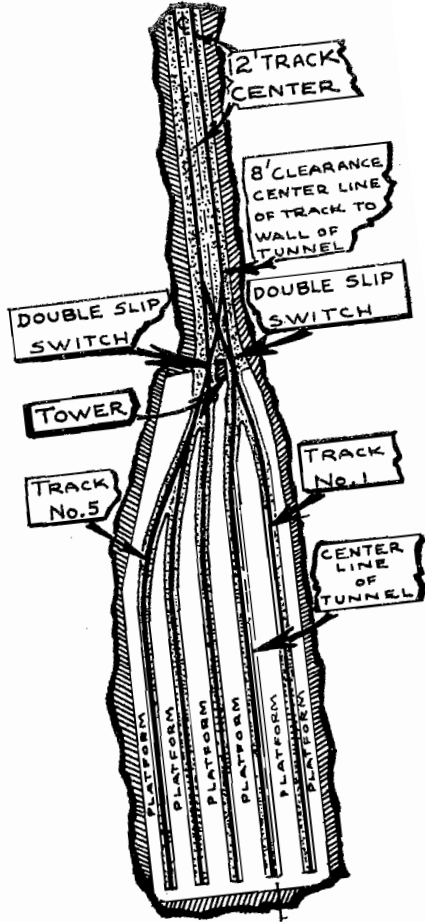
GRAND AVE.

OLIVE ST.

SUBWAY TERMINAL BLD'G
417 So. HILL ST.



5000, in its World War II Navy paint, passes tower outbound to Burbank. (MC)



SUBWAY TERMINAL

Whenever Pacific Electric wanted to make a major improvement, executives at Sixth & Main, after numerous conferences, worked out a formalized "Request for Authority for Expenditure of Funds." This was submitted first to Southern Pacific Headquarters in San Francisco; if approved there, it went on to New York City for final approval or rejection by the Southern Pacific Board of Directors. These Requests were cogent and precise; years later they remain highly interesting to read. Here is the Request for the construction of the Subway Terminal:

"Request for Authority for Expenditure of \$696,155; January 1, 1924.

"To construct depressed passenger terminal and provide other facilities.

"Recommendations:

"1. Construct depressed passenger terminal from Hill St. to Olive St. for Hollywood Subway service.

"2. Purchase of lot on Olive St. for additional yard space.

"3. Construct retaining wall in Olive St. cut and construct Olive St. undergrade crossing.

"4. Demolish old 'leanto' building serving as passenger station for Santa Monica Bay district trains.

"5. Relocate trackage serving Santa Monica Bay district trains.

"6. Wreck Masonic Temple Building to construct new station to accommodate concessionaire tenants and provide a station facility for Santa Monica Bay District cars.

"7. Purchase furniture and fixtures.

"8. Construct 1,000 lineal feet of single track in depressed terminal in addition to trackage under Work Order 22,000.

"9. Provide 165 lineal feet of double track tunnel.

"Reasons: To permit sale of northerly 141 feet of terminal property reserving terminal rights in limit height building to be erected by purchaser. If the terminal were constructed at Hill St. grade as first planned, it would be impossible to ever improve with an office building as cost would be prohibitive. Purchaser has been found who will buy the property and construct a limit height building under the following conditions:

