

CALIFORNIA

HIGHWAYS AND PUBLIC WORKS



*Sacramento River,
looking toward site of
Kennel dam, indicated
dashed line*

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Journal of the Department of Public Works
JANUARY • 1934

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Governor Calls Water Victory the Greatest Event Since Gold Discovery

Executive Confident Federal Authorities will Approve State's Application for Grant and Loan that will Enable Water Project Authority to Start Construction

By JAMES ROLPH, Jr., Governor of California

ON DECEMBER 19, 1933, the people of California put their stamp of approval on the Central Valley Project of the State Water Plan when by a clear majority of over 33,000 votes the referendum against the Central Valley Project Act, passed by the Legislature on July 26 and signed by me on August 5, was defeated at a special election.

This, my Fellow Californians, in my opinion, was the greatest event that has occurred in this State since the discovery of gold.

The people of this State have long looked forward to a coordinated development of the State's water resources to provide for the most effective and efficient conservation, regulation, distribution and utilization of its water supplies for all purposes.

Efforts looking forward to such a plan of coordinated development were started over sixty years ago during the administration of Governor Newton Booth. Since that time, water resources investigations have been more or less sporadic until the initiation of the intensive investigations authorized by the Legislature in 1921 and continued during the past ten years or more, leading finally to the adoption of initial plans to take care of immediate pressing needs and

to the enactment by the 1933 Legislature of an act providing for the construction and operation of the Central Valley Project of the State Water Plan.

The challenge to our future happiness and welfare has been decided unequivocally by the voters at this special election. The decision made is a most constructive one.

This great project will provide vital necessities for a continuation of progressive development and increasing prosperity, not only in the Sacramento and San Joaquin valleys, but also in the great metropolitan areas which through the channels of industrial and commercial trade share to a large extent in the prosperity of the great agricultural industry of the two valleys.



JAMES ROLPH, JR.

Moreover, it is unquestionable that the entire State will be benefited by the consummation of this great project. In addition to furnishing water supplies for highly developed and producing agricultural lands which are facing destruction of investment and production because of serious water shortage, improving navigation to provide cheap water transportation on the Sacramento and San Joaquin rivers and providing greater flood protection to the valley lands,

(Continued on page 8)

Review of 1933 Highway Work Shows a Total Expenditure of \$29,483,000

By EARL LEE KELLY, Director of Public Works

THE year 1933 stands out in relief against the horizon of highway construction history.

It was a year marking the use of highway construction, on a scale never before attained, as a major public work in the hastening of economic recovery.

With reference to California, the following is the part played by the Division of Highways of the Department of Public Works in turning the tide of depression and climbing up on the road to recovery.

With State highway construction for the first eight months of 1933 amounting to little more than \$6,500,000, the push for recovery was begun with the advertising for bids on fifty State highway projects on August 25th and continued during the remaining four months of the year with the result that, on December 31st, records showed an accomplishment of more than \$14,100,000 in work under way and \$2,360,000 in work advertised for bids, making the highway construction total for the year 1933 over \$22,900,000.

In addition to the mammoth construction program, maintenance work on the thousands of miles of State highways has been continuously carried on with an expenditure of over \$6,500,000, bringing the total amount of construction and maintenance work during 1933 to \$29,483,000.

REPRESENTS REHABILITATION

This total for the year represents hundreds of miles of new and reconstructed highways; it represents new bridges; it represents progress in the development of an adequate State highway system; but, of far greater import, it represents work for the hands of many thousand Californians; it represents food, clothing and security for their many thousand families; it represents rejuvenation, in these same thousands of Californians, of that spirit of confidence and self-respect which is engendered by honest work.

It is estimated that the men employed on State highway work for the first eight months of 1933 numbered about 5000 and that the work set in motion between August 25 and



EARL LEE KELLY

December 31 provided work for more than 15,000.

This is the double benefit to California from the increased highway construction activity of 1933: work for Californians and increased capital investment in the network of the State highway system.

KALEIDOSCOPIIC YEAR

In retrospect, 1933 presented a kaleidoscope of rapidly changing incidents having far reaching effects upon the State highways in California, and no picture of highway activities for the year just passed could be complete without mention of the more important of these incidents which have altered the pattern of activity.

By act of the 1933 Legislature State highway mileage was increased from approximately 7350 miles to 14,150 miles by the transfer of 6800 miles of county roads to the State system. A heavy burden was thus shifted from the counties, enabling them, with their share of the gasoline and motor

Tabulation 1933 Highway Construction

During the calendar year just closed the Division of Highways constructed 1546.2 miles of highways and 62 bridge and grade separation structures, in addition to various minor improvements and miscellaneous contract work, at a total cost of \$20,561,500.

To provide an idea of the physical aspects of the year's work the following summary gives the types of construction, mileage and cost for each type.

Type	Miles	Amount
Pavement	180.5	\$7,416,800
Bituminous treated crushed rock surface..	171.5	2,775,800
Untreated crushed rock surface	38.1	557,900
Graded roadbed	168.8	4,602,000
Bridges and Grade Separations.....	(62)	2,276,900
Seal Coat, Shoulder Oiling, etc.....	987.3	1,006,100
Miscellaneous Contracts.....	----	397,600
Minor Improvements.....	----	372,200
Miscellaneous Day Labor.....	----	527,900
Unemployment Relief and Earthquake Reconstruction	----	628,300
Totals	1,546.2	\$20,561,500

vehicle taxes, to raise the standards of construction and maintenance of the county road systems, or to reduce county taxes by the amounts heretofore required for road improvement and maintenance.

CITIES SHARE GASOLINE TAX

The Legislature also provided for incorporated cities by allotting one-quarter cent of the gasoline tax to be distributed among them for street improvement within their limits. This measure has already had effect in many cities where the governing bodies have been able to reduce taxes by the amount of this contribution of State revenue.

On June 27 the California electorate decisively defeated diversion of gas tax revenues for any purpose other than for highway construction and maintenance. In no uncertain

terms the highway users of California declared that the taxes they pay on gasoline are for highway purposes only and that any attempt to divert them for general State expenses would be met with determined opposition.

On June 16 the President signed the National Industrial Recovery Act providing approximately \$400,000,000 for State highway construction throughout the entire country. Of this amount \$15,607,000 was apportioned to California.

BIENNIAL BUDGET REVISED

The California Highway Commission immediately adopted a revised budget for the biennial period from July 1, 1933, to June 30, 1935, based upon Federal funds and anticipated State revenues. Construction projects

(Continued on page 14)

First Annual Report on Bay Bridge Reveals Construction Up to Schedule

CONSTRUCTION on the \$75,000,000 San Francisco-Oakland Bay Bridge, starting on July 9, 1933, went through six months of progress on schedule, according to the first annual report made by Chief Engineer C. H. Purcell to Director Earl Lee Kelly of the Department of Public Works. The report in part is as follows:

The work on all the contracts is up to expectations.

Each contractor has performed the amount of work during the first six months of construction which our plans and specifications required.

This work, performed in 1933, included the construction and sinking of two of the world's largest caissons, designed by the San Francisco-Oakland Bay Bridge Division upon an original plan created by Daniel E. Moran, one of our consulting engineers.

UNDERWATER RECORD SET

One pier was sunk in 106 feet of water, which represents the height of a 9- or 10-story apartment house, and which stands as a record for concrete construction under water.

All the substructures of the west bay sector of the San Francisco-Oakland Bay Bridge will be complete in 1934.

During the year 1934 three of the four steel towers of the twin suspension bridges of the west bay crossing will have been completed according to progress schedule, and the concrete center anchorage between the twin bridges will be raised until its top stands 236 feet above water. (Its final height when completed will be 301.5 feet above water.)

SUPERSTRUCTURE BEGINS IN MAY

The San Francisco cable anchorage and Yerba Buena Island cable anchorage will be built up as far as possible pending the cable spinning process which will not start until 1935.

In the east bay, 20 of the 22 piers, or substructures, will be completed during 1934.

Superstructure construction in the east bay will be undertaken during 1934, starting in May, and 30 per cent will be completed this year.

The Yerba Buena Island vehicular tunnel will be 40 per cent completed during 1934, this being the largest bore tunnel in the world, 58 feet high by 76 feet wide. This vehicular tunnel will not be completed until 1936.

EMPLOYMENT FOR 4000

The cable anchorage tunnels, in which the 28-inch cables will be attached to steel eye-bars embedded in concrete, will be complete during 1934.

Employment in the San Francisco metropolitan area directly in the construction of the bridge will reach a peak during 1934 of more than 4000 men.

During the year 1933, one pier, Pier W-2, at the tip end of San Francisco Harbor Dock No. 24, at the extreme west end of the bridge, was completed.

Twelve other piers were placed in construction during 1933, some of which are far advanced toward completion.

\$25,000,000 BIENNIAL EXPENDITURE

The cable anchorage on Rincon Hill, San Francisco, was built up to 25 per cent of completion, and excavation was started for the Yerba Buena Island cable anchorage during the past year.

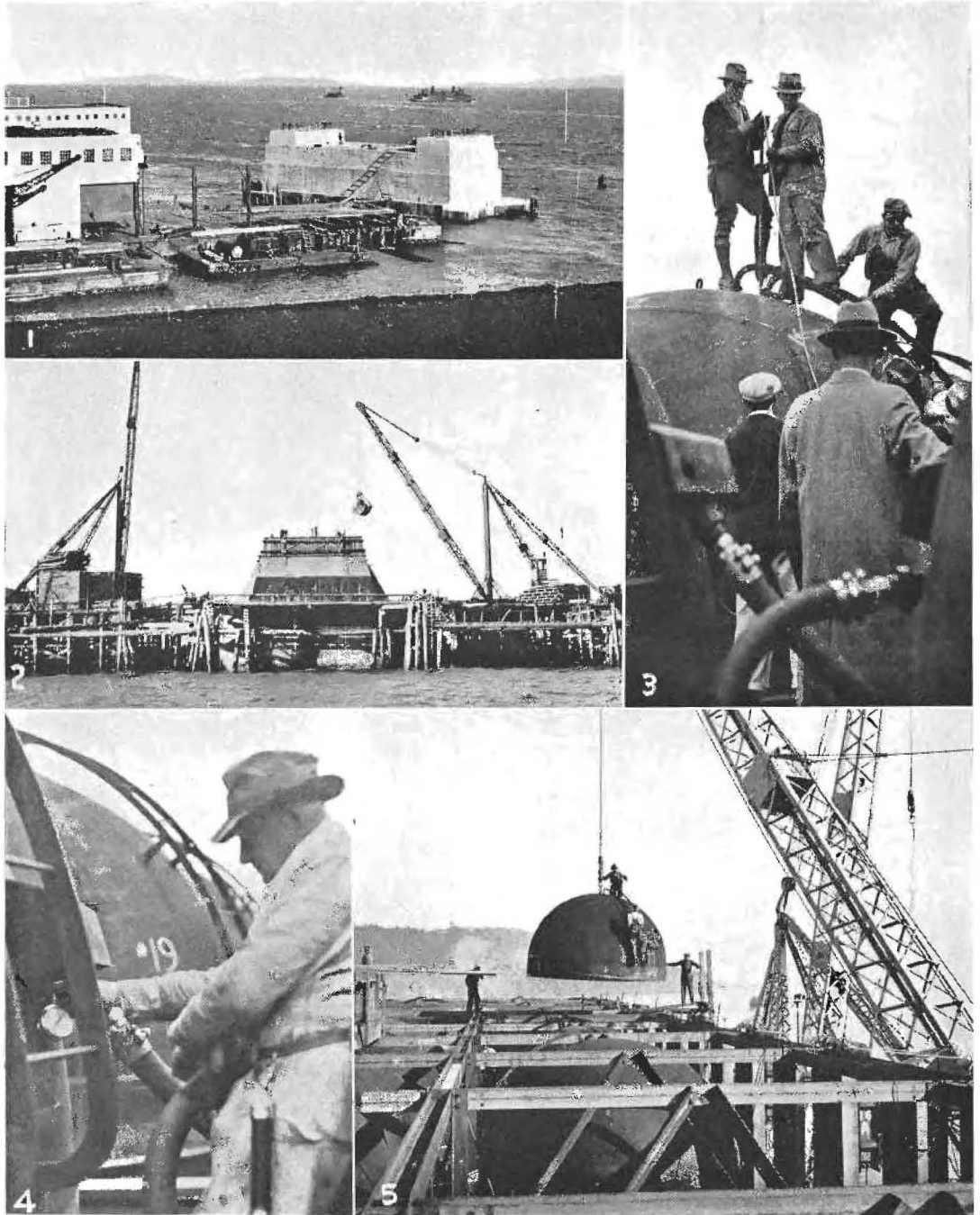
Six million dollars were spent on bridge construction in 1933, and \$19,000,000 will be spent during 1934.

By the close of 1933, 5000 tons of cable wire, or 25 per cent of the total amount required, had been completed in eastern steel mills, and 2500 tons of this amount have already been brought in ships to San Francisco yards of the Columbia Steel Company.

Nearly 50 per cent of the anchorage steel work has gone through the eastern mills. A small quantity has been delivered and is stacked at Rincon Hill.

Fabrication of two towers is well under way.

During the first six months of bridge construction a total of 110,000 cubic yards of concrete was placed. This is four times the amount of concrete used in the Russ Building, largest office structure west of Chicago.



PIERS RISING, CAISSONS SINKING in the waters of San Francisco Bay mark the steady progress of the great Bay Bridge construction. No. 1—Bridge Pier No. 2, the first completed pier, at the foot of Harrison Street, San Francisco, on which will rest the most westerly tower. It is 122 feet long, 52 feet wide and stands 40 feet out of water. No. 2—Pier E-5 with its cutting edge resting 121 feet below the surface and the concrete cellular structure being tapered off. No. 3—Engineers testing the depth of water in a caisson cylinder by lowering a wire device which lights an electric lamp at the upper end when water is touched. No. 4—The sinking of a caisson is accomplished by releasing air from the cylinder. This workman is testing the air pressure of a cylinder much like you test automobile tires. No. 5—Removing domes from the great center anchorage caisson resting on the bottom to permit dredging in the wells. Some of the domes are retained for emergency flotation.

San Diego Celebrates Completion of Million Dollar Highway into City

By E. E. WALLACE, District Engineer

FOR many years the northerly entrance to the city of San Diego and to the vicinity south of the city has been restricted to a very unsatisfactory approach over the old Torrey Pines Grade and the Biological Grade through the attractive city of La Jolla and Mission Beach and thence into San Diego over a very tortuous, steep and narrow roadway.

Through the cooperation of San Diego city and county and the State Highway Commission, the final link of the 18-mile alignment through Rose Canyon and around the head of Mission Bay over Atlantic Street to a direct connection with Broadway, the main business street in the city of San Diego, has now been completed.

A MILLION DOLLAR IMPROVEMENT

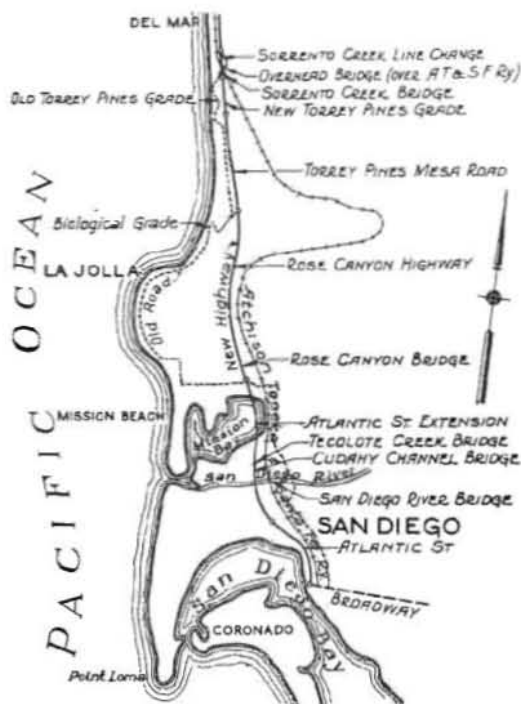
This event was properly celebrated with a public dedication of the highway by members of the California Highway Commission, the Director of the Department of Public Works, Mr. Earl Lee Kelly, and civic authorities, on December 16, 1933, culminating in a dinner and reception given in honor of the State Highway Commission and the Director of Public Works by the city and county authorities of San Diego.

