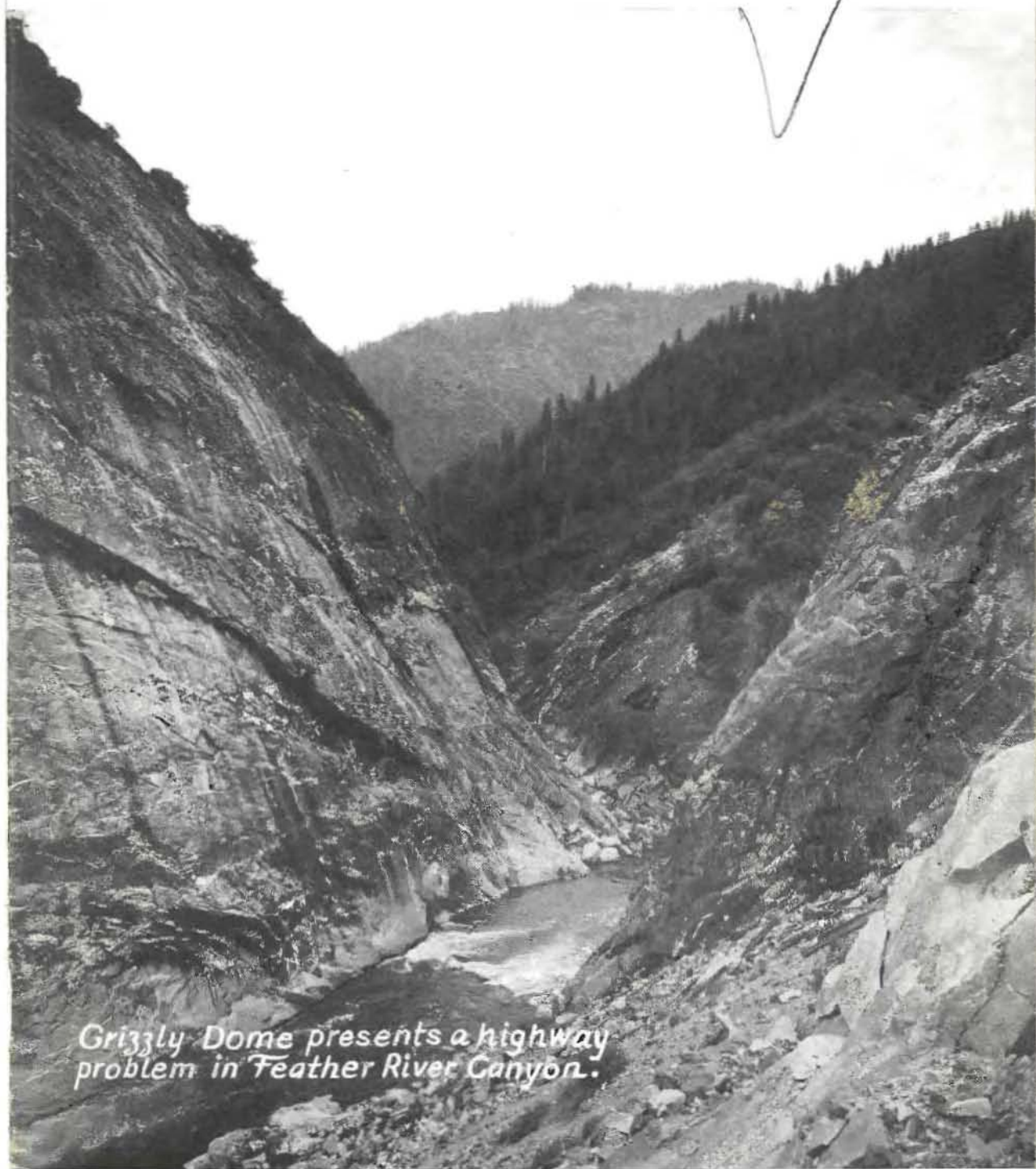


# CALIFORNIA

HIGHWAYS AND PUBLIC WORKS



*Grizzly Dome presents a highway problem in Feather River Canyon.*

Official Journal of the Department of Public Works  
JUNE 1934



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# California Gets \$7,932,206 this Year for Highways Under Act of Congress

Hayden-Cartwright Bill Provides \$200,000,000 for Emergency Construction by States During the 1934-35 Fiscal Period. Further Gasoline Tax Diversions Made Prohibitive

By EARL LEE KELLY, Director of Public Works

**C**ONTINUANCE of the State highway construction program, which has been such a factor in the relief of unemployment in California during the past nine months, is now assured by the passing by Congress on June 9th of the Hayden-Cartwright bill signed by the President June 17th.

By submitting this act to the President for approval, Congress has recognized highway construction as a most effective form of public works for widespread relief of unemployment and has provided the States with the means for the continuation of the mammoth National Recovery road construction program.

To California, the enactment of this federal legislation means that State highway construction activities will continue without abatement and that employment will be furnished to thousands of citizens of the State during the coming year.

This aid for road construction comes at a most opportune moment, as less than 5 per cent of the \$15,607,000 in Federal funds apportioned to California under the National Industrial Recovery Act of last year are allotted to State highway projects which have not been let to contract or advertised for bids.

The enactment of the Hayden-Cartwright measure assures California of approximately \$8,000,000 of Federal funds immediately available for State highway construction and an additional \$4,000,000 Federal aid for each of the two years beginning July 1, 1935.

The bill as originally introduced by Mr. Wilburn Cartwright, Representative from Oklahoma, and Senator Carl Hayden, from Arizona, provided for the appropriation of \$400,000,000 for State highway construction and several lesser amounts for road construction through National Forests, Indian Reservations, National Parks and Monuments and across unappropriated or unre-served public lands.

After reference to the Committee on Post Offices and Post Roads the bill with amendments was favorably reported out of committee and, as amended, and passed, provides for an appropriation of \$200,000,000 for emergency construction of State highways, available this year, the money to be apportioned to the several States under the provisions of the National Industrial Recovery Act, and for an appropriation of \$125,000,000 for each year of the two-year period beginning with July 1, 1935, for Federal aid on State highway construction, this money to be apportioned among the States under the provisions of the Federal Highway Act.

