

CALIFORNIA

HIGHWAYS AND PUBLIC WORKS

OCCIDENTAL COLLEGE
JAN 7 1954
LIBRARY

NOVEMBER - DECEMBER
1953

California Highways and Public Works

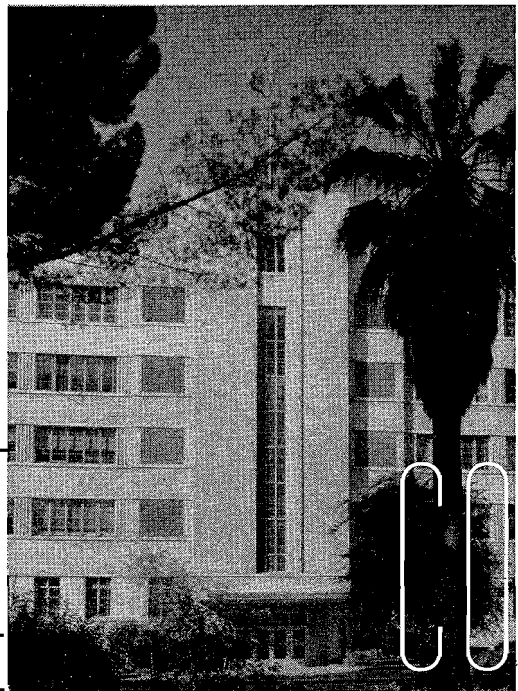
Official Journal of the Division of Highways,
Department of Public Works, State of California

KENNETH C. ADAMS, Editor

HELEN HALSTED, Associate Editor

MERRITT R. NICKERSON, Chief Photographer

Vol. 32 November-December Nos. 11-12



Public Works Building
Twelfth and N Streets
Sacramento

CONTENTS

To the Employees of the Department of Public Works:

This glorious Yule season is a time when we may well pause to review the past year and express through the message of Christmas our thanks and appreciation for the good things we have enjoyed, and the friends and associates with whom we have been privileged to plan and work.

As we look back upon the past year, one of the most gratifying "good things" we have experienced is the wonderful cooperation and excellent performance in the public service of each of the divisions of the Department of Public Works.

The success of any department of government is, in reality, to be found in the attitude, the devotion and the efficiency of its employeemembers. I wish to take this opportunity to express my gratitude to each of you for your individual contributions in this regard.

May the accomplishments of the past year give you all continuing satisfaction, and the challenge of a new year bring you inspiration to resolve that it may be even more productive in the fruits of your labor, in the enjoyment of your friendships, and in the happiness of your families.

A MERRY, MERRY CHRISTMAS

Anna B. Durkee

	Page
First Snowfall of Season Comes to Echo Summit on US 50. Photo Taken on Meyer's Grade by Robert A. Munroe, Photographic Section, Department of Public Works, M. R. Nickerson, Chief.....	Cover
New Bay Crossing, Illustrated.....	1
By Norman C. Raab, Projects Engineer	
Ridgewood Project, Illustrated.....	7
By E. L. Blomquist, District Construction Engineer	
Portola Overhead, Illustrated.....	12
By A. C. Donnenwirth, County Supervisor	
Bond Program, Illustrated.....	14
By W. C. Dalton, County Highway Construction Engineer	
New Freeway, Illustrated.....	16
By Ralph A. Lejonhud, Projects Engineer	
Castro Valley Job, Illustrated.....	22
By A. A. Andrade, Resident Engineer	
Ripon-Manteca Job, Illustrated.....	25
By K. N. Hatch, Resident Engineer	
New Trinity Road, Illustrated.....	27
By Ray Huck, Resident Engineer	
Record Budget.....	30
Tunnel Illumination, Illustrated.....	37
By Roy Matthews, Senior Electrical Engineer	
Sign Route 49 Has New Look, Illustrated.....	38
Another Unit of Bayshore Freeway Opened, Illustrated.....	39
Secret Valley, Illustrated.....	40
Dunsmuir Freeway.....	42
Sacramento Enjoys the Gem and Mineral Show, Illustrated.....	43
By George F. Winslow, Associate Highway Engineer	
Costa Mesa, Illustrated.....	44
By J. L. Needham, Resident Engineer	
Cost Index.....	46
By Richard H. Wilson, Assistant State Highway Engineer; H. C. McCarty, Office Engineer; John D. Gallagher, Assistant Office Engineer	
New Pasadena Bridge Opened, Illustrated.....	48
By R. C. Kennedy, Secretary, California Highway Commission	
District VII Maintenance Employees Picnic, Illustrated.....	49
Out of the Mail Bag.....	50
Traffic Count.....	54
D. E. Watkins Retires as CSAA Manager.....	55
Highway Bids and Awards.....	56
Retirements From Service.....	60
N. J. Morrisey Named to Governor's Cabinet.....	63

New Bay Crossing

Story of the Richmond-San Rafael Bridge

By NORMAN C. RAAB, Projects Engineer, Division of San Francisco Bay Toll Crossings

IN 1915 an automobile and passenger ferry service was inaugurated between Castro Point in Contra Costa County and Point San Quentin in Marin County. The venture was successful from the start, and in 1952 more than 1,000,000 vehicles were transported across the bay.

Since the early 1920's proposals to replace the ferry with a bridge have interested and intrigued many people. In 1926 R. L. Vaughn made an engineering study and reported that such a bridge was entirely feasible and would be a sound financial undertaking. The American Toll Bridge Company, builder of the Carquinez and Antioch Bridges, made a study in 1928. This company obtained a permit from the War Department and a franchise from the County of Contra Costa. Another proposal was made in 1928 by T. A. Tomasini. His crossing was to be between Alameda County and Marin County, and the principal feature was a long subaqueous tube under the navigable channels.

State Becomes Interested

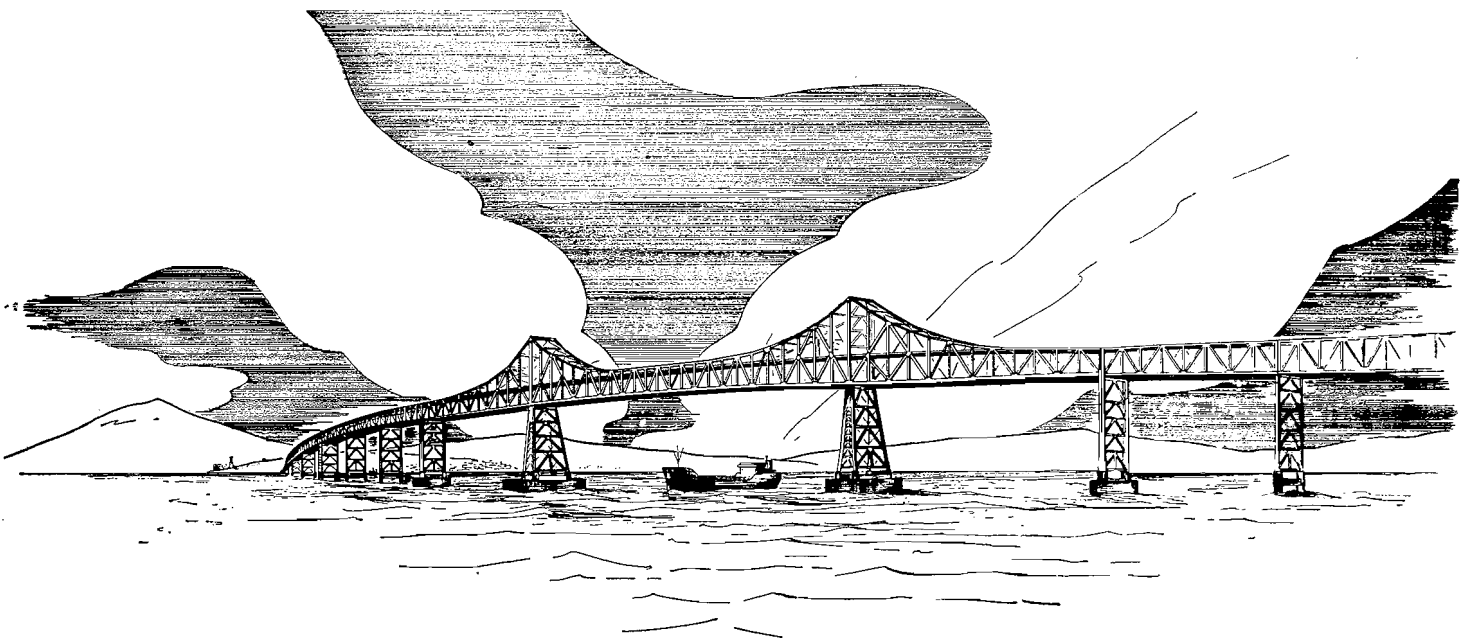
In 1949 the County of Marin and the City of Richmond combined efforts and finances to have a preliminary engineering report made by the firm of Earl and Wright of San Francisco. This report was favorable and expressed the opinion that the project could be accomplished. Marin County and the City of Richmond then succeeded in getting an appropriation from the State Legislature in the 1950 Session for \$200,000 for further studies by the Department of Public Works with instructions to the effect that it be ascertained if a vehicular crossing could be built in accordance with the provisions of the California Toll Bridge Authority Act. The Director of Public Works assigned this investigation to the Division of San Francisco Bay Toll Crossings.

Legislative Appropriation

In January, 1951, a report to the State Legislature determined that a toll bridge could be constructed and

financed under the provisions of the act and an additional sum of \$750,000 was made available to the Department of Public Works to prepare detailed plans and specifications. Out of these funds an amount of \$767,000 was spent and this amount has subsequently been paid back to the State Treasury from the sale of bonds. On August 8, 1951, the Chief of Engineers and the Secretary of the Army approved the location and the preliminary plans for the construction of the bridge. On November 27, 1951, the State approved the preliminary report and determined that the Richmond-San Rafael Bridge should be constructed and operated by the State of California under the provisions of the Toll Bridge Act.

The California Toll Bridge Authority, on November 7, 1952, authorized the creation of an issue of not to exceed \$72,000,000 Richmond-San Rafael Bridge Toll Bridge Revenue Bonds and sold, on February 26, 1953, \$62,000,000 Series A Bonds for the



initial construction of the bridge with the upper deck only. The bonds of Series B, \$10,000,000, are to provide funds for one or more of the following purposes:

(a) To finance the completion of the bridge.

(b) To finance the construction of the lower level, improvements to approaches and additional approach roadways, and additional toll collection facilities.

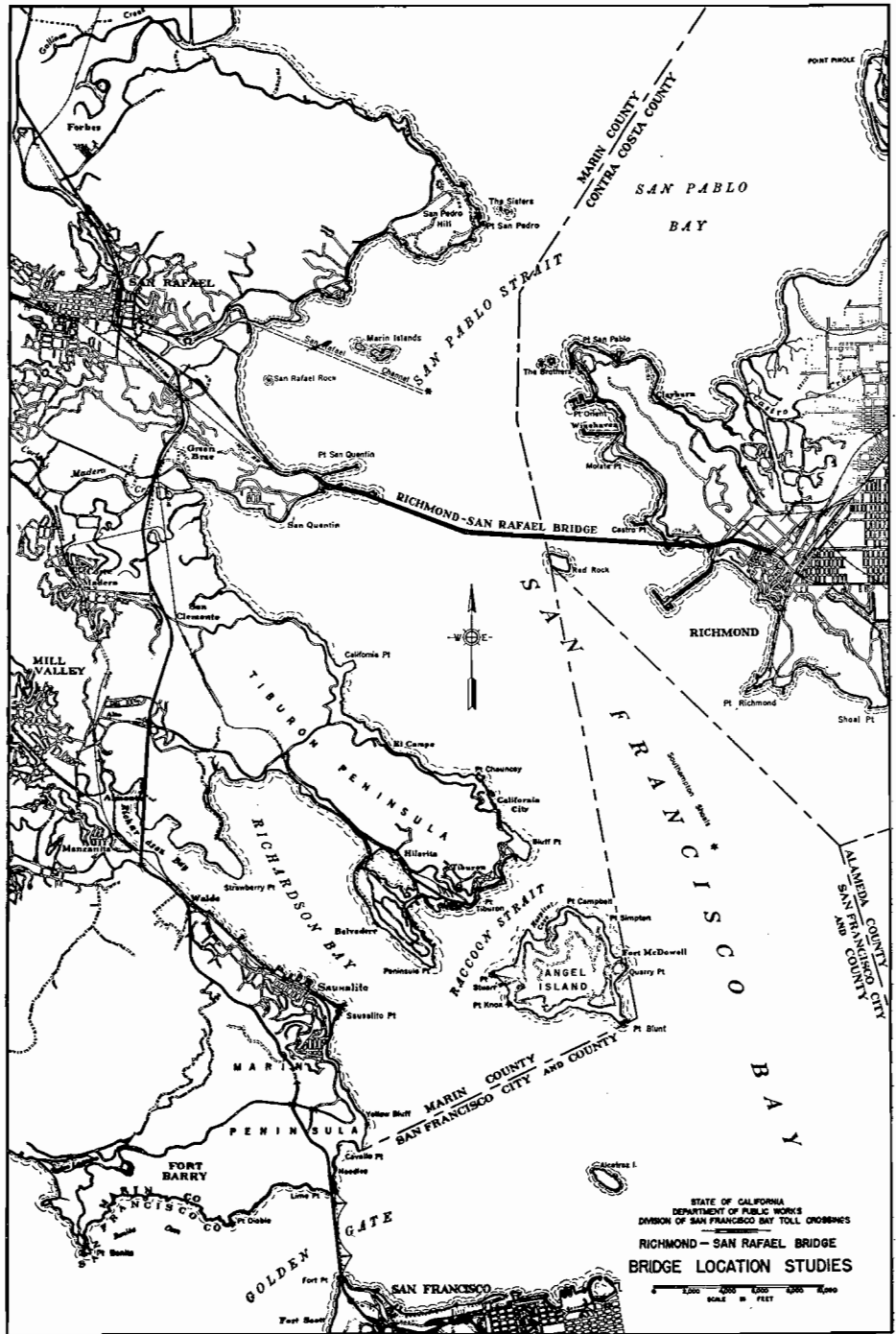
Location and Description of the Bridge

The bridge will provide a new crossing facility over San Francisco Bay, directly connecting the County of Marin at San Quentin and the County of Contra Costa at Richmond. It will form an important link in the existing public highway system, connecting U. S. Route 40, the San Francisco-Oakland Bay Bridge, and other important state highways on the east side of San Francisco Bay with U. S. Route 101 and the north coastal counties on the west side of the bay. In general, the bridge will follow substantially the same route as that now traveled by the Richmond-San Rafael Ferries. In addition to the seven different routes studied, preliminary consideration was also given to an earth and rock fill type of construction across the bay. However, it was ascertained that the cost of such work, including appurtenant facilities such as navigation locks and lift spans would be far beyond any possibility of financing by means available to the California Toll Bridge Authority.

Six-lane Bridge

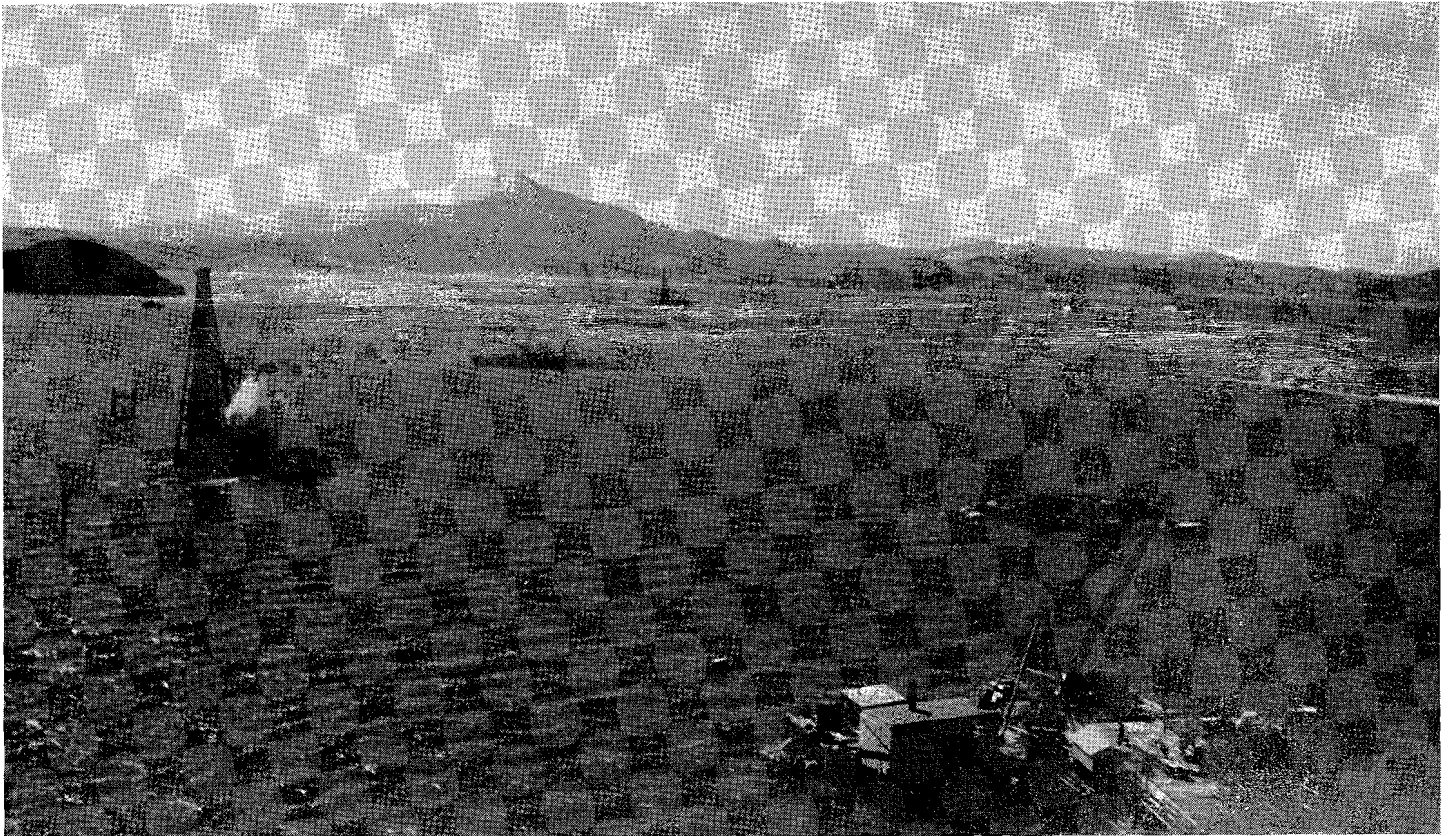
In order that the bridge may serve a traffic capacity sufficient to meet estimated growth in traffic volume for a number of years, it is planned that the bridge will, upon its final completion, be a double-decked structure with three 12-foot westbound traffic lanes on the upper deck and three 12-foot eastbound lanes on the lower deck.

The peak of traffic by ferry has been slightly over 1,000,000 vehicles per year. It is estimated that during the first full year of operation of the bridge, in 1957, there will be 3,900,000 crossings; 10 years later 5,800,000, and by 1980 at least 8,200,000 vehicles will be served by the bridge in one year.



The over-water crossing of the bridge will be 4.0 miles in length; however, the total length of the project, including approaches on each end, will be 5.5 miles. Commencing at Point San Quentin in Marin County, the bridge will consist of 2,800 feet of trestle approach, which in turn will connect to 1,900 feet of 100-foot girder spans. The girder spans will be connected to the cantilever structure

over the main navigation channel by 4,100 feet of 292-foot truss spans. The span of this cantilever structure will be 1,070 feet center to center of the piers with anchor arms of 537 feet. Between this structure and the cantilever structure, over the secondary navigation channel, there will be 3,000 feet of additional truss spans. From this location into Castro Point in Rich-



Pile driving and dredging operations as seen from Contra Costa County shore

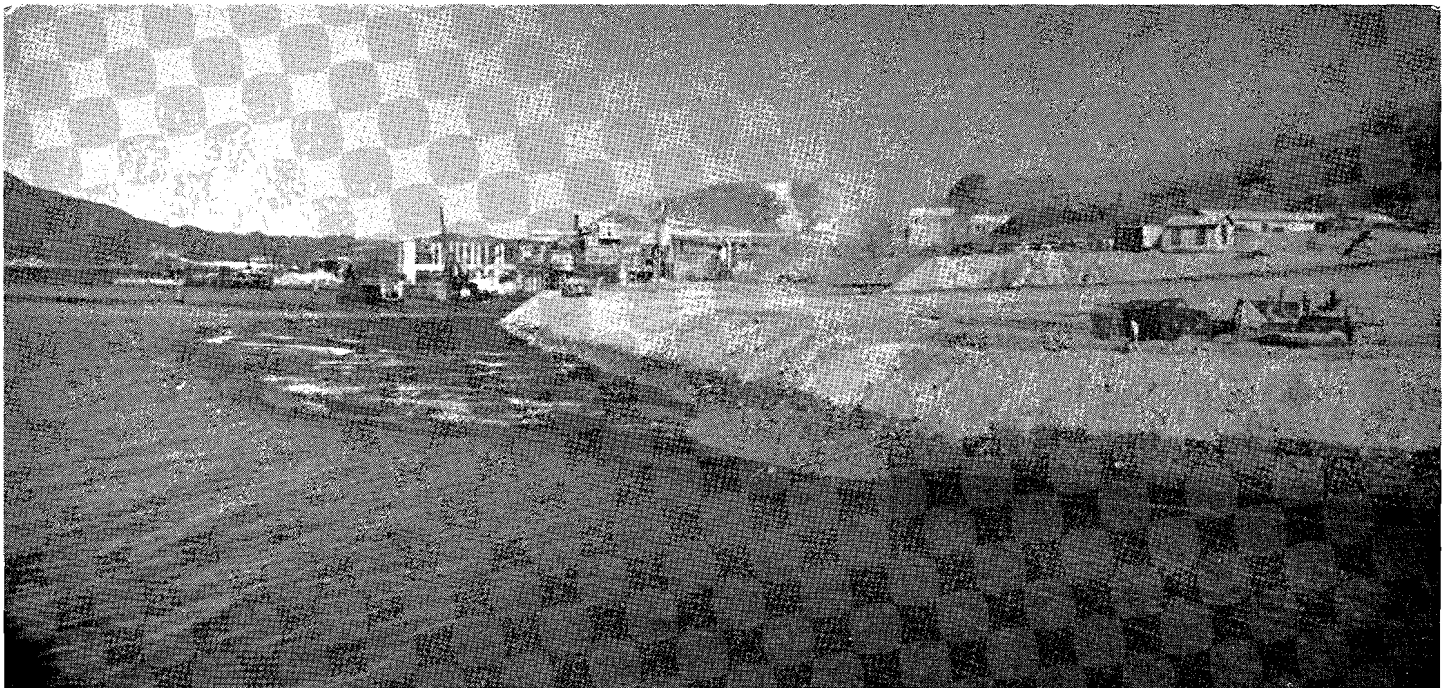
mond there will be 3,500 feet of truss and 1,700 feet of girder spans terminating the over-water structure on an earth fill which will be constructed

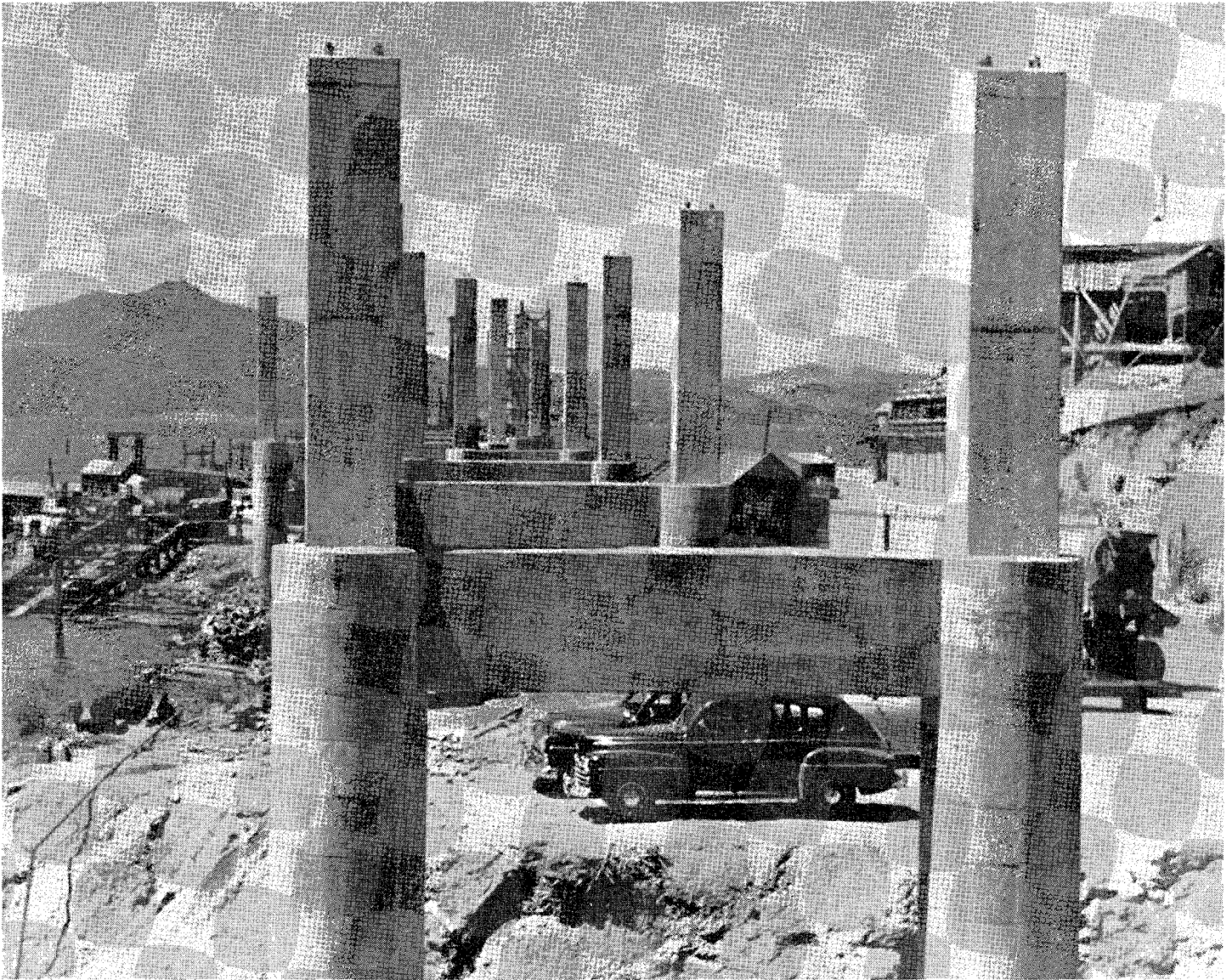
near Castro Point and upon which will be located the toll plaza and toll collecting facilities, as well as administration and maintenance buildings.

Two Cantilever Structures

The two cantilever structures will provide horizontal clearances of 1,000 feet, with a vertical clearance of 185

Mole fill showing mud wave





Completed dry land piers for Richmond approach

the substructure was \$14,234,550 and was awarded to Ben C. Gerwick, Inc., and Peter Kiewit Sons' Co., a joint venture. On the superstructure the low bid was \$21,099,319 and was awarded to Peter Kiewit Sons' Co., A. Soda & Son, and Judson Pacific-Murphy Corp., another joint venture. The bids were well within the engineer's estimates of cost. These contracts comprise approximately 80 percent of the construction cost of the project.

Two Contracts Awarded

Two contracts have subsequently been awarded; one for a mole fill on which will be located the toll plaza, administration and maintenance build-

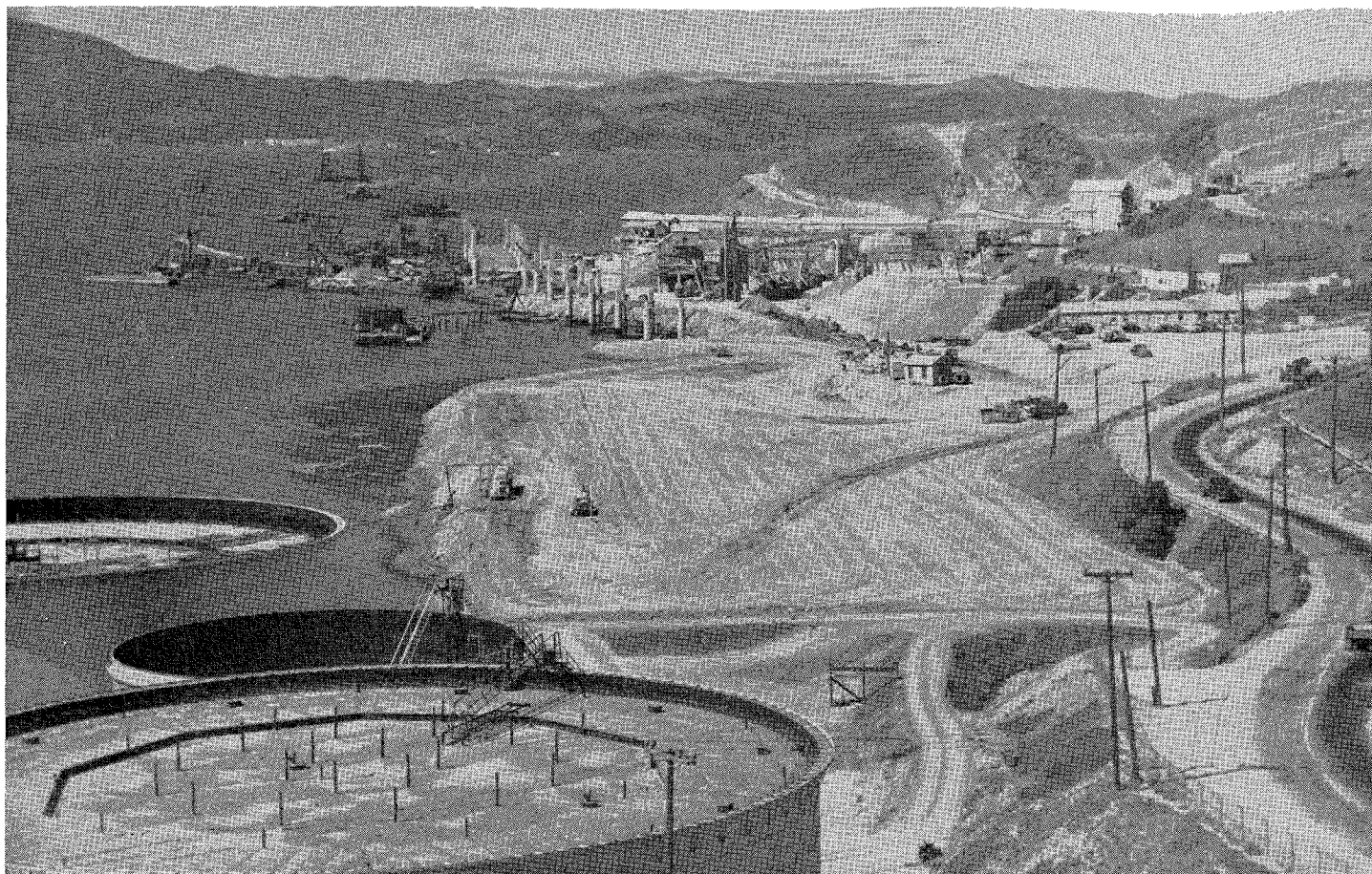
ings on the Richmond end of the project, and the other for a short piece of trestle connecting the present ferry pier with the bridge. This piece of trestle is to be used in the initial stage of construction. The fill contract was awarded to Parish Bros., who submitted a low bid of \$268,787, and the trestle contract to Payne Construction Co. for an amount of \$176,730.

There are other contracts which are to be let at proper times during the various stages of construction of the above work, and which include electrical work, buildings, approaches and pavement thereon. The time of construction estimated by the Department

of Public Works is 3½ years and it is now contemplated that the bridge will be open to public traffic by October of 1956.

Maintenance and Operation

The cost of maintaining and operating the bridge will be paid out of revenues from tolls. Operation by the State will be through an agency similar to and in conjunction with the San Francisco-Oakland Bay Bridge. Total annual maintenance and operation costs are estimated at \$500,000, which includes painting, toll collecting, insurance, and other miscellaneous expenses.



General view of Richmond approach to bridge

Tolls

Tolls sufficient to provide for (a) cost of maintaining and operating the bridge, (b) to meet interest payment on the bonds as they come due, (c) to provide a sinking fund for bonds as they fall due, and (d) to provide a reserve fund for outstanding bonds will be charged. The proposed schedule for the Richmond-San Rafael span at opening is 75 cents for a passenger car, with a commutation rate good for 60 days with 60 rides for \$22.50 or an average of 37½ cents per trip. Trucks will be charged an axle basis, starting at \$1.25 for a two-axle truck up to \$4 for a seven-axle truck. Assuming that experience on this bridge will be similar to that experienced on other bridges crossing San Francisco Bay, the above figures should prove to be very conservative and the volume of business developed after opening should make it possible to either gradually reduce tolls or retire the indebtedness earlier than originally anticipated.

Toll Collection Facilities

Since it is contemplated that the supervision of the bridge will be performed by the staff of the San Francisco-Oakland Bay Bridge, and since the eastern end of the bridge is more readily accessible to the Bay Bridge, this end has been selected for the location of the toll collection facilities. The principal features of the toll plaza are that all collections will be made on the driver's side of the vehicle, and that the Administration Building will be in the center of the plaza with unidirectional traffic flowing on either side. In addition to the Administration Building, it is planned to provide a small maintenance building on both sides of the bay.

Financing

The Toll Bridge Authority, at public sale on December 29, 1952, awarded the initial series of \$62,000,000 bonds to a nation-wide syndicate headed by Blyth & Co., Inc., The First

Boston Corporation, Harriman, Ripley & Co., Incorporated, and Lohman Brothers. The Crocker First National Bank of San Francisco was designated as fiscal agent. The bonds are dated September 1, 1952, and will bear interest at 3⅞ percent per annum, running to September 1, 1992. The bonds are redeemable prior to maturity at the option of the Toll Bridge Authority under a schedule of premiums adopted when this callable feature was included. The only security behind the bonds are the tolls to be collected from the users of the bridge. The project is entirely self-supporting, free of any liability or obligation from any tax source.

The funds provided by this issue will finance the construction of the bridge, including repayment to the State Highway Fund of funds appropriated by the State Legislature and used for the preparation of surveys, plans, cost estimates and specifications, and for other expenses incident to the

... Continued on page 64

Ridgewood Project

Challenges Engineers of
Division of Highways

By E. L. BLOMQUIST, District Construction Engineer

CONSTRUCTION is now under way to replace that section of the Redwood Highway known as Ridgewood Grade. The project is roughly situated midway between Ukiah and Willits and is 4.1 miles in length.

To those familiar with the present highway traversing the Ridgewood Grade, its reconstruction to modern standards was a challenge to design, soils, and construction engineers. This long awaited and eagerly anticipated event, now imperative because of traffic requirements, put to the crucial test their knowledge of highway engineering as well as their ingenuity in developing ways and means of obtaining a stable roadway.

Unstable Terrain

It was appreciated that subsurface drainage, fill and cut stabilization would involve an expenditure of funds which would have financed the construction of several miles of a 1930

standard highway, while on the planned project it would be an unnoticed expenditure to the layman only justified by a reasonably stable highway through terrain probably as unstable as any similar conditions encountered by highway engineers.

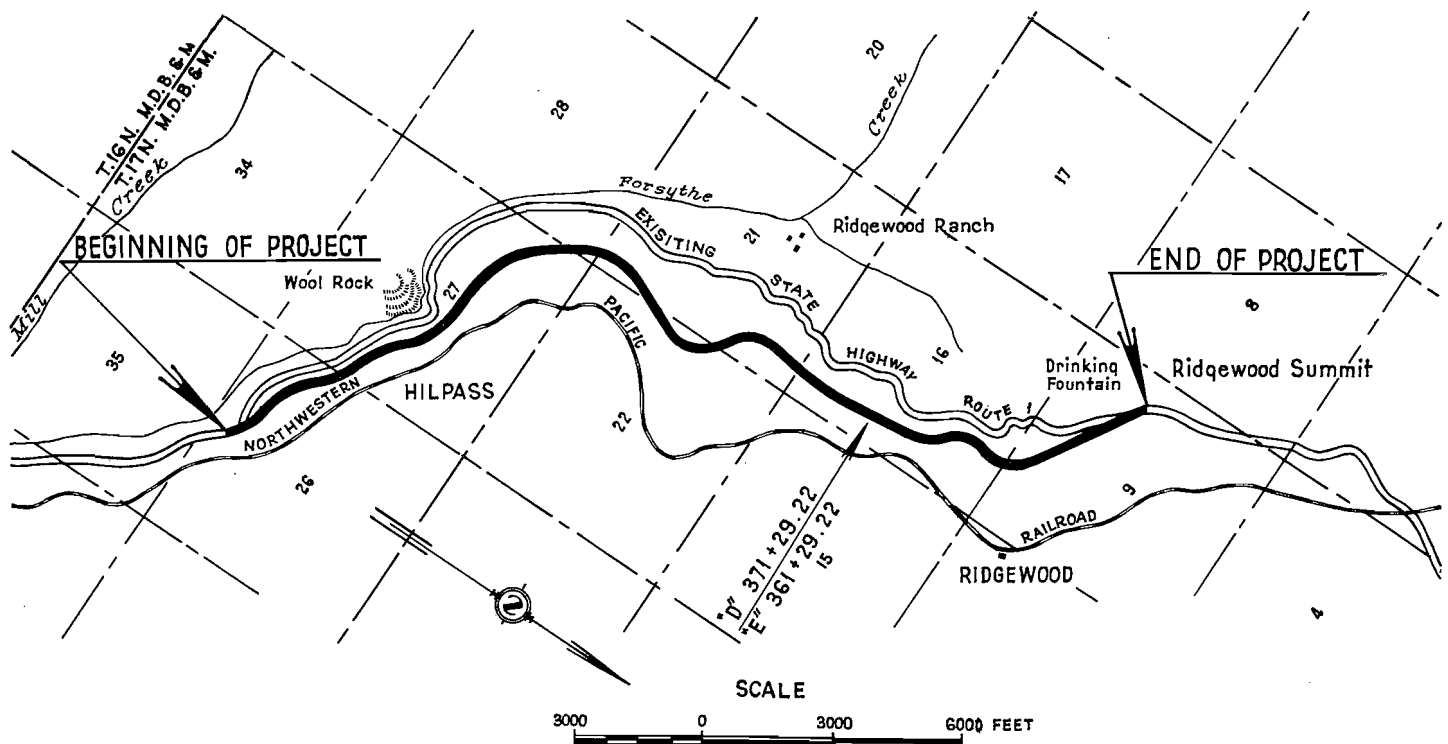
The section of highway to be reconstructed was graded in 1914-15 to horse-and-buggy standards and, except for surfacing, has been improved but little since that time. The present alignment is tortuous, contouring the westerly slope of broken mountainous terrain. Sight distance is very limited, allowing few opportunities for passing slow-moving trucks and house trailers which negotiate the uphill grade at speeds quite aggravating to passenger car traffic. This combination of factors results in the formation of long traffic queues with all traffic reduced to the speed of the leading vehicle. Needless to say, traveling this section of road during the summer

months when tourist traffic is heavy is very frustrating to the average motorist.