The reconstruction of this important highway has involved an expenditure of slightly over \$1,000,000 in order to provide a first class, modern highway on excellent alignment and grade for a distance of approximately 18 miles and has extended over a period of approximately three years.

The road has been constructed in twelve different units or contracts, the last two of which have just been completed, providing the much-needed connection to the business center of San Diego along the scenic and attractive water front. The main portions of this highway traverse the Torrey Pines mesa and grade, the Rose Canyon, Sorrento grade and six major bridges.

GRADES, CURVES ELIMINATED

The new alignment eliminates both the Torrey Pines Grade and the Biological Grade which had approximately 50 curves with a minimum radius of 50 feet and a maximum



grade of 18 per cent. The new route saves approximately five miles in distance, has nothing less than a 1200-foot radius curve and a 6 per cent maximum grade.

The unit of the project, just completed around the head of Mission Bay, traverses a part of the Mission Bay State Park which is now being landscaped and beautified by the State Park Commission.

This last link provides a most attractive entrance to the city as well as a rapid and uninterrupted access for traffic.

DEDICATION CEREMONIES

The formal dedication ceremonies were held at Sports Field near the connection of the new highway with Broadway and the occasion brought State officials, noted Californians from other cities and leading citizens of Mexico to San Diego. The State was represented by Earl Lee Kelly, Director of Public Works; Harry A. Hopkins, chairman of the

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A JUBILANT CAVALCADE of motor cars, three abreast, sped along the beautiful curving shores of Mission Bay upon the official opening and dedication of the new Atlantic Avenue entrance to the city.



STATE, NAVY AND MEXICO were represented at the official ceremonies. On the speaker's stand, left to right are: Rear Admiral William T. Terrant, U. S. N., Commandant, 11th Naval District; Tom Hurley, chairman, San Diego Supervisors; Earl Lee Kelly, State Director of Public Works; Philip A. Stanton, State Highway Commissioner; Fred Lockwood, City Manager; Frank Forward, San Diego Chamber of Commerce; Chairman Harry A. Hopkins, Highway Commission; Mayor Jno. F. Forward; General Ortiz Rubio, Past President of Mexico.



OVER THE SAN DIEGO RIVER, a noble steel and concrete bridge carries the new highway on a 40-foot roadway. It has a total length of 641 feet.

Advocated by Governor at Inaugural

(Continued from page 1)

the construction of this Central Valley Project will give immediate relief by employment to 25,000 or more workers over a period of three years or more and provide a livelihood for 100,000 persons.

INAUGURAL RECOMMENDATION

Since the inception of my administration I have strongly advocated a speedy solution of the water problems of this State. In my inaugural address, delivered on January 6, 1931, I stated:

"... A coordinated solution of these problems has long and earnestly been sought. Surely, in California, where water is so precious, the State must devise a general unified plan for the conservation and use of its water against the increasing needs of its increasing population and the demands of the coming generations whose stewards we are. . . . The difficulties are mainly financial. . . .

We may not rob or wreck one section, industry, or group in order to sustain another. We must not spend more in salvaging lands than the lands will be worth when salvaged. . . . development should not proceed more rapidly than economic needs of the State require. We must be sure we are right before we go ahead with any plan. Yet we should not permit any section, industry or group to languish and suffer unduly for lack of energetic action on the State's part. I stand ready as Governor to give the Legislature and the distressed localities all the assistance in my power toward finding a practicable solution of these pressing problems. We must not approach these problems in a narrow or sectional spirit. While the benefits sought may primarily affect certain localities, the evils we seek to cure have been brought into being by causes that are not local. . . . We can not heal these real woes by sympathy or fair words, however sincere. Distinctly, the duty of relieving the acute situation caused by the uneven distribution of our water resources and the growing demand on them is mainly the business of the State and not solely of the affected localities. . . .

FEDERAL COOPERATION SECURED

Since that time I have lent every assistance at my command to the purpose of obtaining a plan of development for final adoption and the formulation of legislation giving the necessary authorization for the project to proceed. I dispatched two commissions to Washington, D. C., to confer with Federal authorities and enlist Federal cooperation and assistance in the project, one of which went to Washington in February, 1931, and one in June, 1932.

These commissions were instrumental in personal investigation of the State Water Plan being carried out by the U. S. House of Representatives subcommittee on appropriations for the Department of Interior in July, 1931, by the U. S. Senate Committee on Irrigation and Reclamation in August and September, 1932, and by the Board of Engineers for Rivers and Harbors of the U. S. War Department in November, 1932.

As a result of these investigations by Federal agencies, the project not only received general approval by all Federal agencies investigating but

recommendations were also made for Federal financial assistance with a final definite recommendation from the Chief of Engineers of the U. S. War Department for a Federal grant of \$7,300,000 to defray a portion of the cost of the project.

LEGISLATION RECOMMENDED

In accord with the authority conferred upon me by the Legislature of 1931 I appointed nine representative citizens to the California Water Resources Commission on August 24, 1931. This commission made a study and report upon all phases of the State Water Plan and particularly the Central Valley Project thereof, including engineering, economic, legal, financial, constitutional and administrative features. The commission recommended the adoption of a constitutional amendment authorizing the Legislature to enact necessary legislation for carrying out a statewide water program and also submitted a draft of a proposed legislative act under which first units of the State Water Plan could be undertaken.

The commission collaborated with a joint legislative committee working on the same problem and the commission's recommendations were similar to those of the committee's. As a result of these efforts, a constitutional amendment was introduced in the Legislature of 1933 and passed on May 5, 1933. In addition, a revenue bond act, creating a water authority and authorizing the construction of the Central Valley Project of the State Water Plan was passed by the Legislature and approved with my signature on August 5, 1933. Both the constitutional amendment and the legislative act largely embodied the recommendations made by the commission I appointed.

HELD UP BY REFERENDUM

"The Central Valley Project Act of 1933," Chapter 1042, Statutes of 1933, A. B. 259, would have become a law on October 25, 1933, had it not been barred by a referendum petition which was qualified for filing on September 23, 1933. If the vote on this referendum had been allowed to go to the next general election it would have permitted the act to remain ineffective until after November, 1934, and would have meant a postponement of relief from acute water shortage, a failure to carry out a project providing for great relief in unemployment and the probable loss of the opportunity afforded to obtain a Federal grant of 30 per cent of the cost of materials and labor and Federal financing of the balance of the cost of the project under the provisions of Title II of the National Industry Recovery Act of 1933.

Accordingly, on October 4, 1933, I called a special election for December 19, 1933, so that the will of the majority of the people in California might be registered in time to arrange for the financing of this most worthy project under the provisions of the National Industrial Recovery Act.

Despite the beclouding of the issue by a well-organized and well-financed opposition whose campaigners raised the bugaboo of an added tax burden, I had no fear in submitting the case to my fellow Californians, who, I was confident, would exercise their good judgment in behalf of the State. The result confirmed my opinion.



STATE WATER PROJECT AUTHORITY in session at their first meeting. Seated, left to right, in this group empowered to administer the Central Valley Water Project Act are: Chairman Earl Lee Kelly, Director of Public Works; Ray L. Riley, State Controller; U. S. Webb, Attorney General; Charles G. Johnson, State Treasurer. Standing, from left to right, are State Director of Finance Rolland A. Vandegrift and Edward Hyatt, State Engineer and Executive Officer of the Authority.

REFERENDUM ELECTION ON CENTRAL VALLEY PROJECT

At the election on December 19, 1933, the vote was 459,712 "Yes," and 426,109 "No," or a majority of 33,603 in favor of "The Central Valley Project Act of 1933." Of the fifty-eight counties in the State, forty-four approved the measure while only fourteen were against. Of those counties voting against the measure, seven were in southern California, six in the coastal belt and only one within the area of the Great Central Valley. An analysis of the vote shows that in general all of the valley counties and especially those to be most directly benefited by the project voted overwhelmingly for the act. San Francisco and most of the bay counties also registered a substantial majority for the measure.

I am confident that had there been time and opportunity to properly acquaint the people in all sections of the State with the actual facts and outstanding merits of this great project and the legislative act providing for its construction and operation, all counties in the State would have approved the measure with a substantial majority. I feel sure that it was only lack of knowledge or misinformation, or both, which caused many people to vote "No" on their ballots.

The measure was opposed by selfish interests who waged a most intensive campaign against it and broadcast misinformation and appeals to sectional prejudice in an effort to bring about its defeat. Against this opposition was grouped a band of

leading citizens from all parts of the State who undertook voluntarily to present the facts concerning the project and the act to the people.

Leading this group was the State Water Plan Association which was organized on August 26, 1933, for the purpose of furthering the Central Valley Project before the Federal Government and to resist and defeat the referendum against the act.

The officers of this association are: B. S. Crittenden, president and chairman of executive committee; J. M. Inman, vice chairman and treasurer; P. D. Nowell, secretary of association and executive committee.

The executive committee consists of the following: District No. 1, Francis Carr, Redding; District No. 2, Jesse Poundstone, Grimes; District No. 3, A. B. Tarpey, Fresno, and P. D. Newell, Tulare; District No. 4, W. B. Hogan, Stockton; District No. 5, George A. Atherton, Stockton; District No. 6, C. W. Schedler, Pittsburg; District No. 7, Vacancy; District No. 8, Matt I. Sullivan, San Francisco; District No. 9, J. M. Inman, Sacramento; at large B. S. Crittenden, Stockton.

Mr. Clem Whitaker was appointed as campaign manager for the Association on October 9, 1933. The head office of the Association was established in Sacramento and branch offices in Oakland, San Francisco and Los Angeles. Organizations were also set up in most of the counties of the State.

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Election Called to Secure U. S. Funds

(Continued from page 9)

It is to the State Water Plan Association and to the many individuals who joined forces with the Association and voluntarily and unselfishly devoted their time and energy to the campaign in favor of the adoption of the Central Valley Project Act that chief credit is due for the vote of approval given by the people at this election.

Realizing the tremendous importance of this Central Valley Project to California and in line with my expressed convictions since the beginning of my administration, I deemed it my duty as Governor to join forces with these large numbers of leading citizens in favor of the project, and accordingly took an active part in the campaign with appeals to the people of the State through the press and on the radio for a favorable vote on the

measure. The result of the election was a most happy one to me and I heartily congratulate all who took part in waging the campaign for the adoption of the Central Valley Project Act of 1933.

Now that the issue has been definitely decided by the people in accord with the established democratic principles of our government for deciding such issues, it is my earnest hope that all of the citizens of this State from all sections thereof will get solidly behind this great project and lend their assistance to the work that remains to be done before the project can be consummated, for, my Fellow Californians, there is still much work to be done and the job ahead calls for the united and whole hearted support of every individual and interest within the entire State.

FURTHER ACTION NECESSARY IN CONSUMMATION OF PROJECT

Further action looking towards the consummation of the Central Valley Project involves two matters of immediate importance:

First—Obtaining the approval of the application to the Federal Emergency Administration of Public Works for a grant and loan under the provisions of the National Industrial Recovery Act of 1933, of funds to finance the project.

Second—The execution of contracts for the sale of water and electric energy to be developed by the project, in order to assure revenues sufficient in amount to meet all carrying charges of the project, including interest on and retirement of principal on the revenue bonds which will be issued under authority of the Central Valley Project Act.

The legislative act approved by the people creates a "Water Project Authority," composed of the Director of Public Works, the Director of Finance, the Attorney General, the State Controller and the State Treasurer. The Director of Public Works is designated as the chairman and the State Engineer as the executive officer of the Authority. This Water Project Authority is authorized and empowered to proceed with the construction of the Central Valley Project, comprising specifically designated units, when,

in its judgment, income and revenue from all sources will be adequate to pay all costs of the project, including bond redemption, interest, operation and maintenance.

UNITS OF PROJECT

The Authority is directed to proceed with construction immediately upon funds becoming available therefor. The units designated for the project comprise Kennett dam and reservoir on the Sacramento River with hydro-electric power plants and a main transmission line to a central substation near the city of Antioch, the Contra Costa conduit extending from the San Joaquin delta to Martinez, the San Joaquin pumping system extending from the delta to Mendota, Friant dam and reservoir with a power plant on the San Joaquin River, Madera canal extending from Friant dam to the Chowchilla River and the Friant-Kern canal extending from Friant reservoir to Kern River.

The analyses of the cost of the project and the revenues from the sale of water and power which it appears reasonable to anticipate show that the project will be self-liquidating and self-supporting with Federal financing under the provisions of the N. I. R. A. No State financing is contemplated or permissible under the act.

APPLICATION FOR GRANT AND LOAN TO P. W. A.

In order to expedite matters, I authorized the preparation and submission of an application in preliminary form to the Federal Emergency Administration of Public Works for a grant and loan to finance the construction of the Central Valley Project. This application was filed September 27, 1933, and has been under preliminary consideration by the State Engineer and State Advisory Board of the Federal

Public Works Administration in California, and the Public Works Administration in Washington, D. C.