The act also appropriates \$24,000,000 for National Forest, Park, Indian Reservation and public land roads for the fiscal year beginning July 1, 1934, to be expended under the provisions of the National Industrial Recovery Act and, for each of the two fiscal years beginning July 1, 1935, \$10,000,000 for

## NEW FEDERAL FUNDS

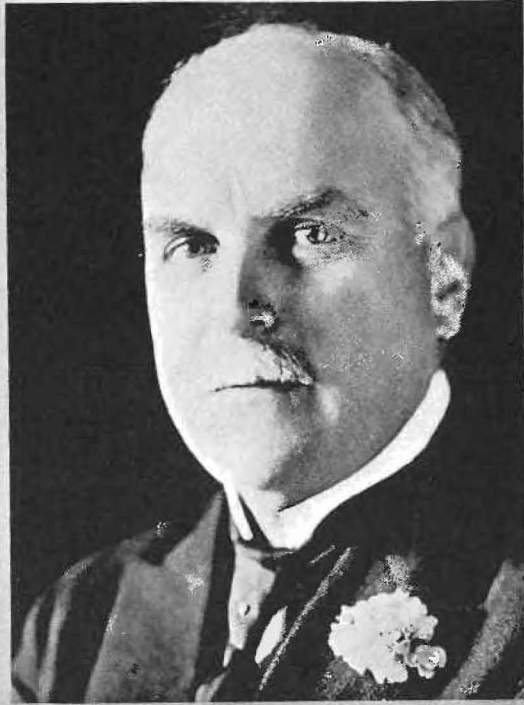
Available 1934-35	\$200,000,000
California's share	7,932,206
Available 1935-36	125,000,000
*California's share	4,000,000
Available 1936-37	125,000,000
*California's share	4,000,000

\*Approximate figures.

(Continued on page 10)



In Memoriam  
James Rolph Jr.



Governor of California

January 1931 ~ June 1934



## Frank Finley Merriam Takes Office as Chief Executive of California

**L**IUTENANT GOVERNOR Frank Finley Merriam of Long Beach was sworn into office as Governor of California following the death of the late Governor James Rolph, Jr., on June 2, 1934.

In addition to becoming the State's chief executive, as provided by law, he will continue to serve as Lieutenant Governor, President of the Senate, member of the Board of Regents of the University of California, Chairman of the Advisory Pardon Board, member of the Department of Penology and Chairman of the California Toll Bridge Authority.

The man who occupies this exalted position of power, authority and leadership in the affairs of the State has had a most varied, interesting and successful career in business and political life as educator, editor and banker, and official of civic and fraternal bodies.

He was born on a farm near Hopkinton, Iowa. His father, Henry Clay Merriam, was Massachusetts born, an Iowa pioneer and Civil War Veteran; his mother, Anna E. Finley, was of Irish parentage and a native of famous Pike County, Missouri. The son was the eldest of eleven children and inherited many of the sterling qualities which characterized the life and deeds of his parents.

Frank F. Merriam was educated in the public schools and at Lenox College from which he was graduated in 1888. He earned his way through college, first as janitor, then as

librarian and later as teacher. During vacations he worked on a farm or at carpenter work. He was an honor man, winning the college oratorical contest and representing his institution in the State association.



FRANK FINLEY MERRIAM

Immediately after graduation from Lenox College, he was elected principal of the Hopkinton schools where he remained three years. He was then elected superintendent of the schools at Wisner, Nebraska, and reelected for the ensuing year but resigned to take charge of the speakers' bureau of the Iowa Republican State Committee in the presidential campaign. Returning to teaching after the campaign, he was principal of the Hesper, Iowa, schools and then superintendent at Postville, Iowa.

Having purchased the *Hopkinton Leader*, he finally gave up

school work to engage in the newspaper business. In connection with his newspaper work, he was elected clerk of the House Committee on Appropriations and at the next session clerk of the Senate Committee on Judiciary of the Iowa Legislature; in 1896 and 1898 he was a member of the House of Representatives and by reason of his experience early became a leader and chairman of one of the most important committees.

#### STATE AUDITOR OF IOWA

In 1898 he was nominated and elected Auditor of the State of Iowa on the Republican ticket, later receiving the nomination for a second term without opposition and elected

(Continued on page 12)

# Bakersfield By-Pass Relocation is Opened with Dedication Ceremonies

By R. S. BADGER, District Construction Engineer

WITH simple ceremonies the new Bakersfield by-pass for Golden State Highway traffic, representing a co-operative investment of more than \$900,000 by city, county and State, was opened to the public on Saturday, June 2, by Chairman Harry A. Hopkins of the California Highway Commission.

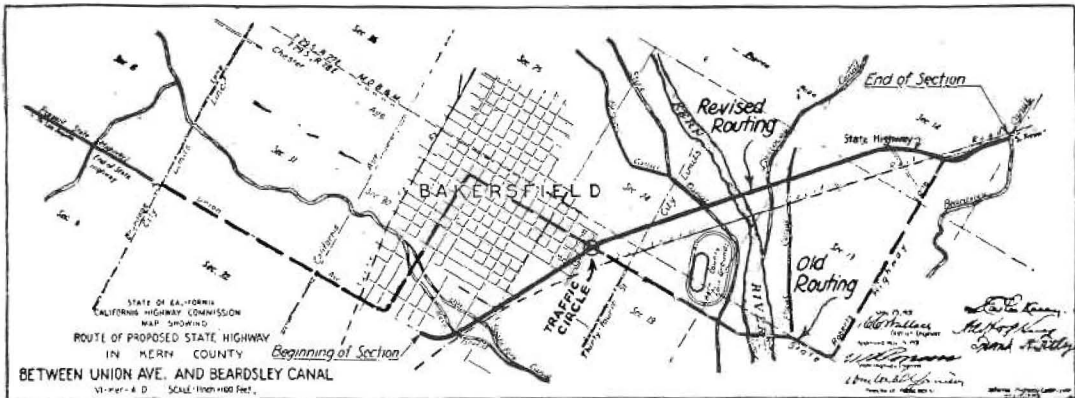
The brief exercises, participated in by public officials and civic leaders, were held on the imposing new over-pass structure near Oil Junction at the north entrance to the city of Bakersfield.

Supervisor Stanley Abel of Kern County presided as master of ceremonies and brief

bridges over Kern River and Beardsley Canal, all of which features tended to make the old route slow, awkward and dangerous. The new routing also satisfactorily relieves congestion of traffic in Bakersfield streets through by-passing the heavy through traffic.

As one travels northerly, the highway now follows Union Avenue to 20th Street whence, by an easy curve, it turns northwesterly and roughly parallels the Southern Pacific Railroad with a 30-foot, three-lane asphaltic concrete pavement, flanked on each side by 3 feet of bituminous treated crushed rock borders.

As it crosses Chester Avenue it passes through a traffic circle of 320 feet diameter



SKETCH MAP showing old and revised routings

addresses were made by Mayor J. R. Gist of Bakersfield; Deputy Director Morgan Keaton of the State Department of Public Works, representing Director Earl Lee Kelly; State Highway Commissioners Philip A. Stanton of Anaheim and Frank A. Tetley of Riverside. The outstanding highway improvement is the result of complete cooperation between the County Planning Commission, the city government and the State Division of Highways.

#### DANGEROUS CROSSINGS AVOIDED

After studying surveys of alternate routings for U. S. No. 99 at Bakersfield, all interests combined on one which avoids the objectionable features of the old route, with its many right angle turns, two grade crossings of multiple trackage, the use of narrow

where traffic from U. S. Route No. 99 can turn into Bakersfield or continue on the by-pass, and where traffic to and from Oildale and Bakersfield can weave in or out of the through traffic with ease and safety.

