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Official Journal of the Division of Highways,
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State Highway Engineer

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Bayshore Freeway

First Unit Within City of San Francisco Opened to Public Use

“TO YOUR USE and the use of the citizens of this community and its environs and to the use of the visitors and guests here assembled, we dedicate this freeway. May it ever be used with pleasure, profit and safety.”

With these words, Highway Commissioner Chester H. Warlow of Fresno, on Friday morning, June 1st, officially opened to traffic the first unit of the Bayshore Freeway within the City of San Francisco. Warlow rep-



CHESTER H. WARLOW
State Highway Commissioner

resented Director of Public Works C. H. Purcell, Chairman of the California Highway Commission.

With Mayor Elmer E. Robinson and city and county officials of San Francisco, engineers of the Division of Highways and U. S. Bureau of Public Roads and several hundred interested spectators in attendance, dedicatory ceremonies were held at 25th and Vermont Streets. The project itself extends from Augusta Street to 25th Street.

Other Units Scheduled

Warlow was the principal speaker at the celebration which was arranged by the San Francisco Chamber of Com-

merce. President Lowrey of that organization introduced the speakers, among whom were State Highway Engineer George T. McCoy, Guy F. Atkinson, whose company was contractor on the project, as well as Mayor Robinson and Commissioner Warlow. Mayor Robinson cut a red ribbon stretched across the freeway, signaling its opening to public use.

McCoy expressed the hope that construction will start soon on two other units of the freeway, from 18th Street to Bryant Street and from Army to 17th Street. Future plans call for the construction of the freeway from San Francisco to San Jose, a distance of 33 miles.

First Unit in San Francisco

The project opened on June 1st is the first unit of the freeway completed in San Francisco. It is 1.3 miles in length, extends from Augusta Street on the south to 25th Street on the north, and was awarded to Guy F. Atkinson Co. and Chas. L. Harney, Inc., on May 11, 1949.

The construction cost was \$3,450,000 and the cost of right of way, including clearing of improvements and utilities, was \$3,400,000, or a total of \$6,500,000.

The freeway consists of an eight-lane divided roadway, crossing over the city street network at the Army Street and Alemany Boulevard intersections, where street level traffic is distributed to and from the freeway by on and off ramps, and local street traffic is segregated and distributed through traffic circles at the street levels.

The structures over Army Street and Alemany Boulevard are structural steel bridges 643 feet and 758 feet in length.

The freeway crosses over Courtland Avenue on a reinforced concrete bridge 132 feet in length.

A pedestrian underpass crosses under the freeway at Faith Street, connecting Holladay Avenue on the west with Bayshore Boulevard on the east.

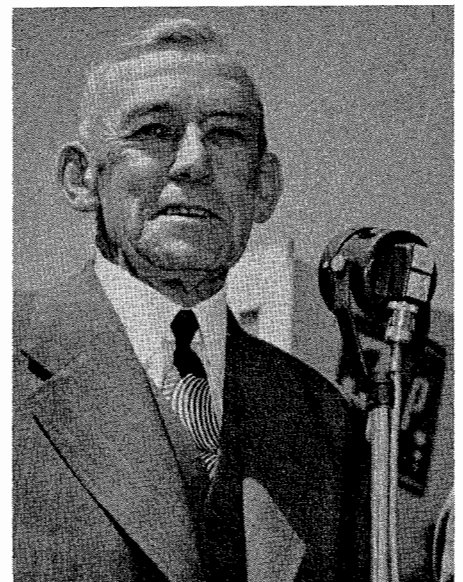
The structural design of the roadway is eight-inch Portland cement concrete

pavement on one foot of imported borrow; the top four inches of which has been cement treated.

The traffic lanes are 12 feet wide, bordered at the shoulder line with rolled gutters and paved shoulders.

A six-foot minimum curbed division strip separates the lanes of opposing traffic.

The ramp connections are paved with plant mix surfacing for color contrast.



COL. JNO. H. SKEGGS
Assistant State Highway Engineer

Illumination is provided at all points of interchange and for lighting directional signs.

Traffic signals are installed at both ends of the freeway to control movement to and from city streets and make connection with old Bayshore Highway.

The construction of this unit consumed approximately two years and was financed from state highway, gas tax and federal aid funds.

In planning this project, which was constructed under the direction of Col. Jno. H. Skeggs, Assistant State Highway Engineer, with headquarters in San Francisco, extensive study was

made relative to the serious traffic problems, the number of going business establishments that would be affected by construction and the surface and underground utility obstructions. The work of removing factories and other buildings began more than two years before the advertisement of the contract and many of the utilities were relocated during this period.

Difficult Traffic System

The traffic situation was made much more difficult by the bridge construction by the City of San Francisco at

the structures were driven to depths up to 100 feet.

Commissioner Warlow Speaks

Highway Commissioner Warlow said in part:

"I stand before you today doubly honored, honored in that I have been invited to address you on this auspicious occasion. Doubly so in that I am asked to speak in the place and stead and on behalf of that distinguished gentleman, Charles H. Purcell, Chairman of the California Highway Commission and Director of Public Works,

→
Aerial photograph of newly completed section of Bayshore Freeway in San Francisco

Unique City

"San Francisco is a unique city, a city of history and hills, of fixed boundaries and big bridges, of beautiful bays and lovely vistas. It is a city where almost every foot of privately owned land is occupied by a business or residence structure; a city whose only lateral expansion, paradoxical as it may seem, will occur in the areas beyond its legal limits. It is a city where



Mayor Elmer E. Robinson snips ribbon, officially opening new unit of Bayshore Freeway. LEFT TO RIGHT: Alan J. Lowrey, President, San Francisco Chamber of Commerce; Mayor Robinson, Highway Commissioner Chester H. Warlow; State Highway Engineer George T. McCoy, Highway Commissioner F. Walter Sandelin.

Islais Creek and Third Street, which closed one of the other main arteries for through traffic between San Francisco and the peninsula area, thereby greatly increasing the amount of traffic which had to be handled through construction.

Alemanly Boulevard is located on an area that at one time was part of the meandering Islais Creek and, as industries became established in this area, more and more of the delta land was filled up with refuse and at a later date a shallow crust of poor fill material was placed. It was necessary to remove large quantities of this unsatisfactory material prior to beginning construction of the various roadways for the planned rotary, and pilings to support

who is unable to be with us today. Mr. Purcell has asked me to convey to you, and all of you, his greetings and best wishes. This I do with great personal pleasure.

"Charlie Purcell would have enjoyed being here today, for no man is more interested in, or concerned with the traffic problems and welfare of this community than he. He would have especially enjoyed this day, for it is the first occasion when this city and its civic organizations have publicly noted the importance of the California Freeway System now under construction, and joined in the festivities celebrating the completion of a major project on that system within its boundaries.

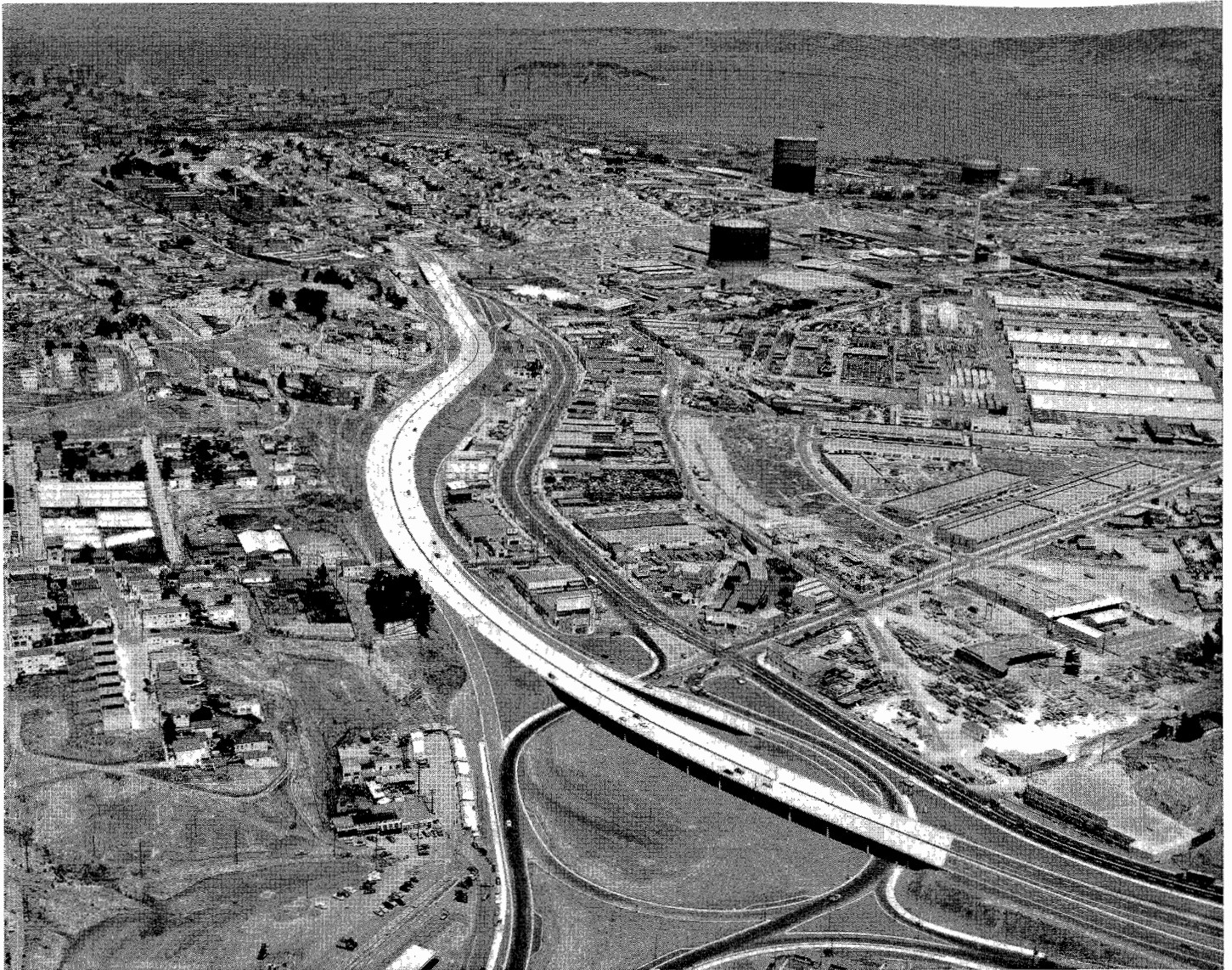
almost one-fifth of its workers leave the place of their labors and daily retire to another community to spend the hours of their refreshment and repose.

"Such a city has traffic problems, and as this city expands, building skyward as it must, those problems will become even more acute than they are now. We therefore must build not only for the present but for the future as well, that major operations, presently necessary, will not of necessity be repeated at an early date.

Colossal Job

"To provide transportation facilities for a major city is a colossal undertaking, and the highway part of that, the portion which falls to our lot, is





This aerial view of Bayshore Freeway is looking toward the San Francisco-Oakland Bay Bridge with which the freeway ultimately will connect

no mean job either physically, as you can see, or financially, as you shall hear.

"This day others will address their attention to the details of the physical and financial aspects of this particular project, whose completion we here note; but I choose to observe, that though it is only 1.3 miles long, yet the right of way, the road bed, the structures and ramps, have cost a total of \$6,500,000. And as we extend this freeway into the heart of the city, there is yet more to come, or should I say, more to go.

"I choose rather to direct your attention to the over-all state-wide picture of the highway problem and San Francisco's position in that picture.

Some Financial Facts

"Prior to 1947 the Department of Public Works was receiving for purchase of rights of way and for highway construction about \$23,000,000 per year. Out of the Legislature during that session, with the aggressive backing of our Governor Earl Warren, came the Collier-Burns Highway Act of 1947. At that time the critical deficiencies on the State Highway System, measured in money, amounted to \$1,700,000,000. During the first five years of operation under this law, there has been spent or allocated for spending this next fiscal year a total in excess of \$460,000,000 for rights of way and new construction. Of this amount, more than \$33,000,000 was assigned to San Francisco, and more than \$111,000,000 was allotted to this highway district which is in charge of Colonel Jno.

H. Skeggs, Assistant State Highway Engineer.

Millions Required

"This freeway, today open for traffic, is not an isolated section of state highway, but is an important project on the Bayshore Freeway leading from San Jose to San Francisco. It is but a part of a well-planned program of progressive construction on this state route, which is one of the major arteries of travel in California.

"Upon this over-all undertaking we have constructed, under construction, or budgeted for immediate construction in the first five-year period, a total of 16.4 miles at a cost of over \$30,000,000. There yet remains an additional 33 miles of freeway

... Continued on page 39

Ground Broken

Construction of Colorado Street Bridge in Pasadena Is Started

By R. C. KENNEDY, Secretary, California Highway Commission

ACTIVE CONSTRUCTION of the Colorado Street Bridge, between Pasadena and the Eagle Rock section of Los Angeles, was officially started at 10.30 a.m. on May 3, 1951.

The contractors, Guy F. Atkinson Company, built a speakers' stand on the site and had one of their largest Diesel shovels parked alongside. Jake Billy, master mechanic for the Atkinson Company, was in charge of the



State Highway Engineer George T. McCoy

shovel and promised to put it practically any place anybody wanted it so that good pictures could be obtained.

Before the actual ceremonies started, pictures of Highway Commissioner Harrison R. Baker, and State Highway Engineer George T. McCoy, were taken, officially starting the first ground-breaking.

Pasadena Radio Station KWKW had a tape recording machine and re-broadcast the ceremonies that afternoon.

John W. Holmes, Chairman of the Community Development Committee of the Pasadena Chamber of Commerce, acted as master of ceremonies and introduced A. J. Hay to start the proceedings. Hay represented the Board of Directors of the Pasadena Chamber of Commerce.

A. Ray Benedict, Mayor of Pasadena, welcomed the people attending the ceremonies and complimented the Highway Commission and the Division of Highways for starting to improve transportation over the Arroyo Seco.

Roger W. Jessup, Chairman of the Los Angeles County Board of Supervisors, had arrived in Los Angeles at 7.30 that morning from Hawaii and came directly to Pasadena to attend the ground-breaking ceremonies. He was the next speaker introduced by Master of Ceremonies Holmes.

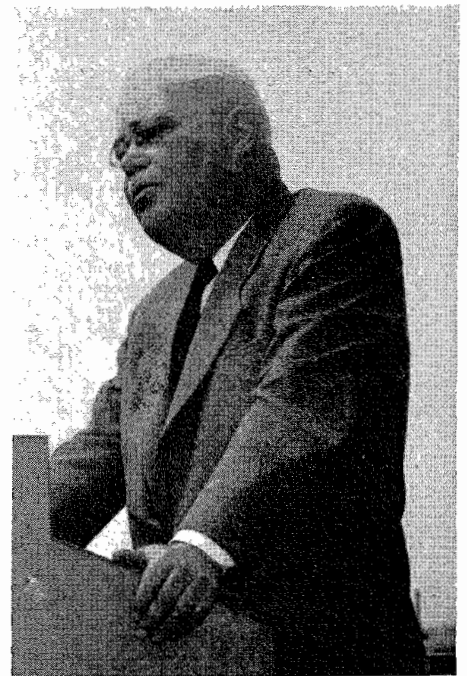
State Highway Engineer McCoy, F. W. Panhorst, Assistant State Highway Engineer in charge of bridges, and P. O. Harding, Assistant State Highway Engineer in charge of District VII, were the next three speakers. Each one, in turn, spoke of and credited several of their assistants for the part everybody had played in the design of this new bridge.

The author was called upon to introduce D. E. Root, Vice President of the Guy F. Atkinson Company, who gave some interesting figures on the amounts of concrete, steel, and wood necessary to build the bridge. Root introduced his chief engineer, his controller, and R. K. Boyd, who is the superintendent of the new job.

Charles T. Leigh and Chester H. Warlow, members of the California Highway Commission, were then introduced and each spoke a few words. Commissioner Baker was the last speaker on the program.

Youthful Contractor

A bit of human interest was injected into the program when it was noticed that a young fellow, just four years old, had decided that he was going to help break ground for the new bridge. His mother had brought him over from Glendale and when he found out they were going to a ground-breaking ceremony, he decided to bring his own



Assistant State Highway Engineer F. W. Panhorst

shovel with him. He was spotted quite a ways from the crowd busily operating his toy shovel and was immediately pounced on by all the photographers present. His shovel was transported to a pile of dirt almost immediately beneath the big shovel and the photographers had a field day shooting pictures of the youngster. After the ceremonies were over, some of the news photographers had Baker pose with the youngster and his miniature shovel.

After the ceremonies were completed, a group of invited guests gathered at the Brookside Golf Club for lunch where a few words were spoken by representative members of civic bodies.

In his address, Commissioner Baker said, in part:

New Era of Progress

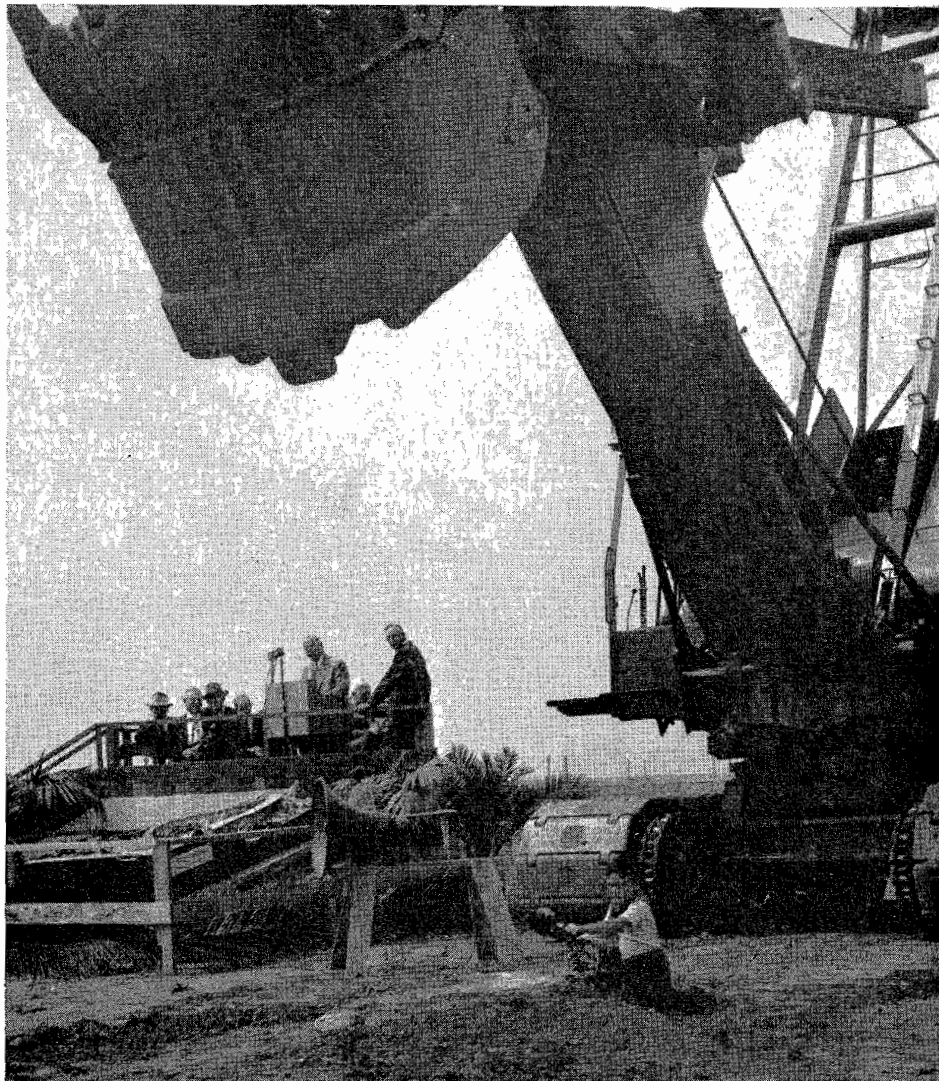
"This great new bridge crossing the Arroyo Seco, replacing or supplementing the beautiful, old Colorado Street Bridge, will be practical in the increased service it will render, massive in its construction and beautiful in appearance—truly a monumental structure.

"But we feel, and hope, that it will be more than this—that it will become also a symbol commemorating the commencement of a new era of progress for Pasadena and this foothill area and be another great milestone in the march toward building the integrated system of metropolitan freeways so badly needed to weld together, and to serve, the communities of Southern California.

"We are standing on historic ground. It was here that Pasadena started. On a sunny day, January 27, 1874, some 77 years ago, on this same bank of the Arroyo Seco, only two blocks to the north of this spot, the members of the 'San Gabriel Orange Grove Association,' also known as The Indiana Colony, met and allocated the lands of the colony in the Rancho San Pascual, each member selecting an individual site, varying from 15 to 80 acres in size. Each site carried with it a 'wood lot' in the Arroyo Seco Canyon of from three to seven acres. It may be of interest that the association had just purchased its 4,000 acres of the Rancho San Pascual in December from Dr. John S. Griffin in 1873, for a total price of \$25,000 and the choice sites were allocated among the members at a price of \$30 per acre. The "wood lots" were sold at prices from \$20 to \$50 each.

Pasadena Founded

"There were only 17 members of the association present, representing 28 original purchasers, on that memorable day in January, 1874. There were not



UPPER—Budding young contractor, four-year old Scott Whitaker of Glendale, brought his own shovel to the ground-breaking ceremony. LOWER—State Highway Commissioner Harrison R. Baker congratulates Scott on his efforts.

many, but they were men of courage and vision. And that day they founded Pasadena.

"Today we are taking another step forward.

"This new bridge crossing the Arroyo Seco will be a great structure and a useful one. The need for a new bridge has long been apparent, in order to solve the congestion on the present Colorado Street Bridge and to provide a safe, convenient and attractive freeway approach to Pasadena from the west.

"It will be an imposing structure; the largest bridge ever constructed by the Division of Highways in the State of California, and the largest nontoll structure ever built in the State. The contract for the bridge, which has been awarded to Guy F. Atkinson Company at a cost of \$3,389,650, is the largest single contract ever awarded by the Division of Highways. Other freeway

... Continued on page 44

Venture Success

Safeway Stores Finds That Freeway Benefits Its New Vallejo Business

By WAYNE HUBBARD, District Right of Way Agent

THE OLD BROMIDE about customers beating a path to your door if you build a better mousetrap seems an apt expression to use in connection with the subject of freeways. The subject—which has tended to flame many controversies over the effects of freeways upon businesses located on adjacent secondary highways—unquestionably is an important one.

Evidence thus far recorded supports the contention that people will seek out a business if the effort is worthwhile—that is, if the place has what the customer desires.

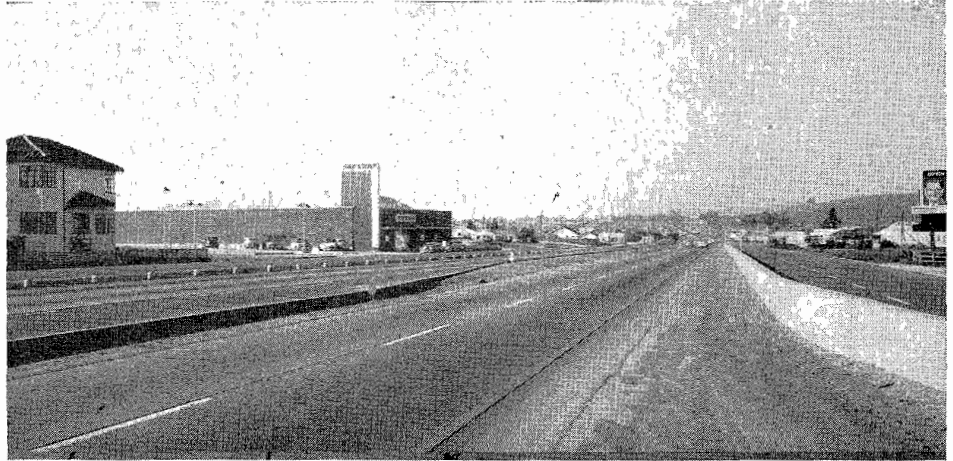
The question that has led to controversy generally is summed up thus: "What happens when traffic—as on a freeway—must travel quite a distance beyond a business location before being able to turn off the road?"

The answer, obviously, is difficult unless one pins the question down to specific cases. In other words, a great deal depends on the nature of the business involved, the attractiveness of the site, how many other business enterprises are centered there, and so forth.

Vallejo Example

A recent addition to the mounting score of examples is a new retail food store constructed in Vallejo by Safeway Stores, Incorporated. The store is located on Highway No. 40, a freeway along the eastern section of Vallejo. Actually, though facing the main highway, the store fronts on Curry Street, a secondary road paralleling the freeway. Another factor adding to the interest of this venture: the site chosen by Safeway is not contiguous to any centralized business area. However, while standing virtually alone, the store does have an apparent advantage of being on the west side of the freeway where the bulk of Vallejo's population is gathered.

Safeway operates over 2,000 retail food stores in 23 of the states, coast to



Looking north on US 40, showing new Safeway Store located off freeway on Perry Street in Vallejo. Note absence of other business enterprises, thus making the Safeway entry an interesting experiment as to the effect, if any, of freeways upon retail food store patronage.

coast, and in five Canadian provinces, and is at present engaged in a multi-million dollar store construction program. Each of the new food stores, with ultra modern equipment and facilities, represents an investment of approximately \$250,000. While exterior

designs of the new stores may vary (in some cases to blend with distinctive architectural styles of a community), and differ in size, the Vallejo store is somewhat typical of the modern Safeway units being constructed.

... Continued on page 43

Aerial view of Safeway Store in Vallejo. Store is located near center of photo. Note cars parked in area which provides parking facilities for 138 cars.



Thomas E. Stanton

*Retires With International
Renown After 39 Years*

By F. N. HVEEM, Materials and Research Engineer

ON MAY 31, 1951, Thomas E. Stanton, Materials and Research Engineer of the Division of Highways, reached the age of 70 and therefore automatically became an heir to the benefits and privileges of the State Retirement System for the creation of which

served successively as Assistant Division Engineer, then as Assistant State Highway Engineer, and finally, Materials and Research Engineer from 1928 until his retirement at the end of May, 1951.

Pioneer Family

Tom Stanton was the first native son of a pioneer family and the third by the name of Thomas Elwood Stanton. His grandfather, Thomas Elwood Stanton, the first of the name, had crossed the plains to California during the gold rush in 1849. Having left a wife and eight children at home, he soon became homesick and returned to Indiana, where he spent the next eight years trying to persuade the entire family to move to California, which was finally accomplished in 1859, after a sojourn in the northeastern part of Iowa where Thomas Elwood Stanton the second was born, near Frankville on April 2, 1854. After the usual hardships attendant upon the long trip across the plains by wagon train, the family finally settled in Santa Barbara, in the area now known as Miramar.

Thomas Stanton the second moved to Los Angeles where he became one of the leading photographers of the era, having studios in the Temple and Downey Blocks at Main and Temple Streets. It was there that Thomas Elwood the third was born on Temple Street between Spring and Broadway, on May 31, 1881, the centennial year of the city. Tom grew up in Los Angeles, attended grammar schools and later graduated from St. Vincent's College in 1889 with the degree of A.B. He then attended the University of California at Berkeley entering in 1889 with the class of 1903. Because it was necessary to work during a portion of his college years, he did not graduate until 1904, receiving a B.S. degree in mining.

Joins Division of Highways

Having no immediate opportunity to follow mining as a profession and hav-

ing passed a civil service examination as instrument man in the City Engineer's Office in Los Angeles, he went to work for the city in 1905. After seven years with the Los Angeles City Engineer's Office, during which he served successively as instrument man,



THOMAS E. STANTON—1951

he himself was largely responsible. Mr. Stanton was in state service for more than 39 years, his name first appearing on the pay roll of the California Highway Commission on April 1, 1912, at which date he was appointed Assistant Division Engineer, Division VI, with headquarters in Fresno.

In 1912 the California Highway Department was in its infancy and the initial work was being planned and organized. Prior to that time Stanton had served as Assistant Engineer in the City Engineer's Office in Los Angeles for a period of seven years, and after entering the employ of the State he

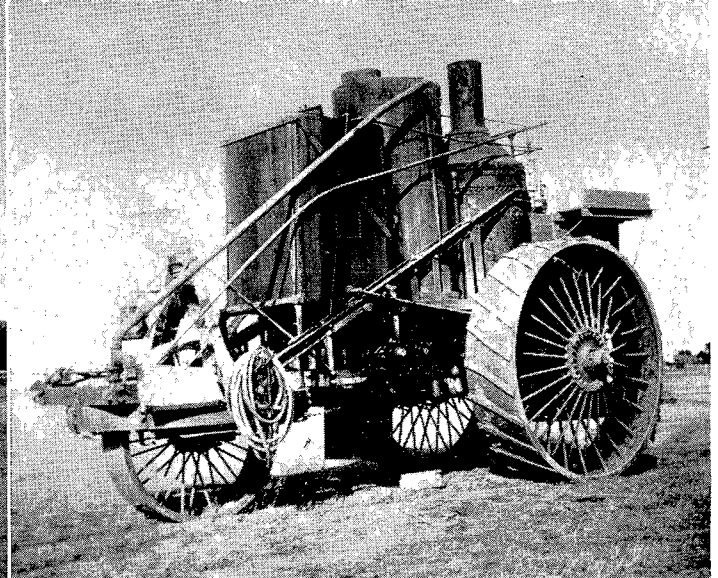
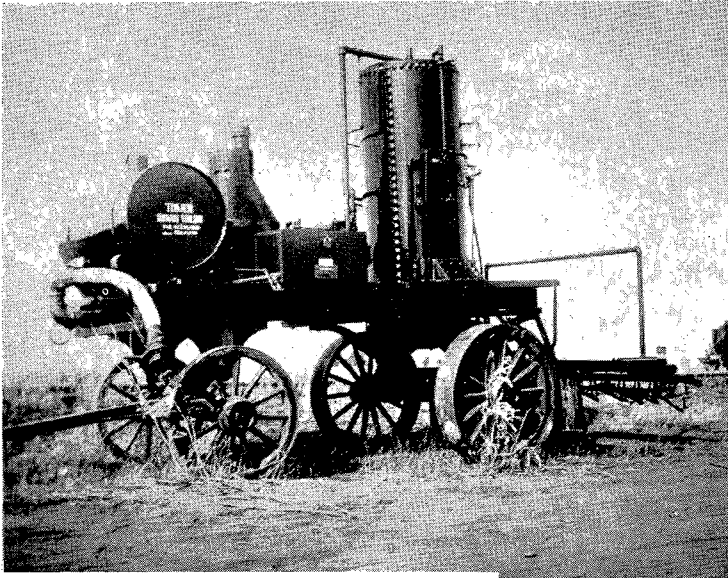


THOMAS E. STANTON—1912

chief of party and as assistant engineer in charge of sewer and paving design and construction, he was lured away by the rosy prospects offered by J. B. Woodson, the new Division Engineer of the California Division of Highways, who offered him an increase of \$5 per month if he would accept the position of Principal Assistant Division Engineer with headquarters in Fresno. Thus, the first pay roll shows that he received a salary of \$150 per month in April of 1912.