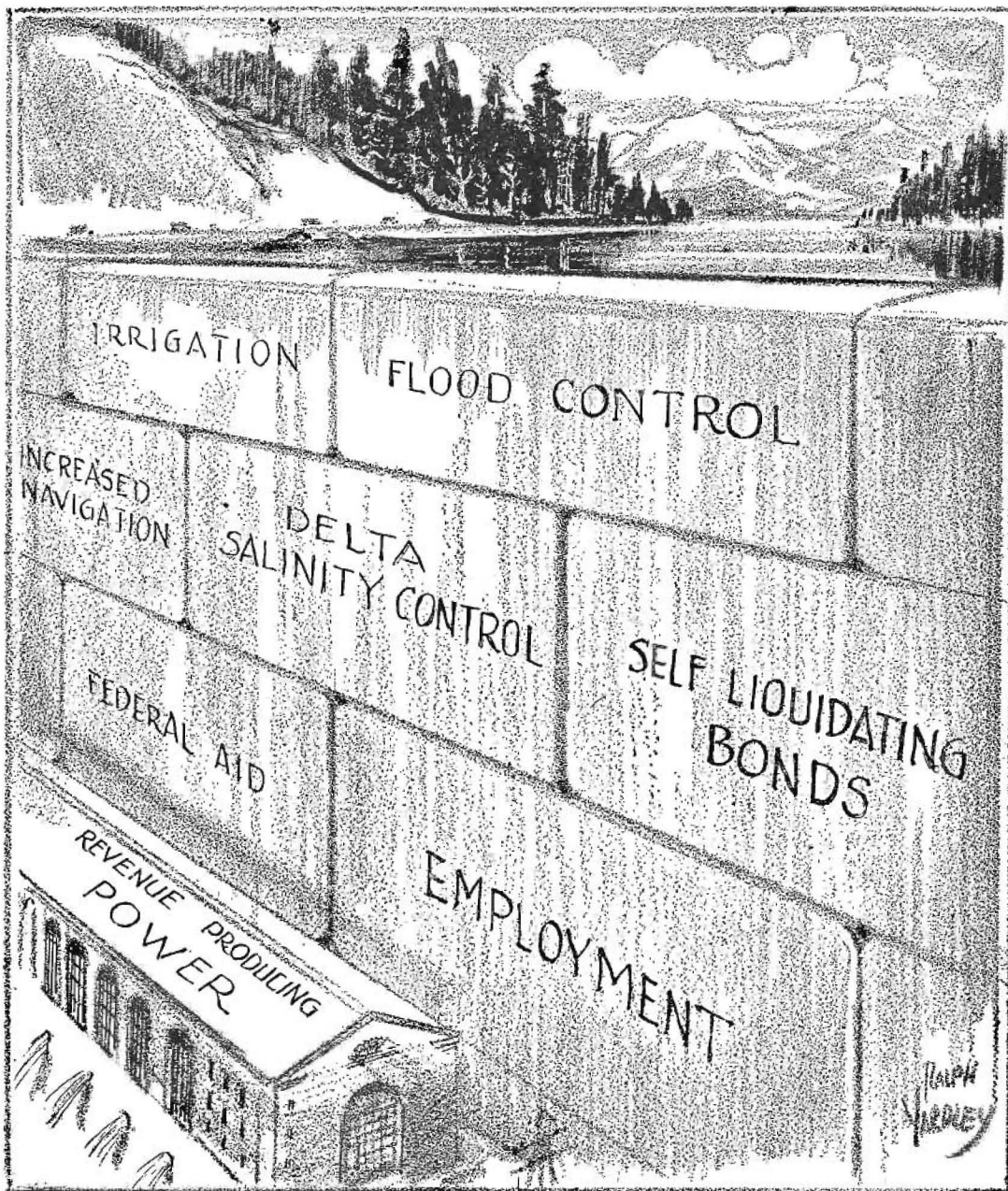
Energetic action is now being taken to press this application both with the Federal representatives of the Public Works Administration in California and also at Washington, D. C. It appears probable that a report by the officials of the

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SOLID BUILDING MATERIAL

State Water Plan Solves Many Problems

Cartoon by YARDLEY in *Stockton Record*



New "M" Street Bridge at Sacramento to be Under Construction in Spring

By F. W. PANHORST, Acting Bridge Engineer

AFTER many years of waiting it now appears that the narrow, dangerous and unsightly bridge over the Sacramento River at "M" Street, the westerly entrance to Sacramento, will soon be replaced by a new and modern structure. The budget



F. W. PANHORST

of the State Division of Highways for the present biennium includes an item of \$433,000 as the State's share for constructing a new bridge. Cooperating with the State, Sacramento county has allotted \$100,000 of the county's share of the gas tax from the present fiscal year budget and \$133,000 from the

next fiscal year budget to be used in conjunction with the State funds for the new bridge.

The present bridge was built in 1910 by the Sacramento Northern Railway Company with financial cooperation from Yolo and Sacramento counties. The railway company secured at that time a 50-year franchise extending to 1960, which has 26 years to run. This bridge, not intended for the heavy highway traffic it now carries, but built primarily for railroad traffic and protected by a 50-year franchise, is to be replaced by a State bridge, built and operated by the State.

NEGOTIATIONS NECESSARY

This situation necessitated numerous conferences of State and railroad officials in order to arrive at an agreement satisfactory to both. The position taken by the railroad company was one of cooperation and an agreement satisfactory to both parties has been executed.

It must be remembered that no possible arrangement of tracks and highway could be such as to be entirely satisfactory to both railway and State. Naturally, the railway

company would prefer to have a clear crossing not hindered by highway traffic, and the State would prefer a bridge with no railway interference, but neither the railway crossing nor the highway traffic could be eliminated.

It was, of course, suggested that the highway traffic should be carried over the tracks clear of all rail interference. Such a solution was possible, but the cost would be far in excess of available funds and the property damage to "M" Street due to the long run-off, as well as many other valid reasons which we will not attempt to enumerate here, made necessary the elimination of such an overhead structure.

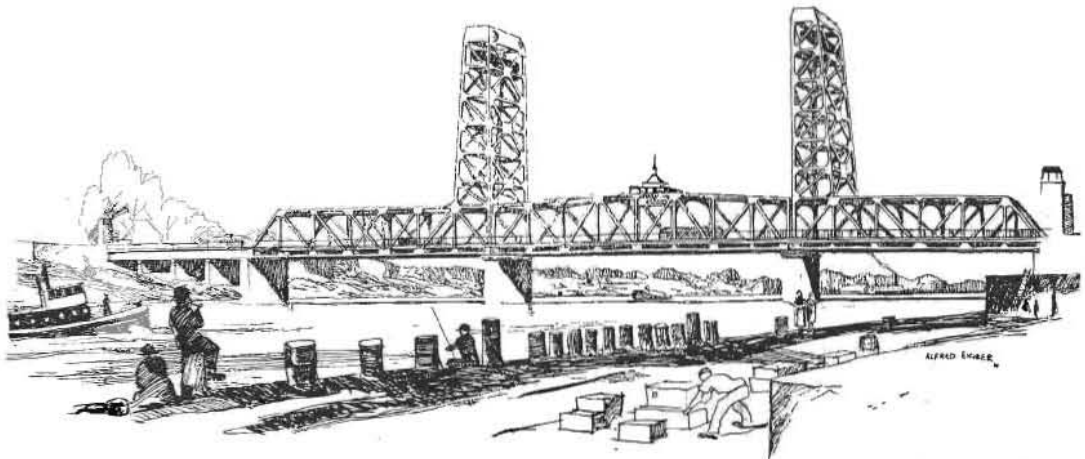
At a conference held December 22, attended by the railway company and State officials agreement was finally reached on the type of structure agreeable to both. The Department immediately began final plans and specifications so that actual construction may be started as soon as the hazard of spring high water has passed.

A combination railroad and highway bridge of the vertical lift type will be constructed. The accompanying sketch shows a typical cross section. The clear width between curbs will be 52 feet with the railway tracks in the center, vehicular traffic being protected by curbs which allow 13 feet for railway traffic. Two lanes of highway traffic in each direction will be provided with the outside lanes 10 feet in width and the interior lanes 9 feet and 6 inches. Four-foot sidewalks will be placed on each side of the bridge outside of the girders.

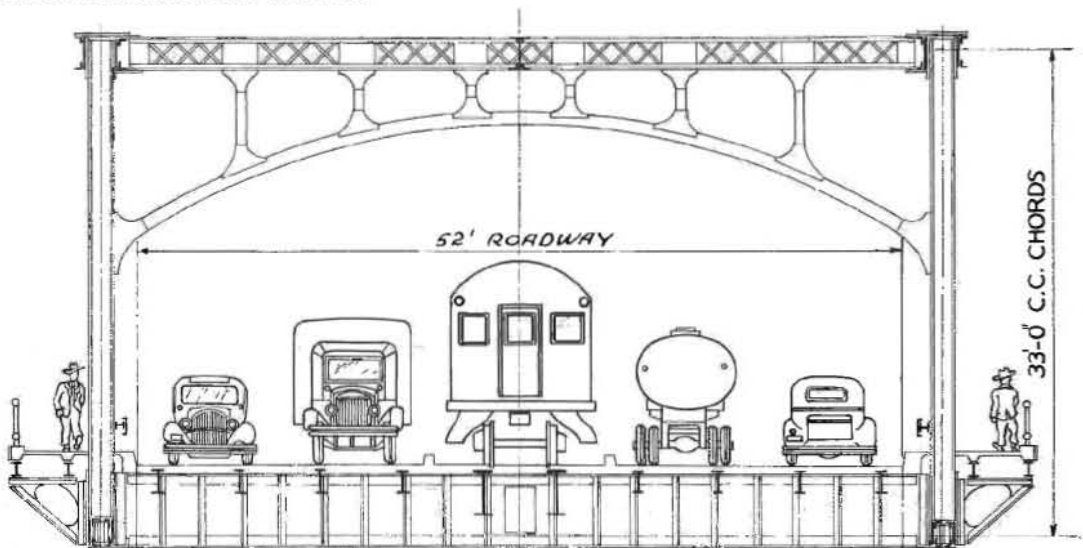
ALL NEW PIERS

Original plans provided for utilizing the present piers but detailed studies have shown that a more economical and satisfactory structure can be secured by building entirely new piers at new locations.

A hearing was held October 18, 1933, before a representative of the War Department and permit has been secured for a clear opening between fenders, for river traffic, of 170 feet and a vertical clearance, with span lifted, of



MODERN IN DESIGN and adequate to accommodate the greatly increased San Francisco-Sacramento traffic to and from the State Capital through the "M" Street gateway this new steel structure will replace the present old, narrow, unsightly bridge over the Sacramento River. It is a lift type bridge, the center span being raised vertically for passage of river craft. The new structure will have an over-all length of approximately 700 feet and cost \$700,000. The above architect's drawing is not final in the detail of certain features and units.



TRAFFIC CAPACITY IS DOUBLED on the new "M" Street bridge as shown by this typical cross-section. The 52-foot roadway will accommodate four lanes of highway traffic, two on either side of the Sacramento and Northern Railroad track occupying the middle lane and separated by curbing. In addition, a 4-foot sidewalk for pedestrians is provided on each side of the roadway.

100 feet above high water. The grade of the bridge will be practically the same as at present with a lift span of 209 feet 6 inches in length flanked by two steel spans one 192 feet 6 inches and the other 165 feet in length.

The vertical lift type of structure was decided upon after considering all other possibilities.

NOVEL SURFACING FEATURE

A novel feature of the structure will be the use of light weight concrete for roadway

slab and sidewalk. This concrete will weigh but 100 pounds per cubic foot while ordinary concrete weighs 150 pounds. The light weight concrete will give 3000 pounds per square inch compressive strength when 28 days old which is comparable to the heavier concrete now used. The lightness of weight is secured by using a special light weight aggregate.

The value, or economy, of using the light weight concrete is that it materially decreases

(Continued on page 27)

Plans Rushed to Provide Employment

(Continued from page 3)

amounting to approximately \$34,000,000 were included in the revised budget.

During the latter part of July and the first three weeks of August a recess in advertising for bids was necessitated to await the 22d of August, upon which date the new State Contract Law, the California Recovery Act and other laws affecting State highway construction became effective. But, under the direction of C. H. Purcell, State Highway Engineer, his assistant George T. McCoy and their able staff of engineers, work in the division offices was rushed so that on Friday, August 25th, fifty projects for State highway construction were advertised.

This unprecedented volume of work instituted under the direct orders of Governor Rolph for the express purpose of relieving unemployment marked the firing of the opening guns of California's Division of Highways' part in the war against economic depression and marked the beginning of the march on the road back to economic recovery. This salient in the line of battle was pushed forward with unabated zeal during the remainder of the year.

TABULATION OF YEAR'S WORK

The following two tabulations set forth a comparison of State highway activities for the first eight months of 1933 with those of the last four months, as well as a comparison of Federal funds and State funds used in getting recovery projects under way:

January 1 to August 24, 1933

Contracts awarded.....	\$5,288,400
Minor improvements.....	211,000
Earthquake reconstruction.....	150,000
Unemployment relief.....	478,300
Miscellaneous day labor work.....	409,200

Total..... \$6,536,900

August 25 to December 31, 1933

	Federal funds	State funds	Totals
Contracts awarded.....	\$8,365,200	\$5,044,800	\$13,410,000
Major day labor.....	156,700	178,000	334,700
Minor improvements.....		161,200	161,200
Miscellaneous day labor.....		118,700	118,700
Totals.....	\$8,521,900	\$5,502,700	\$14,024,600

Construction started during first eight months..... 6,536,900

Total construction started in 1933..... \$20,561,500

A few of the larger and more important projects included in the year's work are listed herewith.

MOST DRASTIC LINE CHANGE

The year 1933 saw the completion of the most drastic change yet made to any one unit of the State Highway System. This change was the construction of the Ridge Route Alternate in Los Angeles County. For many years traffic between southern California and the San Joaquin Valley has battled with the tortuous alignment and adverse grade of the Ridge Route across the Tehachapi and the completion of the alternate, which follows the canyons to the west of the old road, provides a marked saving in time with a great increase in the safety of driving.

The new 30-foot pavement, constructed on an easy alignment, decreases the distance between Castaic School and Tejon Pass by about 10 miles. This improvement, in connection with other work northerly and south-erly of it, has provided a modern high speed arterial between the metropolitan districts of southern California and the great valley regions to the north.

Another improvement to a main arterial of the State highway system to be completed during 1933 was the widening of the 4-mile causeway across the Yolo By-pass about five miles west of Sacramento on the San Francisco-Sacramento road. This structure, built in 1915, with its 20-foot roadway, had become inadequate for the large volume of traffic using this important State highway, and its new width of 42 feet clear roadway is ample for the heaviest traffic.

COAST ROUTE IMPROVEMENT

An important improvement to the heavily traveled Coast Route, which connects Los Angeles and San Francisco, is the new 1232-foot reinforced concrete girder bridge across the Ventura River at the city of Ventura, which was completed during the past year. This new bridge, in conjunction with a co-operative paving project on a new routing within the city, has eliminated one of the

Many Major Projects in Year's Work

(Continued from preceding page)

worst sections of traffic congestion on this main artery.

On the Redwood Highway in Mendocino County, reinforced concrete open spandrel arch span bridges were constructed across Big Dann and Cedar creeks about 2½ miles south of Lane's Flat. These graceful arches blend in with the ruggedness of the country and become a part of the scenic beauty of this famous highway.

As a relief to traffic congestion the recently completed bridge which separates the grades of the State highway and Culver Boulevard, southeast of Venice in Los Angeles County, is a structure of notable interest. The separation of grades at the intersection of these two heavily traveled roads in the heart of the southern California beach area will do much to facilitate the movement of the large volume of traffic which concentrates in this section on Sundays and holidays.

REALIGNMENT AT BAKERSFIELD

Important among the larger projects made up of many units and upon which work has progressed during the year is the new alignment of the Los Angeles-Sacramento arterial through and north of the city of Bakersfield. This improvement covers a distance of approximately five miles, and in addition to the modern roadbed and pavement it involves the construction of three reinforced concrete bridges, including the 2300-foot structure across the Kern River, and two grade separations.

Probably the most important project begun in northern California in 1933 is the grading of the American Canyon Route of the main highway between the San Francisco Bay area and Sacramento. This new routing of this arterial is between the Carquinez Bridge and Cordelia in Solano and Napa counties.

The enormity of the construction of this 10.3 miles of State highway may be judged by the fact that it will require the movement of nearly 1,200,000 cubic yards of earth and approximately 14,000,000 station yards of overhaul; the drainage structures will require 10,800 cubic yards of structure excavation, 650 cubic yards of concrete and 35,500 pounds of reinforcing steel. Over 8700 lineal feet of corrugated metal pipe

will be placed in sizes varying from 8 inches to 96 inches in diameter.

This new route will cut 6 miles from the distance between Sacramento and the Carquinez Bridge.

Further improvement to the Redwood Highway is noted with construction beginning on the grading and surfacing of 9.5 miles of roadbed between Last Chance Slide and Flannigans in Del Norte County and on 7.6 miles between Benbow and 7 miles north of Garberville in Humboldt County.

BIG ARTERIAL PROJECT

In Los Angeles County the improvement of the Los Angeles-Pomona lateral has been advanced along the Garvey Avenue alignment. The bridge across the San Gabriel River on this project is complete and the El Monte Grade separation is under construction. In the city limits of Los Angeles, improvement to the lateral is noted by the putting under way of numerous street grade separations and paving along Ramona Boulevard.

The construction of the Mt. Vernon Avenue viaduct and its approaches at the entrance of the Foothill Boulevard into the city of San Bernardino marks the largest structure to be begun in 1933 by the Division of Highways.