Further to the northwest it crosses two large canals and the Kern River, the latter on a four-lane bridge of concrete deck supported by timber trestles at approaches and by steel girders and concrete piers at river spans. This bridge is 2293 feet long, has 40 feet of clear roadway width with concrete curb and 4 feet of concrete sidewalks on each side. Its deck is divided into four lanes by built-in-place traffic stripes. The aluminum painted iron railing, together with ornamental lamp posts on each side, helps to give this spacious, plainly designed bridge, an

(Continued on page 22)





**BAKERSFIELD BY-PASS UNITS** examples of modern construction. At top, four-lane steel and concrete overpass spanning railroad tracks. Center, portion of 30-ft. asphaltic concrete pavement with 3-ft. shoulders. Below, steel and concrete bridge over Kern River, 2293 feet long with 40-ft. roadway.



## \$322,000 Viaduct Improvement at San Bernardino Completed and Open

IN THE presence of hundreds of citizens from San Bernardino and Colton the Mount Vernon Avenue viaduct over the tracks of the Santa Fe Railroad in San Bernardino was dedicated with impressive ceremonies and officially opened to the public on Saturday, June 9th.

Chairman Harry A. Hopkins of the California Highway Commission gave the dedicatory address and formally accepted the causeway for the people of California.

Frank A. Tetley of Riverside, member of the California Highway Commission, cut the blue ribbon that opened the bridge to public travel.

### TRIBUTE PAID SPONSORS

Superior Judge Charles L. Allison gave an address honoring the memory of the late Raymond Harris in recognition of the leading part he took in the Chamber of Commerce campaign to obtain the viaduct. Tribute was paid by Mayor E. F. Harford of Colton to the memory of the late Supervisor Milton T. Cheney for his part in bringing about the major improvement.

Chairman Clyde C. Whitney of the Chamber of Commerce Viaduct Committee introduced the other speakers, who included President R. A. Stockwell; Morgan Keaton, Deputy Director of Public Works representing Director Earl Lee Kelly; Mayor O. W. Secombe; Philip A. Stanton of Anaheim, member of the California Highway Commission; F. W. Panhorst, Acting State Bridge Engineer, E. Q. Sullivan, District Engineer, M. E. Whitney, Resident Engineer, Supervisor John Anderson of San Bernardino; members of the city council and other local officials and railroad representatives.

### REPRESENTED GOVERNOR

Mr. Hopkins prefaced his dedicatory address by conveying to the audience the regrets of Governor Frank F. Merriam that he was unable to attend the ceremonies at the invitation of the city. He then officially accepted the new viaduct and supplemental improvements on behalf of the people of California, citing the project as another important betterment of the State highway system comprising as it does a new western approach to the

city and providing a gateway for the traffic of Cajon Pass.

The new viaduct is a steel reinforced concrete bridge over the tracks of the Atchison, Topeka and Santa Fe railroad yard, costing \$190,000 and affording four lanes for vehicular traffic and two pedestrian walks. The improvement has long been a necessary one because the alignment of the old viaduct was especially poor, making what was practically a right-angle turn in its 21-foot roadway at its highest point above ground.

### CALLED "DEATH TRAP"

In addition to being inadequate for modern highway loads it was the scene of several fatalities which caused it to be regarded as a danger point. Built in 1907 it consisted of steel floor beams and stringers with a wooden floor surfaced with asphalt and extended 550 feet along Mount Vernon Avenue and 385 feet easterly, parallel to and 300 feet north of Third Street.

The new viaduct has a 40-foot reinforced concrete roadway with a 3-foot 6-inch sidewalk on each side and an overall length of 1016 feet. It has flared approaches giving easy access at either end. This was accomplished in part by cutting through a new street and rerouting the Pacific Electric tracks. The complete project involved the relocation of the street railway tracks at an estimated cost of \$14,000 and yard changes by the Santa Fe Railroad Company at an estimated cost of \$13,000. New street work cost \$58,000 and rights of way \$30,000.

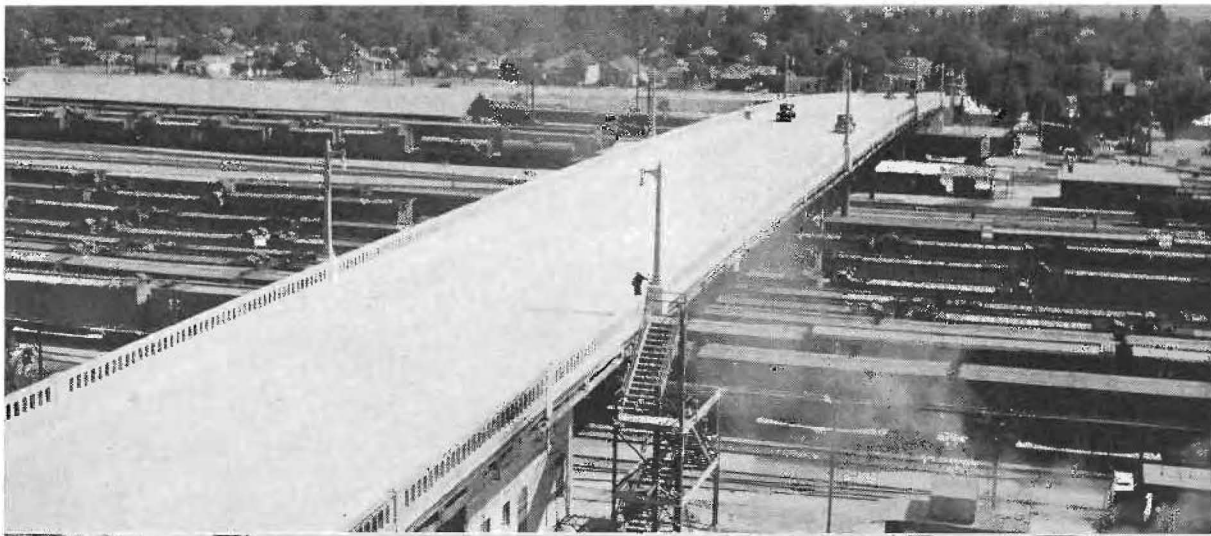
### FINANCED WITH FEDERAL AID

The total cost of the entire improvement project including the viaduct, approaches and work done by the railroads will approximate \$322,000. It was financed from State and Federal funds, the county paying for the necessary rights of way.

The contract, which was awarded October 2, 1933, allowed nine months to complete the work. The contractor finished the job in 5½ months, or 3½ months ahead of schedule.

R. W.: "Do you know what happens to little boys who use bad language when they play marbles?"  
Boy: "Yes, sir, they grow up and play golf."