Earns Promotion

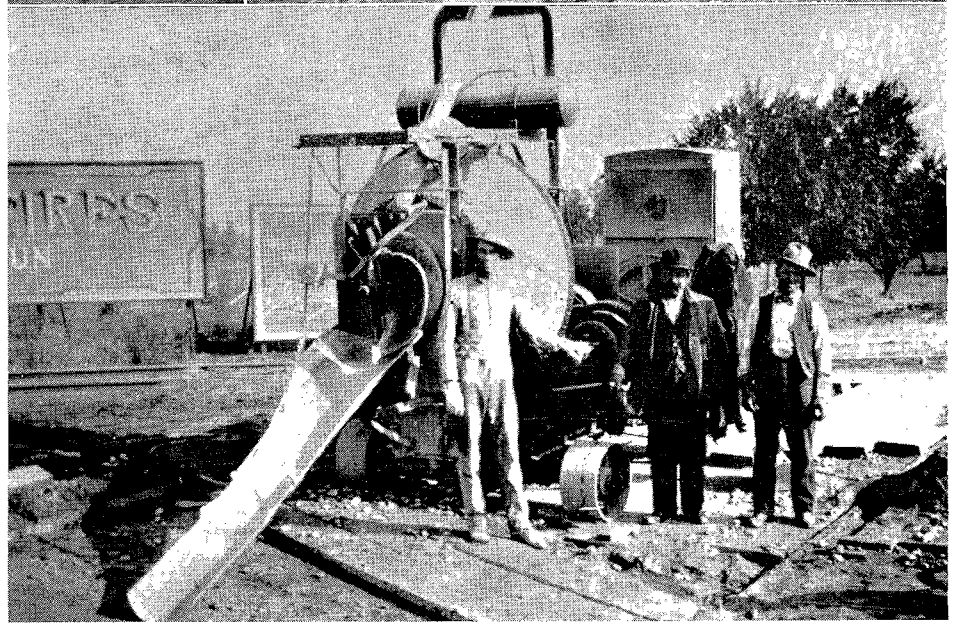
Tom once stated that during the time when he was Assistant Division



Engineer in Fresno he made it a point to be as well informed on the details of headquarters operations as anyone actually in the department at Sacramento. It may be suspected that this fact was responsible for his appointment in 1914 to the position of Principal Assistant Division Engineer in Sacramento. In 1920 he was made Assistant Highway Engineer in charge of general inspection throughout the southerly portion of the State. In 1921, when the Department of Public Works was formed, Mr. Stanton was appointed Assistant State Highway Engineer, in which capacity he served under State Highway Engineers Austin B. Fletcher, Robert M. Morton and Charles H. Purcell until his appointment as Materials and Research Engineer in 1928, which position he occupied for the succeeding 23 years until his retirement on May 31, 1951.

In the earlier years of the Division of Highways, a great many interesting and often colorful experiences were the lot of the pioneering engineers. Ruts and chuckholes were synonymous with roads in those days, and pavements were virtually unheard of outside the limits of incorporated cities. The sums of money available for highway construction and improvement were small indeed compared to modern standards, and everyone in the organization was very close to the problem which often meant being intimately mixed with the mud and dust of the rural roads.

and Public Works



UPPER LEFT—Tomer road oiler used on US 99 in Madera on one of Stanton's early jobs in 1912. UPPER RIGHT—Traction engine used on US 99 in Madera in 1912. LOWER—Foote one-sack paving mixer used on US 99 in Fresno, 1912, and superseded later by two-sack mixer, which was considered the ultimate in mixer size.

Times Do Change

The records show that a seminar of department heads was held in Sacramento May 26th and 27th in 1914, and among the various papers presented was one on accounting by Mr. J. H. Small, Chief Accountant. Mr. Stanton was selected to discuss the paper, and his comments on the organization of the District office work carry the following rather illuminating paragraph: "A variety of such forms makes it possible for one employee who is both clerk and stenographer to handle *all of*

the clerical work of the division of office." Times have indeed changed.

The pioneering urge was obviously strong in the Stanton family, and it appears that Tom inherited a full measure of the energy and initiative that led his namesake to move to California in the days of '49. Thomas Elwood the third has continued to pioneer, and the catalog of his activities represents an extensive and impressive list. It is indeed difficult to sum up in any brief or simple phraseology the impressions and far reaching effects produced throughout the lifetime of an energetic and

**RESOLUTION
OF APPRECIATION**

WHEREAS, On January 15, 1950, Thomas Elwood Stanton completed over 18 years of service as a member and from 1934 to 1950 as President of the Board of Administration, California State Employees' Retirement System; and

WHEREAS, The State Employees' Retirement System started in January, 1932, with approximately 14,000 members and has since grown to include approximately 100,000 members, and

WHEREAS, The System has now invested in excess of 160 millions of dollars, without the loss of one penny in interest or principal during all of the time, due to the good judgment of the members of the Board of Administration; and

WHEREAS, This service of Mr. Stanton as member and president of the board has been given without thought of financial return to himself; and

WHEREAS, The Retirement System, under the leadership of Mr. Stanton and his associates on the Board of Administration has been beneficial to thousands of state employees; therefore, be it

Resolved, That the General Council of the California State Employees' Association, assembled in Long Beach, California, February 11, 1950, hails Thomas Elwood Stanton as a true friend and leader, in whose debt they shall always be for his service in behalf of the Retirement System.

1949 OFFICERS 1950 OFFICERS

President

W. Rex Servoss Stanley B. Fowler

Past President

F. M. Carter W. Rex Servoss

Vice President

Stanley B. Fowler Thomas A. Stead

Secretary-Treasurer

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Director of Law and Legislation

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A. W. Hislop T. W. Martin

Director of Public Relations

Dale B. Frady Dale B. Frady

capable man devoted to his work and to the public interest.

In addition to other honors for notable contributions he was awarded the Wason Medal in 1934 and the Norman Medal in 1943, both for outstanding work on Portland cement concrete.

Gained Wide Renown

While many research projects have been conducted in the Materials and Research Department which have attracted attention in engineering organizations through the United States and in foreign countries around the world, he is probably best known for work on the durability of Portland cement concrete, and among the various aspects of the durability problem. Mr. Stanton was the first to discover that one of the most marked forms of deterioration in Portland cement concrete was attributable to an internal reaction between constituents in the cement and in the aggregate. In other words, certain brands of Portland cement may contain small percentages of alkalis which cause no trouble unless the sand used contains certain minerals such as opal or similar forms of silica which will react with the alkalis in the cement.

In addition to professional activities, much of which were devoted to the committees having to do with retirement benefits, membership qualifications and professional conduct, Tom was also a member of the Committee on Salaries for the American Society of Civil Engineers, and his interest in the welfare of civil engineers and public employees in general is illustrated by his activities in community affairs such as the Red Cross, Community Chest, Boy Scouts, etc., and most noteworthy of all, of course, are his outstanding efforts and achievements in organizing the State Employees' Association and supervising the development and form of the Employees' Retirement System through its early days, until it became firmly fixed in the State law of California in a manner that renders it free from political manipulation or unfavorable influence.

Those who have had occasion to observe Tom in action during employee meetings or those of other groups have

**RESOLUTION IN HONOR OF
THOMAS ELWOOD STANTON**

WHEREAS, The approaching retirement of Thomas Elwood Stanton has come to the notice of Chapter 2 of the California State Employees' Association; and

WHEREAS, Mr. Stanton is a charter member of this chapter and is one of those engaged in the preliminary steps leading to the organization of the California State Employees' Association, and of Chapter 2 of the association; and

WHEREAS, Mr. Stanton has served the employees of the State in many important capacities, including chairman of the Campaign Committee for a State Retirement System; first president of the California State Employees' Association; chairman of the Civil Service Constitutional Committee; member and president of the Board of Administration, State Employees' Retirement System; Delegate to every meeting of the General Council of the California State Employees' Association; and

WHEREAS, Mr. Stanton in his profession as an engineer has held high and important stations in the Division of Highways of this State; and

WHEREAS, Mr. Stanton has received national and international recognition for his work as an engineer, as shown by his holding national office in engineering organizations and by the publication of articles on engineering practices which have been recognized by merit awards from national engineering societies; therefore, be it

Resolved, That Thomas E. Stanton be congratulated for his achievements, for his contributions, and leadership, and that he be informed by the passage of this resolution of the esteem and good will in which he is held by the members of this association; and be it further

Resolved, That a copy of this resolution be presented to Mr. Stanton at the public meeting to be held in his honor in the City of Sacramento, California, May 25, 1951.

SACRAMENTO CHAPTER NO. 2
CALIFORNIA STATE EMPLOYEES
ASSOCIATION

By HERBERT G. GASKILL,
President, 1951

... Continued on page 52

F. N. HVEEM

F. N. HVEEM, the new Materials and Research Engineer, has succeeded to the position after serving more than 20 years in the Materials and Research Department in various capacities which under present civil service terminology would range from Assistant Highway Engineer to Principal Engineer. Hveem is a home-grown product in every sense of the word, having been born in Shasta County, California, February 8, 1898. He claims vivid recollections of an early childhood spent in mining camps and of dwelling in log cabins.



F. N. HVEEM

He entered the employ of the State of California in November, 1917, at the age of 19 as a draftsman in the office of Division II, then located in Duns-muir. The first state highway construction through the Sacramento Canyon was under way at that time, and Hveem was induced to take the job through the advice and assistance of Spencer Lowden, then Resident Engineer. After 13 years of miscellaneous experience which included Assistant Resident Engineer, then Resident Engineer, and Maintenance Superintendent, Hveem joined the staff of the

CAREER OF THOMAS E. STANTON

Born: May 31, 1881, Los Angeles, California.

Engineering Education: University of California, B.S. 1904.

Professional Record:

Assistant Engineer, City Engineers' Office, Los Angeles, April, 1905 to April, 1912. With the California Division of Highways April, 1912, to date serving successively as Assistant Division Engineer; Assistant Highway Engineer and Materials and Research Engineer. In charge of the Materials and Research Department since 1928.

Professional Society Record:

Member:

1. *American Society of Civil Engineers*

(Assoc. M. '19; M. '20; Director '37-'39; Vice President '42-'43; Norman Medal '43). President Sacramento Section 1930. Chairman Society Meeting held in Sacramento 1930. Before and while on the Society Board of Direction, Member of Committees on (1) Aims and Activities (Forerunner Committee on Professional Objectives); (2) Retirement; (3) Membership Qualifications; (4) Professional Conduct; (5) Local Sections; (6) Professional Activities; (7) Honorary Membership; (8) Committee on Salaries (Chairman 1943).

2. *American Association of State Highway Officials*

1945-6-7 Chairman of Committee on Highway Research Activities and Member of Committees on Standards and Materials.

3. *American Society for Testing Materials*

Member numerous committees, including C-1, C-9 and D-4.

4. *Highway Research Board*

5. *American Concrete Institute*

Member Board of Direction 1943-4. Watson Medal for noteworthy Research 1934.

Materials and Research Department in December, 1929. Since that time he progressed through the various civil service grades with positions of increasing responsibility to Supervising Materials and Research Engineer and principal assistant to Mr. Stanton.

Hveem was chiefly identified with the work on bituminous materials and pavement practices, expanding his activities into the realms of soil mechanics, soil materials and to concrete pavements. He is the author of over 20 papers on technical subjects, receiving

6. *Association of Asphalt Paving Technologists*

President 1942.

7. *American Road Builders Association*

Vice President Western District 1948-49-50.

8. *Member U. S. National Committee on Soil Mechanics*

Second International Conference on Soil Mechanics and Foundation Engineering -1948.

9. *Member Engineering Advisory Council of the University of California*

10. *Registered Civil Engineer, California*

Publications:

Author numerous technical papers and discussions contributed to and published by the A.S.C.E., A.A.S.H.O., A.S.T.M., H.R.B., A.C.I., A.A.P.T., and A.R.B.A., as well as by Technical Journals.

Non-Professional Activities

(1) Member at different times of the following Boards of Direction:

- (a) Sacramento Red Cross; (b) Sacramento Community Chest; (c) Sacramento Council of Boy Scouts; (d) Sacramento War Disaster Committee; (e) Board of Administration, State Employees Retirement System; 1931-1950 (President 1934-1950).
- (2) Member, Board of Direction, Sacramento Town Hall (President 1947).
- (3) Member Rotary, Serra and Sutter Clubs, Sacramento.
- (4) Charter Member, University Club of Sacramento.
- (5) Charter Member (1931) and First President of California State Employees' Association.
- (6) Member Sacramento Memorial Bridge Committee 1927-31.
- (7) President Knights of Columbus Hall Association, Sacramento.

the Highway Research Board award for the outstanding paper in 1948. He has been responsible for the development of a number of devices for testing materials, the best known of which is the Hveem Stabilometer which has been adopted for use in many states and foreign countries.

Hveem was appointed Construction Engineer in September, 1950, and leaves that position to take up the duties of Materials and Research Engineer, succeeding Mr. Stanton on June 1, 1951.

DON G. EVANS

DON G. EVANS has been appointed to the position of Construction Engineer effective June 1, 1951, to succeed F. N. Hveem. Mr. Evans brings to this position a long and varied experience in many fields of engineering, much of which has involved field work either on surveys and location or in construction activities.

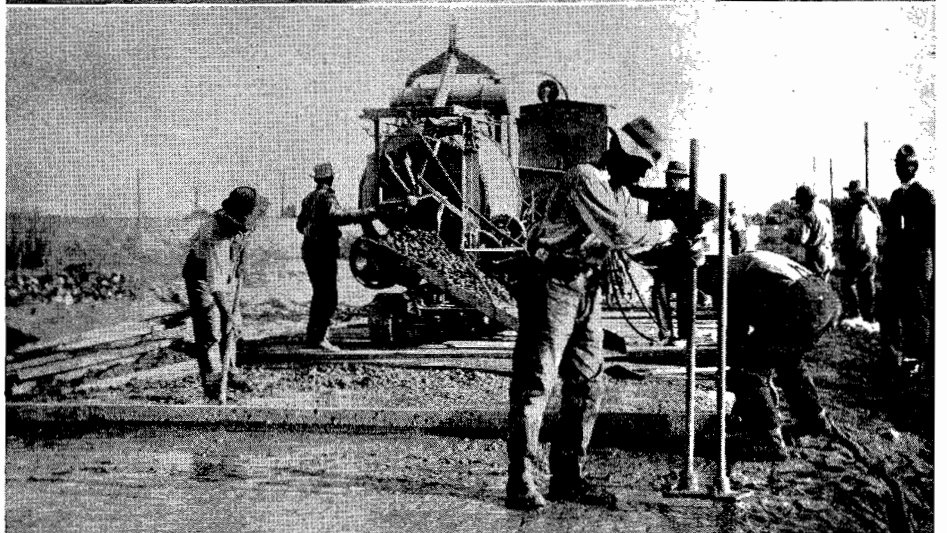
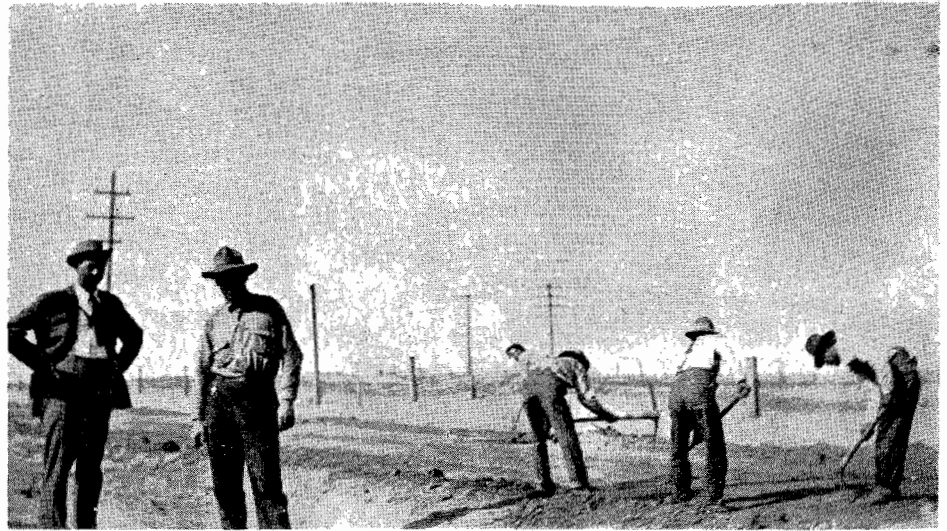
Evans was born January 28, 1890, in Terre Haute, Indiana, and in 1911 graduated from Rose Polytechnic School in that city, receiving a B.S. degree in civil engineering. In 1912 he attended the Colorado School of Mines taking post graduate work in geology and mining. In the years following he was successively mining engineer in Central America and in Colorado and Arizona. From 1920 to 1927 he was with the U. S. Bureau of Public Roads on Forest and National Park roads in Arizona and New Mexico. After a year as superintendent for the J. C. Hirsch Company in Los Angeles, Mr. Evans entered the employ of the State as Locating Engineer in District VII, transferring to District VI in 1931. The next 10 years he was located principally in the Bakersfield area, handling all phases of work ranging from location to construction.

From 1942 to 1945 he was with the Corps of Engineers, U. S. Army, and was released from active duty with the rating of lieutenant-colonel on December 31, 1945.

In 1946 he became Construction Engineer for District VI, and from 1948 to the end of June, 1951, has served as Assistant District Engineer in charge of operations which has included general supervision over both construction and maintenance. He brings to the position of Construction Engineer many years of close and first-hand experience with all types of highway construction.

GOOD HAND SIGNALS

Letting other drivers know what you want to do allows them an opportunity to give you the space you will need to make your turn or pull over



TOP—Tom Stanton (left) and Resident Engineer E. G. Sinclair inspect project on US 99 in Madera in 1912 during pick and shovel days of highway construction. CENTER—Winter hauling difficulties on same project. BOTTOM—Tamping concrete by hand in Fresno in 1912. The pavement on this project had an excellent service record even though only four inches thick.

to stop. Failure to signal your intentions makes it harder for other motor-

ists to cooperate in preventing an accident.

Moving Forward

Los Angeles River Freeway Plans For Future Are Comprehensive

By M. E. CESSNA, District Engineer

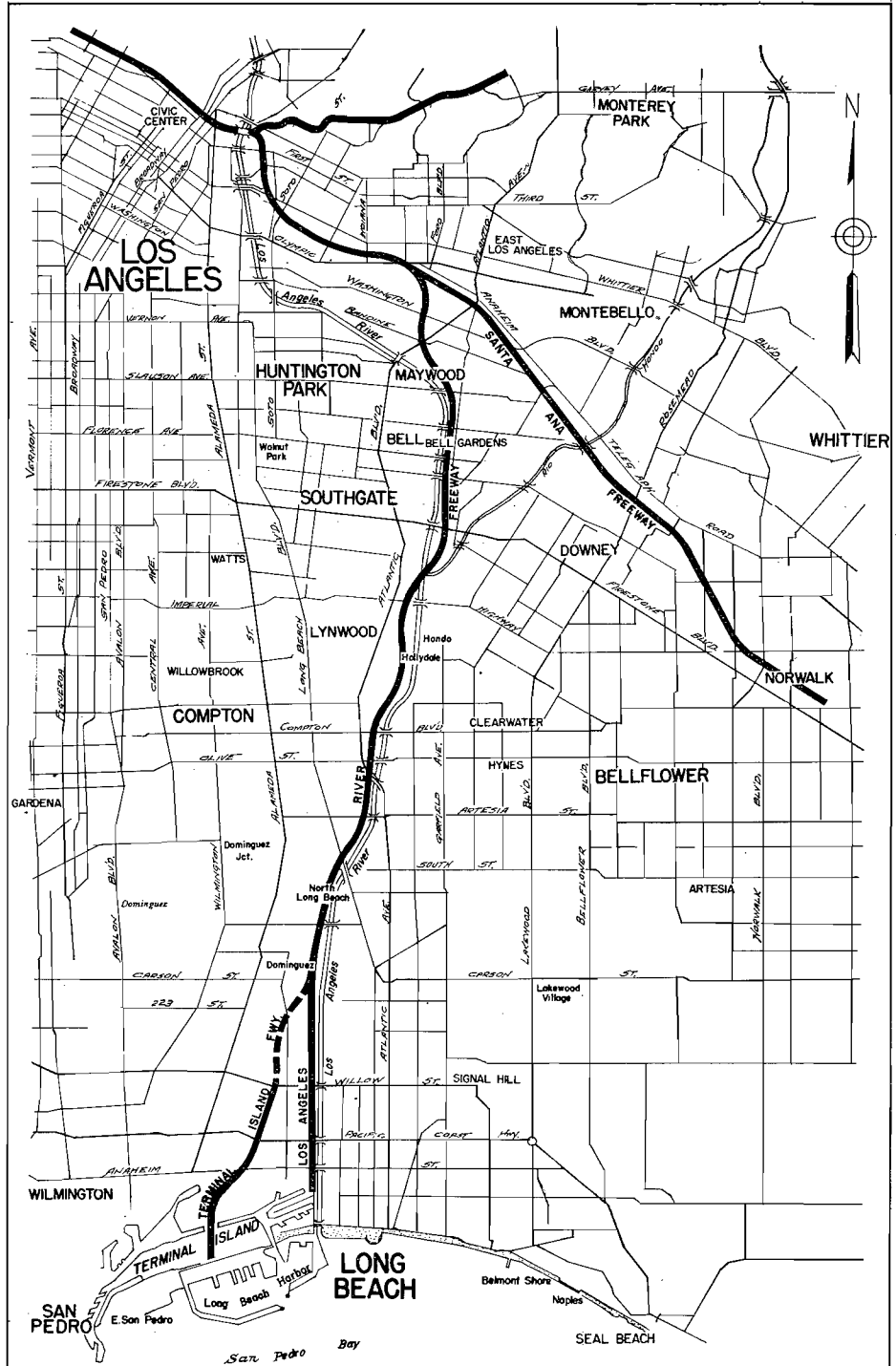
THE LOS ANGELES RIVER FREEWAY,* 16.2 miles in length between Pacific Coast Highway (Route 60) and the Santa Ana Freeway (Route 166), had its inception about 14 years ago when it was proposed by the Long Beach City Engineering Department as a limited access highway to be built along the westerly side of the Los Angeles flood control channel to carry through traffic between the City of Long Beach and Los Angeles and other northerly points.

At that time this proposed limited access road was not on the State Highway System, but the importance of the project was recognized by Long Beach, Los Angeles County and the State Division of Highways, and the proposed freeway was approved for inclusion in the Long Beach major city street system. During the 1939-40 Fiscal Year the city budgeted \$25,000 of major city street funds for the protection and acquisition of rights of way for this project and during subsequent years programmed from state gas tax funds, for expenditure on major city streets, a total of \$160,000. In the 12-year interval that has elapsed since the first allocation of funds, a very considerable amount of valuable right of way has been obtained and many large industrial and housing projects that might have later proved obstacles to the development of this freeway have been forestalled.

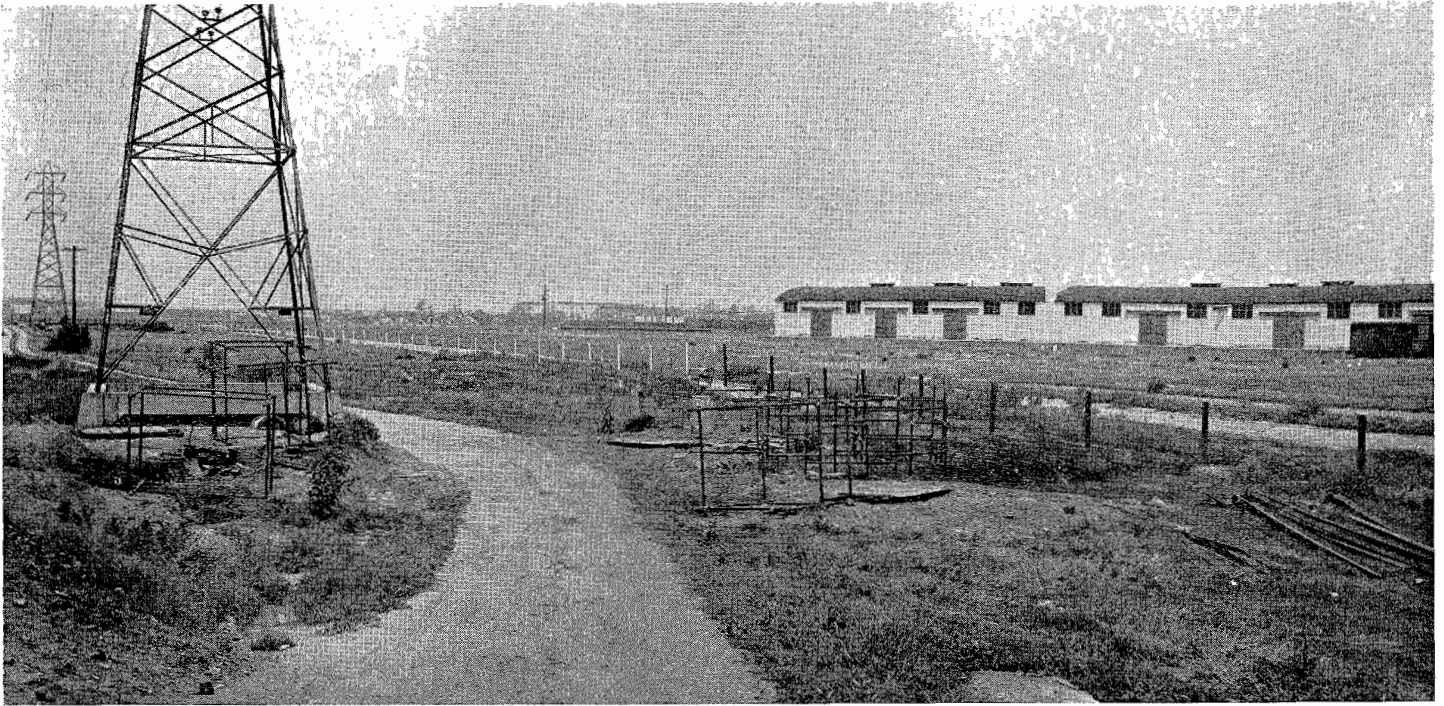
Advance Planning

It is because of the foresight on the part of public-spirited citizens and officials of the City of Long Beach,

* A resolution was recently adopted by the Los Angeles County Board of Supervisors officially changing the name of the "Los Angeles River Freeway" to "Long Beach Freeway." Since many published maps available to the public over a period of many years have indicated the freeway located along the river as the "Los Angeles River Freeway," whereas the "Long Beach Freeway" has been the designation used for another freeway in this locality not on the State Highway System, it is quite likely that the freeway along the river that carries State Highway Route 167 will for some time to come of necessity be known as the "Los Angeles River Freeway."



Vicinity map, showing the Los Angeles River Freeway and its connections with the Terminal Island Freeway and the Santa Ana Freeway



Looking northerly along freeway location, showing buildings of the U. S. Army 822 Air Force Specialized Depot. The freeway passes between the electric power transmission line and the buildings.

working in cooperation with the Division of Highways, that so much of the advance planning and right of way acquisition for the Los Angeles River Freeway in Long Beach has been accomplished.

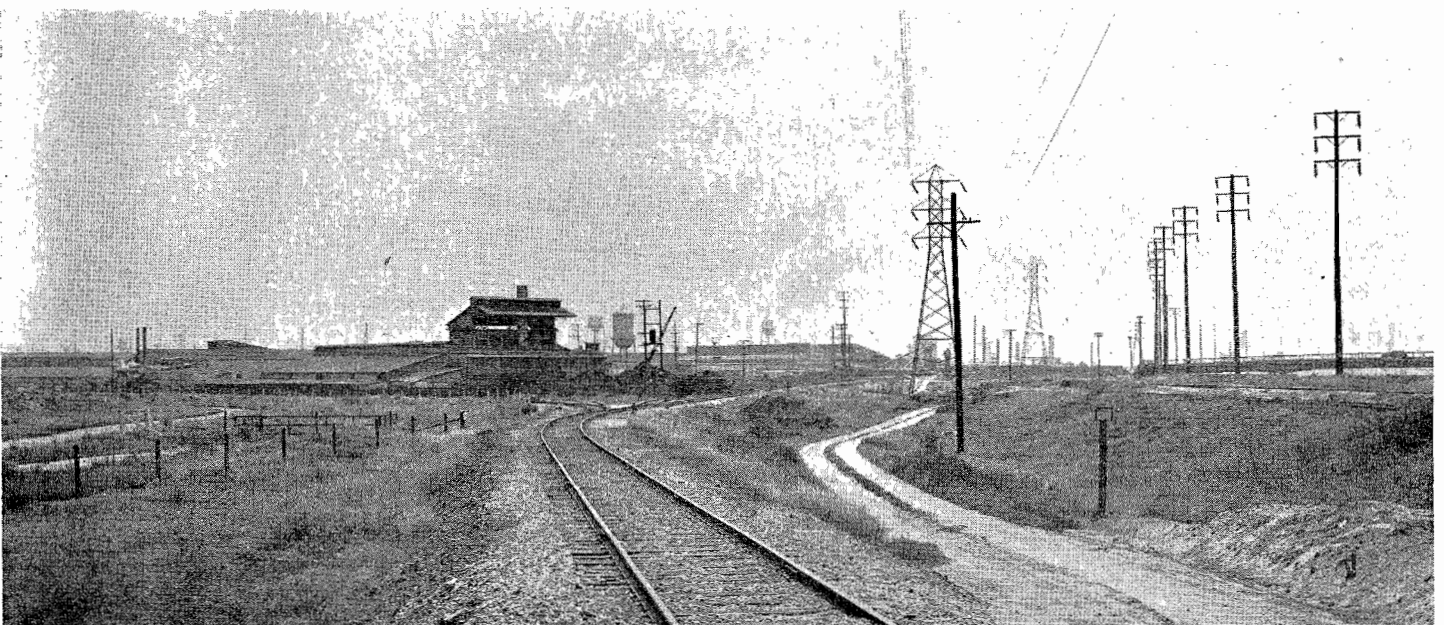
The accomplishment of Long Beach in providing for the Los Angeles River Freeway, before it was taken into the State Highway System, was not con-

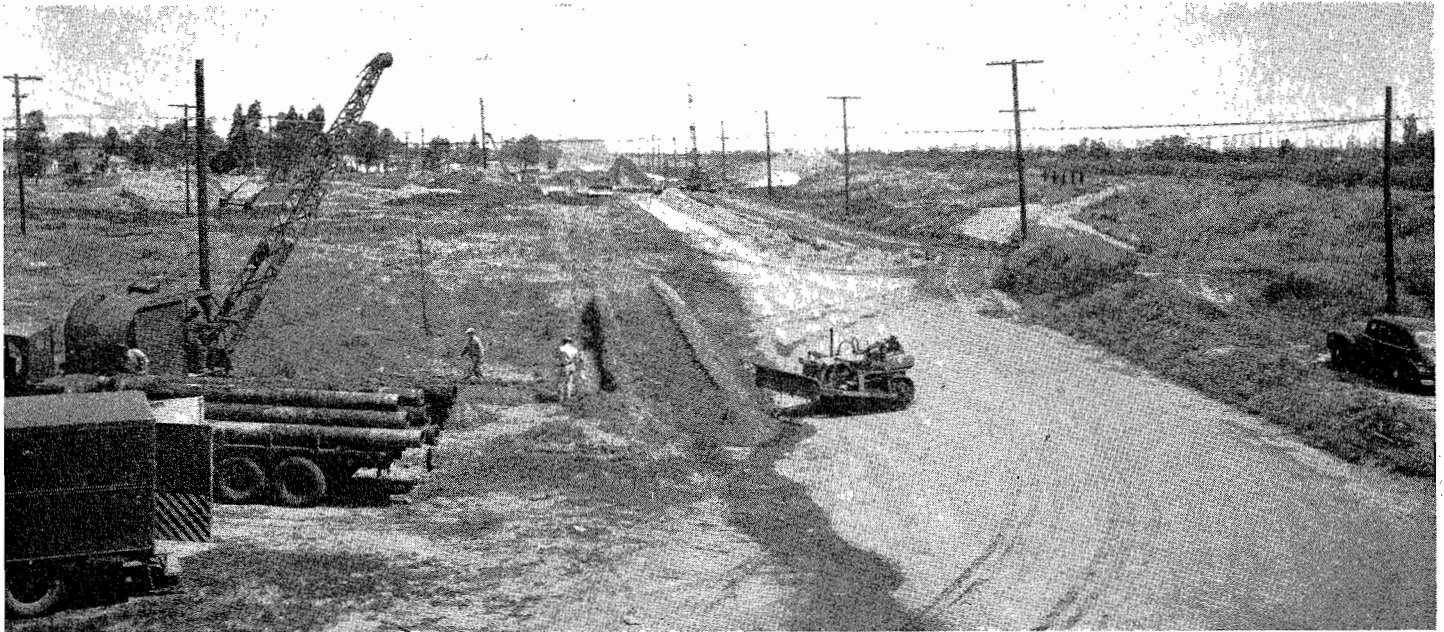
finned entirely to right of way acquisition. Long Beach provided for the construction of spans for the Los Angeles River Freeway at the time the bridge was built over the Los Angeles River for Willow Street. The County of Los Angeles made a similar provision in its bridge plan for the Belhart Street project.