Grading was completed and surfacing begun on the drastic realignment of the Redwood Highway between Cloverdale and Hopland in Sonoma and Mendocino counties. This improvement, which, by following the Russian River, eliminates the climb over the hills between these two towns, has also involved the construction of three major bridges and two grade separations, construction on all of which began in 1933.

BAY BRIDGE APPROACH JOB

As a unit in the construction of the east bay approach for the San Francisco-Oakland Bay Bridge, the Division of Highways is constructing a graded roadbed of variable width involving dredging out the underlying mud to depths of from 6 to 15 feet below the mud surface level and placing a dredger fill to a completed height of approximately 13 feet above mean lower, low water; furnishing and constructing a rock retaining wall, to act also as a breakwater, to a finished elevation of 13

(Continued on page 19)

Realignment of Redding-Alturas Lateral Takes Route Out of Shasta Lava Beds

By J. B. HODGES, District Construction Engineer

THE recent completion and opening to the public of an important section of the Redding-Alturas lateral between Burney and Fall River Mills gives the motoring public of Modoc and Shasta counties 19 miles of modern high standard highway replacing a longer, tortuous old county road that winds through lava beds and over rough country with many curves and grades.

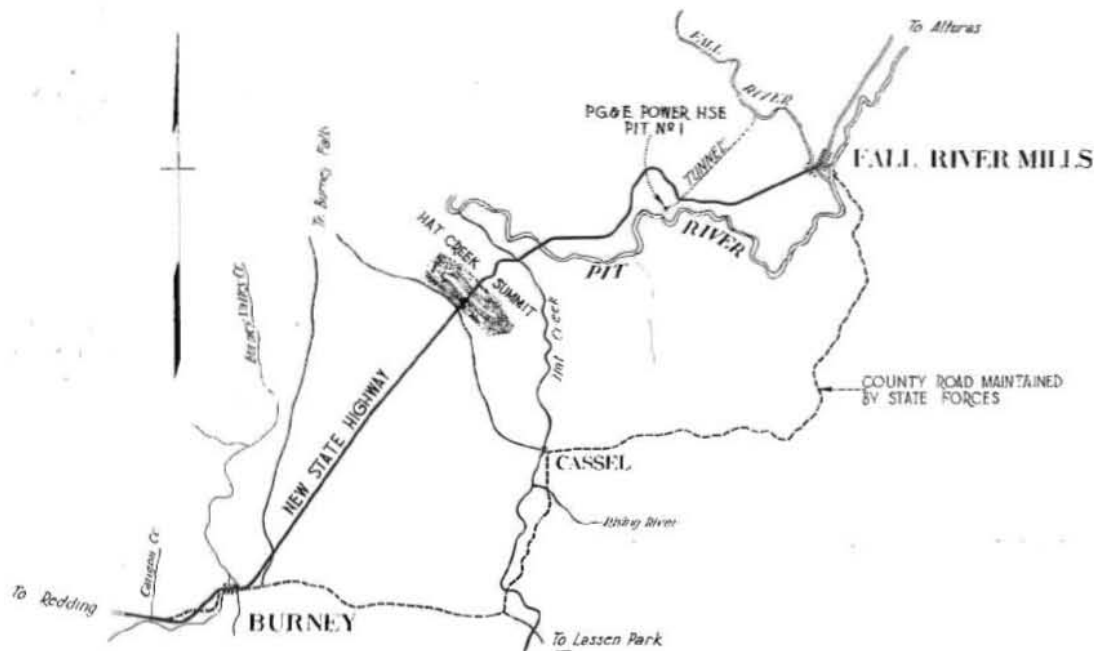
The lateral between Redding and Alturas is of utmost importance to the people of this

improvement now under way adjacent to Redding.

SHORTER, STRAIGHTER ROUTE

Traffic has been reasonably well provided for by existing county roads which have been under State maintenance since 1926.

The old county road between Burney and Fall River Mills which will soon be little used except as a cattle and sheep driveway, complied only too well with the old saying



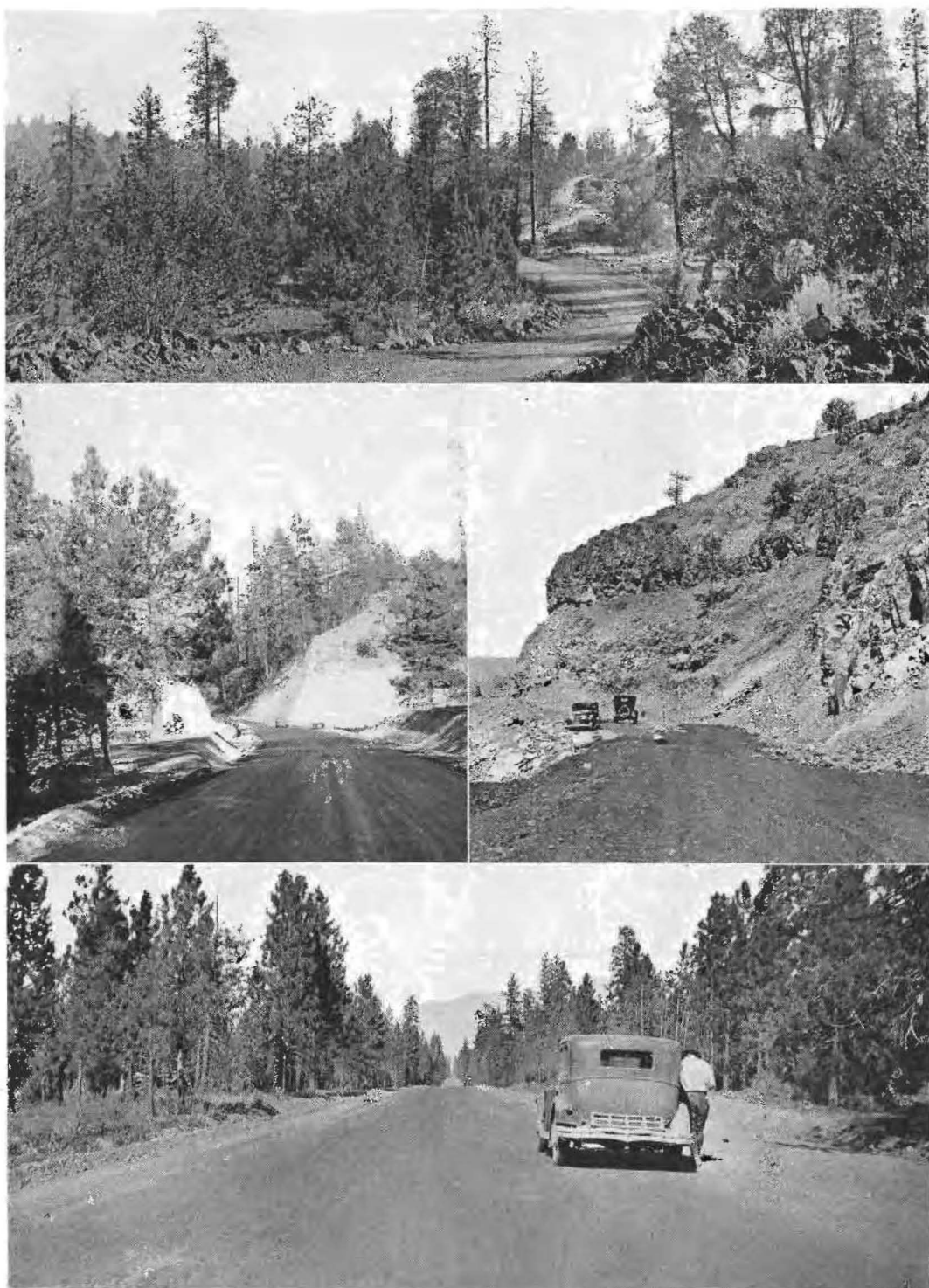
region, providing access on the west to the Sacramento Valley and the Pacific Highway at Redding and on the north to southeastern Oregon and Idaho. To the sportsmen and vacationists of California it has become more familiar in recent years as the route to scenic areas, good fishing grounds and the mule deer country of Modoc County.

With the completion of the realigned section, there yet remains on this route some 32 miles upon which no major construction work has been performed. This will, however, soon be reduced to 17 miles by an

that "the longest way round is the shortest way home," as doubtless it was at the time it was first placed in use. A glance at the accompanying map will show that much of the new State highway is a straight line, and, consequently, "the shortest distance between two points."

A saving in distance of 4.2 miles, with savings in construction and operating costs, has been made. This reduction in distance, the elimination of curves too numerous to count, as well as radical betterment of

(Continued on page 28)



LAVA BEDS, CURVES AND MILEAGE are eliminated by realignment of the Redding-Alturas lateral between Burney and Fall River Mills. At top, narrow, winding old road through lava beds. Left center, new highway through chalk cliffs near Hat Creek Bridge. Right, construction scene in Pit River Canyon. At bottom, completed road east of Burney with only one curve in 7.5 miles.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

EARL LEE KELLY.....Director
JOHN W. HOWE.....Editor

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No. 1

WHAT ARE HIGHWAYS?

Highways, to the State Highway Commission and to the motoring public, are thoroughfares for traffic traversing the State. They are not mere connecting links from the business district of one town to the business district of the next.

The State Legislature, in acceding to the request of the League of California Municipalities and others to allow the cities a portion of State gasoline tax funds, evidently faced this problem. The Legislature purposely gave the expenditure of these funds over to the State Highway Commission, rather than to the city officials of the individual cities, because they sought to serve the motoring public of the State as a whole and not the individual desire of property owners within the cities which happen to be traversed by State highways.—*Santa Cruz Sentinel*.

THAT WHITE LIFE LINE

Ordinarily a white line doesn't mean much. A white line drawn across a sheet of paper or a blackboard wouldn't of itself be of much account, but a white line extending for miles down the middle of a fog-shrouded or rain swept highway is "something again," as they say in modern slang parlance.

During the recent foggy nights and mornings the white line down the highways has been the means of preventing many serious accidents. Motorists are guided safely along on their own side of the road which would be almost impossible to follow without this help.

We commend the State Highway Department for the fine work that it has done in marking the highways of the State. It has saved many lives.—*Oxnard Advertiser*.

Highway Construction Under N. I. R. A. Act Totals \$159,575,000

Progress in award of contracts for public works highway construction has been so rapid in many States as to leave only small balances of the appropriated funds still available for allotment, according to reports of the U. S. Bureau of Public Roads.

At the end of the year, 64 per cent of the \$400,000,000 provided for emergency construction of highways by the National Industrial Recovery Act had been taken up in work advertised for contract or started by day labor employed directly by the highway authorities.

Including California that had taken up 68.6 per cent of available funds there were 26 other States that had exceeded the average rate of progress in putting the road money to work as indicated by reports of work advertised for contract or started by day labor.

A total of 5287 projects, estimated to cost \$273,849,000 had been advertised for contract or begun with day labor up to December 30, the bureau states. The cost of the day-labor projects included in the above is estimated at \$20,160,000.

Of the total number of projects approved by the Federal bureau, 2752 were under construction at the end of the year and 476 were completed. The work under construction, which is estimated to cost \$159,575,000, was giving regular employment to nearly 130,000 men at the turn of the year.

32 Curves in 1.9 Miles Will be Reduced to 9

In Humboldt County a drastic revision in alignment is to be made on the portion of the Redwood Highway between Jordan Creek and the South Scotia Bridge, a distance of 1.9 miles. The work involves grading a road-bed 31 feet and 37 feet wide.

That the new alignment will be a marked improvement over the existing road is evidenced by the fact that in the short distance of two miles the number of curves will be reduced from 32 to 9, and the total curvature from 810° to 215°.

He: "I'll bet when you have to do your own washing you wish you'd married some other man."

She: "Yes, I wish I'd married Mahatma Gandhi."

Seven New Projects Now Under Way on the Monterey Coast

TWO road construction jobs and five bridge projects are under way on the Roosevelt Highway along the Monterey County coast.

Between the Carmel River and Carmel, a distance of about 1.9 miles, the road is being graded to a 36-foot roadbed and the selected material surface is being treated by the road mix method. This project is financed under the National Recovery Act of 1933, and is expected to be completed in May.

At the southerly end of the above project a new bridge across the Carmel River is under construction. This is a reinforced concrete structure with a 24-foot roadway and a 2-foot sidewalk on each side.

WITH N. I. R. A. FUNDS

Between Big Sur and 1.6 miles south of Molera's Ranch, the highway is being constructed with a 24-foot roadbed. This project is also financed under the National Industrial Recovery Act of 1933, and will be completed the latter part of June.

Across Willow Creek, about 32 miles north of San Simeon, a timber bridge is under construction. The structure consists of one 76-foot truss span, two 57-foot truss spans, and fifteen 19-foot spans on frame bents. The roadway is 24 feet wide.

Between 52 and 56 miles south of Monterey, three timber bridges are under construction: one across Anderson Canyon, consisting of one 76-foot truss span and twenty 19-foot stringer spans; one across Buck Creek, consisting of one 57-foot truss span and fourteen 19-foot stringer spans, and one across Lime Creek, consisting of ten 19-foot stringer spans.

INCREASE IN NIGHT DRIVING BOOSTS DEMAND FOR REFLECTORIZED SIGNS

Night driving has so increased during recent years that there is much greater demand for reflectORIZED highway signs, or those outlining direction or warning words with small glass mirror buttons which reflect headlight illumination, reports the Automobile Club of Southern California, official road-marking agency. More than 2500 reflectORIZED signs are in operation in that section.

The grocer and his wife were discussing the costumes they were to wear at a fancy dress ball. Joan, aged seven, was an interested listener.

"Mother," she said, "can I go as a milkmaid?"

"No, dear, you're too small."

"Well, can I go as a condensed milkmaid?"

Modern Substantial Highways Approved by War Department

IN a recent speech, Roy Britten, Director of the National Highway Users' Conference said:

"The propagandist claims that enormous sums are being expended to build roads of excessive strength to accommodate heavy commercial vehicles to compete with the railroads.

"Federal aid for highway construction is extended to facilitate the movement of the mails and to make provision for the national defense. Recently in approving the uniform size and weight restrictions recommended by the American Association of State Highway Officials the War Department said:

"Highways designed to safely carry vehicles of the weights and sizes provided in the recommended Code, it is believed, will be adequate for the War Department needs in time of war or national emergency.

"In the opinion of the War Department, proper provision would not be made for the National defense if our major highways were designed for vehicles of smaller dimensions and weights.'"

REVIEW OF 1933 HIGHWAY WORK

(Continued from page 15)

feet above mean lower low water with a top 4 feet wide. The contract for constructing the dredger fill involves the removal of nearly one million cubic yards of mud and the placing of over three and one-half million cubic yards of dredger sand fill. The construction of the wall along the face of the fill will require approximately three hundred fifty thousand tons of rock. This work is the foundation of the construction for the east bay approaches to the bridge.

Among other important works completed or begun in 1933 are the reconstruction of the Redding-Alturas lateral east of Redding and between Burney and Fall River Mills in Shasta County, construction of the final units of the Crest Route between San Bernardino and Big Bear Lake in San Bernardino County, grading and paving of the Sacramento-Auburn road between Loomis and Newcastle in Placer County, surfacing the Merced-Yosemite lateral between Orange Hill School and Mariposa in Mariposa County and on the Coast Route north of Santa Barbara, grading and paving the 5 miles between Arroyo Hondo and Gaviota Canyon.

President's Letters Are Sympathetic

(Continued from preceding page)

gressional committees from both houses, by the U. S. Army Engineers and by the engineers of the U. S. Bureau of Reclamation.