To Be Four-lane Expressway

The need for reconstructing this section of highway was recognized 10 years ago with the adoption of the District Postwar Construction Program by the Highway Commission on November 18, 1943. Project No. 4 of this program covered 9.3 miles of proposed reconstruction between 1.5 miles south of Forsythe Creek and Ridgewood Summit. In 1948-49 the southerly 5.2 miles of this section were reconstructed to modern two-lane standards by Guy F. Atkinson Company.

The present project undertakes the grading of the northerly 4.1 miles of the original project and will be developed to a four-lane expressway. It is planned to place the surfacing under a separate contract during the summer of 1954. Recent traffic studies



and current design standards dictated a complete realignment on new location and a 58-foot, four-lane all-paved section for the project.

Geological Formations Varied

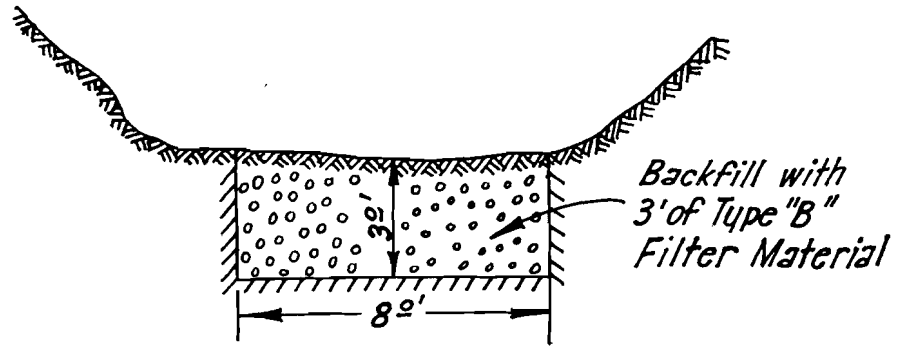
Geologically, the formations on the project are quite varied and involved. The area is characterized by landslides and old fault lines which have resulted in numerous springs and unstable areas. Plastic grey to brown clays mixed with a large percentage of sandstone and schist particles are encountered throughout the project. Test borings indicate plastic clay layers extending to depths up to 100 feet in several fill areas. The low permeability of this material permits high hydrostatic pressures to develop with resulting instability unless corrective measures are undertaken.

Because of the generally unstable nature of the terrain traversed throughout the project, the following design features were incorporated in the plans to provide corrective treatment of unstable areas:

1. Stabilization trenches
2. Channel stripping
3. Embankment foundation stripping

Stabilization Trenches

Stabilization trenches were designed where unstable fill foundations are well-defined and are usually located in swales or ravines. These trenches are 12 feet in bottom width, have 1:1 side slopes and are being excavated to

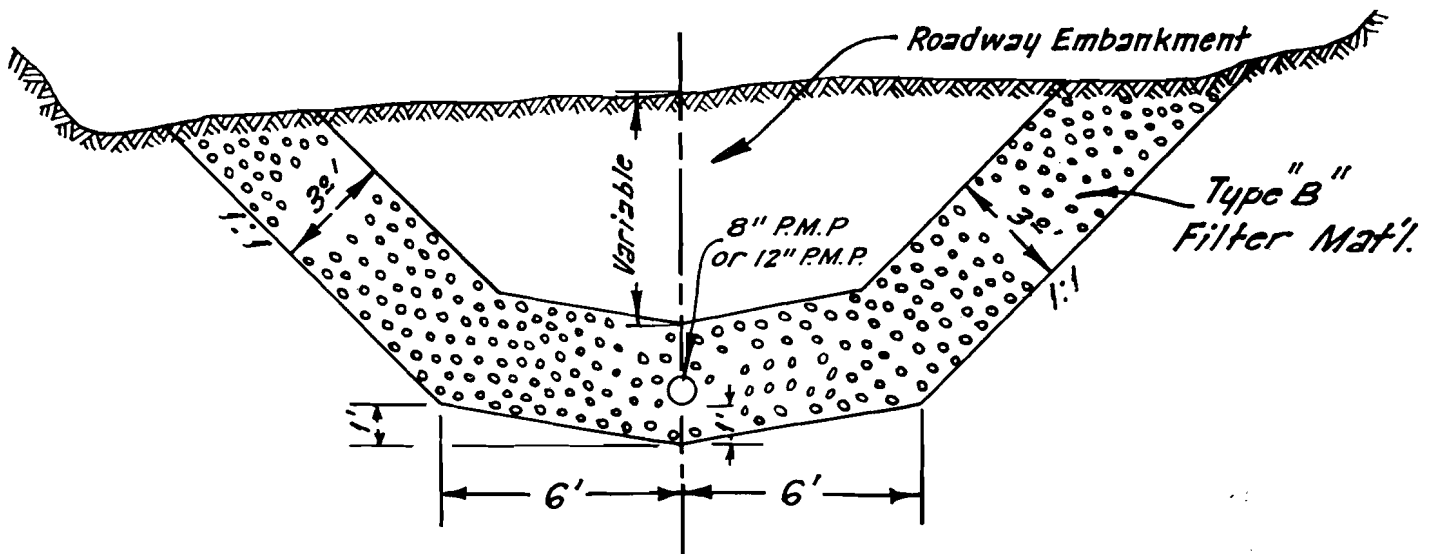


TYPICAL SECTION CHANNEL STRIPPING

depths varying from 5 feet to 25 feet. Complete subsurface exploration was not made during the design stage as the soil is too rocky for hand borings and the cost would have been prohibitive if all trenches were investigated by power drilling equipment. For this reason the design of the trenches was based on a few power borings and a geological study made by the Materials and Research Department. Hand borings were made during construction after excavating the trenches to approximate planned grade. Final depths to which the trenches will be excavated are based upon these hand borings.

Some of these trenches are "floating"; that is, they are not excavated to a firm bottom, as to do so would be prohibitive in cost. The trenches are generally constructed more or less

normal to the highway but in some instances are constructed with wye branches. The bottom and side slopes of the trenches are blanketed with filter material three feet thick normal to the slopes, and the remaining part of the trenches backfilled with roadway embankment. Perforated metal pipe eight inches and/or 12 inches in diameter is placed in the filter material one foot above the bottom of the trench. These trenches are very effective in providing an outlet for seepage or subsurface waters and for dehydrating the surrounding ground and have proven very successful for fill stabilization on previous projects throughout the district. Seventy-seven stabilization trenches are being constructed on this project involving 63,000 cubic yards of trench excavation and 58,000 tons of filter material.



TYPICAL SECTION - STABILIZATION TRENCH



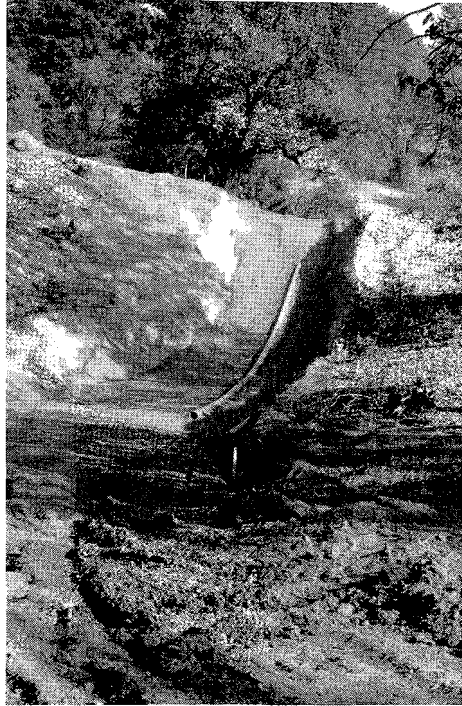
Heavy construction on section of Ridgewood grade project

Channel Stripping

A modified form of stabilization trench was designed for locations where existing water channels fall under embankments. These channels are being stripped to a width of eight feet and a depth sufficient to place three feet of filter material. This treatment is not intended to provide foundations for culverts as their location does not usually follow the existing channel, but rather to provide an outlet for seepage or subsurface water which might otherwise be trapped under the new embankment. Thirty-one such channels are to be stripped involving 5,400 cubic yards of channel stripping and 9,000 tons of filter material.

Embankment Foundation Stripping

Ten large embankment areas are being stripped to a depth varying from three feet to 10 feet to remove wet and unstable surface soils to provide a stable foundation for embankment construction. These stripped areas are blanketed with three feet of filter material prior to constructing embankments thereover to provide an outlet for seepage water. This work involved 25,000 cubic yards of excavation and 37,000 tons of filter material.

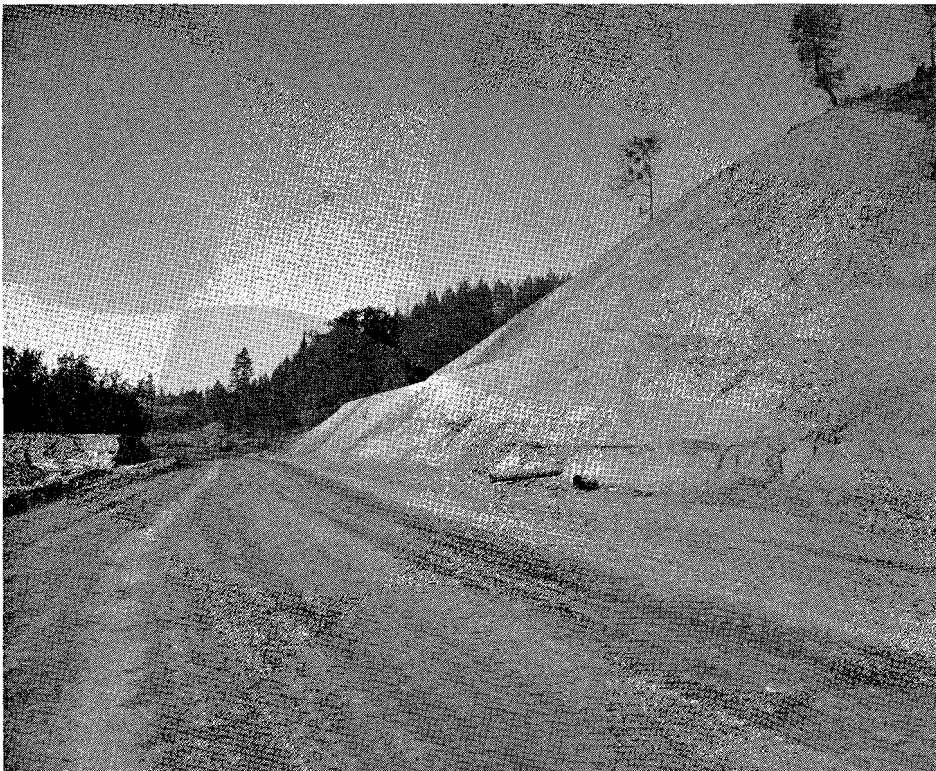


Slab trench showing pipe in place

Including filter material to be utilized for underdrains, a total of 107,000 tons will be required for the project. Specifications for filter material conform to those listed for Type "C" filter material proposed for the forth-

coming new Standard Specifications. Gravel from Forsythe Creek about three miles south of the project is being utilized for filter material and the project. Gravel from this source meets specification requirements by simply scalping off the oversize.

Bench cut on Ridgewood grade project



Heavy Excavation

All of the above corrective treatments, although involving a large amount of work, may be considered as but preparatory to the grading proper, which involves some 785,000 cubic yards of roadway excavation. The short time limit of 155 working days made it mandatory for the contractor to plan a tight working schedule coordinating the preparatory work with the grading, which has been no easy task. Construction of the stabilization trenches, channel stripping, and embankment foundation stripping and backfilling with filter material before embankments can be constructed is further complicated by the necessity of utilizing material resulting from these excavations in the construction of embankments.

Vibratory Tampers

An innovation on this project is the required compaction of filter material by vibratory tampers. This re-

quirement was specified to minimize consolidation of the filter material subsequent to construction of the roadway, which has possibly been partly responsible for the settlement indicated at pavement grade on several previous projects.

It was considered that the vibratory method of compaction would be ideally suited to the granular type of material specified for filter material and that compaction by this method would prove to be both practicable and economical. A satisfactory field test procedure has yet to be developed to determine the relative compaction of a granular material such as filter material. Furthermore, actual compaction results that could be expected to be obtained with vibratory tampers was not known. For the foregoing reasons the cost of compacting the filter material by vibratory tampers was specified to be paid for as extra work in lieu of the customary procedure of specifying a minimum relative compaction requirement. The contract special provisions require that filter material placed in the bottom of stabilization trenches, channel stripping areas and for embankment foundation be placed in layers not exceeding 18 inches thick, and thoroughly compacted by the use of approved vibratory tampers, as directed by the engineer. Compaction of filter material placed on the side slopes of stabilization trenches is not specified as it is impracticable to compact this granular material and keep it in place on a 1:1 slope.

Equipment Used

The vibratory equipment furnished by the contractor for this work consists of three Jackson vibrating tamper units mounted on the front of a D-4 crawler tractor. Each vibrating tamping unit is 24 inches wide, so that the three units mounted side by side make a total tamper width of six feet. The tamper units are mounted similarly to a bulldozer blade and are easily lowered into position for compacting or raised for turning of the tractor just as a bulldozer blade is raised or lowered.

A Jackson power plant unit is mounted on the tractor and provides power for the three Jackson vibrating



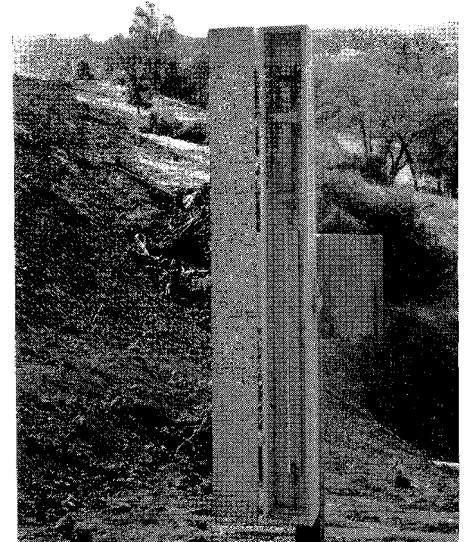
UPPER—Settlement platform set-up may be seen on left. LOWER—Close-up of settlement platform.

tamping units. The power plant consists of a small gasoline motor and electric generator. Each tamper unit is operated by its own electric motor. The tamper shoes are leveled in front and are operated only on the forward motion of the tractor. Generally three to six passes are made over an area to be compacted at a travel speed of about 24 feet per minute. This equipment operates satisfactorily on grades up to 25 percent. Compaction results being obtained with this equipment have not been fully evaluated and further analysis must be made before arriving at any conclusions relative to compaction of filter material by vibratory tampers.

Erosion Control

The seeding of fill slopes is planned throughout the project as an erosion control measure.

No special preparation of slopes for seeding is planned; however, as an additional erosion control measure the special provisions require that the surfaces of all embankment slopes shall be rolled with a tamping roller, a total of 12 times or six round trips of the roller.



Embankment settlement subsequent to surfacing of the finished roadway is, of course, undesirable and engineers strive to prevent this condition by adhering to well-accepted construction practices during construction. Unfortunately, some large roadway embankments do settle, even though foundations were stripped or recomacted and compaction requirements strictly enforced throughout construction of the embankment. Such settlement may be caused by consoli-

... Continued on page 36

Portola Overhead

F. A. S.-County Funds Finance
Plumas County's Road System

By A. C. DONNENWIRTH, County Supervisor

Two steel girder bridges, with concrete slab decks, one 255 feet in length across the Middle Fork Feather River and the other, 196 feet long spanning the tracks of Western Pacific Railroad, are now under construction.

This project, known as the Portola Overhead, was first proposed in 1935 after having been discussed locally since the early twenties. A group of Portola businessmen tried to undertake this work under the Public Works Administration. At that time Portola was an unincorporated town of about 1,500 people and its leaders were poorly organized to present a united front. When PWA officials arrived to make a survey, it was found that there were three groups, pulling in different directions, each having a favored crossing of the river. It took two years

to reach an agreement favorable to all groups concerned and when a final decision was made the PWA no longer existed.

Project Materializes

The next attempt was made by the county in 1945 at which time \$25,000 was placed in the budget under Portola Overpass Capital Outlay. This amount was increased to \$50,000 in 1949 and thanks to the tireless efforts of the present board of supervisors the project was materialized this year at a cost of \$290,245.84 with the aid of federal secondary funds.

Portola is an important business center for the eastern portion of Plumas County, and a division point of the Western Pacific Railroad. It has a population of about 3,400. It is also the trading center of Sierra Valley.

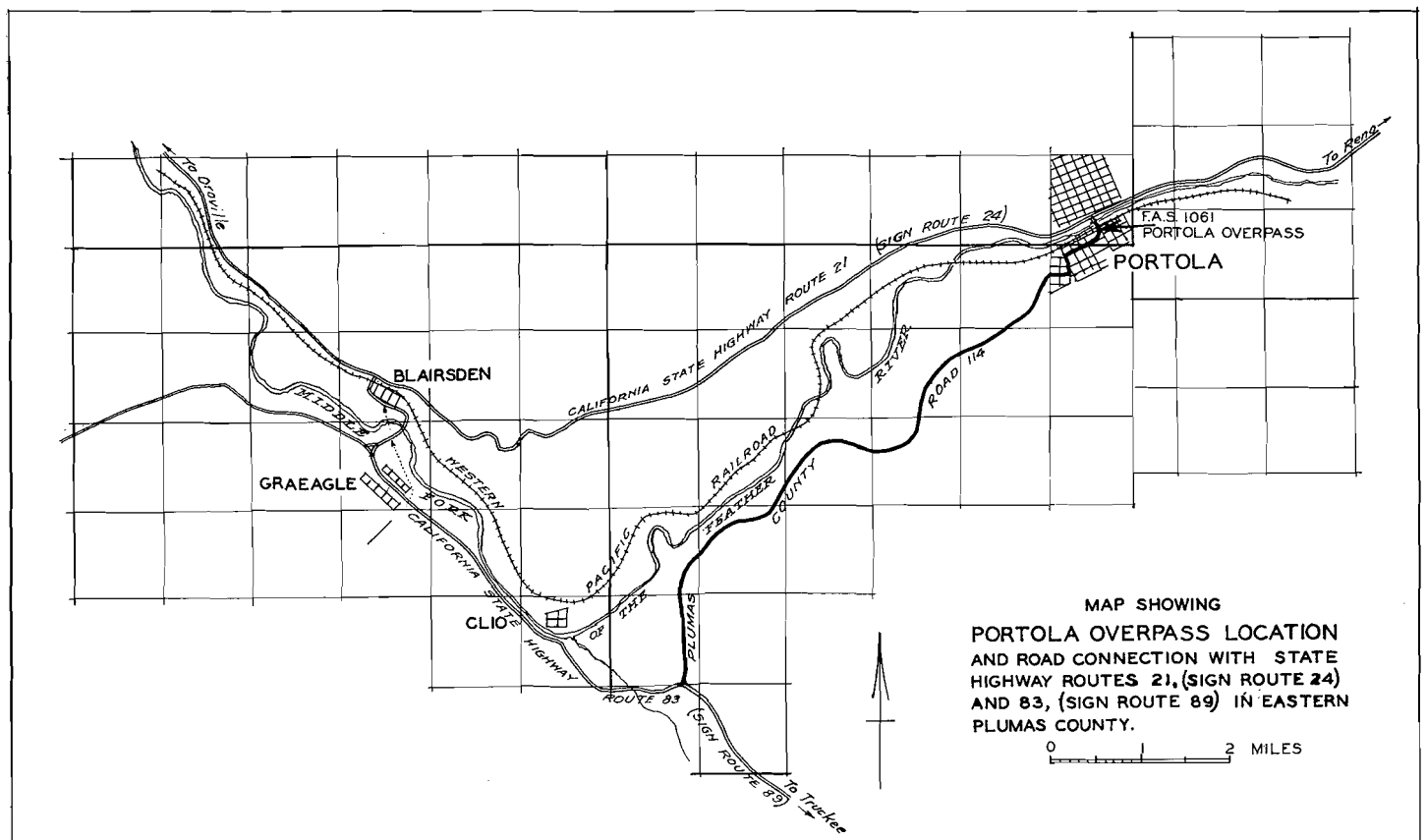
The town is evenly divided by the Feather River and by the tracks of the W. P. R. R. The schools, post office, banks and most of the business section are on the south side. The north side is at present growing at an accelerated rate and it is anticipated that soon will be as large as South Portola.

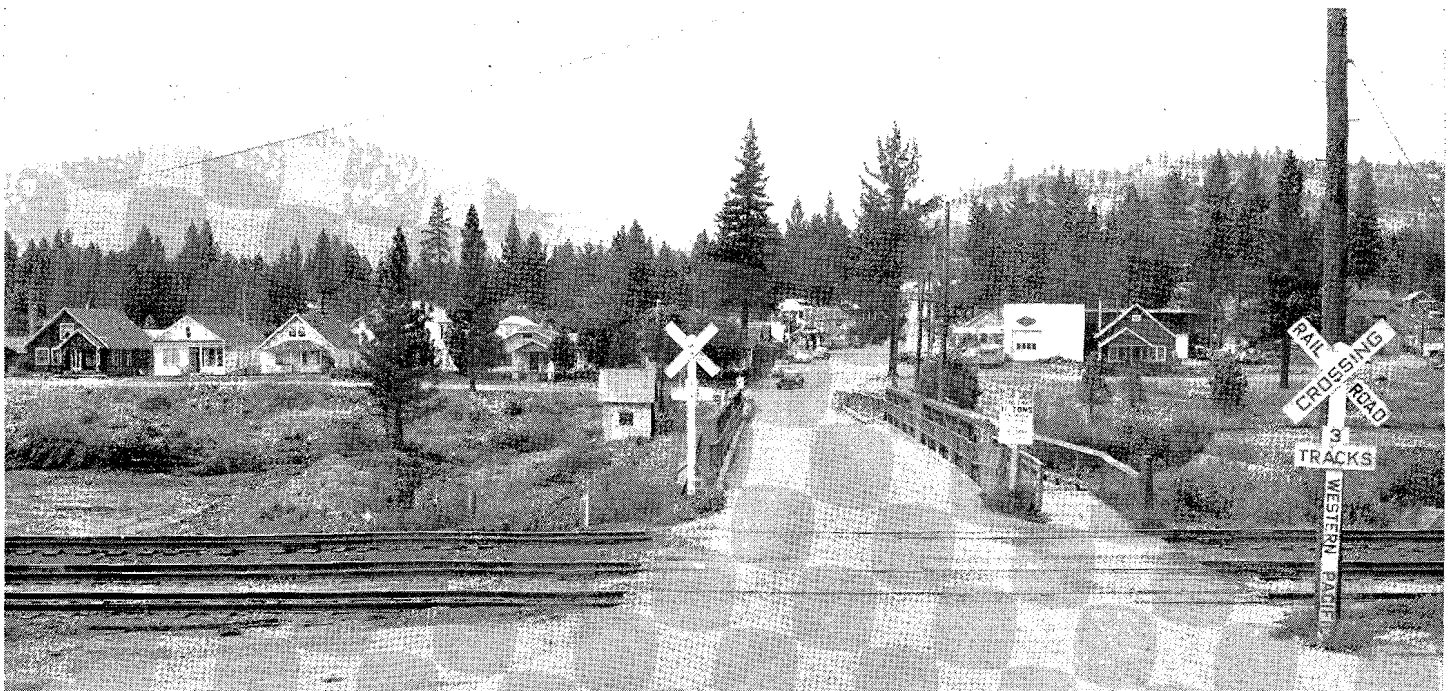
Trains Cause Traffic Delays

Train movements through Portola create very serious traffic delays, particularly when fire engines, police cars or ambulances are involved. At times, there are trains of more than 125 cars

... Continued on page 53

UPPER—Frequent traffic delays at existing railroad grade crossing in Portola will be a thing of the past when the new FAS railroad overhead and bridge are opened to traffic. LOWER—As grade crossing looks without blocked traffic.





Bond Program

Contra Costa County Completes
First Bond Issue Project

By W. C. DALTON, County Highway Construction Engineer

THE COMPLETION of a 3.6-mile section of the Byron Highway in eastern Contra Costa County marks the first step towards completion of a \$10,250,000 county road bond issue program. It is noteworthy that this first contract was also a federal aid secondary project, since the FAS program has had an important influence on the postwar construction planning in Contra Costa County.

The contract just completed was awarded December 5, 1952, to the Stephens Trucking Company of French Camp with the stipulation that roadway work would not be undertaken until about April 15, 1953. Structures and incidental items were constructed during the winter and the contractor was able to concentrate on major roadway items under favorable weather conditions. Work was completed August 27, 1953, with a final cost of \$214,700 exclusive of engineering.

The geometrical section (two 11-foot traffic lanes flanked by 7-foot

Contra Costa County is to be congratulated for its straightforward approach to the solution of its traffic problems.

G. T. McCOY
State Highway Engineer

shoulders) of this job was identical with that used on the FAS project adjoining on the north which was completed in 1951. The traffic lanes are paved with plant-mixed surfacing three inches thick, the 3-foot strip of shoulder adjacent to the plant-mixed surfacing has a double seal coat treatment, while the outside four feet of shoulder has a penetration treatment.

Difference in Projects

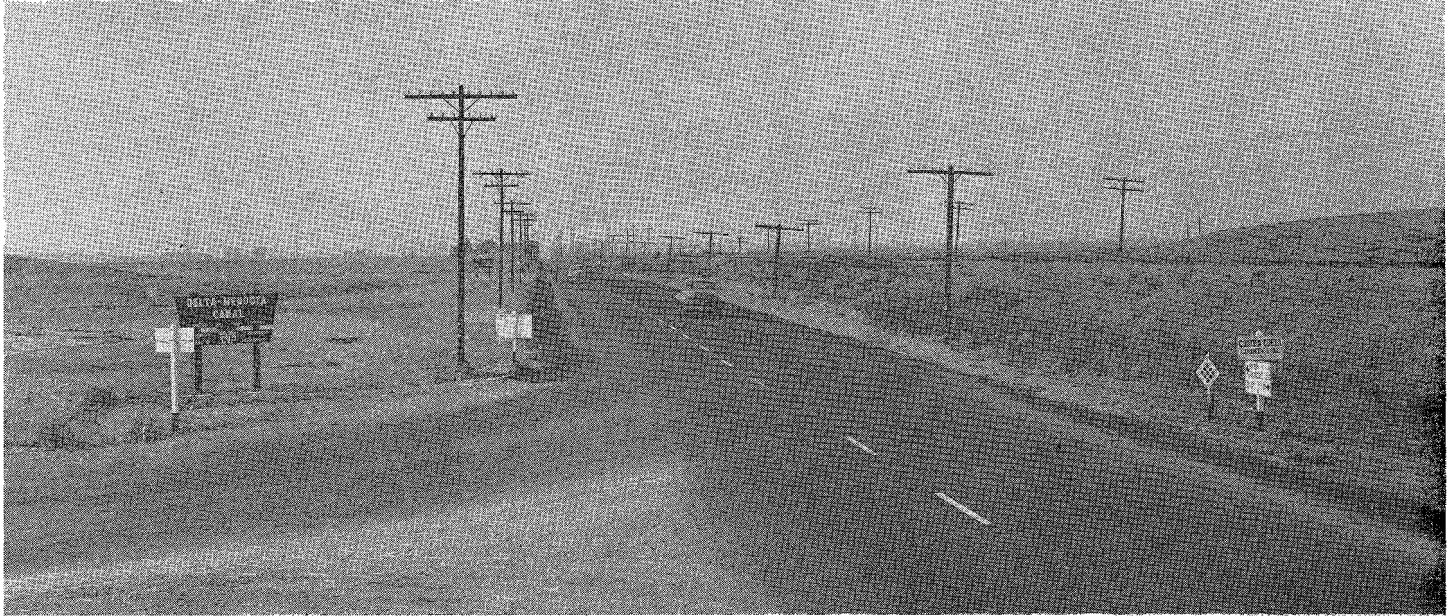
The major difference between the two FAS projects is in the structural section. The project just completed has a 6-inch thickness of crusher-run base under the plant-mixed surfacing and seal coat. This was placed on the old 5-inch thick Portland cement concrete pavement or on imported sub-

base material five to twelve inches thick. This section contrasted with the earlier project where better base and drainage conditions prevailed and where the plant-mixed surfacing was placed directly on the old pavement which had been patched and widened with five inches of crusher-run base that had been treated with 2 percent of Portland cement. Imported base material supported both the cement-treated and untreated crusher-run base shoulder strips.

One unplanned difference in the two projects which may affect future maintenance was the quality of the two kinds of imported base materials. The first job was constructed with material from a local sand deposit which required rigid grading, blending, and compaction controls, whereas on the recent contract, Stephens Trucking Company elected to haul from a pit at some distance from the project where the pit-run material was almost equal to crusher-run base in most respects.

Railroad grade crossing on Byron Highway, a county road in eastern Contra Costa County, is modernized with flashing light signals, improved alignment and extra width for busses and petroleum trucks which must stop at all grade crossings





New Byron Highway as viewed from Alameda County. This project was the first to be completed under the new \$10,000,000 county road bond issue. (No negative available.)

State Procedures Followed

As mentioned above, the influence of Contra Costa County's FAS projects on the engineering of other county work has been notable. A much improved knowledge of the changes and current application of special provisions and state specifications has been achieved. Structural designs and material controls have served as a guide on other county projects.

The State Division of Highways' Construction Manual is used on county projects with as little deviation as possible. The construction procedures and forms used by the Division of Highways have been adopted as standards by the county construction division and will be used on all bond projects. This policy, in general, permits the county construction forces to draw on the experience of the State, and it also tends to stabilize contract and material prices within the county.

With the approval of the county road bond issue by the voters last year, the county highway department's engineering staff began preparing plans for the most urgent projects. An expansion of this staff was necessary to complete the bond issue work in the scheduled five-year period, but this expansion was held to a minimum by contracting for aerial surveys, topographic maps, and other surveying and

engineering services. The reorganization of the county highway department had been achieved prior to the bond issue approval with four main divisions being established directly under the road commissioner. These divisions are administration, engineering and planning, construction, and maintenance. The staff and service functions of rights of way, materials and testing, traffic, records, surveys, structures, and accounting have been integrated with the main divisions in such a way as to permit independent or coordinated operations. Emphasis was placed on the need for keeping engineers on engineering work, and to this end much of the office routine as well as certain nontechnical field work has been reassigned.

Bond Issue Program

Progress on the bond issue program is difficult to estimate in terms of dollars at the present time because only three projects totaling \$300,000 are beyond the advertising stage. However, an additional \$1,650,000 of roadway and structure contracts are off the drawing boards and should be under way before the end of 1953. This group consists of four projects, two completely engineered by the county, one by the State, and one by a consulting engineering firm. One of the county-engineered jobs will be a FAS project. The projects not de-

signed by the county involve major structures which will cost about \$350,000 each. The project being handled in its entirety by the Division of Highways consists of an overpass and connections to the Arnold Highway at Loveridge Road near Pittsburg. The State had the basic design information for this heavy industrial freeway interchange and its cooperation in this project resulted in considerable savings to the county in time and money. The Tudor Engineering Company of San Francisco is preparing plans and specifications for the L Street underpass in Antioch, another connection to the Arnold Highway. This firm also prepared the deficiency report on county highways which was the basis for the \$10,250,000 bond issue.

Surveys and plans have been started by the road commissioner's staff and are in various stages of completion on another projected \$1,240,000 worth of bond issue work, and consulting engineering firms have been engaged to survey three of the larger projects totaling \$1,850,000. Target dates for contracting most of the above-mentioned projects are within the next 20 months.

The resident engineer, on the first bond contract was R. B. Vaile and Lee Stephens was the contractor's superintendent. The county road commissioner is Victor W. Sauer.

New Freeway

Oceanside-Carlsbad Project
Opened With Ceremonies

By RALPH A. LEJONHUD, Projects Engineer

THE OPENING of the Oceanside-Carlsbad Freeway marked the completion of a project that was actually started some 13 years ago. In 1940 the inadequacies of the state highway along Hill Street in the City of Oceanside were already apparent. During that year a cooperative project involving some of Oceanside's ¼-cent gas tax funds was initiated. This early project, which contemplated widening the existing street by decreasing the sidewalk area through the business district as an interim improvement, was abandoned because of the shortage of men and materials, combined with rapidly rising costs caused by World War II. It was already obvious that Hill Street could not be considered as the ultimate highway location.

The problem of highway routing is always a major factor in community planning and there was an increasing demand that the ultimate highway location be definitely established. The California Highway Commission approved surveys and plans for the Coast Highway between the San Diego

north city limits and the Oceanside north city limits on July 18, 1946. On March 26, 1947, District XI, Division of Highways, submitted a report discussing the problem of ultimate location through Carlsbad and Oceanside.

Ten Locations Studied

A total of 10 possible locations were discussed but no one route was definitely recommended. Various officials of the City of Oceanside, including the mayor, members of the planning commission, school board and city council, met with representatives of the Division of Highways on April 23, 1947, to discuss these possible routings. The ultimate location was narrowed down to two alternatives, both of which involved some conflict with Oceanside school property. In an attempt to find a solution that would be satisfactory to all agencies, members of the Oceanside School Board, State Department of Education, and representatives of the Division of Highways met in conference in Los Angeles on May 8, 1947, to discuss the conflict

... Continued on page 20

Freeway Ceremonies

WITH BANDS and fanfare, the Oceanside-Carlsbad Freeway in San Diego County was opened to the use of the public at 5 p.m., November 16, 1953.

The Oceanside High School Band, dressed in Kelly green uniforms with white trimmings and their majorettes dressed to match, were on the northbound lanes of the freeway. Massed on the southbound lanes was the Marine Band from Camp Pendleton, dressed in their "blues."

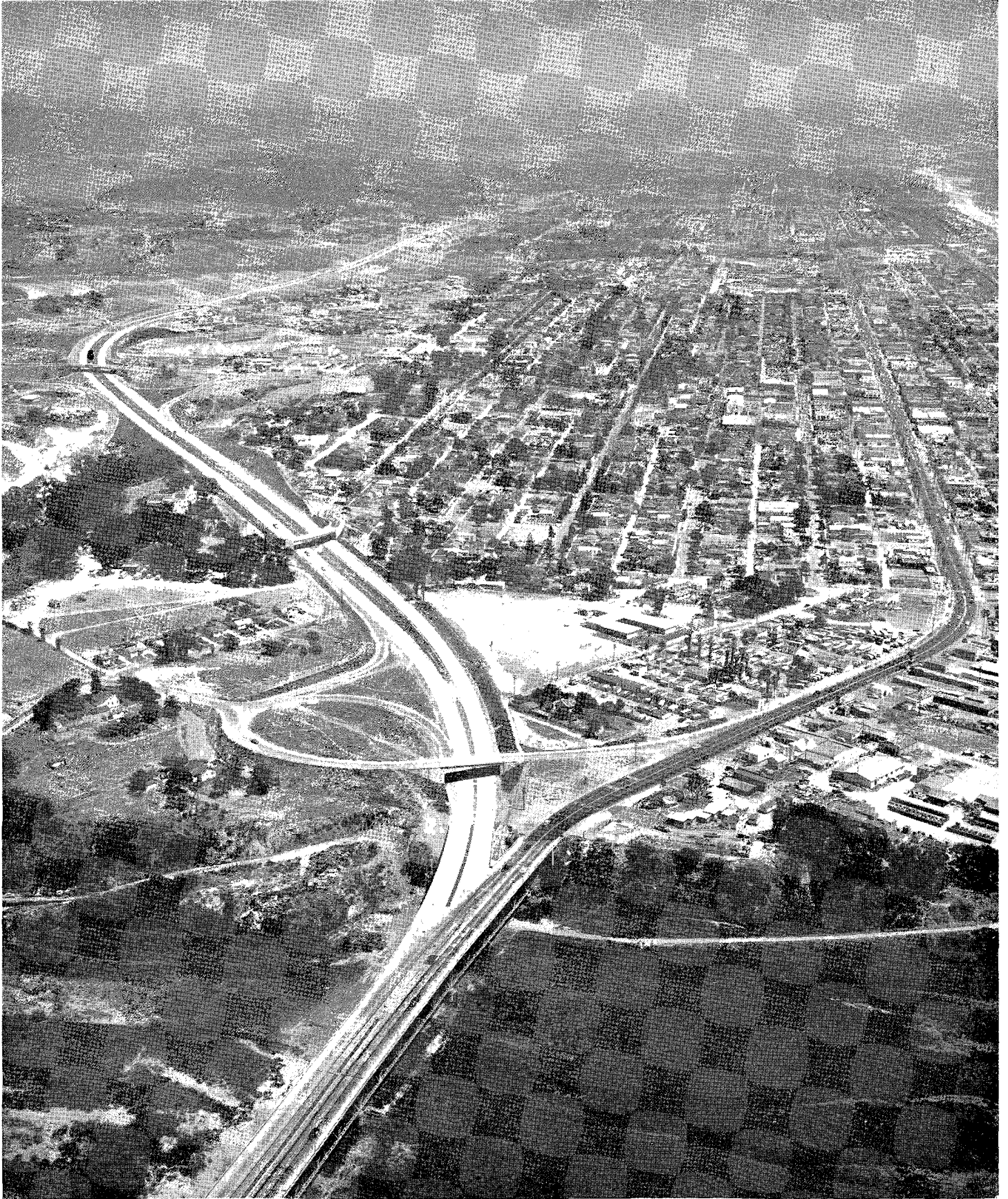
All the dignitaries of San Diego County were seated on the platform. The highest state official to attend the ceremonies was Lieutenant Governor Harold J. Powers. Highway Commissioners Harrison Baker, James A. Guthrie and Charles T. Leigh, Deputy State Highway Engineer R. M. Gillis, Special Assistant to the Director of Public Works Fred Bagshaw, E. E. Wallace, District Engineer of District XI, State Senator Fred Kraft; Assemblymen L. M. Backstrand, Riverside, E. S. Bulen, Escondido, and Frank Luckel, San Diego, county board of supervisors representatives, mayors of practically every city in western San Diego County, major generals from Camp Pendleton and a captain from the Eleventh Naval District, made up a partial list of the guests for the festivities.

Immediately after the ceremonies on the freeway, guests were entertained by the Carlsbad Chamber of Commerce at the Carlsbad Inn. At 7 p.m. more than one hundred guests sat down for dinner at the Colonial Inn in Oceanside as guests of the San Diego Chamber of Commerce.

—R. C. K.