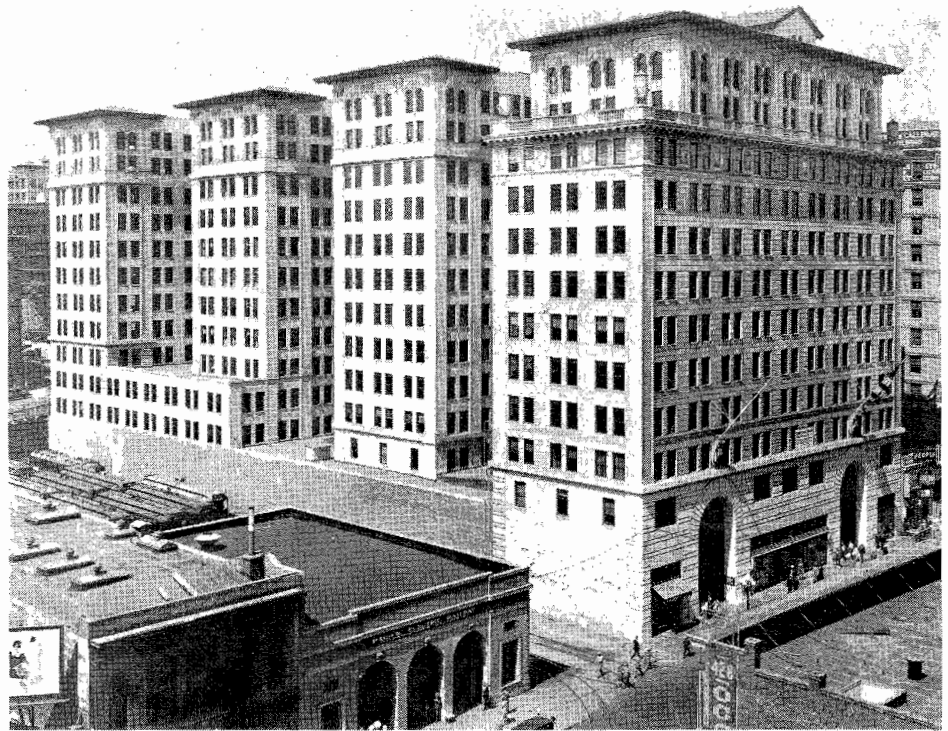
"(a) Pacific Electric Railway Company to retain perpetual rights to entire basement area, the west 194' of ground floor area on Hill St. level, and the ground floor area fronting twenty feet on Hill St. giving access to rear and basement areas.

"(b) Pacific Electric to construct foundations and basement structure for a limit height structure up to and including the rough concrete floor at the Hill St. level and buyer will pay PE \$400,000 as full payment for such work.

"This plan will permit expansion to care for future subway requirements by connection from remaining terminal property on the south, while original grade terminal plan precluded the possibility of extending the subway system in the future.

"Present station building and old Masonic Temple building will have to be wrecked in order to relocate the Venice Short Line terminal tracks. These track changes also require the purchase of a lot at the southwest corner of the station grounds.

"Additional advantages are: (1) Large office building at terminal drawing additional railway travel and anchoring business to vicinity. (2) 200% more concessionaire revenue, up to \$27,000 per year. (3) Rail-



The great Subway Terminal Building at 417 S. Hill St. is one of Los Angeles' largest office buildings, containing 1100 rooms. In this photo, the new Hill Street Station and yard are seen in foreground. (SFN)

way property having frontage of 122' on west side of Olive St. will be little affected in value by new plan as tracks will be so far underground that surface and air rights will be extremely valuable. Former plan would have prevented any return from property."

Work Order 22,000 referred to above was the authorization to construct the subway itself. The "former plan" mentioned had to do with the original plan to bring tracks in from Figueroa St. via a tunnel to west edge of Hill St. Station yard, then emerge on grade level with Hill St.; this plan is reproduced on page 42-E.

The "purchaser" above mentioned was the Subway Terminal Corporation, formed by some of the city's leading citizens. This corporation paid PE \$705,000 for the land on which the huge structure was built, plus \$400,000 for construction work from foundations to and including the ground floor.

Ground for the Hollywood Subway was broken on May 3, 1924 at the west portal; it was more than a year later that excavation work began on the site of the terminal itself: May 13, 1925. Plans for the building were prepared by Schultze & Weaver, Los Angeles and New York architects. The tunnel and terminal project, jointly accomplished by PE and the Subway Terminal Corporation, represented the largest relief offered up to that time for traffic congestion; it brought outlying communities three miles nearer the central business district in point of time; it stabilized property values for many blocks around; it provided a business and professional office address unequalled in the city.