**A BROAD SPAN** of concrete and steel now carries the highway over the railroad yard at San Bernardino as shown at top. 2. One of the wide, flaring approaches. 3. Old, narrow structure with right-angle turn. 4. Official group at dedicatory ceremonies (left to right): Chamber of Commerce President Ray Stockwell; Mayor A. W. Seccombe; State Bridge Engineer F. W. Panhorst; Highway Commissioner P. A. Stanton; Deputy Director of Public Works Morgan Keaton; Highway Commissioner F. A. Tetley; Chairman C. C. Whitney; Harry A. Hopkins, Chairman Highway Commission; Mayor E. F. Harford, Colton; R. H. Mack, Secretary Chamber of Commerce; Supervisor John Andreson.

# Court Upholds Outdoor Advertising Act and Enforcement Campaign is Renewed

By MORGAN KEATON, Deputy Director of Public Works

ONE of the most important decisions of recent years in connection with the control of outdoor advertising was rendered on May 23, 1934, by Superior Judge Fitzpatrick of the City and County of San Francisco, who ruled that the Outdoor Advertising Act as passed by the last session of the Legislature is constitutional.

The act was attacked in court by the Special Site Sign Company of Oakland, California, alleging that the act is unconstitutional on the ground that it is double taxation and deprives persons of their property without due process of law. Both of these points were decided in favor of Director Earl Lee Kelly, the Department of Public Works, against whom the suit was filed.

The suit had attracted nation-wide attention because several other States have similar laws but in no case has the constitutionality of such acts been tested in the courts. Also, the California decision was being watched by a number of other States who are contemplating passing similar laws.

## REMOVAL CAMPAIGN BEGINS

In rendering this decision, Judge Fitzpatrick dissolved the restraining order placed upon the Department of Public Works against the enforcement of the provisions of the Outdoor Advertising Act. Therefore, the decision now permits its full enforcement and it is now the plan of the director to immediately start a campaign to clean up all nonconforming sign boards existing on any of the highways in California. This will be done by beginning removal on the heavily traveled highways first.

All signs or structures within 300 feet of intersections not in subdivided areas, in unincorporated sections of the State, will be eliminated as well as all signs and structures that are in an unsafe condition, in drainage channels, or obstructing the view of the highways for 500 feet. The act provides that any signs or structures that come within the above violations are public nuisances, and according to the wording of the Civil Code no notice is necessary for the removal of public nuisances. However, in view of the fact that the act provides for a ten days' notice to the owner of the sign or structure, this procedure will be followed.

## 800 PERMITS ISSUED

During the waiting period pending the decision of the case filed against the director, the work of the department was considerably hampered by the reticence of owners of signs and structures to pay the fees in compliance with the law. Yet, in the face of the delay, over 200 persons or corporations have applied for licenses to operate an "Outdoor Advertising Business" and permits have been issued for approximately 8000 structures and 3500 signs throughout the State to date.



MORGAN KEATON

In connection with the enforcement of the act, considerable comment has been forthcoming concerning political candidates' outdoor advertising problems. This act includes all advertising of every nature in unincorporated areas in view of any highway, whether county or State. Therefore, any candidate tacking up quarter cards on private property without the permission of the property owner involved and without securing a permit from the Depart-



# The Axe is About to Descend

Cartoon by Buel—Courtesy Sacramento Bee



ment of Public Works to erect such a sign or structure is liable under the terms of the act and may be prosecuted the same as anyone else using the outdoor advertising method of advertising.

#### NO HARDSHIP INTENDED

In view of the multiplicity of candidates, National, State, and local, the problems of the department in the enforcement of the act will

be many and arduous between now and the general election on November 6, 1934.

Therefore, it shall not be the desire or wish of the department to cause any hardship upon any candidate for public office but it is the hope of the department to enforce the provisions of the act, which is a mandate of the State Legislature, fairly and fearlessly upon all persons who come within the purview of the law.

# 100 Per Cent Federal Grant for 1934-35

(Continued from page 1)

National Forest roads and trails, \$7,500,000 for National Park roads, \$4,000,000 for Indian Reservation roads and \$2,500,000 for main roads across public lands.

These latter appropriations, while having little effect on State highway construction, are of great benefit to the western States, as the greater portion of these parks and public lands are in the eleven western States.

Certain of the provisions of the act demand special mention and attention is called to the new "set up" in the aid of the National government to the States in highway construction.

**The \$200,000,000 appropriation for the coming fiscal year is a "100 per cent grant" appropriation and does not require the States to match Federal funds with State funds.**

There is also a provision which permits the Secretary of Agriculture, upon proper application of State highway departments, to use up to \$10,000,000 of the funds appropriated, for the repair or reconstruction of highways and bridges damaged or destroyed by floods, hurricanes, earthquakes or landslides.

Section 4 of the act, which provides for the \$125,000,000 a year for two years beginning July 1, 1935, sets in operation again the old Federal-aid contributions which began in 1916. This money must be matched by the States with their own funds and is subject to the requirements of the Federal Highway Act.

#### LIMITATIONS PROVIDED

Sections 9 to 15 of the new act are special provisions applying to all funds appropriated by the act, and of these sections 11, 12, 13 and 14 are of vital importance to the States among whom these Federal funds are to be apportioned.

One of these provisions is that, with the approval of the Secretary of Agriculture, not more than 1½ per cent of the amount apportioned to a State in any one year may be used for surveys, plans and engineering investigations of projects for future construction on the Federal-aid highway system or on secondary or feeder roads. While this provision is not of great importance in California, where the development of the State

highway system is well planned, there are many States to which this use of Federal funds will be of great assistance.

Section 12 provides a requirement which is of utmost significance as it definitely sets forth the government's position in regard to the diversion of motor vehicle and gas tax revenues to purposes other than highway construction and maintenance.

#### PROHIBITS FURTHER DIVERSIONS

**The words of the act are unmistakable: "Since it is unfair and unjust to tax motor vehicle transportation, unless the proceeds of such taxation are applied to the construction, improvement or maintenance of highways, after June 30, 1935, Federal aid for highway construction shall be extended only to those States that use at least the amounts now provided by law for such purposes in each State from State motor vehicle registration fees, licenses, gasoline taxes and other special taxes on motor vehicle owners and operators of all kinds for the construction, improvement and maintenance of highways \* \* \*"**

Another provision lifts the limitations set forth in the Federal Highway Act as to Federal participation up to a limited cost per mile for construction and to such participation within the limits of municipalities.

Section 14 waives any further repayments by the States to the Federal government on account amounts paid or advanced to the States under the Federal Highway Act or the Emergency Relief and Construction Act of 1932.

#### CHAMBERS OF COMMERCE HELPED

The passage of this act by the second session of the 73d Congress has assured the Nation of continued assistance on the road back to recovery, but it must be remembered that the action of Congress was only at the instance of the people. The California Highway Commission, upon the recommendation of the Director of Public Works, at its meeting on April 6, last, passed a resolution requesting Congress to pass this act and Mr. Harry A. Hopkins, chairman of the commission, went to Washington to lend his support to those others from many States who were working for its passage.