Belhart Street Bridge

Belhart Street is a very important east-west thoroughfare and is a major highway on the Los Angeles County system. This county bridge project with road approaches cost in excess of \$2,000,000 and was completed and opened to traffic on April 28, 1951. The length of separate bridge structure to provide separation openings for the

Looking southerly along Los Angeles River Freeway location north of Slauson Avenue, showing plant of the American Brake Shoe Company, which will be interfered with by freeway construction





Looking northerly along freeway from Pacific Coast Highway, showing storm drain construction by City of Long Beach to clear way for freeway

Los Angeles River Freeway was 224 feet.

Southerly Extension of Freeway

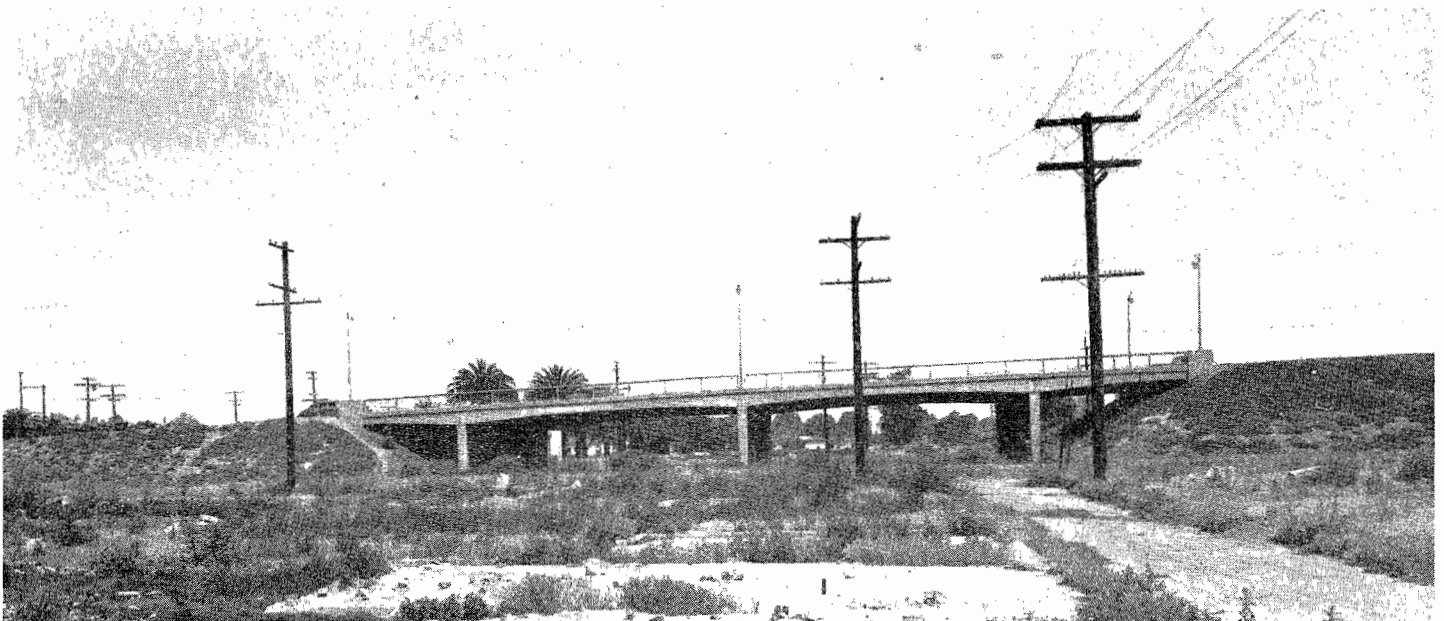
From Pacific Coast Highway southerly into the Long Beach Harbor area, the Los Angeles River Freeway is not on the State Highway System; however, the City of Long Beach is proceeding with construction financed with city funds. At the present time Long Beach has a contract under way for a bridge over the Los Angeles

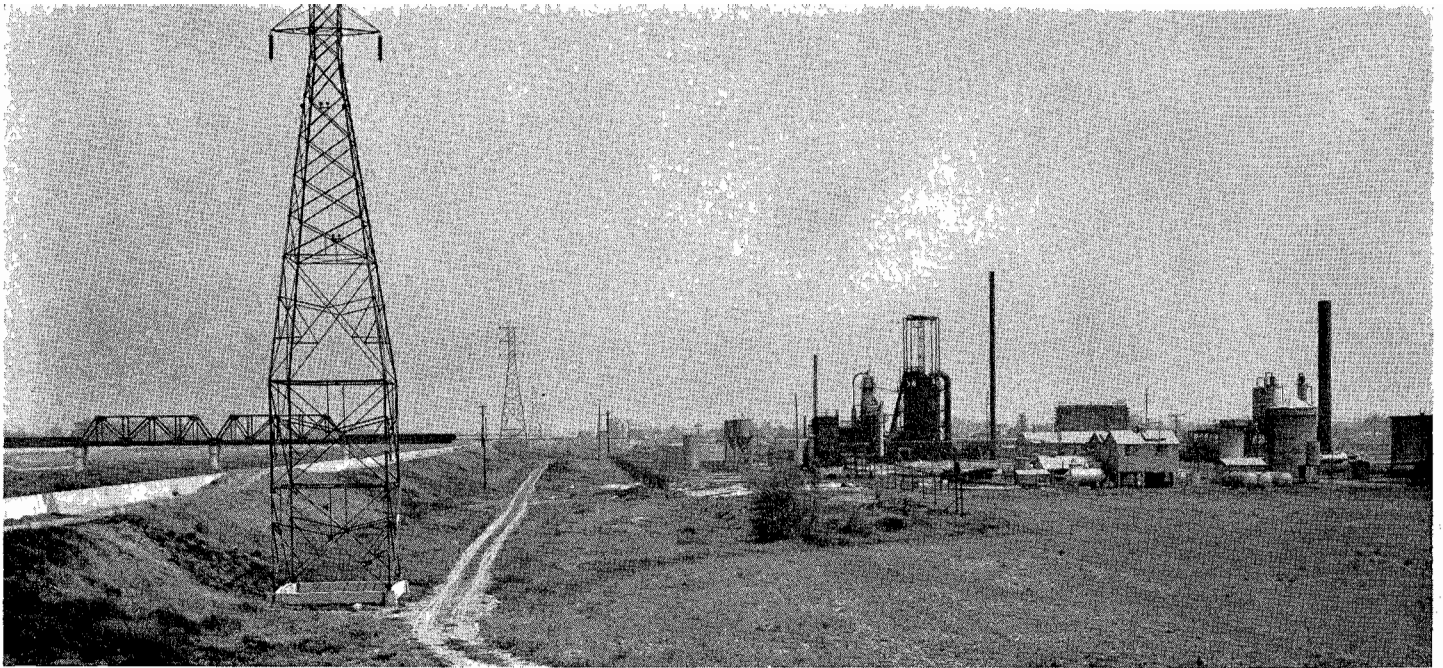
River at Anaheim Street, which provides a grade separation structure and interchange roadways with the Los Angeles River Freeway. Later this year Long Beach proposes to let another construction contract for the grading and paving of the Los Angeles River Freeway from Anaheim Street to Pacific Coast Highway. It is planned to extend construction from Anaheim Street into the harbor area as rapidly as funds become available.

Progress Northerly of Pacific Coast Highway

On April 26th, bids were opened in the Los Angeles Office of the Division of Highways for construction 2.5 miles in length on the Los Angeles River Freeway between Pacific Coast Highway and 223d Street. The Griffith Company was the low bidder. The low bid for the contract items was \$1,429,-146. This contract provides for grading, paving, incidental items and structure at Pacific Coast Highway.

Looking northerly along the freeway toward Willow Street, showing overcrossing grade separation previously built by City of Long Beach to accommodate freeway





View from Firestone Boulevard looking northerly along the Los Angeles River Freeway location, showing Richfield oil refinery which will be interfered with by freeway construction

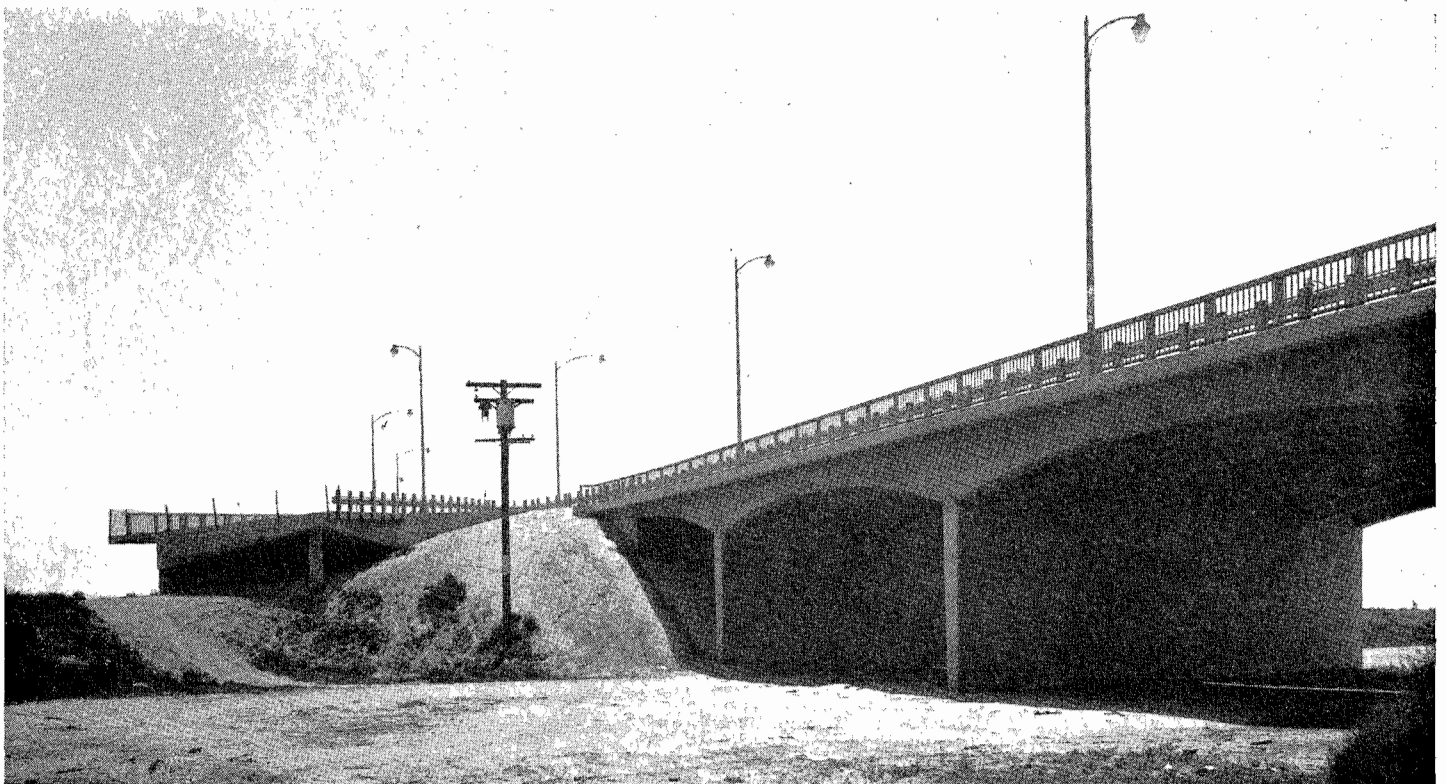
Interchange roadways will be constructed at Pacific Coast Highway, at Willow Street and at Belhart Street. The pavement on the freeway roadways will be eight-inch thickness of

Portland cement concrete pavement 36 feet wide placed upon four inches of cement treated subgrade and eight inches of imported subbase material. The central dividing strip between

the northbound and southbound roadways is planned 12 feet in width and the area between the curbs is to be landscaped.

... Continued on page 51

View of recently completed Los Angeles county project providing new bridge across the Los Angeles River for Belhart Street, which included an overcrossing grade separation to provide for the Los Angeles River Freeway and the on-ramp for northbound traffic



17 Contracts

Hollywood Freeway Construction Under Way Is Extensive and Varied

By W. L. FAHEY, District Engineer

AT NO TIME since construction first started on the Hollywood Freeway in 1939 when the City of Los Angeles advertised and awarded a contract for the eight-lane freeway through Cahu-

enga Pass, has there been so much and so varied construction in progress as at the present time. The State Division of Highways now has active construction under way on 17 contracts. These

contracts cover grade separation bridges, storm drains, sanitary sewers, grading and paving, safety lighting and signing, and landscaping. These 17 contracts are as follows:

<i>Description</i>	<i>Contractor</i>	<i>Resident engineer</i>	<i>Estimated construction cost</i>
Eight-lane Freeway, Los Angeles Street to Grand Avenue.....	Webb & White	R. A. Collins	\$1,050,000
Hill Street Relocation, from Sunset Boulevard to Temple Street.....	Webb & White	R. A. Collins	235,000
Hill Street Overcrossing.....	Spencer-Webb	C. J. Verner	495,000
Roadside Planting, Grand Avenue to Beaudry Avenue.....	Jannoch Nurseries	R. A. Collins	55,000
Roadside Planting, Beaudry Avenue to Virgil Avenue.....	Jannoch Nurseries	R. A. Collins	60,000
Eight-lane Freeway, Virgil Avenue to Western Avenue.....	Griffith Co.	John Ritter	1,719,000
Lighting and Signs, Virgil Avenue to Western Avenue.....	Fischbach & Moore	Ray De Groff	70,000
Pumping Plant and Storm Drains near Santa Monica Boulevard.....	J. E. Haddock	John Ritter	145,000
Fountain Avenue Overcrossing.....	Oberg Const. Co.	C. B. Ousted	360,000
Wilton Place Overcrossing.....	Geo. W. Peterson	W. B. James	350,000
Sunset Boulevard Overcrossing.....	Lars Oberg	J. M. Peterson	343,000
Van Ness Ramp Bridges.....	J. E. Haddock	L. E. Crayne	358,000
Hollywood Boulevard Overcrossing.....	Frederickson & Kasler	Oscar Johnson	385,000
Grading, Paving and Five Bridges between Gower Street and Cahuenga Blvd.....	Winston Bros. Company	C. J. Wood-bridge	1,800,000
At Bronson Avenue and at Gower Street, Two Bridges, Storm Drain System and Sanitary Sewer System.....	Geo. W. Peterson and Jack W. Baker	I. W. Black	1,005,000
Holly Drive Undercrossing.....	Geo. W. Peterson and Jack W. Baker	F. M. Morrill	335,000
Cahuenga Boulevard Overcrossing.....	Oberg Bros.	Jack Sylvester	325,000
		Total	\$9,090,000

Relocate Facilities

In addition to the above construction contracts, the Division of Highways has entered into service agreements with public utilities to relocate and reconstruct their existing facilities that are interfered with by freeway construction. Active work is now in progress on this reconstruction by the Pacific Telephone and Telegraph Company and the Los Angeles City Bureau of Water and Power. Extensive

reconstruction work of pipe lines is also under way by the Southern California Gas Company. The final moving or demolition of buildings is now in progress to clear the last of the right-of-way areas so that final contracts to complete the grading and paving and other necessary construction between Western Avenue and Highland Avenue can be advertised very soon.

The Hollywood Freeway has been referred to as the "backbone" of the

Los Angeles Metropolitan Freeway System. It is a part of U. S. Highway 101, which through the Los Angeles Civic Center is called the "Santa Ana Freeway" from the center line of Spring Street easterly, while from this point westerly it has been given the glamorous title of "Hollywood Freeway."

Construction now in progress on the section of U. S. Highway 101 from Los Angeles Street to Grand Avenue,



Looking west toward Western Avenue crossing, showing final roadbed preparation for pouring operations

for grading and paving under the previously constructed overcrossing grade separation bridges, was started January 31, 1951, by the contractors, Webb and White. From Broadway to Grand Avenue the excavation cuts averaging 50 feet in depth were brought down with $1\frac{1}{2}$:1 side slopes. From Los Angeles Street to Broadway the main freeway roadways are being enclosed by counter-fort type reinforced concrete retaining walls 30 feet high. Outside of these walls will be built outer

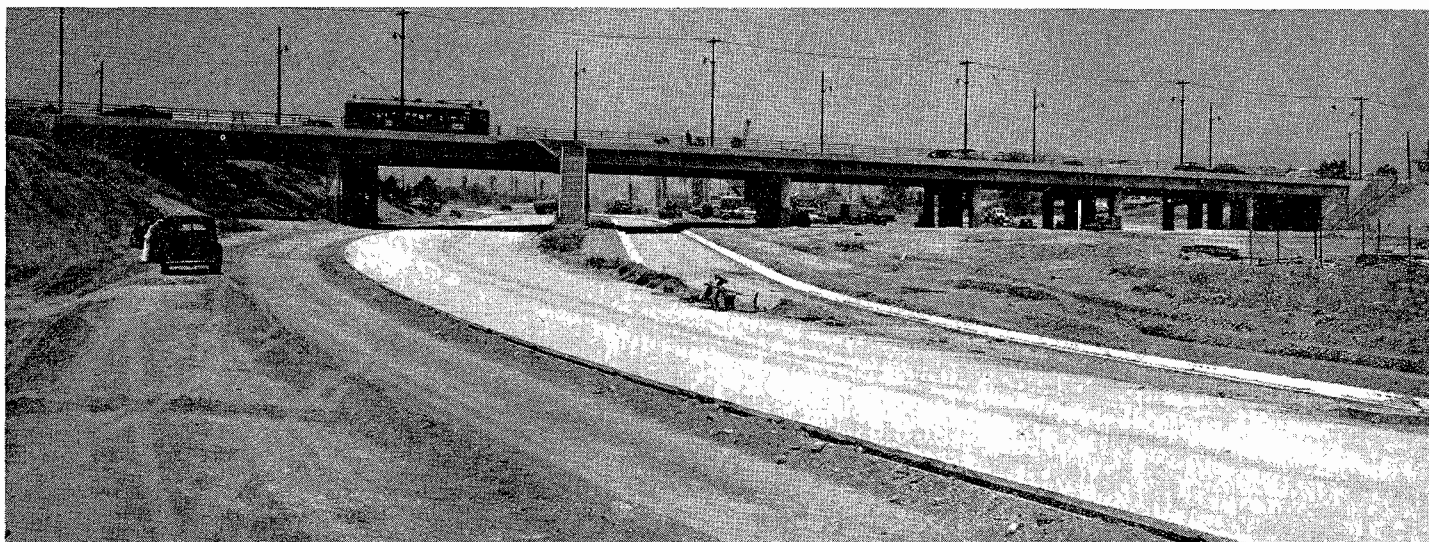
highways connecting with the existing city streets. By previous contracts overcrossing structures were built on Hill Street, Broadway, Spring Street, Main Street and Los Angeles Street. Under these former contracts the roadway under the bridges was excavated to about six feet above final grade. There remained between Los Angeles Street and Grand Avenue 467,000 cubic yards of roadway excavation to be removed to complete the grading work. To date this has been 90 percent

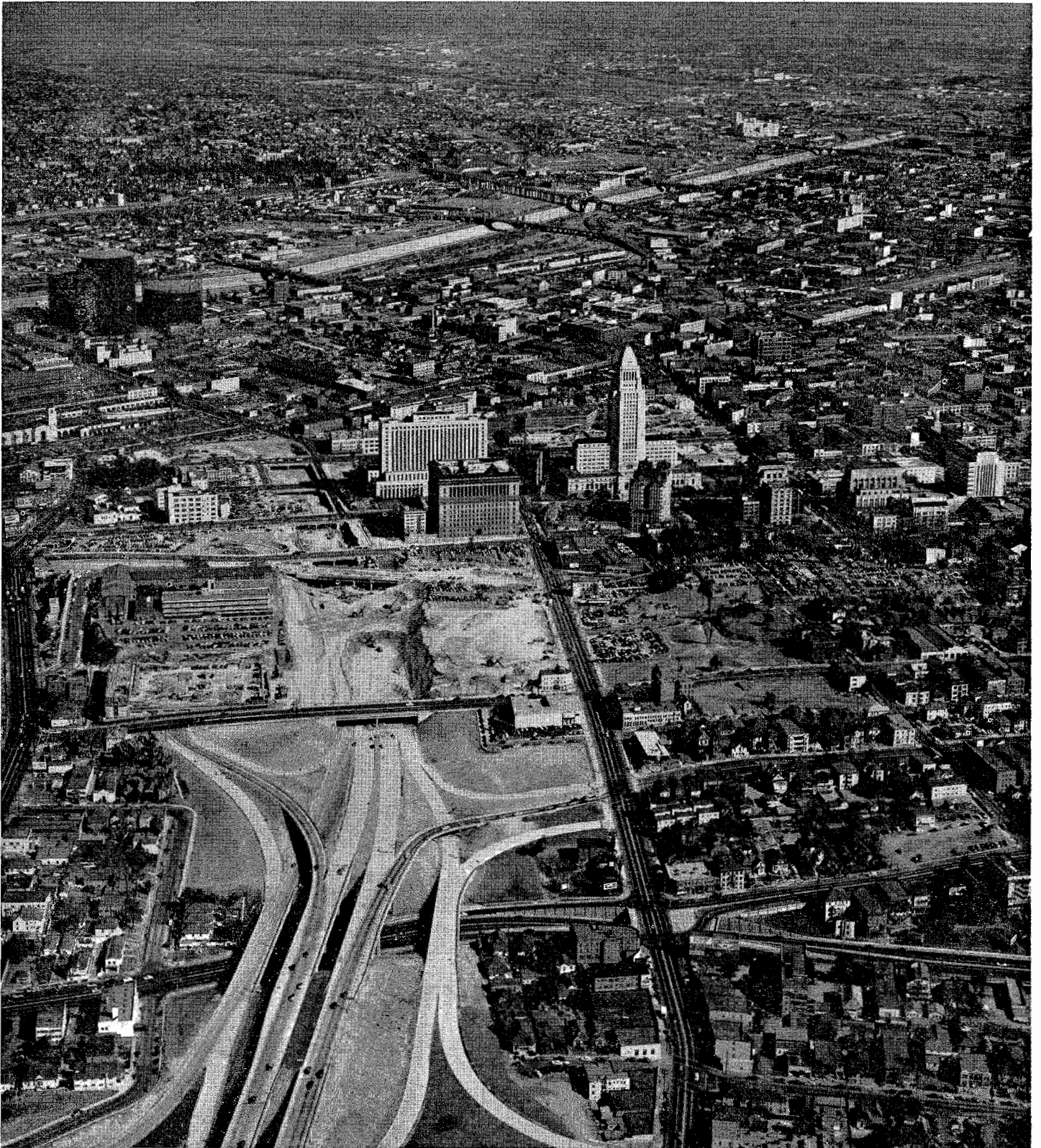
removed. The reinforced concrete retaining walls and the bridge over the Spring Street outlet ramp, comprising 4,600 cubic yards of structural concrete, are now 30 percent complete and are progressing rapidly.

Storm Drain Work

Storm drains and appurtenant catch-basins and junction structures are complete from Broadway to Spring Street. This is about 20 percent of the total storm drain work. It was foreseen that

This photograph shows one roadway poured and second in preparation at Vermont Avenue crossing





View looking easterly along Hollywood Freeway from above the four-level grade separation structure, showing grading contract work in progress through Los Angeles Civic Center area between Grand Avenue and Alameda Street

—Courtesy Pacific Air Industries

spring water flows would be encountered in the excavations, therefore, the main storm drains and laterals were laid with open joints and backfilled with filter material. In addition, between Broadway and Spring Street, at 50-foot intervals, six-inch perforated metal pipes were laid in diagonal trenches across the freeway, and were encased in filter material. By this means the water flowing in the sand strata imprisoned in the shale was effectively tapped and a dry, firm subgrade has been obtained.

Since the excavation work started on Fort Moore Hill over two years ago treasure hunters with imaginations fired by the exploits of the conquistadores have been eagerly haunting the construction area between Broadway and Grand Avenue. The power shovels have exposed bones and coffins at the site of the old French Cemetery, and bottles and utensils bearing marks of antiquity, but, alack and alas, no gold.

Outlet Ramps

Outlet ramps will transfer traffic eastbound from the freeway to Grand Avenue, Broadway, Spring Street, Main Street and Los Angeles Street;

and westbound traffic to Spring Street. Inlet ramps to the freeway will provide access for traffic from Alameda Street, Los Angeles Street, Broadway and Grand Avenue. The contract is now 38 percent complete. It is expected that this section of the freeway will be completed by December 15, 1951.

As previously reported in the January-February, 1951, issue of *California Highways and Public Works*, traffic is now utilizing the top of the four-level grade separation interchange structure and moving over the completed portion of the Hollywood Freeway between Grand Avenue and Virgil Avenue. Westerly from Virgil Avenue the 1 ¼-mile section to Western Avenue is now being paved by Griffith Company and completion of this contract is expected by October 15, 1951.

Griffith Contract

The Griffith Company contract continues the same general type of eight-lane freeway construction as the completed section just easterly. The pavement on the freeway is Portland cement concrete, eight inches in thickness. This is placed upon an eight-inch

layer of disintegrated granite, the top four inches of which is treated with 3 ½ percent Portland cement. This layer in turn is placed upon an eight-inch thickness of selected subbase material of relatively high bearing value. The source of the disintegrated granite is a location on Los Angeles City-owned land where it can be obtained free of royalty cost. The subbase material came from Fort Moore Hill excavation that had previously been selected and stockpiled for this purpose. Thus high quality material to provide suitable foundation for the Portland cement concrete pavement, making the total structural design 24 inches in thickness to support the modern heavy traffic loads, was obtained at a much lower cost than if all of this material had had to be obtained from commercial sources.

The Griffith Company contract also is providing for a large amount of storm drain system construction. This portion of the freeway intercepts large amounts of storm water flow originating in the Hollywood hills and flowing in the existing street gutters and storm drains. One of the special storm drain installations provides a 13-foot x

Paving machines in operation. Pouring and finishing work east of Western Avenue.





Aerial view looking northwesterly along Hollywood Freeway with Los Angeles Civic Center buildings in foreground

—Courtesy Pacific Air Industries

13-foot culvert and another provides a 69-inch diameter reinforced concrete pipe inverted siphon. Many other reinforced concrete culverts and pipes are necessary to complete the storm drain system.

Outer Highways

This contract also includes considerable lengths of outer highways on

both sides of the freeway in order to connect existing city streets that would otherwise be dead-end. The contract includes a pedestrian underpass located between Kingsley Drive and Ardmore Avenue. This structure is necessary for the convenience of pedestrians in order to supplement grade separations at Normandie Ave-

nue and at Santa Monica Boulevard, completed under other prior contracts which are already in service. In order to make the full length of the Griffith contract available for the use of public traffic immediately upon completion, temporary ramp connections are being provided at Western Avenue. These temporary ramps will enable public



Aerial view of Hollywood Freeway, looking southeasterly and taken from above Western Avenue, showing in the foreground work under construction between Western Avenue and Virgil Avenue, with completed portion of freeway in background

—Courtesy Pacific Air Industries

traffic to enter and leave the freeway at this location and to have the full use of completed Hollywood Freeway, a distance of 4.5 miles, between Western Avenue and Grand Avenue. Later in the year, when the Webb and White contract is completed through the Los

Angeles Civic Center, traffic will then be able to travel on the freeway an additional one-half mile and turn on and off as desired at various locations in the civic center.

The budget for the 1951-52 Fiscal Year includes funds so that subsequent construc-

tion contracts can be advertised and let to complete the Hollywood Freeway. The construction schedule calls for a completion of the Hollywood Freeway throughout its entire length, from the Los Angeles Civic Center to Vineland Avenue, a distance of 10 miles, by the end of 1953.

Modern Expressway

Replaces Section of
Deficient Highway
in Riverside County

By CLYDE HIPPENSTIEL, Junior Civil Engineer

A MAJOR BOTTLENECK on U. S. 70-99, the last remaining link of rural two-lane highway between Los Angeles and the Palm Springs junction 90 miles to the east, was eliminated by the completion on May 21, 1951, of a 9.6-mile stretch of four-lane divided expressway between Redlands and Beaumont in Riverside County. The \$1,240,000 project, jointly financed from state and federal aid funds, was constructed by the Sacramento firm of Fredericksen and Kasler.

Even before the "Old Spanish Trail" became the first overland trade route into California during the 1830's, the Spanish and Mexican peoples had endeavored to find a trail which could be traveled with reasonable safety between Sonora and California. The Yuma Indian massacres of the 1780's had caused the abandonment of the Anza Trail established by Juan Bautista de Anza, Spanish conqueror, who led an expedition from Sonora to Monterey in the year 1774, to establish a traversable land route. The Anza route when reopened in the 1820's was shifted to enter the San Bernardino

Valley via the San Gorgonio pass which provided a much easier route than the rugged mountain crossings farther south.