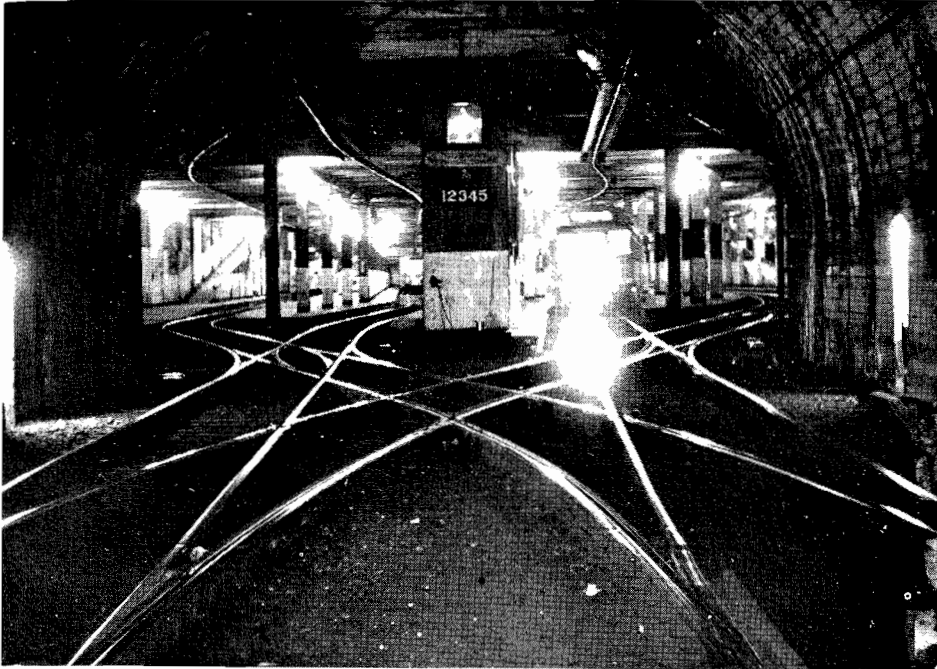
The Subway Terminal Building contained 600 offices; a garage, entered from Olive St., afforded parking for exclusive use of tenants. 122,000 cubic yards of earth were excavated for the building---the largest excavation for any building in the city up to that time. The building had a frontage of 141 feet on Hill St. and a depth of 330 feet. The steel framework for its limit

height hugeness contained more steel than any other building in Los Angeles: 6,000 tons, of which 2,400 tons were below the street level; the latter figure was greater than the total of all steel used in the city's largest hotel, the Biltmore.

The excavating was pushed forward with all possible speed; 45 trucks and 3 steam shovels worked 15 hours daily. As the west boundary of the site bit deep into Bunker Hill, the tracks there would be four floors beneath Olive St., while at the east end of the subterranean train shed they would be but thirty feet below Hill St. It was, of course, necessary to close Olive St. for several months to permit excavating, installation of retaining walls and the various subsurface facilities required: the trainmen's rooms, the passenger traffic headquarters, etc. Most of the Olive St. subsurface structure was unfinished; temporary offices were partitioned off from a dark, huge, shapeless room with rough concrete walls; doubtless this would have received finishing touches had the Venice Subway been built to connect. Directly opposite the Hill St. property on Olive St. stood an old public school; PE bought this property and it, too, was excavated to provide the throat of the tunnel, approximately 68 feet west of Olive St.

On August 23, 1925, all excavation work was complete and the reinforced concrete foundations were started. Erection of the steel framework followed, to be finished on October 24, 1925 with the traditional unfurling of Old Glory on the topmost girder---symbol of success wherever steelmen toil.

Even while heavy steel girders were being hoisted into place far above, PE crews were pressing forward in the great train shed far below the surface of the ground. By September, 1925, the vast room had taken shape. The concrete curbs, similar to the ones on the 6th & Main elevated structure, were in place and the five stub tracks had been laid between them. Tracks were laid on ballast cushions, and the work of con-



● The throat of the subway; left of interlocking tower are tracks 1 and 2; tracks 3, 4 and 5 are to right. (R. B. Petersen Photo)

structing the concrete loading and unloading platforms was nearing completion. All of the rough work involved in the concrete ramps leading to and from the mezzanine floor to the train platforms had been completed. All rough work in connection with the Olive St. undergrade crossing was finished and Olive St. was reopened to public use; the tower to house the interlocking plant at the throat was almost completed, it being a part of the Olive St. structure.

By the end of October, all work in the trainshed was finished, as was the block signal system. The interlocker was about 90% complete, and large forces were busy putting the final touches on the terminal; placing tile, terra cotta and marble. The brick curtain wall was completed for the first story, and facing granite was placed on the Hill St. front to a height of 1½ floors. The date of completion was near and the Transportation Department was busy mapping out timetables; a fitting celebration was being planned for the great event, which, as PE Vice-President D. W. Pontius proudly announced, would take place on November 30th with a civic banquet at the Biltmore Hotel preceding the formal opening.