Hill Street in Oceanside, looking north, showing traffic conditions prior to freeway opening





Looking south, showing new highway location on left and old route on right through Oceanside



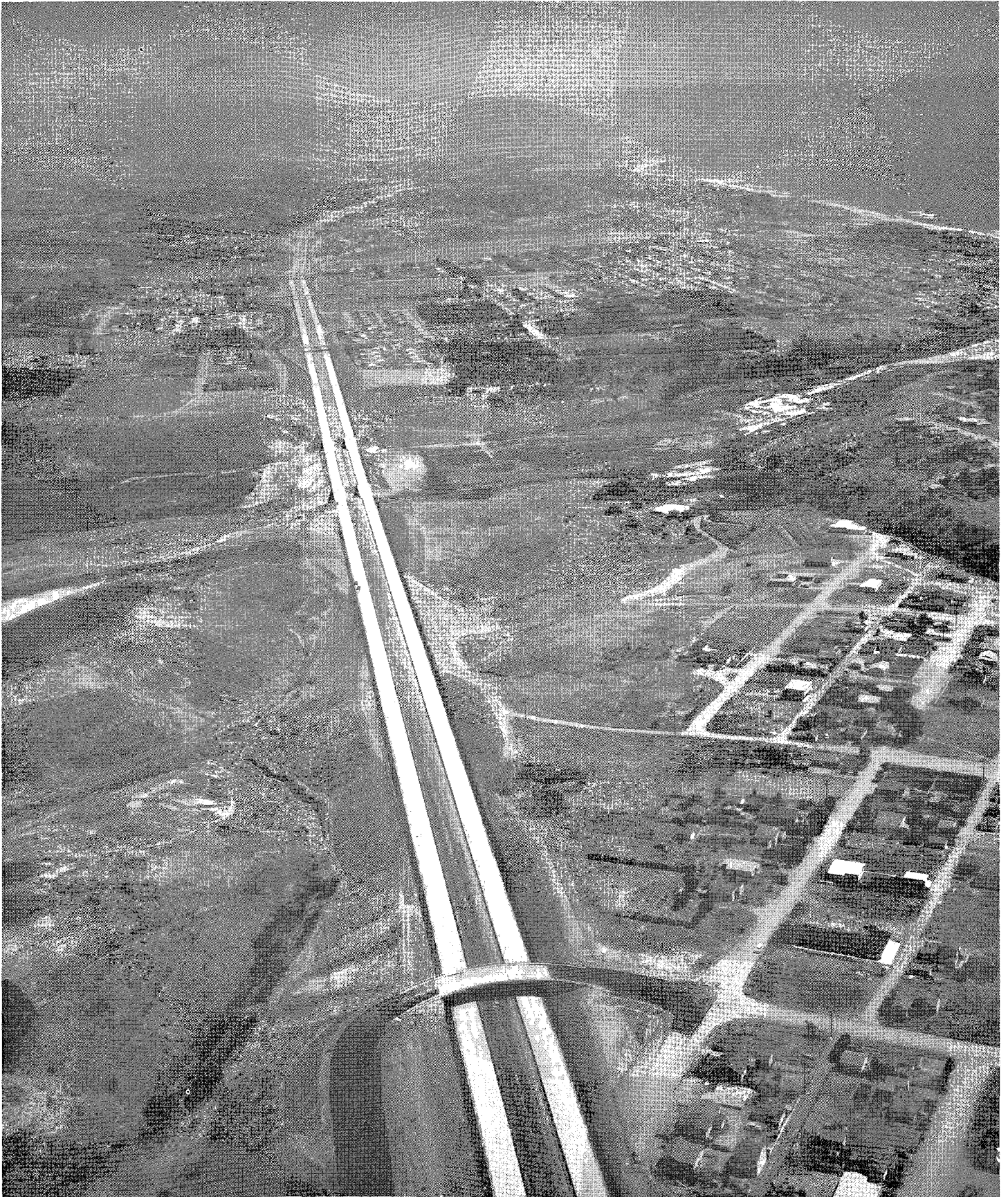
Looking north, showing freeway through Oceanside. Vista Way grade separation in foreground.

SUMMARY OF CONTRACTS FOR OCEANSIDE-CARLSBAD FREEWAY

Unit	Length †	Contractor	Construction cost, including construction engineering
¼ mile south of Mission Ave. to San Luis Rey River; grade, pave and structures.....	1.06	Cox Bros. Const. Co.	\$1,084,000
0.7 mile south of San Marcos Creek to 2.2 miles south of Carlsbad; grade, pave and structures	3.21	Cox Bros. Const. Co.	739,000
0.13 mile south of the San Luis Rey River to Camp Pendleton main entrance; grade, pave and structures.....	0.51	Chas. MacClosky	1,055,000*
Buena Vista Lagoon to ¼ mile south of Mission Ave.; grade, pave and structures.....	2.09	J. A. Payton and Bent Const. Co.	1,763,000*
2.2 miles south of Carlsbad to Buena Vista Creek; grade, pave and structures.....	4.40	Bressi & Bevanda Constructors, Inc.	2,497,000*
¼ mile south of Mission Avenue to San Luis Rey River; erosion control and protective screen planting	---	Castro and Fisher	29,000*
Buena Vista Creek to Monterey Drive; highway lighting	---	Ets-Hokin & Galvan	51,000*
South city limits of Carlsbad to Buena Vista Creek; highway lighting	---	Ets-Hokin & Galvan	33,000*
Hill St. to Capistrano Drive in Oceanside; grade and surface.....	---	Pending	23,000*
Miscellaneous signs and striping	---	Miscellaneous	24,000*
Construction totals	10.5†		\$7,298,000
Rights of way.....			1,950,000
Grand total			\$9,248,000

* Based on latest estimates. Final figures not yet available.

† Total shows net length over-all. Because of connections, ramps, etc., there is some overlap between individual projects.



Oceanside-Carlsbad Freeway looking south. Brooks Street overcrossing in immediate foreground.



Looking north on freeway through Carlsbad. Tamarack overcrossing in center foreground.

between school and highway developments.

Freeway Agreements Signed

After approximately two years of study and investigation of all possible locations in the area, the California Highway Commission on September 14, 1949, adopted as a freeway a location which bypassed the various business districts and yet was close enough to provide adequate traffic service to the communities. This adoption was revised slightly on June 21, 1950, to avoid anticipated improvements in the Agua Hedionda area.

Final agreement between the various public agencies was completed with the signing of freeway agreements with San Diego County on August 1,

1950, for the county section between 2.2 miles south of Carlsbad and the south city limits of Oceanside, and with the City of Oceanside on August 23, 1950, for that portion within the city limits of Oceanside. The southerly portion of the proposed freeway, from San Marcos Creek to 2.2 miles south of Carlsbad, was covered by a freeway agreement with San Diego County signed on March 26, 1951.

First Unit

The first unit of work, covering that portion from one-fourth mile south of Mission Avenue to the San Luis Rey River, was advertised on February 16, 1951, and work finally started on March 26, 1951. The complete 10.5-mile project, extending

from 0.7 mile south of San Marcos Creek to the Camp Pendleton main entrance, was constructed under a series of five major contracts plus several minor contracts for highway lighting, landscaping and erosion control, signs and stripes, etc. These various contracts are tabulated at the end of this article. The total cost of the complete project, including rights of way and construction engineering, will be approximately \$9,248,000. Final figures on all contracts are not yet available.

The completed freeway will remove highway traffic from a city street that is critically inadequate for handling present traffic demands. Police records indicate an average of $34 \pm$ accidents per month for the $3\frac{1}{4}$ -

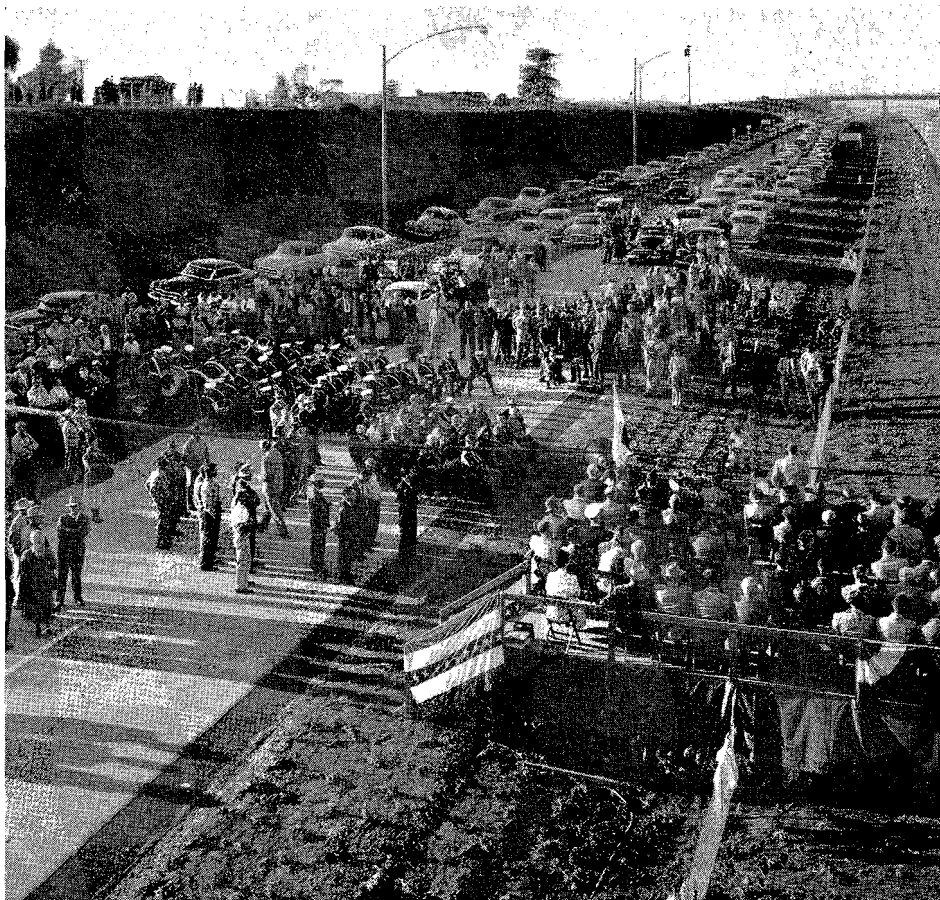
mile portion of Hill Street within the city limits of Oceanside, due primarily to the narrow streets and congestion with heavy vehicular and pedestrian traffic.

Population Growth

There are nine sets of traffic signals along the old city street route that are being eliminated or bypassed by the new freeway. A review of the population growth will illustrate the congestion of the previous location. When the population of Oceanside was only 4,651, in 1940, Hill Street was already inadequate for highway traffic. By 1953 Oceanside's population had more than tripled to a total of 18,377. In addition to the expansion of Oceanside, the City of Carlsbad with a population of 6,963 was incorporated July 16, 1952. Carlsbad is contiguous to Oceanside on the south. The freeway is an effective bypass of the Cities of Carlsbad and Oceanside, and yet is in close proximity to the business and residential areas. Traffic separation structures at 15 locations provide access and effective service to and from all of these areas.

Major Features of Project

Some of the major features involved in construction of this freeway were the widening and remodeling of a 950-foot steel truss structure across the San Luis Rey River to provide a Y connection north of the Oceanside business district; the crossing of six major water courses, some of which involved the removal of up to seven feet of unsuitable silt and replacement with selected material; the construction of traffic separation structures at 15 locations; the construction of railroad separation structures at two locations, and the construction of a pedestrian undercrossing in the City of Carlsbad.

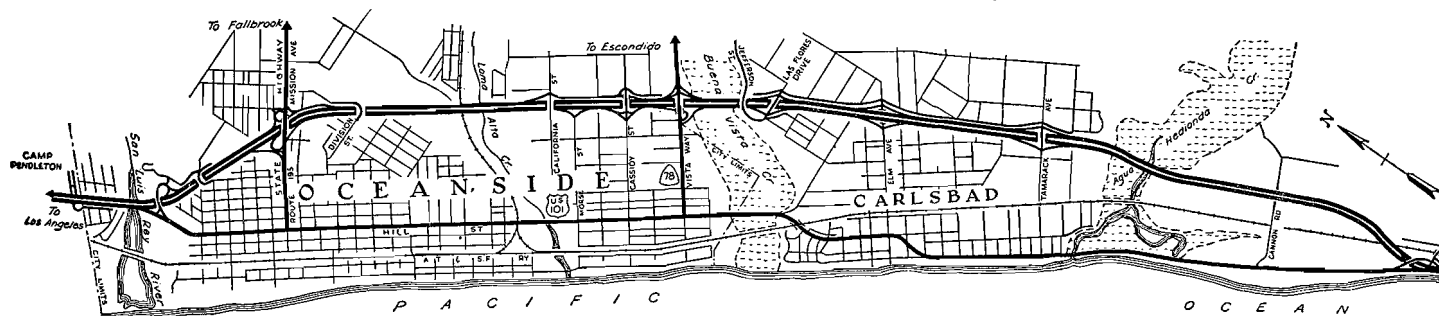


Bands, dignitaries and spectators add color to dedication of new freeway

Because of the divided roadbed section, the complete project involved a total of 33 structures of which 30 were new construction. One existing structure, the San Luis Rey River bridge, was remodeled and widened and two others south of Carlsbad on the existing road were used for one direction of traffic without requiring any additional work. Although cuts and fills were not excessive, the project involved the handling of approximately 2½ million cubic yards of material. The traveled way was surfaced with 87,000 cubic yards of

Portland cement concrete supplemented with 20,000 barrels of Portland cement for cement-treated base and subgrade. The structures involved the furnishing and placing of approximately 2½ million pounds of structural steel and 4¼ million pounds of bar reinforcing steel. Forty-one thousand feet of storm drains and culverts were installed, plus an additional 21,000 feet of pipe for sewer, water and sprinkler systems. Rights of way for the complete project involved the acquisition of 292 separate parcels at a total cost of approximately \$1,950,000.

Sketch map shows termini of newly opened section of freeway



Castro Valley Job

**New Freeway Section Will
Break Bottleneck on U. S. 50**

By A. A. ANDRADE, Resident Engineer

A MAJOR bottleneck to the flow of traffic on U. S. 50 between the metropolitan East Bay area and the San Joaquin Valley has been through Castro Valley. Under construction is the Castro Valley Bypass, a full freeway approximately 1.5 miles in length, from point opposite Crow Canyon on the east to approximately one-tenth of a mile easterly of Foothill Boulevard on the west.

U. S. 50 is an east and west arterial of great importance connecting the San Joaquin Valley with the Oakland-San Francisco metropolitan residential and industrial areas. The reactivation of Camp Parks as the Parks Air Force Base and the construction of an Atomic Energy Research Laboratory further to the east increases the importance of this route. These federal installations have promoted a very heavy influx in population, resulting in a proportional increase in traffic volume.

Project One of Series

This project is one in a series along this route to be recently placed under construction. An 8.4-mile section of Altamont Pass between Greenville and Mountain House was constructed in 1938 as a four-lane divided highway. Progressive planning and construction saw an additional 5.8 miles west of Livermore, commonly known as the Livermore Bypass, opened to traffic late in 1950.

Early in the fall of 1950 construction work began on the next link of this continuous chain of four-lane divided highway, commencing 1.5 miles west of Livermore and extending 5.9 miles to Hopyard Road. Another section of this route from the westerly terminus of the previous contract was opened to traffic in December, last year, extending the four-lane freeway to a point 2.5 miles west of Dublin. There is a gap of approximately six miles from this westerly point to the

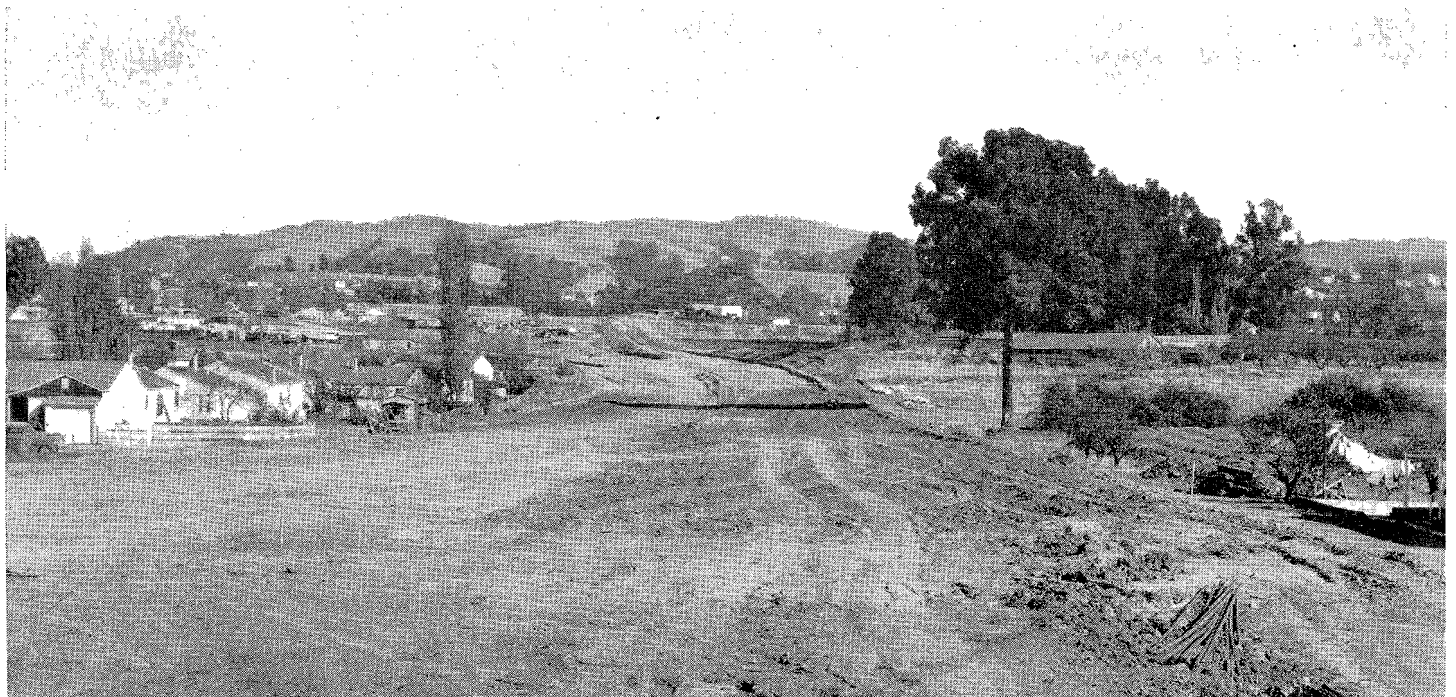
easterly limits of the Castro Valley Bypass, plans for which are being prepared at the present time. Another section, extending the freeway easterly from the Altamont Pass section, seven miles to Coral Hollow Road just west of Tracy, is now under construction and is scheduled for completion in 1955.

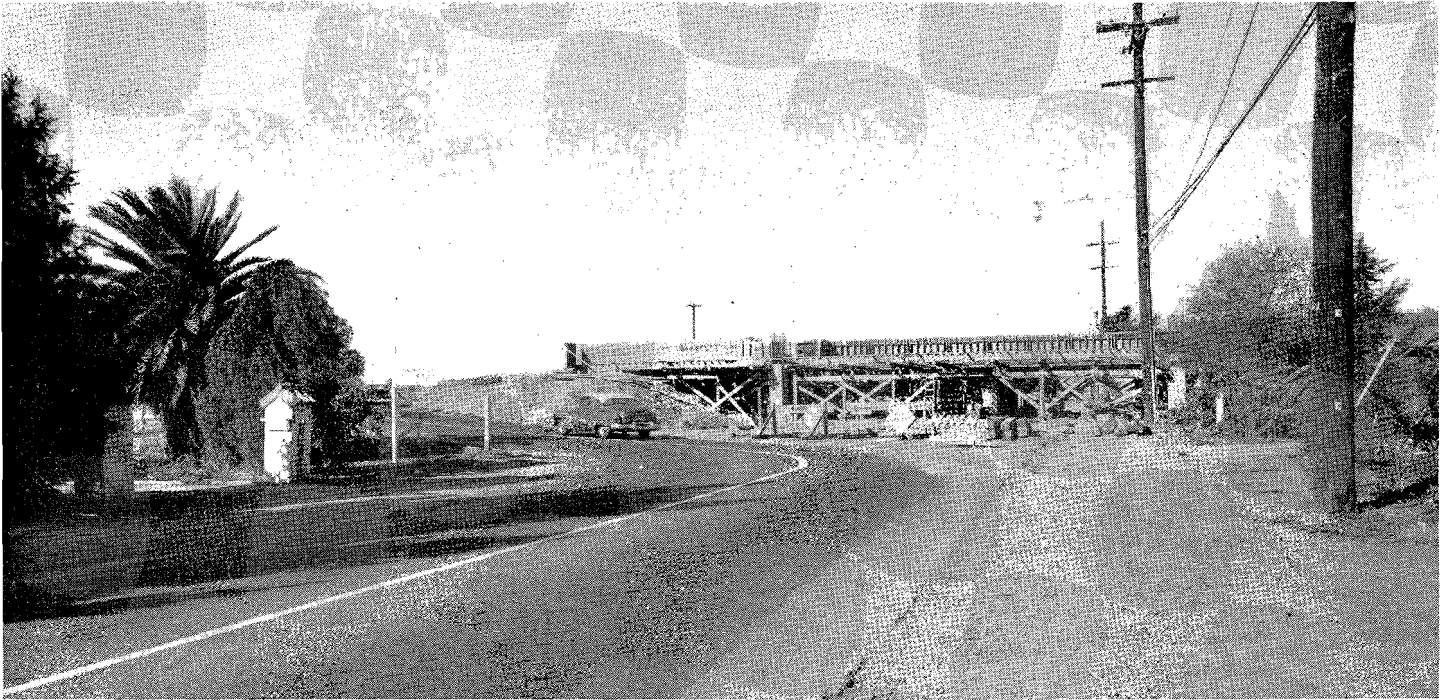
Hazardous Intersections

The contract for the Castro Valley Bypass was awarded to Fredrickson Brothers Construction Company on June 4, 1953. The existing roadway in this section consisting of three-lane concrete pavement through the business district of Castro Valley, with several hazardous intersections and with a large percentage of truck and local shopping traffic, presented an over-all dangerous condition as well as a heavily congested peak-hour traffic tie-up.

The new freeway will provide two Portland cement concrete 12-foot traf-

Looking east from Redwood Avenue overcrossing





Looking north toward Redwood Avenue overcrossing

fic lanes in each direction, divided by a variable 12- to 16-foot median strip. A frontage road parallel to the freeway from Redwood Road to Strobridge Avenue, which allows local residential area access, and the numerous on and off ramps are to be con-

structed of plant-mixed surfacing with barrier-type curbs and gutters.

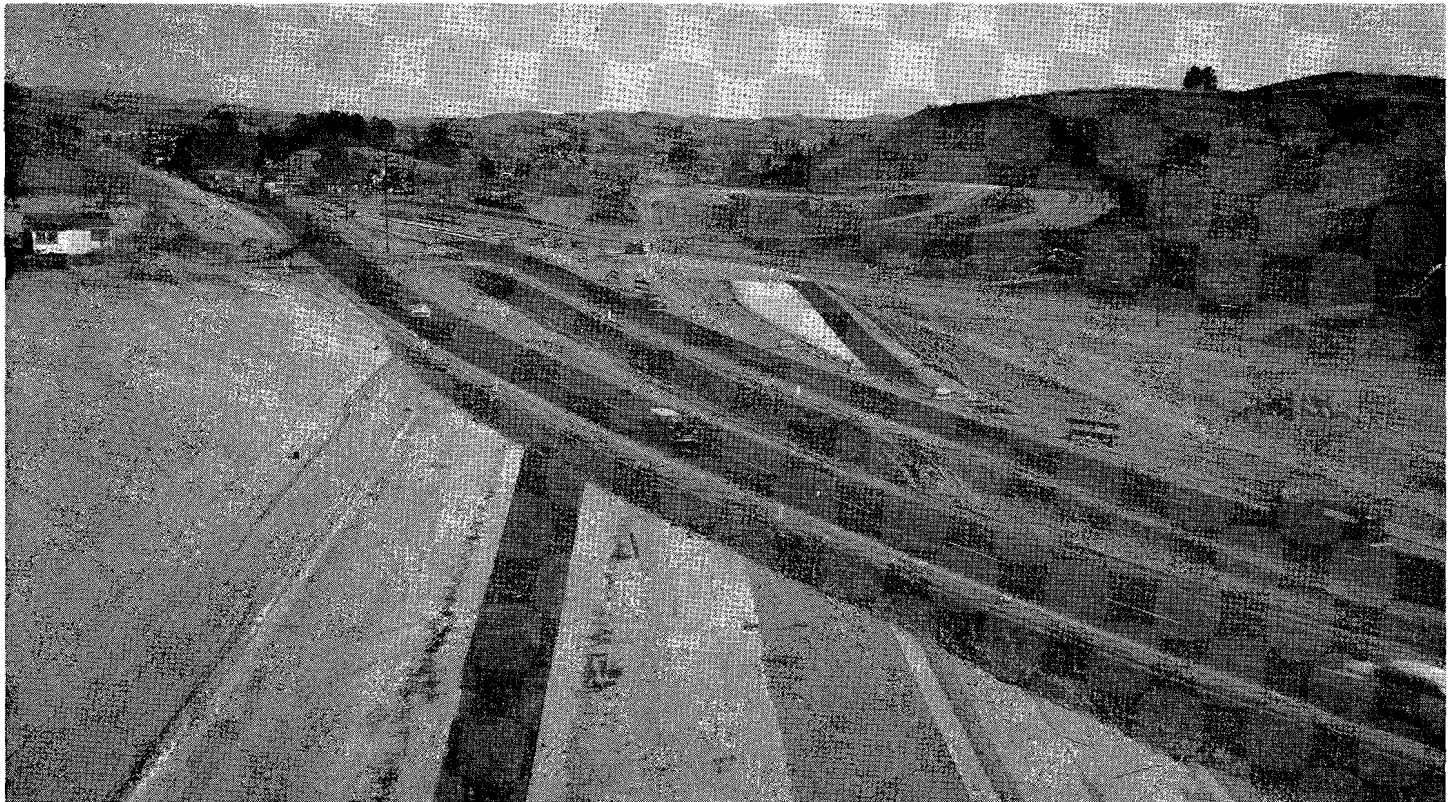
Major Structures

Major structures to be constructed are the Redwood Road, Strobridge Avenue, Mattox Road and the right

bridge of the Castro Valley Undercrossings, all of which are of the concrete girder type. Major drainage structures include a double 8- by 5-foot reinforced concrete box at Castro Valley Creek and a double 6- by 6-foot reinforced concrete box at Lake

Looking east toward Strobridge Avenue undercrossing





Looking east from west end of construction

Chabot Creek. There is also a pedestrian undercrossing to be constructed near Lake Chabot Road.

The new alignment is entirely tangent with the exception of one 2,500-foot radius curve near the westerly terminus of the project. The maximum gradient is 3.14 percent at the westerly end of the project. Other maximum grades within the project limits are 3 percent on the approaches to the various undercrossings.

Grading involves two heavy cut sections, one of approximately 55 feet in depth and another involving cut and fill sections through an old rock quarry of 32 and 24 feet in depth, respectively. About 20 percent of the excavated material has been placed in embankment just westerly of Foothill Boulevard to provide for the ultimate extension of Route 228 westerly to connect with the Eastshore Freeway at the Washington Avenue interchange at San Lorenzo, plans for which are complete and rights of way being acquired.

Heavy Equipment

Major grading equipment being used by the contractor includes five

DW-10 Caterpillar jeeps and scrapers, supplemented by five D-8 Caterpillar dozers, two LeTourneau Turnapulls and a D-8 Caterpillar dozer and scraper. Material excavated for the fill westerly of Foothill Boulevard was accomplished by a Northwest No. 80 shovel and hauled to the embankment area by a fleet of seven 10-wheel dump trucks.

Major construction items on the present contract include 2,100 cubic yards of concrete removal, 401,200 cubic yards of roadway excavation, 18,900 cubic yards of structure excavation, 8,270,000 station yards overhaul, 6,750 barrels of Portland cement for cement-treated subgrade and base, 11,000 tons plant-mixed surfacing, 2,300 cubic yards curb and gutter concrete, 10,670 cubic yards pavement concrete and 4,300 cubic yards of structure concrete. There is also 4,764 feet of cast-in-place concrete piling and 7,500 feet of reinforced concrete drainage pipe.

Construction work began on June 10, 1953, and the estimated completion date is September 29, 1954. At present the project is approximately 35 per-

cent complete. Financing is from both state gas tax and federal aid funds.

Construction is under the supervision of Assistant State Highway Engineer B. W. Booker and Assistant District Engineer R. P. Duffy. The author is Resident Engineer, and R. L. Hood is general superintendent for Fredrickson Brothers Construction Company, contractor.

RATHER SURPRISING

THE FLYING TIGER LINE INC.
Burbank, Calif.

MR. KENNETH C. ADAMS, *Editor*

DEAR MR. ADAMS: We have been receiving a copy of *California Highways and Public Works* for sometime and I want to take this opportunity of congratulating you and your staff on the excellent reading material it contains.

You might not think that the air freight business could use a publication such as yours but it is being constantly read by our department heads and put to valuable use in the conduct of our business.

GEO. T. CUSSEN
Vice President

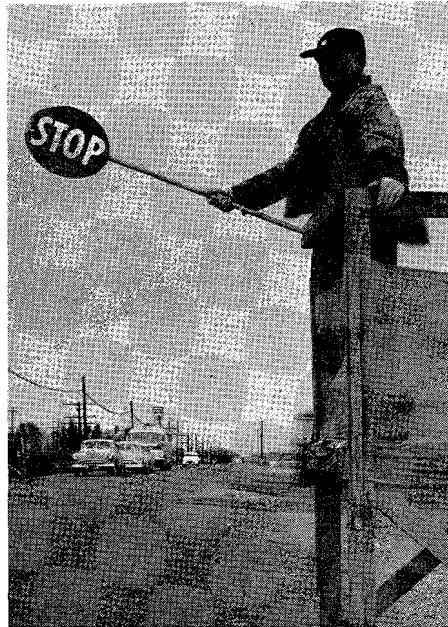
Ripon-Manteca Job

San Joaquin County's
First Full Freeway

By K. N. HATCH, Resident Engineer

THE FIRST contract for a full freeway in District X was issued as a joint venture to Lord and Bishop of Sacramento and M. J. B. Construction Company of Stockton in mid-July of this year. This contract will convert existing US 99 to a full freeway between Ripon and Manteca in San Joaquin County and will be the first of an anticipated series of full freeway contracts in District X.

The total mileage of full freeways in District X will be limited and restricted, in general, to the most important routes such as US 99, US 50, and US 40. The northerly end of this project is designed to tie in with a future full freeway bypass of the City of Manteca. This \$1,180,000 contract will provide four and one-quarter miles of four-lane divided highway with full controlled access.



Flagman regulates traffic through construction from elevated platform

Frontage Road and Structures

A frontage road to serve local traffic will be constructed on the northeastern side of the freeway for almost the entire length of the project. Because the present two-lane highway parallels the Southern Pacific Railroad tracks, it was necessary to construct a frontage road on one side of the freeway only. Two overcrossings, one near each end of the project, will provide full interchange facilities to and from the freeway.

The existing two-lane pavement was incorporated in the design as the southbound lanes of the freeway, except at the overcrossings, where the present road will be utilized in the traffic interchange systems. It was necessary to "bow" the freeway alignment at the interchanges to permit the overcrossing county roads to return to grade immediately adjacent to the

Looking north from Ripon end of project. Existing two-lane highway on left and frontage road on far right of new lanes under construction.



northeasterly side of the Southern Pacific Railroad tracks. Initial county road railroad crossings are at grade; the interchange design, however, will permit future separation over the railroad tracks when warranted by traffic on the county road.

Design of Overcrossings

Overcrossing structures are located on Jack Tone and Austin Roads, two important county highways. The structures will be of reinforced concrete, each consisting of two continuous box girder spans supported by a reinforced concrete center and hollow type reinforced concrete abutments. The center bent and the abutments will be placed on reinforced concrete piles.

Right of way for this project totaled about 100 acres acquired in 50 separate parcels. In the acquisition of the right of way, it was interesting to observe the complete acceptance of the full freeway design principal by the abutting property owners. All right of way was acquired by mutual agreement without the necessity of condemnation trial.

Except for a coaxial Pacific Telephone and Telegraph repeater station, the right of way was cleared by the time the contract was awarded. This station operates automatically, amplifying the speaking voice for the circuit linking the west and east coasts. The heavy brick building, including cables carrying hundreds of wires, was moved from the right of way with no interruption of service.

Traffic Regulated

The borrow pit, for an estimated quantity of 350,000 cubic yards of imported borrow, is located on the southwesterly side of the Southern Pacific Railroad tracks. This material is being hauled across the railroad and the existing two-lane highway, in dump trucks which are loaded in the pit by a 2½-cubic-yard Northwest dragline. Location of the pit results in about 80 additional truck movements per hour across the railroad and the existing highway.

Traffic on the existing highway is regulated at the truck crossing by signs, flashing yellow lights, and two flagmen stationed on elevated platforms at the edges of the shoulders.



Moving Pacific Telephone & Telegraph Company's repeater station

To date, this method of traffic control has been very satisfactory. It has resulted in a minimum amount of traffic hazard and very little delay either to the traveling public or the contractor's operations. Although almost 35 percent of the imported borrow already has been hauled, only two minor rear-end collisions have been experienced to date.

Drainage System

Drainage for this four and one-quarter mile project is unusual because of an almost complete absence of drainage facilities. There are no drainage pipes under the existing highway,

and the few that will be placed under the new northbound lanes will serve primarily as equalizers.

Storm water will seep directly into the native soil or will be carried by side drainage to specified percolation areas within the right of way. This design is feasible because of several factors. The area traversed is flat and without defined waterways; the native soil has high absorptive qualities, and the annual rainfall of 11 inches is moderately low.

The existing pavement (southbound lanes), frontage road, ramps, and

... Continued on page 64

New Trinity Road

Weaverville to Douglas
City Job Recalls Early Days

By RAY HUCK, Resident Engineer

ON MAY 25, 1953, a \$432,000 contract was awarded to M. W. Brown and R. E. Hertel for construction of 2.34 miles of road on US 299-W along Weaver Creek, four miles south of Weaverville to Douglas City in Trinity County. Letting of this portion of road was accelerated by loss, during last winter's high water, of a second span of Weaver Creek Bridge. The contract set up 180 working days for completion of the project with a deadline of November 1, 1953, for completion of bridge work.

Ray Hertel, by special agreement with the laborer's union, worked during a portion of last summer's strike

and completed the 218-foot concrete girder bridge under the deadline.

Easy Grade

Grading, being done by Monte Brown, consists of a 32-foot roadbed topped with 0.5-inch cement-treated base and 0.2-inch plant-mixed surfacing. The line has been dropped down against Weaver Creek to eliminate curvature and decrease yardage, with the creek side of fills being protected by rock slope protection throughout. Grade rate is about 1 percent and finish grade is held to a minimum of 12 feet above the creek which at times becomes violent. Rough grading will

be completed this year with base and surfacing placed when weather permits in 1954.

The present Highway 299-W from Tower House to Weaverville was a good road in its day, but like so many others of the State's highways, it is becoming old fashioned. This road tends to follow contours instead of bravely venturing straight forward from cut to fill. In a stretch of seven miles from Trinity River to Fawn Lodge, there are no stretches suitable for passing except by courtesy (often practiced) of the lumber or logging truck driver who slows down and pulls over to permit the strings of fas-

Present Weaver Creek Bridge that lost a span in last winter's flood. All the gravel in this creek channel has been mined many times.



ter vehicles to zip around. The combination of sharp curves and narrow roadbed often makes it mandatory for truck and trailer combinations to stop and ease by each other when meeting at the tight spots.

Although by 1950 census Trinity County had only 5,087 population, astounding to see is the amount of mixed traffic using the highway. Load after load of logs and lumber interspersed liberally with cars of commuting sawmill workers and loggers, an occasional woman driver and hordes of sportsmen.

No Roads in Early Days

One hundred years ago the field for highway engineers in Trinity County was strictly open. That county, one of the original 27 whose boundaries were approved by an act of the First Legislature of the State of California February 18, 1850, contained over 5,000,000 acres—but no roads. Subsequent statutes slashed off Humboldt and Del Norte Counties, leaving Trinity with an area of 2,042,880 acres—all mountainous—all virgin territory for the road builder.

Major P. B. Reading discovered gold on the Trinity River in July of 1848 at Kanaka Bar which later became Douglas City. This was some 20 miles northwest of the Spanish land grant Buenaventura which he owned.

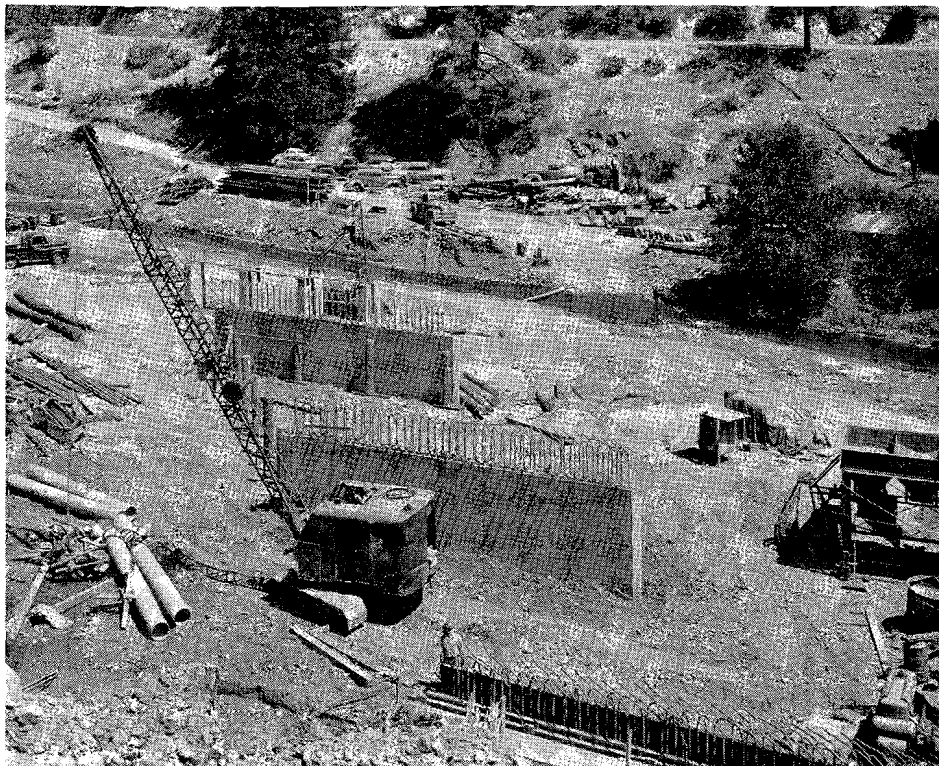
He went back to his rancho, recruited a party of 62 Indians and two white helpers. They took along about 100 head of cattle for food. In six weeks they had taken out about \$80,000 in gold.

At that time a party of Oregonians appeared and took considerable exception to Reading's Indians. They stated that, in their estimation, "The only good Indians were dead ones."

Reading assessed their intent and arms. His party was equipped for mining and not fighting. He withdrew his party. Actually, he was not too much put out. He felt he had enough for his needs. "I left the stream," he said, "and returned to my home where I have since remained in the enjoyment of the tranquil life of a farmer."

Trinity Gold Rush

Following Reading's discovery of gold in the bars of the Trinity River,



Substructure of new bridge about 700 feet above old one

hordes of seekers invaded the area and by the end of 1851, most all of the Trinity area had been explored and prospected, but no roads yet built to link this rich area to the "outside." Within the next couple of years most of the tillable parcels of land were taken up by the longer visioned settlers who fattened their poke by furnishing supplies, food and accommodations for the miner, foot traveler or the horse or mule pack trains which at that time held a monopoly on transportation of supplies. It is reported that 10,000 pack animals trailed out of "Old Shasta" to Trinity and on north to Oregon.

Along about that time, the early 1850's, a road was built from Weaver-ville down Weaver Creek to Kanaka Bar, thence down the Trinity River to Steiner's Flat. We have been unable to unearth any construction information on this road, but it would accommodate wagons. Those wishing to go down the Trinity River from Steiner's Flat to Junction City simply waited till summer's low water and then forded the river and traveled the bars.