Arguello Finds New Route

This portion of the trail leading through Banning and Beaumont remained in use until the year 1824 or 1825, when Santiago Arguello, on a punitive expedition to catch some Indian horse thieves, found the Indian trail up San Felipe Creek, past Borrego Valley, and up to the mountain plateau, at what is now Warner's Hot Springs. It was the San Felipe gateway that was to become the important southern gateway, the one used by Stephen Kearny, the Mormon battalion, and the Butterfield stages of later years.

The newly completed section of expressway follows a course basically the same as that traversed by a portion of the Monterey-Sonora Road, the upper branch of the old "Emigrant Trail" from early California history. This branch of the Emigrant Trail, established in the 1820's, came from Warner's Ranch via Aguanga and passed

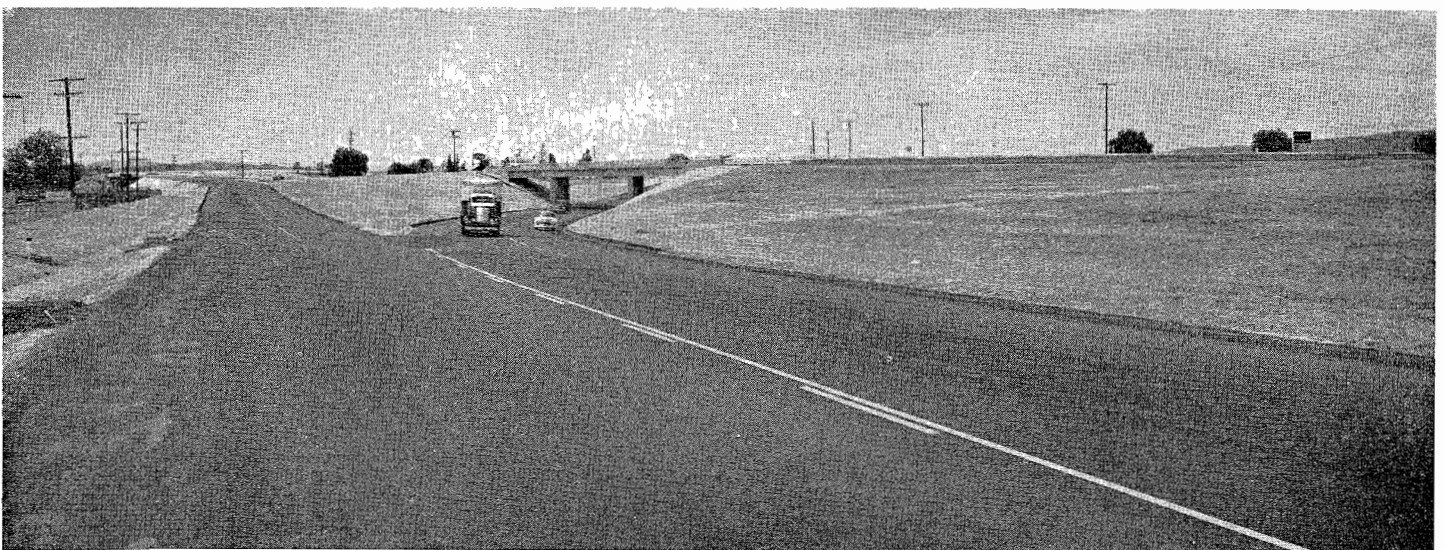
down the San Jacinto Valley and across the hills to the site of what is now Beaumont. From there it continued northwest and west along the approximate course of the existing U. S. 70-99 through Redlands and old San Bernardino, or Guachama, to what is now Colton.

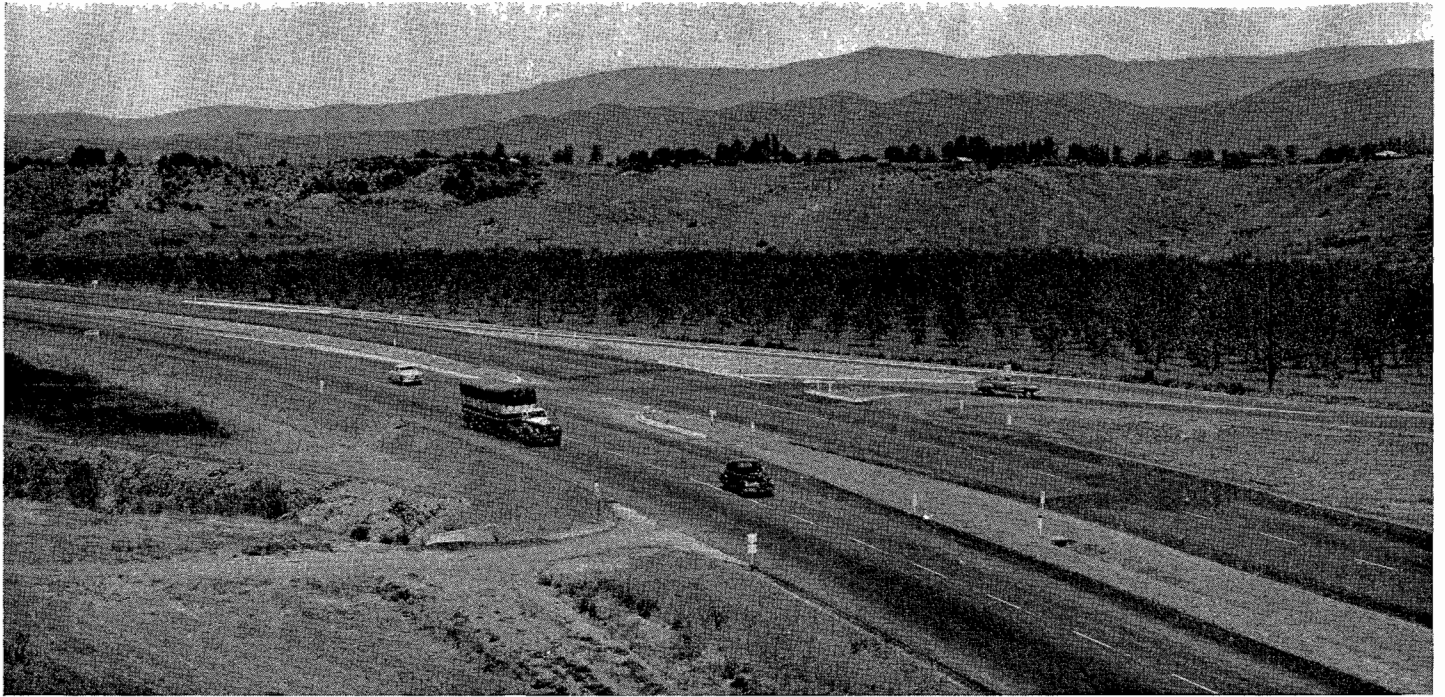
Two Major Gateways

U. S. 60-70-99 and San Gorgonio Pass, immediately east of this new section of expressway, form one of the two major gateways to coastal Southern California from the east, the other being U. S. 66 through Cajon Pass. At the westerly city limits of Beaumont, U. S. 60 and U. S. 70-99 divide the heavy load of interstate and local traffic bound for the metropolitan Los Angeles area, the former via Riverside and the latter by way of Redlands.

Of local interest, the completion of the four-laning of U. S. 70-99 will alleviate the conditions created by the extremely heavy truck traffic between the coastal cities and the fertile Imperial and Coachella Valleys. This, coupled with the transcontinental busses and trucks, eastern tourists, and

Undercrossing looking west from eastbound roadway at intersection of US 60 and US 70-99





Looking west at westerly intersection to Calimesa

the bulky recreational traffic headed for desert resorts in the Palm Springs area, caused a constant delay and congestion on the narrow, up and down highway.

Changes in Alignment

For the most part the existing highway was utilized as one roadway in the construction of the expressway. A face-lifting operation was performed

on the old roadway in the form of re-surfacing portions of the existing pavement, flattening the eroded roadside cut slopes, and seeding them with a mixture of alfalfa, barley and rye grass

This view is looking east through Calimesa after highway modernization



to conform to the slopes on the adjoining new construction.

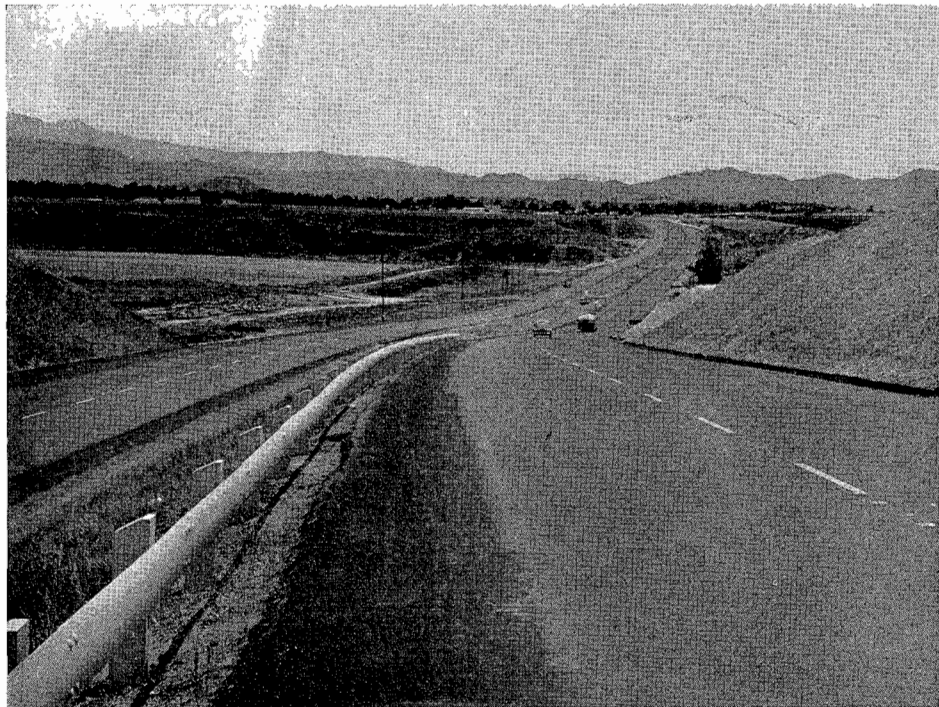
Two major changes in alignment were effected in the construction of the new expressway. At the San Bernardino-Riverside county line, the old highway passed through a section of roadside business establishments in the small farm community of Calimesa. The constant delay, caused by local traffic plus the steep grade and unsatisfactory alignment of Calimesa Hill, immediately west of the business district, have been eliminated by skirting the community to the west. Channelized intersections east and west of Calimesa provide convenient access to and from the expressway.

The other major change in alignment was the construction of a grade separation structure and interchange at the "Y" junction with U. S. 60 near the west city limits of Beaumont. The intersection, formerly channelized at grade, had outlived its usefulness by reason of increased traffic volumes.

Separation Structure

The only solution to this problem, a grade separation providing an interchange between the two highways, was denied for many years by the lack of funds. However, the increase in state gas tax in recent years made the improvement possible. The newly constructed separation structure now permits a free flow of opposing streams of traffic and should entirely eliminate accidents at the intersection of the two heavily traveled routes. To complete the remodeling, frontage roads were provided for properties fronting on the intersection with ingress and egress to the expressway at a safe distance from the interchange.

The right of way for this project involved the acquisition of 118 parcels, which included both land and access rights. Since the major portion of the construction consisted of widening existing facilities, in many cases the limitation of access along existing right of way lines was the only negotiation necessary. That portion of the project by-passing Calimesa required the purchase of land and access rights on new alignment.



Looking east one-fourth mile east of Calimesa turnoff

Right of Way Work

Properties involved consisted of irrigated farm land, residential, light industry, motels, trailer courts, and commercial properties. In many cases where development was located within the new right of way, the existing improvements were disposed of at public auction.

Another phase of right of way work necessary for the construction of the expressway was the relocation of high tension power line facilities, various telephone lines, gas lines, and privately owned irrigation systems. One very important utility facility affected was the coaxial cable owned by the Pacific Telephone and Telegraph Company. Construction of the expressway necessitated lowering and protection of the cable on a major portion of the project so as not to interfere with construction operations. This was accomplished by capping the cable with a concrete slab in all locations where the cable was less than five feet below the roadway grade. This and other work was performed by the utility company without any interruption in service. Consistent with the emphasis placed on safety in the design of the expressway, all cable manholes were removed from the pavement and improved shoulder

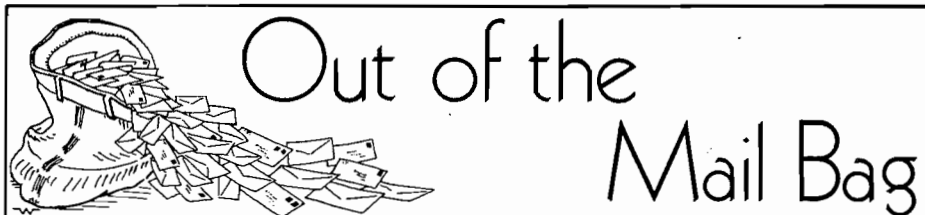
areas. This was accomplished by constructing tunnels up to 20 feet in length from the cable to the relocated manhole. Further off-shoulder parking areas for cable maintenance equipment were constructed, as a safety measure.

The total cost for additional lands required, including limitation of access and utility relocation, was approximately \$450,000. A single parcel, which involved access rights only, was acquired by condemnation proceedings. Three additional parcels were acquired by stipulated judgment without proceeding to actual trial, and all the remaining parcels were acquired by negotiations.

E. A. Bannister was Resident Engineer, assisted by F. M. Morrill, as Bridge Department Representative, on the construction of the expressway. G. D. Gardner is representing the State during the installation of the highway lighting and sign bridge under separate contract.

RIGHT OF WAY

It's a dangerous practice to debate the right of way on the highway. A better habit is to GIVE the right of way and debate it later. It may save your life.



FROM A GEOLOGIST

UNIVERSITY OF OREGON
College of Liberal Arts

JANUARY 11, 1951

California Highways and Public Works
Post Office Box 1499
Sacramento, California

DEAR SIR: I have seen your excellent magazine titled *California Highways and Public Works*. It has some excellent articles on engineering geology and as a geologist and traveler on California highways, I would appreciate being put on the mailing lists.

California seems to excel in daring when placing highways. The cuts are deeper, the fills larger than any that I have seen.

Sincerely yours,

(Signed) EWART M. BALDWIN
Associate Professor,
Geology
Eugene, Oregon

USES MAGAZINE IN CLASSES

THE UNIVERSITY OF TENNESSEE
Knoxville
Department of Civil Engineering

JANUARY 9, 1951

MR. KENNETH C. ADAMS, *Editor*
California Highways and Public Works
Post Office Box 1499
Sacramento, California

DEAR SIR: I should like very much to become a subscriber to *California Highways and Public Works*. I think it the best highway magazine that I see, as it has so many worthwhile articles as well as many interesting pictures. Since I teach the subject of highway location, survey and plans, I can always find some interesting material in your publication for my classes.

Very truly yours,

(Signed) R. T. BROWN
Associate Professor of
Civil Engineering
Knoxville 16, Tenn.

KNOWS HIGHWAYS

Division of Highways
Post Office Box 1499
San Luis Obispo

GENTLEMEN: Having been directly interested in all California highways for a lifetime and for ten years as a Greyhound driver, I find your publication of a technical magazine very interesting to a layman. It always holds information of lasting interest to me and my passengers.

Would it be possible to put me on your mailing list?

I thank you.

JED S. BLAKE

WANTS OWN COPY

APRIL 30, 1951

California Highways and Public Works
Sacramento, California

GENTLEMEN: Your journal, *California Highways and Public Works*, is in files at the Union Oil Co. head office at Los Angeles. As a designer, I have made use of it many times.

I would like to have it sent to my residence, as my son (an engineering student at Berkeley), is also interested.

IRVING C. DODGE
10561 E. Olive St.,
Temple City

ENJOYS MAGAZINE

California Highways and Public Works
Post Office Box 1499
Sacramento, California

DEAR SIR: To try to tell you how much I have enjoyed your publication *California Highways and Public Works* would be impossible. I have had the pleasure of reading it for many years, then passing it on to a friend.

Very truly yours,

J. A. BOYD,
1719 38th Ave.
San Francisco

In Memoriam

LESTER G. COREY

Friends and co-workers of Lester G. Corey in District VII, State Division of Highways, were saddened to learn of his death from a heart attack at his home, 2701 Birch Street, Alhambra, during the night of May 9, 1951, after 31 years of highway engineering service. He was a California native son, born in San Francisco on June 25, 1890, and residing in the Los Angeles area for the past 51 years.

Lester was a veteran of World War I, serving in the United States Army in the Philippines for a period of over three years. Upon receiving his honorable discharge from the Army in February, 1920, he took employment in District VII as a survey party chainman. He very quickly was promoted to field draftsman and instrumentman, working on extensive location and construction surveys until November, 1922. At that time he was transferred to construction and worked for two years as Assistant Resident Engineer on the first heavy grading operations for the Coast Highway along the ocean front south of Oxnard.

In March, 1924, Lester was promoted to Chief of Survey Party, a position which he held for 19 years. During these years he handled many important highway location and construction survey jobs throughout District VII.

Then Lester was transferred in September, 1943, to the District Office and for the last eight years of his engineering career worked on highway design problems. His broad engineering training and practical experience extending over so many years of survey and highway construction made him a very valuable addition to the engineering staff of the District Office. During the course of this assignment, he worked on special design features for the Hollywood Freeway, the Santa Ana Freeway and the Ramona Freeway.

He is survived by his widow, Mrs. Alma L. Corey, and by two brothers, Robert D. Corey of Huntington Park, and Ed L. Corey of San Gabriel. His many friends and associates extend their heartfelt sympathy to his family.

By-Pass Effects

Consistent Pattern Developed by
Division of Highways Studies

By W. STANLEY YOUNG, Headquarters Right of Way Agent

THE STUDIES of the by-passes of the business districts of Folsom, Sacramento County, and Imperial, Imperial County, both having populations of approximately 1,700, have enabled us to compare the effects of circumventing a business district by several miles by means of a controlled access highway, to the effects on a similar-sized community where the by-pass is only one-half block removed from the former route down the main street.

The consistent pattern developed in our previous by-pass studies indicated that it is relatively unimportant that local business be visible to highway travelers. The insignificant contribution from through traffic to business along a main street has been further delineated by the facts brought out in the first of the two most recently completed by-pass studies, which are discussed herein.

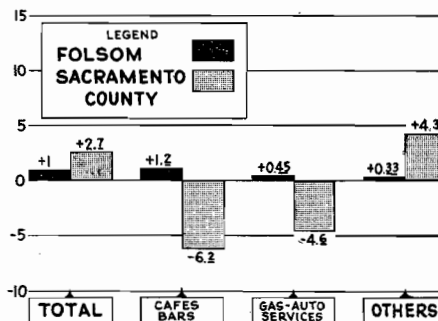
FOLSOM

The reason for building a controlled access by-pass of the City of Folsom, located 17 miles easterly of Sacramento, was for the purpose of providing a better highway alignment on this section of U. S. Highway 50. As a result of building the expressway along the most direct route practical, the highway now misses Folsom by several miles, and the distance between Sacramento and the Lake Tahoe resort area has been accordingly reduced by more than three miles.

As a consequence of the placing of the highway so far removed from Folsom, it is unlikely that an appreciable amount of recreational traffic now passes through the city.

Contrary to many expectations of the effect on the cafe, service station and bar business resulting from the almost total elimination of highway traffic, these businesses did not disclose any adverse effects. This is despite the fact that the Sunday and holiday traffic in Folsom was nearly halved. Weekday traffic remained about the same.

GROSS RETAIL SALES AFTER FREEWAY OPENING



Weekday traffic along the new section of U. S. Highway 50 is approximately the same as the weekday traffic count within the City of Folsom since the by-pass, the number of vehicles per day being approximately 4,300.

Increase in Business Volume

In studying retail business of various types in Folsom over a period of years since the war, we found that the business volume of these establishments had not fluctuated so widely as had Sacramento County business volume, but rather had maintained a fairly constant, but slight, year to year increase in volume. This pattern continued during the year following opening of the freeway, when the 36 retail business establishments in Folsom showed an over-all increase of 1.0 percent, while Sacramento County business gained 2.7 percent.

The local cafe and bar business increased 1.2 percent while Sacramento County cafes and bars declined 6.2 percent.

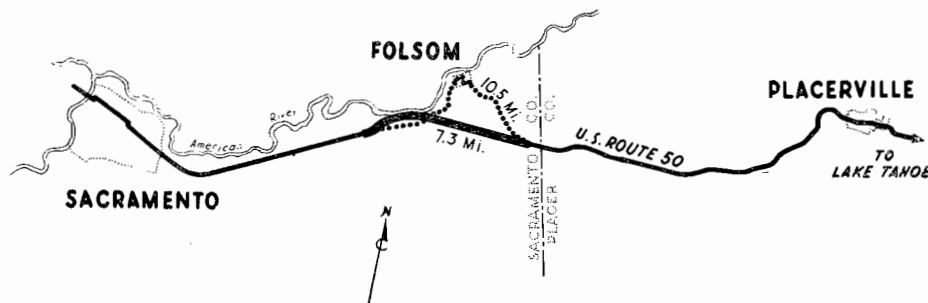
Folsom service stations increased 0.45 percent during the time that Sacramento County service stations decreased 4.6 percent.

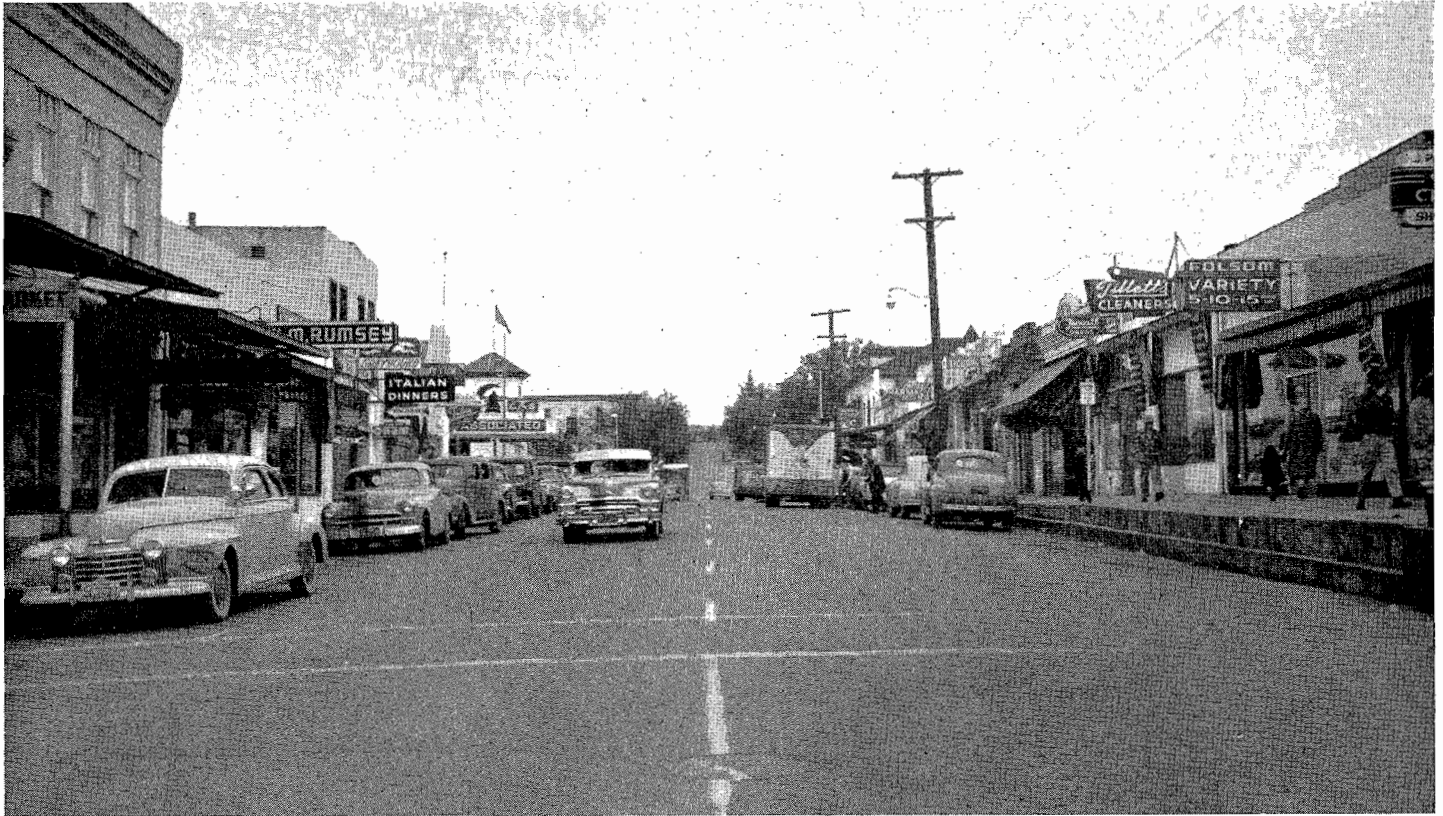
Inasmuch as cafes, bars and service stations were almost the only businesses open on Sundays and holidays, and in a position to obtain a substantial amount of patronage from the heavy Sunday and holiday recreational traffic, the fact that these businesses did better than other types of retail outlets in Folsom establishes that the effect of through traffic removal was not detrimental. This is further brought out by the fact that Folsom cafes, bars and service stations had business increases, while county- and state-wide trends were downward.

Local Shoppers Not Discouraged

Contrary to the findings in our previous by-pass surveys, the classification "all other businesses" did not increase as much as did cafes, bars and service stations, which ordinarily enjoy a larger portion of business from highway through traffic. This indicates that traffic congestion had not reached the point where it was discouraging local shoppers who provide nearly all the patronage to these pedestrian-catering businesses. Businesses

Engineering diagram of U. S. Highway 50 between Sacramento and Placerville, showing the new expressway by-pass and the superseded route through Folsom





Downtown business scene in Folsom after opening of the by-pass, showing typical weekday parking and traffic conditions

such as clothing stores, groceries, varieties, etc., catering primarily to local patronage, disclosed an increase of .33 percent in business volume, while Sacramento County volume in these businesses increased 4.3 percent.

There were insufficient real estate transactions along the superseded highway in Folsom to produce any percentage figures but a general upward trend consistent with that section of the county was apparent. There were no signs of any decline in values of any Folsom properties resulting from the elimination of highway traffic.

IMPERIAL

While Folsom retail business did not register any actual monetary benefits from the through traffic removal, largely because no serious traffic condition existed along the main street during weekdays, the City of Imperial, located between El Centro and Brawley on U. S. Highway 99 in Imperial County, reflected slight benefits from the removal of the heavy produce truck and agricultural worker traffic.

Weekday traffic along the main street of Imperial was about 50 percent greater than that in Folsom. The fact that traffic volume was somewhat greater on weekdays than Sundays indicates the business and worker character of the through traffic, as distinguished from the heavy holiday use of the highway in the vicinity of Folsom which had placed only cafes, bars and service stations in Folsom in a position to secure a substantial amount of highway business. All types of business in Imperial had this opportunity, because of the uniform traffic count throughout the week.

RETAIL BUSINESS

Business volume throughout Imperial Valley, as well as in the City of Imperial, reflected the 24.33 percent decline in agricultural income during 1949 in the county. This was to be expected, inasmuch as practically the entire county economy is based on agriculture.

Imperial County over-all business volume dropped 6.8 percent. Meanwhile Imperial city business averaged a decline of 6.2 percent.

This downward trend was carried to the cafe and bar business in both Imperial and the county. County-wide businesses of this type declined 7.2 percent. Reflecting slight benefits from through traffic removal, Imperial cafes and bars declined only 6.7 percent.

Failing to follow general economic conditions in the county, service stations enjoyed small gains in retail business volume. These establishments in the City of Imperial registered an 8.2 percent increase, while the Imperial County service station average was somewhat poorer, being a 5.3 percent increase. Gasoline gallonage in the City of Imperial declined 10 percent, however, while county-wide gallonage declined an unknown amount.

INDUSTRY

Although retail business was slightly improved after the alleviation of traffic congestion in Imperial, the principal benefits to the community, besides safety and convenience, were found in the stimulating effects of the highway improvement on light industrial development and expansion.

Soon after the expressway by-pass was opened to traffic, several new light industries sprang up on the east side of the highway opposite the main business district of the city. Included in these enterprises are a liquified gas concern, a sugar refinery, two masonry product plants, and a fertilizer distribution plant. In addition, the facilities of the Imperial Irrigation Company, largest valley industry, were considerably expanded.

The accompanying engineering diagram of the highway improvement through Imperial pictures the location of these new industries along the east side of the expressway opposite the main business district and also illustrates two methods commonly used by subdividers to obtain the maximum profits from their developments. The method of backing the first tier of lots up to the highway or by building a frontage road serving properties adjacent to the highway by the limiting of access, avoids the obsolescence of the highway facility in addition to preserving the advantages of highway proximity.

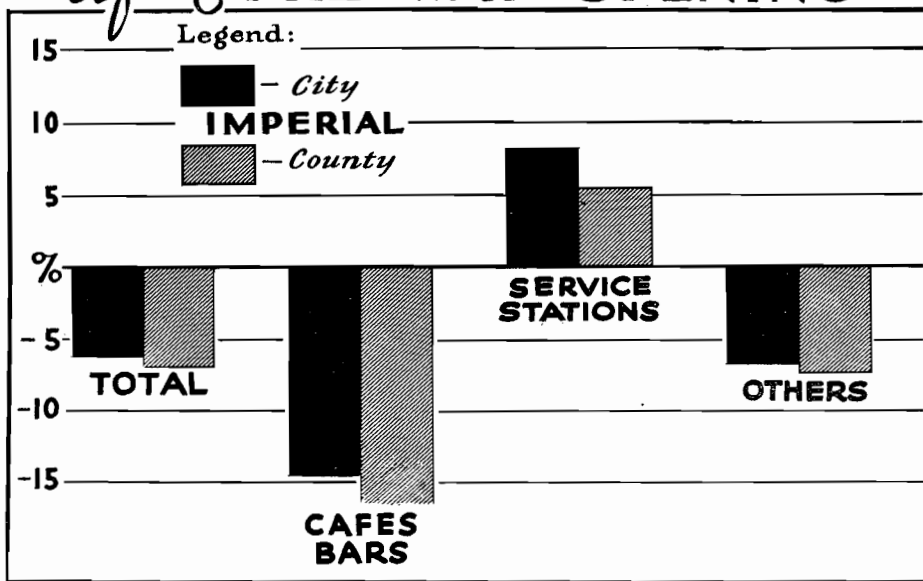
Highway Access Limited

The Division of Highways accomplished the same results in Imperial by buying the east tier of lots in the block east of the main street and building the expressway thereon. In this manner highway access was limited without disturbing the existing access rights of any abutting properties because the city street was left to serve as a frontage road for properties east of the expressway while properties immediately west of the expressway continued to be served as formerly—by the main business street.

The industrial plant developers in Imperial were quick to recognize the advantages of the frontage road—expressway arrangement which greatly extended the profitable economic life of their establishments.