FEDERAL OFFICIALS APPROVED

The Chief of Engineers of the U. S. War Department recommended a direct Federal contribution of over seven million dollars towards the construction of the Kennett Reservoir in behalf of navigation improvement and flood control. The U. S. Senate Committee on Irrigation and Reclamation reported favorably on the project and recommended Federal financial assistance. In consideration of the favorable approval of all Federal agencies which have heretofore investi-

gated the project, I feel that we may be assured of favorable action by the Federal Emergency Administration of Public Works.

It may be expected that the Water Project Authority will be successful in negotiating contracts for the sale of water and power which will assure the necessary revenues to guarantee the discharge of loans by the Federal Government for construction. Both the water and electric energy to be developed by the project are needed and careful studies made by the State Engineer and reviewed by eminent consulting engineers conclusively show that both the water and the power are needed and can be used and sold in the available markets to produce the requisite revenues.

LETTERS TO GOVERNOR FROM PRESIDENT ROOSEVELT

I have received two communications from President Franklin D. Roosevelt showing his sympathy and favorable regard for the Central Valley Project. On July 7, 1933, the President wrote me in part as follows:

"I am sorry that the pressure of international affairs and the immediate problem of getting the reconstruction program into full swing prevented me from personally going over this matter as, of course, you know my deep interest in projects of this sort.

I sincerely hope that you will meet with great success in this very constructive work in which your State is engaged.

Sincerely yours,

FRANKLIN D. ROOSEVELT."

On November 22 I received another communication from the President with reference to the policy of the Public Works Administration in respect to public works projects in California which I quote in full:

"My dear Governor Rolph:

I have your telegram of November 13. Secretary Ickes tells me that he gave out no statement with reference to a further allocation of funds to California. I am informed that two senators from another State, following a general conference with Secretary Ickes, gave out an interview which was widely quoted, especially on the Pacific Coast. This interview did not represent Secretary Ickes' views.

Secretary Ickes sent a telegram to Senator Hiram W. Johnson on November 20 which does state his views, which telegram was as follows:

'Re tel. I certainly never meant that California would be cut off in future but merely that for time being we would have to proceed with greater discrimination until allotments to other States which have not received their full quota could be increased. I know that California has many worthy projects still awaiting action. I appreciate the unemployment situation in your State and I would gladly favor further immediate allocations

to California if they could be made in fairness to other States. I hope that this is temporary situation so far as California is concerned and that we may be in position shortly to aid you further in your program of public works. You may quote me to this effect if you care to do so.'

In addition to the foregoing telegram to Senator Johnson, Secretary Ickes last week, in response to a telegram from the San Francisco Chronicle, telegraphed that paper as follows:

'Re tel. Public Works Board will continue to consider projects from California on their merits but we must use great discrimination because so many States have not yet had fair proportion of public works funds while California with other western States have already been generously dealt with. We are not committed one way or the other on one hundred seventy million dollar Central Valley Water Conservation and Development Project.'

I hope that this statement of the situation will correct any misapprehensions that exist in your State with reference to the policy of the Public Works Administration.

Sincerely yours,

(Signed) FRANKLIN D. ROOSEVELT."

I have also received communications from several of our congressional representatives offering their assistance and promising their active support and their cooperation with the State's representatives. I am hopeful that every congressman from this State will get actively behind the State's application and assist in obtaining favorable action.

I look forward, my fellow Californians, to great and lasting benefits from this project—to greater happiness and increased prosperity for the Sacramento and San Joaquin valleys and the entire State. The expenditure of this large sum of money for construction and the employment created will be a great impetus to an immediate increase in prosperity, but the more enduring benefits which will emanate from this great undertaking are of even greater importance.

GODSPEED TO OUR REPRESENTATIVES IN WASHINGTON, D. C.

Loan Application Made to Washington

(Continued from page 10)

Federal Public Works Administration in California may be expected shortly.

WATER AUTHORITY MET

Following the approval of the act at the election on December 19, the Water Project Authority, created under the act, met on December 22, 1933, in the office of Attorney General U. S. Webb in Sacramento.

Members of the Authority present comprised:

Earl Lee Kelly, Director of Public Works (chairman).

Charles G. Johnson, State Treasurer.

Ray L. Riley, State Controller.

Rolland A. Vandegrift, Director of Finance.

U. S. Webb, Attorney General.

Also present were Edward Hyatt, State Engineer and executive officer of the Authority and A. D. Edmonston, Deputy State Engineer and acting secretary.

The Authority decided to press immediately and vigorously the application for a grant and loan to

finance the project with the Federal authorities and agencies at Washington, D. C., and authorized State Engineer Edward Hyatt to proceed to Washington, D. C., for this purpose. It was also decided to make every effort to obtain the advice and assistance of the State's representatives in Congress in furthering early and favorable consideration by the Federal authorities.

COMMITTEE APPOINTED

It was further agreed that a suggestion be made to the State Water Plan Association to the effect that they appoint a committee to cooperate with the Authority in the various actions under way.

Representing the Water Project Authority in Washington, D. C., in addition to State Engineer Edward Hyatt, will be Attorney General U. S. Webb, who is in Washington, D. C., on other State business as well, and also Director of Public Works Earl Lee Kelly, Chairman of the Authority. The Authority will be assisted in Washington by representatives of the State Water Plan Association.

WATER PLAN ASSOCIATION LENDS COOPERATION

A meeting of the State Water Plan Association was held in Sacramento on December 29, 1933, to initiate and perfect an organization and program to assist in furthering the consummation of the Central Valley Project. A steering committee was authorized composed of the following members:

James M. Burke, Visalia.

John B. McColl, Redding.

John C. Austin, Los Angeles.

Robert P. Easley, Antioch.

B. S. Crittenden, Stockton.

C. F. Reid, Oakland.

A subcommittee was authorized to outline a method whereby communities could put themselves into a position to obtain water and power from the Central Valley Project and thus make it possible to enter into contracts with the Water Project Authority for the purchase of water and power, thereby putting the

Authority in position to guarantee to the Federal Government the revenue required to justify a grant of 30 per cent of the cost of materials and labor and a loan to cover the balance of the cost of the project to finance its construction.

UTILITY DISTRICTS RECOMMENDED

This committee has already made a preliminary report under date of January 5, 1934, recommending the establishment of a series of municipal utility districts under the law governing organization thereof found in the Statutes of 1921, page 245, Chapter 218, as subsequently amended.

On January 8, 1934, the State Water Plan Association authorized Senators J. M. Irman and John B. McColl to proceed at once to Washington, D. C., to lend their assistance in obtaining favorable action by the Federal authorities on the State's application for a grant and loan to finance the Central Valley Project.

FAVORABLE ACTION ANTICIPATED BY P. W. ADMINISTRATION

Although it is understood that the \$3,300,000,000 appropriation provided by last year's Congress for construction of public works has now been allocated to various approved projects throughout the Nation, the advice from several sources in the Federal administration is to the effect that an additional substantial appropriation for more public works projects will be made at the present session of Congress.

It is anticipated therefore that Federal funds

will be available for financing the Great Central Valley Project and I am confident that the Federal authorities will approve the State's application for a grant and loan which will enable the Water Project Authority to start construction of this great project during this year.

The Project has been approved by all Federal agencies which have had it under investigation during the last three years. It has been approved by Con-

Scheme of Numeral Designations for U. S. Roads Wins Success

IN an interesting article by E. W. James, Chief of the Division of Highway Transport of the U. S. Bureau of Public Roads, Mr. James tells of the confusion and resultant inconvenience caused to motorists by the old practice of giving different names to portions of through highway routes and the history of developments that led to the adoption by the bureau in 1925 of a complete, uniform scheme for designating and marking a system of U. S. highways.

"In this ambitious project" says the article "the cooperation of the Secretary of Agriculture was invited, and he concurred by approving the plan, and designated a board consisting of 21 representatives from as many States, and of three representatives from the Bureau of Public Roads.

"After nine years the wisdom of the course pursued can no longer be questioned. The joint board designated a total of 75,000 miles of routes to be marked and provided a method for increasing this number.

124,758 MILES IN SYSTEM

"At the present time the system comprises 124,758 miles. The trail associations so far as they cause embarrassment or annoyance have almost entirely disappeared. Several at once converted themselves into proponents of one or the other of the principal numbered U. S. highways. For several years, the 'U. S. 40 Association' was active but it was soon seen that the plans of the several States for systematic construction were actually producing the very results for which the earlier associations stood, and it became evident that their continued existence was no longer necessary.

"The routes selected were designated by a systematic scheme of numbering. Those routes which were generally north and south in direction were given odd numbers, with Route No. 1 close to the Atlantic Coast and Route No. 99 close to the Pacific. Even numbers were used for routes whose direction is generally east and west, with the low number along the Canadian border and the high number along the Gulf Coast and Mexico.

SCHEME PROVED SUCCESS

"Among east and west routes No. 10 and its multiple were used to designate the most important and longest of the transcontinental

ENGLAND HAD WEIGHT LAWS FOR VEHICLES 150 YEARS AGO

Three years before the Declaration of Independence there was enacted a weight law for vehicles using the highways in England. It provides that:

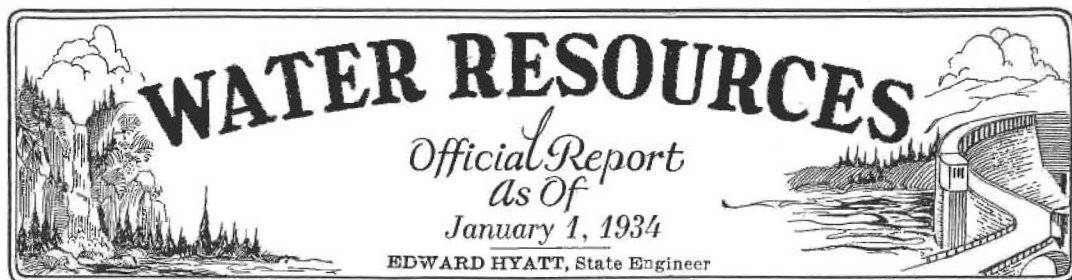
"To every waggon with wheels of less breadth than six inches the weight to be carried shall not be greater than three and one-half tons." It then provided for increasing weights as the breadth of the wheels was widened until the upper limit was reached: "To every waggon upon rollers of the breadth of sixteen inches," the law reads, the weight was limited to 8 tons.

"The distance from wheel to wheel (width between wheels on same axle) shall be not more than four feet two inches. . . ." Axle spacing was limited as follows: "And the distance from the centre of the fore wheel to the centre of the hind wheel . . . be not more than 9 feet to be measured from the centre of the axles."

As in the present day statutes which give exemptions to farmers, there was the provision that, "The regulations of weight shall not extend to wagons, carts or carriages employed only in husbandry . . . or carrying hay, straw, fodder or corn unthreshed." Again, as governmental vehicles are exempted now, so the law then provided that, "nothing contained shall extend to any chaise-marine, coach, landau, berlin, chariot, chaise . . . or the carriage of ammunition or artillery as shall be for his Majesty's service."

connections. Among the north and south routes No. 1, No. 11, No. 21, etc., were similarly used. The success of this scheme seems today unquestioned.

"Routes are known by their numbers almost to the point of attaining a certain individuality. Route No. 30 is known in every community through which it passes. Routes Nos. 40 and 50, and especially No. 90 along the Gulf Coast are equally well known. Route No. 1 on the Atlantic has the distinction of having been used by writers of fiction in describing the travels of their characters, and newspapers, radio announcers and other channels of road information regularly use the U. S. designations.



The State Civil Works Administration has approved of three projects totaling more than \$370,000 for flood control maintenance and channel clearing affording work for many unemployed laborers. The recent storms bringing a greatly increased water flow have resulted in practically eliminating salinity in the delta regions. An increase in applications for the construction of dams is noted, due to opportunity afforded for financing such projects under Federal aid. News of the irrigation districts, water applications and other activities of the department are contained in the following report of State Engineer Edward Hyatt:

Large numbers of relief employment laborers are being assigned to repairs, ditch cleaning and other irrigation district maintenance work throughout the State. At its meeting December 7th, the board of supervisors of Modoc County found for the sufficiency of a petition requesting authority for the formation of the South Fork Irrigation District and referred the same to the State Engineer, who upon investigation of the project, reported that he had found no objection to the proposal for organization.

FLOOD CONTROL AND RECLAMATION

Upon application of the Director of Public Works, the State Civil Works Administration has approved Project No. 502 for various items of maintenance work in the Sacramento River Flood Control Project in Sacramento, Yolo, Yuba and Sutter counties. This involves a total of 71,200 man-hours labor, to cost approximately \$53,380, including tools, supplies and transportation. The cost of supervision will be carried by the maintenance appropriation.

So far the respective county CWA committees have not been able to allocate men to this work, the available quotas being engaged on local projects.

Upon application of the State Reclamation Board, the Civil Works Administration has approved Project No. 503 covering construction, clearing and grubbing in the Sacramento Flood Control Project in Sutter, Yuba and Yolo counties, at an estimated cost of \$312,172 for labor, and this office has been requested to supervise the work, for which purpose funds from \$8,000 to \$12,000 have been allocated out of which tools and transportation will be provided. This work is ready to proceed immediately as far as this office is concerned, but men are not yet available in the various counties on account of the small quotas being occupied on various local projects.

Russian River Jetty.

During the past few weeks work has been so interrupted by storms that only approximately 60 per cent of the normal month's work could be done. A severe storm on December 10th caused considerable damage to the trestle, breaking off and removing the caps and stringers on the five spans at the outer end, a length of 75 feet. Upon application of the Director of Public Works, the State Civil Works Administration has approved Project No. SLF 70 for the continuance of work on the Russian River Jetty. This involves the employment of 24 men for a period of 22 weeks at a labor cost of \$12,500 with an allowance of \$3,520 for materials. Large rock in considerable quantity is now being produced in the quarry, so that effective work can be done.

Pajaro River.

The State Civil Works Administration has approved an item in Project No. 502 for additional clearing in the Pajaro River channel, to be equally divided between the counties of Santa Cruz and Monterey. This work involves 8000 man-hours and a cost of \$6,000, including tools, transportation and contingent expense. This work can be gotten under way just as soon as the men can be furnished from the county quotas.

WATER RIGHTS

Supervision of Applications to Appropriate.

During the month of November 42 applications to appropriate were received, 14 denied and 18 approved.

Among the applications received were 5 of considerable magnitude by the Imperial Irrigation District, which proposes the construction of five power plants along the route of the All American Canal. The estimated cost of the development is \$6,100,000. The electrical installation will approximate 125,000 h.p.

As a result of recent storms the flow of the Sacramento River at Sacramento has increased from about 4000 second-feet at the last of November to 22,000 second feet on December 16th.

At the time salinity sampling was discontinued on November 1st the salinity at Collinsville was 360 and at Antioch 270 parts of chlorine per 100,000. With the recent increase in the flow of the rivers to the delta this salinity at the lower point of the delta should now have been practically eliminated.

DAMS

Judging from the many inquiries, requests for rules and regulations and detailed questions on requirements,

(Continued on page 31)

Seventeen Grade Crossings Eliminated by New Structures and Realignment

By PAUL DUNCKHORST, Assistant Bridge Construction Engineer

ALTHOUGH somewhat lost to view in the present intensive program of highway and bridge construction, the work of grade crossing elimination throughout the California State Highway System is advancing. The Department of Public Works through its Division of Highways is constantly at work on this important problem.

As pointed out in the recent joint report on the grade crossing situation by the California State Railroad Commission and the Division of Highways, the crossings are necessarily given consideration in groups of relative importance, the first or most important group being those involving the intersection of trunk line highways with main line railroads where volume and normal rate of traffic speed demand complete elimination of the hazard.