High Prices in Diggings

Probably in this same period a native of Great Britain, though probably of Irish stock, named William Kelly, came to California and wrote "A Stroll Thru the Diggings of California." He landed at San Francisco, went to Sacramento, visited the Feather River, Upper Sacramento and Trinity River areas.

Before leaving the lower Trinity area he made this statement:

"The price of flour at the small settlement, when they left was five dollars per pound; pork, four dollars; beans, three dollars; coffee was cheap being abundant; and sugar normal as nine-tenths of the miners dispensed with its use; but spirits of any kind had attained the monstrous figure of sixteen dollars per pint. Oh, for a few puncheons of Cambelton of Islay whiskey there! and a snap of the fingers for the diggings!"

He then added this note to his observations:

"I concur with Colonel Fremont that the great natural wall of the Sierra Nevadas produces many modifying influences on the climate, owing to which tropical fruits may be pro-

duced at high northern latitudes. But according to my experience, my humble opinion is, that California must ever be mainly dependent on the States, Oregon, Chile, Australia and the Sandwich Islands for its supply of bread stuffs and other great staples of existence."

First Wagon Road

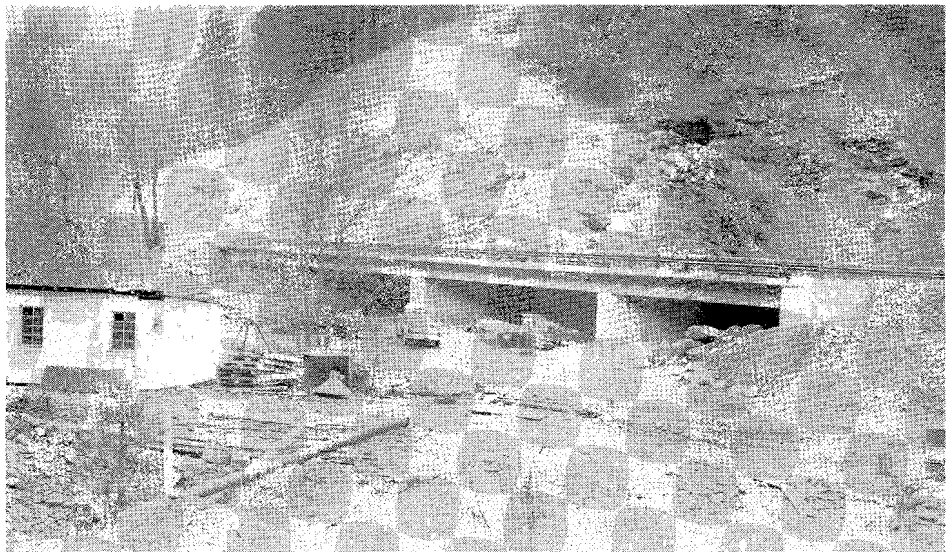
It wasn't until 1857 that W. S. Lowden and others, formed a joint stock company known as "Weaverville and Shasta Wagon Road Company," and started work on the first wagon road into Trinity County. That toll road, known locally as the Buckhorn or Grass Valley Toll Road, started from Tower House in Shasta County, up Willow Creek, through Buckhorn Pass, then down Grass Valley Creek to the W. S. Lowden ranch, across the Trinity River on Lowden's bridge, up Trinity Gulch to the top of Brown's Mountain and down Little Brown's Creek to its junction with Weaver Creek, a point three miles from Weaverville by public road.

The tolls on this road were set by the franchise granted by Trinity County. They were:

- Saddle horse—round trip—\$1.
- Stock—\$0.25 per head one way.
- Two-horse wagon—round trip—\$3.
- Each extra span of horses—\$1.
- \$1 additional if two wagons were used.

Many River Crossings

The Buckhorn Road, as at first constructed, had a maximum grade of about 10 percent. To avoid heavy grading around the rocky points, the road crossed Willow Creek, the stream leading west from Tower House, and Grass Valley Creek, more than a hundred times, mostly over log bridges. This 24½ miles of road was completed in the spring of 1858 at an estimated cost of \$22,352, including bridges and including surveying \$1,000, clearing \$2,000 and toll house \$450. That initial cost figures a little under \$1,000 per mile. Repair and replacement of bridges was a costly maintenance item and after the floods of the winter of 1861-62 washed out many of the bridges, the road was rebuilt on alignment eliminating most of the crossings at a reported cost of \$15,000. This road was considered one of the finest in the State.



New Weaver Creek Bridge

Farming of the small but rich pieces of bottom land boomed in those gold rush days, supplying food for the mass of men working the placer mines, and hay and grain for the great number of pack animals. Heavy freight charges dictated a policy of self-proviso and prudence. Flour mills were erected at Hayfork and Minersville and nearly all of the meat products such as ham, bacon and lard were pro-

duced in the communities where used.

As placer mining gave way to the newer large scale hydraulic methods, lumber came into great demand for the large tail flumes, riffles, blocks, etc., and the small sawmills of former years were equipped with more effective machinery—so the Trinity County lumber business was born and has now grown to a major position in this great California industry.

Highway Officials Elect California Engineer

CALIFORNIA'S outstanding achievements in highway construction were recognized by the American Association of State Highway Officials at its annual convention in Pittsburgh, Pa., when it elected George T. McCoy, State Highway Engineer, first vice president.

A. E. Johnson, Director of Highways of Arkansas, was chosen president; and Mark Watrous, Chief Engineer of Colorado Highways, was elected regional vice president of the Far West.

Of particular interest to California was the action of the association in adopting a resolution memorializing Congress to appropriate \$53,400,000 for constructing highways through national forests. The resolution pointed out that the movement of heavy log loads over forest highways is causing the destruction of roadway surfacing built for light traffic.



GEO. T. MCCOY

Record Budget

Highway Commission Allocates Total of \$298,998,830 for 1954-55 Fiscal Year

A STATE HIGHWAY BUDGET containing an all-time high of \$205,110,000 for major construction purposes for the fiscal year beginning July 1, 1954, has been adopted by the California Highway Commission. It is believed to be the largest annual state highway budget of any state in the Nation's history.

The 1954-55 budget allocates \$145,387,000 for major construction projects and construction engineering, and \$59,723,000 for the acquisition of rights of way for future highway improvement, out of a total of \$267,241,290 for all state highway purposes.

It provides for improving a total of 585 miles of highway, including many sections of multilane urban freeways, intercity expressways, and a large mileage of rural routes.

Higher Than Revised Budget

The new budget is slightly higher than the 1953-54 state highway budget as revised by the commission last July following the enactment of increased highway user taxes by the Legislature at its 1953 session. The revised 1953-54 budget came to \$247,000,000, of which \$190,000,000 was allocated for major construction purposes.

The effect of the increased revenues in speeding up highway improvement is shown by a comparison with the last budget before the new legislation. The 1954-55 budget amount for major construction purposes is 74 percent higher than the \$118,035,000 available in the budget which was adopted in October, 1952.

Although the fiscal year covered by the new budget does not begin until next July, some of the projects will be advertised for bids beginning in January. State law permits the awarding of contracts on or after April 1st, three months before the start of the fiscal year, so that full advantage may be taken of favorable construction weather.

Items in Budget

The state highway items in the budgets are as follows:

Major construction projects, \$131,387,000; construction engineering, \$14,000,000; rights of way, \$59,723,000; maintenance, \$25,000,000; preliminary engineering, \$16,000,000; administration, \$6,500,000; contingencies, \$4,931,290; buildings and plants, \$4,500,000; highway planning, \$1,750,000; honor camps, \$1,250,000; maintenance of the San Francisco-Oakland Bay Bridge, \$1,200,000; minor improvement and betterment, \$500,000; equipment, \$500,000; and outdoor advertising, \$75,000.

For nonstate highway functions included by law in the State Highway Budget, the following amounts are provided: gas tax apportionment to cities for improvement of city streets, \$24,807,540; Federal Aid Secondary funds for county roads, \$4,375,000; and \$2,500,000 for county roads, to be used in matching federal aid funds apportioned to the counties. These items bring the grand total budgeted by the commission to \$298,998,830.

Largest Single Allocation

The largest single allocation of the 180 items in the construction budget is \$8,550,000 for the construction of 3.9 miles of the Ramona Freeway (US 70-99) through and near El Monte. The next largest is a \$6,000,000 item for 4.7 miles of US 40 on its new freeway location through Richmond, El Cerrito, and San Pablo in Contra Costa County.

Other major projects in the 1954-55 budget include:

Alameda County, grading, paving, and structures on new 2.5-mile freeway connecting Eastshore Freeway near San Lorenzo with US 50 slightly east of Foothill Boulevard, \$3,570,000.

Alameda County, grading, paving, and structures on 0.8 mile of Eastshore Freeway between Market and Eleventh Streets in Oakland, \$2,414,000.

Eastshore Freeway

Alameda County, paving and structures on 1.6 miles of the Eastshore Freeway from south of University Avenue to El Cerrito Overhead, \$3,110,000 (continuation of freeway widening project now under construction between the Oakland Distribution Structure and El Cerrito Overhead).

Calaveras County, widening of Sign Routes 12 and 49 through San Andreas, 1.7 miles, \$350,000.

Colusa and Glenn Counties, widening of bridges and resurfacing of US 99-W between Maxwell and Willows, three projects totaling \$765,000.

Contra Costa County, grading, paving, and structures on 4.7 miles of new US 40 freeway between 0.2 miles south of Jefferson Avenue in Richmond and County Road No. 24 east of San Pablo, \$6,000,000.

Del Norte County, clearing, fencing, grading, and cattlepass construction on 6.2 miles of US 101 between the junction with US 199 and the Smith River Bridge, \$835,000.

El Dorado County, grading and surfacing of new routing of US 50 between 2¼ miles east of Clarksville and Shingle Springs, 4.8 miles, \$550,000.

Fresno Project

Fresno County, grading, paving, and structures on new route of US 99 between Teilman and Princeton Avenues in and north of the City of Fresno, \$2,100,000.

Humboldt County, grading and structures on five miles of US 101 from north city limits of Eureka to Gannon Slough, \$975,000 (when completed, will connect with Burns Freeway now nearing completion through Arcata).

Imperial County, California's share (50 percent) of a new bridge on US 80 over the Colorado River at Yuma, \$800,000.

Kern, Inyo, and Mono Counties, grading and surfacing on US 395 in

various locations, four projects totaling 30.6 miles, \$685,000.

Kern and Tulare Counties, grading, paving, and structures on US 99 between one mile south of the Delano Underpass and one-half mile north of the Tulare County line, 4.8 miles, \$2,960,000 (extension of continuous multilane divided highway now stretching from north of San Fernando to just south of Delano).

Kings County, grading and surfacing seven miles of Central Valley Highway (State Highway Route 135) between Kansas Avenue and one mile north of Corcoran, \$400,000.

Lake County, grading and surfacing of 1.5 miles of Sign Route 29 northerly from Napa County line, \$350,000.

Southern Freeways

Los Angeles County, structures and approaches on 0.6 mile of the Santa Ana Freeway between Lyon Street and the junction with the Ramona Freeway, including widening of the Aliso Street Bridge over the Los Angeles River, \$2,450,000.

Los Angeles County, grading, paving, and structures on Whittier Boulevard (US 101) for 3.7 miles between Painter Avenue and the Orange County line, \$750,000.

Los Angeles County, grading, paving, and structures on approximately seven miles of the Ramona Freeway (US 70-99) between Rosemead Boulevard and Puente Avenue, two projects totaling \$13,050,000 (continuation of the freeway easterly through and beyond El Monte, \$8,550,000 from Rosemead Boulevard to San Gabriel River and \$4,500,000 from Durfee Avenue to Puente Avenue, including bridges over the San Gabriel and Rio Hondo Rivers and many other structures).

Los Angeles County, structures on the route of the Sepulveda Freeway, between Waterford Street and Casiano Road in West Los Angeles, \$800,000 (first construction on the Sepulveda Freeway).

Colorado Freeway

Los Angeles County, grading, paving, and structures on the Colorado Freeway from Patrician Way (west of new Pioneer Bridge over Arroyo

Seco) to Eagle Vista Drive, 0.9 mile, \$1,320,000.

Los Angeles County, grading, paving, and structures on three miles of the Harbor Freeway between Battery Street in San Pedro and just north of the Pacific Coast Highway, \$4,650,000.

Los Angeles County, grading, paving, and structures on the Long Beach Freeway, two projects totaling one mile between Leonis Street and Verona Street, \$4,050,000 (extending north and south from the overhead structure now being built over the railroad classification yards).

Los Angeles County, structures on the Santa Ana Freeway between Rosecrans Avenue and the Orange County line, \$1,534,000 (to convert an expressway to a full freeway).

Marin County, new bridge over Richardson Bay on US 101, \$3,000,000.

Marin County, paving of US 101 between Golden Gate Bridge and Manzanita (Waldo project now being graded), State's share, \$790,000.

Mendocino County, surfacing of portions of US 101 between Sapp Creek and the Humboldt County line, two projects totaling \$240,000.

Merced County

Merced County, grading, surfacing, and structures on Sign Route 152 for 4.9 miles between the junction of State Highway Route 121 and east of Highline Canal, \$710,000.

Modoc County, grading and surfacing on US 299 for 8.2 miles between Canby and Chambers Ranch, \$480,000.

Monterey County, grading, paving, and structures on 5.5 miles of the US 101 freeway in Salinas, \$2,820,000 (grading and structures on a portion of this freeway now under construction).

Napa County, grading and surfacing of 2.6 miles on Sign Route 12-37 between 2.1 miles east of the Sonoma County line and 2.2 miles east of the Carneros School, \$470,000.

Orange County, grading, paving, and structures on portions of the Santa Ana Freeway from Broadway in Santa Ana to the Los Angeles County line, totaling 2.7 miles, \$3,828,000.

Orange County, grading, paving, and structures on Sign Route 14 for

4.5 miles on new location between Cypress Avenue and the Santa Ana Canyon Road, \$1,200,000.

US 40 Project

Placer County, grading and surfacing of 2.6 miles of US 40 between one mile west of Applegate and Heather Glenn, \$900,000.

Riverside County, structures on new route of US 60-70-99 in Banning, \$280,000.

Riverside County, grading, surfacing, and structures on 14.5 miles of US 60-70-99 from 2.3 miles west of Garnet to Edom, \$2,655,000.

Sacramento County, grading, surfacing, and structures on 5.2 miles of US 50-99 between one-half mile south of Elk Grove Road and 1.8 miles south of Florin Road, \$1,000,000.

Sacramento County, grading, surfacing, and structure on the Elvas Freeway between C Street and Swanston Street, \$1,130,000 (most of Elvas Freeway project completed or under construction).

San Bernardino County, structures on US 70-99 Freeway between one mile west of Colton and South E Street, \$900,000.

San Diego County, grading, paving, and structures on two miles of Sign Route 94 on new freeway location between 0.6 mile east of Euclid Avenue and College Avenue, \$1,900,000.

Bayshore Freeway

San Francisco-San Mateo Counties, grading and structures on Bayshore Freeway between just south of the San Francisco city limits and the Third Street Overcrossing now under construction, one mile, \$850,000.

San Francisco County, grading, paving, and structures on Bayshore Freeway connection to San Francisco-Oakland Bay Bridge, between Fifth and Third Streets at Harrison, \$1,360,000 (final unit of freeway-bridge connection project).

San Francisco County, grading, paving, and structures on first unit of Embarcadero, between Fourth Street and Broadway (portions), 1.5 miles, \$5,000,000.

San Joaquin County, grading, paving, and structures on 4.6 miles of US 99 between Austin Road and slightly

Major Construction Projects in State Highway Bureau

north of Lathrop Road, \$1,700,000 (connecting with expressway now under construction between Austin Road and Ripon and providing bypass of Manteca business district).

US 50 Project

San Joaquin County, grading and paving of six miles of US 50 from Alameda County line to west city limits of Tracy, \$1,500,000 (connecting with freeway now under construction in Alameda County).

San Luis Obispo County, grading, paving, and structures on 3.5 miles of US 101 between Arroyo Grande and Pismo Beach, \$2,455,000.

San Luis Obispo County, paving of US 101 expressway between Paso Robles and San Miguel, 6.6 miles, \$1,350,000 (grading and structures now under construction).

Santa Barbara County, paving of US 101 expressway between slightly east of Carpinteria and slightly east of Arroyo Parida, 3.4 miles, \$1,020,000 (grading and structures now under construction).

Santa Barbara County, grading, paving, and structures on US 101 between

one mile north of Nojoqui Summit and just south of the Santa Ynez River, 4.2 miles, \$2,515,000.

Santa Clara County, grading, paving, and structures on Sign Routes 9 and 17 between one-half mile south of Los Gatos and Roberts Road, 2.4 miles, \$2,263,000.

Shasta County, grading and surfacing on US 99 between Project City and Mountain Gate, 3.5 miles, \$925,000.

Petaluma Bypass

Sonoma County, grading, paving, and structures on eight miles of US 101 between a mile south of Petaluma Creek and just south of Railroad Avenue (Cotati), \$4,713,000.

Stanislaus County, grading, surfacing, and widening of bridge on US 99 for 1.8 miles south of Modesto, \$700,000.

Tehama County, grading and surfacing on US 99-E for 12.2 miles, from Los Molinos to Mill Race Creek, \$820,000.

Trinity County, grading, surfacing, and bridge on 2.5 miles of US 299 between 1.8 miles east of Weaverville

and 2.3 miles west of Douglas City, \$393,000.

US 99 Expressway

Tulare County, grading, paving, and structures for 7.2 miles of US 99 expressway from just north of Kern County line to just north of Earlimart, \$2,500,000 (connecting with freeway project in Delano area immediately to the south).

Tulare County, grading, paving, and structures on 7.6 miles of Sign Route 65 between 1.5 miles north of Deer Creek and Linda Vista Avenue north of Porterville, \$1,110,000.

Tuolumne County, grading, surfacing, and bridge on Sign Route 120 for 2.7 miles between Stevens Bar Bridge and Moccasin Creek Road, \$500,000.

Ventura County, grading, paving, and structures on US 101 between just west of Central Avenue and the Santa Clara River, 5.1 miles, \$1,943,000 (extension of Camarillo freeway project now under construction).

Yuba County, structures on new location of US 99-E on four-mile section between Olivehurst and Marysville, \$475,000.

County	Route	Description	Approximate mileage	Estimated cost
Alameda	228, 5 (US 50)	Junction Route 69 (Eastshore Freeway) to 0.4 mile east of Foothill Boulevard; grade, pave and structures	2.5	\$3,570,000
Alameda	5 (US 50)	Two miles east of Redmond Overhead to San Joaquin county line; pave (See San Joaquin County for continuation of project)	1.7	360,000
Alameda	69 (SR 17)	Eastshore Freeway, Market to Eleventh Street; grade, pave and structures	0.8	2,414,000
Alameda	69 (US 40)	Eastshore Freeway, South of University Avenue to El Cerrito Overhead; pave and structures	1.6	3,110,000
Alameda	107 (SR 21)	Hearst Ranch to Dublin (portions); surface	5.4	115,000
Alameda	227	Route 5 to Route 75 (Mountain Boulevard) (portions), Joint Highway District No. 26; grade and surface	9±	300,000
Alameda	Various	Rights of way on state highway routes		2,744,000
Alpine	24, 23 (SR 4, 89)	Centerville Bridge to Markleeville (portions); grade and surface	5.0	250,000
Alpine	24 (SR 4)	Jackass Gulch Bridge; redeck		30,000
Amador	97 (SR 88)	San Joaquin county line to west of Jackson Creek; grade and surface	2.0	250,000
Butte	Various	Rights of way on state highway routes		89,000
Calaveras	24, 65 (SR 12, 49)	Through San Andreas; grade and surface	1.7	350,000
Colusa-Glenn	(US 99W)	0.5 mile north of Williams to Wilson Creek; widen bridges		145,000
Colusa	7 (US 99W)	Maxwell to Glenn county line (portions); base and surface		320,000
Colusa	15 (SR 20)	Williams to Colusa (portions); base and surface	8.2	250,000
Colusa	Various	Rights of way on state highway routes		25,000
Contra Costa	69, 14 (US 40)	Eastshore Freeway, 0.2 mile south of Jefferson Avenue to south of County Road No. 24; grade, pave and structures	4.7	6,000,000
Contra Costa	75 (SR 4, 24)	0.2 mile west to 0.1 mile east of Hillcrest Road; grade and surface	0.3	50,000
Contra Costa	75 (SR 4, 24)	Two miles east of Antioch to 0.8 mile west of Oakley; surface	2.0	55,000
Contra Costa	106 (SR 4)	Alhambra Avenue intersection; grade and surface		100,000
Contra Costa	Various	Rights of way on state highway routes		1,471,000
Del Norte	1 (US 199)	At 27.1 miles northeasterly of Crescent City; grade and surface		50,000

Budget for 1954-55 Fiscal Year Total \$131,387,000

County	Route	Description	Approximate mileage	Estimated cost
Del Norte	1, 71 (US 101)	Junction Route 1 to Smith River Bridge and Westbrook cattlepasses; clear, fence, grade, and cattlepasses	6.2	\$835,000
Del Norte	Various	Rights of way on state highway routes		30,000
El Dorado	11 (US 50)	2¼ miles east of Clarksville to Shingle Springs; grade and surface	4.8	550,000
El Dorado	Various	Rights of way on state highway routes		225,000
Fresno	4 (US 99)	Selma to Fowler; surface	3.7	50,000
Fresno	4 (US 99)	Teilman Avenue to Princeton Avenue; grade, pave and structures		2,100,000
Fresno	Various	Rights of way on state highway routes		450,000
Glenn	7 (US 99W)	Colusa county line to Willows (portions); base and surface		300,000
Glenn-Colusa	7 (US 99W)	0.5 mile north of Williams to Wilson Creek; widen bridges		*145,000
Glenn	Various	Rights of way on state highway routes		65,000
Humboldt	1 (US 101)	Mendocino county line to Benbow; surface	7.4	75,000
Humboldt	1 (US 101)	Gannon Slough to 0.9 mile north of Plaza Avenue; highway illumination and traffic signals	2.9	65,000
Humboldt	1 (US 101)	North city limits of Eureka to Gannon Slough; grade and structures	5.0	975,000
Humboldt	1 (US 101)	Gannon Slough to north city limits of Arcata (portions); surface		15,000
Humboldt	20 (US 299)	Willow Creek to South Fork Trinity River Bridge (portions); base and dust oil		5,000
Humboldt	Various	Rights of way on state highway routes		300,000
Imperial	26 (US 99)	One mile west of Brawley to Trifolium Canal (portions); surface and shoulders	11.7	140,000
Imperial	27 (US 80)	Grays Well to Ogilby Road; surface	6.3	65,000
Imperial	27 (US 80)	Yuma Crossing of Colorado River; structure (California share)		800,000
Inyo	23 (US 6, 395)	Haiwee to 0.5 mile north of Cottonwood Creek; grade and surface	15.1	175,000
Inyo	Various	Rights of way on state highway routes		5,000
Kern	4 (US 99, 466)	Station 552 to Station 587 near Cawelo; grade and pave	0.7	115,000
Kern	4 (US 99, 466)	Cawelo to north end of Famoso Underpass; surface	7.2	400,000
Kern-Tulare	4 (US 99)	One mile south of Delano Underpass to 0.5 mile north of Tulare county line; grade, pave and structures	4.8	*2,960,000
Kern	23 (US 6)	At junction of Route 58 (SR 178); reconstruct intersection	0.5	30,000
Kern	23 (US 6)	Jawbone to Ittner's; grade and surface	3.9	250,000
Kern	57 (SR 178)	East city limits of Bakersfield to Horace Mann Avenue; surface and drainage	1.2	40,000
Kern	58 (SR 178)	In Bakersfield, I Street to Chester Avenue and N Street to Route 4; surface	0.5	20,000
Kern	58 (US 466)	Bena Cattlepass and Lomand Cattlepass; replace cattlepasses		30,000
Kern	138 (SR 33)	Mile 7.42 A to mile 8.9 B, between Maricopa and McKittrick, (portions), surface, shoulders and bridges	11.7	250,000
Kern	140 (US 399)	Sunset Railroad to Weed Creek (portions); grade and surface	2.6	250,000
Kern	142	Beardsley Avenue to 0.6 mile north of China Grade Loop; grade and surface	2.1	418,000
Kern	Various	Rights of way on state highway routes		319,500
Kings	125 (SR 41)	North Fork of Kings River Overflow; culvert and fill		20,000
Kings	135	Kansas Avenue to one mile north of Corcoran; grade and surface	7.0	400,000
Kings	Various	Rights of way on state highway routes		1,000
Lake	49 (SR 29)	0.3 to 4.9 miles northerly of Napa-Lake county line (portions); grade and surface	1.5	350,000
Lake	89 (SR 29)	0.1 mile to 0.6 mile northerly of Cobb Post Office; grade and surface	0.5	80,000
Lake	Various	Rights of way on state highway routes		70,000
Los Angeles	2	Orange county line to Painter Avenue; grade, pave and structures	3.7	750,000
Los Angeles	2 (US 101)	Santa Ana Freeway-Ramona Freeway (Route 26) to Lyon Street; structures and approaches	0.6	2,450,000
Los Angeles	19, 77 (US 60)	At Pomona, 0.7 mile west of Route 77 to Hansen Avenue; grade, surface and structures	1.2	390,000
Los Angeles-San Bernardino	19 (US 60)	Los Angeles county line to Kadota Avenue; bridge and approaches	0.3	*85,000
Los Angeles	26 (US 60, 70, 99)	Ramona Freeway-Puente Avenue to Durfee Avenue; grade, pave and structures	3.4	4,500,000
Los Angeles	26 (US 60, 70, 99)	Ramona Freeway-San Gabriel River to Rosemead Boulevard; grade, pave and structures	3.9	8,550,000
Los Angeles	26 (US 70, 99)	Holt Avenue in Pomona, east city limits to Reservoir Avenue; subseal and surface	0.9	43,000
Los Angeles	59 (SR 138)	Route 4 (US 99) to Route 23 (US 6) (portions); grade and surface	5.5	335,000
Los Angeles-Orange	62 (SR 39)	Junction Route 171 (Huntington Beach Blvd.) to junction Route 176 (Imperial Highway); grade, surface and structures	3.0	*305,000
Los Angeles	77	Valley Boulevard-Ivar Street to east city limits of San Gabriel; grade and surface	0.7	138,000
Los Angeles	158 (SR 7)	Sepulveda Freeway-Waterford Street to Casiano Road; structures		800,000
Los Angeles	161 (US 66A, SR 134)	Colorado Boulevard and Freeway-Eagle Vista Drive to Patrician Way; grade, pave and structures	0.9	1,320,000
Los Angeles	164 (SR 107)	Route 60 (US 101 Alt.) to 190th Street (portions); grade, pave and structures	3.6	800,000
Los Angeles	165 (US 6, SR 11)	Harbor Freeway-Battery Street to 0.2 mile north of Route 60 (US 101 Alt.); grade, pave and structures	3.0	4,650,000
Los Angeles	167 (SR 15)	Los Angeles River Freeway-Sheila Street to Leonis Street; grade, pave and structures	0.3	965,000
Los Angeles	167 (SR 15)	Los Angeles River Freeway-Noakes Street to Verona Street; grade, pave and structures	0.7	3,085,000
Los Angeles	174 (SR 10)	Grevillea Avenue to Prairie Avenue; grade and surface	0.7	185,000
Los Angeles	174 (US 101)	Santa Ana Freeway-Rosecrans Avenue to Orange county line; structures		1,534,000
Los Angeles	Various	Rights of way on state highway routes		24,357,500
Madera	Various	Rights of way on state highway routes		300,000

County	Route	Description	Approximate mileage	Estimated cost
Marin	1 (US 101)	Golden Gate Bridge to Manzanita; pave (State Highway Fund share)	3.9	\$790,000
Marin	1 (US 101)	Richardson Bay; bridge	1.0	3,000,000
Marin	8 (SR 37)	Ignacio to Black Point (portions); surface and widen 2 bridges	2.3	120,000
Marin	52	2.5 miles to 3.0 miles west of Belvedere; (portions); grade and surface	0.5	50,000
Marin	56 (SR 1)	Coyote Creek; bridge		50,000
Marin	Various	Rights of way on state highway routes		600,000
Mariposa	18 (SR 140)	9.3 miles to 6.3 miles west of Mariposa; grade and surface	3.0	200,000
Mariposa-Tuolumne	110 (SR 132)	Stanislaus county line to Coulterville (portions); grade and surface	5.0	25,000
Mendocino	1 (US 101)	Gobbi Street to Low Gap Road (portions); curbs and gutters		30,000
Mendocino	1 (US 101)	Sapp Creek to 3 miles south of Rattlesnake Summit; surface	2.0	125,000
Mendocino	1 (US 101)	Panther Springs to Humboldt county line (portions); surface		115,000
Mendocino	56 (SR 1)	Ross Creek; culvert and fill		50,000
Mendocino	Various	Rights of way on state highway routes		392,000
Merced	18 (SR 140)	Junction Route 4 (US 99) to easterly boundary (portions); surface	4.5	200,000
Merced	32 (SR 152)	West of junction Route 121 to east of Highline Canal; grade, surface and structures	4.9	710,000
Merced	32 (SR 33, 152)	0.1 mile east of Los Banos to the Dos Palos Wye (portions); surface	7.3	125,000
Merced	Various	Rights of way on state highway routes		125,000
Modoc	28 (US 299)	Canby to Chambers Ranch; grade and surface	8.2	480,000
Mono	23 (US 395)	½ mile north of McGee Creek Maintenance Station to Whitmore Tubs Road; grade and surface	1.3	50,000
Mono	23 (US 395)	Crestview to 2.0 miles south of Rush Creek; grade and surface	10.3	210,000
Monterey	2 (US 101)	Hartnell Road to East Market Street (Salinas); grade, pave and structures	5.5	2,820,000
Monterey	2 (US 101)	John Street (Salinas) to 0.4 mile north of Salinas Underpass (portions); surface	1.0	55,000
Monterey	56 (SR 1)	At Alder Creek; grade, surface and culvert	0.2	130,000
Monterey	56 (SR 1)	Torre Canyon; bridge and approaches	0.2	305,000
Monterey	117 (SR 1)	El Estero to Del Monte Junction; traffic signals and highway illumination	1.2	60,000
Monterey	Various	Rights of way on state highway routes		345,000
Napa	8 (SR 12, 37)	2.1 miles east of Sonoma county line to 2.2 miles east of Carneros School; grade and surface	2.6	470,000
Napa	Various	Rights of way on state highway routes		350,000
Nevada	37 (US 40)	West end Donner Lake to Junction Route 83 in Truckee; surface	5.9	100,000
Nevada	83 (SR 89)	Truckee to 2 miles north of Hobart Mills (portions); base and surface	4.9	80,000
Nevada	Various	Rights of way on state highway routes		350,000
Orange	2 (US 101)	Sixth Street in Tustin to Santa Ana Freeway at First Street; surface	1.5	40,000
Orange	2, 174 (US 101)	Santa Ana Freeway-Broadway to Los Angeles county line (portions); grade, pave and structures	2.7	3,828,000
Orange	60 (US 101 Alt)	South city limits to north city limits of Newport Beach; grade and surface	1.4	225,000
Orange-Los Angeles	62 (SR 39)	Junction Route 171 (Huntington Beach Blvd.) to Junction Route 176 (Imperial Highway); grade, surface and structures	3.0	305,000
Orange	175 (SR 14)	Cypress Avenue to junction Route 43 (SR 18); grade, pave and structures	4.5	1,200,000
Orange	Various	Rights of way on state highway routes		2,057,000
Placer	37 (US 40)	One mile west of Applegate to Heather Glen; grade and surface	2.6	900,000
Placer	Various	Rights of way on state highway routes		320,000
Plumas	21 (SR 24, 89)	4.1 miles east of Spring Garden to Deleker (portions); surface	10±	140,000
Plumas	Various	Rights of way on state highway routes		80,000
Riverside	26 (US 60, 70, 99)	22d Street in Banning to 0.5 mile east of Banning; structures		280,000
Riverside	26 (US 60, 70, 99)	2.3 miles west of Garnet to Edom; grade, surface and structures	14.5	2,655,000
Riverside	64 (SR 74)	Elsinore to Perris; surface	11.5	200,000
Riverside	64 (US 60, 70)	Range 9 east to Desert Center (portions); surface	10.3	100,000
Riverside	146 (US 95)	D Canal and C Canal; bridges and approaches		173,000
Riverside	187 (SR 111)	2.3 miles southeast of Thermal to junction Route 26 (US 99); surface	6.4	85,000
Riverside	Various	Rights of way on state highway routes		2,835,000
Sacramento	4 (US 50, 99)	½ mile south of Elk Grove Road to 1.8 miles south of Florin Road; grade, surface and structures	5.2	1,000,000
Sacramento	98	Elvas Freeway, C Street in Sacramento to Route 3 near Swanston Road; grade, surface and structure	2.8	1,130,000
Sacramento	Various	Rights of way on state highway routes		1,505,000
San Benito	119 (SR 25)	Tres Pinos Creek Bridge No. 43-17; bridge and approaches	0.7	175,000
San Benito	Various	Rights of way on state highway routes		140,000
San Bernardino-Los Angeles	19 (US 60)	Los Angeles county line to Kadota Avenue; bridge and approaches	0.3	85,000
San Bernardino	26 (US 70, 99)	Etiwanda Avenue and Archibald Avenue Interchanges; structures	0.8	670,000
San Bernardino	26 (US 70, 99)	One mile west of Colton to South E Street; structures		900,000
San Bernardino	31 (US 91, 466)	Junction Route 58 to Cronise Valley; shoulders	42.2	325,000
San Bernardino	43 (US 91, 395)			
San Bernardino	(SR 18)	Eighth Street Underpass and approaches (State's share)	0.2	400,000
San Bernardino	43 (SR 18)	Route 190 to 0.5 mile north of 40th Street; surface	2.5	60,000
San Bernardino	58 (US 66)	Eight miles west of Ludlow to Amboy (portions); surface and shoulders	18.0	300,000
San Bernardino	145 (US 395)	Eight miles to 3.2 miles south of Route 58; grade and surface (State's share)	4.8	200,000
San Bernardino	192	Euclid Avenue, Eucalyptus Avenue to junction Route 190 (Baseline Road) (portions); surface (State's share)	8.4	163,000
San Bernardino	Various	Rights of way on state highway routes		3,050,000
San Diego	2 (US 101)	L Street Overcrossing; grade, pave and structure		235,000
San Diego	2 (US 101)	Camp Pendleton main entrance; grade, surface and structure		360,000
San Diego	196 (SR 78)	3.7 miles east of junction Route 2 to Vista; grade and surface	3.0	650,000

County	Route	Description	Approximate mileage	Estimated cost
San Diego	199 (SR 75)	Junction Route 2 to Coronado Heights (portions); grade and surface	1.4	\$430,000
San Diego	200 (SR 94)	0.6 mile east of Euclid Avenue to College Avenue; grade, pave and structures	2.0	1,900,000
San Diego	Various	Rights of way on state highway routes		2,085,000
San Francisco	56 (SR 1)	Funston Tunnel; illumination		120,000
San Mateo	68 (US 101 By-pass)	Bayshore Freeway, 0.1 mile south of south city limits of San Francisco to Third Street Overcrossing; grade and structures	1.0	850,000
San Francisco	68 (US 40, 50)	Fifth Street to Third Street at Harrison; grade, pave and structures	0.2	1,360,000
San Francisco	224	Embarcadero, San Francisco-Oakland Bay Bridge at Fourth Street to Broadway (portions); grade, pave and structures	1.5	5,000,000
San Francisco	Various	Rights of way on state highway routes		6,800,000
San Joaquin	4 (US 99)	Austin Road to 0.5 mile north of Lathrop Road; grade, pave and structures	4.6	1,700,000
San Joaquin	5 (US 50)	Alameda county line to west city limits of Tracy; grade and pave (See Alameda County for portion of project)	6.0	1,500,000
San Joaquin	5 (US 50)	Paradise Cut Bridge to San Joaquin River (portions); grade, surface and frontage roads	1.0	30,000
San Joaquin	75 (SR 4)	Holt to San Joaquin River (portions); grade and surface	1.8	100,000
San Joaquin	75 (SR 4)	McDougal Canal to French Camp Turnpike; grade and surface	0.5	140,000
San Joaquin	75 (SR 4)	Junction Route 5 (US 50) to Junction Route 4 (US 99) on Mariposa Road; surface	1.3	85,000
San Joaquin	97 (SR 88)	Junction Route 4 (US 99) to Junction Route 24 (SR 12) south of Lockeford (portions); surface	4.7	60,000
San Joaquin	Various	Rights of way on state highway routes		765,000
San Luis Obispo	2 (US 101)	Arroyo Grande to Pismo Beach; grade, pave and structures	3.5	2,455,000
San Luis Obispo	2 (US 101)	Villa Creek to junction Route 56; surface	0.7	35,000
San Luis Obispo	2 (US 101)	Pismo Beach to Marsh Street in San Luis Obispo (portions); surface		200,000
San Luis Obispo	2 (US 101)	Marsh Street in San Luis Obispo to San Luis Obispo Creek; highway lighting	2.3	60,000
San Luis Obispo	2 (US 101)	Yerba Buena Creek; grade, surface and culvert	0.2	50,000
San Luis Obispo	2 (US 101)	Paso Robles to San Miguel; pave	6.6	1,350,000
San Luis Obispo	56 (SR 1)	Santa Maria River; bridge and approaches	0.7	*740,000
San Luis Obispo	Various	Rights of way on state highway routes		555,000
San Mateo	55 (SR 5)	0.2 mile south of junction Route 56 (SR 1) at Thornton to San Francisco county line; grade, surface and structure	0.7	400,000
San Mateo	56, 105 (SR 1)	0.2 mile north of Canada Verde Creek to Frenchman's Creek; Joint Highway District No. 9; grade, surface and structure	4.2	540,000
San Mateo-San Francisco	68 (US 101 By-pass)	Bayshore Freeway, 0.1 mile south of south city limits of San Francisco to Third Street Overcrossing; grade and structures	1.0	*850,000
San Mateo	68 (US 101 By-pass)	Bayshore Freeway, north city limits of Redwood City to Bransten Road; surface	0.8	40,000
San Mateo	Various	Rights of way on state highway routes		340,000
Santa Barbara	2 (US 101)	One mile east of Carpinteria to 1/2 mile east of Arroyo Parida; pave	3.4	1,020,000
Santa Barbara	2 (US 101)	One mile east of Orella to one mile west of Refugio; surface	2.8	100,000
Santa Barbara	2 (US 101)	One mile north of Summit to 1/2 mile south of Santa Ynez River; grade, pave and structures	4.2	2,515,000
Santa Barbara	56, 149 (SR 1, 150)	Route 149 (SR 150) to north city limits of Lompoc and west city limits to east city limits of Lompoc; surface	3.0	110,000
Santa Barbara-San Luis Obispo	56 (SR 1)	Santa Maria River; bridge and approaches	0.7	740,000
Santa Barbara	149 (SR 150)	Buellton to Route 80 (San Marcos Pass Road) (portions); grade, surface and structures (State's share)	2.9	355,000
Santa Barbara	Various	Rights of way on state highway routes		995,000
Santa Clara	2 (US 101)	0.1 mile south of south city limits of Gilroy to north city limits of Gilroy; grade, surface and widen bridge	1.5	215,000
Santa Clara	5, 42 (SR 17)	0.5 mile south of Los Gatos to Roberts Road; grade, pave and structures	2.4	2,263,000
Santa Clara	Various	Rights of way on state highway routes		875,000
Santa Cruz	Various	Rights of way on state highway routes		600,000
Shasta	3 (S 99)	Sulphur Creek to Project City; surface	5.0	750,000
Shasta	3 (S 99)	Project City to Mountain Gate; grade and surface	3.5	925,000
Shasta	20 (SR 44)	Clover Creek; bridge and approaches		100,000
Shasta	29 (SR 36)	Middle Fork Cottonwood Creek; bridge and approaches		30,000
Shasta	Various	Rights of way on state highway routes		420,000
Sierra	25, 83 (SR 49, 89)	Bassetts to junction Route 83 (SR 89) and six miles north of Nevada county line to 3.5 miles north of Sattley (portions); grade and surface		200,000
Sierra	Various	Rights of way on state highway routes		23,000
Siskiyou	72 (US 97)	0.8 mile east of Horse Thief Creek to Macdoel; surface	10.9	150,000
Siskiyou	72 (US 97)	Dorris to Oregon state line; grade and surface	2.9	250,000
Siskiyou	Various	Rights of way on state highway routes		77,000
Solano	7 (US 40)	Tennessee Street to Route 208; surface	1.7	90,000
Solano	7 (US 40)	Octo Inn (West of Fairfield); drainage correction		50,000
Solano	74 (SR 29)	Vallejo Wye to Vallejo; grade and surface	1.0	150,000
Solano	Various	Rights of way on state highway routes		150,000
Sonoma	1 (US 101)	1.1 miles south of Petaluma Creek to 0.5 mile south of Railroad Avenue; grade, pave and structures	8.0	4,713,000

County	Route	Description	Approximate mileage	Estimated cost
Sonoma	1 (US 101)	Wilfred Crossing to Santa Rosa and Russian River to Northwestern Pacific Railroad in Healdsburg and 0.1 mile south of south city limits to north city limits of Cloverdale; surface and shoulder improvement	5.6	\$215,000
Sonoma	56 (SR 1)	Kolmer Gulch, Miller Creek, and Deadman Gulch; replace culverts		80,000
Sonoma	Various	Rights of way on state highway routes		372,000
Stanislaus	4 (US 99)	0.6 mile south of Turlock to 0.8 mile north of Turlock (portions); grade and surface	0.6	60,000
Stanislaus	4 (US 99)	Keyes to 0.5 mile south of Ceres and 2.0 miles north of Modesto to San Joaquin county line (portions); grade and surface		75,000
Stanislaus	4 (US 99)	Hatch crossing to Modesto; grade, surface and widen bridge	1.8	700,000
Stanislaus	13 (SR 120)	Oakdale to Tuolumne county line (portions); grade and surface	5.5	125,000
Stanislaus	41 (SR 33)	Railroad grade crossings south of Westley and north of Patterson and Puerto Creek Bridge; grade, surface and widen bridge		60,000
Stanislaus	41 (SR 33)	Main Canal, Orestimba Creek, and Timba Cattlepass, bridges and approaches		145,000
Stanislaus	66 (SR 120)	San Joaquin county line to Oakdale (portions); grade and surface	3.5	300,000
Stanislaus	109	M.I.D. Canal Lateral No. 3, bridge; widen		50,000
Stanislaus	Various	Rights of way on state highway routes		415,000
Sutter	Various	Rights of way on state highway routes		10,000
Tehama	3 (US 99E)	Los Molinos to Mill Race Creek; grade and surface	12.2	820,000
Tehama	29 (SR 36)	Tedoc Road to Button Canyon; grade and surface (State's share)	5.0	110,000
Tehama	Various	Rights of way on state highway routes		20,000
Trinity	20 (US 299)	Humboldt county line to Prairie Creek (portions); base and dust oil		65,000
Trinity	20 (US 299)	1.8 miles east of Weaverville to 2.3 miles west of Douglas City; grade, surface and bridge	2.5	393,000
Trinity	Various	Rights of way on state highway routes		5,000
Tulare-Kern	4 (US 99)	One mile south of Delano Underpass to 0.5 mile north of Tulare county line; grade, pave and structures	4.8	2,960,000
Tulare	4 (US 99)	0.5 mile north of Kern county line to 0.5 mile north of Earlimart; grade, pave and structures	7.2	2,500,000
Tulare	4, 10 (US 99, SR 198)	Visalia Airport Interchange; grade, pave and illumination	0.3	750,000
Tulare	4 (US 99)	0.5 mile south of Kings River to Clark Avenue; surface	1.3	55,000
Tulare	129 (SR 65)	1.5 miles north of Deer Creek to Linda Vista Avenue; grade, pave and structures	7.6	1,110,000
Tulare	Various	Rights of way on state highway routes		995,000
Tuolumne	40 (SR 49)	Stevens Bar Bridge to Moccasin Creek Road; grade, surface and bridge	2.7	500,000
Tuolumne-Mariposa	110 (SR 132)	Stanislaus county line to Coulterville (portions); grade and surface	5.0	*25,000
Tuolumne	Various	Rights of way on state highway routes		5,000
Ventura	2 (US 101)	0.4 mile west of Central Avenue to Santa Clara River; grade, pave and structures	5.1	1,943,000
Ventura	Various	Rights of way on state highway routes		1,440,000
Yolo	50 (SR 16)	Rumsey to three miles north; grade and surface	3.0	150,000
Yolo	90	2¾ miles north of Madison to 6.5 miles north of Madison; grade, surface and structures	3.7	464,000
Yolo	Various	Rights of way on state highway routes		25,000
Yuba	3 (US 99E)	Olivehurst to Marysville; structures	4.0	475,000
Yuba	Various	Rights of way on state highway routes		150,000

Ridgewood Project

Continued from page 11 . . .

dation or subsidence of the underlying foundation, to consolidation of the materials placed in the embankment, or to some combination of these factors.