Principally as a result of the industrial expansion on properties adjacent to the expressway, the value of building permits rose 29.2 percent in 1950, as compared to 1949. The properties on which these new establishments are located were previously vacant, largely

GROSS RETAIL SALES *After* FREEWAY OPENING



unused, and had only conventional city street frontage.

The rapid expansion of previously undeveloped property along the new highway alignment, is further found in a comparison of assessed valuations in Imperial for the year 1950 to 1951. During the assessing year after opening of the expressway by-pass, assessed values within the city were raised \$216,993. Since there was no deviation in the assessing rates of previously existing improved properties, this 20.2 percent increase over the preceding year, accurately reflects the actual business and residential growth, value-wise, in the City of Imperial. This growth is attributable principally to improvement of the highway facility.

POPULATION

An analysis and comparison of population trends in Imperial County and in the City of Imperial also indicate that construction of the expressway stimulated the growth of the city.

Imperial County population, which had remained static for several decades, showed an over-all increase of only 4.6 percent during the 10-year period between 1940 and 1950.

Percentage-wise, all of this population gain was absorbed by incorporated cities in the county and in addition enough rural residents moved to

cities to register a total average city population increase of 13.1 percent. This resulted in a reduction of 6 percent in the number of people living in the county outside of cities.

Although the population of the City of Imperial followed average area trends through the war years, the city thereafter began to forge ahead of the average city gains throughout the county. Largely as a result of improvement of the highway and the light industrial development adjacent to the expressway, the number of residents in Imperial increased 3.2 percent above the average gain of all cities in the county between the years 1940 and 1950, or a total gain of 16.3 percent in 10 years.

Improvement of the highway apparently has also made this small city attractive to farmers, agricultural and other seasonal workers, because their radius of employment has been extended by the shortening of driving time and increased safety and convenience with which they can reach their places of employment.

FOLSOM AND IMPERIAL COMPARED

Although the population of these two cities is almost identical, and the principal economic support of both is from agriculture, the character of the through traffic formerly passing along



The main business street of Imperial subsequent to opening of the expressway by-pass, showing normal summer parking conditions

the main street highway in each location was considerably different. In the case of Folsom, the recreational nature of much of this through traffic was evident in the facts that Sunday and holiday traffic was nearly double that on weekdays and that weekday traffic did not drop off appreciably after the expressway opening. The year around resorts in the Lake Tahoe and other mountain areas have made U. S. 50 a very popular weekend vacation route for Northern California residents.

The business nature of the through traffic along Imperial's main street, previous to the construction of the expressway by-pass, was apparent in the very stable traffic count throughout the week, where the volume varied precisely with the amount of agricultural activity in the county. This traffic volume during the week was 50 percent greater than the average weekday vehicular traffic in Folsom, while Folsom's holiday traffic count was approximately 50 percent above Imperial's daily average.

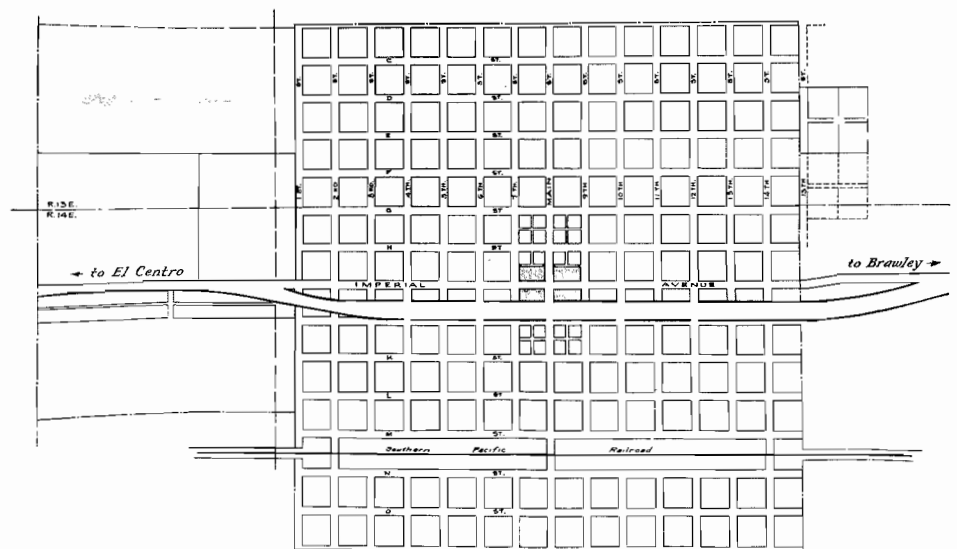
The principal reason for the expressway by-pass in Folsom was the improvement of the highway alignment rather than to alleviate a congested

condition. Congestion in Imperial and the slowing down of the large volume of through-traffic throughout the week necessitated the by-pass in this city.

While the by-pass of Folsom removed highway traffic several miles

from the city, well outside of sight distance, and eliminated almost all of the through traffic trade, the by-pass of Imperial, only one-half block removed from the main business section, made it probable that most of the former highway patronage would continue

Engineering diagram of Imperial, showing the expressway by-pass of the main street. The shaded area represents the main business district. The location of the new industrial development in the city is east of the expressway along the city street, which now acts as a frontage road. The advertising value of highway frontage is thus coupled with safe and convenient property entrance from a lower speed local road.



IMPERIAL



Scene looking northerly towards Brawley, showing some of the new industries to the right of the expressway, opposite the Imperial business district

despite the by-pass. This was important to the cafes and service stations that cater to a considerable extent to truck drivers and packing plant representatives passing through the city.

CONCLUSIONS

It is apparent in our analysis of the gross retail sales of the various classes of business in Folsom, that the through traffic contribution to the business volume of the various business classes was insignificant. Since the businesses such as service stations, cafes and bars showed increases above other retail businesses which had small chance of obtaining any of the heavy Sunday and holiday through traffic patronage, this fact is established. In the light of our previous studies, the fact that Folsom retail businesses other than cafes, bars and service stations showed only slight gains indicates that traffic congestion was no serious problem in the city.

The retail business volume analysis of Imperial businesses of all types, indicates that there was a slight increase in patronage following opening of the expressway, as compared to the county-wide average. Since the entire county had been very uniform in economic trends, these county figures provided an accurate measure of the by-pass effects on business.

No Detrimental Effects

Careful analysis of building permits issued, assessed valuation increases, and population figures in Imperial has

pointed out some of the frequently less obvious benefits which may be realized by a small highway city as a result of improving the highway facilities in the vicinity.

It is significant that neither of these two smallest of the by-passed cities yet studied by the Division of Highways, has shown any detrimental effects on business or property values resulting from the highway improvement, despite the fact that in the case of Folsom almost all through traffic was totally eliminated.

As a result of the thorough study of all the facts available pertaining to these two locations, the apparent importance of highway patronage has diminished as compared to local customers, even in very small cities in California. This has been partially because of the changing habits of highway travelers to take advantage of the increased speed and safety of controlled access highways, and partly because the commonly held theory that "potential business volume is directly proportional to highway traffic volume" has proved to be erroneous.

From the analyses of the by-pass effects on the small cities of Folsom and Imperial and from the previously published analyses of by-pass effects on the Cities of North Sacramento, Au-

PEDESTRIAN SAFETY CONTEST

San Francisco and Burlingame have again been adjudged safe cities for pedestrians. In their population groups, San Francisco tied with Washington, D.C., for third place and Burlingame won honorable mention in the 1950 nation-wide Pedestrian Protection Contest conducted by the American Automobile Association and its affiliated clubs.

A year ago, San Francisco was first among cities in the 500,000 to 1,000,000 population group and won the grand award.

Burlingame took honors in the contest for the third consecutive year. In 1949, Burlingame won second place in its population group, and in 1948 was awarded a special citation.

PEDESTRIAN INJURIES

Two-thirds of all persons hurt in city traffic mishaps are on foot. Don't be a casualty of careless walking—look both ways before crossing streets.

burn and Fairfield, has evolved the premise that "where existing through-traffic volume justifies a business district by-pass, retail businesses generally are financially benefited."

Report on Progress and Records in Pavement Construction During 1950

By CARL ALZUETA, Assistant Engineer, Construction Department

DURING THE YEAR 1950 on our paving contracts there was not only a marked increase in the daily output of paving mixtures, but also a noticeable improvement in pavement riding qualities. With the return of normal working conditions after World War II and before the effects of the present crisis were materially felt, excellent paving records were made on state highway projects. From 1941-45, the demands of the war effort on trained construction personnel together with unavailability of new construction equipment resulted in decreased rates of production and lower quality of work.

Revisions are being made in the standards of design with respect to required thickness of surfacing and base materials. An attempt is being made to correlate more closely the supporting capacity of the basement soils and magnitude and number of individual wheel loads with the type and thickness of base and surfacing. The revised design procedure should largely eliminate the costly inequalities of over and under designing.

The roughness index, as mentioned in this article, is obtained by means of the roughometer, an instrument used by Headquarters Construction Department for some time to evaluate pavement roughness. The instrument is mounted on a passenger car and is actuated by vertical movements of the front axle as the car is driven over the road. Roughness is measured by summarizing on counters these vertical movements.

(2) The use of 1-2 percent cement to strengthen local materials for base courses under bituminous pavements and make importation of expensive higher quality rock bases unnecessary.

(3) The use of 3-5 percent cement to harden the subgrade under concrete pavements in soils that may soften and erode under rocking of the slabs.

PORTLAND CEMENT CONCRETE

Automatic proportioning has become a specification requirement for all major jobs and the use of 34 E dual drum pavers is almost universal with the contractors. With the permissible 20 percent overload now provided for in the specifications, these traveling mixers can mix a 1½ cubic yard batch. Average daily production of pavement concrete for 1950 has been materially increased over any past year in which records were kept. Average daily production in the past year reached 662 cubic yards which is better than 200 cubic yards per day higher than the previously recorded high attained in 1941.

Present practice on transverse joints calls for the elimination of expansion joints except at bridge abutments and the placing of weakened plane joints at 15-foot intervals. Forming strips at the weakened plane joints remain in the concrete pavement and are finished over without edging. This procedure has resulted in improved riding qualities for this type of pavement.

The average roughness index for 41 miles of Portland cement concrete pavement completed under nine contracts during 1950 was 6.3 inches per mile. This value is considerably lower than any other value obtained since 1940.

CEMENT TREATMENTS

Due to increasing wheel loads in both magnitude and number, on the highway system, the trend has been toward strengthening the bases by various types of cement treatments. The types of treatments vary in cement content and are for three distinct purposes as follows:

(1) The use of 4-7 percent cement in the construction of base courses under bituminous pavements to furnish

PAVEMENT PROGRESS

Year	PCC PAVEMENT Class "B" Concrete		PMS		RMS		BST	
	Average C.Y./day	Aver. Comp. Strength PSI †	Aver. Roughness Index inches/mile	Aver. Roughness Index inches/mile	Aver. Roughness Index inches/mile	Aver. Roughness Index inches/mile	Aver. Roughness Index inches/mile	Aver. Roughness Index inches/mile
1940.....	374	4204	7.4	23.1	49.2	---	---	---
1941.....	460	3840	7.8	19.3	29.4	---	---	---
1942.....	367	3690	8.0	14.6	25.5	---	---	---
1943.....	337	3588	14.2	18.8	23.4	---	---	---
1944.....	426	3876	10.3	16.8	32.9	---	---	---
1945.....	236	4101	14.2	19.5	31.2	---	---	---
1945-1949 *	---	---	---	---	---	---	---	---
1950.....	662	3520	6.3	11.2	23.1	24.6	---	---

* No records were compiled in this period.
† 28-day breaks.

As an aid to materials control on construction, testing equipment formerly available only in Headquarters Laboratory was placed in the districts to expedite reporting of test data.

a suitable and economical foundation with the object of obtaining a limited slab strength greater than the natural material but less than that of concrete pavement.



Portland cement concrete pavement on the Hollywood Freeway in Los Angeles

Air entraining agents have not been specified as admixtures to pavement concrete since California's pavements are generally not subjected to alternate freezing and thawing. In addition, the properties of air entrained concrete do not lend themselves to the California method of delayed pavement finishing.

The highest average daily production of pavement concrete was accomplished on Contract 0-6VC35-F, Route 4 between 1 mile south of Tipton and the Tulare Airport. N. M. Ball Sons was the Contractor and C. F. Oliphant and J. T. Landers, resident engineer and street inspector, respectively. The exceptionally high average daily output of 1,040 cubic yards was attained.

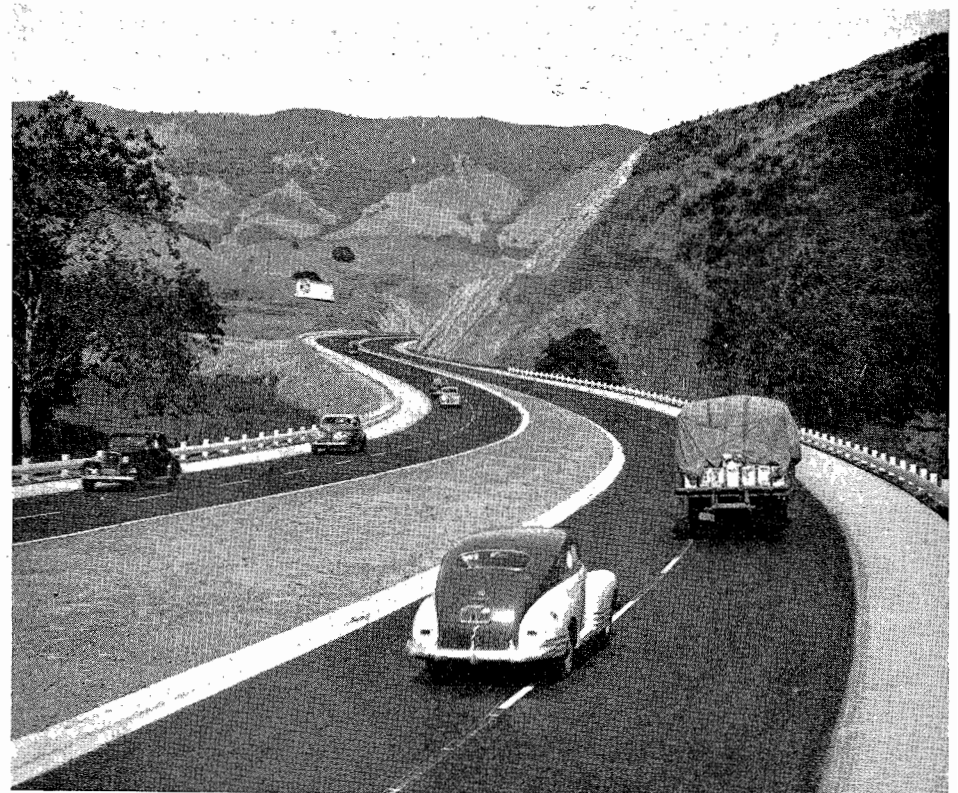
The highest average compressive strength was obtained on the Parish Bros. Contract 1-10TC53-F on Route 7 through the American Canyon with an average 28 day strength of 4,315 psi. E. L. Craun was resident engineer, and M. B. Rowan, street inspector.

The average compressive strength for the State was 3,520 psi which is the lowest recorded value since 1940. This lower figure may well reflect the present emphasis on workability rather than on strength.

The record for riding quality was achieved on Contract 1-10TC54-F, Route 4 between Turlock and Keyes with an average roughness index of 5.2

inches per mile. United Concrete Pipe Corp. was the Contractor, W. L. Hurd, resident engineer, J. Schook, street inspector.

Plantmixed surfacing on US 101 near San Luis Obispo





Roadmixed surfacing near Salt Wells in San Bernardino County

BITUMINOUS PLANT-MIXED SURFACING

Plant-mixed surfacing continued as the predominating surfacing and was used on 72 percent of the bituminous treated mileage completed under contract in 1950. During the year a total of 338 miles was laid, both on resurfacing projects and on new construction.

The tendency towards the use of low penetration asphalts for plant-mixed surfacing is becoming more pronounced from year to year. Present practice is to provide various grades of paving asphalts in the specifications and to permit the engineer to designate the grade which will best suit the conditions at the time of the paving operations.

Continuous mixers are being used in greater numbers on State contracts involving plant-mixed surfacing but the conventional batch plant remains as the principal type of equipment. Despite their limited use, 7 of the 13 contracts exceeding 950 tons average daily output used continuous mixers.

The 1950 record for quality of riding surface on bituminous plant-mixed surfacing was shared by two projects:

Contract 1-4TC86-F, Route 5, between Greenville and 1.5 miles west of Livermore, Harms Bros. and N. M. Ball, Contractors, J. F. O'Brien, resident engineer.

Contract 1-7VC141-F,* Santa Ana Parkway, between Rosecrans Ave. and Orange county line, Peter Kiewit Sons, Contractor and B. N. Frykland, resident engineer.

Each contract had a roughness index of 6.4 inches per mile.

The average for the State was 11.2 inches per mile as compared to the previous low of 14.6 inches per mile in 1942.

* Contract 1-7VC141-F contained both asphaltic concrete and plant-mixed surfacing.

ASPHALTIC CONCRETE SURFACING

Asphaltic concrete, once a major type of surfacing, was used on only 2 percent of the asphaltic type surfaces.

Present day asphalt concrete is laid without the use of side forms with self propelled mechanical spreading and finishing equipment.

ROAD-MIXED SURFACING

The total mileage of road-mixed surfacing constructed under contracts completed during 1950 was 95 miles which was 22 percent of the total bituminous surfacing placed by the State.

The road-mixed method of bituminous construction, while not requiring the oil, moisture, or aggregate gradation control of the plant-mixed method, does have a place in the construction of low cost highways in remote regions. It continues to be an economical type of pavement construction in the desert regions where drying conditions are suitable and in remote areas for small jobs that do not warrant a plant set-up.

Prevalence of road-mixing in the desert regions is illustrated by the fact

that 79 percent of all road-mix mileage laid in 1950 was done in Districts IX and XI.

The record for road-mixed surfacing smoothness was on Contract 1-11VC59, Route 187 between Holtville and Calipatria. The contractor was Arthur A. Johnson and the resident engineer was W. L. Cattell. The roughness index was 13.4 inches per mile. Average roughness for the year was 23.1 inches

per mile which compares favorably with the previous low of 23.4 inches in 1943.

BITUMINOUS SURFACE TREATMENT

No attempt was made to compare the riding characteristics of bituminous surface treatments. This surfacing calls

for treatment of the existing materials and there are no specifications for the mineral aggregate. Since it is obvious that the riding qualities of the surfacing are partly dependent on the aggregate grading, and that the contractor and engineer cannot obtain a riding quality higher than that inherently in the aggregate, it would be unfair to compare all such projects on an equal basis.

PORTLAND CONCRETE CEMENT PAVEMENT

Location	Contractor	Resident Engineer	Street Man	Average cu. yds. placed per day	Average strength, 28 days, lbs. per sq. inch	Roughness index, inches per mile
Eastshore Freeway, south city limits Oakland— 16 miles south High Street	Frederickson & Watson Const. Co.	J. F. O'Brien	E. Carlstad & J. W. Vickrey, Jr.	651	3735	5.8
Route 5, Greenville—1.5 miles west Livermore	Harms Bros. & N. M. Ball Sons	G. L. Beckwith	L. Marshall	755	3495	5.7
Route 2, .2 mile east Ventura County Line— .2 mile east Carpinteria	Granite Const. Company	J. C. Adams	C. L. Bunce	358	3563	7.3
Route 4, 1 mile south Tipton—Tulare Airport	N. M. Ball Sons	C. F. Oliphant	J. T. Landers	1040	2622	6.9
Bakersfield, Golden State Ave., 23st-H St., north Garces Circle	Griffith Co.	W. M. Nett	O. R. Adams	691	3270	5.8
Rosemead Blvd., Beverly Blvd.—Garvey Avenue	J. E. Haddock, Ltd.	F. A. Read	R. H. Butler	559	3325	6.7
Route 4, Mariposa Road south of Stockton— Calaveras River	United Concrete Pipe Corp.	F. Fleharty	R. K. Wells	540	3810	6.9
Route 7, .25 mile west of Napa County Line— Cordelia Underpass	Parish Bros.	E. L. Craun	M. B. Rowan	814	4315	6.2
Route 4, Turlock-Keyes	United Concrete Pipe Corp.	W. L. Hurd	J. Schook	551	3630	5.2
			Average	662	3520	6.3*

* Weighted average.

ROAD-MIXED SURFACING

Location	Contractor	Resident Engineer	Roughness Index Inches per Mile
Rte. 48, Maple Creek—1.2 miles easterly	A. R. McEwen	A. J. Braga	28.1
Rte. 89, 5.4 miles—6.0 miles north of Middletown	Arthur B. Sin, Inc.	C. Morrison	55.5
Quincy High School line change	Steele and Easton	J. L. Fonseca	37.8
Rte. 57, 4 miles east of Cuyama Maintenance Station— 3 miles west of SLO county line	Rand Const. Co.	M. A. Dawson	19.2
Lovers Lane, State Rte. 134—6 miles north	George France	W. C. Clark	13.8
Rte. 41, Kingsburg Canal (near Centerville)	Fred F. Braun	R. Windele	55.0
Rte. 57, 6 miles west—2 miles west of San Emidio Road	Rand Const. Co.	W. M. Nett	21.3
Rte. 127, Soda Plant—8 miles south	R. A. Erwin	F. N. Roberts	21.7
Rte. 23, Little Lake—3 miles north	Halloran & Gill	M. D. Tetrick	17.4
Rte. 111, 1 mile north of Grant Lake—Junction Rte. 23	Westbrook and Pope	W. E. Kip	18.5
Rte. 145, Searles Road—Rademacher	E. C. Young and Co.	R. M. Kelly	26.8
Rte. 23, Aberdeen and Black Rock Curves	E. C. Young and Co.	R. W. Fisher	17.8
Rte. 95, Rte. 23—Topaz	Harms Bros.	G. J. Snyder	31.4
Rte. 212, Kern county line—5.5 miles east of Salt Wells	Oilfields Trucking Co. and Phoenix Const. Co.	F. E. Thompson	23.2
Rte. 187, At Sandia and Alamorio Turns	E. C. Young and Co.	W. L. Cattell	22.2
Rte. 202, Ash Canal—South Alamo Canal	Hubbs Equipment Co.	W. L. Cattell	14.7
Rte. 27, Midway Wells—Colorado River	E. S. and N. S. Johnson	W. R. Connelly	18.0
Rte. 187, Holtville—Calipatria	Arthur A. Johnson	W. L. Cattell	13.4
Rte. 64, Indio—Black Butte	R. P. Shea Co.	W. L. Cattell	23.6
		Weighted Average	23.1

BITUMINOUS PLANT-MIXED SURFACING

Location	Contractor	Resident Engineer	Tons per Day	Roughness Index Inches per Mile	Remarks
Rte. 1, Klamath River Bridge—Wilson Creek	Harms Bros. & C. M. Syar	E. J. Reed	608	6.7	
Rte. 1, 1 mile south of Orick—2 miles south of Del Norte county line	Mercer Fraser Co., Mercer Fraser Gas Co.	R. L. Meyers	516	7.6	
Rte. 1, 5 miles south of Stone Lagoon Summit—1 mile south of Orick	Mercer Fraser Co., Mercer Fraser Gas Co.	H. M. Hansen	515	8.3	
Rte. 3, Anderson—Clear Creek	Frederickson and Watson Const. Co.	W. Z. Hegy	428	6.8	
Rte. 28, Chambers Ranch—Alturas	Clements Co.	W. H. Bartlett	810	10.6	
Rte. 7, Southerly District Boundary—Proberta	McGillivray Const. Co.	R. J. Wilson	1080	8.4	3000# Stationary Batch Plant
2 miles east of Chico—Paradise	A. G. Raisch Co.	E. H. Wyman	725	11.0	
Rte. 87, Tudor Road—Lincoln Road	Rice Bros.	G. B. Sherman	503	8.8	
Rte. 37, 1 mile east of Auburn—1 mile west of Applegate	Frederickson Bros.	F. D. Hillebrand	848	10.7	
Rte. 6, south half Yolo Causeway	Brighton Sand and Gravel	H. A. Towne	438	8.6	
Rte. 87, Marysville—Butte County line (various locations)	Rice Bros.	M. Chapman	295	15.3	
Rte. 87, Sutter Causeway about 12 miles north Knights Landing	Rice Bros.	G. B. Sherman	350	10.6	
Rte. 5, Greenville—1.5 miles west of Livermore	Harms Bros. & N. M. Ball Sons	J. F. O'Brien	419	6.4	
Rte. 1, Ignacio—Richardson Bay Bridge	A. G. Raisch Co.	C. W. Schemel	550	12.2	
Rte. 42, .3 mile south Saratoga Ave.—1 mile south (near Saratoga)	Dan Caputo & E. A. Keeble	R. J. Norris	442	11.0	
Rte. 107, at Roseworns under-crossing 1.5 mile east of Niles	Elmer J. Warner	L. G. Marshall	323	10.8	
Rte. 8 and 49, Foster Road—Union Station	Frederickson Bros.	E. J. Carter	601	9.9	
Rte. 56, Frenchman's Creek—1 mile north (near Half Moon)	Eugene G. Alves	W. G. Remington	397	24.5	
Rte. 2, Gilroy—2-6 miles south of Gilroy	Frederickson & Watson Const. Co.	R. J. Norris	735	10.0	
Rte. 2, 3.3 miles south of San Jose—Madrone (Various locations)	Leo. Piazza	E. W. Strandberg	739	12.3	
Avila Road, Ontario Hot Springs—Avila	Granite Const. Co.	H. J. Holman	515	9.6	
Rte. 2—Gonzales—Chualar	Rice Bros.	M. A. Dawson	716	10.5	
Rte. 2, Spence underpass—2 miles south of Salinas	Rice Bros.	J. M. Sturgeon	598	11.3	
Rte. 2, 6 miles east of Arroyo Quemado—.7 miles west of Arroyo Hondo	Clyde W. Wood	G. T. McCoy, Jr.	409	10.5	
Rte. 2, Cuesta Siding—1 mile south of Santa Margarita	Granite Const. Co.	V. E. Pearson	519	10.0	
Rte. 56, San Julian Road, Jalama Road—Rte 149	Rand Const. Co.	M. A. Dawson	565	11.6	
Rte. 2, Orcutt Wye—Santa Maria	Madonna Const. Co.	A. L. Lamb	1005	10.5	Continuous Mixer
Rte. 2, 2 miles east of Ventura County line—.2 miles east of Carpinteria	Granite Const. Co.	J. C. Adams	475	9.3	
Rte. 33, Rte. 125—Kern County line	Granite Const. Co.	W. J. Pairine	539	11.9	
Brundage Lane, Union Ave.—Fairfax Road	Oilfields Trucking Co. and Phoenix Const. Co.	J. W. Cole	495	9.5	
Madera Ave., Church Ave.—Adams Ave.	Gene Richards Inc.	H. R. Langworthy	770	13.1	
Rte. 4, 1 mile south Tipton—Tulare Airport	N. M. Ball Sons	C. F. Oliphant	438	9.7	
Rte. 10, Visalia—Venida Substation	Griffith Co.	C. F. Oliphant	1290	9.1	Continuous Mixer
Rte. 4, San Fernando Blvd.—Burbank Blvd.	Griffith Co.	R. M. Cooley	514	10.6	Asphaltic Concrete
Rte. 2, near El Rio and Oxnard	Griffith Co.	M. F. Masters	664	12.2	Asphaltic Concrete
Rte. 60, Washington Blvd.—Venice Blvd.	Jesse S. Smith and A. A. Edmondson	L. E. Steele	496	16.3	

BITUMINOUS PLANT-MIXED SURFACING—Continued

Location	Contractor	Resident Engineer	Tons per Day	Roughness Index Inches per Mile	Remarks
Firestone Blvd., Lakewood Blvd.—Rosecrans Ave. -----	Basich Bros. Const. Co. and Basich Bros. -----	A. W. Carr -----	960	14.5	Continuous Mixer
E. Foothill Blvd. and Mountain Ave.—Shamrock Ave. and Huntington Drive	Vido Kovacevich Co. -----	D. J. Faulkner -----	841	11.5	Asphaltic Concrete
Rte. 213, Pacoima Creek—Saure Ave. -----	Vido Kovacevich Co. -----	F. E. Sturgeon -----	945	10.2	
Grand Ave., Artesia Ave.—A. T. & S. F. underpass -----	Cox Bros. -----	C. J. McCullough -----		25.6	Production rate not available
Anaheim-Telegraph Road, Hoefner Ave.—A. T. & S. F. underpass -----	Griffith Co. -----	C. E. Dresser -----	577	10.7	
Santa Ana Parkway, Rosecrans Ave.—Orange County line -----	Peter Kiewit Sons Co. -----	B. N. Frykland -----	990	6.4	Continuous Mixer A. C. and P. M. S.
Oxnard Blvd., north city limits—south city limits (Oxnard) -----	Baker and Pollack -----	M. F. Masters -----	642	12.5	Asphaltic Concrete
Rte. 60, south city limits (Newport Beach)—Myrtle Ave (Laguna Beach) -----	Hensley Const. Corp. -----	L. W. Sixt -----	1005	14.5	Continuous Mixer
Huntington Beach Blvd., Garfield Ave.—23d St. -----	Sully-Miller Const. Co. -----	C. J. McCullough -----	1150	9.3	4000# Stationary Batch Plant
Sepulveda Blvd., Sunset—Ventura Blvd. -----	Schroeder and Co. -----	H. F. Meinke -----	636	15.5	3000# Stationary Batch Plant
N. Figueroa St., Marmion Way—Ave. 50 -----	C. O. Sparks, Inc. and Mundo Engr. Co. -----	R. A. Collins -----	750	16.8	
Rte. 2, east city limits—San Jon Road (city Ventura) -----	Griffith Co. -----	M. F. Masters -----	834	15.8	
Rte. 164, Imperial Hwy.—Century Blvd. -----	Oswald Bros. Co. -----	F. A. Reed -----	615	12.3	
Sepulveda Blvd., Ohio Ave.—Bolas St. -----	Jesse S. Smith -----	H. F. Memke -----	974	18.5	
Firestone Blvd., Central Ave.—Ivy St. -----	C. O. Sparks Inc. and Mundo Engr. Co. -----	R. A. Collins -----	600	8.7	
San Clemente, Mile 1.77—Mile 3.89 -----	Sully-Miller Const. Co. -----	L. W. Sixt -----	832	14.1	
S. Figueroa St., Lomita Blvd.—I St. -----	Warren Southwest, Inc. -----	D. J. Faulkner -----	925	14.5	
Olympic Blvd., Lemon St.—Boyle Ave. -----	Griffith Co. -----	R. A. Collins -----	1540	19.2	11 hrs. per day 4000# Stationary Batch Plant
Pacific Coast Highway, A. T. & S. F. overhead—Figueroa St. -----	Griffith Co. -----	D. J. Faulkner -----	750	16.0	
Foothill Blvd., Sierra Madre Villa Ave.—Michillinda Ave. -----	J. E. Haddock -----	D. J. Faulkner -----	900	12.3	
Rte. 207, Long Point—1.3 miles west of Running Springs -----	Fredericksen and Kasler -----	T. A. Bannister -----	923	9.3	
Rte. 43, Russell St.—.3 mile north San Bernardino County line (city Riverside) -----	J. A. Payton -----	W. H. Crawford -----	719	7.8	
Rte. 77 and 192, 3.6 miles west Corona and Pine Ave. about 7.5 miles south of Ontario -----	A. Teichert and Son, Inc. -----	K. B. Stone -----	471	10.1	
Rte. 190, E. St.—east city limits (city San Bernardino) -----	George Herz -----	W. Ford -----	723	10.3	
Rte. 31, Manix—Cronise Lake -----	Basich Bros. Const. Co. and R. L. and N. L. Basich -----	H. C. Prentice -----	1181	9.7	Continuous Mixer
Rte. 26, San Antonio Ave.—Corona St. (city Ontario) -----	George Herz -----	L. M. Barnett -----	1280	13.8	2 Plants Used
Highland Ave., 1 mile west Riverside Ave.—1 mile west of Cajon Creek -----	R. A. Erwin -----	S. J. Smith -----	432	10.3	
Rte. 190, north city limits—Rte. 26 and Orange St.—east city limits (city Redlands) -----	George Herz -----	L. B. Barnett -----	680	9.7	
Rte. 192, 3 mile south of south city limits—Dessau St. (city Ontario) -----	Cox Bros. -----	K. B. Stone -----	565	8.1	
Rte. 23, Conway Summit—Bodie Road -----	Harms Bros. -----	W. R. Coons -----	688	12.0	
Rte. 23, Los Angeles County line—Freeman junction (portions) -----	G. W. Ellis -----	F. N. Roberts -----	685	15.1	

BITUMINOUS PLANT-MIXED SURFACING—Continued

Location	Contractor	Resident Engineer	Tons per Day	Roughness Index Inches per Mile	Remarks
Los Banos—Pipe Line Road	Covina Const. Co.	H. Jantzen	663	11.3	
Thornton Road, Benson Ferry Bridge—8 mile southeasterly	M. J. B. Const. Co.	C. Plecarpo	275	18.2	
Grant Line Road, State Rte. 5 northwest of Tracy-Holly Sugar Spur	P. J. Moore and Son	C. Plecarpo	727	13.5	
Vander-Vacaville and Vacaville-Elmira	Frederickson Bros.	R. Dixon	420	31.2	
Wilson Way, East Charter Way—north city limits (city Stockton)	A. Teichert and Son	R. K. Wells	826	14.1	
Rte. 13, Junction Rte. 109—1 mile east of Oakdale	Munn and Perkins	M. B. Rowan	435	8.5	
Rte. 32, 10.4 miles east Los Banos—San Joaquin River (portions)	Valley Paving and Const. Co.	H. Jantzen	831	10.8	
Rte. 7, Junction county road to Vacaville—2.5 miles north (portions)	Frederickson Bros.	E. L. Craun	714	7.5	
Rte. 53, 4 miles east of Terminous	Claude C. Wood	F. Fleharty	315	11.2	
Rte. 18, 1.7 miles west of Mariposa County line—Cathay Junction	Rice Bros.	F. Fleharty	747	8.7	
Rte. 77, Miramar—Lake Hodges	Peter Kiewit Sons	G. L. Richardson	1483	12.3	
Rte. 2, Del Mar—San Onofre (portions)	Griffith Co.	J. A. Jespersen	1150	11.9	Continuous Mixer 4000# Stationary Batch Plant
Rte. 2, 16th St.—7th St. Channel (National City)	R. E. Hazard Const. Co.	W. T. Rhodes	500	14.4	
Pacific Highway, Counts St.—Rosecrans St. (city San Diego)	Cox Bros.	L. G. Cline	392	70.6	
				Weighted Average	11.2

LETTER FROM RIVERSIDE

COUNTY OF RIVERSIDE

June 4, 1951

MR. G. T. MCCOY,
State Highway Engineer
Division of Highways
Sacramento 7, California

DEAR SIR: The contractor will this week complete the bridge over the Whitewater River at Thermal.