November 30, 1925, was truly a great day in Los Angeles' history. Your editor was among the thousands who crammed into the Subway Terminal that day and perhaps his first-hand recollections would be of interest. First of all, there was the long walk from Hill St. to the waiting room: 130 feet down a marble-floored arcade flanked on both sides by shops. Then the main waiting room itself—surely as impressive as ornate head offices of banks and reminiscent of same. Then there were the long, winding ramps to the lower mezzanine where more waiting room space was provided; and finally the gradually descending straight ramps to track level. Winding down the ramps with the crowd, it was slow going—but swelling martial music from below stirred the senses and further heightened the excitement felt by everyone. Then the first glimpse of the great cavern itself—a cavern brightened at intervals by photographers' flashguns—a cavern wherein the PE Band on a bunting-bedecked flat car outdid itself—a cavern wherein were placed on display a priceless collection of PE equipment from early days to the present. There was a resurrected old

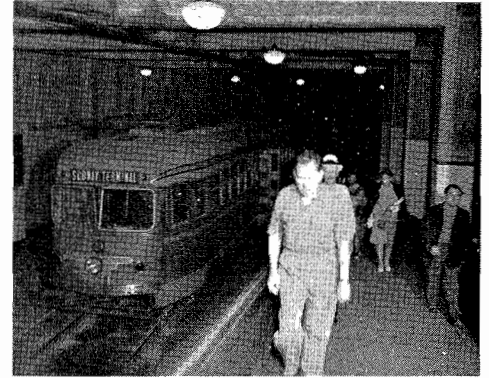
horsecar, then a little wooden city car of the Nineties; a high wooden interurban car, one of the Golden Gates, represented the 1902 intercity concept, and modern equipment was represented by a new 1100 type interurban, a 1600 Class locomotive, and three-car trains of 600s which offered free rides to the west portal to all comers. I remember well that first ride through the blackness of the Hollywood Subway; the little lights in the refuge pockets guided us on into the depths—our headlight seemed remarkably futile; the exciting curve of the lights as we reached the midpoint, and then the completely disappointing sight, far ahead, of the west portal which we had not wished to behold so soon. The train pulled up to Beverly & Glendale Blvds. and then changed ends, giving us a brief glimpse of Toluca yard and substation. Then back into the depths and into the Terminal, this time getting a much better view of the interlocking tower. Then there followed about an hour of exploration, ranging from the cars on display to the depths of the Olive St. undergrade structure, surely as eery as anything imaginable.

The basement trainshed of the Subway Terminal could accommodate thirty cars on its five tracks. Six inclined ramps were provided between the track level and the mezzanine concourse and waiting room; loading and unloading platforms and ramps were provided to eliminate confusion and speed up turnaround time.

The breaking of a bottle of gingerale (prohibition then, remember?) against car 741 and the departure of that car and its two trailers formally opened the Hollywood Subway on November 30, 1925. The next day the subway went into regular service with Glendale-Burbank trains using it. Sunday, February 7, 1926, saw Hollywood and San Fernando Valley cars rerouted into the subway via a new track connection on Park Ave. between Glendale Blvd. and Sunset Blvd. PE's expenditure of more than \$4,000,000 was in the laps of the gods.

OPERATION: The height of the subway's passenger handling occurred in World War II, so let's take a quick look at the way this facility met the severe test:

In early 1944, a total of 884 trains, made up of 1194 cars, entered and left the



● Train platforms were reached and left via gentle ramps; here is Track 5's exit ramp.

Subway Terminal and surface tracks. At the time five rail lines used it; from the subway proper ran the Glendale-Burbank Line, the Santa Monica Blvd.-West Hollywood Line, the Van Nuys Line, and most of the Hollywood Blvd. Line; the Venice Short Line ran out of the surface terminal. From the bus deck over the surface tracks operated the Redondo Beach Line, the Santa Monica via Beverly Hills Line, and the Beverly-Sunset-Castellamare Line. Altogether, these lines carried 65,000 passengers daily into and out of the Subway Terminal. Moreover, a large proportion of the assignments of trainmen and operators for Western District passenger lines, as well as all assignments for box motor and railway post office operations out of the Union Passenger Terminal were made from the Subway Terminal Foreman's office. Other Western District assignments were made at West Hollywood and Ocean Park. Truly, the Subway Terminal was the focal point of all activities on the entire west.

Top man at the Subway Terminal was the Trainmaster for the western District; 1943 saw him supervise the handling of 52% of PE's passengers—61,032,000 of the system total of 116,550,000. The chain of command went down from him through Supervisors, Terminal Foremen and Stationmasters. Some 700 trainmen and operators were supervised from the Subway. At the heart of the whole operation were the three Subway Tower operators; on average days some 754 trains and perhaps 100 empty cars switching in and out from Toluca Yard had to be guided from the two tunnel tracks to the proper one of five terminal tracks. So dense was traffic that it was estimated that a single error on the part of a towerman would so upset schedules that 30 to 60 minutes would be required to rectify the mistake.