Settlement Platforms

In an effort to determine whether such settlement occurs within the roadway embankment or in its foundation on this project, settlement platforms are being installed at various locations to provide a means of accurately checking settlement, if any, at various levels within the embankment and its underlying foundation. It is hoped that the information obtained from this data will be of value in design studies to minimize roadway embankment settlement.

The settlement platform devices being installed to record settlement consist essentially of an inverted siphon of copper tubing with one end installed in the embankment or underlying foundation at the point chosen to determine settlement and the other end positioned outside the limits of construction at about the same elevation where recordings may be taken. Recordings are taken by filling the inverted siphon with water and noting the elevation of the water. An overflow into pervious material is provided when installing the settlement platform in the embankment. Installation of these embankment settlement platforms is being supervised by W. S. Maxwell of the Materials and Research Department in Sacramento.

It is estimated that all work will be completed on the subject grading project early in 1954. Current esti-

mates are that the completed contract will involve the expenditure of approximately \$1,060,000.

McCammon-Wunderlich of Palo Alto is the contractor. The firm is represented on the job by Superintendent James Wilson. The work is being supervised for the State by District Engineer Alan S. Hart and Resident Engineer Harold M. Hansen.

INTERSECTIONS ARE DANGEROUS

Intersections are places of danger for the motorist, points out the Public Safety Department of the National Automobile Club. All kinds of unexpected things can take place there and that is why the motorist should approach them with caution and drive through them with alert care.

Tunnel Illumination

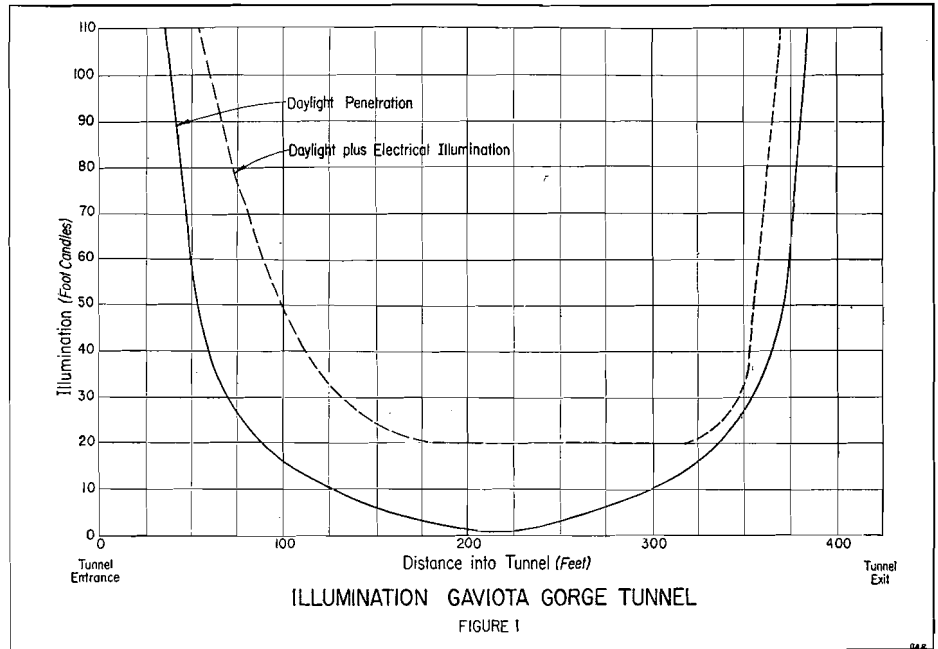
Gaviota Gorge Project
Develops New Ideas

By ROY MATTHEWS, Senior Electrical Engineer

THE GAVIOTA GORGE TUNNEL on US Route 101, about 30 miles north of Santa Barbara, was recently opened to traffic.

The lighting within a tunnel, particularly during daylight hours, always poses a problem for the engineer. Very careful consideration must be given to the lighting contrast and driver reaction to the change from sometimes brilliant open highway conditions to artificial lighting which must be supplied within any tunnel of considerable length.

The Gaviota Tunnel is over 400 feet long. The terrain in the vicinity of the tunnel imposed controls on grade and alignment. Because of the 1,200-foot radius horizontal curve, an entering vehicle cannot see entirely through the tube. The 4.47 percent grade means that heavy vehicles will



Tunnel lighting from south face of bore



be moving at reduced speeds. Although traffic will be in one direction only, northbound, adequate protection must be accorded the lighter vehicles overtaking slower moving heavy vehicles.

Slimline Fluorescent Lamps

Slimline fluorescent lamps were chosen as the illuminant because of their long life, low power consumption, ease of maintenance and high light output. One row of an industrial type fixture of three 96-inch slimline fluorescent lamps is provided throughout the length of the tunnel.

Since the human eye takes considerable time to adapt itself from a brightly lighted area, such as natural daylight of 5,000 to 10,000 foot-candles, to a dark area of only a few foot-candles, such as the inside of a tunnel, additional illumination is needed just inside the entering tunnel portal during the daylight hours. Daytime entrance lighting is provided in the Gaviota Gorge Tunnel by means of two

... Continued on page 59

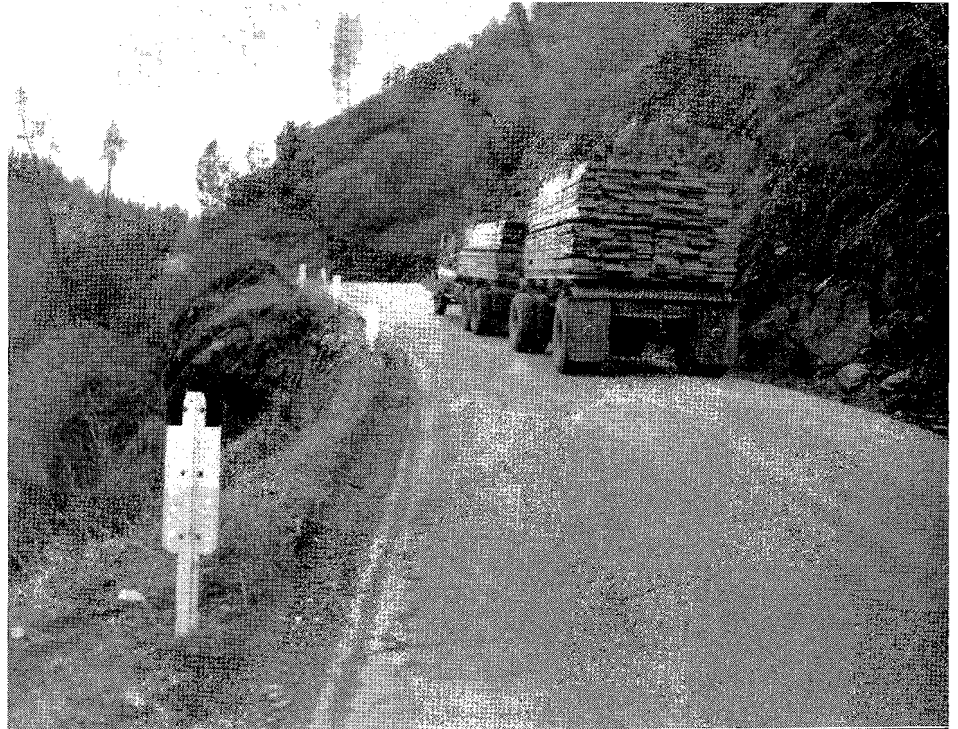
Sign Route 49 Out of Auburn Has New Look

COMPLETION of the widening and straightening of State Sign Route 49, on the river grade between Auburn and the American River Bridge in Placer County, cleared the way for removing the ordinance, passed by the Placer County Board of Supervisors two years ago, which prohibited truck travel over this section of road for two hours each day while school busses were transporting students over the road to school in Auburn. This ordinance was enacted following two school bus-truck accidents on the grade in September of 1951.

To mark the removal of the ordinance on September 30th, a ceremony was arranged by the Auburn Area and Placer County Chambers of Commerce which had spearheaded the request for improvements on this portion of the road. Following a luncheon at the Hotel Auburn, an inspection was made of the widened road and the ordinance signs were torn down personally by members of the Placer County Board of Supervisors.

Among those attending the ceremonies were A. M. Nash, District Highway Engineer, and Perry Lowden, Supervising Engineer, both from District III, Division of Highways, Marysville; State Senators Harold Johnson of Roseville and Stephen Teale of Calaveras; Archie Stevenot, President of the Mother Lode Highway Association, Sonora; Fred Dunow, Deputy State Forest Ranger, Sacramento; Mayor Roy Mikkelsen of Auburn; members of the Placer County Board of Supervisors; and representatives of the Golden Chain Council, Placer Union High School, industrial and commercial users of the road, and representatives of the two chambers.

There have been 905 fires on the San Francisco-Oakland Bay Bridge since it was opened to traffic in 1936, which averages out to more than four a month.



UPPER—River grade on Sign Route 49 just above American River as it looked in October, 1951, prior to widening. LOWER—Highway at same point in September, 1953. Shown at left are Senators Harold T. Johnson and Stephen Teale, and Pat Train, President, Auburn Area Chamber of Commerce.

California's basic speed law requires a speed which is reasonable and prudent in view of traffic, weather and road conditions and in no case en-

dangers the safety of property or persons. Almost one-third of all arrests are for excessive speed, a major factor in the highway death and injury toll.

ANOTHER UNIT OF BAYSHORE FREEWAY IS OPENED



On October 1, Director of Public Works Frank B. Durkee joined with Mayor Elmer Robinson of San Francisco in severing with a blow torch a chain stretched across the Bayshore Freeway, signaling the opening of a new two-mile section of the freeway between Army and Bryant Streets in the Bay city.

The upper photo is an aerial view looking northeasterly across San Francisco. The 18th Street pedestrian overcrossing over the Bayshore Freeway in center foreground. Ninth and Tenth Street connections at left. San Francisco-Oakland Bay Bridge, Yerba



Buena Island and man-made Treasure Island in upper right.

The lower picture shows Durkee, right, with Mayor Robinson on the left, cutting the ceremonial chain.

RELATED SAFETY CURES

Those who disregard health rules contract serious ailments and suddenly become desperately aware of the need for a cure. Drivers who disregard safety rules sooner or later become involved in serious accidents and then suddenly become desperately aware of the necessity of traffic safety rules and practices.

Secret Valley

Another Link Completed
On U. S. Route 395

WITH THE completion of the current contract covering two miles of highway on U. S. 395 north of Secret Valley in Lassen County one more link in the improvement of the highway south of Alturas to Susanville, eastern Lassen County and Reno, has been accomplished.

This is known as the Three Flags Highway.

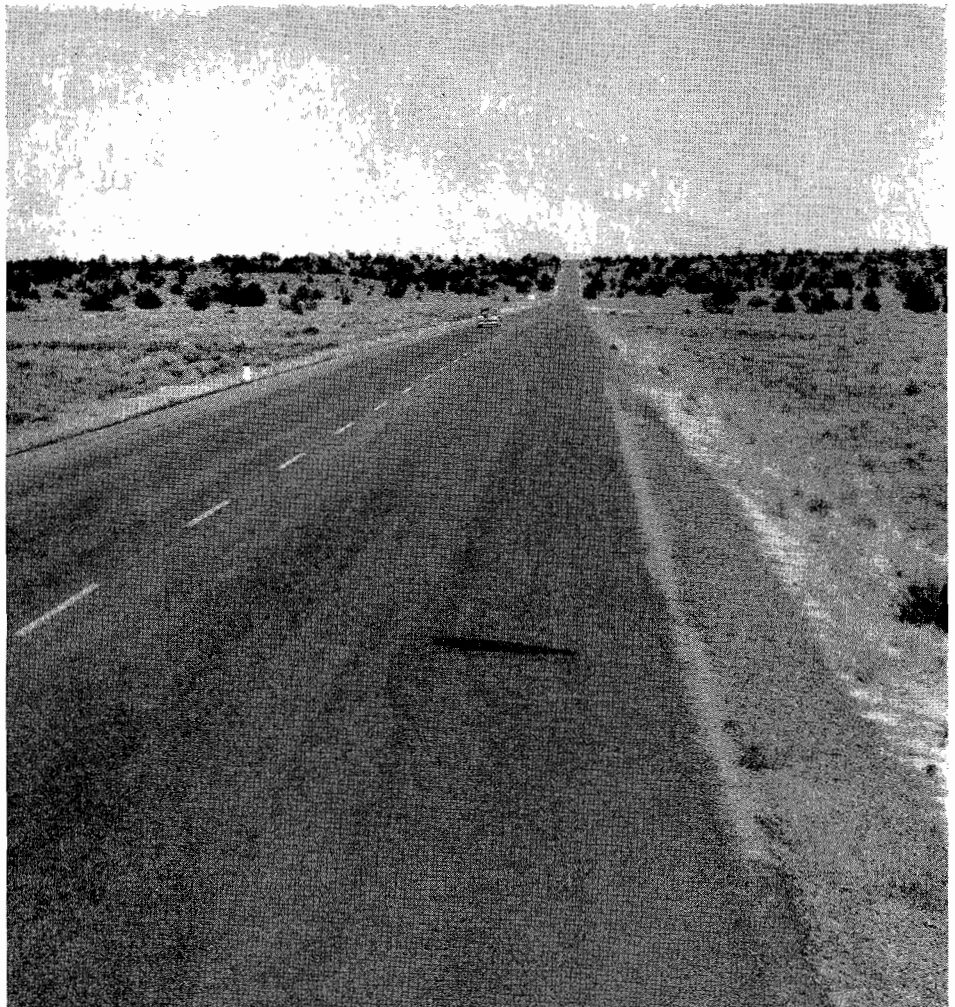
This entire section, running from near Johnsonville some five miles east of Susanville to Alturas, was taken into the State Highway System in 1933.

Prior to that time it had been a county road maintained by Modoc and Lassen Counties.

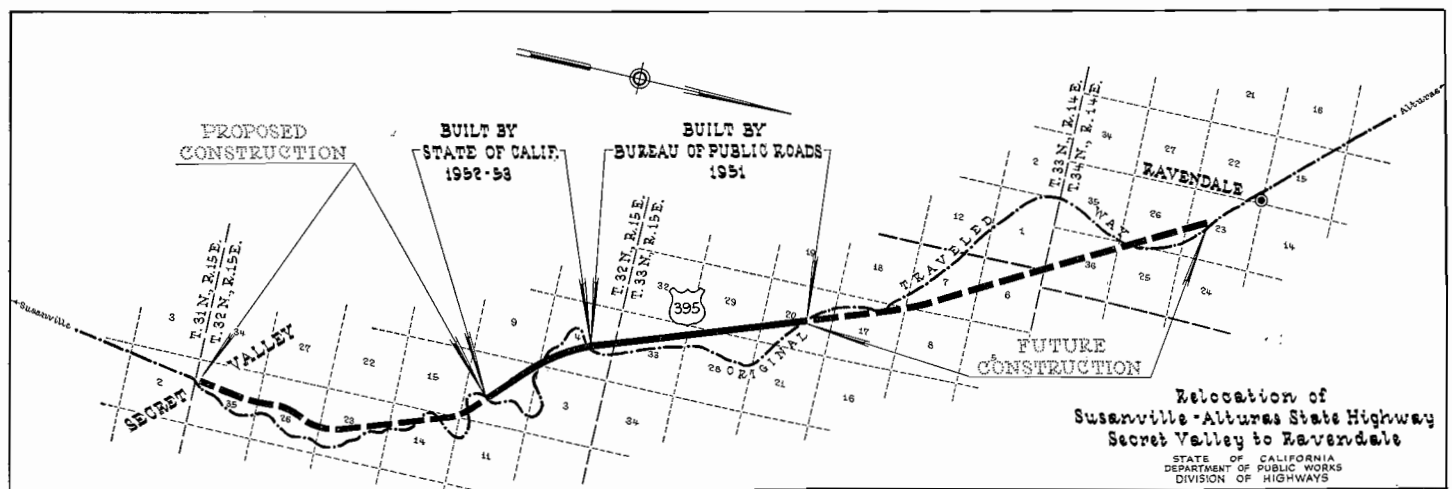
Maintenance Was Costly

Maintenance was hard and costly. The area is semidesert. The terrain is not particularly rough but every hill is likely to be solid lava. Several dry lake beds that had to be crossed are adobe and the flats between are covered with small lava boulders. All in all, it was hard to accomplish any showing with the limited funds available.

After the section was taken into the state system, some improvement has been made as funds became available. The Federal Government made some money available for construction



Type of new construction on Secret Valley section of US 395



MS. Oct. 53

through public lands. From this source a project covering two sections north of Madeline each of about two miles in length and passing through public lands were constructed. They were completed in 1939 at a cost of \$77,698.

Other minor improvements were made from time to time as funds could be allotted.

Worst Section

Finally the worst section of the route was the portion south of Ravendale in Lassen County. In order to improve any part of this it was necessary to make a study of the whole section. Only by this means was it possible to be sure that any improvement would fit into the completed plan.

Accordingly, the Division of Highways completed a survey covering this section, 16.7 miles in length, from Ravendale to the improved highway at the south end of Secret Valley in 1946.

Using this location, the Bureau of Public Roads, awarded a contract to Harms Bros. in 1949 for \$306,506 and constructed three miles. This section began about six and three-quarters miles north of the south end of survey and extended three miles north.

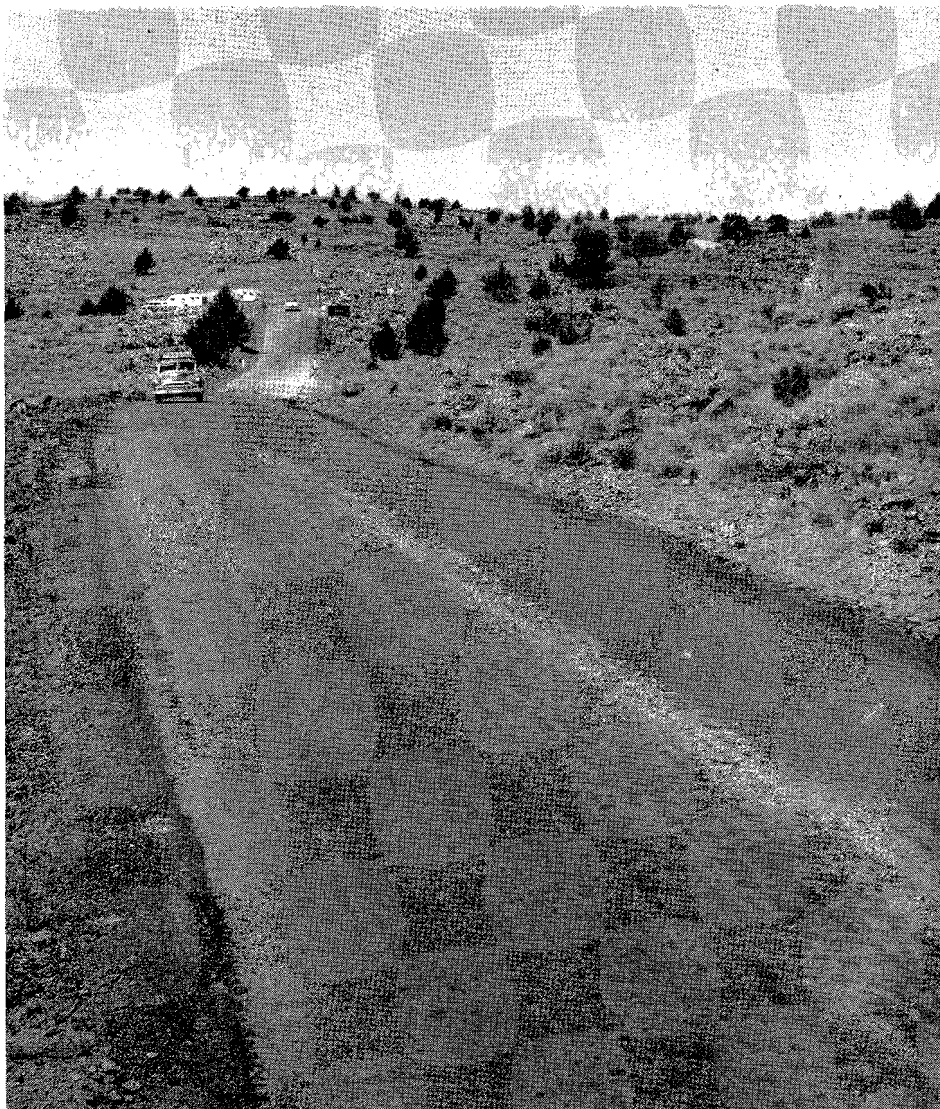
In January, 1952, the Division of Highways awarded a contract to A. Teichert & Sons, Inc., for extending construction of two miles further south. This is the contract just completed at a cost of \$332,266.

Tough Construction

The grading and structures were practically completed in 1952. Surfacing was placed on the mile on the north end. It was too cold to mix and lay the road-mix surface on the south mile. That has just been completed, but was delayed by a late spring and a strike of about a month duration.

Highway construction in this area is tough. Most excavation is lava. It drills hard, is hard to shatter, and breaks coarse and blocky. Any soil encountered is adobe and must be kept generally 18 inches below finish grade. Fortunately, there is a good deposit of material suitable to place over native material and under the base.

Following the enactment of Assembly Bill No. 1237 in June of this year, the Highway Commission adopted an



Type of construction replaced. Note that road reappears in the upper right corner.

amended budget. From the increased funds made available by the increase in gas tax and other levies they allotted money for the improvement of the balance of the four and two-thirds miles still remaining on the south end of this section. Bids were opened on October 28th, and a contract for \$491,161.50 awarded to Harms Bros., Sacramento.

When this is completed the southerly nine and three-quarters miles of this section will have been improved.

A. Teichert and Sons, Inc., was the contractor on the section just completed. J. W. Trask is district engineer at Redding and Ellis Engle was resident engineer on all the work, except surfacing of the southern mile. Bob Felton was in charge of this portion.

CHAMBER OF COMMERCE PLEASED

GARBERVILLE CHAMBER OF COMMERCE
Garberville, Humboldt County, California

October 31, 1953

MR. GEORGE T. MCCOY,
State Highway Engineer,
Sacramento, Calif.

DEAR MR. MCCOY: The Garberville Chamber of Commerce wishes you to know that we appreciate the work that was and is being done in the way of resurfacing in this area.

As we do not anticipate any great improvements in highway construction for some time, we are particularly grateful for and pleased with the type of resurfacing done in the area.

Thanking you again, we remain,
H. E. TUCKER, *President*
Garberville Chamber of
Commerce

Dunsmuir Freeway

New Routing for U. S. 99 in Shasta and Siskiyou Proposed

A PRELIMINARY step toward the proposed construction of a freeway through the Dunsmuir area of the Sacramento River Canyon has been taken by the California Highway Commission.

The commission announced its intention to consider adopting a new routing for a 7.3-mile portion of U. S. Highway 99 between one-half mile south of Castella, Shasta County, and the north city limits of Dunsmuir in Siskiyou County. If adopted, the section would be declared a freeway.

Between south of Castella and the Shasta-Siskiyou county line, the proposed new routing follows the general location of the existing highway and the Southern Pacific Railroad tracks along the west side of the Sacramento River. It is a new line which provides easier grades and eliminates many of the sharper curves.

Major Relocation

From the Shasta-Siskiyou county line at Little Castle Creek northward to the Sacramento River crossing at Dunsmuir, the proposed new routing would be a major relocation, roughly paralleling the existing highway and skirting the business district of Dunsmuir on the so-called "high line" to the west. It enters the city near Daly Street and passes between the Dunsmuir High School and Castle Avenue, continuing west of Castle Avenue to rejoin the existing highway at the Sacramento River Bridge. At this point it

THOUGHTS ABOUT HIGHWAYS AT CHRISTMAS TIME

"In the wilderness prepare the way of the Lord,
Make straight in the desert a highway for our God.

Every valley shall be lifted up, and every mountain and hill be made low;

The uneven ground shall become level, and the rough places a plain."

Isaiah 40:3-4

"I will make all my mountains a way, and my highways shall be raised up."

Isaiah 49:11

"Prepare the way for the people; build up the highway, clear it of stones."

Isaiah 62:10

"Set up waymarks for yourself, make yourself guideposts; Consider well the highway, the road by which you went."

Jeremiah 31:21

"There will be a highway from Egypt to Assyria, and the Assyrian will come into Egypt, and the Egyptian into Assyria."

Isaiah 19:23

"And a highway shall be there, and it shall be called the Holy Way; The unclean shall not pass over it, and fools shall not err therein. No lion shall be there, nor shall any ravenous beast come up on it; They shall not be found there, but the redeemed shall walk there."

Isaiah 35:8-9

Submitted by
MRS. A. VAN BOEN
Junior Civil Engineer
District XIV

would connect with the current 4.3-mile project under construction between Dunsmuir and Big Canyon.

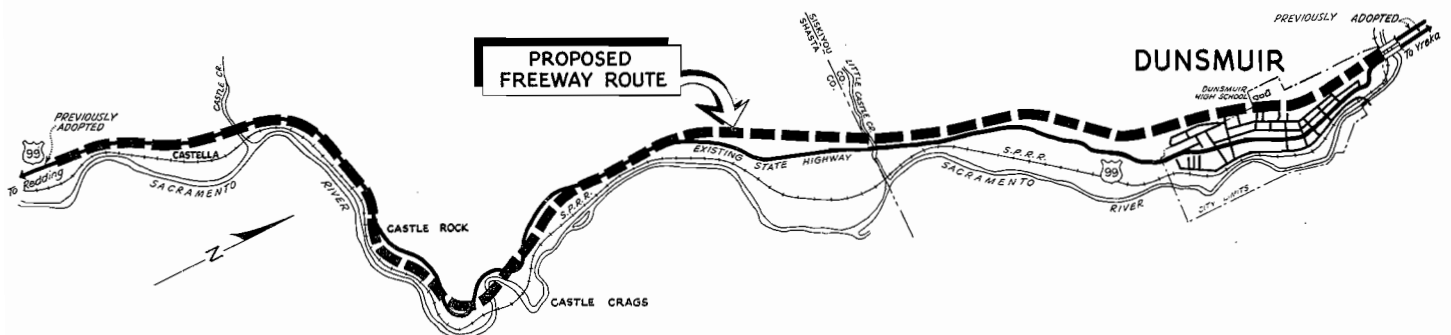
Plans of the Division of Highways call for future construction as a four-lane divided freeway, with separation structures at major intersections, including a pedestrian crossing near the Dunsmuir high school.

State engineers estimate the costs at approximately \$4,700,000, including rights of way, but start of construction would be dependent on the availability of future highway funds.

The new routing under consideration was recommended by the Division of Highways as the most feasible and the one which would best serve both local and through traffic. The existing route through Dunsmuir over Florence Avenue is winding and narrow, and engineering studies found it to be unsuitable for development to freeway standards because of disruption to existing commercial development and prohibitive right-of-way costs.

SAFETY BEGINS AT HOME

The first 25 miles away from home are the most hazardous when you're driving an automobile, says the California State Automobile Association. Statistics show that 61 percent of the drivers involved in the 33,000 fatal accidents during 1952 lived within 25 miles of where the accident occurred. In short, safety should begin at home.



Sacramento Again Enjoys the Annual Gem and Mineral Show

By GEORGE F. WINSLOW, Associate Highway Engineer

AN OCCASION of considerable interest in Sacramento November 7th-8th was the annual Gem and Mineral Show of the Sacramento Mineral Society. A beautiful array of material from the common rock to the highly polished stones and faceted gems pleased the eye of everyone who visited the show.

Governor Goodwin J. Knight, who has considerable background with minerals, was invited to open the show but due to other commitments was unable to attend. A group of the society members met with the Governor before the show, at which time a beautifully polished specimen of California Nephrite Jade, obtained from the Monterey County coast, was presented to him. Among the many activities of the Governor are: A year in the lead and zinc mines of Southern Nevada, following high school; vacation work as a hard-rock miner, while in college; and owning and operating a gold mine in Kern County.

On February 29, 1936, a group of state employees, with a few others, organized what is now the Sacramento Mineral Society. Allan Nicol of the

... Continued on page 63

View of exhibits at gem and mineral show



Members of Sacramento Mineral Society present Governor Knight with gem from show. LEFT TO RIGHT—Hal Altman, Elmer Lester, Governor Knight, Geo. Winslow, President of Society, and Perry Baker.



In Costa Mesa

Newly Incorporated City
Gets Big Freeway Project

By J. L. NEEDHAM, Resident Engineer

FRANK B. DURKEE, Director of the State Department of Public Works, on October 2, 1953, announced the acceptance in the name of the State of a contract covering completed construction of a six-lane limited access freeway through the recently incorporated City of Costa Mesa in Orange County. The community of Costa Mesa in the County of Orange adjoining to the north the City of Newport Beach has been growing steadily particularly since the war years. The estimated census at the time of incorporation as a city on June 29, 1953, was 16,185 persons. The people elected as their first mayor, Charles T. Tewinkle. Councilmen that were elected are: Claire Nelson, Walter Miller, Bruce Martin and Bert Smith. The City of Costa Mesa at the time of incorporation approved the city manager type of government and George

W. Coffey was appointed as city manager.

Limited Access Freeway

On November 3, 1952, construction of another link in the conversion of State Highway Route 43 to a limited access freeway was started. This contract provided for reconstructing two miles of existing Newport Boulevard to provide a six-lane divided highway from a point just northerly of State Highway Route 60 (Coast Boulevard) in Newport Beach to 20th Street in Costa Mesa. Construction from State Highway Route 60 to 17th Street is on new alignment through a former canyon utilizing an abandoned Southern Pacific Railroad right of way. From 17th Street to 20th Street in the City of Costa Mesa the existing Newport Boulevard was utilized as the northbound roadway of the divided

highway and a new southbound roadway was constructed on the west. Frontage roads were constructed to facilitate flow of local traffic and to provide access to business establishments.

The work done consisted of constructing a graded roadbed for a six-lane divided highway and paving with four inches of plant-mixed surfacing on eight inches of imported cement-treated base over imported subbase material and select material.

Drainage Channel

The small canyon from Route 60 to 17th Street serves as a drainage channel for the surrounding area and receives quite a concentration of storm waters in a relatively short time. It was found that subsurface drainage on an impervious underground strata was also concentrated in this gully.

Looking northerly along completed six-lane limited access freeway approaching business district of Costa Mesa





Looking southerly along freeway from south end of business district of Costa Mesa

This caused some difficulty during construction as it was impossible for equipment to operate over the natural ground from 15th Street to 17th Street for a period of about six weeks.

In order to provide adequately for drainage throughout the project it was necessary to construct approximately 8,000 lineal feet of reinforced concrete pipe drains of varying sizes; 890 lineal feet of a 5-foot x 4-foot reinforced concrete box culvert; 1,200 lineal feet of reinforced concrete ditch; 6,000 lineal feet of plant-mixed and pneumatically applied mortar lined ditches; and 4,000 lineal feet of earth ditches, with required inlet and outlet structures.

Cut Slopes Stabilized

Restricted right of way in the vicinity of the Hoag Memorial Hospital and in the rear of business properties from Route 60 to 15th Street required the use of 1:1 and 1½:1 cut slopes. Due to the sandy nature of the soil encountered in this area it was considered advisable to stabilize all the cut slopes. Type "A" slope stabilization, consisting of wooden frames filled with topsoil and covered with straw and wire mesh, was placed on all 1:1

slopes. Type "B" slope stabilization, consisting of straw and wire mesh, was placed on all 1½:1 slopes. Both types of stabilization and all median strips were planted with ice plant (*Mesembryanthemum edule*) cuttings.

The community of Costa Mesa which incorporated as a city during the construction period was using the existing right of way from 18th Street to Broadway Avenue as a parking area. Local civic organizations were concerned over the loss of this facility due to the new highway construction. The problem was considered in the highway design and provisions were made to permit parking on shoulder areas of the divided highway and on the frontage road from 17th Street to 19th Street.

Landscaping

Ornamental palm trees had been planted and maintained in the parkway area in the center of the highway from 17th Street to Broadway Avenue and the community of Costa Mesa requested that the existing type of landscaping be preserved under the new construction. Under a previous contract 85 existing Cocos Plumosa and Washingtonia Robusta palm trees

were selected and moved to a storage area between 20th Street and Bay Street. These trees were replanted in the median strip between the highway and the frontage road on the left from 17th Street to 19th Street under the present contract. It is of interest to note that of the 85 palm trees originally selected, 83 successfully withstood the double transplanting in less than a year's time.

The contract work for construction on this two-mile section of highway amounted to \$713,220. Sully-Miller Contracting Company was the contractor with E. L. White as superintendent.

MAYOR PAYS COMPLIMENT

The completion of the freeway through the business district of the City of Costa Mesa is a real tribute to those involved in the development and planning of this section of the highway.

We of Costa Mesa are particularly proud of the landscaping of those areas adjacent to the freeway and feel that it is a good job well done.

CHARLES W. TEWINKLE
Mayor

Cost Index

California Highway Construction Costs
Stationary Through Third Quarter, 1953

By RICHARD H. WILSON, Assistant State Highway Engineer
H. C. McCARTY, Office Engineer
JOHN D. GALLAGHER, Assistant Office Engineer

DURING the third quarter of 1953 the California Highway Construction Cost Index rose only two-tenths of 1 percent over the second quarter of 1953, indicating that over-all construction costs on state highway contracts continued to remain at approximately the same level as for the two previous quarters.

The index for the third quarter of the year was 218.0 (1940 = 100) as compared to 217.5 for the second quarter and 218.3 for the first quarter. This third quarter index figure of 218.0 is 27.4 index points, or 11.2 percent, under the 245.4 for the fourth quarter of 1951, which was the quarter of highest construction costs as reflected by the Index. It also is 58.0 points, or 36.3 percent, over the 160 of the first quarter of 1950, which was the low dip in prices prior to the beginning of the Korean War.