The completion of this bridge will be a worthy and needed addition to the improvements on this county's federal aid system.

The assistance given this office by your staff—both Mr. Sweet and others in the Sacramento office, and Mr. Green and his staff in the Los Angeles office—is greatly appreciated.

May we also thank you for the courteous treatment accorded Mr. Powell in connection with the proposed bridge over the Santa Ana River on Crestmore Road during his recent visit to Sacramento.

Very truly yours,

A. C. KEITH
County Surveyor and Road
Commissioner

Highway Dodgerettes Seek Championship



Highway Dodgerettes—FRONT ROW, LEFT TO RIGHT: Shirley Hicks, Mary Bush, Arleen Scott, Clarene Heon, Salley Jaime, Agnes Raker. REAR ROW, LEFT TO RIGHT: Paul Wulff (Manager), Ann Pratt (Coach), Shirley Meredith, Esther George, Hazel Blair, Velora Meredith, and Corinne Dolce.

THE HIGHWAY DODGERETTES, sponsored by the Public Works Athletic Association and managed by Paul Wulff, are beginning their second season in the Girls Night City Soft Ball League. Ann Pratt is the coach.

They were the winners of the 1950 Sacramento City Championship in B Division. This enabled the team to get its uniforms and equipment for this year.

To date the Dodgerettes have had one tie game with Anglo Bank—score 8 to 8. The girls are all out to win the 1951 championship.

Bayshore Freeway

Continued from page 4 . . .

to be built between these two cities, and it will require another \$50,000,000 to complete it to modern freeway standards.

"A major undertaking—financially comparable to your magnificent Bay Bridge—a necessary undertaking! Upon this highway traffic builds up from over 11,000 vehicles per day just north of San Jose to more than 60,000 per day at this section, which is near the ultimate San Francisco terminus. The estimated 1970 comparable figures are 20,000 and 105,000 vehicles per day.

"But vehicles per day are not the only evidence of importance of a route, nor the only justification for building freeways to modern standards, or spending these sums of money.

Accident Rates Important

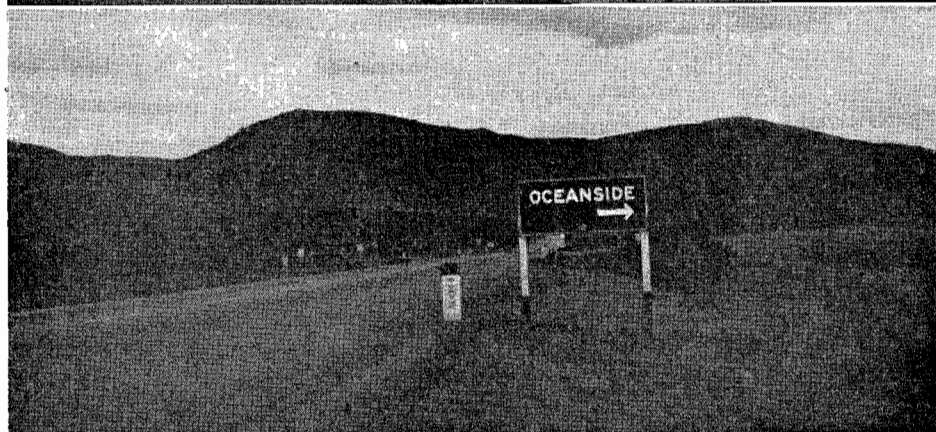
"Accident rates are important and I am able to report to you that on freeways built during the last four years, the death rate on them is 73 percent less than the death rate reported for all our highways in the year 1949. To be more specific, in a major city of the southland, we have a freeway and an ordinary state highway carrying nearly comparable traffic, approximately 45,000 vehicles per day on each, with slightly more on the freeway. The accident rate per million motor vehicle miles on the highway is at the state-wide average; the rate on the freeway only one-sixth of that amount.

"Freeways in high traffic areas are not only desirable but highly necessary. I can assure you that your State Highway Commission is concerned with this problem, and that this state route, a portion of which is completed for use today, will be constructed to freeway standards as rapidly as possible consistent with the needs, requirements and fairness to other parts of California.

"But let us not be too optimistic about getting this and the other freeways of California completed at an early date.

"Apparently we have been making progress, substantial progress, in the freeway program, not only here but throughout the State of California. But, in fact, we are still losing in the struggle to catch up with the growing

OCEANSIDE APPRECIATES HIGHWAY SIGN



UPPER—Oceanside directional sign visibility in daylight
LOWER—Visibility at sunset

APPRECIATION of the action of the Division of Highways in placing a directional sign at the intersection of State Route 195 and US 395, directing traffic to Oceanside in San Diego County, has been received by Director of Public Works C. H. Purcell from Arthur L. Strong, Chairman of the Highway Committee of the Oceanside Chamber of Commerce.

"The Oceanside Chamber of Commerce," Strong wrote, "requested that

demands, the necessary requirements of present-day highway traffic.

"California is still a growing State in every respect except land area. The greatest migration the world has ever known is damming up here on the

a suitable sign directing traffic to Oceanside be erected at the intersection of State Route 195 and US 395. We were given the sign without cost and are very grateful for it and the recognition of the importance of State Route 195.

"We are enclosing a couple of photographs of the Oceanside sign, one taken at 3 p.m. and one at late twilight. We feel that these pictures tell the story better than we could tell it with words."

Pacific Coast. We now have more than 10,500,000 people within our boundaries, and more than 5,100,000 motor vehicles registered for use. More vehicles than any other state in the Union,

. . . Continued on page 41

No Damages

San Diego Jury Supports the State in Freeway Litigation

By JAMES R. SMITH, Right of Way Agent

A NOTEWORTHY ADDITION to the volume of actual records indicating the beneficial effects of freeway construction on the value of abutting properties is a recent San Diego court case.

The property involved is located on the southeast corner of 10th Avenue and Ash Street in San Diego. Ash Street was made a primary approach road to the Cabrillo Freeway, while 10th Avenue became a one-way artery, delivering freeway traffic into the downtown street system. The construction of the highway improvement transformed a little used park road and its feeders into high volume arteries fusing traffic from U. S. 80 and 395 and directing it into the main business area.

In the fall of 1948, after unsuccessful attempts at negotiation, the property owner requested court action to determine the damages to his property by the State's taking of the access rights along Ash Street.

The defendant's witnesses during the course of the trial testified that the taking of access rights had the effect of changing the character of the prop-



Southeast corner of 10th and Ash Streets in San Diego before construction. Stucco apartment building visible at extreme right. Ash Street approach to Cabrillo Freeway in left foreground.

erty from a corner lot to an inside lot, the resulting difference between the two representing a diminution in value, ranging from \$3,800 to \$6,000.

State's Contentions

In light of the subsequent development, it is interesting to review the contentions made by the State prior to the acquisition, and concurred in by

the impartial expert witnesses employed by the State at the trial, that the taking of access rights along the north side would have no adverse effect on the development of the lot for its highest and best use, which was for apartment house purposes, because entrance ways could be best developed on the 10th Avenue frontage, that the property after the taking would still retain all the valuable attributes of the corner lot, such as light, air, and view, and in addition the property would enjoy special benefits to the extent of \$2,500 through increased prominence and advertising value due to the construction of Ash Street as an integral part of the freeway.

The jury indicated its concurrence in the opinion of the State's witnesses by arriving at a verdict of no damages and special benefits of \$2,500.

Property Value Increases

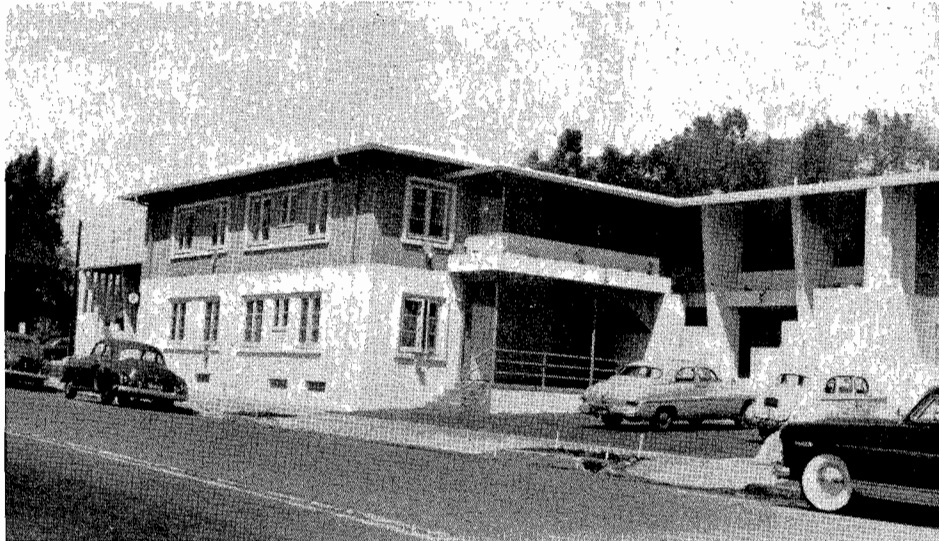
The subsequent development of the property is graphically portrayed in the accompanying before and after photographs. The degree to which the entire holding was developed to its highest and best use and the rapidity

Southeast corner of 10th and Ash Streets after construction. Motel is fronting on 10th Street.



with which this was accomplished after the freeway had been constructed, is indicative of the enhancement by highway improvement.

The subject property with its two old single family residences was purchased in 1948, prior to the freeway construction, for \$17,500 by the owner of the adjoining lot. The improvement on this adjoining lot consisted of a two-story stucco apartment building.



This after-construction photograph shows south end of motel

In the fall of 1950, the owner entered into a 49-year lease with the nationally known Travelodge Corporation for the two lots. The corporation immediately demolished the three old buildings and has since constructed in their place, without cost to the owner, the present modern apartment-motel, containing 15 hotel rooms and 18 bachelor apartments with kitchenettes, shown in the accompanying photograph.

Revealing Figures

The lease provides for a monthly rental to the owner of \$300. This is an

annual net income of \$3,600 to the owner, the equivalent of a 5 percent return on a \$72,000 investment because the lessee pays all expenses, including taxes and public utilities, and no management is necessary on the part of the owner.

The property prior to execution of the Travelodge lease indicated a capitalized value of \$48,000, based on a 5 percent return on a net income of

\$200 per month, after subtractions for costs of management, taxes, insurance, depreciation, maintenance, utilities, and incidental operating expenses from the prior average gross income.

The present indicated value of \$72,000 is secured by a \$242,000 building which guarantees beyond a doubt the payment of the \$300 monthly rental for the 49-year term of the lease. By adding the value of the building at the termination of the lease, an amount in excess of the \$72,000 is indicated as the present value of the property, which is a 50 percent increase in the two years following completion of the freeway.

Bayshore Freeway

Continued from page 39 . . .

more autos in relation to population than any other state or nation in the world, and still they come, crowding our highways with an additional 100,000 or 200,000 cars which individually stay but a short time, but collectively remain pretty much the same total throughout the year.

“This increase in population and vehicle registration, the increase in use per car per year that is taking place, have necessitated changes in design and planning—more traffic lanes—more structures—wider rights of way. Cost of construction per unit is also climbing—35 percent in the last year.

Charles H. Parker Retires to Enter Private Practice

CHAS H. PARKER, who established the first Hydraulics Department in the Division of Highways, in District VII in 1938, and who has headed, directed and instructed that department ever since, has retired after 23 years with District VII. He persistently advocated a concept of highway drainage based on the utilization of approach velocities, the application of Bernoulli's constant method of nonuniform flow design, and the doctrine that most culvert failures are the result of inlet ponding or outlet erosion.

“Chuck” had completed 38 years of engineering practice and had established and taught enough principles of storm water run-off to satisfy most men, but is determined to pursue his specialty as an avocation and will practice hydraulics, hydrology, and drainage as a consulting engineer.

“The result—well, though we have spent or allocated more than \$460,000,000 in the first five-year period, the unbudgeted critical deficiencies as of January 1, 1951, now total \$3,000,000,000, with an income for rights of way and construction of approximately \$100,000,000 per year. San Francisco's portion in this deficiency list amounts to \$173,600,000 within her county boundaries. You may do your own calculating as to when this program will be completed.

“I say these things to you, not in advocacy of additional taxes or changed laws, but that you may know the facts, understand the problems of the State Highway Commission and be more charitable to and less demanding of us when we are unable immediately to solve your highway problems, untangle your traffic snarls, and reduce your accident rates as soon as we all would like to see these things accomplished. It all amounts to a Herculean task. Let us all cooperate to build a whole highway system carefully, thoughtfully, with full view not only of the present but also of the future. Let us all with patience join in building California as she should be built.”

Sets Record

Highway Foreman on Job 30 Years
Without Loss of Day Due to Accident

By J. H. BUCKLE, District Safety Supervisor

THIRTY YEARS without losing a day's work due to an accident!

That's the safety record of Foreman G. C. Brunk of District VI, Fresno. This is indeed a remarkable record when you consider that for years Brunk was stationed at Oak Glen on the Ridge Route south of Bakersfield where traffic always is heavy and snow conditions induce added hazards in the winter.

Mr. Brunk, however, is not the only safety-conscious employee in District VI. Ninety-six safety awards were made in this district for the year 1950, and it is not easy to get a safety award in District VI.

Purcell Directive

District Engineer E. T. Scott, following the directive of State Highway Engineer C. H. Purcell in 1940 that a corrective safety program be inaugurated to reduce the high employee accident rate, outlined the basic principles for a district program:

1. That employee safety would be the responsibility of supervision at all levels in a manner similar to other aspects of work control.

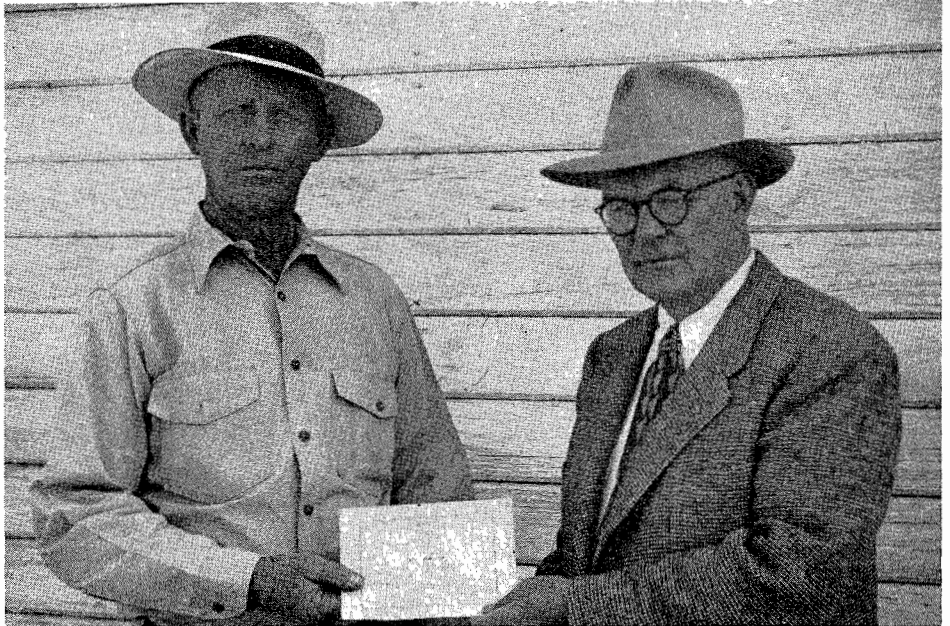
2. That safety considerations would be given appropriate weight in efficiency reports of supervisors and employees alike.

3. That the basic weapon with which to attack the problems would be a district safety council.

4. That membership in the council should be restricted to employees in the lower brackets under the theory that men who suffer the accidents are in the best position to determine how to prevent them.

Competition Encouraged

5. That the basic ideas as to how to prevent specific types of accidents would originate in the field and the function of district office personnel would largely be to encourage and co-ordinate, supply basic facts from accident analysis, direct efforts into needed channels, evaluate ideas, attempt to put worthwhile suggestions into effect, disseminate information



Foreman George C. Brunk, left, receiving from C. F. Waite, Assistant District Engineer, his Safety Certificate

and otherwise assist the safety council in its constant search for preventive measures.

6. That competition between individuals and groups should be encouraged.

7. That maximum recognition would be given to individuals and organizational units for safety achievements.

8. That within the organization as wide publicity as possible be secured for all types of safety information so as to engender and maintain safety consciousness.

District Safety Council

The district safety council consists of a member from each maintenance superintendent's territory, a member from the Equipment Department, and field engineers from the Engineering Section. Since the council is to represent men in the field, councilmen from the grade of foreman or below are selected from and for the maintenance and shop crews. Field engineers are represented by a member below the rank of resident engineer. Councilmen are elected by the men in the territory which they represent. Offices are for one year and elections are staggered.

Council meetings are held about every six weeks. Not all of the members attend every meeting. Meetings are held in different locations in the district so that all the members have an opportunity to attend at one time or another.

Recommendations and suggestions made by the Council are presented to a district safety committee of administrative officers appointed by the district engineer. The district safety committee can take direct administrative action or refer questions for advice and decision to the division safety committee at headquarters in Sacramento.

Various Safety Awards

Chairman of the district committee is C. F. Waite, assistant district engineer. Serving on the district committee are F. E. Baxter, maintenance engineer; F. M. Roush, construction engineer; E. W. Taylor, traffic engineer; E. R. Bunker, right-of-way agent; and W. H. Riechel, shop superintendent. J. H. Buckle, safety supervisor, is secretary of the committee.

The district safety council issues safety awards for good safety records. Certificates, lapel pins and a trophy are used. All field employees are classified into two groups. Maintenance and shop employees below the grade of foreman are classified as being in "hazardous" occupations. Foremen and field engineers are in "semihazardous" occupations.

Employees in hazardous occupations must work five years without a lost-time accident to receive a second-class certificate. A gold seal is added for each additional year to 10 years. For 10 years without a lost-time accident, an employee receives a first-class certificate. Gold seals are then added yearly to the fifteenth year, at which time an employee is presented with a gold lapel pin.

Trophy Awarded Each Year

Employees in semihazardous occupations work eight years to receive a second-class certificate, thirteen years to be eligible to receive a first-class certificate and 20 years for a pin.

The trophy is awarded each year to the superintendent's maintenance crew which has the best accident record, the lowest frequency rate, for the year. If the crew holds the lowest frequency rate for three consecutive years, that crew keeps the trophy permanently. Two crews have permanent trophies. The Taft crew, under Maintenance Superintendent L. W. Seymour, and the Porterville crew, under Superintendent A. F. Jeffrey, have both maintained three years of record without a lost-time accident.

Gold seals, pins and trophies are financed by contributions from the district department heads and other supervising personnel. The State provides only the printed certificates.

District VI has the distinction of having made the lowest frequency rate, that of 13.22, for any year of the 10 years of Division of Highways' record. Three years the district held first place. Six times the district placed among the top three. Only twice has the district dropped below the yearly state-wide district frequency rate.

TRAFFIC ACCIDENT TOLL

An average of 33 American soldiers was killed daily in Korea during the first year of the war, while at home automobile deaths averaged 99 a day.

Venture Success

Continued from page 7 . . .

Ample Parking Space

The building averages 15,000 square feet and the location has parking facilities for about 138 cars, with additional space available for potential expansion. All of which—considering the magnitude of this venture—implies that Safeway expects the freeway to prove no barrier to business volume in the new super market.

Inquiry at the company's headquarters reveals that an extensive and impressive array of research is involved in the search for probable profitable sites for Safeway's new retail stores.

starts out with the odds in its favor provided our facts and figures and foresight are substantiated."

Experimental Venture

Regarding the reasons for selecting the site adjacent to the freeway in Vallejo, the company frankly admits:

"The problem of freeways is increasing and many business firms must face it sooner or later. We decided to face it in Vallejo in the hopes of finding some valuable answers."

That the company is discovering some valuable answers to the question of freeways is evident since the Vallejo store opened for business recently.



This is a front view of the modern food store constructed by Safeway Stores, Inc., in Vallejo

The company has maps made to order of all cities and towns in which Safeway operates. The maps are all to the same scale and contain such essential information as population, traffic, important civic buildings, zoning, etc.

"In some cases," explains a company spokesman, "we have special surveys made by our research department, and these may be to determine shopping habits within a specified area, or to establish the amount of foot and vehicular traffic passing a certain site. All in all, there's a great deal of factual study undertaken before a location is selected for a Safeway store. Thus, with the guesswork removed, the new store

While not wishing to reveal actual figures or submit to prophesying at this early date, Safeway sources hint that the volume in the new store is exceeding the fact-finders' estimates. Thus while a freeway may speed up traffic, it doesn't restrict the freedom of shoppers—and customers will continue to "beat a path to the door" of any business that has what the customers desire.

Another vital factor advanced by many firms located on off-roads paralleling freeways is added safety. Guests or patrons can park their cars on secondary highways in comparative

. . . Continued on page 49



Highway Commissioner Harrison R. Baker operates controls of huge shovel at Colorado Bridge ground-breaking ceremonies. On his right are Highway Commissioners Chester H. Warlow and Charles T. Leigh.

Ground Broken

Continued from page 6 . . .

projects have been larger, but the contract awards have been in smaller units. The entire cost of the project, including the bridge, right of way and the freeway approaches extending from Patrician Way on the west to Holly Street on the east, will be approximately \$6,000,000.

Freeway Approaches

"The present Colorado Street Bridge, which was built in 1912-1914 to serve the traffic of that day when there were 35,000 registered motor vehicles in the County of Los Angeles, is a world famous and beautiful structure which has served its purpose well.

"It was designed by Waddell & Harrington, eminent bridge engineers, and built by Mercereau Bridge and Construction Co. at a total cost of approximately \$200,000 for the structure and some \$30,000 for right of way.

"Funds have been budgeted for the construction of the freeway approaches to the new bridge extending about three-fourths mile to Patrician Way on the west and to Holly Street on the east. The contracts for this construction will be let during the coming year so that the freeway approaches will be completed and placed in use concurrently with the bridge.

"As a symbol of the future it is our hope that this new bridge structure

Highway Agencies Conduct Course in Photogrammetry

By SCOTT H. LATHROP
Assistant Engineer, Public Relations
and Personnel

UNDER THE JOINT sponsorship of the California Division of Highways and the U. S. Bureau of Public Roads, a course on photogrammetry as applied to highway location was held in Sacramento from April 2d to April 13th. Of those receiving instruction, 23 were from the California Division of Highways, nine from the U. S. Bureau of Public Roads, three from the Arizona Highway Department and one from the California Division of Water Resources.

The instructor was William T. Pryor of the Washington office of the Bureau of Public Roads. Pryor is one of the outstanding authorities on the application of aerial surveying, or stereophotography, to highway location and has used these methods in locating highways in Alaska and Panama, as well as in many sections of this Country. At present he is engaged in applying the principles to the reconnaissance for the Mississippi Valley Parkway.

The first week of the course was devoted to lectures covering all phases of the subject, including early development of aerial surveying, the use of various available plotting machines and the theory and practice of photogrammetry as applied to the location of highways. Underlying theories were developed and their application to practical problems demonstrated by means of slides and photographs.

During the second week all the time was given to actual practice with aerial

will be a part of a great freeway extending easterly and westerly to serve the traffic needs of the foothill area, probably to be known as the Colorado Parkway, and as such, to serve as another link in the chain of the great metropolitan freeway system so urgently required to serve the traffic needs of this populous Southern California area."

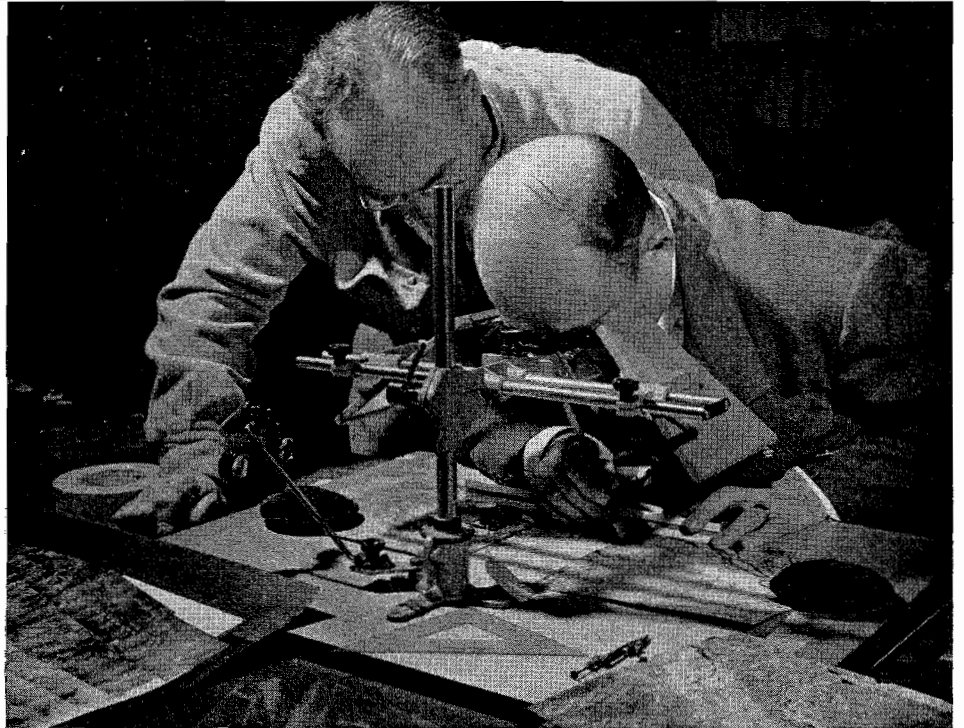


photographs and stereoscopes. Instruction was given in applying the principles covered previously to the location of a section of highway from 10 to 20 miles long.

On Monday afternoon of the second week, an inspection trip through the topographic office of the U. S. Geological Survey was arranged for all the students. This office uses many of the methods and machines which were discussed by Pryor. Arrangements for the trip were made with Conrad Ecklund, and the details of the inspection were handled by D. H. Rutledge, both of whom are with the U. S. Geological Survey. The information gained on this trip was of great help in aiding the students to make practical application of the theoretical material which had been presented to them.

The engineers assigned to this course were well grounded in the theory and practice of highway location by the older conventional methods.

This study of photogrammetry is expected to result in more extensive use of the latest aerial techniques in highway location, with resultant savings in cost and more rapid completion of plans for future construction.