(Continued on page 11)



## Gasoline Sales Tax Report Shows Gain in Revenue for State

CALIFORNIA gasoline taxes for April amounted to \$3,643,836.19, exceeding the April collections for the past three years, according to the latest report made by the State Board of Equalization. The month's tax surpassed that for April, 1933, by \$288,387.22 marking a gain of 8.5 per cent.

"Comparisons of monthly distributions of motor vehicle fuel for years prior to 1931 can not be made readily from our records," says the report, "because the tax was not paid on a monthly basis until April of that year. Before then, oil companies made their returns to the board for quarterly periods.

### PRACTICALLY NO DELINQUENCIES

"Payment of the tax each month, as advocated by the board, has proved of great benefit to the State in reducing losses through failure of gasoline distributors to meet their tax obligations. Despite the trying financial period during which we have passed there have been practically no delinquencies in the three cents per gallon motor vehicle fuel tax.

"Although the gasoline tax for April was considerably less than the March total of \$4,048,511.61, which marked a gain of 24.4 per cent over the corresponding month of 1933, the figure is indicative of a substantial upward trend in the petroleum industry."

### HIGHWAY COMMISSION ACTED

(Continued from page 10)

Copies of the commission's resolution were sent to every Chamber of Commerce in California with the request that they pass similar resolutions and inform their Congressmen and Senators of their desire for the legislation.

It was only through the cooperation and united efforts of a great army of American citizens from all States, who are interested in highway development and who realize the effectiveness of highway construction as an unemployment relief measure, that this aid from the Federal government was granted, and California is proud of the efforts of her sons who so ably assisted, and now she steps forward again with an intensive highway construction program which will provide employment and the necessities of living for thousands of her citizens and their families.

### ROADS AND STREETS GIVING JOBS TO 3,000,000 MEN IN U. S.

Road building has been tested during the past year as a means of relieving unemployment and has been found most satisfactory, according to W. R. Smith, President of the American Road Builders Association. More than a million men are now employed on roads and streets. Two other men are busy furnishing each road worker with supplies, he estimated.

"Money spent on public roads is spread over a wide area in both country and city. The dollar spent in road and street construction has double value; it pays the bills of the worker, and thereby aids in the creation of a stronger market for commodities, and it has a permanent value in decreasing the cost of highway travel that affects everyone," continued Mr. Smith.

"A man out of a job needs it where he lives and road and street work bring the job to him. Highway work readily absorbs men from all classes of industry temporarily inactive. Relief of unemployment might well be concentrated on road and street construction that has been tested and found efficient."

### New Sheets Available of Topographic Map

Advance sheets of a revision of the Truckee Quadrangle of the new State topographic maps are now available on a scale of 1/96000. The field work in connection with the revision was carried on in 1932 and the sheet will later be published in color on a scale of 1/125000 with a contour interval of 100 feet. This sheet was originally surveyed in 1889 and the maps heretofore available did not show roads, trails, and culture as of today so that the new edition will be a distinct boon to recreationists in the Tahoe-Truckee area.

Final sheets of the La Cima Quadrangle are now available. This topographic sheet covers an area in Fresno and Kings counties in the Kettleman Hills area. It is published on a scale of 1/31680 with a contour interval of 5 and 25 feet.

Both of the above described sheets were produced by the U. S. Geological Survey in cooperation with the State of California, acting through the State Engineer's office.

Visitors were present:

"Daddy, may I have a dime?" asked little George. Daddy obliged with a smile.

"This time you won't make me give it back after the company's gone, will you, daddy?" was the son's loud remark.



## Governor Merriam Leader in Civic Life

(Continued from page 3)

by nearly one hundred thousand majority over the fusion candidate. Following his occupancy of the Auditor's office, Mr. Merriam removed to Muskogee, Indian Territory, where he engaged in the newspaper business, first as owner and editor of the *Times* and later as half owner and business manager of the *Phoenix*. Owing to sickness in the family the Merriams removed to Long Beach, California, in 1910, and have since made that city their home.

Mr. Merriam's California experience has been exceedingly pleasant. For ten years he was connected with the advertising department of the *Long Beach Press*, resigning as advertising manager to give personal attention to other business in which he had become interested. In 1924 he became president of the Citizens State Bank of Long Beach; entering the political campaign in 1926, he resigned the presidency although remaining with the bank as director and vice president. In recent years he has been a broker and engaged in the real estate business in addition to his banking connection.

### SPEAKER OF THE ASSEMBLY

Business success, however, does not measure the attainments of Governor Merriam in Long Beach. In 1916 he was elected to the California Assembly from the Seventieth District and was reelected in 1918, 1920, 1922 and 1924. The last two elections were practically unanimous since no Republican candidate opposed him either in the primary or the general election. He was elected Speaker of the forty-fifth and forty-sixth sessions and served with great credit and distinction.

Friend W. Richardson's successful effort to secure the Governor's office in 1922 received Mr. Merriam's support and he had full charge and management of the campaigns in southern California for the primary and the general election. The presidential primary campaign for the selection of delegates to the Republican National Convention in 1924 again brought Mr. Merriam into prominence, this time as one of the managers for Calvin Coolidge in southern California.

### WON POLITICAL HONORS

In 1928 he was elected State Senator from the Thirty-third District for a term

of four years. Less than a month later another honor came to Mr. Merriam in his selection as chairman of the Republican State Central Committee.

Although he had served but half of his term in the State Senate, he was nominated for the office of Lieutenant Governor on the Republican ticket at the primaries in August, 1930, and at the November election was elected by the largest vote ever accorded a candidate for Lieutenant Governor in the State of California.

Few men are held in higher esteem at his home in Long Beach than Governor Merriam. He served three years as president of the Red Cross Chapter; was chairman of the Boy Scout Council; served for several years as president of the Federated Church Brotherhood of Long Beach; is a charter member of the Advertising Club and served as president; is a member of the Sons of Veterans and of the Chamber of Commerce. He was a Four Minute Speaker during the war period and was active in the campaigns for sale of liberty bonds and war savings stamps.

### PRESIDENT OF CIVIC BODIES

By reason of his election to the Speakership of the Assembly he was Regent of the University of California for four years; he was president of the Harbor District Chambers of Commerce (a federated organization of more than sixty Chambers of Commerce and Improvement Associations) for five years; was president of the Long Beach Kiwanis Club for the year 1927; is a past president of the Iowa Association for Southern California; is superintendent of the Sunday School of the First Presbyterian Church and is serving his ninth year as president of the Men's Brotherhood of that church. He is a Royal Prince of the Dramatic Order Knights of Khorassan and Past Grand Chancellor of the Knights of Pythias of California.