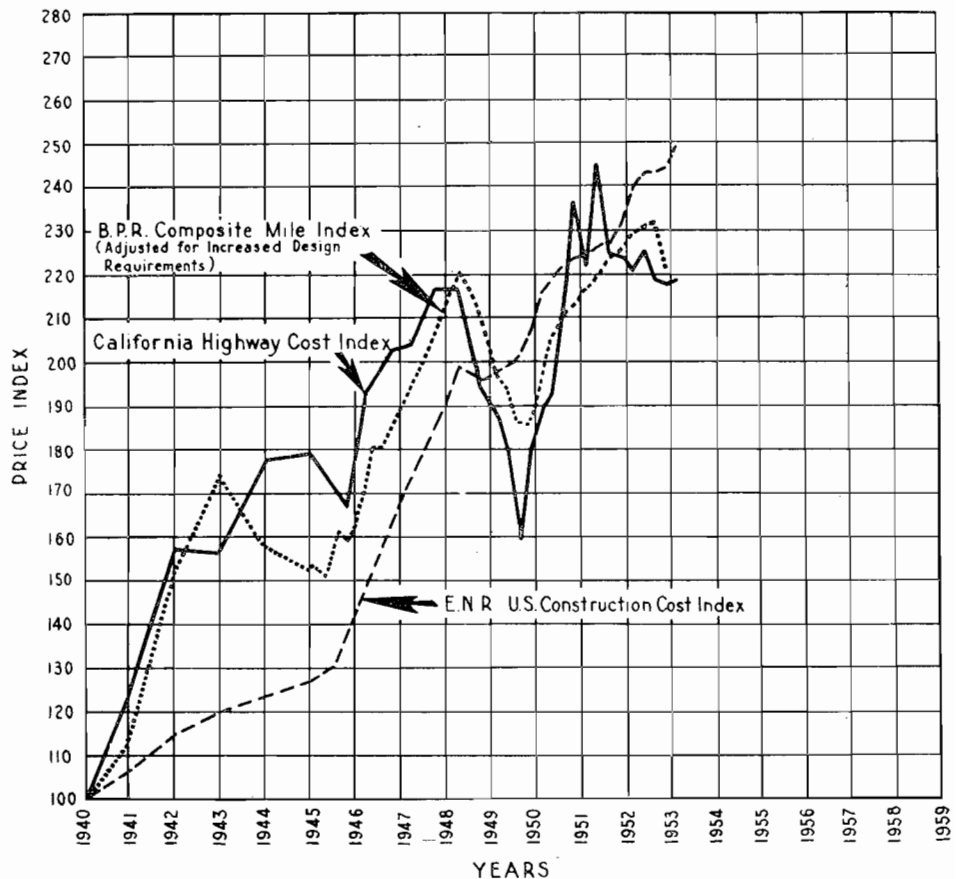
The following is a tabulation of the California Highway Construction Cost Index by years and quarters since 1940:

Year	Cost index
1940	100.0
1941	125.0
1942	157.5
1943	156.4
1944	177.8
1945	179.5
1946	179.7
1947	203.3
1948	216.6
1949	190.7
1950 (1st quarter)	160.0
1950 (2d quarter)	180.0
1950 (3d quarter)	189.2
1950 (4th quarter)	194.8
1951 (1st quarter)	215.4
1951 (2d quarter)	238.3
1951 (3d quarter)	221.9
1951 (4th quarter)	245.4
1952 (1st quarter)	224.8
1952 (2d quarter)	224.4
1952 (3d quarter)	221.2
1952 (4th quarter)	226.2
1953 (1st quarter)	218.3

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

**PRICE INDEX
CONSTRUCTION COSTS**

1940 = 100



Year	Cost index
1953 (2d quarter)	217.5
1953 (3d quarter)	218.0

Costs Stationary

The index for the first three quarters of 1953 would indicate that construction costs have been practically stationary during the nine months. In

the over-all this is the case, but for the individual construction items there has been some fluctuation, both up and down, as may be noted in the accompanying tabulation of average contract prices.

Roadway excavation which had dropped from 66 cents per cubic yard

... Continued on page 56

CALIFORNIA DIVISION OF HIGHWAYS AVERAGE CONTRACT PRICES

	Roadway excavation, per cu. yd.	Crusher run base, per ton	Plant-mix surfacing, per ton	Asphalt concrete pavement, per ton	PCC pavement, per cu. yd.	PCC structures, per cu. yd.	Bar reinforcing steel, per lb.	Structural steel, per lb.
1940	\$0.22	\$1.54	\$2.19	\$2.97	\$7.68	\$18.33	\$0.040	\$0.083
1941	0.26	2.31	2.84	3.18	7.54	23.31	0.053	0.107
1942	0.35	2.81	4.02	4.16	9.62	29.48	0.073	0.103
1943	0.42	2.26	3.71	4.76	11.48	31.76	0.059	0.080
1944	0.50	2.45	4.10	4.50	10.46	31.99	0.054	0.132
1945	0.51	2.42	4.20	4.88	10.90	37.20	0.059	0.102
1946	0.41	2.45	4.00	4.68	9.48	37.38	0.060	0.099
1947	0.46	2.42	4.32	5.38	12.38	48.44	0.080	0.138
1948	0.55	2.43	4.30	5.38	13.04	49.86	0.092	0.126
1949	0.49	2.67	4.67	4.64	12.28	48.67	0.096	0.117
1st quarter 1950	0.34	2.22	3.65	3.74	---	40.15	0.077	0.081
2d quarter 1950	0.40	2.13	4.48	3.74	10.86	43.03	0.080	0.105
3d quarter 1950	0.41	2.32	4.25	5.50	10.91	44.34	0.093	0.131
4th quarter 1950	0.42	2.81	4.64	4.61	12.55	43.18	0.098	0.120
1st quarter 1951	0.45	3.07	4.06	5.22	11.71	46.38	0.103	0.206
2d quarter 1951	0.63	3.88	4.56	4.63	12.93	51.50	0.105	0.166
3d quarter 1951	0.56	2.88	4.59	3.90	12.41	46.14	0.107	0.165
4th quarter 1951	0.66	2.91	5.66	4.89	12.71	49.38	0.105	0.169
1st quarter 1952	0.56	3.25	4.88	4.77	14.25	47.46	0.094	0.152
2d quarter 1952	0.53	3.19	5.29	4.13	14.20	49.12	0.091	0.143
3d quarter 1952	0.55	2.61	5.49	4.60	12.80	48.21	0.094	0.132
4th quarter 1952	0.66	2.68	4.97	---	12.53	48.45	0.094	0.128
1st quarter 1953	0.45	2.48*	5.27	4.46	12.47	53.19	0.098	0.150
2d quarter 1953	0.50	2.07	5.38	4.59	13.06	52.68	0.091	0.132
3d quarter 1953	0.54	2.15	5.30	4.82	13.78	49.23	0.092	0.129

* Untreated rock base substituted for crusher run base at this point. ...

NUMBER AND SIZE OF PROJECTS, TOTAL BID VALUES AND AVERAGE NUMBER OF BIDDERS

(July 1, 1952, to June 30, 1953)

Project volume ...	\$50,000		\$100,000		\$250,000		\$500,000		Over \$1,000,000	All projects
	Up to \$50,000	to \$100,000	to \$250,000	to \$500,000	to \$1,000,000	to \$1,000,000	to \$1,000,000	to \$1,000,000		
Road projects:										
No. of projects	149	42	67	30	14	8	310			
Total value (bid items)	\$3,266,574	\$3,017,829	\$10,575,448	\$9,953,453	\$9,566,240	\$11,208,491	\$47,588,035			
Avg. no. bidders	4.5	5.0	5.9	5.8	8.2	7.4	5.2			
Structure projects:										
No. of projects	40	20	10	6	5	3	84			
Total value (bid items)	\$896,140	\$1,443,987	\$1,714,427	\$2,097,372	\$3,233,306	\$5,242,057	\$14,627,289			
Avg. no. bidders	4.8	6.9	9.2	9.0	9.4	9.3	7.2			
Combination:										
No. of projects	---	---	---	---	2	8	10			
Total value (bid items)	---	---	---	---	\$1,917,715	\$19,972,108	\$21,889,823			
Avg. no. bidders	---	---	---	---	3.0	8.0	7.0			
Summary:										
No. of projects	189	62	77	36	21	19	404			
Total value (bid items)	\$4,162,714	\$4,461,816	\$12,289,875	\$12,050,825	\$14,717,261	\$36,422,656	\$84,105,147			
Avg. no. bidders	4.7	5.6	6.3	6.8	9.0	7.9	5.7			

Total Average Bidders by Months

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	Year
1952-53	4.3	4.3	5.9	5.1	5.9	4.8	5.5	6.1	7.5	6.4	5.9	6.0	5.7
1951-52	4.3	4.0	4.6	4.4	8.0	7.3	7.6	6.4	6.9	6.0	4.5	4.8	5.3

NUMBER OF BIDDERS PRE-QUALIFIED TO BID ON STATE HIGHWAY CONSTRUCTION

The following data shows number of contractors qualified to bid state highway projects as of July 1, 1953. Based on their maximum ratings, these 691 contractors are grouped as follows:

10,000,000 and over	— 32
5,000,000 to 10,000,000	— 66
2,500,000 to 5,000,000	— 117
1,500,000 to 2,500,000	— 184
1,000,000 to 1,500,000	— 233
500,000 to 1,000,000	— 337
250,000 to 500,000	— 481
100,000 to 250,000	— 575
50,000 to 100,000	— 607
up to 50,000	— 691

The combined bidding capacity on June 30, 1953, of these 691 contractors was \$1,345,632,100, or in round figures one billion three hundred fifty million dollars.

In arriving at this combined bidding capacity figure all ratings in excess of 20 million dollars are entered at the 20 million dollar figure.

Last year at this time there were 611 prequalified contractors with a combined bidding capacity of \$1,118,337,500, using the twenty million dollar cut-off point.

NEW PASADENA BRIDGE OPENED TO TRAFFIC

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

WHEN THE Guy F. Atkinson Co., contractors building the new bridge across the Arroyo Seco at Pasadena, decided that construction had progressed to the point where the old bridge had to be closed and the north side of the new bridge opened for traffic the City of Pasadena decided that there should be a celebration.

The matter was taken up with the city council, called the board of directors in Pasadena, and the mayor appointed a committee to handle the details of the dedication ceremonies for the opening of the new bridge. Two members of the board of directors, representatives of the Pasadena Historical Society, Pasadena Pioneer Association, Native Sons, Native Daughters, the Chamber of Commerce and Harrison R. Baker, vice chairman of the California Highway Commission, were appointed by Mayor Winder as a committee.

The celebration started with a luncheon at the Pasadena Elks Club sponsored by the Kiwanis Club. Over 200 people sat down for lunch and to listen to short talks by representatives of the different groups.

After the lunch the entire group repaired to the east end of the bridge. Here a speakers' platform had been erected and the site of the proverbial ribbon cutting was established.

Part of the celebration was a parade of old horse-drawn vehicles and ancient model automobiles.

The highlight of the occasion was the cutting of the ribbon. Helping Harrison Baker was Mrs. Alice Eaton Smith of Berkeley, California. She had come to Pasadena at the invitation of the committee just for this purpose. Her grandfather was the first president of the original "Orange Grove Society" that was made up of members of the "Indiana Colony," who really founded Pasadena on January 27, 1874.

It was in 1911 that the start of the old bridge was made. That year Pasadena voted a bond issue of \$100,000



At ribbon-cutting ceremony. LEFT TO RIGHT—Guy F. Atkinson, Mrs. Alice Eaton-Smith, Highway Commissioner Harrison R. Baker

which was matched by the County of Los Angeles. Formal opening of the old bridge took place on December 13, 1913.

It was in May, 1951, that ground breaking ceremonies were held celebrating the start of construction of

the new bridge. And it was on October 8, 1953, that part of the new bridge was opened for traffic. Just 40 years between ceremonies of the start and finish of both bridges.

The old bridge has a 28-foot roadway with pedestrian walks.

Joe O. Mattson, New Head Automotive Safety Foundation

JOE O. MATTSON of Long Beach, California, has been named president of the Automotive Safety Foundation, it is announced by General Levin H. Campbell, Jr., chairman of the foundation's board of trustees.

Mattson succeeds Pyke Johnson, who has retired as operating head of the organization. General Campbell said that Johnson will continue to serve the foundation in a consulting capacity.

Formerly Director of the Department of Motor Vehicles in California, Mattson was born in Los Angeles, and received his education in the Long Beach public schools and at Oregon State College. He started his career with the motor vehicle department as a driver license examiner in Pasadena in 1934, later working his way to the top of the organization as a civil service employee.

In 1940 Mattson left the department to join the field staff of the Automobile Manufacturers Association. He transferred to the Automotive Safety Foundation early in 1942, and was immediately loaned to the Highway Traffic Advisory Committee to the War Department, working in the West during the war with the 7th, 8th and 9th Service Commands.

Mattson has remained on the Pacific Coast since the war, first in the foundation's Laws Division, and in recent years as assistant to the president whom he now succeeds.

OLD SANTA FE TRAIL

Commerce along the old Santa Fe Trail ran into big business, according to the National Automobile Club. One firm had 3,500 wagons, 4,500 men, 40,000 oxen, and 1,000 mules on the trail over which they hauled 16,000,000 pounds of goods annually in the early 1850's.

and Public Works

District VII Maintenance Employees Picnic



Lunch time at District VII. Third annual Maintenance Department picnic.

By LEO LINDE, Accounting Technician III

APPROXIMATELY 350 District VII maintenance employees and their families enjoyed a full day of festivities at the Third Annual Maintenance Picnic held in Brookside Park at the Pasadena Rose Bowl on October 17, 1953.

These picnics, under the guidance of W. D. Sedgwick, Assistant District Engineer, have become an exciting affair eagerly looked forward to and attended by the many Maintenance Department families from all corners of the district.

The program opened with several competitive sporting contests, principal among which was the baseball elimination series. The baseball championship was won by Superintendent John O'Malley's select team, which is proudly displaying the trophy award at its San Fernando office.

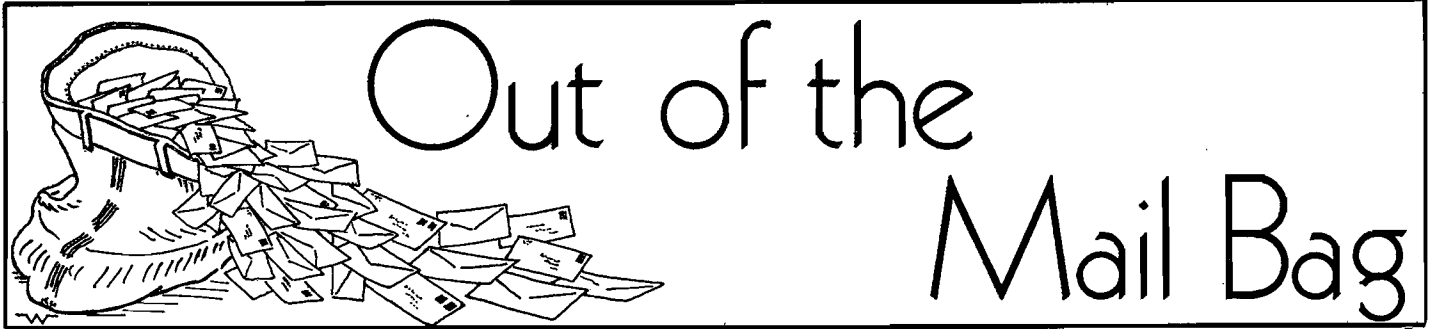
After a well-planned midday feast everyone gathered at the pavilion to witness a program of excellent enter-

tainment, the awarding of prizes and a community sing. The most noteworthy of the entertainment was a one-act play portraying the adventures of an engineer's humble family, starring W. L. Fahey, District Engineer. A treat for everyone was the astounding feats of magic performed by the near-professional prestidigitator A. S. L. Hewes, Traffic Signal Technician.

The success of the outing is demonstrated by the enthusiastic interest shown in already planning next year's picnic.

SHOWING OFF

The next time you feel the urge to show off when behind the wheel of a car remember that it takes but a split second, just a panic stricken moment of confusion, to switch from spectacular driving to spectacular disaster.



FROM NEW YORK

2175 Cedar Avenue
New York 68, New York

California Highways and Public Works
Sacramento, California

GENTLEMEN: I have been reading and enjoying for the past two years your excellent public works magazine entitled "California Highways and Public Works." I should like to complement your organization on its content and the manner in which it is written.

As one who is actively engaged in the design and construction of major highways in the East and along the Eastern Seaboard, I am writing to ask if my name could not be added to your mailing list to receive your publication.

Thanking you for your consideration,

Yours very truly,

MILTON SCHWARTZ

ANOTHER USE FOR MAGAZINE

THE PRESBYTERY OF LOS ANGELES
Los Angeles 13, California

November 2, 1953

MR. KENNETH C. ADAMS, *Editor*

DEAR MR. ADAMS: I want to take this means to express my appreciation for the magazine *California Highways and Public Works* which I receive regularly. I have read it most diligently and have found many helpful suggestions in our work in the establishment of new churches in Southern California. It has been extremely helpful also in the development of our inner city ministry in the inner city of Los Angeles, particularly as it relates to your freeway development.

Very sincerely,

JAMES WILLIAM BAIRD
Director of Missions

THANKS FROM RED CROSS

AMERICAN RED CROSS
Oakland Chapter

OAKLAND 7, CALIFORNIA
September 30, 1953

San Francisco-Oakland Bay Bridge
Roadway Service
Toll Plaza, San Francisco

GENTLEMEN: Our motor service fleet cars have driven many, many miles across the Bay Bridge in the last 10 years without mishap of any kind.

Yesterday one of our drivers had a flat tire on the bridge.

Tow Truck No. 1, Driver J. Thornton, was close at hand and changed the wheel on the car without compensation of any kind.

We should like you to know that we are deeply appreciative of the courtesy extended to us both by your organization and by Mr. Thornton personally.

Most sincerely,

MRS. GERTRUDE W. SELOVER
Equipment Officer

WE WILL SEND MORE MAGAZINES

BOARD OF HARBOR COMMISSIONERS
Long Beach 2, California

MR. KENNETH C. ADAMS, *Editor*

DEAR MR. ADAMS: One or two members of this organization have been receiving your publication for several years, and during that time my section has been able to obtain and read it intermittently. I have found many articles not only interesting but containing valuable information in regard to right of way work.

The Harbor Department has grown to such size and is so spread out geographically that it is now next to impossible to see the magazine. I therefore repeat my request of a year

ago, that I be placed on your mailing list for your very fine publication.

I shall be happy at a future date to furnish you with extensive information on the development of the Harbor Department's program of bridge and freeway construction which is now in progress over and adjacent to the Los Angeles River. As you may know, our area is at the terminus of the state-constructed Long Beach Freeway which is a branch of the Santa Ana Freeway.

Let me assure you that I shall continue to give your magazine maximum circulation among the members of this organization who are desirous of reading it.

Sincerely,

MAX J. DURHAM
Senior Harbor Engineer
Chief, Right of Way Section

FIRE-FIGHTING AID

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Angeles National Forest

LOS ANGELES 12, CALIFORNIA
October 8, 1953

State of California
Division of Highways
Los Angeles, California

GENTLEMEN: May we take this opportunity to express our appreciation to your department for the assistance offered during the recent Fish Fork fire in the Angeles National Forest.

Your assistance in providing road maintenance on the San Gabriel Canyon Road, Highway 39, enabled our men and equipment to perform their job in a more efficient manner.

Again may we say thanks for your generous cooperation.

Very truly yours,
WM. V. MENDENHALL
Forest Supervisor

AN APPRECIATIVE READER

September 3, 1953
Ankara

MR. KENNETH C. ADAMS, *Editor*

DEAR MR. ADAMS: It is indeed very kind of you to send me *California Highways and Public Works* regularly. I take great pleasure reading it and flatter myself that I know many of your friends, though I missed meeting you. It would have been very useful for me while I stayed with the Division of Highways if I had been able to follow up the way you prepare such a wonderful magazine.

The new publications of Division of Highways which I receive through Mr. Maynard Glass, and *California Highways and Public Works* give me further training and make it possible for me to keep up to date with the most advanced methods on highway engineering.

Sincerely yours,

HUSEYIN H. CONTURK

Karayollari

Etut ve Proje Mudurlugu

Diskapi-Ankara

Turkey

MAGAZINE APPRECIATED

DEPARTMENT OF WATER AND POWER
The City of Los Angeles

KENNETH C. ADAMS, *Editor*

DEAR SIR: Enclosed is the annual card mailed to me for checking the current addresses of those lucky enough to receive your splendid publication, *California Highways*.

Really, you haven't any idea how very much I enjoy reading some of the articles and keeping abreast of the times as to our great highway programs, especially so because of being employed in our City of Los Angeles Water and Power Department in the Water System Specification Section, where our particular functions are to prepare purchasing specifications for construction jobs and materials. I always pass these very acceptable issues on to other persons in our department who also are interested.

Thank you so much for them and I shall appreciate receiving them in the year to come.

Very truly yours,

GRACE L. SAMPSON

A SEA CAPTAIN SPEAKS

AMERICAN PRESIDENT LINES
ON BOARD S. S. PRESIDENT PIERCE
Yokohama, Japan
September 12, 1953

MR. KENNETH C. ADAMS, *Editor*

DEAR SIR: It has been my good fortune in the past to receive your excellent publication. It is one of the most interesting and outstanding magazines of its kind.

Aboard this vessel we carry passengers to all parts of the world and they, the passengers, surely enjoy reading and receive much valuable information from your fine magazine about the State of California and its public works.

I want you to know that I greatly appreciate your courtesy in sending me the magazine and that I make very good use of the publication. Please continue to send it as long as you find it possible to do so.

Regarding the article on roadside trash, as a master of a vessel I believe in cleanliness. We do not pollute the world's harbors and there is a very heavy fine and jail sentence for those careless enough to do so. Why not make an official endorsement to enact the same punishment to the garbage pigs of the highways?

Very sincerely yours,

CAPT. F. P. WILLARTS

Master, S. S. President Pierce

FROM AN OLD TIMER

Redwood City

KENNETH C. ADAMS, *Editor*

DEAR MR. ADAMS: I wish to say I've enjoyed every copy of your magazine for the past 14 years.

All the features are very interesting and to see the improvement in the methods of construction is to me outstanding. When just a young man of 20, I drove an old dump truck on the highway out of Dixon. We'd back it up to a mixer or on the open road bed—usually the hydraulic lift would break down and then a shovel did the job. Even when it was 100 degrees in the shade.

Yours for continued success with the magazine,

Sincerely,

A. H. STORCH

LIKES MAGAZINE

7525 Eighth Avenue
Los Angeles 43, California

TO THE EDITOR: I would like to congratulate you and the members of your staff on the wonderful job you have been doing to inform the public of California and other states on the progress and innovations of the Division of Highways with your publication *California Highways and Public Works*. I have utilized your publication on numerous occasions in my engineering classes at the University of Southern California.

The magazine is superbly edited in that it appeals to both the layman and the engineer. The articles are written in such a manner as to present technical information which may be readily understood by the layman and yet is not over simplified. From the standpoint of the engineer, the magazine provides an opportunity to be informed of the various problems which are encountered by our highway engineers and their methods of solution.

I have received your publication for the past two years and would like to continue to receive it.

Thank you,

JOE VICELJA

PRAISE FOR FREEWAYS

State of California
Division of Highways
Los Angeles, California

DEAR SIR: Please consider this as a letter of thanks and appreciation to all the people concerned in the building of the beautiful new freeways in Los Angeles and vicinity. I just can't express the wonderful feeling that overcomes me when I drive on the gorgeous system of highways.

I sincerely wish I could have the opportunity of meeting the engineers and laborers who have developed their skill to the point of achieving this sight.

As I drove on the new link of the Santa Ana Freeway yesterday a feeling of pride swelled in my heart to imagine that only two years ago the road wasn't even scratched through, and it has all brought about a drastic development of Downey. We bought our home just three years ago in

Downey amidst old orange groves and dusty streets, and so you can imagine how much I appreciate all the work and effort put forth by everyone involved in the vastness of the Los Angeles freeways.

Thanking you again, I am one Californian who would never object to the "gas tax" when you can see the money spent for benefit of the taxpayer.

Sincerely,

GLORIA EARNSHAW
9009 Parrot Avenue,
Downey, California

MR. BOOKER THANKS YOU, TOO

MR. B. W. BOOKER

*Assistant State Highway Engineer
150 Oak St., San Francisco, Cal.*

DEAR SIR: The following residents living along the Bear Creek Road wish to express their appreciation for the fine improvement recently completed by your forces on State Highway No. 5 immediately east of the Brown School, and to commend the workmen for their courtesy to the traveling public while performing the work.

	No. People	No. Cars
Mickey Miller	2	2
Stanley MacCarty	4	3
Henry B. Thomas	3	2
Earl Glunt	2	2
Don Wentworth	2	2
Don Meagher	4	2
Fred E. Starr	3	2
Earl H. Hoffman	3	2
A. E. Helwig	4	3
George Van Hagel	2	2
Stuart P. Fletcher	2	1
Jack Stewart	2	3
R. L. Richards	2	1
	--- 35	--- 27

As ever,

R. L. (DICK) RICHARDS
Los Gatos

FROM EMPIRE STATE

STATE OF NEW YORK
DEPARTMENT OF CIVIL SERVICE
Municipal Service Division

KENNETH C. ADAMS, *Editor*

DEAR MR. ADAMS: Occasionally a copy of *California Highways and Public Works* such as your May-June issue of 1953 is sent to me because this division is interested in learning more of the activities of your particular department.

Amplified Radio Reports on Road Conditions

UP-TO-THE-MINUTE information on travel conditions along California state highways will be supplied by radio this winter from a fleet of more than 600 maintenance vehicles as they patrol their assigned routes.

The California Division of Highways has prepared to resume its seasonal publication of a daily road report bulletin. Since last winter it has added two-way FM radio equipment to 100 more of its autos and trucks, making possible improved coverage of state-wide road conditions.

Each year, from the time that travel on major routes is affected by the first snows to reopening of these routes in the spring, the division publishes its daily bulletin of last-minute information reported via radio by the maintenance men who patrol every mile of highway.

Last year the first report went out on November 17, 1952. The final report of the season was issued on April 3, 1953. Two years ago, a year of record-breaking snowfall, the reports spanned a period extending from November 19th all the way to May 3d.

Wide Distribution

The bulletin is normally assembled by 10 o'clock in the morning and ready for distribution to newspapers, wire services, radio stations, auto clubs, truckers, oil companies and other interested media and organizations for dissemination to the motoring public.

Although the primary purpose of the division's FM radio setup is the speeding up of maintenance work and keeping the highways open, other maintenance communications, except

emergencies, are suspended during the early morning period while information is being collected for the road condition bulletin.

This year the division announced many improvements in the radio coverage of the roads throughout the State, as well as in the format of the road condition bulletin itself.

More Powerful Equipment

In the Northern California coastal and mountain areas more powerful sending equipment has been installed. Relocation of some fixed relay stations to positions more advantageous for sending has made direct contact with headquarters in Sacramento possible.

In the Los Angeles-Bakersfield-San Fernando area an interlocking radio exchange has been set up which will mean faster correlation and receipt of information concerning conditions along the Ridge Route.

The radio setup in the Inyo-Mono-San Bernardino region east of the Sierra Nevada also has been improved to give better coverage of U. S. 395.

Improvements to the published road condition bulletin itself include an index at the bottom of each page listing roads by route number, making it easier to locate a particular highway; and a list of areas other than snow country where traffic may be subject to delays and suggested detours around sections of road temporarily closed.

Use of two-way radio in state highway operations began 15 years ago, but was limited largely to emergency work in snow areas until after World War II.

With the excellence of these two articles in mind, I am wondering if there is any possibility of your placing this division on your mailing list to receive regularly copies of your excellent publication.

Cordially yours,
HENRY J. McFARLAND
Director

The article by Earl Sorenson, equipment engineer, entitled "On-Job Training" was of considerable interest to us because of some of our training problems. Our division's engineering examiner found a great deal of use in Rex Fulton's article on basic photogrammetry for highway engineers.

Portola Overhead

Continued from page 12 . . .

pulling over the crossing at eight miles per hour or less. Vehicular traffic at this crossing is approximately 5,000 per day. The shortest detour involves a 25-mile trip around Blairsden and this during summer and fall months only, as portions of road are closed after the first snowfall.

Recent traffic checks by the Plumas County Road Department indicate that there are approximately 26 switching movements and 19 through trains per day with delays from 30 seconds to 13 minutes.

The new Portola Overhead and Feather River bridge by no means will serve the local people only. The Plumas County Road Department, under the supervision of County Road Commissioner F. L. O'Rourke, has been reconstructing the Portola-McLear Road, County Road 114, a distance of about eight miles, which connects the Quincy-Reno highway (State Sign Route 24) with Quincy-Truckee highway (State Sign Route 89). The grading has been completed and it is anticipated that the surfacing will be finished by August, 1954, when the overpass project will be opened to traffic.*

With the opening of this improved road a considerable increase in traffic

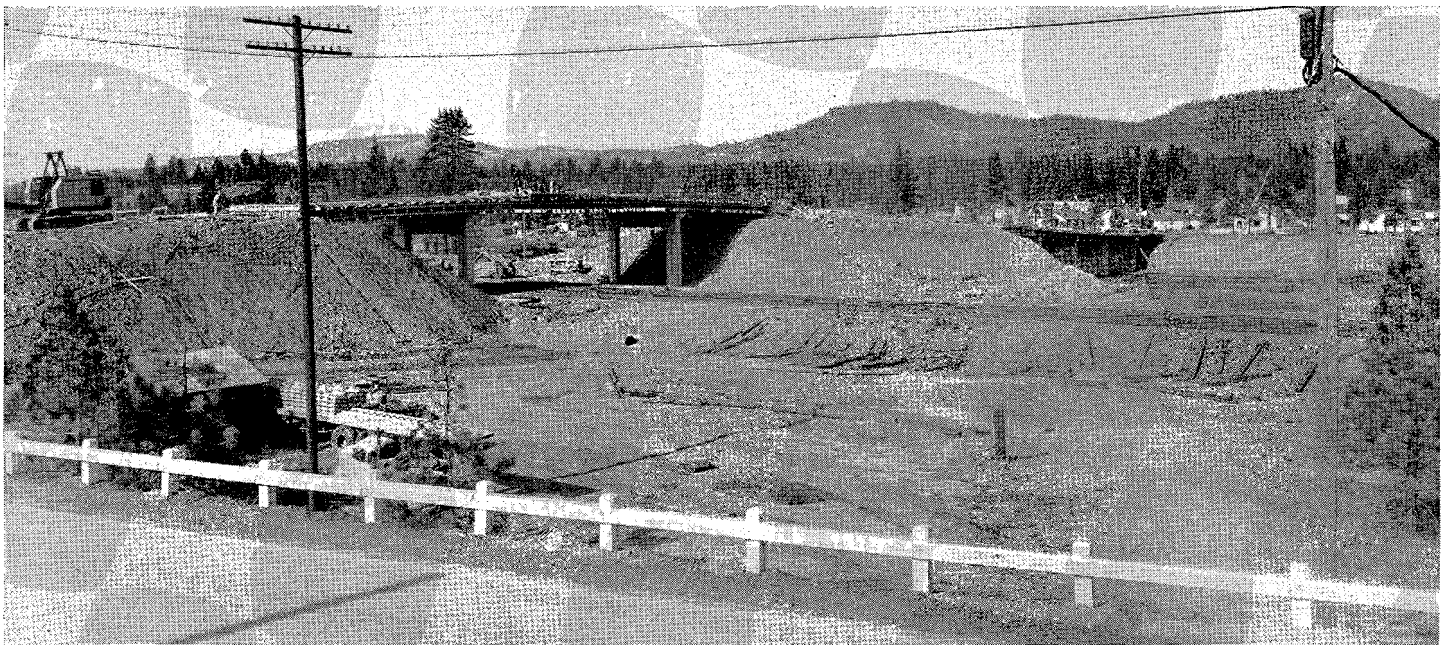
from Graeagle, Clio and Mohawk Valley is expected as Portola is the logical shopping center of this area.

The Plumas County Board of Supervisors and the Road Commissioner are very grateful for the co-operation shown by the Division of Highways and the Bureau of Public Roads and to the group assigned to the project by the Walsh Construction Company.

** Inspection of this road project indicates that the county has designed and is constructing to modern standards. This will be an excellent addition to the Plumas County Road System.*

H. B. LAFORGE
Engineer of Federal Secondary
Roads, State Division of
Highways

Partially completed railroad overhead and bridge over north fork of Feather River at Portola. This project is being constructed as a cooperative venture of the County of Plumas, the State of California, and the Federal Government.



Expanded Federal Aid for Nation's Major Highways

A 10-YEAR expanded federal-aid program to improve the Nation's major highways is advocated by Gen. Eugene Reybold, executive vice president of the American Road Builders' Association. The General, wartime chief of the U. S. Corps of Engineers, addressed the annual convention at the Homestead of the Carolinas Branch,

Associated General Contractors of America, an affiliate of ARBA.

"The ARBA suggests," he said, "that Congress authorize appointment of a joint committee of the Senate and House to conduct a thorough investigation of the entire national network of highways, including the federal-aid system of interstate, primary, secondary, and urban highways, together with a concurrent study of ways and means for financing requirements for the correction of deficiencies. We are firmly convinced that a bold, realistic 10-year program providing for a stip-

ulated annual expenditure for new highway construction is the goal to be sought."

General Reybold reviewed the status of the Nation's roads in relation to the mounting traffic volume. "The mounting pressure of motor vehicle demands is the challenge that highway planners, designers, and builders must meet," he stated. "We now face an exasperating traffic congestion that is a direct economic drain. As a Nation, we are remiss in not tackling road construction on a really effective scale."

Traffic Count

*Freight Vehicles Increasing at
Faster Rate Than Passenger Cars*

THE ANNUAL state-wide traffic count taken on Sunday and Monday, July 12th, and 13th, 1953, shows an increase of 4.15 percent over the previous annual count of July, 1952, according to State Highway Engineer George T. McCoy. Although this gain is substantially less than has prevailed over the last several years, it is probably too early to predict a leveling off in California's postwar traffic boom.

Monthly traffic counts show that freight vehicles are increasing at a faster rate than passenger vehicles. Also, for the second straight year, Sunday traffic increases are markedly less than those for weekday traffic. These factors point to a lessening of pleasure travel as a factor in the reduced rate of growth.

Count Procedure

No change was made from the regular procedure of previous years in the manner of taking the count. Actual recording covers the 16-hour period from 6 a.m. to 10 p.m. for both Sunday and Monday, totals being shown for each hour. At selected representative stations, counts are also continued for the entire 24-hour period and are extended to record each of the seven days of the week. Traffic is segregated into the following vehicle classifications: California passenger cars, out-of-state passenger cars, busses, pickups, two-axle commercial units, three-axle units, four-axle units, five-axle units, and six-or-more-axle units.

Each year some minor changes in the census becomes necessary, such as the relocation, addition, or discontinuance of individual stations, but in every instance these are excluded in determining comparison with the previous year, only those stations that were identical during both years being taken into consideration.

Various Route Groups

These comparisons for the various route groups are as follows:

PERCENT GAIN OR LOSS FOR 1953 COUNT AS COMPARED WITH 1952

	Sunday	Monday
All routes	+3.47	+4.26
Main north and south routes.....	+3.69	+4.76
Interstate connections	+3.93	+5.30
Laterals between inland and coast....	+2.51	+3.26
Recreational routes	+6.04	+4.22

The gain or loss of traffic volume for State Highway Routes 1 to 80, inclusive, which constitute the basis for the foregoing summary, is shown in the following tabulation:

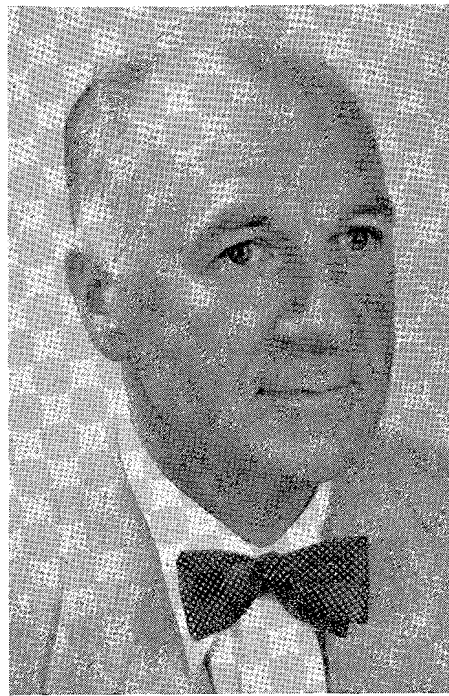
Route	Termini	1953 Percent gain or loss			
		Sunday		Monday	
		Gain	Loss	Gain	Loss
1.	Sausalito-Oregon Line	9.40		2.71	
2.	Mexico Line-San Francisco.....	4.44		5.69	
3.	Sacramento-Oregon Line		1.12	3.50	
4.	Los Angeles-Sacramento		3.56		0.46
5.	Santa Cruz-Junction Route 65 near Mokelumne Hill.....	5.40		5.38	
6.	Napa-Sacramento via Winters.....	10.16		9.83	
7.	Crockett-Red Bluff	2.45		7.85	
8.	Ignacio-Cordelia via Napa.....	12.65		0.52	
9.	Route 2 near Montalvo-San Bernardino.....		0.86	4.02	
10.	Route 2 at San Lucas-Sequoia National Park.....		3.91		8.20
11.	Route 75 near Antioch-Nevada Line via Placerville.....	5.15		7.39	
12.	San Diego-El Centro		3.97	3.71	
13.	Route 4 at Salida-Route 23 at Sonora Junction.....	7.41			0.60
14.	Albany-Martinez		1.03		0.46
15.	Route 1 near Calpella-Route 37 near Cisco.....	6.52		8.79	
16.	Hopland-Lakeport	5.58		3.69	
17.	Route 3 at Roseville-Route 15, Nevada City.....	4.01		5.01	
18.	Route 4 at Merced-Yosemite National Park.....		11.00		6.08
19.	Route 2 at Fullerton-Route 26 at Beaumont.....		0.40	5.77	
20.	Route 1 near Arcata-Route 83 at Park Boundary.....	1.60			1.53
21.	Route 3 near Richvale-Route 29 near Chilcoot via Quincy.....		0.62		0.79
22.	Route 56, Castroville-Route 32 via Hollister.....	6.36		4.62	
23.	Route 4 at Tunnel Station-Route 11, Alpine Junction.....	3.30		3.37	
24.	Route 4 near Lodi-Nevada State Line.....	4.67		2.80	
25.	Route 37 at Colfax-Route 83 near Saffley.....	16.13		9.88	
26.	Los Angeles-Mexico via San Bernardino.....		0.79	3.49	
27.	El Centro-Yuma	6.29		2.27	
28.	Redding-Nevada Line via Alturas.....	9.75		4.11	
29.	Peanut-Nevada Line near Purdy's.....	16.18		7.70	
30.	Colton-Nevada State Line	3.05		3.50	
31.	Route 56, Watsonville-Route 4 near Califa.....	5.94		3.16	
32.	Route 56 near Cambria-Route 4 near Famoso.....	2.38			1.48
33.	Route 4 at Galt-Route 23 at Pickett's Junction.....	4.22			6.82
34.	Route 1 at Altton-Route 20 at Douglas City.....	11.66		10.32	
35.	Auburn-Truckee	23.22		9.21	
36.	Route 11 at Mays-Nevada Line via Truckee River.....	8.46			3.87
37.	Route 38 at Tahoe City-Nevada State Line.....	4.16		6.17	
38.	Route 13 near Montezuma-Route 76 at Benton.....	21.75		20.24	
39.	Route 5 near Tracy-Kings River Canyon via Fresno.....		4.18		8.06
40.	Redwood Park-Los Gatos	13.71			0.74
41.	Route 60 at Newport Beach-Route 31 near Victorville.....	11.71		10.23	
42.	Boulder Creek-Redwood Park.....	17.04		1.73	
43.	Route 7, Willows-Route 3 near Biggs		7.81	0.83	
44.	Route 1 near Klamath-Route 3 near Cray.....		25.66		10.55
45.	Route 7, Orland-Route 29 near Morgan.....	0.28			1.28
46.	Route 1 north of Cloverdale-Route 56 near Albion.....	5.05			6.27
47.	Napa-Route 15 near Sweet Hollow Summit.....	8.15		9.20	

D. E. Watkins Retires as CSAA Manager; E. S. Moore Is Successor

RETIREMENT of D. E. Watkins as secretary and general manager of the California State Automobile Association and appointment of Edwin S. Moore as his successor was announced by Harold J. McCurry, CSAA president.