ELIMINATING HAZARDS

It is to the separation of grades at this type of crossing that the Division of Highways is, in the main, directing its attention. Among exceptions are a few crossings over main line tracks and yards within municipalities, notably the bridge over the Santa Fe Railway in Barstow, and the Mt. Vernon Avenue Viaduct, now under construction in the city of San Bernardino.

Within the past few years eight separation structures have been constructed on the Redwood Highway. Sixteen have been built on the Sacramento-Reno road, twenty between San Francisco and San Diego, and twenty at various other locations. In addition to these there are seven crossing jobs now under contract for completion before the end of the coming summer.

SEVEN JOBS UNDER WAY

Two of the structures now being built are on the Cloverdale-Hopland relocation of the Redwood Highway; one at Preston in Sonoma County and the other at Hopland in Mendocino County, which will bring the total to ten separations completed on this famous highway during the past five years.

Two miles north of Ventura, the Coast Highway passes under the Southern Pacific Railroad on one of those tricky, reverse, hope-I-can-make-it-at-this-speed, curves through a

structure which ever-increasing traffic has rendered too narrow. This situation is being corrected by replacing the old crossing with an overhead with easy grades and approaches. The new bridge has 40-foot roadway, with two 5-foot sidewalks.

On Garvey Avenue near El Monte in Los Angeles County an undercrossing is under construction on new projection of the Imperial Valley Highway, Los Angeles to Yuma.

TWO IMPORTANT VIADUCTS

A busy crossing, especially in the fruit season, is the one at McConnel fifteen miles south of Sacramento where the central valley highway crosses the double track line of the Southern Pacific Railroad. An underpass with a 33½-foot roadway clearance and one 5-foot sidewalk is under contract at this point.

Outstanding among the separations recently built is the bridge across the main lines and yards of the Atchison, Topeka and Santa Fe Railway in Barstow, San Bernardino County. As described in a previous issue of this magazine, the structure is 1163 feet long, consisting of three 175-foot through steel truss spans, one 76-foot and two 65-foot steel girder spans, and 435 feet of timber approach. The structure has a concrete deck with 24-foot roadway and one 5-foot sidewalk, and cost \$158,000. It carries traffic over three main line tracks and twenty yard tracks.

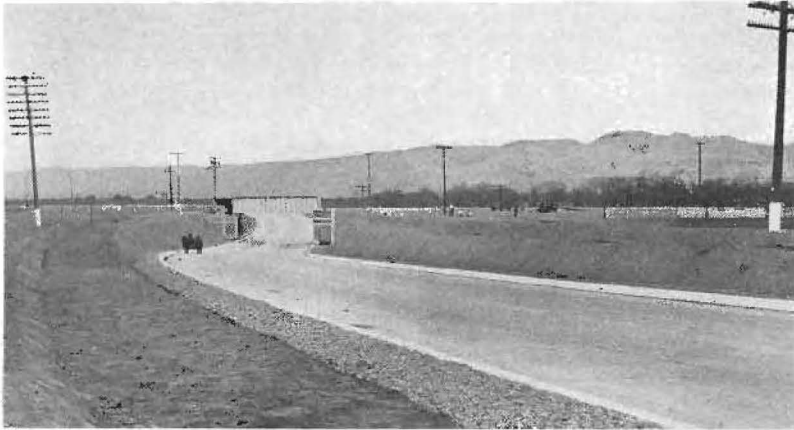
CROSSES 35 TRACKS

A similar project is the Mount Vernon Avenue viaduct under construction in the city of San Bernardino on Foothill Boulevard, State Highway Route 9, between that city and San Fernando in Los Angeles County. It crosses two Santa Fe main line tracks and 33 yard tracks. The bridge is 1016 feet long, consisting of seventeen deck steel girder spans varying from 25 feet to 90 feet long and three concrete spans, with a 40-foot roadway and two 3½-foot sidewalks, costing \$223,000 when complete.

During the past year the old overhead crossing at Elwood, in Santa Barbara County, has been replaced by a new structure. At Madrone, about 20 miles south of San Jose on the Coast Highway, a new underpass was built replacing a dangerous crossing at grade.

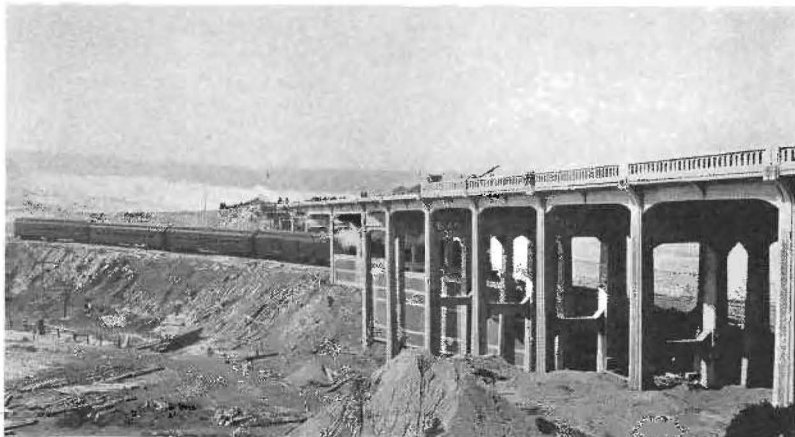
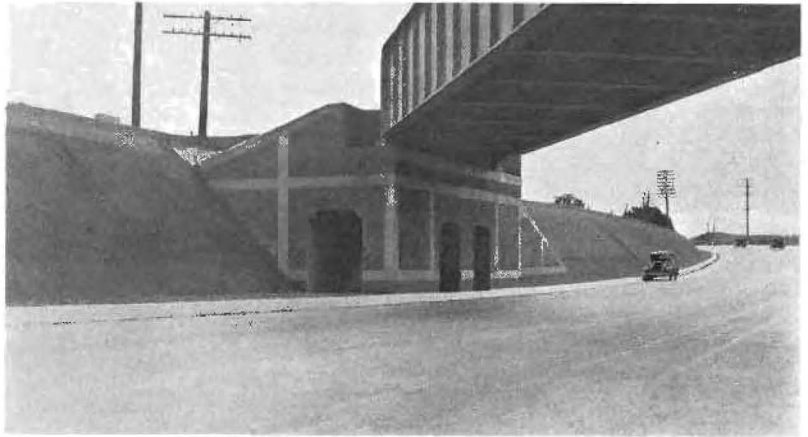
(Continued on page 27)

Newly Completed Grade Separations



Underpass on Coast Highway near Madrone in Santa Clara County where traffic proceeds beneath railroad tracks through a wide subway having planted slopes and sidewalk facilities.

Close-up view of Madrone separation looking across 45-foot roadway at east abutment showing skew of overhead structure and sidewalk facilities with arched openings through abutment.



At Sorrento Canyon near Del Mar in San Diego County the heavy traffic of the Coast Highway is carried over a railroad on a 550-foot structure providing a 42-foot roadway and a 4-foot sidewalk.

Bay Bridge Towers to Rise this Year

(Continued from page 4)

The employment peak of 1933 was reached in November with 2100 men at work in the bay region in addition to those in eastern steel mills. At the close of the year 1933 the pay roll stood at 1990.

Construction of the huge cellular steel towers by the Columbia Steel Company in Pennsylvania mills was started in August, and now the most westerly tower of the bridge is 50 per cent completed. These towers are manufactured in segments and the segments erected by creeper derricks on the site.

The smaller towers are 465 feet high, the larger ones 505 feet high, and there are two of each size. These huge segments, according to officials of the Columbia Steel Company and American Bridge Company, will be shipped out to San Francisco by rail, necessitating in some instances specially designed railroad cars.

ERECTION WORK TO START

Each tower consists of two shafts joined with diagonal cross bracing, and set upon a base-plate of engine-turned steel some four inches in thickness which rests upon the top of the concrete pier. The shafts of the tower are cross-shaped and taper from an overall dimension at the bottom of 36 feet by 19 feet to 15 feet by 12 feet at the top.

Erection of the first of these towers on the San Francisco harbor line will be started early in 1934 and, as before mentioned, three of them will be completed during 1934 and the fourth one early in 1935.

Beautification of the bridge has been a matter of the personal concern of the Director of Public Works and has not been overlooked. A board of architects consisting of Timothy L. Pflueger, Arthur Brown, Jr., and John J. Donovan has during the year produced a pleasing design for the huge concrete masses on Rincon Hill at the cable anchorage, and we incorporated their suggestions in the angles of the tower bracing in order to embody aesthetic principles in these huge structures.

One of the most pleasing aspects of the bridge construction of 1933 has been the fact that the first use of the compressed-air-flotation open-dredging-well caisson has checked so fully with our expectations.

PRECEDENTS ESTABLISHED

Throughout this bridge we have followed, whenever possible, established precedence in

bridge construction. It was, however, necessary, because of the great depth of rock to which we had to go in our pier construction, as well as the great depth of water, that we make precedents in pier construction. It was even necessary for us to design an entirely new method of pier construction based on an invention of one of our consulting engineers, Daniel E. Moran, as has been pointed out.

These caissons have now passed most of the dangerous stages and each has acted in full accord with our expectations. To plan on drafting boards the sinking of a caisson in 106 feet of water, and to engineeringly conjecture on its actions under given conditions in advance of construction, and then to observe the actual operation reacting in every respect as predicted, is of particular satisfaction to engineers.

The rule of the San Francisco-Oakland Bay Bridge Division is to build a bridge rather than set precedents or invent new methods of construction, but nature forced us into some precedent-making operations and these operations have checked with plans as far as we have gone.

IMPORTANT IMPROVEMENT FOR OWENS VALLEY HIGHWAY

An important improvement to the Owens Valley-Tahoe road in Mono County is to be made on the 9.7 miles between Crestview and two miles south of Rush Creek, just southerly of Mono Lake. This project involves a complete reconstruction of this section of State highway with respect to both alignment and grade.

The present road is of low standard, unsuited to modern traffic as it follows the natural contours and undulations of the mountainous terrain in this section.

The new roadbed will be 24 feet wide and will be surfaced 20 feet wide with bituminous treated selected material.

"What historical background is there," queries a Yermouth youth, of the Boston Transcript, "for the hateful habit of forming good resolutions on New Year's?"

"The historical fact," pedagoed the editor, "that every time Eve changed her dress, she turned over a new leaf."

Temporary Bridge to Carry R. R. Over Sacramento River

(Continued from page 13)

the dead load on the bridge which in turn permits of smaller sized steel members.

As far as possible, the structure will be given suitable architectural treatment. The State Division of Architecture is cooperating to insure an esthetic structure.

Special attention is being given to the entrance and exit to the bridge in order that a pleasing appearance will be secured. Special attention is also being given to the approach across Front Street that a smooth street grade will replace the existing rough journey over the various railway tracks.

TEMPORARY BRIDGE NECESSARY

During construction of the bridge vehicular traffic will be routed over the "I" Street bridge and rail traffic over a temporary bridge to be built just upstream from the existing "M" Street bridge.

After considering all possibilities of rerouting the rail traffic across the river the most economical solution was to build a temporary bridge using old railroad girders, which are available, supported by timber pile piers, with a temporary movable span to provide for river traffic.

The changes on the "I" Street bridge consisting of improving the sharp kinks by widening the bridge four feet at these points, will be started in the near future so that the work will be completed prior to the award of contract on the "M" Street bridge which will be in April or May of this year after danger of high water is passed.

RICH TOURIST CROP IN CANADA

Tremendous profit derived from motor tourist travel is well illustrated in a recent report from Canada reaching the Automobile Club of Southern California. This reveals that during 1932, despite economic conditions, the Canadian Dominion received a revenue of \$165,000,000 from motor tourists. In 1931 United States motor tourists spent \$250,000,000 there. Visitors totaled 15,000,000 in 4,909,989 cars, which if strung out in a line would more than reach around the world at the equator.

First Motorist—I see you got the rear end of your coupe built over into a rumble seat.

Second Motorist—Yes, and the whole job only cost me \$100.

First Motorist—Gosh, is it worth that much to you?

Second Motorist—It sure is! You see, my mother-in-law is with us now.

New American Canyon Route Avoids Five Railroad Crossings

(Continued from page 24)

In addition to the elimination of grade crossings by means of structures, the Division of Highways reconstructed portions of some of the trunk line roads on new location, thus eliminating some hazardous situations. Prominent among these are the new road from Gold Run to Airport in Placer County on the Donner Pass route, and the American Canyon cut-off under construction between Cordelia and Carquinez Bridge in Solano County.

The American Canyon cut-off is a newly-established route adopted into the State Highway System by the last Legislature. The northern entrance to this cut-off will be through an undercrossing at the Southern Pacific Line one mile south of Cordelia. The cut-off avoids five crossings at grade with branch lines of the railroad between Napa and Vallejo, and shortens the distance from Sacramento to Oakland by six miles. Bids have just been received for the building of the Cordelia underpass.

The Gold Run to Airport relocation not only converts 13½ miles of tortuous turns into 11½ miles of safe fast highway but eliminates two grade crossings with the main line of the Southern Pacific Railroad to Ogden. It also does away with a narrow and otherwise inadequate timber crossing at Gold Run. One of the grade crossings is three-quarters of a mile east of Gold Run and the other is at Alta. The old road also crossed two spur tracks at Gold Run. The new highway crosses the railroad through a new underpass one-half mile east of Towle, one of the sixteen recently constructed between Sacramento and the Nevada State line.

IMPROVEMENT AT MODESTO

Still another noteworthy project is the realignment of the highway immediately south of the city of Modesto which eliminates the grade crossing at Hatch. The old highway, after paralleling the railroad for miles, took one of those unreasonable jumps across the tracks at Hatch, and continued still parallel and adjacent to the railroad into Modesto. Now, instead of crossing the tracks at Hatch, the new highway continues along the easterly side of the railroad into Modesto, crossing the Tuolumne River on a steel and concrete bridge which was a part of the project.

Route Cuts Through Cinder Mountain

(Continued from page 16)

grades, effects a saving in time for the average driver of between 15 and 20 minutes on the trip between Burney and Fall River Mills.

THROUGH LAVA BEDS

The old road, especially between Cassel and Fall River Mills, passed through lava beds and down into miniature craters. This was interesting at first, but not a pleasure after many trips, and can be forgone in favor of the more varied and spectacular scenery on the new State highway.

On the new highway many lava ledges are cut through west of Burney and east to Hat Creek Summit. Through this section there is also some splendid virgin timber, and with the easy rolling grades, the long tangents are not monotonous, as in some locations.

From Hat Creek Summit the new road descends to cross Hat Creek and Pit River on new bridges constructed during the past winter at a combined cost of \$58,000. Meadows at Hat Creek and Pit River offer a pleasing contrast to the more rugged and primitive country adjacent.

The view at the crossing of the Pit River is especially attractive, and both Hat Creek and Pit River justifiably intrigue the fisherman. Chalk cliffs, in this vicinity of nearly pure diatomaceous earth, and the accessibility of the streams, afford an opportunity to demonstrate that rock will float.

ALONG CANYON BLUFFS

Soon after crossing the Pit River, a gradual ascent on a 4.2 per cent grade is begun to the bluffs of the Pit River Canyon. For a distance of approximately one mile the new construction lies along abrupt cliffs above the canyon. The river, with beautiful falls, is plainly visible from the new highway, as well as an old, abandoned toll road at the river's edge.

At the eastern end of this canyon section, a mountain of volcanic cinders was cut through in constructing the new highway. These cinders, which vary in color, being red, gray and black, were found to be very useful as well as ornamental. Considerable economy was effected by using them as a "sub-base" under the surfacing, as well as for surfacing material on the shoulders.

After passing through the canyon, the new road follows a "bee line" through prairie country to Fall River Mills, and at this point joins previously constructed State highway.