Subway Terminal was a station of magnificent distances; from sidewalk to train-side was 596 feet of steady walking; in the reverse direction it was 506 feet. After complaints that this was excessive, PE released a comparative table of distances in some of the nation's large terminals: Grand Central, New York City, 790 feet in, same out; Pennsylvania Station, New York City, 630 feet in either direction; Chicago Union Station, 720 feet either way.

To provide even greater safety in subway operation, PE installed automatic train stops throughout the tunnel in 1927. These were manufactured by the Union Switch & Signal Company and had been in successful use on New York subways and Boston elevateds since 1904. The installation, involving a heavy capital expenditure, was made with the approval of the State Railroad Commission which thoroughly investigated the device. This automatic train stop consisted of an air line valve cock mounted on the leading truck on each side of car; at some block signals was an arm which raised when signal displayed a red aspect; when raised, this arm engaged the valve cock on any truck which passed it, opening the car's air line and applying the brakes. The equipment was applied to each of the 210 cars then using the subway, and to thirteen of the 21 block signals. About the only disadvantage to

this scheme was the bother of applying the valve cocks to additional cars when for any reason they were required to operate in the tunnel (as, for example, the 100s on New Year's Day), although Western District cars on foreign lines were occasionally embarrassed by having their air thrown in emergency by a trackside rock of the right size. Throughout the subway's years of use, there was never a wreck of any consequence, ample proof of the efficacy of the automatic train stops.

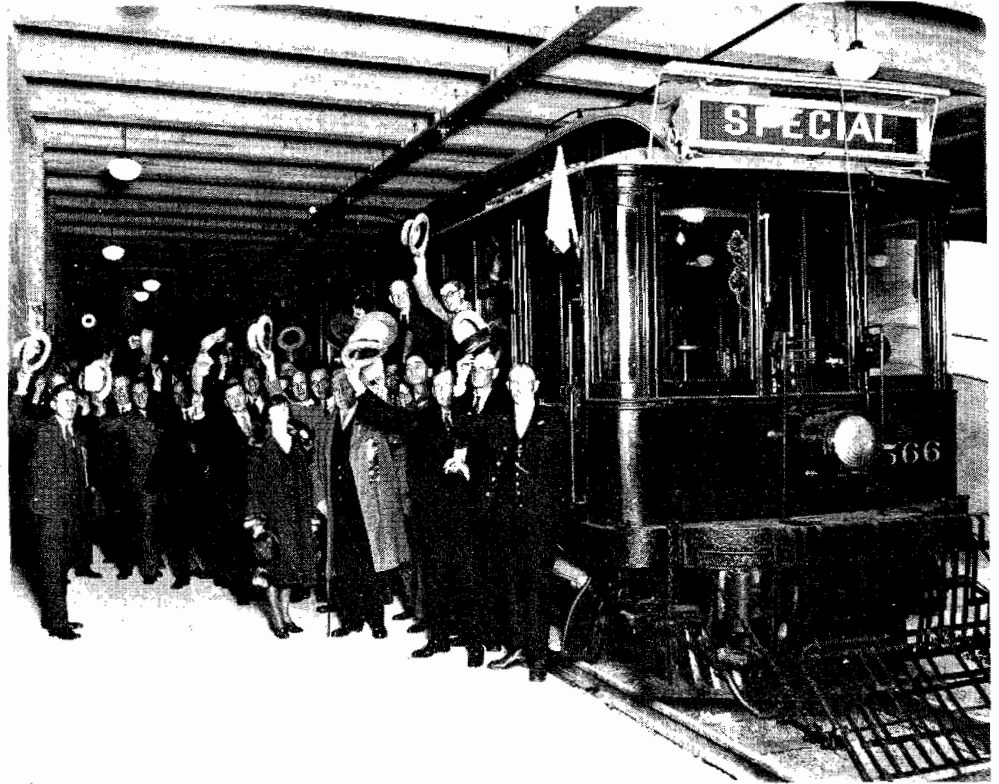
Periodically the city chortled at newspaper accounts of attempts of inebriated automobile drivers to negotiate the mile of tunnel. As the entrance to the subway was in direct line with Glendale Blvd., they could perhaps be pardoned, considering their hazy state of mind. Some autoists even made it into the Subway Terminal, doubtless creating a certain amount of consternation in that sacred-to-rail country. Such intrepid voyagers were carted off to sober up and a PE crane and flat car picked up their car and returned it to good asphalt footing. In due time it became the turn of the sobered autoist to register consternation; this usually took place when he received a bill from PE for services rendered plus repairs for any damage caused.