The fortieth anniversary of Watkins' appointment to the position on October 13, 1913, was marked by a special meeting of the CSAA Board of Directors in San Francisco Tuesday evening, October 13th, honoring his four decades in the service of California motorists.

Moore, who has been Watkins' assistant since last January, is widely known as head of the CSAA's public safety, legislative and highway devel-



Edwin S. Moore, newly elected secretary and general manager of the California State Automobile Association

opment activities. He was manager of the association's Public Relations Department for 11 years and assistant manager of the department nine years. An attorney, he started with the association in 1927 on the Law Department staff.

During the 40 years of Watkins' administration, the motorists' organization has grown from a membership of about 500 with a one-room office in San Francisco's Monadnock Building to a membership exceeding 280,000 with its own building at Van Ness Avenue and Hayes Street and district offices in 46 cities of northern and central California and Nevada. It is now one of the largest of the 276 motor clubs affiliated with the American Automobile Association. Watkins retires with the distinction of the longest term of service of any AAA club executive. He organized and managed AAA clubs in Nebraska, his native state, and in Kansas for three years before coming to California in 1913.

Route	Termini	1953 Percent gain or loss			
		Gain	Loss	Gain	Loss
48.	Sacramento-Route 15 near Wilbur Springs	7.06		4.56	
49.	Route 8 at Shellville-Sebastopol	5.88		6.68	
50.	Alfo-Tiburon	12.42		20.17	
51.	Route 7 at Fairfield-Route 4 near Lodi via Rio Vista		1.58	1.58	
52.	Route 11 at Perkins-Route 65 at Central House		9.49		21.59
53.	Route 5 near Glenwood-San Francisco	11.14		15.05	
54.	Route 2 at Las Cruces-Route 1 near Fernbridge	7.04		3.74	
55.	Route 2 near Santa Maria-Route 23 near Freeman via Bakersfield		1.99		0.69
56.	Route 2 near Santa Margarita-Arizona Line near Topock via Mojave and Barstow		0.04	9.72	
57.	Route 4 at Gorman-Route 43 at Lake Arrowhead	7.59		15.56	
58.	Route 2 at Serra-Route 2 at El Rio	8.85		12.64	
59.	Route 4 south of Glendale-Route 59 near Phelan		13.09	7.05	
60.	Route 171 near Buena Park-Route 61 near Crystal Lake	13.97		28.10	
61.	Big Pine-Nevada State Line		23.55		37.18
62.	Route 2 at San Juan Capistrano-Blythe		10.25		1.40
63.	Route 18 near Mariposa-Auburn	5.26		5.27	
64.	Route 5 near Mossdale-Route 13 near Oakdale	0.90			1.74
65.	Pajaro River-Route 2 near San Benito River Bridge	8.02		5.43	
66.	San Jose-San Francisco	7.29		3.03	
67.	Route 5 at Warm Springs-Route 1, San Rafael	6.44		3.23	
68.	Ukiah-Talmage	6.10			12.41
69.	Crescent City-Oregon Line		10.30	10.38	
70.	Weed-Oregon Line	14.49		10.55	
71.	Route 29 near Johnstonville-Oregon Line	1.72		6.51	
72.	Napa Wye-Cordelia via Vallejo and Benicia		8.84		13.05
73.	Oakland-Junction Route 65 at Altaville	5.49		4.77	
74.	Route 125 at Shaw Ave.-Nevada State Line near Benton	1.09		5.98	
75.	San Diego-Los Angeles via Pomona	0.18		6.91	
76.	Route 12 near Descanso-Route 19 near March Field	10.60		17.69	
77.	Route 2, Ventura-Route 4 at Castaic	2.69		7.83	
78.	Route 51, Rincon Creek-Route 2 near Zaca		16.36		9.66

URBAN PROBLEMS STRESSED

Urban transportation is the subject of one large section in the *Proceedings* of the 1953 California Street and Highway Conference. The *Proceedings* have just been published by the Institute of Transportation and Traffic Engineering, University of California. They are for sale by the University Press, Berkeley 4, California.

Specialists from different parts of the Country contributed papers to the California conference, and participated in a panel discussion. Both the papers and panel discussion are included in the *Proceedings*. Among the contributors: Richard Graves, executive director, League of California Cities; Charles E. DeLeuw, engineer, Chicago; and Edward G. Wetzel, highway planning engineer, the New York Port Authority.

AIR CLEANER

The air cleaner on your car should be serviced regularly to insure efficient engine operation, reminds the California State Automobile Association. Under normal operation this should be done every 1,000 miles.

HIGHWAY BIDS AND AWARDS

October, 1953

ALAMEDA COUNTY—At the intersection of San Pablo Avenue with Washington Avenue (West) in the City of Albany, a traffic signal system to be furnished and installed. District IV, Route 14. Hall-Sloat Electric Co., Inc., Oakland, \$7,111; L. H. Leo-

nardi Electric Construction Co., San Rafael, \$7,136; Abnett Electric Corp., San Francisco, \$7,489; R. Goold & Son, Stockton, \$7,542; R. Flatland, San Francisco, \$7,700; Jones Electric Co., Inc., Hayward, \$7,984; Manning & Whitaker, Inc., San Francisco, \$9,294. Contract awarded to Scott-Buttner Electric Co., Inc., Oakland, \$6,910.

Cost Index

Continued from page 46 . . .

to 45 cents during the first quarter of 1953 climbed back to 50 cents in the second quarter and to 54 cents in the third quarter. Similarly Portland cement concrete pavement which dropped slightly during the first quarter rose during the second and third quarter to reach a price of \$13.78 per cubic yard, the highest in over a year. Structure concrete continued to drop as it has during the entire year, the \$49.23 price per cubic yard being \$3.45 less than in the second quarter and \$3.96 less than in the first quarter of 1953. There wasn't a great deal of change in steel prices, bars were up one-tenth of a cent while structural steel continued to decline, being down four-tenths of a cent.

In the face of increasing wages in both the construction industry and manufacturing, there are several factors which apparently are of sufficient influence to offset the inflationary tendencies of rising wages. Competition in bidding continues to increase. In the last quarter it has been an unusual project which attracted less than six or seven bidders and on many the number of bidders has been from 12 to 15 or 16.

The governmental freeze on the anticipated extensive defense construction programs continues, leaving some California contractors who thought they had firm contracts for such work holding empty sacks while the programs are reviewed.

Another factor which undoubtedly has had considerable effect in lowering bid prices is the stabilization of materials availability. Over an extended period contractors in preparing bids have been faced with uncertainty resulting from short supply in various lines of materials. Steel, in its various forms of bars, shapes, and plates, was

not available; forgings were difficult to secure; cement, plywood and other materials have from time to time been in very short supply. In some cases, resort to the "gray market" appeared to be the only solution and bidders added a percentage, possibly as high as 10 percent, to allow for added costs of securing materials to complete their contracts in the specified time. The muddied waters of materials availability have cleared and the sand in the bottom of the pool may be seen. It may be that elimination of a bid factor to care for the uncertainties in delivery of materials is sufficient to offset in some degree the effects of past and current wage increases in both the construction industry and manufacturing.

Comparison of the California Highway Construction Cost Index with the Bureau of Public Roads Composite Mile Index and the Engineering News-Record Construction Cost Index shows the latter continuing its slow but steady rise and the B. P. R. composite mile index more or less following the pattern of the California index.

It is the belief of this department that while many inflationary tendencies are becoming stabilized, the demands for increased wages will continue, with the result that highway construction costs will tend to rise to some degree.

Accompanying tabulations show: (1) the average unit price by years and quarters for the eight basic highway construction items on which the California index is based (2) the average number of bidders on various sized contracts for the fiscal year from July 1, 1952, to June 30, 1953; and (3) the number of bidders prequalified to bid on state highway construction on June 30, 1953, grouped by the several brackets of bidding capacity.

CONTRA COSTA COUNTY—Across the track of the Atchison, Topeka & Santa Fe Railway Co. at 47th Street in Richmond and at San Pablo Creek at the north city limit of San Pablo, respectively, a reinforced concrete railroad overhead and a reinforced concrete arch culvert to be constructed. District IV, Routes 14, 69. Stolte, Inc., & Cantor & Coull, Oakland, \$298,546; O. C. Jones & Sons, Berkeley, \$305,044; Tumblin Co., Bakersfield, \$308,248; Peter Kiewit Sons' Co., San Francisco, \$322,755; Granite Construction Co., Watsonville, \$328,806; Walsh Construction Co., San Francisco, \$330,624; Gordon H. Ball and San Ramon Valley Land Co., Berkeley, \$339,592; Dan Caputo, San Jose, \$344,598; Fredrickson & Watson Construction Co., M & K Corp., Oakland, \$347,639; C. K. Moseman, Redwood City, 362,365; Victor Weidmer, Penryn, \$366,100; G. M. Carr Co. and Bati Rocca, Santa Rosa, \$366,304; George Pollock Co., Sacramento, \$367,235; Erickson, Phillips & Weisberg, Concord, \$367,268; Lew Jones Construction Co., San Jose, \$372,031; Stanley H. Koller Construction, Crockett, \$378,006; Charles MacClosky Co., San Francisco, \$461,944. Contract awarded to MacDonald, Young & Nelson, Inc., San Francisco, \$294,738.50.

CONTRA COSTA COUNTY—Between 1.5 and 0.9 mile north of Glen Fraser, about 0.6 mile, riprap and concrete embankment and channel protection to be constructed. District IV, Route 106, Section A. Robert R. Murdoch, Oakland, \$14,940; Charles S. Moore, San Jose, \$15,290; Eugene G. Alves, Pittsburg, \$15,383; Bos Construction Co., Berkeley, \$15,607; James W. Hill, Walnut Creek, \$16,276; R. G. Clifford and C. O. Bodenhamer, Berkeley, \$16,932; Morison Construction Co., Nevada City, \$17,021; Al Erickson & Co., Napa, \$17,369; Callagher & Burk, Inc., Oakland, \$17,977; J. Henry Harris, Berkeley, \$18,013. Contract awarded to O. C. Jones & Sons, Berkeley, \$14,522.

LOS ANGELES COUNTY—On the Santa Ana Freeway in the City of Los Angeles, between Ramona Freeway and Seventh Street, additional ramps to be graded and paved with asphalt concrete on Portland cement concrete base. District VII, Route 2. George W. Peterson and Jack W. Baker, Los Angeles, \$229,332; R. R. Hensler, Sun Valley, \$243,394; Norman I. Fadel, North Hollywood, \$260,321; Contract awarded to Webb & White, Los Angeles, \$223,286.60.

LOS ANGELES COUNTY—In the City of Los Angeles adjacent to State Route 2 on Hewitt Street, between Commercial Street and Ducommon Street, freeway connection to be constructed. District VII, Route 2. T. E. Sherlock, El Monte, \$10,208; Jesse S. Smith, Glendale, \$10,374; George W. Peterson and Jack W. Baker, Los Angeles, \$12,010; Griffith Company, Los Angeles, \$13,066. Contract awarded to C. O. Sparks, Inc., and Mundo Engineering Company, Los Angeles, \$9,602.50.

LOS ANGELES COUNTY—City of Los Angeles on Harbor Freeway between Flower Street and Olympic Boulevard, highway lighting and illuminated sign system to be furnished and installed. District VII, Route 165. Electric & Machinery Service, Inc., South Gate, \$81,678; Ets-Hokin & Galvan, Wilmington, \$82,469; C. D. Draucker, Inc., Los Angeles, \$84,455; Fischbach and Moore, Inc., Los Angeles, \$85,353; A. S. Schulman Electric Company, Los Angeles, \$85,626; Newbery Electric Corp., Los Angeles, \$86,213; Ed Seymour, Long Beach, \$86,848. Contract awarded to Westates Electrical Construction Co., Los Angeles, \$80,542.

LOS ANGELES COUNTY—In the City of Los Angeles on Manchester Boulevard between Lincoln Boulevard and near Osage Avenue, about 1.3 miles in net length, roadway intersections to be channelized, reinforced with untreated rock base, and surfaced with plant-mixed surfacing. District VII, Routes 174, 60, 158. Schroeder & Company, Sun Valley, \$72,919; George Savala Paving Co., Inc., Hawthorne, \$74,458; C. O. Sparks, Inc., and Mundo Engineering Co., Los Angeles, \$74,671; Warren Southwest, Inc., Torrance, \$75,519. Contract awarded to Jesse S. Smith, Glendale, \$62,092.50.

LOS ANGELES AND VENTURA COUNTIES—At the intersections of Ventura Boulevard with Lewis Road and in the City of Oxnard, Oxnard Boulevard with First Street, Colonia Road, Deodar Avenue and Palm Drive, traffic signal and highway lighting systems to be furnished and installed and channelization to be constructed. District VII, Routes 2, 60. C. D. Draucker, Inc., Los Angeles, \$17,438; Westates Electrical Construction Co., Los Angeles, \$17,563; Drury Electric Co., San Bernardino, \$17,704; Fischbach and Moore, Inc., Los Angeles, \$17,918. Contract awarded to Electric and Machinery Service, Inc., South Gate, \$16,905.50.

MADERA COUNTY—Between 2.6 miles north of Fresno county line and Califa, about 11 miles in net length, roadside areas to be prepared and planted. District VI, Route 4, Sections A,B,C. Diabolo View Gardens, Antioch, \$15,080; Huettig, Schromm & Bennett, Inc., Palo Alto, \$22,026; Watkins & Sibbald, San Anselmo, \$24,247; Justice-Dunn Co., Oakland, \$26,431. Contract awarded to Oliver's Nursery, Fresno, \$13,230.10.

MENDOCINO COUNTY—At Big Gulch, about 13 miles south of Point Arena, about 1.1 miles to be graded and surfaced with road-mixed surfacing on cement treated base and an arch culvert to be constructed. District I, Route 56, Section A. Arthur B. Siri, Inc., Santa Rosa, \$151,300; Transocean Engineering Corp., Hayward, \$179,270; Huntington Bros., Napa, \$180,959; Eaton and Smith, San Francisco, \$218,414; Nomellini Construction Co., Stockton, \$230,958. Contract awarded to Claude C. Wood Co., Lodi, \$139,964.30.

MERCED COUNTY—Portions between 10 miles west of Merced and Merced, about 3.9 miles to be widened and resurfaced with plant-mixed surfacing and untreated rock base, two reinforced concrete bridges to be widened and one reinforced concrete bridge to be constructed. District X, Route 122, Section B. Granite Construction Co., Watsonville, \$329,469; Volpa Brothers, Fresno, \$344,707; Norman I. Fadel, North Hollywood, \$402,270. Contract awarded to M. J. Ruddy & Son, Modesto, \$300,754.

MONTEREY COUNTY—Between 2 miles north of Gonzales and Chualar, about 3.8 miles to be graded and paved with Portland cement concrete on cement treated subgrade. District V, Route 2, Sections C,B. Clyde W. Wood & Sons, Inc., North Hollywood, \$525,561; Gordon H. Ball and San Ramon Valley Land Co., Berkeley, \$528,597; Ukropina, Polich, Kral and John R. Ukropina, San Gabriel, \$556,389; Fredrickson & Watson Construction Co., Oakland, \$581,029. Contract awarded to Granite Construction Co., Watsonville, \$499,353.50.

RIVERSIDE COUNTY—In the City of Beaumont, at the intersections of Sixth Street with California Avenue-Grace Avenue and with Beaumont Avenue, traffic signal systems and highway lighting to be installed. District VIII, Route 26. Drury Electric Co., San Bernardino, \$25,387; Electric and Machinery Service, Inc., South Gate, \$27,514. Contract awarded to Fischbach and Moore, Inc., Los Angeles, \$24,385.

RIVERSIDE COUNTY—In the City of Perris on D Street between Fourth Street and 0.2 mile north of San Jacinto Avenue, about 0.5 mile to be resurfaced with plant-mixed surfacing. District VIII, Route 78. E. L. Yeager Co., Riverside, \$8,790; R. A. Erwin, Colton, \$9,240. Contract awarded to Geo. Herz & Co., San Bernardino, \$8,235.

SAN BERNARDINO COUNTY—In and adjacent to the Cities of Upland and Ontario, between Central Avenue and Archibald Avenue, highway lighting and illuminated sign systems to be furnished and installed. District VIII, Route 26. Drury Electric Co., San Bernardino, \$68,208; C. D. Draucker, Inc., Los Angeles, \$69,465; Ets Hokin & Galvan, Wilmington, \$69,900; Fischbach and Moore, Inc., Los Angeles, \$71,653; Westates Electrical Construction Co., Los Angeles, \$72,026. Contract awarded to Paul R. Gardner, Ontario, \$67,876.

SAN DIEGO COUNTY—Between the international border and 0.3 mile south of Nestor, about 3.9 miles to be graded and surfaced with plant-mixed surfacing on cement treated base and two reinforced concrete bridges to be constructed, to provide a four-lane divided freeway. District XI, Route 2, Section G. Griffith Company, Los Angeles, \$1,110,216; R. R. Hensler, Sun Valley, \$1,110,912; M. H. Golden Construction Co., San Diego, \$1,146,489; Cox Bros. Construction Co., Stanton, \$1,172,018; Webb &

White, Los Angeles, \$1,211,355; J. A. Thompson & Son, Inglewood, \$1,235,404; Winston Bros. Company, Monrovia, \$1,240,329; Peter Kiewit Sons' Co., Arcadia, \$1,273,297; E. T. Haas Co., Belmont, \$1,281,333; Frederickson & Kasler, Sacramento, \$1,346,635; Daley Corp., San Diego, \$1,450,007. Contract awarded to J. A. Payton, Riverside, \$1,094,357.

SAN DIEGO COUNTY—Between 0.3 mile west of Palomar Mountain Road and northeast boundary of Rancho Cuca, about 1.9 miles in length to be graded and bituminous surface treatment applied thereto. District XI, Route 195, Section D. E. L. Yeager Co., Riverside, \$197,800; L. C. Anderson Co. and E. Paul Ford Co., San Diego, \$199,557; Einer Bros., Inc., Escondido, \$208,885; Clyde W. Wood & Sons, Inc., North Hollywood, \$218,338; Chas. J. Rounds Co., Los Angeles, \$237,089; Ralph B. Slaughter, Julian, \$250,626; Cox Bros. Construction Co., Stanton, \$255,298; Matich Bros., Colton, \$280,265; Ralph A. Bell, San Marino, \$280,762; Webb & White, Los Angeles, \$293,721; Norman I. Fadel, North Hollywood, \$333,814. Contract awarded to Arthur B. Johnson, Laguna Beach, \$179,263.

SAN DIEGO COUNTY—Between Barrett Junction and 1.9 miles east, about 1.9 miles to be graded and bituminous surface treatment applied, and a reinforced concrete bridge to be constructed. District XI, Route 200, Section C. Ball and Simpson, Berkeley, \$433,732; Clyde W. Wood & Sons, Inc., North Hollywood, \$441,902; Hess Construction Co., Inc., Long Beach, \$476,124; W. F. Maxwell and C. G. Willis & Sons, Inc., Los Angeles, \$480,727; E. C. Young & Service Construction Co. of Southern California, Sun Valley, \$491,598; James E. Roberts, San Bernardino, \$517,169; Walter H. Barber, La Mesa, \$527,853; Cox Bros. Construction Co., Stanton, \$537,030; Ralph A. Bell, San Marino, \$555,384; Webb & White, Los Angeles, \$561,106; Contract awarded to L. C. Anderson Co. and E. Paul Ford Co., San Diego, \$386,499.40.

SAN FRANCISCO COUNTY—Between Eighth Street and Fourth Street, a portion of a bridge and miscellaneous road work to be constructed. District IV, Route 68. Rothschild, Raffin & Weirick & Pacific Bridge Co., San Francisco, \$3,708,891; Guy F. Atkinson Co., South San Francisco, \$3,768,893; Peter Kiewit Sons' Co., San Francisco, \$3,781,337; Fredrickson & Watson Construction Co., M & K Corp., Oakland, \$3,810,547; A. Teichert & Son, Inc., Sacramento, \$3,914,099; Ukropina, Polich, Kral and John R. Ukropina, San Gabriel, \$3,918,187; Winston Bros. Co., Monrovia, \$3,919,455; Stolte, Inc. and The Duncanson-Harrelson Co., Oakland, \$3,978,104; Granite Construction Co., Watsonville, \$3,981,690; Contract awarded to Chas. L. Harney, Inc., San Francisco, \$3,680,237.

SAN JOAQUIN COUNTY—About 0.1 mile southerly of intersection of Bird and Linne Roads, at Siphon Curve, about 0.5 mile to be graded and surfaced with plant-mixed surfacing on untreated rock base. District X, Route 41, Section A. M. J. Ruddy & Son, Modesto, \$85,631; Browne & Krull, Hayward, \$88,151; O. C. Jones & Sons, Berkeley, \$88,478; A. Teichert & Son, Inc., Sacramento, \$88,518; Stanfield & Moody, Tracy, \$90,247; Claude C. Wood Co., Lodi, \$91,095; Friant Construction Co., Fresno, \$92,521; S. M. McGaw Co., Inc., Stockton, \$94,844; Nomellini Construction Co., Stockton, \$106,444; Ace Excavators, Oakland, \$136,095. Contract awarded to Stephens Trucking Co., French Camp, \$84,106.25.

SAN LUIS OBISPO COUNTY—Between Huer Huero Creek and one mile west of Estrella River about 3 miles east of Paso Robles, about 7.3 miles to be graded and paved with plant-mixed surfacing on imported base material and cement treated base and two reinforced concrete bridges to be constructed. District V, Route 33, Section A. Frederickson & Kasler, Sacramento, \$771,796; Stolte, Inc., and Stephens Trucking Co., Oakland, \$804,475; Granite Construction Co., Watsonville, \$808,428; Fredrickson & Watson Construction Co., Oakland, \$817,038; Griffith Co., Los Angeles, \$839,742; L. C. Smith Co., San Mateo, \$841,855; J. A. Thompson & Son, Inglewood, \$855,126; Clyde W. Wood & Sons, Inc., North Hollywood, \$877,419; A. Teichert & Son, Inc., Sacramento, \$892,774; R. R. Hensler, Sun Valley, \$899,679; John Delphia, Patterson, \$907,093; Gordon H. Ball and San Ramon Valley Land Co., Berkeley, \$910,561; Guy F. Atkinson Co., South San Francisco, \$911,691; McCammon-Wunderlich Co., Palo

Alto, \$914,535; G. W. Ellis Construction Co. and L. A. & R. S. Crow, North Hollywood, \$925,478; Eaton & Smith, San Francisco, \$954,550; J. E. Had-dock, Ltd., Pasadena, \$969,160; M. J. B. Construction Co. and M. J. Ruddy & Son, Stockton, \$990,591; D & H Construction Co. and M. H. Hasler Construction Co., Sacramento, \$1,197,730. Contract awarded to Madonna Construction Co., San Luis Obispo, \$695,878.40.

SANTA BARBARA COUNTY—In the City of Santa Barbara, between Park Place and Rancheria Street, about 2.2 miles of roadside areas to be prepared and planted, sprinkler system to be modified and areas to be surfaced with plant-mixed surfacing and Portland cement concrete. District V, Route 2. Stephen L. Vistica, San Mateo, \$61,517; Henry C. Soto Corp., Los Angeles, \$66,400; Justice-Dunn Co., Oakland, \$70,056; James E. Boothe, Compton, \$73,647; Huettig, Schromm & Bennett, Inc., Palo Alto, \$73,965; Jannoch Nurseries, Altadena, \$81,335. Contract awarded to Watkin & Sibbald, San Anselmo, \$60,726.94.

SANTA CLARA COUNTY—City of Santa Clara, at the intersection of El Camino Real with Gould Street-Scott Lane, traffic signal system and highway lighting to be furnished and installed and intersection improvement to be constructed. District IV, Route 2. O. C. Jones & Sons, Berkeley, \$20,554; A. J. Raich Paving Co., San Jose, \$21,360; J. Henry Harris, Berkeley, \$21,400; J. C. Bateman, Inc., San Jose, \$25,887. Contract awarded to Howard Electric Co., Gilroy, \$19,223.50.

SANTA CLARA COUNTY—1.2 miles westerly of Saratoga, existing concrete structures to be removed and metal bin-type retaining wall and roadway shoulder to be constructed. District IV, Route 42, Section A. Granite Construction Co., Watsonville, \$17,478; Lew Jones Construction Co., San Jose, \$19,336; J. Henry Harris, Berkeley, \$20,455; Flora Crane Service, San Francisco, \$23,691. Contract awarded to O. C. Jones & Sons, Berkeley, \$15,919.75.

SOLANO COUNTY—Between 0.7 mile and 0.9 mile east of Ulatis Creek near Vacaville, frontage road to be graded and paved with plant-mixed surfacing. District X, Route 7, Section D. A. Teichert & Son, Inc., Sacramento, \$18,732; Harms Bros., Sacramento, \$19,412; O. C. Jones & Sons, Berkeley, \$20,087; J. Henry Harris, Berkeley, \$22,790. Contract awarded to Fredrickson Bros., Emeryville, \$17,788.

SOLANO COUNTY—At two locations about 3 miles west of Cordelia Underpass and about 2.4 miles west of Cordelia Underpass, about 3,065 lineal feet of metal plate guard railing to be constructed in the median strip. District X, Route 7, Section H. Al Erickson & Co., Napa, \$11,187; Geo. Pollock Co., Sacramento, \$11,861; Charles S. Moore, San Jose, \$12,106; Bos Construction Co., Berkeley, \$12,934. Contract awarded to Wulfert Co., San Leandro, \$9,149.

SOLANO COUNTY—Between Vallejo and Benicia (portions), about 0.5 mile of highway shoulders to be reconstructed. District X, Route 74, Section B. Ben. J. Henry Harris, Berkeley, \$12,423; Contract awarded to O. C. Jones & Sons, Berkeley, \$9,438.50.

STANISLAUS COUNTY—At Modesto Irrigation District Main Canal Bridge, about 0.8 mile north of junction with State Route 109, existing bridge to be replaced with reinforced concrete pipe and roadbed resurfaced with plant-mixed surfacing on untreated rock base. District X, Route 13, Section A. M. J. Ruddy & Son, Modesto, \$22,046; H. H. Anderson, Hayward, \$22,222; Standard Materials, Inc., Modesto, \$22,701; M. W. McLam, Merced, \$26,427; Alpine Construction Co., Inc., Oakland, \$28,251. Contract awarded to Friant Construction Co., Fresno, \$21,604.

TEHAMA COUNTY—Across various streams between Corning and the south county boundary, nine existing reinforced concrete bridges to be widened. District II, Route 7. R. G. Clifford and C. O. Bodenhamer, Berkeley, \$154,548; A. A. Edmondson, Butte City, \$159,680; James H. McFarland, San Francisco, \$165,771; Bishop, Younger, Bradley Co., San Francisco, \$170,006; O'Connor Bros., Red Bluff, \$171,565; Nomellini Construction Co., Stockton, \$173,278; Bos Construction Co., Berkeley, \$178,231; Tumbler Co., Bakersfield, \$180,661; Norman I. Fadel, North Hollywood, \$230,125; Underground

Construction Co., Oakland, \$236,181; Charles MacClosky Co., San Francisco, \$264,818. Contract awarded to Ruby Construction Co., Inc., and H. W. Ruby, Sacramento, \$139,963.50.

TULARE COUNTY—Between Ash Avenue near Tulare and Route 132, about one mile to be graded and surfaced with plant-mixed surfacing on cement treated base. District VI, Route 134, Section B. Baun Construction Co., Fresno, \$191,012; Guy F. Atkinson Co., South San Francisco, \$199,848; Gordon H. Ball and San Ramon Valley Land Co., Berkeley, \$208,112; Stephens Trucking Co., French Camp, \$213,904; Rice Bros., Inc., Marysville, \$214,524. Contract awarded to Thomas Construction Co., Fresno, \$183,465.50.

F. A. S. County Routes

FRESNO AND KINGS COUNTIES—Across Kings River, Clark's Fork of Kings River, and Kings River Overflow, near Hanford, three reinforced concrete bridges to be constructed. District VI, Routes 820, 940, 568. C. K. Moseman, Redwood City, \$127,397; Gene Richards, Inc., Fresno, \$127,543; Thomas Construction Co., Fresno, \$129,921; C. B. Tuttle, Long Beach, \$129,973; Norman I. Fadel, North Hollywood, \$133,955; Bishop Younger Bradley Co., San Francisco, \$134,005; S & Q Construction Co. and Rayor Construction Co., South San Francisco, \$134,819; G. M. Carr Co. and Bati Rocca, Santa Rosa, \$135,498; O. B. Pierson, Bellflower, \$139,331; Sooy & Jackson & Marks Bros. Construction Co., Redlands, \$142,114; Trewhitt-Shields & Fisher, Fresno, \$143,715; Bos Construction Co., Berkeley, \$166,470; Sharp & Fellows Contracting Co., Los Angeles, \$166,959. Contract awarded to Gordon H. Ball and San Ramon Valley Land Co., Berkeley, \$124,350.

KERN COUNTY—On Stockdale Road, between Oak Street and Allen Road, about 6.1 miles, to be graded and surfaced with plant-mixed surfacing on cement treated base. District VI, Route 575. Dicco, Inc., Bakersfield, \$126,129; Stephens Trucking Co., French Camp, \$144,211. Contract awarded to Griffith Company, Los Angeles, \$112,405.15.

MODOC COUNTY—Across five canals near Stronghold, five concrete slab bridges to be constructed. District II, Route 1192. James B. Allen, San Carlos, \$63,279; James H. McFarland, San Francisco, \$65,338; Al Erickson & Co., Napa, \$67,073. Contract awarded to A. A. Edmondson, Butte City, \$50,968.20.

TULARE COUNTY—At various locations between about 3.4 miles north and 0.7 mile west of Farmersville, three reinforced concrete bridges and one reinforced concrete culvert to be constructed. District VI, Routes 1136 and 1143. W. M. Lyles Co., Avenal, \$80,794; Thomas Construction Co., Fresno, \$82,973; C. B. Tuttle, Long Beach, \$88,434; Monterey Construction Co., El Monte, \$88,818; Tumblin Company, Bakersfield, \$88,895; Alpine Construction Co., Inc., Oakland, \$102,846. Contract awarded to Rice Brothers, Inc., Marysville, \$77,893.40.

November, 1953

ALAMEDA COUNTY—Between Ashby Avenue and El Cerrito Overhead, about 3 miles to be graded and paved with portland cement concrete on cement-treated subgrade and separation structures to be constructed. District IV, Routes 69, 206. Frederickson & Watson Construction Co. M & K Corp., Oakland, \$4,640,170; A. Teichert & Son, Inc., Sacramento, \$4,679,778; Chas. L. Harney, Inc., San Francisco, (a) \$4,781,887; (b) \$5,220,607; Ukropina, Polich, Kral & John R. Ukropina, San Gabriel, \$4,836,134; Guy F. Atkinson Co., South San Francisco, \$4,870,218; MacDonald, Young, & Nelson, Inc. and Morrison, Knudsen Co., Inc., San Francisco, \$5,172,609; Construction Aggregates Corp., San Francisco, \$5,466,479. Contract awarded to Peter Kiewit Sons Co., San Francisco, \$4,387,474.50.

ALAMEDA COUNTY—On Mattox Road between East 14th Street and 300 feet east of Oak Street, about 0.4 mile to be widened and resurfaced with plant-mixed surfacing. District IV, Route 228, Section A. Independent Construction Co., Oakland, \$20,996; O. C. Jones & Sons, Berkeley, \$21,023;

J. Henry Harris, Berkeley, \$25,092; Clements Construction Co., Hayward, \$25,189; McGuire & Hester, Oakland, \$28,397; John A. Carstensen, Castro Valley, \$29,645; Silva Bros., Hayward, \$30,195. Contract awarded to Lee J. Immel, San Pablo, \$19,912.50.

HUMBOLDT COUNTY—At intersection of Routes 1 and 56 at Fernbridge, about 0.3 mile to be widened and resurfaced. District I, Route 1, Section G. Fredrickson Bros., Emeryville, \$19,935. Contract awarded to Mercer, Fraser Co. & Mercer, Fraser Gas Co., Inc., Eureka, \$19,200.

HUMBOLDT COUNTY—In Whittmore Grove State Park, between South Fork Eel River Bridge and west park boundary, about 0.7 mile to be graded and surfaced. District I. John Burman & Sons, Eureka, \$44,750; Humboldt Constructors, Inc., Eureka, \$50,528; J. Henry Harris, Berkeley, \$67,896. Contract awarded to Paul E. Woof, Fresno, \$35,928.

IMPERIAL COUNTY—Between east city limits of El Centro and 0.3 mile east of State Route 201, about 2.4 miles, roadbed to be graded and surfaced with plant-mixed surfacing on cement treated base. District XI, Route 27, Section C. Peter Kiewit Sons Co., Arcadia, \$329,706; R. R. Hensler, Sun Valley, \$356,671; James E. Roberts, San Bernardino, \$358,263; Ralph B. Slaughter, Julian, \$364,431; G. W. Ellis Construction Co., North Hollywood, \$367,601; Clyde W. Wood & Sons, Inc., North Hollywood, \$367,953; Cox Bros. Construction Co., Stanton, \$389,845. Contract awarded to Basich Bros. Construction Co., R. L. and N. L. Basich, South San Gabriel, \$324,485.75.

LASSEN COUNTY—Between Secret Valley and 4.7 miles north, about 4.7 miles to be graded and surfaced with road-mixed surfacing on untreated rock base. District II, Route 73, Section D. Eaton & Smith, San Francisco, \$514,379; T. E. Connolly, Inc., San Francisco, \$533,090; A. Teichert & Son, Inc., Sacramento, \$587,761; H. Earl Parker, Inc., Marysville, \$591,495; M. Malitano & Son, Inc., Pittsburg, \$611,519; Fredrickson & Watson Construction Co., Oakland, \$624,453. Contract awarded to Harms Bros., Sacramento, \$491,161.50.

MONTEREY COUNTY—About 0.2 mile west of Bradley, existing reinforced concrete bridge to be widened and about 0.6 mile of approaches to be graded and surfaced with plant-mixed surfacing on cement-treated base. District V, Route 2, Section I. Thomas Construction Co., Fresno, \$104,401; Norman I. Fadel, North Hollywood, \$113,965; Granite Construction Co., Watsonville, \$130,051. Contract awarded to Bos Construction Co., Berkeley, \$87,769.

MONTEREY COUNTY—Between 0.1 mile north of Seaside Junction and Prattco Siding, south bound roadway of four-lane highway to be graded and surfaced. District V, Route 56, Section I. J. Henry Harris, Berkeley, \$39,246. Contract awarded to Granite Construction Co., Watsonville, \$29,817.20.

MARIN AND SONOMA COUNTIES—Between Ignacio and 1.5 miles south of Petaluma, chain link fences and concrete curbs to be constructed. District IV, Route 1, Sections A, C. Baldwin Contracting Co., Inc., San Rafael, \$8,175; Bos Construction Co., Berkeley, \$8,281; Charles S. Moore, San Jose, \$8,670; Wulfert Co., San Leandro, \$9,476; Watkins & Sibbald, San Anselmo, \$9,533; Underground Construction Co., Oakland, \$9,960; Crocco & Hanson, Vallejo, \$12,299. Contract awarded to J. Henry Harris, \$7,617.65.

MARIPOSA COUNTY—Between 0.2 mile south of King Solomon Mine and Brieberg, about 2.5 miles to be graded and surfaced with plant-mixed surfacing on untreated rock base. District X, Route 18, Section E. Ball & Simpson, Berkeley, \$575,683; Eaton & Smith, San Francisco, \$611,607; H. Earl Parker, Inc., Marysville, \$644,762; Piombo Construction Co., San Francisco, \$691,956. Contract awarded to Harms Bros., Sacramento, \$570,614.

SAN BERNARDINO COUNTY—Across Blossom Ditch, about 13 miles east of Barstow, a reinforced concrete bridge to be constructed. District VIII, Route 58, Section F. C. B. Tuttle, Long Beach, \$8,812; Tumblin Co., Bakersfield, \$9,430; Norman I. Fadel, North Hollywood, \$9,571; Monterey Construction Co., El Monte, \$10,113; E. F. Grandy, Laguna Beach, \$10,140; Albert S. Pratt, Jr., Pasadena, \$11,428; Fred D. Kyle, Pasadena, \$11,504; Lloyd R. Johnson, Rialto, \$11,648; Trott & Kinggaard, Inc., Solano Beach, \$11,982; Hubbs Equipment Co., Colton, \$12,572; Gerstenberger and Pierson, Los Angeles, \$12,755; Kast Construction Co., Inc., Manhattan Beach, \$13,357; Ruane Corp., San Gabriel, \$13,500; Owl Truck & Construction Co., Compton, \$15,516; E. L. Yeager Co., Riverside, \$15,526; Ragenovich Construction Co., Los Angeles, \$18,031. Contract awarded to Louis J. Strona, Pomona, \$8,809.89.

SAN DIEGO COUNTY—Construction of drainage facilities between Laurel Street and San Diego River channel at Lakeside. District XI, Route 198, Section B. Sim J. Harris Co., San Diego, \$3,348. Contract awarded to R. E. Hazard Contracting Company, San Diego, \$3,870.85.

SAN DIEGO COUNTY—Between 5.6 miles and 3.6 miles west of Ramona, at east limits of Ramona and at Sutherland Dam Road, a net length of 1.7 miles to be graded and bituminous surface treatment to be applied and cut slopes to be excavated at Sutherland Dam Road. District XI, Route 198, Sections H & D. Robert E. L. Parker Company, Claremont, \$113,488; Norman I. Fadel, North Hollywood, \$116,930; James E. Roberts, San Bernardino, \$126,553; Ralph B. Slaughter, Julian, \$130,962. Contract awarded to Einer Bros., Inc., Escondido, \$102,752.55.

SAN LUIS OBISPO COUNTY—In the City of San Luis Obispo at the intersection of Santa Rosa Street with Foothill Boulevard, traffic signal system and highway lighting to be furnished and installed. District V, Route 56. Electric & Machinery Service, Inc., South Gate, \$14,385; Collins Electrical Co., Inc., Stockton, \$14,470; A. R. Ochs, San Luis Obispo, \$14,950; L. H. Leonardi Electric Construction Co., San Rafael, \$16,754. Contract awarded to Ed. H. Anderson, Santa Maria, \$12,181.