Mrs. Nellie E. Merriam died very suddenly at Santa Rosa on July 6, 1931, as she and her husband were returning from a trip to Eureka where Mr. Merriam had delivered a Fourth of July address.

Visitor: "Well, Joe, how do you like your new little sister?"

Joe: "Oh, she's all right, I guess, but there are lots of things we needed worse."—*Pathfinder*.



## The Maintenance Man

Since Adam blamed Eve for the apple  
In words too lurid to quote,  
There's always been some poor mortal  
Who's fated to be the goat,  
And the guy in the highway system  
Like the dog who is tied to a can,  
Is that poor and unsung hero  
Entitled "The Maintenance Man."

For he blades his road in the morning  
And leaves it a beautiful sight,  
But a tractor goes through with a harrow or two—  
You should see that road by night!

He cleans out his gutters and shoulders,  
Then tears at his graying locks,



For since Adam blamed Eve for the apple,  
And Cain sowed his first wild oat,  
There's always been some poor mortal  
Who's fated to be the goat,  
And the guy in the highway system  
Who everyone loves to damn  
Is that poor, long-suffering creature  
Entitled, "The Maintenance Man;"  
And I think when he meets Saint Peter  
And looks at the heavenly road,  
Where the tractors all have street plates  
And the trucks never over-load,  
With never a broken guard rail,  
No thistle or puncture vine,

So he patches his pavement  
And toils with his blade,  
Cleans out his ditches  
And builds up his grade,  
Replaces his guard rails,  
Trims up his trees,  
Crawls through his culverts  
To clear out the leaves,  
Lays dust oil in summer,  
Sprays weed oil in spring,  
Drives over each mile  
Never missing a thing,  
In short he does all  
That he possibly can,  
This poor patient guy  
Called the "Maintenance Man;"  
But whenever it rains  
And the pavement gets slick,  
Or the paint stripe fades  
When the fog is thick,  
Or a tourist gets dust  
On his big sedan—  
Who gets the blame?  
Why, "The Maintenance Man!"

For the sheep come through and a thousand or two  
Can scatter a million rocks!

He sweats all week with his hot pot,  
Patching each hole, and then  
The trucks come through with a trailer or two,  
And he patches all over again!

He sets the posts for his guard rail  
Two feet eight inches deep,  
But a driver comes through with a drink or two,  
And the guard rail's a kindling heap!

He places a red reflector  
At a curve on the broad main line,  
And a hunter comes through, takes a pot shot or two,  
And that is the end of the sign!



No dust to lay, no weeds to spray  
And never a shattered sign,  
He'll turn to the worthy Peter with,  
"Pete, this is surely swell,  
"But I've heard of another district,  
"We used to call it 'Hell,'  
"And the roads are not so much there  
"For they're paved with good intentions,"  
"And I think that would suit me better,  
"You see, I forgot to mention—"  
"Just stop right there," Saint Pete will say,  
"For now that I look at your pan  
"I can see why you'd rather go Below—  
"You're an old time Maintenance Man!"

—Gladys Craig Potter (Wife of C. A. Potter, Maintenance Superintendent, Marysville, California.)





# Building a Viaduct Under Difficulties Where Teeming Traffic Lanes Cross

By C. W. JONES, Bridge Construction Engineer, Southern District

**A**T THE intersection of Sunset and Glendale boulevards, two major traffic thoroughfares in the heart of the city of Los Angeles, the State is constructing a new concrete viaduct. This structure will replace a dilapidated timber trestle which has served for the past 29 years to separate grades at this boulevard intersection.

Sunset Boulevard has ever been a heavy travel artery into the Hollywood area and it is roughly estimated that in the twenty-nine years of its service the old timber trestle has carried more than 100,000,000 vehicles over Glendale Boulevard, an equally busy arterial.

There are a number of interesting problems in connection with the work. Ordinarily it is not considered difficult to demolish a three-span timber trestle structure and construct a 90-foot concrete arch span.

In the case of the Sunset-Glendale structure, however, it will be necessary to accomplish this work without interrupting two lines of street railway traffic which cross the intersection, one over the structure and the other on the street level under it. This is being accomplished by constructing the arch one-half width at a time, building temporary trestle work and making three separate shifts of railway tracks and trolleys.

#### PUBLIC SERVICES MAINTAINED

In addition to the railway traffic, there is at this boulevard intersection a tremendous volume of vehicular traffic. It was found necessary to temporarily reroute this vehicular traffic over adjacent streets. In order to minimize this inconvenience, work is being rushed with all possible speed so that the structure may be in use as quickly as possible.

In addition to the traffic interference, there are pole lines carrying a maze of trolleys, cables and wires. There are also conduits, sewers and gas lines. All of this service has to be maintained. The temporary relocation and shifting of these lines of public utilities so that they will not interfere with construction work required considerable study, work and expense.

The structure is also hemmed in by buildings, some of which had to be underpinned and supported when excavation was made. It was also necessary to provide access to buildings where excavation removed street entrances and to provide for pedestrian traffic over and under the structure throughout construction.

#### CONCRETE PILES USED

Investigation showed that the natural ground formation could not safely support the proposed type of structure. Any appreciable spreading or unequal settlement of abutments in the case of this fixed concrete arch would prove disastrous. The poor ground formation has been made strong enough to support the structure by driving into it a large number of concrete piles.

The original timber bridge consisted of three spans with intermediate piers through which traffic had to filter on Glendale Boulevard. The underclearance in the case of the old structure was barely sufficient to accommodate the trolleys of the street cars. It was decided to construct a clear span across the entire street without any central pier obstructions. It was also decided to maintain present street grades, for altering same would involve tremendous damage to adjoining property and make difficult the entrance to existing buildings.

In order to secure this long clear span free from central piers and at the same time not alter street grades nor encroach upon necessary trolley clearances it was necessary to design and build an extremely flat and shallow arch structure and during construction make use of heavy steel girders to temporarily support the falsework over the tracks.

#### MAXIMUM EMPLOYMENT PROVIDED

The structure is being financed from Federal aid funds. It is the desire of the Federal and State governments that these funds be expended to provide a maximum amount of employment. The contractor, under the contract as written, must do the work with laborers sent to him by the local United States employment office. He is also required to make use largely of hand labor methods.

(Continued on page 29)





*Drawing by Owens, courtesy Los Angeles Times*



**BUSY SCENE IN CITY'S HEART.** Activities attendant upon the construction by the State of the \$130,000 viaduct now being built over Glendale Boulevard at the intersection with Sunset Boulevard in the city of Los Angeles is shown in the top sketch by Artist Charles Owens of the "Los Angeles Times." The lower photographs show how the excavation and building work is being carried on without interrupting traffic of the two street railway lines on both levels of the grade separation.

## 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

Address communications to California Highways and Public Works, P. O. Box 1499, Sacramento, California.