Biggest cars to use the subway were the 950s, while the almost-as-large 800s saw considerable service up to 1940. 5000s and 600s (5050s) bore the brunt of the service, while the 550s opened the tunnel and ran in it until 1937. 100s saw use on New Year's Day once or twice, and business car 1299 was equipped with a lowered version of PE's pneumatic trolley base to permit it to negotiate the subway on inspection trips. All cars entering the bore had to have double trolleys as restricted clearances in the trainshed made it impossible to swing poles.

Certain special rules were in effect at the Subway Terminal: Illuminated numbers 1, 2, 3, 4, and 5 on west side of tower at throat of tunnel indicated on which track the inbound train was to proceed; upon receiving track indication from tower, motormen signalled conductors by electric bell communicating signal, indicating by number of rings the track to be taken so that conductors could open either right or left center doors to proper exit landing. After the last passenger left car, conductors opened opposite side doors so outbound passengers could enter. Whenever an emergency arose, the tower stopped all trains by one long sound of tower horn; two short sounds of horn was signal to resume normal operation. As an indication to towerman for placing of arriving trains, Glendale trains displayed "Subway Terminal" on head signs, Valley trains displayed "Los Angeles," Hollywood Blvd. cars displayed "Hollywood Blvd.," and Santa Monica Blvd. cars displayed "Santa Monica Blvd." Deadhead equipment inbound displayed head sign indicating line on which it was to go into service. When trains were ready to leave the Terminal, conductors notified the tower by the use of push buttons located on posts alongside tracks.

ABANDONMENT: One by one the rail lines using the Subway Terminal were converted to motor coach operation. PE itself cut down the Valley and Santa Monica Blvd.-West Hollywood Lines. Metropolitan Coach Lines, purchaser of PE passenger service on October 1, 1953, was successful in scuttling the Hollywood Blvd. and Glendale-Burbank Lines. The Venice Short Line, sole user of the surface tracks, gave up the ghost in 1950. The last regular car left the cavernous, brooding subterranean trainshed early Sunday morning, June 19, 1955. With its rear markers went the hopes of Angelenos for a true rapid transit system; with it also went PE's four millions, now represented by a hole in the ground which apparently could be used for nothing.

Such apparently was the feeling of the Subway Terminal Corporation which in February of 1956 sued PE for \$2,500,000; the Subway Terminal Corporation alleged that by routing its passengers away from the building, PE had in effect decreased the value of the structure. Discontinuance of use of the ground floor and of facilities below



First train to carry passengers into the subway was headed by car 566; this Glendale booster group made November 30, 1925, a day to be remembered. (SFN)

ground, the complaint said, violated a 1924 agreement under which the 12 story building was built. Ultimately the federal government became the tenant of the former waiting room and main store complex—first, for the Social Security Administration, and now for the Veterans Administration.

After abandonment, thirteen 5050s were removed from the Subway by truck to Terminal Island for scrapping; the thirty PCCs remained stored in the Subway until September 1959, when they were trucked to the harbor and shipped to Buenos Aires—to the General Urquiza Railway which had purchased them for further transit use.

For several years the unused tunnel stood vacant, save for desultory use of its Beverly Blvd. end for storage of impounded autos and some microfilm storage in the downtown train shed—which was also stocked with a certain amount of foods, first aid material and other requisites for use as a disaster shelter.

The first physical destruction of a part of the abandoned subway occurred in December, 1967, when that portion from Flower St. to just west of Figueroa St. was filled in due, it was claimed, to the fact that it was "unsafe." The City of Los Angeles, to which the subway had been deeded by Southern Pacific, asserted that the unused subway was incompatible with the Bunker Hill redevelopment project because the tunnel lacked reinforcing steel, hence nothing could be built above it. As a matter of fact, the Harbor Freeway, a defense system highway, was constructed directly over the tunnel in 1947, after U.S. Army and state engineers had determined that the subway was so strong that no bridge structures or caissons would be required.

The photo at right, taken while the removal and filling in of this segment of the tunnel was underway, shows clearly that a great deal of steel reinforcing material had in effect been incorporated into the walls of the subway.

The remainder of the tunnel, filled in the middle by the Bunker Hill plugging, is intact, although unused. It remains as a most fitting monument to Los Angeles' unhealthy obsession with the automobile.