SAN LUIS OBISPO COUNTY—Between Route 56 near Morro Bay and 2.6 miles east, about 2.6 miles to be graded, imported subbase and base material to be placed and bituminous surface treatment to be applied. District V, Route 125, Section A. Madonna Construction Co., San Luis Obispo, \$132,160; Paul E. Woof, Fresno, \$135,055; Clyde W. Wood and Sons, Inc., North Hollywood, \$135,537; Granite Construction Co., Watsonville, \$139,923; Brown & Krull, Hayward, \$142,410; A. G. Raisch Co., San Rafael, \$159,613. Contract awarded to Valley Paving Company, Pismo Beach, \$113,274.

STANISLAUS COUNTY—Between Empire and Waterford, about 7.6 miles to be widened and resurfaced with plant-mixed surfacing. District X, Route 110, Section C. Ralph B. Slaughter, Julian, \$103,610; Ukropina, Polich, Kral and John R. Ukropina, San Gabriel, \$108,940. Contract awarded to M. J. Ruddy & Son, Modesto, \$91,551.

TULARE COUNTY—Across Kaweah River, about 4.6 miles east of Woodlake, about 0.4 mile in length, new bridge to be constructed and approaches to be graded and surfaced with plant-mixed surfacing on untreated rock base. District VI, Route 131, Section C. O. B. Pierson, Bellflower, \$153,766; Norman I. Fadel, North Hollywood, \$167,592; Thomas Construction Co., Fresno, \$167,761; C. B. Tuttle, Long Beach, \$170,253; Gordon H. Ball and San Ramon Valley Land Co., Berkeley, \$176,209; Sharp & Fellows Contracting Co., Los Angeles, \$181,006; Trewhitt-Shields & Fisher, Fresno, \$185,289; Charles MacClosky Co., San Francisco, \$214,331; Sooy & Jackson & Marks Bros. Construction Co., Redlands, \$4,700,463,463 [amount OK]. Contract awarded to W. F. Maxwell, Los Angeles, \$142,521.

VENTURA COUNTY—Between Station 312 and Station 340, near Moorpark, four corrugated metal pipe culverts to be furnished and installed. District VII, Route 155, Section B. Union Construction Co., Inc., Ventura, \$2,967; D. E. Higday, Temple City, \$3,582; Jesse S. Smith, Glendale, \$4,273; N. M. Saliba Company, Los Angeles, \$5,226. Contract awarded to Daniel W. Thaxton, Oxnard, \$2,815.

F. A. S. County Routes

CONTRA COSTA COUNTY—Alhambra Avenue Extension and Pleasant Hill Road, between State Route 106 and 2.6 miles south, about 2.6 miles to

be graded and surfaced with plant-mixed surfacing on crusher run base. District IV, Route 796. Fredrickson & Watson Construction Co., M & K Corp., Oakland, \$329,080; Stephens Trucking Co., French Camp, \$332,406; Gallagher & Burk, Inc., Oakland, \$333,971; McGuire & Hester, Oakland, \$343,978; Fredrickson Bros., Emeryville, \$345,607; J. R. Armstrong, El Cerrito, \$347,451; O. C. Jones & Son, Berkeley, \$347,726; Gordon H. Ball & San Ramon Valley Land Co., Berkeley, \$349,573; Lee J. Immel, San Pablo, \$361,399; Vega Engineering and Grading Co., Berkeley, \$372,033. Contract awarded to Eugene G. Alves Construction Co., Inc., Pittsburg, \$308,357.50.

FRESNO COUNTY—On Clovis Avenue between State Route 4 and Columbia Avenue, about 5.3 miles to be graded and surfaced with plant-mixed surfacing on cement-treated base. District VI, Route 814. Stewart & Nuss, Fresno, \$195,493; Gene Richards, Inc., Fresno, \$199,487; Volpa Bros., Fresno, \$208,176; Baun Construction Co., Fresno, \$217,834; Clements Construction Co., Hayward, \$221,582; G. W. Ellis Construction Co., North Hollywood, \$227,288; M. J. Ruddy & Son, Modesto, \$231,653; Harms Bros., Sacramento, \$245,469; Gordon H. Ball & San Ramon Valley Land Co., Berkeley, \$267,735; A. G. Raisch Co., San Rafael, \$270,124. Contract awarded to Rice Brothers, Inc., Marysville, \$195,104.64.

HUMBOLDT COUNTY—Across Martin's Slough, about four miles south of Eureka, a reinforced concrete bridge to be widened. District I, Route 970. Contract awarded to James H. McFarland, San Francisco, \$19,412.

LOS ANGELES COUNTY—On Slauson Avenue between Telegraph Road and Rosemead Boulevard, about 1.1 miles to be graded and paved with asphalt concrete on untreated rock surfacing and base and a reinforced concrete bridge to be constructed. District VII, Route 844. J. A. Thompson & Son, Inglewood, \$481,107; Ukropina, Polich & Kral, and John R. Ukropina, San Gabriel, \$483,106; W. F. Maxwell, Los Angeles, \$502,123; Tom E. Norcross, Rex W. Murphy & Boddum Construction, Long Beach, \$512,410; O. B. Pierson, Bellflower, \$513,135; Griffith Company, Los Angeles, \$516,144; Byerts & Sons, and Geo. K. Thatcher, Los Angeles, \$531,690; Norman I. Fadel, North Hollywood, \$535,687; George W. Peterson and Jack W. Baker, Los Angeles, \$538,440; A. Teichert & Son, Inc., Baldwin Park, \$542,493; Charles MacCloskey Company, San Francisco, \$544,352; J. E. Haddock, Ltd., Pasadena, \$544,407; John Strona, Pomona, \$548,265; Guy F. Atkinson Company, Long Beach, \$582,341; Dragline Rentals Co., Long Beach, \$583,417. Contract awarded to Webb & White, Los Angeles, \$478,074.04.

MADERA COUNTY—Across Ash Slough, about 3 miles west of Chowchilla, a reinforced concrete slab bridge to be constructed. District VI, Route 1197. Charles S. Moore, San Jose, \$53,428; Friant Construction Co., Fresno, \$53,720; Gene Richards, Inc., Fresno, \$53,949; Monterey Construction Co., El Monte, \$54,248; James H. McFarland, San Francisco, \$54,678; C. B. Tuttle, Long Beach, \$54,962; Lew Jones Construction Co., San Jose, \$55,650; W. F. Maxwell, Los Angeles, \$56,910; Norman I. Fadel, North Hollywood, \$57,430; Al Erickson & Co., Napa, \$62,380; Nomellini Construction Co., Stockton, \$64,560; Trehitt-Shields & Fisher, Fresno, \$65,257. Contract awarded to G. M. Carr Co. & Bati Rocca, Santa Rosa, \$52,875.

SAN DIEGO COUNTY—On Mission Gorge Road, between Powers Street and Twain Avenue, and between north end of Mission Gorge and Woodside Avenue in Fanito Rancho, about 1.3 miles in length to be graded and surfaced with plant-mixed surfacing on imported base material. District XI, Route 731. Sim J. Harris Company, San Diego, \$145,547; Einer Brothers, Inc., Escondido, \$149,042; Daley Corp., San Diego, \$152,352; R. E. Hazard Contracting Co., San Diego, \$161,879. Contract awarded to V. R. Dennis Construction Co., San Diego, \$133,884.60.

SHASTA COUNTY—Between 0.2 mile south of Palo Cedro and Bella Vista about 5.9 miles to be graded and surfaced with plant-mixed surfacing on imported base material. District II, Route 1073. Harms Bros., Sacramento, \$290,693; Close Building Supply Inc., Hayward, \$322,922; A. Teichert & Son, Inc., Sacramento, \$323,570; Transocean Engineering Corp., Hayward, \$325,609; Ransome Co.,

Tunnel Illumination

Continued from page 37 . . .

additional rows of fluorescent fixtures extending from the entering portal to a point approximately 150 feet within the tunnel.

Daytime Lighting

Since the Gaviota Gorge Tunnel is used by northbound traffic only, it was necessary to provide daytime entrance lighting inside the south portal only.

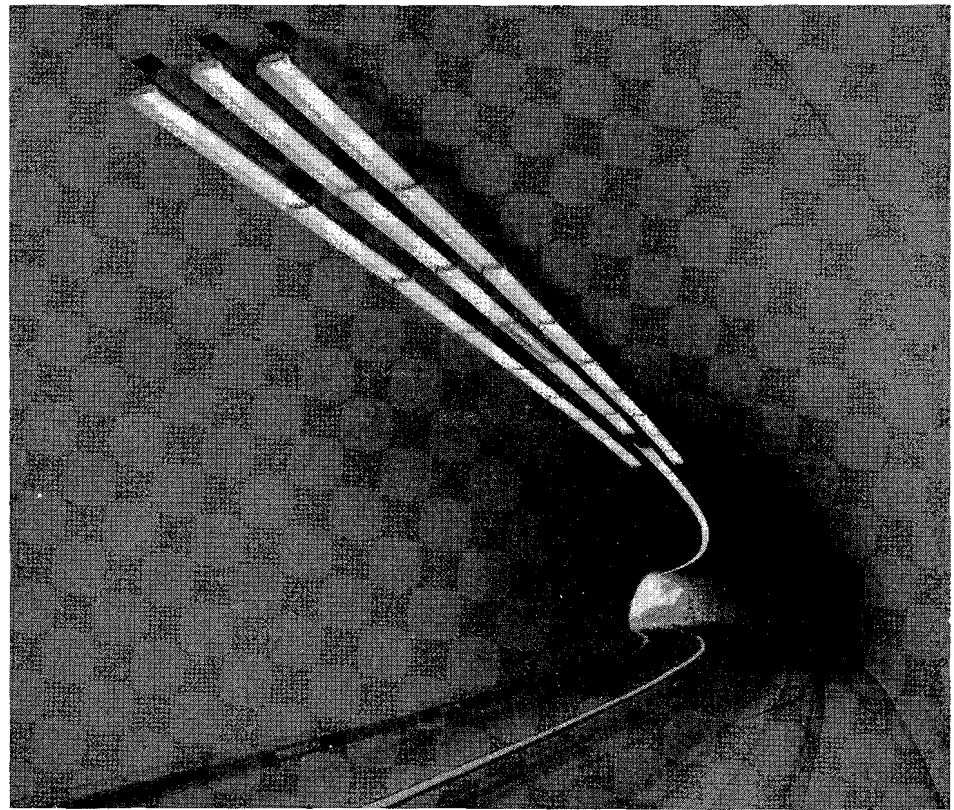
Figure 1 is a curve showing the values of illumination within the tunnel both with natural daylight only

and daylight plus electrical illumination.

At night, a photoelectric control switches off all lamps except one in every third fixture so as to provide a reduction in illumination to a level appropriate for night driving.

Initially, the average illumination at the center of the tunnel was approximately 20 footcandles during the day and 3 footcandles at night. After the tunnel has been in use several months these values will be reduced somewhat by accumulated residue from exhaust gases on the tunnel walls.

Looking north inside Gaviota Gorge tunnel



Emeryville, \$333,149. Contract awarded to Fredrickson & Watson Construction Co., Oakland, \$276,428.11.

VENTURA COUNTY—On Hueneme Road, between State Route 60, about 5 miles east of Port Hueneme and Wood Road, a distance of about 0.8 mile to be surfaced with plant-mixed surfacing on untreated rock base and imported borrow. District VII, Route 867. Dimmitt & Taylor, Monrovia, \$37,678; Griffith Company, Los Angeles, \$40,081; Union Construction Co. of Calif., Inc., Ventura, \$42,470.

Contract awarded to Baker and Pollock, Ventura, \$34,730.

VENTURA COUNTY—On Santa Clara Avenue, between Central Avenue and State Highway Route 9, a length of about 1.5 miles to be graded and surfaced with plant-mixed surfacing on untreated rock base. District VII, Route 871. Griffith Company, Los Angeles, \$76,002; Robert E. L. Parker Company, Claremont, \$80,141; Union Construction Co. of Calif., Inc., Ventura, \$87,271; Dimmitt & Taylor, Monrovia, \$88,663. Contract awarded to Baker and Pollock, Ventura, \$67,680.50.

Retirements *from* Service

Milo E. Eidson

ON OCTOBER 3, 1953, Milo E. Eidson retired from the Division of Highways after completing more than 25 years of service, most of which was spent in District VII as a surveyor and engineer. He entered state service on August 2, 1928.

Milo was born on December 28, 1890, in Berthoud, Colorado. His early years were spent on his father's ranch. He was educated in the Colorado public schools and in later years he increased his engineering knowledge by studying night school and correspondence courses.

From 1912 to 1914 he worked as an engineer for the Greeley-Poudre Irrigation District in Greeley, Colorado. In 1915 he spent a short time as an engineer for the Engineers Construction Corporation, also in Greeley. He moved to Denver where he worked for the Denver Tramway Company

... Continued on page 61

Banquet for Honored Guests

John B. Davidson, Highway Superintendent, and Milo E. Eidson, Junior Civil Engineer, were honored by fellow employees, associates, and friends attending a banquet at Knotts Berry Farm, October 23d. A group of 175 attended the gay retirement party which was spiced with a liberal amount of good-natured ribbing.

District VII and the Santa Ana territory in particular lost two of its most valuable employees. This was evidenced by tributes paid each of them in a talk by Assistant District Engineer W. D. Sedgwick.

The program for the evening was presided over by W. L. Fahey, District Engineer, as master of ceremonies. He kept the dinner guests amused and the honored guests squirming with his witticisms and good-natured razzing. He called upon Paul O. Harding, Assistant State

... Continued on page 62

John B. Davidson

AFTER having completed more than 33 years of service with the Division of Highways, John B. Davidson, Superintendent in Santa Ana, retired on November 1, 1953. John was one of the early employees in District II, and also worked for considerable periods in District VII and VIII.

He was born on June 1, 1889, in Goulburn, New South Wales, Australia. His early education was obtained in private schools in Goulburn. He came to this Country with his parents in 1907, and attended Heald's Engineering College in San Francisco for two years. In later years he added to his education by attending various evening schools.

John was first employed by the Division of Highways as a rodman in District II March 20, 1913. In June, 1913, he was promoted to draftsman

... Continued on page 61

LEFT—Paul O. Harding, Assistant State Highway Engineer, right, presents Milo E. Eidson with a 25-year service pin. RIGHT—John B. Davidson receives retirement scroll from District Engineer W. L. Fahey.



MILO E. EIDSON

Continued from page 60 . . .

from 1915 to 1917. In 1918 he was employed as assistant hydrographer by the State of Colorado. He returned to the Engineers Construction Corporation in Greeley in 1919, as a field engineer in charge of construction, where he remained until 1926 when this corporation was dissolved. He was employed as assistant engineer for the Iowa State Highway Department in 1926, where he remained for approximately one year. In 1927 he moved to Redlands, California, where he worked for the Mountain Water Company, in connection with irrigation pipeline maintenance and repairs.

In 1928 he entered the employ of the State Division of Highways as a rodman on a survey party in District VII. In 1929 he was promoted to instrumentman, and from then until 1936 he worked on various survey parties and construction projects as instrumentman, assistant resident engineer, and chief of party.

When District XI was formed in 1933, he was working in San Diego County and remained with District XI until June, 1934, when he transferred back to District VII.

In 1936 he was promoted to junior highway engineer and worked in the Location Department as an instrument man and chief of party until 1938. He was assigned to the Maintenance Department, with headquarters in Santa Ana, in March, 1938, where he remained as engineering assistant and assistant superintendent until his retirement.

He is highly respected by both his supervisors and fellow employees for his thorough knowledge of the work and his efficiency in getting jobs done. While Milo is a very quiet and retiring person, he is noted for his cheerfulness, sense of humor, and even temper. He will be greatly missed by his friends and associates in Orange County, as well as by the entire District VII staff. However, he will be available to his friends, as he plans to spend considerable time in his wood-working shop and in working around his home.

Clarence F. Woodin

A TESTIMONIAL dinner for Clarence F. Woodin, Assistant Maintenance Engineer of the Division of Highways who retired after 37 years of state service, was held in Sacramento with about 150 friends and colleagues present on November 2d.



CLARENCE F. WOODIN

Although he served in many different capacities in his early career with the Division of Highways, Woodin has specialized in the highway maintenance field since 1931, working out of headquarters office in Sacramento. Since then he has traveled some 40,000 miles a year, coordinating the work of various district maintenance forces all over California.

Born in Alameda, Woodin received his bachelor of science degree in civil engineering at the University of California in 1914. He promptly joined the staff of the Highway Commission as a draftsman in the district office at Willits, later becoming chief draftsman at the Dunsmuir office.

He left state employ for two years beginning in 1925, engaging in school

. . . Continued on page 62

JOHN B. DAVIDSON

Continued from page 60 . . .

and spent a large portion of his time working on U. S. 99 from Dunsmuir to the Oregon border. In January, 1918, he took military leave of absence and spent approximately a year and a half in the U. S. Corps of Engineers with the A. E. F. in France during World War I. He returned to State employment in August, 1919, as a draftsman in District II where he remained until May, 1923. In May of 1923 he resigned to enter private practice as a civil engineer in Los Angeles. He remained in private practice until November, 1930, at which time he rejoined the State Division of Highways as a maintenance foreman in District VIII. In November, 1932, he was promoted to maintenance superintendent, which position he held in District VIII until May, 1941.

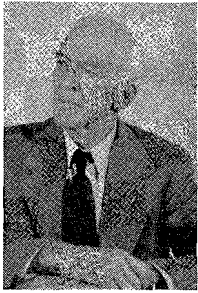
In July, 1939, John took leave of absence to go on a big game hunting expedition in Africa; however, the outbreak of World War II caught him in Paris, and he was unable to continue with his expedition. He returned to work in District VIII in November, 1939. In 1941 he transferred to District VII as the maintenance superintendent in charge of Orange County, with headquarters in Santa Ana. He has remained in this location until his retirement.

His former plans for a big game hunting expedition have not been forgotten and now, in retirement, John plans to spend approximately one year in New Zealand and Australia, under the auspices of the Los Angeles Museum of Natural History, completing its ornithological collection from these two countries. He then plans to spend a year or more on a big game hunting trip through Belgian Congo, Uganda, India, and the Netherlands Indies.

He will be greatly missed by his fellow employees and many friends while he is away, but they are all looking forward to his return so they can view his moving pictures and listen to the stories of his travels.

F. C. Macaulay

ON OCTOBER 31st, Fremont C. (Mac) Macaulay culminated 40 years of continuous State service with the Division of Highways when he retired. For the past 29 years Macaulay has been Highway Maintenance Superintendent in the Redding area for the Division of Highways.



F. C. MACAULAY

Macaulay began his career with the State on November 17, 1913, as a teamster and stake puncher on the first highway location survey between Yreka and the Oregon boundary. The chief of party was the late Spencer W. Lowden and the survey was directed by District Engineer T. A. Bedford and his assistant R. S. Stalnaker. He graduated to chainman in a few months and helped survey several original highway locations in District II. When construction work started in 1914 he was assigned as an engineering aid to this work. Much of the highway construction in early years was performed by State forces under day labor and Mac's duties gradually shifted to that of highway foreman. Among the many construction projects to which he was assigned was the major construction in the Sacramento River Canyon between Pollock and La Moine.

In 1921 he was assigned as Construction Superintendent and subsequently supervised construction of many miles of road in Lassen and Shasta Counties. Included in the project was the construction of the highway over Hatchet Mountain between Montgomery Creek and Burney.

A change of policy in 1924 resulted in the discontinuance of most day labor projects and Mac was assigned to his present position of Maintenance Superintendent of the area between Cottonwood and Pollock and Redding to Adin. Although his territory has changed due to the advent of new roads into the system it has always

CLARENCE F. WOODIN

Continued from page 61 . . .

construction as a contractor, then re-joined the Division of Highways, serving as resident engineer for District III, Sacramento, until December, 1930. Since then he has been an assistant maintenance engineer.

He has served on nation-wide committees in the highway engineering field for the Highway Research Board of the National Academy of Sciences, and for the American Association of State Highway Officials.

Mr. and Mrs. Woodin and their son, James, live at 611 Garden Street, North Sacramento. Two daughters, Mrs. Barbara J. Corning and Mrs. Virginia L. Massey, live in Stockton and in Bellingham, Wash., respectively.

Master of ceremonies at the testimonial dinner was R. M. Gillis, Deputy State Highway Engineer.

included the section over Hatchet Mountain that he constructed in 1922, and this section will probably always be considered as "Mac's road."

Macaulay was born at Oro Fino in Siskiyou County on October 11, 1883. This old gold mining town situated in Scott Valley is now a ghost town. His early childhood was spent in this area and at the age of 16 he moved to Walker on the Klamath River. Prior to his employment with the State he engaged in gold mining and farming along the Klamath River from Happy Camp to Hombrook.

Many friends and coworkers attended a dinner and party at the Redding Golf and Country Club on the evening of November 10th in honor of his retirement.

EDITOR MAY WRITES

OREGON STATE MOTOR ASSOCIATION

Portland 5, Oregon
November 13, 1953

KENNETH C. ADAMS, *Editor*

DEAR MR. ADAMS: The September-October issue of *California Highways and Public Works* has just come across my desk and I just want to take a moment to tell you that it is a splen-

Banquet

Continued from page 60 . . .

Highway Engineer, who responded with a very interesting talk about both honored guests, livened by a clever story aimed at John. Mr. Harding presented Milo with a 25-year service pin and a certificate of service, since just prior to retiring, Milo had completed 25 years.

Milo and John each received a beautifully drawn scroll suitably framed, one side of which expresses the high esteem in which the recipient is held by his fellow employees, the other side bears their signatures.

Continuing the gay atmosphere of the occasion, the present for each man was camouflaged and tagged with humorous appurtenances. John Davidson's wrapped present appeared at first to be a gun, then a telescope, but finally turned out to be a pair of binoculars. Milo Eidson's present was too large to wrap but was liberally tagged with accident reports, sick leave requests, blood stains, and suggestions how to avoid further difficulties with it. After all the attachments were removed, it was revealed to be a table power saw. The two guests of honor then responded with heartfelt speeches of thanks and appreciation.

Bill Axtman, District Maintenance Engineer, Administration, was the official photographer of the occasion and took some excellent photographs of the highlights of the evening. Two sets of these photographs were later bound in photograph albums and each man was presented with a bound set.

did and informative issue. Your photographs as well as the articles are quite remarkable and of interest to the layman as well as to the technical road builder.

The issue is going into our files for reference after we have digested what we need to know for the moment.

With good wishes,

Yours sincerely,

OREGON STATE MOTOR
ASSOCIATION
WALTER W. R. MAY, *Editor*
The Oregon Motorist

N. J. Morrisey Is Named Member of Governor's Cabinet

GOVERNOR KNIGHT's new State Director of Professional and Vocational Standards, N. J. (Nick) Morrisey of Sacramento, on October 29th was administered his oath of office by Secretary of State Frank M. Jordan. Morrisey succeeds James A. Arnerich, resigned. The salary for the position is \$12,000 a year.

Morrisey, 47, has been State Registrar of Contractors since 1950. He has been an employee of the Contractors' State License Board since 1932 when he joined the staff as an investigator. He became deputy registrar in San Francisco in 1939 and was transferred to Sacramento as assistant registrar in 1947.

Knight said that through his long experience he has become an expert in the administration of licensing and regulatory laws. As director of the department of professional and vocational standards, he will supervise 30 state boards and commissions.

Morrisey is a native of San Francisco and attended the University of San Francisco. He resides with his wife and two children at 2749 Eleventh Avenue. He is a member of the Elks, the Knights of Columbus and the Sierra Club.



Secretary of State Frank M. Jordan, left, administers oath of office to N. J. Morrisey

Mineral Show

Continued from page 43 . . .

California Highway Testing Laboratory, and J. B. Nichols, an amateur collector, had such fine collections of rocks that others became interested.

Early records bring back the names of D. Wickham, Clyde Gates and George G. Pomeroy. Among past presidents are: W. R. Lovering of the Division of Highways, J. H. Moon, State Printing Department; O. T. Illerich, Division of Architecture; and Paul Downard of the Department of Institutions. The society president for 1953 is George F. Winslow, asso-

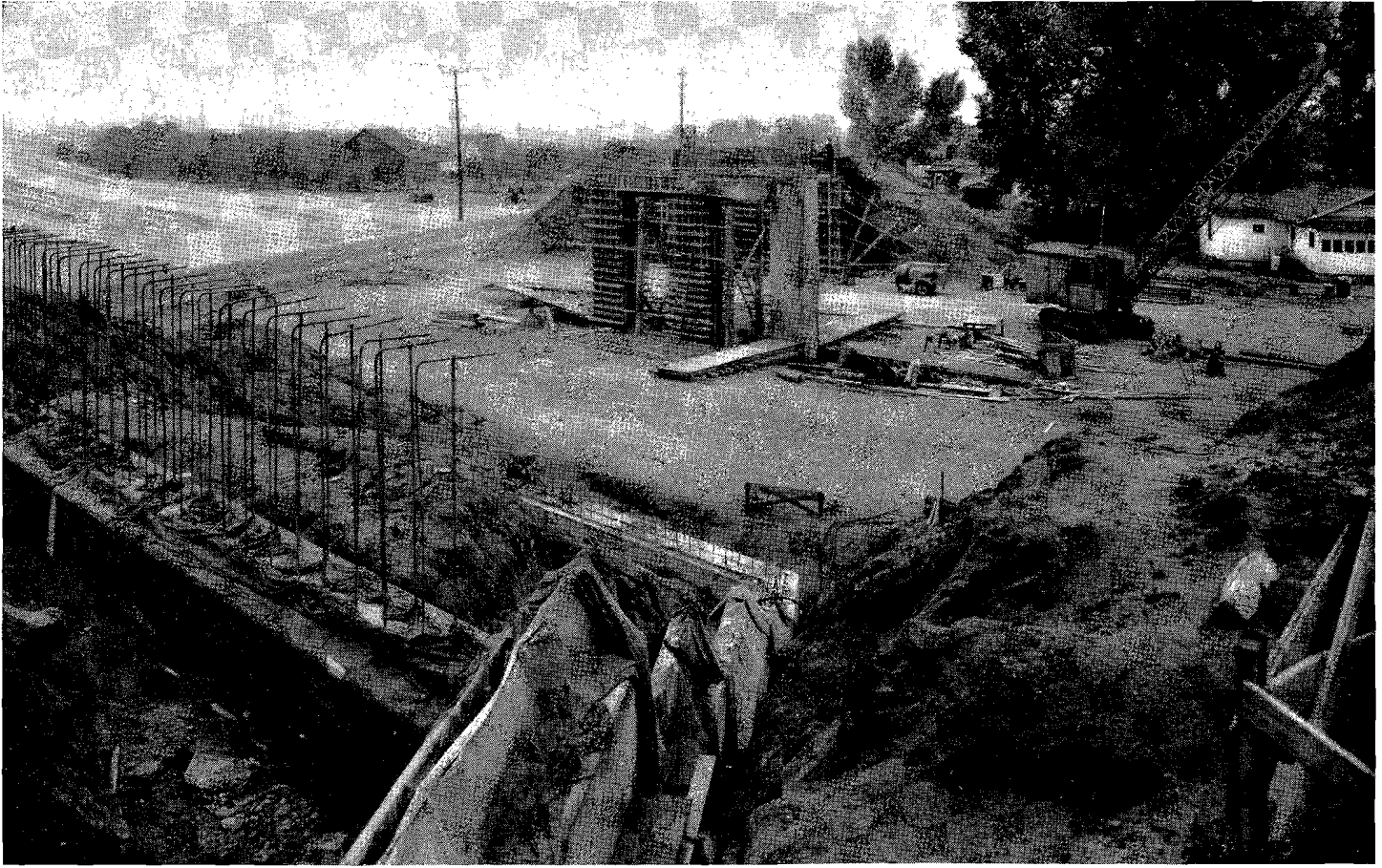
ciate highway engineer. Honorary membership has been bestowed upon Allan Nicol and J. H. Moon in appreciation of their untiring efforts on behalf of the society.

The Sacramento Mineral Society is composed of people (often referred to as "rockhounds") who enjoy collecting rocks; minerals, and gems; cutting, shaping and polishing those materials to enhance their natural beauty and who have grouped together to give and receive further knowledge of mineralogy, gem cutting, and geology.

The society has grown steadily until now the membership in Sacramento is over 125, many of whom are state

employees. There are similar societies scattered throughout the United States, with more than 80 such clubs in California alone.

In the early days of the society, minerals were plentiful and travel over the highways was relatively short. Now that local material has been acquired by most collectors, greater distances to new fields are necessary. Better and extended highways have increased the range of collecting possibilities. Field trips are a fundamental part of every gem or mineral society, and the fine highways over which we travel going to and from the more rugged rock-hunting areas are appreciated by all rockhounds.



Construction at Jack Tone Road overcrossing. Detour at left. New freeway at extreme left.

Ripon-Manteca Job

Continued from page 26 . . .

county road overcrossing will be surfaced with plant-mix over untreated rock base. The new northbound lanes will be of Portland cement concrete construction over cement-treated subgrade. Paving on the project will begin sometime next spring and it is anticipated that the contract will be completed next fall.

This highway lies in the heart of the San Joaquin Valley agricultural region and is a portion of principal inland route US 99 between the Los Angeles, Sacramento, and San Francisco Bay areas. The present average daily traffic is about 12,000 vehicles of which a large percentage is commercial traffic, particularly during the busy harvest season.

The author is the resident engineer; E. F. Nordlin is the Bridge Department representative on the project, and Henry Linkert is the contractor's general superintendent.

New Bay Crossing

Continued from page 6 . . .

investigation and study of the feasibility of financing and construction of the bridge, expenses of the authority in connection with the issuance and sale of bonds, and all other charges of whatsoever kind or character properly chargeable to the cost of constructing the bridge, and also for the payment of interest on the bonds during the construction of the bridge and for six months thereafter. An additional issue may be made by the authority, not to exceed \$10,000,000, if necessary to complete the bridge or to finance the completion of the lower level of the structure, including surfacing and completion of such lower level, improvements to approaches and additional approach roadways, and additional toll collection facilities.

This greatly needed highway facility first conceived in the latter part of 1949, has moved forward with record speed and at the present time it is esti-

mated to be 20 percent complete, with every indication that it will be completed and serving the traveling public by the date originally set, in October of 1956. The project is an outstanding example of the progress which can be accomplished by the cooperative efforts of governmental agencies at the city, county, and state levels, working together for a public improvement, needed by all.

CALIFORNIA STREET AND HIGHWAY CONFERENCE

The Sixth California Street and Highway Conference has been scheduled for February 3, 4, and 5, 1954, at the University of California at Los Angeles. Presented annually by the Institute of Transportation and Traffic Engineering, University of California (Berkeley and Los Angeles), the conference serves as a forum for road men from all levels of government and from the industry.

GOODWIN J. KNIGHT

Governor of California

FRANK B. DURKEE . . . Director of Public Works

CALIFORNIA HIGHWAY COMMISSION

FRANK B. DURKEE, Chairman

- HARRISON R. BAKER** Pasadena
- H. STEPHEN CHASE** Sacramento
- JAMES A. GUTHRIE** San Bernardino
- CHARLES T. LEIGH** San Diego
- F. WALTER SANDELIN** Ukiah
- CHESTER H. WARLOW** Fresno
- R. C. KENNEDY**, Secretary Sacramento
- RUSSELL S. MUNRO**, Deputy Director of Public Works

DIVISION OF HIGHWAYS

GEO. T. MccOY

State Highway Engineer, Chief of Division

- R. M. GILLIS** Deputy State Highway Engineer
- CHAS. E. WAITE** Assistant State Highway Engineer
- EARL WITHYCOMBE** Assistant State Highway Engineer
- F. W. PANHORST** Assistant State Highway Engineer
- J. W. VICKREY** Assistant State Highway Engineer
- R. H. WILSON** Assistant State Highway Engineer
- F. N. HVEEM** Materials and Research Engineer
- GEORGE F. HELLESOE** Maintenance Engineer
- J. C. YOUNG** Engineer of Design
- G. M. WEBB** Traffic Engineer
- DON G. EVANS** Construction Engineer
- H. B. LA FORGE** Engineer of Federal Secondary Roads
- C. E. BOVEY** Engineer of City and Cooperative Projects
- EARL E. SORENSON** Equipment Engineer
- H. C. McCARTY** Office Engineer
- J. C. WOMACK** Planning Engineer
- J. P. MURPHY** Principal Highway Engineer
- F. M. REYNOLDS** Principal Highway Engineer
- E. J. SALDINE** Principal Highway Engineer
- A. L. ELLIOTT** Bridge Engineer—Planning
- I. O. JAHLSTROM** Bridge Engineer—Operations
- J. E. McMAHON** Bridge Engineer—Southern Area
- STEWART MITCHELL** Bridge Engineer—Special Studies
- E. R. HIGGINS** Comptroller

Right of Way Department

- FRANK C. BALFOUR** Chief Right of Way Agent
- E. F. WAGNER** Deputy Chief Right of Way Agent
- GEORGE S. PINGRY** Assistant Chief
- R. S. J. PIANEZZI** Assistant Chief
- E. M. MacDONALD** Assistant Chief

District IV

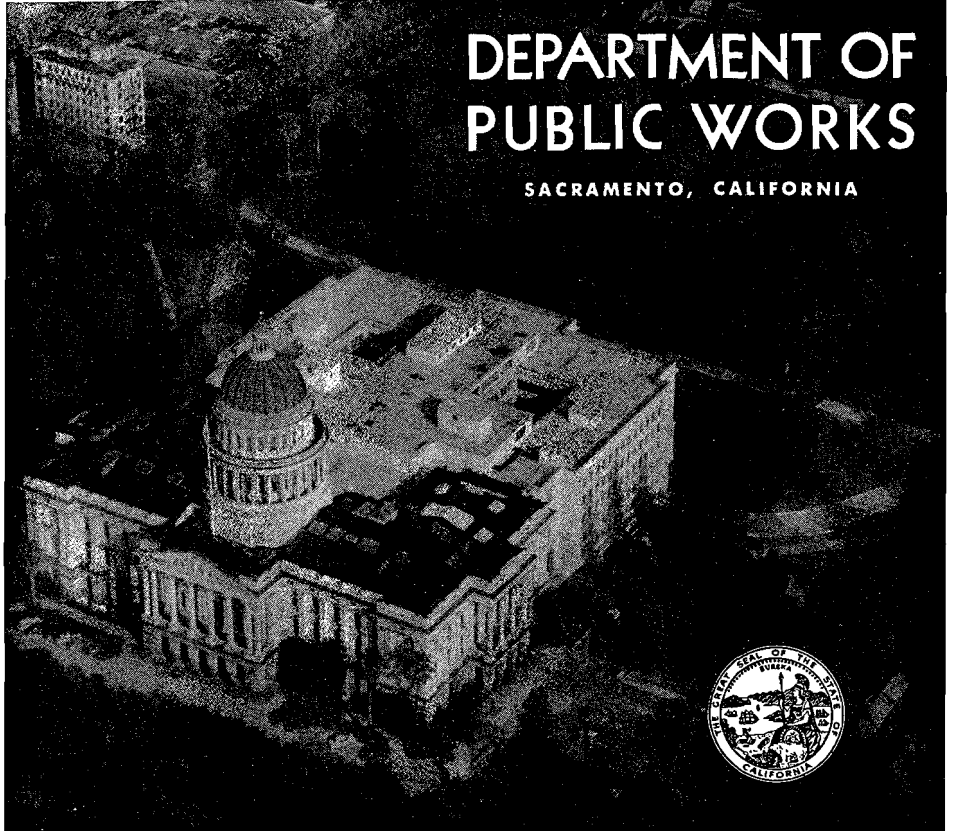
B. W. BOOKER Assistant State Highway Engineer

District VII

P. O. HARDING Assistant State Highway Engineer

District Engineers

- ALAN S. HART** District I, Eureka
- J. W. TRASK** District II, Redding
- A. M. NASH** District III, Marysville
- J. P. SINCLAIR** District IV, San Francisco
- L. A. WEYMOUTH** District IV, San Francisco
- E. J. L. PETERSON** District V, San Luis Obispo
- E. T. SCOTT** District VI, Fresno
- W. L. FAHEY** District VII, Los Angeles
- E. T. TELFORD** District VII, Los Angeles
- C. V. KANE** District VIII, San Bernardino
- MILTON HARRIS** District IX, Bishop
- JOHN G. MEYER** District X, Stockton
- E. E. WALLACE** District XI, San Diego
- HOWARD C. WOOD** Bridge Engineer
State-owned Toll Bridges



DEPARTMENT OF PUBLIC WORKS

SACRAMENTO, CALIFORNIA



DIVISION OF CONTRACTS AND RIGHTS OF WAY

Legal

- ROBERT E. REED** Chief Counsel
- GEORGE C. HADLEY** Assistant Chief
- HOLLOWAY JONES** Attorney

DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

NORMAN C. RAAB Chief of Division

DIVISION OF WATER RESOURCES

A. D. EDMONSTON
State Engineer, Chief of Division

G. H. JONES Assistant State Engineer, Sacramento River Flood Control Project, Supervision of Safety of Dams, Sacramento-San Joaquin Water Supervision

T. B. WADDELL
Assistant State Engineer, Water Resources Investigations, Central Valley Project, Irrigation Districts

HARVEY O. BANKS Assistant State Engineer, Water Rights and Water Quality Investigations

MAX BOOKMAN
Principal Hydraulic Engineer, Los Angeles Office

HENRY HOLSINGER Principal Attorney

T. R. MERRYWEATHER Administrative Officer

DIVISION OF ARCHITECTURE

ANSON BOYD State Architect, Chief of Division

H. S. HUNTER Deputy Chief

ROBERT W. FORMHALS
Administrative Assistant to State Architect

Administrative Service

- W. K. DANIELS** Assistant State Architect, Administrative
- WADE O. HALSTEAD** Principal Estimator
- EARL W. HAMPTON** Construction Budgets Administrator
- CARLETON PIERSON** Supervising Contracts Writer

Planning and Design Service

- P. T. POAGE**
Assistant State Architect, Design and Planning
- A. F. DUDMAN**
Principal Architectural Designer, San Francisco
- JAMES A. GILLEM**
Principal Architectural Designer, Los Angeles
- CARL A. HENDERLONG**
Principal Mechanical and Electrical Engineer
- C. L. IVERSON** Chief Architectural Draftsman
- JOHN S. MOORE** Supervisor of Special Projects
- WALTER E. LORD** Supervising Specifications Writer
- GUSTAV VEHN** Production Manager

Construction Service

- D. C. WILLETT** Chief Construction Engineer
- F. A. JOHNSON** Principal Structural Engineer
- NATE W. DOWNES**
Supervising Engineer of Maintenance and Operations

Area Construction Supervisors

- THOMAS M. CURRAN** Area I, Oakland
- J. WILLIAM COOK** Area II, Sacramento
- FRANK R. AUSTGEN** Area III, Los Angeles

Area Structural Engineers, Schoolhouse Section

- C. M. HERD** Area I, San Francisco
- M. A. EWING** Area II, Sacramento
- H. W. BOLIN** Area III, Los Angeles

Shores of Lake Mary in Mono County, reached by State Route 112, take on light mantle of white in preparation for winter's snows. Photo by Robert A. Munroe, Photographic Section