Vol. 14 JUNE, 1934 No. 6

### THE HIGHWAY PROGRAM

Every Californian should be proud of the vast highway improvement plan that has been mapped out for the current biennium, requiring the expenditure of no less than \$34,000,000, and which has been speeded up to provide work throughout the State, until at the peak of activity during the early summer it is expected that it will furnish employment for no less than 18,000 men.

The two year program calls for the building of 1157 miles of new road, besides extensive improvements throughout the entire system. Every day's work expended upon permanent highway construction is a direct benefit to society in which all may share, and when the money has been paid out California will have something to show for its \$34,000,000 that it has spent for employment.

California has set an example in highway construction that could be followed profitably by every other State in the Union. Why fritter away billions of dollars in useless projects when road construction offers a real investment in every community in the country? Here is a solution for unemployment that really gives the taxpayer something for his money and at the same time gives the employed the feeling that he is worthily engaged in constructive endeavor, rather than the beneficiary of a dole.—*Tustin News.*

### TUNNEL PROJECT MEANS JOBS FOR HUNDREDS

Jobs for hundreds of men will be created when work starts on the low-level tunnel this month, and Contra Costa County will benefit directly by the launching of this first of the major public work projects to get under way in California.

## 22,000 Contractors Warned to Renew Licenses by June 30

CONTRACTORS and builders throughout California have been cautioned that they must file an application for the renewal of their State contractor's license before June 30, if they expect to remain in business.

Warning that the licenses of approximately 22,000 registered contractors would become delinquent June 30 was broadcast by Glen V. Slater, assistant State registrar of contractors.

Under State law, all contractors are compelled to register. The renewal fee is \$5 if the renewal application is filed before June 30. A delinquent fee of \$5, making a total license fee of \$10, is required on all licenses issued after June 30. It is illegal for a contractor to operate without a license.

With an upward trend apparent in the building and construction industry, contractors and builders who fail to apply for their 1934-35 licenses before June 30 will be endangering their right to bid on new construction work.

Col. Carlos W. Huntington, State Registrar of Contractors, has so advised builders in urging prompt action in filing renewal applications.

The Registrar hailed the large number of renewal applications already filed as "further indication of a general improvement in building and construction operations."

"The heavy volume of renewal applications received in the Sacramento offices," Huntington said, "is gratifying and indicates a continued improvement in building and construction operations."

"The trend of business appears to be improved generally, and we feel confident that the 1934-35 registrations will exceed the total for the fiscal year ending June 30."

For the untiring efforts of those responsible for shaping up the project and for driving through the details of financing and clearing away the legal obstacles, full credit is in order. \* \* \* Their combined efforts are responsible for the early start, marked by the ground-breaking ceremonies on June 17.

Completion of the project is expected by January, 1936, and Diablo Valley, no less than the close-in districts, will be benefited at once.—*Brentwood News.*



## Projects Advertised for Bids

Improvements totaling \$1,670,500 estimated cost are being advertised for bids during June. They comprise State highway improvements in eleven counties providing work in all parts of the State. The list includes 9 road jobs covering 121.8 miles and 3 bridge structures.

### DETAILED LIST OF PROJECTS

County	Location	Type	Miles
Santa Barbara	Santa Barbara City	Grade Separation	(1)
San Diego	Escondido to Lake Hodges Dam	Graded Roadbed	5.5
Yolo	Bet. Woodland and Elkhorn Ferry	Untreated Gr. Base	3.9
Shasta	Across Sacramento R. at Redding	Steel Bridge	(1)
Monterey	Mustang Grade to Priests Valley	Graded Roadbed	3.3
San Diego	El Cajon to 1 mile easterly	Pavement	1.0
Nevada	Hinton to Floriston	Bituminous treated cr. rock surface	3.5
Colusa	Maxwell to Delevan	Pavement	5.5
Yolo-Sacramento	Across Sacramento River at Sacramento	Steel Bridge	(1)
Mono	Carringtons to Rush Creek & Hot Creek to Mammoth Ranger Station	Oil Roadbed	19.7
Ventura	Ojai to Westerly Boundary	Oil Roadbed	42.1
Kern	Rio Bravo to Wasco & Old Quarry to Sequoia National Park	Oil Roadbed	37.3

### SUMMARY

Type	Miles	Amount
Pavement -----	6.5	\$209,100
Bituminous Treated Crushed Rock Surface -----	3.5	17,800
Untreated Rock Surface -----	3.9	13,300
Graded Roadbed -----	8.8	262,800
Bridges and Grade Separation -----	(3)	1,108,700
Oiling Program -----	99.1	58,800
Totals -----	121.8	\$1,670,500

#### L. A. COUNTY HIGHWAY NEEDS

Los Angeles County needs to spend \$117,000,000 and to construct 6618 lane miles of highway before its road system can be regarded as adequate to meet the motoring needs of its residents and tourists. This estimate was furnished by the County Regional Planning Commission as a result of traffic counts and population surveys looking far into the future.

J. A. Mellen, highway engineer, says it will take 23 years to bring present county highways up to standard, under present incomes. State highways within the county will require 17 years to be regarded as adequate, Mr. Mellen says.

#### AUTO REGISTRATIONS INCREASE

A report issued by the Division of Registration, State Department of Motor Vehicles, shows for the first four months of 1934 increased registrations, more dealers and a greater number of transfers than for the same four months of 1933.

Registrations total 1,940,517, an increase of 34,692, or 1.82 per cent. This increase was reflected in every class of fee-paid registrations except solid tire vehicles. Dealers number 2943, an increase of 416, and transfers total 363,291, an increase of 13,948, or 3.99 per cent over last year indicating improved conditions in the motor car industry and in tourist travel.

# Realignment of Redwood Highway in Humboldt Co. Eliminates 96 Curves

By E. M. CAMERON, District Construction Engineer

UPON the completion of the contract now under way in the vicinity of Garberville, in Humboldt County, two of the most dangerous sections left on the Redwood Highway will have been eliminated, one over the divide between Benbow and Garberville, and the other from Bluff Creek to a point seven miles north of Garberville.

The first portion, while not in an exceptionally difficult country, is governed by the necessity of crossing the divide between the

appearance to those portions of the highway in the forest.

The total value of the work under contract is \$375,500, which includes a three-inch plant-mix top. W. W. Compton is the Resident Engineer in charge.

## BAD CURVES ELIMINATED

The following comparative table shows the great improvement in alignment between the new construction and the old road:



MAP SHOWS new highway in solid lines, old curves by dots

two points in a limited distance, calling for a 7 per cent grade and an exceptionally heavy cut at the summit.

The second portion, a very dangerous section known as the Redway Bluffs, the scene of a number of fatal accidents, will be widened and straightened and the hazard to traffic at this point eliminated.

## TWO SHOVELS WORKING

Two shovels, one 2½-yard and one 1½-yard, are working three five-hour shifts with the hope of completing this section well before the winter rains.