The interesting and aggressive pioneer towns of Burney and Fall River Mills have assumed a metropolitan air by reason of the full width street section provided by the new construction.

ENTIRELY NEW LOCATION

The construction covered by the above contracts starts at a point 2.3 miles west of Burney, and except for a short section in the vicinity of Canyon Creek and a section through Burney, is on entirely new location. The length of new construction, including bridges, is 19.1 miles. The length via the old road is 23.3 miles, or a saving in distance of 4.2 miles. The cost of construction of this new section of State highway, including bridges at Hat Creek, Pit River and Fall River was \$696,000.

On the section from Canyon Creek, west of Burney, to Hat Creek Summit, a distance of 10.2 miles, M. Fredericksen was resident engineer.

On the section from Hat Creek Summit to Fall River Mills, Frank Russell was the resident engineer. This section, including bridges, is 8.9 miles in length. The bridges at Hat Creek, Pit River and Fall River were constructed under two contracts and A. L. Richardson was the resident engineer.

Work was under way on the two road contracts and on the two bridge contracts at the same time, and employment so furnished helped to alleviate the unemployment situation at a time when such help was most needed.

REPAIRING COAST HIGHWAY SECTOR

On the Coast Highway between San Luis Obispo and Pismo, the oil macadam portions of the road, about 1.9 miles in length, are being reconstructed with a 20-foot cement concrete pavement. This project comes under the provisions of the National Industrial Recovery Act of 1933 and will be completed about the first of March.

A man is something that can see pretty ankles three blocks away while driving a motor car in a crowded city street, but will fail to notice, in the wide open countryside, the approach of a locomotive the size of a schoolhouse and accompanied by a flock of forty-two box cars.—*The Borrow Pit.*

State-wide Traffic Survey to Continue in April and July

THE most sweeping and thorough traffic survey ever attempted in California is to be initiated this year by the State Department of Public Works.

With establishment of twelve hundred stations throughout the State, Earl Lee Kelly, Director of Public Works, announces plans to obtain the most comprehensive analysis of automobile and road needs. This work will be undertaken during the months of January, April and July.

In addition, a survey will be started to determine:

1. Total mileage traveled on California highways in the year.
2. Mileage per gallon of gasoline.
3. Types of vehicles driven.

This analysis was made January 14th and 15th with assistance of both northern and southern automobile clubs and the State Chamber of Commerce. Twenty typical locations where the clubs and the State Motor Vehicle Department are issuing license plates were selected in counties through which pass 89 per cent of the total auto registration of California.

The counts for this month, as well as for April and July, will, it may be noted, be scheduled for Sundays and Mondays close to the middle of these months and will be conducted from six o'clock in the morning until ten o'clock at night.

San Francisco, Berkeley, Oakland and Alameda will carry on the work in the cities under State supervision, using CWA workers selected from projects now under way. Captain Macauley, Director of the CWA, has approved the principle of conducting such a state-wide survey with CWA workers, providing it is made a separate project and does not increase the quota now allocated to the respective counties. In other sections of the State, the Department of Public Works will conduct the survey with its regular maintenance crews.

The following cities will have a station to approximately every two thousand inhabitants:

Alameda
Auburn
Bakersfield
Berkeley
Chico

Colusa
Crescent City
El Centro
Eureka
Fresno

CARRYING ON THE HIGH TRADITIONS OF THE SERVICE

Trona, San Bernardino County,
California, December 13, 1933.

Mr. Harry Hopkins,
State Highway Commissioner,
Taft, California.

Dear Sir:

I am taking this occasion to write you of the great courtesy I received at the hands of your superintendent in District No. 6 on the highway between Kern County Park and Glendale December 8th.

I skidded on some snow while rounding a curve and my old Cadillac and I went over the bank together. No one was hurt and the car was not damaged but I was wondering where I would spend the night. Your superintendent came along pretty soon and in a very few minutes he had a tractor there which promptly pulled me back up the bank onto the highway. I was not delayed more than twenty minutes by the mishap. I was very grateful, I assure you for the service of the super and his crew. Not knowing who they were nor why they were so courteous, I took out a roll of bills and asked how much I owed for such prompt and efficient aid. They refused the money which I would have been happy to have paid them and all my urging was useless. The boss said, "No, we do this kind of work every day for someone and it is part of our job."

And so Mr. Commissioner, we have here a splendid example of what Public Service can be when the right type of men are on the job. I wish to commend the Superintendent of District No. 6 and his fine crew and respectfully call your attention to the fine quality of service the public is receiving far up there in the snow-covered Greenhorn Mountains where men are men and where great services are rendered with no thought of accepting money from those benefited. Such men uphold the highest traditions in our beloved California and renew and rekindle our faith in public servants.

Respectfully yours

GEO. P. BEAUCHAMP.

Glendale
Huntington Park
Inglewood
Hanford
Long Beach
Los Angeles
Marysville
Modesto
Needles
Oakland
Orange
Palo Alto
Pasadena
Pomona
Red Bluff
Redding
Redlands
Richmond
Riverside
Sacramento

Salinas
San Bernardino
San Diego
San Francisco
San Jose
San Luis Obispo
Santa Ana
Santa Barbara
Santa Cruz
Santa Monica
Santa Rosa
South Gate
Stockton
Susanville
Ukiah
Vallejo
Ventura
Visalia
Whittier
Woodland

Highway Bids and Awards

FOR DECEMBER

ALAMEDA COUNTY—East Bay Approach, San Francisco-Oakland Bay Bridge, between the westerly end of Key Mole fill and foot of Folger Avenue in Berkeley, District IV, about 4.1 miles to be graded by dredging and placing selected dredger material fill. San Francisco Bridge Co., San Francisco, \$962,685. Contract awarded to American Dredging Co., San Francisco, \$855,963.

ALAMEDA COUNTY—East Bay Approach, San Francisco-Oakland Bay Bridge, between westerly end of Key Mole fill and foot of Folger Avenue in Berkeley, District IV, about 4.1 miles rock retaining wall and miscellaneous riprap to be placed. Healy-Tibbitts Construction Co., San Francisco, \$286,282; Heafey-Moore Co., and J. A. Casson, Oakland, \$241,601; MacDonald & Kahn Company, Ltd., San Francisco, \$351,629. Contract awarded to Fredrickson & Watson Construction Co., Fredrickson Bros., Basalt Rock Company, Inc., Oakland, \$274,687.

HUMBOLDT COUNTY—Reinforced concrete girder bridge across Dean Creek about 5 miles north of Garberville, consisting of three 44-foot spans with concrete piers and abutments. District I, Route 1, Section B. Mittry Brothers, Los Angeles, \$11,464; F. J. Maurer & Son, Inc., Eureka, \$13,930; John Carcano, San Rafael, \$12,742; J. W. Halterman, Willows, \$13,954; Baldwin & Butler, Berkeley, \$11,774. Contract awarded to Theodor Johans, San Francisco, \$10,985.

HUMBOLDT COUNTY—Between Smith Point and Twin Tree Bridge, 0.7 of a mile to be graded and surfaced with screened gravel. District I, Route 1, Section A. Mittry Bros. Const. Co., Los Angeles, \$35,397; Harris Bros., Sacramento, \$39,427; Mercer-Fraser Co., Eureka, \$54,894. Contract awarded to Hemstreet & Bell, Marysville, \$32,238.50.

INYO COUNTY—Between Dougherty's Corner and Birch Canyon, about 5.8 miles to be graded and surfaced with bituminous treated selected surfacing material. District IX, Route 23, Sections D, E, F. Hemstreet & Bell, Marysville, \$131,120. Contract awarded to Basich Brothers, Torrance, \$128,963.

KERN COUNTY—Six timber bridges between junction Route 140 and Junction Route 58, about 494 feet. District VI, Route 139, Section A. C. Bongiovanni Construction Co., Hollywood, \$32,590; Macco Construction Co., Clearwater, \$28,795; R. R. Bishop, Long Beach, \$27,438; F. O. Bohnett, Campbell, \$27,826; Geo. K. Thompson, Los Angeles, \$29,215; M. E. McGowan, Inc., San Francisco, \$28,551; Byerts & Dunn, Los Angeles, \$28,451; Alfred H. Vogt Company, Inc., San Francisco, \$31,400. Contract awarded to Parish Bros., Los Angeles, \$26,344.

LAKE COUNTY—Between Middletown and Putah Creek, about 4.6 miles to be graded and surfaced with crusher run base and bituminous treated crushed gravel or stone surfacing. District I, Route 49, Section A. von der Hellen & Pierson, Castaic, \$147,589; Hemstreet & Bell, Marysville, \$130,066; Peninsula Paving Co., San Francisco, \$137,158; A. Teichert & Son, Inc., Sacramento, \$148,242; Heafey-Moore Co., Oakland, \$149,482; Eaton & Smith and A. J. Grier, San Francisco, \$154,342; Larsen Bros. and Hein Bros. Basalt Rock Co., Petaluma, \$146,347; Hanrahan Co., San Francisco, \$138,934. Contract awarded to Fredrickson & Watson Construction Co.-Fredrickson Bros., Oakland, \$122,398.

LAKE COUNTY—Reinforced concrete bridge across St. Helena Creek, near Middletown, consisting of six 31-foot spans on concrete piers with steel pile foundations and concrete abutments with wing walls. District I, Route 49, Section A. Fredrickson & Watson Const. Co., Oakland, \$20,386; F. C. Amoroso & Sons, San Francisco, \$27,758; M. E. McGowan, Inc., San Francisco, \$19,876; Baldwin & Butler, Berkeley, \$21,245; J. W. Halterman, Willows, \$20,652. Contract awarded to Thos. J. Doyle, San Francisco, \$16,757.

LOS ANGELES COUNTY—In Los Angeles City, between State and Fickett streets, 0.6 of a mile to be graded and paved with Portland cement concrete. District VII, Route 26, Sections L. A. Southern Calif. Roads Co., Los Angeles, \$83,077; Oswald Bros., Los Angeles, \$125,343; Griffith Co., Los Angeles, \$86,109.

Contract awarded to Byerts & Dunn, Los Angeles, \$77,486.

LOS ANGELES COUNTY—Between Olive View and Tunnel Station, about 3.5 miles to be graded and paved with Portland cement concrete. District VII, Route 157, Sections L.A. Sharp & Fellows Contracting Co., Los Angeles, \$275,359; P. J. Akmadzich, Los Angeles, \$274,334; Griffith Co., Los Angeles, \$220,673; Jahn & Bressi Construction Company, Inc., Los Angeles, \$217,664. Contract awarded to J. L. McClain, Los Angeles, \$216,962.

LOS ANGELES COUNTY—Between Evergreen Avenue and Atlantic Boulevard, about 2.8 miles to be graded and paved with Portland cement concrete and asphalt concrete. District VII, Route 26, Section D. Griffith Company, Los Angeles, \$319,894; J. E. Haddock, Ltd., Pasadena, \$302,819; Sander Pearson, Santa Monica, \$326,761; Oswald Bros., Los Angeles, \$314,929; United Concrete Pipe Corp., \$362,900. Contract awarded to Jahn & Bressi, Los Angeles, \$299,644.25.

LOS ANGELES COUNTY—Between Central Avenue & Alameda Street in Graham, 1.5 miles paved with asphalt concrete. District VII, Route 174, Section E. United Concrete Pipe Corp., Los Angeles, \$166,673; Oswald Brothers, Los Angeles, \$142,779; P. J. Akmadzich, Los Angeles, \$164,443; Southern California Roads Co., Los Angeles, \$130,941. Contract awarded to Griffith Company, Los Angeles, \$129,445.50.

MONTEREY COUNTY—Between Big Sur and 1.6 of a mile south of Molera's Ranch, 3.1 miles to be graded. District V, Route 56, Section F. M. J. Bevanda, Stockton, \$162,277; Larsen Bros., Sacramento, \$157,676; S. H. Palmer, San Francisco, \$170,918; Hanrahan Co., San Francisco, \$161,182; Union Paving Co., San Francisco, \$171,985; Hemstreet & Bell, Marysville, \$154,799. Contract awarded to Force Construction Co., Piedmont, \$136,965.55.

MONTEREY COUNTY—Three timber bridges 45 and 49 miles south of Monterey, across Anderson Canyon consisting of one 76-foot span and twenty 19-foot stringer spans; across Buck Creek, one 57-foot span and fourteen 19-foot stringer spans; across Lime Creek, ten 19-foot stringer spans. District V, Route 56, Section D.E. W. J. Tobin, Oakland, \$89,816; G. K. Thompson, Los Angeles, \$80,534; Eaton & Smith & Grier, San Francisco, \$79,983; Theo. M. Malno, San Luis Obispo, \$92,136; R. H. Travers, Los Angeles, \$98,754; Lynch-Cannon, Los Angeles, \$96,495; Lindgren & Swinerton, San Francisco, \$86,376; M. E. McGowan, Inc., San Francisco, \$81,968; F. O. Bennett & N. M. Ball, Berkeley, \$84,800. Contract awarded to Bodenhamer Construction Co., Oakland, \$78,096.

ORANGE COUNTY—Steel stringer bridge with concrete deck consisting of eight 47-foot spans on concrete piers and abutments with pile fenders, across Santa Ana River at Buaro Street. District VII, Herbert M. Baruch Corporation, Ltd., Los Angeles, \$43,944; R. R. Bishop, Long Beach, \$42,168; Silveria & Robbins, Ventura, \$42,511; Sharp & Fellows Contracting Co., Los Angeles, \$44,302; David J. Reed and Joseph Malser, Los Angeles, \$49,063; Byerts & Dunn, Los Angeles, \$42,139. Contract awarded to Franklin B. Gridley, Pasadena, \$41,832.

PLUMAS COUNTY—Steel stringer bridge with concrete deck across Yellow Creek about 2 miles west of Howells consisting of one 50-foot span, one 44-foot span and two 22-foot spans on concrete piers and abutments. District II, Route 21, Section A. Contract awarded to E. T. Lesure, Oakland, \$18,462.

SAN BERNARDINO COUNTY—Between westerly boundary and Camp Cajon, about 15.1 miles to be graded and treated with fuel oil and bluminous surface treatment applied. District VIII, Route 59, Section A. Basich Bros. and John Jurkovich, Torrance, \$147,137; Macco Construction Co., Clearwater, \$165,203; Gist & Bell, Arcadia, \$184,444; Griffith Co., Los Angeles, \$176,564; J. E. Haddock, Pasadena, \$170,906; Isbell Construction Co., Carson City, Nevada, \$187,540; C. G. Willis & Sons, Inc., Chas. G. Willis & Crow Bros., Los Angeles, \$169,355; M. J. Bevanda, Stockton, \$155,862; Geo. K. Thompson, Los Angeles, \$158,356. Con-

State Highway Bids and Awards for the Month of December

(Continued from preceding page)

tract awarded to Sharp & Fellows Contracting Co., Los Angeles, \$146,975.

SAN BERNARDINO COUNTY—Between Pomona and Ontario, 2.1 miles graded and paved with asphalt concrete. District VIII, Route 23, Section C. United Concrete Pipe Corporation, Los Angeles, \$57,304; Oswald Bros., Los Angeles, \$57,753; Imperial Rock Corp. & Orange County Rock Co., Los Angeles, \$76,998. Contract awarded to Griffith Company, Los Angeles, \$57,207.70.

SANTA CRUZ COUNTY—Between north city limits and Ocean Street, in Santa Cruz, about 0.6 mile to be graded, surfaced with crusher run base and bituminous surfacing. District IV, Route 5, Section A. Granite Construction Company, Ltd., Watsonville, \$43,929; J. L. Conner and K. Kristich, Monterey, \$45,982; Biasotti, Willard & Biasotti, Stockton, \$48,967; Kennedy Construction Co., Oakland, \$54,393; Mitty Bros. Construction Co., Los Angeles, \$50,312. Contract awarded to Union Paving Co., San Francisco, \$43,320.