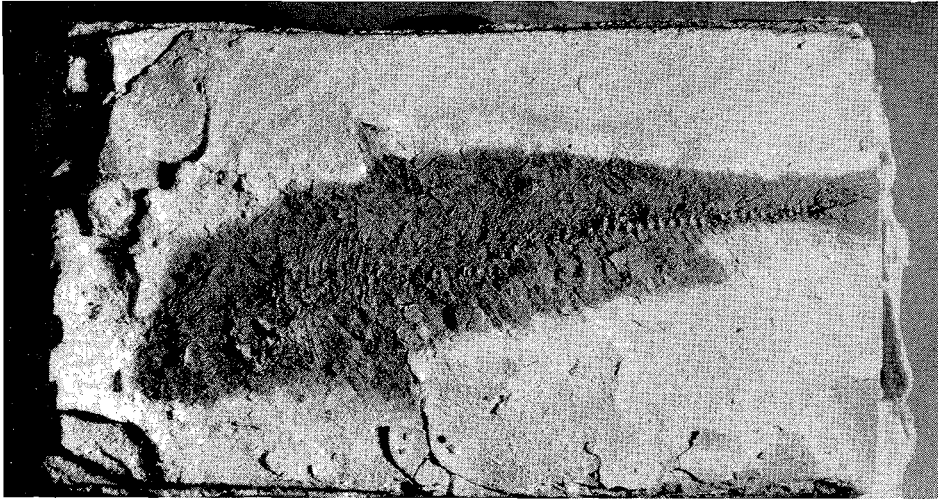
UPPER—Photogrammetry class at work on individual highway locations
LOWER—Instructor William Pryor, seated, demonstrates use of stereoscope

MOTERING RESPONSIBILITY

Owning and driving an automobile is a major responsibility. Behind the wheel of your car, you are concerned

not only with your own safety, but with that of others. Take this responsibility seriously, and always drive carefully.

THIS FISH FOSSIL 15 MILLION YEARS OLD



Fish fossil found during excavation of old Fort Moore Hill in Los Angeles to make way for Hollywood Freeway

IF YOU SCRATCH the surface of a highway engineer, you often find underneath that he is a geologist, paleontologist or archeologist. Henry (Hank) Compagnon, a Supervisor of Survey Parties in District VII, Los Angeles, is no exception to this rule. During his off duty time on Amchitka Island in the Aleutians during World War II, Hank made exploratory excavations among ancient Indian kitchen middens and brought to light numerous skeletons, Indian relics, and artifacts. Many of his finds were turned over to the Smithsonian Institution and to the Los Angeles County Museum where they are now on exhibition.

When Hank came back from the war and resumed his civilian occupation with the State Division of Highways, one of the highway projects upon which he was responsible for the construction surveys was the Guy F. Atkinson Company's contract for excavation of old Fort Moore Hill in the City of Los Angeles, to make way for the Hollywood Freeway. This construction contract was first reported in *California Highways and Public Works* magazine in the issue of May-June, 1949. A concluding writeup regarding the completion of this contract appeared in the January-February, 1951, issue, with illustrative photographs of the work.

Find Fish Fossil

The record of the Fort Moore Hill excavation is not complete, however, without a story of the splendid and unique fish fossil found in the excavation by Hank Compagnon and Paul Wallace, Chief of Survey Party. A row of grade stakes was being surveyed near the site of the northerly abutment of the Broadway overcrossing bridge. The fish fossil, about 15 inches long, was found in a tilted clay strata about 75 feet below the original ground surface. Fossils of animal life or marine life which have tough bones or hard shells are very common, but well preserved fish fossils are rare indeed because when fishes die their soft bodies are usually consumed long before they are covered with sediment, and become fossilized. This particular fossil is very unusual in appearance because the percolating waters that replaced the bone tissue were of such a nature that the fossil has an opalized appearance, with the scales and bone structure of the fish giving off a gemlike sparkle.

15 Million Years Old

The fossil has been turned over to Dr. Hildegard Howard, former Curator of Paleontology, now Chief Curator of Science, at the Los Angeles County Museum at Exposition Park. Dr. Howard has stated that the sedi-

ALLERGIC TO LAWYERS

A citizen in Venice, California, has an abiding fear of attorneys who threaten to sue him. He admits as much in a letter to the legal division of the Department of Public Works. He wrote:

"I am writing in reference to Bill No. 7127-D7 for \$20.93 which was incurred by tearing up one of the State's culverts with the underside of my automobile (hereafter to be referred to in the past tense). I should have contacted you when I received your first bill, but I am lazy, forgetful and irresponsible. This is not an excuse but an explanation. Now, however, I feel that I must meet my obligation to you. You have done the right thing. A threat of legal action always galvanizes me into frenzied financial activity.

"I truly wish that I could pay the whole amount immediately, thus taking the pressure off us both. But you are only one of many, so the best that I can offer is a promise of \$2.93 in the next mail, with similar small amounts to follow as regularly and as often as my insufficient income will allow. Would two or three dollars a week be satisfactory?

"Yours, till the bill is paid."

mentary deposit in which the fossil was found is of the Upper Miocene geological age and that it is estimated to be at least 15,000,000 years old. As fossils go, this is quite ancient because those found in the famous La Brea Pits at Hancock Park on Wilshire Boulevard in Los Angeles, are of the Upper Pleistocene age and are approximately 40,000 years old.

Dr. Howard says that very few fish fossils have been found in this area similar to the one found by Compagnon and Wallace, and that the only one of which she has knowledge was found in the Santa Monica Mountains about 35 miles away. So the fish fossil that District VII has turned over to the Los Angeles County Museum is the only one of its kind yet to be found in the City of Los Angeles, and it is interesting to note that this fossil was actually found in the Civic Center, even within the shadow of the City Hall Tower.

HIGHWAY BIDS AND AWARDS

Highway Bids and Awards April, 1951

ALAMEDA COUNTY—Furnish and install a traffic signal system in City of Livermore at intersection of W. First Street and S. L Street. District IV, Route 108. Spott Electrical Co. of Hayward, Hayward, \$3,575; L. H. Leonardi Electric Construction Co., San Rafael, \$3,596; R. Goold and Son, Stockton, \$4,100; Sam Elliott Electric, Livermore, \$4,197; Abbett Electric Corp., San Francisco, \$4,283; Severin Electric Co., San Francisco, \$4,470; Sloat-Hall Electric Co., Inc., Oakland, \$4,484; Fields Electric Works, Santa Clara, \$7,058. Contract awarded to Howard Electric Co., Gilroy, \$2,986.

ALAMEDA COUNTY—Across San Leandro Bay, between Bay Farm Island and Alameda, in the City of Alameda, a bascule bridge to be constructed. District IV, Route 226. Ben C. Gerwick, Inc., San Francisco, \$1,670,286; Healy Tibbitts Construction Co., San Francisco, \$1,690,022; Guy F. Atkinson Co., South San Francisco, \$1,707,588. Contract awarded to The Duncanson Harrelson Co. and Stolte, Inc., Richmond, \$1,631,057.80.

ALAMEDA COUNTY—On Eastshore Highway, between Ashby Avenue and El Cerrito Overhead, about 2.4 miles to be surfaced with plant-mix surfacing over existing pavement. District IV, Route 69, Section Ber., Alb., Ransome Co., Emeryville, \$115,812; J. R. Armstrong, El Cerrito, \$123,571; J. Henry Harris, Berkeley, \$139,722. Contract awarded to Lee J. Immel, San Pablo, \$105,423.30.

AMADOR COUNTY—At Dry Creek, about 5 miles north of Ione, a reinforced concrete "T" beam type of bridge, to be constructed, and about 0.5 mile of approaches to be graded and plant-mix surfacing placed on imported base material. District X, Route 97, Section B. Thomas Construction Co., Fresno, \$74,207; Carey Brothers and Bailey, San Rafael, \$75,987; B. S. McElderry and Chittenden and Chittenden, Auburn, \$87,177; O'Connor Brothers, Red Bluff, \$96,572; Johnson, Drake and Piper, Inc., Oakland, \$97,406. Contract awarded to Lefever and Bing, Sacramento, \$73,878.

BUTTE COUNTY—At Clear Creek, about 10 miles northwest of Oroville, a reinforced concrete slab bridge to be constructed and approaches to be surfaced with plant-mixed surfacing. District III, Route 87, Section B. Eugene G. Alves, Pittsburg, \$51,266; Commercial Construction Co., Marysville, \$51,639; D. Gerald Bing, Sacramento, \$55,369; O'Connor Brothers, Red Bluff, \$59,937; B. S. McElderry and Chittenden and Chittenden, Auburn, \$64,321; H. H. Anderson, San Leandro, \$66,356; Piombo Construction Co., San Francisco, \$71,726. Contract awarded to R. C. Downer, Reno, \$47,713.50.

COLUSA COUNTY—Between Colusa and Meridian, about 6.9 miles to be widened and surfaced with plant-mixed surfacing on untreated rock base and existing pavement. District III, Route 15, Section B. Rice Brothers, Inc., Marysville, \$154,819; H. Earl Parker, Inc., Marysville, \$165,240. Contract awarded to Harms Brothers, Sacramento, \$142,934.

DEL NORTE COUNTY—Between Smith River Bridge and one-fourth mile north of Winton Corners, about 4.7 miles to be surfaced with plant-mixed surfacing on cement treated base. District I, Route 71, Sections A, B. Clements and Co., Hayward, \$263,476; Harms Brothers and C. M. Syar, Sacramento, \$264,163; Ball and Simpson, Berkeley, \$302,963. Contract awarded to Mercer Fraser Co. and Mercer Fraser Gas Co., Inc., Eureka, \$205,445.50.

DEL NORTE AND HUMBOLDT COUNTIES—Across Redwood Creek at Orick, and across Smith River, about 3.3 miles south of the town of Smith River, 2 existing steel bridges to be cleaned and painted. District I, Route 1, 71, Sections K, A. R. W. Reade and Co., Berkeley, \$43,122. Contract awarded to Russell Hinton Co., San Francisco, \$26,568.

HUMBOLDT COUNTY—Across South Fork Eel River 6 miles south of Garberville, across South

Fork Eel River at Dyerville, across Eel River at Scotia, and across Eel River 1.8 miles north of Scotia, four existing steel bridges to be cleaned and painted. District I, Route I, Sections A, C, E. Deemer and Deemer, San Francisco, \$76,650; J. S. Morris Company, Berkeley, \$98,800; R. W. Reade and Co., Berkeley, \$124,777. Contract awarded to Russell Hinton Co., San Francisco, \$50,781.

INYO COUNTY—Between Route 63 and 1.3 miles north and between the west city limits and Main Street in Bishop, about 1.8 miles to be surfaced with plant-mixed surfacing on cement treated base and drainage facilities to be constructed on Location 2. District IX, Route 23, 76, Sections C, Bis. Bailey Construction Co. and Bishop Engr. and Const. Co., Bishop, \$97,481; Oilfields Trucking Co. and Phoenix Construction Co., Inc., Bakersfield, \$109,757; Basich Brothers Construction Co. and R. L. Basich and N. L. Basich, Garvey, \$115,212. Contract awarded to G. W. Ellis Construction Co., North Hollywood, \$96,587.10.

INYO COUNTY—Between Division Creek and Aberdeen and between Kough Hot Springs and Steven's Corner, about 0.4 mile at Location 1 to be surfaced with road-mixed surfacing and about 5.6 miles at Location 2, bituminous surface treatment applied to shoulders. District IX, Route 23, Sections B, D. Arthur A. Johnson, Laguna Beach, \$28,654; Bailey Construction Co. and Bishop Engr. and Const. Co., Bishop, \$31,564; Anderson Co., Visalia, \$32,370; Oilfields Trucking Co. and Phoenix Const. Co., Inc., Bakersfield, \$34,574; L. B. Wells Const. Co., Visalia, \$37,661. Contract awarded to Verne MacArthur, La Crescenta, \$26,035.

KERN COUNTY—Between the junction Route 136 and the Tulare County line, about 1 mile to be resurfaced with plant-mixed surfacing and imported borrow placed. District VI, Route 4, Section Dln. Dicco, Inc., Bakersfield, \$30,298. Contract awarded to Griffith Co., Los Angeles, \$24,116.50.

KERN COUNTY—Between 4.4 miles east of Sivert and 2 miles west of Bear Mountain Ranch, about 7.1 miles, existing roadbed material to be cement treated and surfaced with plant-mixed surfacing. District VI, Route 58, Section D. Griffith Co., Los Angeles, \$157,408; Basich Brothers Construction Co., N. L. Basich and R. L. Basich, Garvey, \$190,947; Peter Kiewit Sons' Co., Arcadia, \$193,050; Dicco, Inc., Bakersfield, \$198,607. Contract awarded to Oilfields Trucking Co. and Phoenix Const. Co., Inc., Bakersfield, \$151,289.05.

KERN COUNTY—At the intersection of U. S. 99 with 11th Avenue, in the City of Delano, a full traffic actuated signal system and highway lighting to be furnished and installed. District VI, Route 4, Westates Electrical Construction Co., Los Angeles, \$13,410; L. H. Leonardi Electric Construction Co., San Rafael, \$13,999; A-C Electric Co., Bakersfield, \$14,565. Contract awarded to Fischbach and Moore, Inc., Los Angeles, \$12,971.

LASSEN COUNTY—At two locations, near Standish and between Doyle and Constantia, existing bridges to be replaced with culverts. District II, Route 73, 29, Sections A, E. Eugene G. Alves, Pittsburg, \$85,240; Eaton and Smith, San Francisco, \$87,601; E. G. McLain, Crescent Mills, \$88,925; Bailey Construction Co., San Rafael, \$89,565; O'Connor Brothers, Red Bluff, \$92,699; Chittenden and Chittenden and B. S. McElderry, Auburn, \$103,896. Contract awarded to Harms Brothers, Sacramento, \$74,650.90.

LOS ANGELES COUNTY—On Sierra Highway, between Tunnel Station and the northerly end of Section H, about 2.0 miles to be resurfaced with plant-mixed surfacing. District VII, Route 23, Sections L. A., H. Griffith Co., Los Angeles, \$41,965; Schroeder and Co., Sun Valley, \$42,929; Southwest Paving Co., Sun Valley, \$44,714; P. J. Akmadzich, Sunland, \$45,173; G. W. Ellis Construction Co., North Hollywood, \$45,460. Contract awarded to Basich Brothers Const. Co. N. L. Basich, R. L. Basich, Garvey, \$40,924.85.

LOS ANGELES COUNTY—On the Hill Street relocation between Sunset Boulevard and 200 feet south of Temple Street, about 0.5 mile to be graded and paved with asphalt concrete. District VII, Route 2. Vido Kovacevich Co., South Gate, \$220,325; J. E. Haddock, Ltd., Pasadena, \$255,718; Griffith Co., Los Angeles, \$264,859. Contract awarded to Webb and White, Los Angeles, \$199,646.20.

LOS ANGELES COUNTY—In the City of Santa Monica on the Palisades Beach Road, between Westerly Tunnel Portal at Colorado Ave. and California Ave. Incline, about 0.9 mile in length, plant-mixed surfacing to be placed over existing surfacing and shoulders to be constructed of untreated rock base and plant-mixed surfacing. District VII, Route 60. Vernon Paving Co., Inc., Los Angeles, \$28,256; Jesse S. Smith, Glendale, \$28,850; C. O. Sparks, Inc., and Mundo Engineering Co., Los Angeles, \$31,345; R. R. Hensler, Sun Valley, \$34,820. Contract awarded to Schroeder and Co., Sun Valley, \$27,594.75.

LOS ANGELES COUNTY—In the City of Los Angeles, on Pacific Coast Highway between Vermont Ave. and Figueroa St., about 0.6 mile, plant-mixed surfacing to be placed on existing surfacing and shoulders constructed and surfaced with plant-mixed surfacing on untreated rock base. District VII, Route 60. Griffith Co., Los Angeles, \$59,063; Sully Miller Contracting Co., Long Beach, \$67,349. Contract awarded to Warren Southwest, Inc., Torrance, \$56,795.

LOS ANGELES COUNTY—On Mint Canyon Highway, between 0.5 mile south of Southern Pacific Railroad Overhead and Solamint, about 0.9 mile to be resurfaced with plant-mixed surfacing. District VII, Route 23, Section I. Schroeder and Co., Sun Valley, \$19,787; Southwest Paving Co., Sun Valley, \$20,913; P. J. Akmadzich, Sunland, \$21,445; Griffith Co., Los Angeles, \$21,530; G. W. Ellis Construction Co., North Hollywood, \$21,860. Contract awarded to Basich Brothers Const. Co., N. L. Basich, R. L. Basich, Garvey, \$18,685.

LOS ANGELES COUNTY—On Lakewood Boulevard, between Carson Street and Center Street, about 3.7 miles, shoulders to be excavated and untreated rock base and plant-mix surfacing placed thereon. District VII, Route 168, Sections A, L.Bch. Vido Kovacevich Co., South Gate, \$166,445; Sully-Miller Contracting Co., Long Beach, \$168,004; Warren Southwest, Inc., Torrance, \$172,036; Griffith Co., Los Angeles, \$176,830; C. O. Sparks, Inc. and Mundo Engineering Co., Los Angeles, \$184,540; Oswald Brothers Co., Los Angeles, \$194,275; Fredricksen and Kasler, Sacramento, \$201,910. Contract awarded to M. S. Mecham and Sons, South Gate, \$157,003.30.

LOS ANGELES COUNTY—In the City of Redondo Beach, at the intersection of Pacific Coast Highway with Vincent Street, traffic signal system to be furnished and installed. District VII, Route 60. Electric and Machinery Service, Inc., South Gate, \$3,028; Fischbach and Moore, Inc., Los Angeles, \$3,132; Westates Electrical Construction Co., Los Angeles, \$3,381. Contract awarded to C. D. Draucker, Inc., Los Angeles, \$2,948.

LOS ANGELES COUNTY—At the intersection of Rosemead Boulevard with California Street, traffic signal system and highway lighting to be furnished and installed. District VII, Route 168, Section C. C. D. Draucker, Inc., Los Angeles, \$11,731; Electric and Machinery Service, Inc., South Gate, \$11,862; Fischbach and Moore, Inc., Los Angeles, \$11,966; Westates Electrical Construction Co., Los Angeles, \$12,321. Contract awarded to Paul R. Gardner, Ontario, \$11,072.

LOS ANGELES COUNTY—At the intersection of Pacific Coast Highway with Topanga Canyon Boulevard, traffic signal system and highway lighting to be furnished and installed. District VII, Route 60, 156, Sections B, A. Electric and Machinery Service, Inc., South Gate, \$12,123; Fischbach and Moore, Inc., Los Angeles, \$12,816; C. D. Draucker, Inc., Los Angeles, \$13,276. Contract awarded to Westates Electrical Construction Co., Los Angeles, \$11,966.

MADERA COUNTY—Between Cottonwood Creek and north city limits of Madera, about 4.1 miles, existing pavement to be resurfaced with plant-mixed surfacing and widened with plant-mixed surfacing on untreated rock base. District VI, Route 4, Section A. Guy F. Atkinson Co., South San Francisco, \$89,337; Gene Richards, Fresno, \$95,894; Volpa Brothers, Fresno, \$96,070; J. Henry Harris, Berkeley, \$98,721; Thomas Construction Co., Fresno, \$101,762. Contract awarded to P. J. Moore and Son, Tracy, \$87,187.40.

MONO COUNTY—Between 5.5 and 2.9 miles south of Benton Station, about 2.8 miles to be graded and road-mixed surfacing to be placed on imported base material. District IX, Route 76, Section B. Bailey Construction Co. and Bishop Engineering and Construction Co., Bishop, \$99,004; Arthur A. Johnson, Laguna Beach, \$993,479; Flickinger-Welker, Los Angeles, \$103,864; Oilfields Trucking Co. and Phoenix Construction Co., Inc., Bakersfield, \$119,298; E. C. Young, San Fernando, \$143,842; C. V. Kenworthy, Stockton, \$191,064. Contract awarded to Anderson Co., Visalia, \$77,048.

MONO COUNTY—Between Dressler's Corner and 1.1 miles north of Fales Hot Springs, about 12 miles, shoulders to be widened and surfaced with road-mixed surfacing on imported base material. District IX, Route 23, Section I. Browne and Krull, Hayward, \$51,770. Contract awarded to Oilfields Trucking Co. and Phoenix Construction Co., Inc., Bakersfield, \$48,662.

MONO COUNTY—At Cadillac Curve, about 1.5 mile south of Tom's Place, about 0.3 mile of roadway to be graded and surfaced with road-mixed surfacing. District IX, Route 23, Section B. Ken Lowe, San Bernardino, \$19,151; Anderson Co., Visalia, \$19,859. Contract awarded to Conrad Construction Co., Inc., Ojai, \$14,525.50.

MONTEREY COUNTY—Between Chualar and Spence Underpass, about 5.2 miles to be graded and surfaced with Portland cement concrete pavement on imported subbase material with the upper portion cement treated. District V, Route 2, Section B. Granite Construction Co., Watsonville, \$524,905; Ball and Simpson, Berkeley, \$528,559; Guy F. Atkinson Co., South San Francisco, \$533,228; M. J. B. Construction Co., Stockton, \$569,370; Madonna Construction Co., San Luis Obispo, \$584,360. Contract awarded to Fredrickson and Watson Construction Co., Oakland, \$513,377.80.

MONTEREY COUNTY—Between Moss Landing and two miles south of Watsonville Airport, 2.1 miles to be surfaced with plant-mixed surfacing and seal coats applied. District V, Route 56, Section J. Granite Construction Co., Watsonville, \$35,300; Browne and Krull, Hayward, \$37,690. Contract awarded to Leo F. Piazza Paving Co., San Jose, \$33,707.66.

PLACER COUNTY—At Deadman's Curve, about 1.3 miles south of Nevada County line, about 0.2 mile to be graded and surfaced with plant-mixed surfacing on untreated rock base constructed on selected material. District III, Route 17, Section C. Baker Trucking Co., Hamilton City, \$24,846; O'Connor Brothers, Red Bluff, \$26,832; Rice Brothers, Inc., Marysville, \$29,494; J. Henry Harris, Berkeley, \$29,742. Contract awarded to Joe Chevreaux, Auburn, \$17,084.19.

PLACER COUNTY—Between Oak Street and Holt Street in the City of Roseville for landscaping. District III, Route 3. Capital Nursery Co., Sacramento, \$15,445. Contract awarded to Damá R. Tyson Co., Sacramento, \$11,268.86.

RIVERSIDE COUNTY—Between the Southern Pacific Railroad and Sedgwick Avenue in the City of Riverside, about 0.35 mile of roadway to be widened and surfaced with plant-mixed surfacing on cement treated base and existing pavement to be resurfaced with plant-mixed surfacing. District VIII, Route 19. E. L. Yeager Co., Riverside, \$45,016. Contract awarded to R. A. Erwin, Colton, \$36,349.

RIVERSIDE COUNTY—In the City of Beaumont, between the west city limits and the east city limits, about 1.2 miles to be surfaced with plant-mixed surfacing. District VIII, Route 26. R. A. Erwin, Colton, \$24,085; Frederickson and Kasler, Sacramento, \$28,632; G. W. Ellis Construction Co., North Hollywood, \$37,575. Contract awarded to Matich Brothers, Colton, \$23,993.

RIVERSIDE COUNTY—Between Indio and Avenue 62, about 9.3 miles, a portion to be graded and surfaced with plant-mixed surfacing on cement treated base to provide a divided highway, the existing pavement on the remainder of the project to be surfaced with plant-mixed surfacing and seal coats applied. District XI, Routes 26, 64, Sections Ind, F, Coa, Ind. Basich Brothers Construction Co., N. L. Basich and R. L. Basich, Garvey, \$369,587; R. A. Erwin, Colton, \$378,178; R. R. Hensler, Sun Valley, \$392,867; Griffith Co., Los Angeles, \$393,112; Peter Kiewit Sons Co., Arcadia, \$411,423; R. P. Shea Co., Indio, \$436,107. Contract awarded to John J. Swigart Co., Torrance, \$349,980.05.

SAN BERNARDINO COUNTY—On Main Street through Barstow and from Main Street to North Junction with Route 58 portions about 3.4 miles in net length, plant-mixed surfacing to be placed over existing pavement. District VIII, Route 31, 58, Sections Bsw., G. James L. Miller and Sons, Los Angeles, \$67,675; George Herz and Co., San Bernardino, \$68,316; Basich Brothers Construction Co., N. L. Basich, R. L. Basich, Garvey, \$71,200; G. W. Ellis Construction Co., North Hollywood, \$71,757; E. L. Yeager Co., Riverside, \$79,506; R. A. Erwin, Colton, \$98,380. Contract awarded to Peter Kiewit Sons' Co., Arcadia, \$66,824.

SAN BERNARDINO AND RIVERSIDE COUNTIES—Between 1.5 mile northwest of the Riverside County line in San Bernardino County and the City of Beaumont in Riverside County, highway lighting and illuminated sign bridge to be furnished and installed. District VIII, Route 26, Sections B, A, Bau. Fischbach and Moore, Inc., Los Angeles, \$20,488; Electric and Machinery Service, Inc., South Gate, \$21,037. Contract awarded to Paul R. Gardner, Ontario, \$19,225.

SANTA CLARA COUNTY—Furnish and install a traffic signal system in the City of Los Gatos at the intersection of Main Street and Santa Cruz Avenue. District IV, Routes 5, 42, Section LGts. L. H. Leonard Electric Construction Co., San Rafael, \$10,502; Severn Electric Co., San Francisco, \$11,023; Abbett Electric Corp., San Francisco, \$12,410; Fields Electric Works, Santa Clara, \$15,121. Contract awarded to Howard Electric Co., Gilroy, \$9,839.

SANTA CRUZ COUNTY—Repair a timber trestle pier in Seacliff Beach State Park about 8 miles east of Santa Cruz. District IV, Seacliff Beach State Park. Granite Construction Co., Watsonville, \$13,835; Barnhart Construction Co., Santa Clara, \$13,895; C. C. Gildersleeve, Nevada City, \$15,970; L. W. Jensen and A. E. Mangs, Palo Alto, \$18,406; B. S. McElderry, Berkeley, \$19,440. Contract awarded to Barton Construction Co., Oakland, \$11,608.04.

SAN DIEGO COUNTY—Between Chambers Street in El Cajon and Second St., about 2.0 miles to be graded and paved with plant-mixed surfacing on cement treated base. District XI, Route 12, Section ECJ, B, C. Griffith Co., Los Angeles, \$203,012; Daley Corp., San Diego, \$212,533; V. R. Dennis Construction Co., San Diego, \$219,790. Contract awarded to R. E. Hazard Contracting Co., San Diego, \$189,828.75.

SAN FRANCISCO COUNTY—At San Francisco Oakland Bay Bridge, upper-deck painting scaffold track in Yerba Buena Island Truss Spans between Pier YB-1 and Pier E-1, to be constructed. District IV, Route 68. Herrick Iron Works, Oakland, \$30,100; Moore Dry Dock Co., Oakland, \$37,100. Contract awarded to California Steel Products Co., Richmond, \$21,630.

SAN MATEO COUNTY—In the City of Daly City, at the intersections of Mission Street with San Jose Avenue and with Market Street, full traffic actuated signal systems to be furnished and installed and channelization to be constructed at two intersections. District IV, Route 2, Section DIC. Charles L. Harney, Inc., San Francisco, \$63,567; J. Henry Harris, Berkeley, \$64,605; Eaton and Smith, San Francisco, \$74,794. Contract awarded to R. Flatland, San Francisco, \$57,644.

VENTURA COUNTY—Between Route 2 and Santa Clara River about 3.9 miles to be surfaced with plant-mixed surfacing and seal coat applied. District VII, Route 9, Section A. Baker and Pollock, Ventura, \$38,783; Griffith Co., Los Angeles, \$42,526. Contract awarded to Conrad Construction Co., Inc., Ojai, \$38,234.

F. A. S. County Routes

SAN DIEGO COUNTY—On Penasquitos-Poway Road between State Highway Route 77 and San Diego County Road Survey 944, about 3.6 miles to be graded. District XI, Route 729. Flickinger-Welker, Los Angeles, \$202,733; Einer Brothers, Inc., Escondido, \$207,794; Sim J. Harris Co., San Diego, \$228,091; Arthur A. Johnson, Laguna, \$236,900; Cox Brothers Construction Co., Stanton, \$272,141; Clifford C. Bong and Co., Arcadia, \$274,383; L. A. and R. S. Crow, El Monte, \$280,201; Basich Brothers Construction Co. and N. L. Basich and R. L. Basich, Garvey, \$301,207. Contract awarded to Ralph A. Bell, Monrovia, \$202,277.

MONTEREY COUNTY—At Elkhorn Slough on Old Toll Road, about 3½ miles south of Pajaro, about 0.5 mile to be graded and culverts installed. District V, Route 593. Louis Biosotti and Son, Stockton, \$79,220; M. Malfitano and Son, Inc., Pittsburg, \$87,740; Thomas Construction Co., Fresno, \$89,089; Granite Construction Co., Watsonville, \$99,498; Eugene G. Alves, Pittsburg, \$118,648. Contract awarded to Edward Keeble, San Jose, \$54,153.

May, 1951

CONTRA COSTA COUNTY—Between Luzon Underpass and Christie Underpass, about 3.1 miles, portions of roadway to be graded and surfaced with plant-mixed surfacing on cement treated base over imported subbase material and applying seal coats. District IV, Route 106, Section A. J. R. Armstrong, El Cerrito, \$126,428; Ransome Co., Emeryville, \$131,248; Eugene G. Alves, Pittsburg, \$142,801; J. Henry Harris, Berkeley, \$150,980. Contract awarded to Lee J. Immel, San Pablo, \$122,883.

HUMBOLDT COUNTY—Between Trinidad and 2.8 miles northerly, about 0.5 mile to be graded, and about 2.8 miles of cement treated base to be constructed and surfaced with plant-mixed surfacing. District I, Route 1, Section Trnd.-J. Harms Brothers and C. M. Syar, Sacramento, \$163,614. Contract awarded to Mercer, Fraser and Co. and Mercer Fraser Gas Co., Inc., Eureka, \$145,099.75.

IMPERIAL COUNTY—On Main Street between First Street and east city limits of El Centro, a distance of about 0.5 mile to be graded, surfaced with road-mixed surfacing on cement treated base and on the existing pavement, and storm drains to be installed. District XI, Route 27, Section ECn. J. L. McElvany, El Centro, \$89,422. Contract awarded to Anderson Co., Visalia, \$74,675.50.

IMPERIAL COUNTY—Between Dixieland and El Centro, between 2 miles north of Sandy Beach Road and the Riverside County line, between East Highline Canal and Colorado River, between Holtville and Calipatria, and between Heber and Brawley, about 46 miles, plant-mixed surfacing to be placed over existing surfacing on portions of project and over imported base material on other portions of the project. District XI, Routes 12, 26, 27, 187, 201, Sections C, CDE, AB, BCD, AB. R. R. Hensler, Sun Valley, \$484,940. Contract awarded to Basich Brothers Construction Co., N. L. Basich and R. L. Basich, Garvey, \$470,990.

INYO COUNTY—At Bishop Creek, about 7.1 miles west of Bishop, existing timber bridge to be replaced with double 8' x 3' 91' 2" field-assembled plate arch culvert; and the roadbed to be graded and bituminous surface treatment applied to imported base material. District IX, Route 76, Section B. Bishop Engineering and Construction Co., Bishop, \$14,551; Anderson Co., Visalia, \$17,320. Contract awarded to Conrad Construction Co., Inc., Ojai, \$13,202.04.

KERN COUNTY—Across Goose Lake Slough, about 10 miles south of Shafter, a reinforced concrete slab bridge on concrete piers and abutments with concrete pile foundations to be constructed. District VI, Route 139, Section A. Norman I. Fadel, North Hollywood, \$47,703; Thomas Construction Co., Fresno, \$48,936; E. G. Perham, Los Angeles, \$49,436; C. B. Tuttle Co., Long Beach, \$50,880; Volpa Brothers, Fresno, \$52,171; Walter Kaucher, Los Angeles, \$52,938; McClain Construction Co., Inc., Hawthorne, \$57,847. Contract awarded to Tumblin Co., Bakersfield, \$42,505.60.

LOS ANGELES COUNTY—At Central Maintenance Station between the frontage road of Santa

Ana Freeway and Slawson Ave., about one-half mile easterly of Garfield Ave., three buildings to be constructed. District VII, Route 166, Section A. D. C. Leneve, Inc., Montebello, \$39,627; Ray V. Anderson, Los Angeles, \$45,619. Contract awarded to Manderbach Construction Co., Glendale, \$36,438.

LOS ANGELES COUNTY—On Centinela Avenue, between Freeman Boulevard and Sepulveda Boulevard, about 1.5 miles, the existing pavement to be widened with untreated rock base and the existing pavement and newly constructed untreated rock base surface with plant-mixed surfacing. District VII, Route 164, Section Ing. LA, A. Vido Kovacevich Co., South Gate, \$195,837; Warren Southwest, Inc., Torrance, \$197,322; J. A. Thompson and Son, Inglewood, \$201,156; Vernon Paving Co., Los Angeles, \$203,300; Jesse S. Smith and Service Construction Co., of Southern California, Burbank, \$212,412; Tomei Construction Co., Van Nuys, \$226,045. Contract awarded to Oswald Brothers Co., Los Angeles, \$180,527.50.

LOS ANGELES COUNTY—In the City of San Gabriel, at the intersections of Valley Boulevard with Isabel Avenue and with Walnut Street, traffic signal systems to be furnished and installed. District VII, Route 77. C. D. Draucker, Inc., Los Angeles, \$5,910; Electric and Machinery Service, Inc., South Gate, \$6,082; Fischbach and Moore, Inc., Los Angeles, \$6,245; Westates Electrical Construction Co., Los Angeles, \$6,260. Contract awarded to Clinton Electric Corp., Burbank, \$5,683.

LOS ANGELES COUNTY—Between Parkman Avenue and Grand Avenue, about 2.2 miles of roadside areas to be prepared and planted. District VII, Route L. A.-2-L. A. D. and M. Sprinkler Co., Long Beach, \$36,122; Moulder Brothers, Glendale, 42,700; Stephen L. Vistica, San Mateo, \$44,565; Henry C. Soto Corp., Los Angeles, \$56,054; Jannoch Nurseries, Altadena, \$69,535. Contract awarded to James E. Boothe, Compton, \$35,633.76.

MENDOCINO COUNTY—At Middle Creek, about 1½ miles east of Ukiah, an existing bridge to be widened and about 0.3 mile of approaches to be graded and surfaced with road-mixed surfacing on cement treated base. District I, Route 70, Section A. O'Connor Brothers, Red Bluff, \$41,609; J. Henry Harris, Berkeley, \$52,785. Contract awarded to Arthur B. Siroi, Inc., Santa Rosa, \$34,494.50.

NAPA COUNTY—Between 6.5 and 6.8 miles east of the city limits of Napa, about 0.3 mile to be graded and seal coat applied. District IV, Route 6, Section A. J. Henry Harris, Berkeley, \$29,468. Contract awarded to C. M. Syar, Vallejo, \$26,856.50.

ORANGE COUNTY—On Garden Grove Boulevard between Stanton Avenue and the P. E. R. R. in Garden Grove, about 3 miles existing shoulders to be graded to provide additional width for surfacing; untreated rock base to be placed and plant-mixed surfacing to be placed over existing pavement and new base. District VII, Route 179, Section A. Sully-Miller Contracting Co., Long Beach, \$72,552; John J. Swigart Co., Torrance, \$77,986; Cox Brothers Construction Co., Stanton, \$82,746; Griffith Co., Los Angeles, \$83,285; Warren Southwest, Inc., Torrance, \$100,441; Pacific Rock and Gravel, Monrovia, \$147,220. Contract awarded to Roland T. Reynolds, Anaheim, \$70,797.50.

RIVERSIDE COUNTY—Between Indio and Black Butte, about 22.4 miles to be resurfaced with plant-mixed surfacing. District XI, Route 64, Sections H, I, B, C, D. R. R. Hensler, Sun Valley, \$162,950; Basich Brothers Construction Co., N. L. Basich and R. K. Basich, Garvey, \$163,506; George Herz and Co., San Bernardino, \$170,270; Peter Kiewit Sons' Co., Arcadia, \$173,310. Contract awarded to James L. Miller and Sons, Los Angeles, \$159,470.

RIVERSIDE COUNTY—Between two miles west of Hemet and Sanderson Avenue, about one mile to be graded and surfaced with plant-mixed surfacing on imported base material. District VIII, Route 64, Section K. E. L. Yeager Co., Riverside, \$54,751; George Herz and Co., San Bernardino, \$55,523; Match Brothers, Colton, \$56,713. Contract awarded to R. A. Erwin, Colton, \$47,998.50.

SACRAMENTO COUNTY—At the bridge across the Sacramento River about 1.3 miles north of Isleton for reconstructing a timber fender. District III, Route 11, Section D. Lord and Bishop, Sacramento, \$6,998; Healey Tibbitts Construction Co., San Francisco, \$7,928. Contract awarded to H. F. Lauritzen, Pittsburg, \$5,819.80.

SAN BERNARDINO COUNTY—Across Mojave River at Victorville, and over the tracks of Atchison, Topeka and Santa Fe Railway Co. at Barstow, two existing steel bridges to be cleaned and painted. District VIII, Route 31, Sections D, G. R. W. Reade and Co., Berkeley, \$32,341; Acme Maintenance Engineering Co., Montebello, \$43,753; G. C. Hewitt and Co., Ltd., Los Angeles, \$50,000. Contract awarded to Timmons Painting and Engineering Co., Long Beach, \$31,080.83.

SAN MATEO COUNTY—Between 0.2 mile north of Lobitos and 0.3 mile north of Canada Verde Creek, about 3.4 miles to be graded and surfaced with plant-mixed surfacing on imported base material. District IV, Route 56, Section C. John Delphia, Patterson, \$369,700; Guy F. Atkinson Co., South San Francisco, \$396,750; Ball and Simpson, Berkeley, \$426,072; L. C. Smith, San Mateo, \$435,540. Contract awarded to S. A. E. Co., Redwood City, \$364,903.30.

SIERRA COUNTY—Between 1.4 miles east of Yuba County line and 1.5 miles west of North Yuba River, about 0.8 mile to be graded and bituminous surface treatment applied, and a reinforced concrete girder bridge across Indian Creek to be constructed. District III, Route 25, Section A. M. Malfitano and Son, Inc., and M. W. Brown, Pittsburg, \$369,780. Contract awarded to Richter Brothers, Oroville, \$313,618.04.

SOLANO COUNTY—Between Vallejo and Davis, portions, about 0.8 mile of frontage road connections to be graded and surfaced and chain link fences to be constructed. District X, Route 7, Sections G, C, D, I. Parish Brothers, Benicia, \$86,667. Contract awarded to Fredrickson Brothers, Emeryville, \$81,434.70.

SUTTER COUNTY—Between Meridian and three miles west of Yuba City, about 7.1 miles, borders to be constructed of untreated rock base and plant-mixed surfacing on portions of the project and untreated rock base and plant-mixed surfacing to be placed over existing pavement and new borders on a portion of the project. District III, Route 15, Sections A, B. Harms Brothers, Sacramento, \$85,007; H. Earl Parker, Inc., Marysville, \$87,723. Contract awarded to Rice Brothers, Inc., Marysville, \$79,604.90.

VENTURA COUNTY—From Santa Clara River bridge through Montalvo, about 1.3 miles to be graded and paved with plant-mixed surfacing on cement treated base and on existing pavement and outer highways to be constructed to provide a 4-lane divided highway. District VII, Route 2, Section C. Baker and Pollock, Ventura, \$375,983; Griffith Co., Los Angeles, \$380,613; Match Brothers and K. and H. Co., Colton, \$387,630; J. E. Haddock, Ltd., Cox Brothers Construction Co., Pasadena, \$454,018. Contract awarded to Fredericksen and Kasler, Sacramento, \$372,755.70.

YOLO COUNTY—Between East Street in Woodland and Yolo By-pass, about 5.1 miles, border trenches to be excavated, imported base material to be placed, and surfaced with plant-mixed surfacing. District III, Route 50, Sections Wd, E. Munn and Perkins, Modesto, \$159,907; P. J. Moore and Son, Tracy, \$171,018; Harms Brothers, Sacramento, \$183,805; Frank B. Marks, Jr., Newman, \$208,136; J. R. Reeves, Sacramento, \$245,250. Contract awarded to A. Teichert and Son, Inc., Sacramento, \$130,940.

F. A. S. County Routes

CONTRA COSTA COUNTY—On Marsh Creek Road between 7.1 miles east of Clayton and 12.4 miles west of Byron, about 0.5 mile to be graded and surfaced with plant-mixed surfacing on crusher run base. District IV, Route 609. Silva Brothers, Hayward, \$67,330; J. Henry Harris, Berkeley, \$75,947; M. Malfitano and Son, Inc., Pittsburg, \$77,652; C. V. Kenworthy, Stockton, \$83,200; Edward Keeble, San Jose, \$84,078; Karl C. Harmeling, Stockton, \$84,304; Eugene G. Alves, Pittsburg, \$84,322. Contract awarded to Louis Biasotti and Son, Stockton, \$57,514.

LOS ANGELES COUNTY—Across San Gabriel River on Spring Street, a reinforced concrete girder bridge to be constructed. District VII, Route 751. John Strona, Pomona, \$203,456; G. W. Peterson and J. W. Baker, Los Angeles, \$230,795; R. M. Price Co. and O. B. Pierson, Altadena, \$232,632; Bongio-

Venture Success

Continued from page 43 . . .

safety, no longer confronted with the hazard of parking directly alongside a main thoroughfare. Also, cars traveling on the main highway are spared the hazard of cars pulling in and out of parking areas alongside the road. This safety factor may not apply to a business such as the new Safeway store, which provides its own parking facilities for customers, but is of particular import to those enterprises not having private parking facilities.

MAGAZINE HELPFUL
BOROUGH ENGINEER'S OFFICE
Town Hall, Ilford, Australia

The Editor,
California Highways and
Public Works Journal

DEAR SIR: After reading several issues of your journal which has been forwarded by Mr. James J. Harman of 1675 38th Avenue, San Francisco 22, California, I am writing to enquire if it could be possible for you to have this council's name put on your mailing list.

The interesting articles dealing with the size and expanse of the vast road works carried out by you are read with great interest by the engineers of this corporation.

Ilford is a municipal corporation consisting of 8,503 acres and a population of approximately 200,000, and I can assure you that your journal will be put in our department library for all technical assistants to peruse.

I am, sir, your truly,

CLAUD H. HARDING
Chief Administrative Assistant

vanni Construction Co., Los Angeles, \$240,794; MacDonald and Kruse and Pacific Allied, Sun Valley, \$245,562. Contract awarded to Charles MacClosky Co., San Francisco, \$188,705.25.

MODOC COUNTY—Between 4 miles north of Lake City and Fort Bidwell, about 12.5 miles to be surfaced with gravel base and road-mixed surfacing. District II, Route 513. Clements and Co., Hayward, \$173,887; Harms Brothers, Sacramento, \$205,917. Contract awarded to Tyson and Watters, Inc., Sacramento, \$155,677.20.

STANISLAUS COUNTY—On Oakdale-Valley Home Road, between State Highway Route 66 and Valley Home, about 3.9 miles, existing pavement to be widened with borders of untreated rock base, existing pavement and borders to be surfaced with plant-mixed surfacing on untreated rock base. District X, Route 904. M. J. Ruddy and Son, Modesto, \$73,210. Contract awarded to United Concrete Pipe Corp., Baldwin Park, \$68,870.20.

Human Relations

*More Important Than Mathematics,
Young Engineers Are Told*

By JOHN J. MANNING, M. ASCE; Vice Admiral, CEC, USN; Chief, U. S. Bureau of Yards and Docks (Retired); Vice President, John McShain, Inc., Philadelphia, Pa.

YOUNG engineers have a disconcerting knowledge of many things that older engineers have forgotten. However, there are compensations for growing older in the engineering business. As the hard, bright facts of formal education begin to dull with time, we begin to develop a better understanding of human relationships and the ways and means of translating knowledge and ability into effective action. We learn that many phases of engineering have more to do with psychology than mathematics, and that quite often a slide rule can be of far less value than a sense of humor.

Among the qualities of a civil engineer which are less commonly recognized—but which must be acquired if his vital role is to be played out to the full—is the ability to present his case effectively to nonengineers. Frequently the engineer's attitude in this connection may be likened to that of the country man in the old English folktale who went to a village fair. He saw a large crowd gathered about an entertainer who was imitating the squeal of a little pig. The crowd was getting a lot of amusement out of the performance, but the country man thought the imitation a poor one. So the next day he returned and demanded that the crowd listen to his version of the squeal of a young pig. The crowd listened for a minute, then told him his imitation was no good. Whereupon, he reached inside his coat and pulled out the little pig which he had been pinching. The crowd was still unimpressed, and still preferred the professional pig squealer. In other words, it is one thing to have a good product, and it is quite another thing to dramatize that product so that the layman will find it attractive.

Engineers experience a feeling of frustration when all too often they

come off second best in their encounters with salesmen and politicians. The story has been told of a politician and an engineer, who after discussing some project of mutual interest, left the office of the engineer and went to his club for luncheon. As they entered the club they met a gentleman just leaving. The politician greeted him warmly and shook hands with him. As the politician rejoined the engineer, he said, "Don't you know Mr. So-and-So?" The engineer replied, "Yes, I know him." The politician said, "I didn't see you speak to him," to which the engineer answered, "He knows that I know him so why should I speak to him?"

Probably the young engineer will react to this characterization with a certain amount of defensive pride, interpreting the engineer's attitude as an indication of integrity. And probably he will be entirely right. Nevertheless, we should not accept with equanimity the fact that engineers lack the ability to persuade nonengineers to their point of view. Now, I know that the American people consider it an inalienable right to denounce politicians. Yet it must be admitted that the politician is highly skilled in dealing with intangibles. With amazing accuracy he is able to appraise emotions and prejudices and to harness those great human forces which no mathematical formula can measure or evaluate. Far from being contemptuous of such powers, we as engineers should seek to develop them for ourselves.

Avoid Professional Snobbery

Now, the question is how this can be done. I can't give all the answers, but I can make a few suggestions. The first of these is basic to the others. It is to avoid professional snobbery.

One form of such snobbery is the use of technical and scientific terms which

are incomprehensible to the layman. To the young engineer who has just finished a course of intensive training which has taught him to think in technical terms, it may seem that the non-engineering mind is filled with cobwebs. Nevertheless, the engineer who possesses humility rather than arrogance in dealing with nonengineers is going to profit in the long run—and, for that matter, in the short run too. The farther engineers get from their theoretical training, the more value they will attach to those human relationships which are based upon open-mindedness and mutual respect.

Security Versus Professional Growth

Another important point is the tendency of young engineers to seek economic security at almost any sacrifice. Not long ago, the bureau made a survey of senior engineering students in college to determine what they considered the most important inducement in a job opening. The majority wanted job security. Almost as many were interested primarily in salary. And close to the bottom on the survey were those few who wanted only the opportunity to develop professionally. A young man's desire for security is easy to understand, but security should not be sought for its own sake. It should come as the result of ambition, enthusiasm and hard work.

Some 70 years ago Ralph Waldo Emerson told a student audience: "When you are willing to renounce your ideals and ambitions for premature comforts and security, then dies the man in you, then once more perish the buds of art and poetry and science as they have died already in a thousand men. Explore and explore. Be neither chided nor flattered out of your position of perpetual inquiry. . . . Why

should you renounce your right to traverse the starlit deserts of truth . . . for premature comforts?"

Another suggestion concerns the importance of speaking and writing effectively. Last year, because of the importance I attach to these abilities, I authorized groups of my co-workers to attend weekly classes in public speaking. The result was surprising. Men whose personal courage had never been in doubt and whose coats were covered with campaign ribbons and battle stars, had the look of boot sailors under fire for the first time. And the instructor informed me that they certainly must be good engineers because, with a couple of exceptions, they were the world's worst public speakers.

Frankly, that doesn't make sense. Those few engineers who have taken the trouble to rid themselves of the phobia against public speaking have been outstandingly successful. An example is my predecessor as Chief of the Bureau of Yards and Docks, Admiral Ben Morrell, Hon. M. ASCE, now President of Jones and Laughlin Steel Corp., who is an extremely effective speaker. And this ability played no small part in his success.

What has been said about the ability to speak in public applies with even greater force to the ability to write persuasive English. Unless young engineers have changed more than I think they have, they still study English with a minimum of enthusiasm—regarding it largely as a form of gibberish which liberal arts students use to wrangle a degree without doing any work.

The ability to speak and to write effective English will aid the engineer not only to persuade his fellow engineers, but the people who hire engineers and who let contracts for construction and for engineering services. And ultimately, if the profession is to obtain the stature and the influence it deserves, the engineer must be able to plead its cause by persuasive writing directed to the public. The alternative is to accept the status of a hired technician.

Modern life is so closely integrated that the individual no longer can operate as an independent machine. He is part of the larger machine which is his

community, and of the still larger one which is his country. In fact, we can hope that the day is not too distant when national barriers will be lowered to permit a true comity of nations.

Engineers' Activity Needed for Peace

In the meantime, our prime concern must be that the United States serve as the most powerful instrument for achieving order and peace. Unlike the groundless optimism indulged in after World War I, it is now realized that true peace is an elusive thing, which only continuing effort will attain. We have learned the hard way that Utopia is not "for free." Our Country needs the engineer's active participation, his ideas, his enthusiasm, and his ability in the military reserve organizations. Passive support is not enough. The Nation's influence for peace is only as strong as the force which lies behind it. We are citizens first and engineers second.

My advice to the young engineer is, in brief, to go beyond the narrow horizon of his technical training to the broader horizon of usefulness and influence in his community. If the young engineer recognizes that his fellow men can offer him as much as he can offer them, and that humility offers a faster road to success than pride and intolerance, he will reap rich satisfaction both as an engineer and as a citizen.

FROM A STUDENT

LOS ANGELES 7, CALIFORNIA
California Highways and Public Works
Sacramento, California

DEAR SIR: For the past several years I have been reading your excellent magazine in the school and public libraries. It is undoubtedly the best periodical of its type in the country.

Although I am an electrical engineering student at University of Southern California, I am intensely interested in highway engineering and development. The articles on land values and effects on business properties adjacent to freeway developments are of particular value.

Yours sincerely,

ROBERT W. LOGUE

Moving Forward

Continued from page 16 . . .

Design in Progress

Between 223d Street and the Santa Ana Freeway designs are now in progress for the remaining portion of the Los Angeles River Freeway. These designs will include studies for future connection with the Terminal Island Freeway for which the northerly terminus now is Willow Street. Access to the U. S. Naval Base on Terminal Island and to the defense industries on the island will be greatly improved when the connection is made between the present north end of the Terminal Island Freeway and the new Los Angeles River Freeway. The Terminal Island Freeway is not on the State Highway System, and the responsibility for making this connection rests with the Navy.

The present three-mile length of the Terminal Island Freeway was designed by the Division of Highways and a considerable portion of it constructed under state highway contracts as a part of the federal access road program carried out during the war and immediately thereafter, and this work was financed by funds provided by the U. S. Bureau of Public Roads and the Navy.

Complicated Crossing

One of the major problems of design is the complicated crossing of the Los Angeles River Freeway by the Pacific Electric Railway and the Union Pacific Railway which cross each other at approximately right angles at the location of the Los Angeles River Freeway. The State is conducting negotiations with the U. S. Engineers looking toward cooperative financing of the cost of constructing these railroad grade separations at ultimate grades in the immediate vicinity of the freeway crossing in order that the tracks will fit in the planned 12-foot ultimate raise of the river levees. This work is under consideration by the Los Angeles County Flood Control District at this time.

Roadway interchange systems and grade separations are also being designed at crossings of Long Beach Boulevard, Artesia Street, Atlantic

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Moving Forward

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Avenue, Rosecrans Avenue, Platt Avenue, Imperial Highway, Firestone Boulevard, Florence Avenue, Atlantic Boulevard, Bandini Boulevard and Washington Boulevard.

Railroad grade separation problem studies are in progress where crossings of the freeway are made with the Pacific Electric Railway main line to Santa Ana, the main line of Union Pacific Railway, the Central Manufacturing District house tracks that are now serving the various industrial plants in the Bandini area, and the main lines to the east of the A. T. & S. F. and Union Pacific Railroads.

Freeway agreements have been entered into with the Cities of South Gate, Lynwood, Compton, Long Beach and the County of Los Angeles so that the entire length, 16.2 miles, of the Los Angeles River Freeway between its southerly terminus at Pacific Coast Highway and its northerly terminus at the junction of the Santa Ana Freeway has been covered by freeway agreements.

In the establishment of the Los Angeles River Freeway location every effort has been made to cause the least possible interference with existing industries. A freeway, such as the Los Angeles River Freeway, cannot be located so as to be entirely in the clear of all important installations. It is unfortunate that there is no way to avoid interference with the oil refinery fa-

cilities of the Richfield Oil Company northerly of Firestone Boulevard or the manufacturing plant of the American Brake Shoe Company near Slau-son Avenue. Another very important installation, which is affected, is the U. S. Army 822d Air Force Specialized Depot in Maywood. Many conferences have been held with high ranking officers of the Air Force in connection with the freeway location in this vicinity. A design has been worked out which causes a minimum of damage to the Air Force installations. None of the buildings will be affected by the freeway construction but many alterations will have to be made in the railroad siding tracks.

The Los Angeles River Freeway connecting as it will the vast industrial and manufacturing areas easterly of the City of Los Angeles with Long Beach Harbor facilities, is of vital importance as a major north and south traffic artery. The total estimated cost of this freeway is about \$30,000,000 for the 16.2 miles. This is an average cost of considerably less than \$2,000,000 a mile, which is very low for a modern six-lane freeway complete with grade separation structures at all important cross streets and all railroad tracks. This freeway will undoubtedly be classified as of strategic military importance and it can be expected that each year substantial allocations will be made in future state highway budgets so that this freeway can be completed as rapidly as possible.

TESTIMONIAL DINNER

Four hundred-odd co-workers and friends of Thomas E. Stanton tendered him a testimonial dinner on the night of May 25th. The affair was held in Governor's Hall on the State Fair Grounds in Sacramento. Many sections of the State were represented.

Mr. Stanton was presented with a number of gifts among which was a bound volume of hundreds of letters and telegrams from almost every state in the Union and from foreign countries wishing him a happy retirement. Also he was given \$500 worth of camera equipment, including a camera and projector.

Thomas E. Stanton

Continued from page 10 . . .

often been impressed by his ability to direct the activities and especially his capacity to introduce a strong element of sanity and common sense on those occasions when ill-advised or unsound moves have been proposed. It is not difficult for a man in a position of authority to control and direct the organization that must look to him for guidance. It does require a much higher type of ability to guide the actions and procedures of a group in a democratic meeting where many suggestions are inevitably made without considering the long range effects of or all of the implications.

In addition to his many contributions toward the security and welfare of his fellow-employees, Tom Stanton has also established in the minds of those who have known him and worked with him a reputation for personal integrity that is equaled by few, and quoting one of his subordinates who worked in close contact with him for nearly 20 years, "Mr. Stanton is the most honest man whom I have ever known."

of practical value in supplementing the basic course content.

Cordially yours,
ROBERT C. GILLINGHAM, Chairman
Social Science Department

OFF WITH THE OLD; ON WITH THE NEW

In his column "On the Square" appearing in the *Pasadena Independent* on May 20th last, Ed Essertier has this comment:

"MONEY'S WORTH — Just 40 years ago this week, the city bonded itself for \$100,000 to pay half the cost of the Colorado Street bridge. (The county paid the other half.) This week, as a new \$3,500,000 bridge begins taking shape, city directors will make the last payment on the old one. Total interest on the bonds, at 4½ percent over 40 years, has been \$92,250."

COLLEGE APPRECIATIVE

COMPTON COLLEGE
Compton, California

June 4, 1951

KENNETH C. ADAMS, *Editor California Highways and Public Works*, Sacramento, California

DEAR EDITOR, I am writing to again express the appreciation of myself and our institution of the receipt of your magazine, *California Highways and Public Works*, during the passed school year.

This publication has been circulated in our economic and government classes, now numbering in excess of 600 students. We find such material to be

EARL WARREN

Governor of California

CHARLES H. PURCELL

Director of Public Works

FRANK B. DURKEE

Deputy Director

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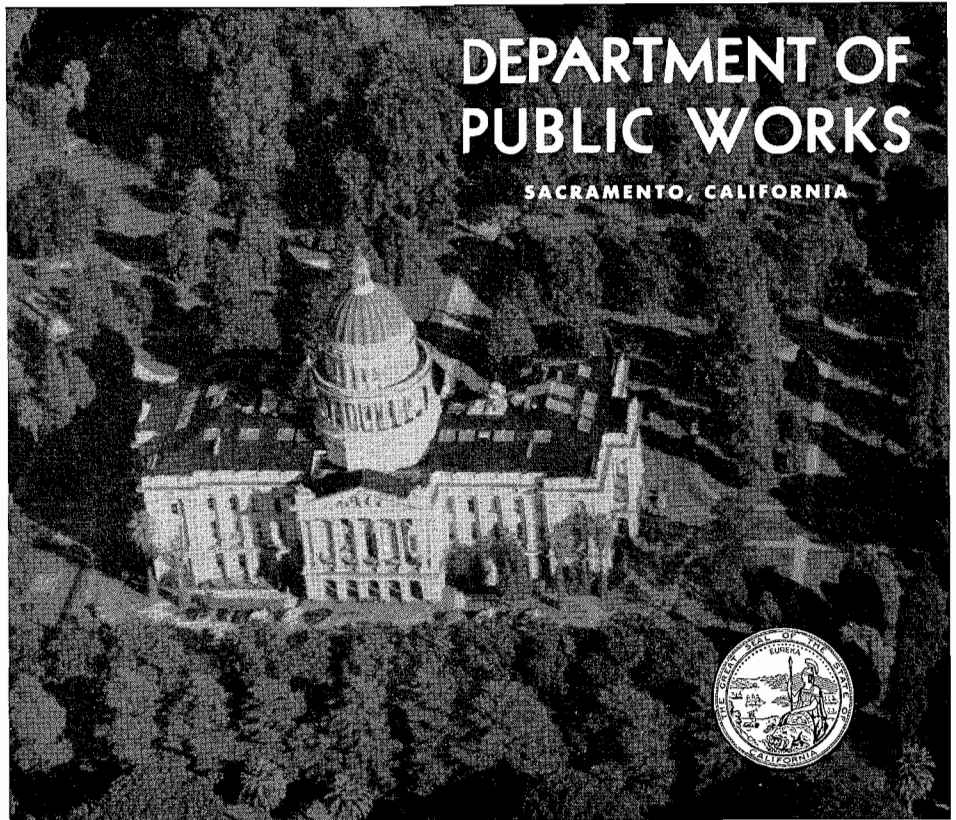
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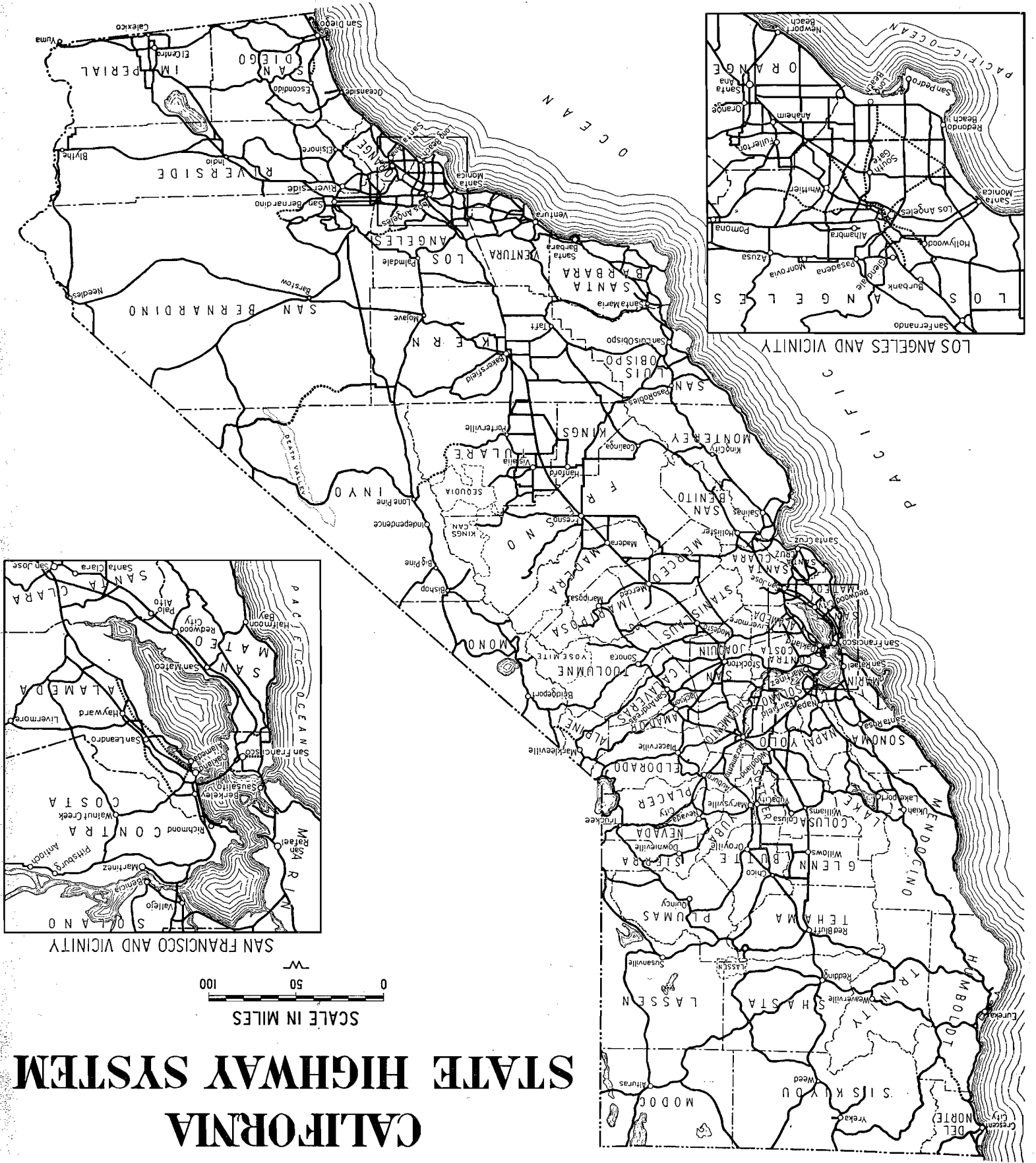
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