STANISLAUS COUNTY—At Modesto, 1.3 miles to be paved with asphalt concrete. District X, Route 4, Section B. Biasotti, Willard & Biasotti, Stockton, \$71,867; Valley Paving & Construction, Fresno, \$59,918; A. Teichert & Son, Sacramento, \$66,051. Contract awarded to Heafey-Moore Co., Oakland, \$57,774.

TEHAMA COUNTY—At Red Bluff about 0.8 of a mile to be graded and paved with Portland cement concrete and bituminous treated crushed gravel or stone surfacing. Dist. II, Rt. 3, Section C. M. J. Bevanda, Stockton, \$57,070; J. P. Brennan, Redding, \$48,769; A. Teichert & Son, Sacramento, \$48,766. Contract awarded to Hein Bros. Basalt Rock Co., Petaluma, \$46,771.47.

TRINITY COUNTY—Between 1.8 miles west of Burnt Ranch and McDonald Creek, 2.3 miles to be graded and oil treated. District I, Route 20, Section C.D. von der Hellen & Pierson, Castaic, \$112,004; Contoules Const. Co., San Francisco, \$113,307. Contract awarded to Hemstreet & Bell, Marysville, \$111,522.95.

AUTOMOBILE PRODUCTION IN 1933 SHOWS 43 PER CENT INCREASE

Production of motor vehicles in the United States and Canada in 1933 increased 43 per cent over 1932, with foreign sales showing 29 per cent improvement over the previous year's figures, it is reported in preliminary computations from the National Automobile Chamber of Commerce. The report shows that the United States has 72 per cent of the world's automobiles and 3,040,000 miles of highways, of which 920,000 miles are surfaced.

According to the record, the automobile industry last year consumed 85 per cent of the nation's gasoline supply, 80 per cent of the rubber, 59 per cent of the lubricants, 38 per cent of the plate glass, 28 per cent of the nickel, 25 per cent of the aluminum, 15 per cent of the steel and iron, 14 per cent of the lumber and hardwood, 11 per cent of the copper, and 10 per cent of the lead. Cotton fabric used in manufacturing tires totaled 185,000,000 pounds.

A Scotsman on a visit to a friend in London outstayed his welcome. His host thought a hint might have the desired result.

"Don't you think," he asked, "that your wife and family will want you to be with them?"

"Mon," replied the Aberdonian, "I believe you're right. It's rare thoctful of you. I'll just send for them."—*Rotary Reminder.*

New Applications to Build Dams Show Increase for Month

(Continued from page 23)

which have been received during the past month, it is to be expected a number of applications for approval of plans and specifications for construction of dams will be filed shortly. Probably a large part of the activity is due to the opportunities afforded for financing projects under Federal aid, although some of the activity, particularly in debris dams, undoubtedly arises from the advance in the price of newly mined gold.

FEDERAL COOPERATION

Cooperative Topographic Mapping.

It is hoped to obtain some assistance to the general topographic mapping program through cooperation of the Civil Works Administration, which has made \$60,000 available to the Coast and Geodetic Survey. It is anticipated that a portion of this money at least will be made available in the extension of horizontal and vertical controls which will later be useful to the Geological Survey in its topographic mapping program.

WATER RESOURCES

The Central Valley Project Act, which authorizes the construction of the initial units of this plan, was approved by the people at the special election on Tuesday, December 19, 1933, by a majority of approximately 30,000 votes. The Secretary of State estimates that the canvass of the vote will be completed and the official declaration thereof made by him in time to make the act effective sometime between January 10 and January 15, 1934.

MORRO BAY-ATASCADERO RECONSTRUCTION PLANNED

Plans are in progress for the reconstruction of approximately five miles of the road from Morro Bay easterly toward Atascadero. This road is a portion of State Route No. 125 between Morro Bay and Fresno that was included in the secondary roads taken over from the county by an act of the recent Legislature. This project will come under the provisions of the National Industrial Recovery Act of 1933.

LINE CHANGES AT ELWOOD

On the Coast Highway at Elwood a change of line, including the approaches to the new bridge over the Southern Pacific tracks, is under construction with a 20-foot cement concrete pavement on a 36-foot graded roadbed. The project comes under the provisions of the National Industrial Recovery Act of 1933 and will be completed in February.

Joyous Cavalcade of Cars Participates in Highway Dedication

(Continued from page 6)

California Highway Commission; Philip A. Stanton, Timothy A. Reardon and Frank A. Tetley, members of the Commission.

Other notables present included General Ortiz Rubio, past president of Mexico; Assemblymen George B. Bowers, Bruce R. Stannard and Charles W. Stream; Admiral William T. Terrant, U. S. N., Commandant of the 11th Naval District; Tom Hurley, chairman, board of supervisors of San Diego County; city and county officials and representatives of the Chamber of Commerce and civic organizations.

A DREAM FULFILLED

Mayor John Forward, Jr., presiding at the dedication ceremonies opened the program by introducing the Navy band which furnished music for the occasion.

"For years the city has sought an entrance in keeping with the natural beauty of San Diego," said Mayor Forward. "First it was a dream—then it became a necessity. Now we have it and we hope the city will be able to beautify it until it becomes unique."

The mayor paid tribute to the successful efforts of the State Board of Public Works, State Highway Commission, State Park Department and many local organizations and citizens in making the dream come true.

Director Kelly described the highway as one of the finest in California and a splendid auxiliary to Lindberg Field. "The State is seriously considering your needs along El Cajon Boulevard and on the Point Loma road," he said.

PRESIDENT WILL SEE IT

"Congratulations—I hope to have President Roosevelt rolling over this road when Congress adjourns," wired Congressman George Burnham.

Harry A. Hopkins, Chairman of the Highway Commission, spoke of the difficulties overcome in construction of the boulevard, and brief addresses were made by Commissioners Reardon, Stanton and Tetley.

Other speakers included Supervisor Tom Hurley, Frank Forward, chairman of the Chamber of Commerce Road Committee, and Assemblymen Bowers, Stannard and Stream.

At the conclusion of the program a cara-

TABLE OF COMPARATIVE ACCIDENT HISTORY OF 2, 3 AND 4 LANE HIGHWAYS

The following tabulation showing the relation of accidents to number of highway lanes was made by Clarence P. Taylor, Traffic Engineer, State Department of Public Works, Mass., revealing the superiority in safety of the four-lane type. Intersection accidents and accidents to pedestrians are not included.

Number of Lanes	2	3	4
Number of highway links considered	6	8	3
Total mileage involved	150.7	108.4	25.4
Average annual traffic volume—millions of vehicles	2.18	2.49	6.02
Total number of accidents in one year	450	379	144
Rate of accidents per mile	2.99	3.49	5.67
True accident index—accidents per million vehicle miles	1.37	1.40	0.94

van of several hundred automobiles, three abreast, a colorful, jubilant cavalcade, swept along the new boulevard around the curving bayshore to the scene of the ribbon-cutting ceremony at the foot of Rose Canyon, at Balboa Street, Pacific Beach.

KELLY DEDICATES ROAD

After a few words by Mayor Forward, Director of Public Works Kelly's scissors snipped the ribbon barrier as he dedicated the new highway "To the service of the people of California and our visitors."

The last unit of this "million dollar" highway to be completed was the bridge over the San Diego River. This deck plate girder bridge, with concrete deck, consists of eight 80-foot spans on concrete piers and abutments with pile foundations, making a total over all length of 641 feet and having an elevation of 20 feet above the stream bed.

The bridge provides a clear roadway width of 40 feet, and two 4-foot sidewalks. All spans are carried on reinforced concrete hollow piers resting on concrete footings 11 feet 6 inches by 45 feet 3 inches, which in turn rest on 62 untreated Douglas fir piles. The base of the piers is carried 20 feet below the bed line. End abutments rest on 16 reinforced concrete piles 20 feet in length.

Piles for the outer piers in the stream line of the river had to be extended 20 feet in length on account of quicksand. Construction of these piers, owing to subterranean flow of the river, presented some difficult subaqueous problems. Contract for this bridge was awarded February 27, 1933.

STATE OF CALIFORNIA
Department of Public Works

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 EARL LEE KELLY-----Director
 ERIC CULLENWARD-----Deputy Director
 MORGAN KEATON-----Assistant Deputy Director

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CALIFORNIA HIGHWAY COMMISSION

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 TIMOTHY A. REARDON, San Francisco
 PHILIP A. STANTON, Anaheim
 FRANK A. TETLEY, Riverside
 DR. W. W. BARHAM, Yreka
 C. H. PURCELL, State Highway Engineer, Sacramento
 JOHN W. HOWE, Secretary

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 R. H. WILSON (Acting), Office Engineer
 T. E. STANTON, Materials and Research Engineer
 FRED J. GRUMM, Engineer of Surveys and Plans
 C. S. POPE, Construction Engineer
 T. H. DENNIS, Maintenance Engineer
 F. W. PANHORST (Acting), Bridge Engineer
 L. V. CAMPBELL, Engineer of City and Cooperative Projects
 R. H. STALNAKER, Equipment Engineer
 E. R. HIGGINS, Comptroller

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 F. W. HASELWOOD, District II, Redding
 CHARLES H. WHITMORE, District III, Marysville
 J. H. SKEGGS, District IV, San Francisco
 L. H. GIBSON, District V, San Luis Obispo
 R. M. GILLIS (Acting), District VI, Fresno
 S. V. CORTELYOU, District VII, Los Angeles
 E. Q. SULLIVAN, District VIII, San Bernardino
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 R. E. PIERCE, District X, Stockton
 E. E. WALLACE, District XI, San Diego
 General Headquarters, Public Works Building,
 Eleventh and P Streets, Sacramento, California

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A. D. EDMONSTON, Deputy in Charge Water Resources Investigation
 R. L. JONES, Deputy in Charge Flood Control and Reclamation
 GEORGE W. HAWLEY, Deputy in Charge Dams
 SPENCER BURROUGHS, Attorney
 EVERETT N. BRYAN, Hydraulic Engineer, Water Rights
 A. N. BURCH, Irrigation Investigations
 H. M. STAFFORD, Sacramento-San Joaquin Water Supervisor
 GORDAN ZANDER, Adjudication, Water Distribution

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 C. H. KROMER, Principal Structural Engineer
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 J. W. DUTTON, Principal Engineer, General Construction
 W. H. ROCKINGHAM, Principal Mechanical and Electrical Engineer

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 HUGH K. McKEVITT, Attorney, San Francisco
 FRANK B. DURKEE, General Right of Way Agent
 C. R. MONTGOMERY, General Right of Way Agent

DIVISION OF PORTS

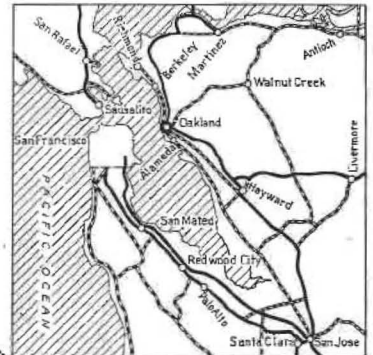
Port of Eureka—William Clark, Sr., Surveyor
 Port of San Jose—Not appointed

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

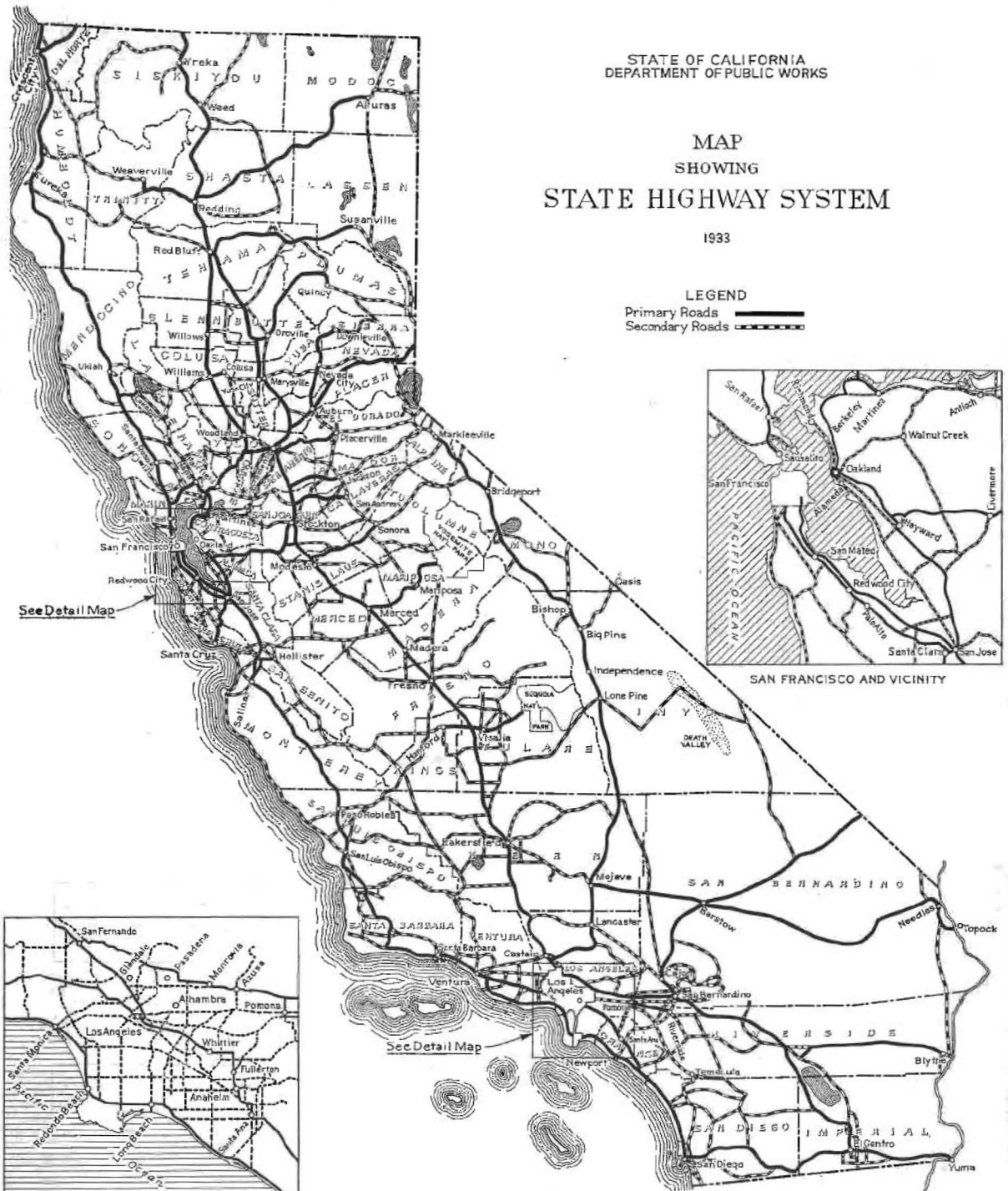
MAP SHOWING STATE HIGHWAY SYSTEM

1933

LEGEND
Primary Roads —————
Secondary Roads - - - - -

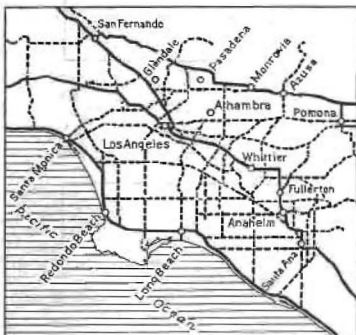


SAN FRANCISCO AND VICINITY



See Detail Map

See Detail Map



LOS ANGELES AND VICINITY