In the redwood area approximately one-half mile in length, it has been found necessary to remove a few trees ranging in size from two to ten feet. They are cut in suitable lengths and placed in the fills in the nature of cribs thus eliminating the necessity of disposing of the timber and giving a rustic

	Old	New
Maximum radius.....	3,700 ft.	10,000 ft.
Minimum radius.....	50 ft.	500 ft.
Total curvature.....	4,387°	945°
Number of curves.....	130	34
Length in miles.....	8.04	7.58

The portion of the old road between Benbow and Garberville was constructed in 1914 and the section north of Bluff Creek in 1917.

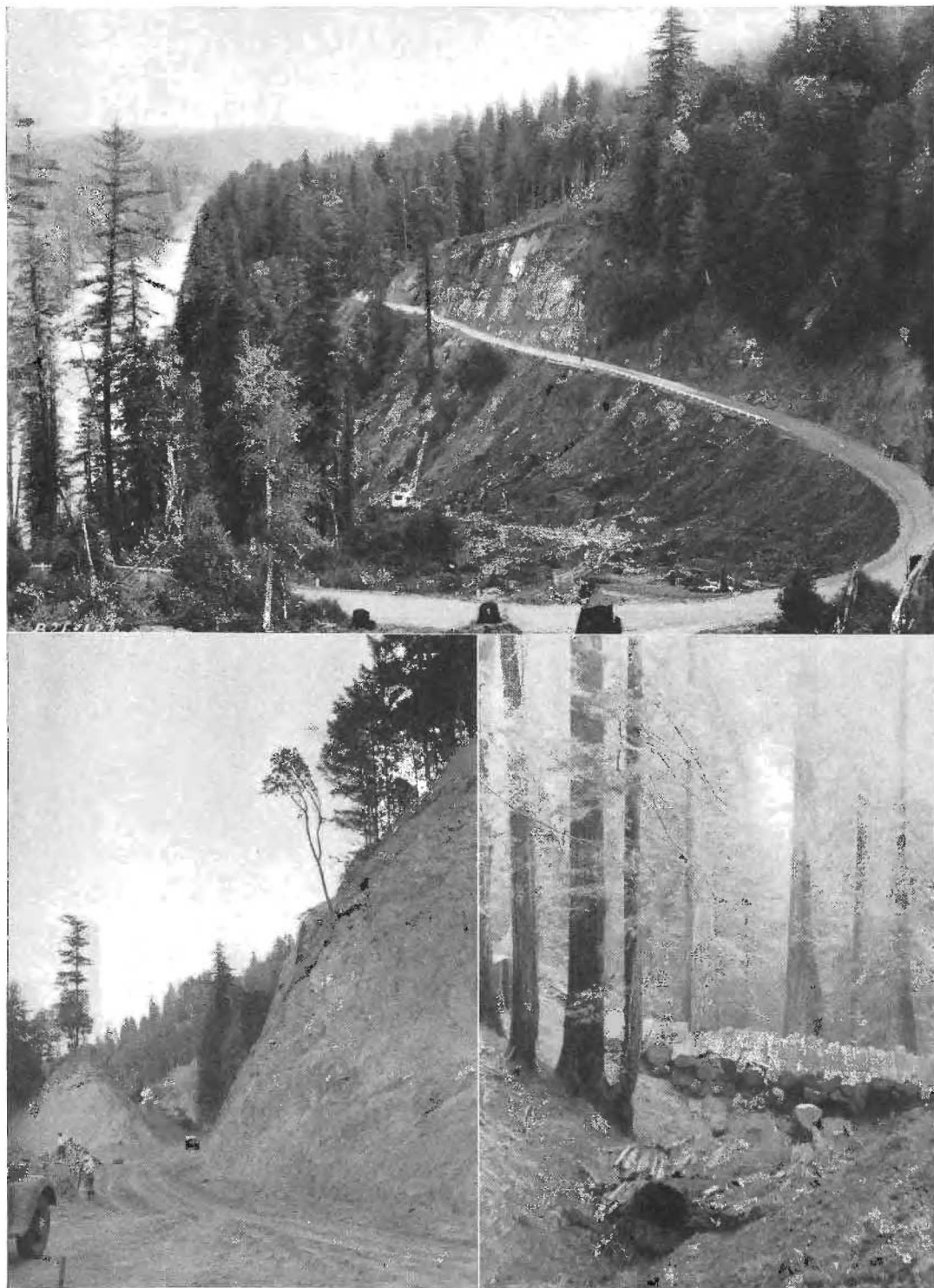
## NEW ROAD TO THE PINNACLES OPEN

Supplanting the old one-way road which necessitated controls on the last mile into The Pinnacles National Monument, a new road built by the National Park Service has been opened to traffic. The Pinnacles is an area of nearly 5000 acres containing rock formations of impressive beauty and inspiring scenic vistas.

"Dearest," sighed the young man, "couldn't you learn to love me?"

"I might," said the girl. "I learned to eat spinach."





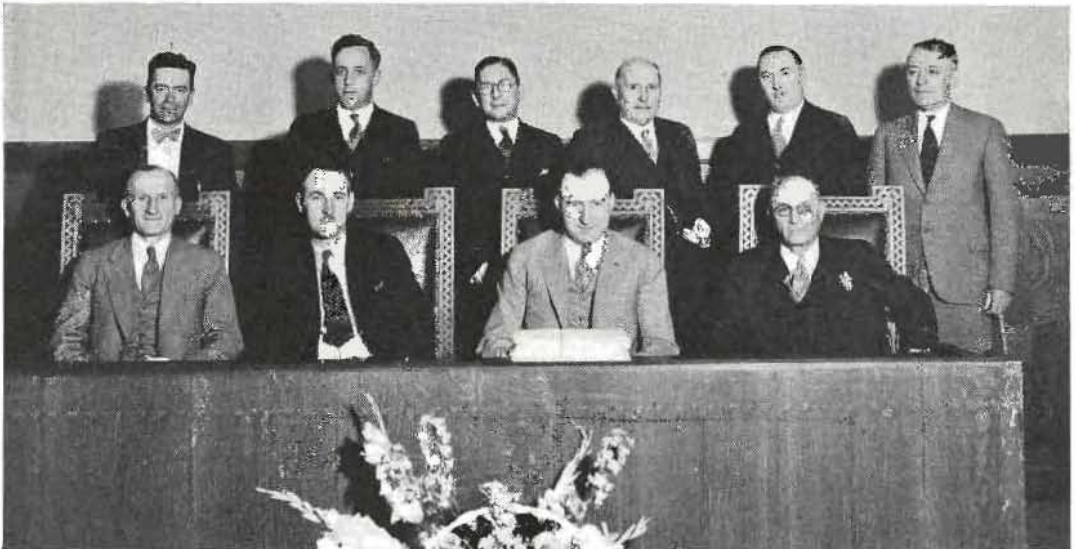
**THROUGH THE REDWOODS** in Humboldt County dangerous sections of the State highway are being relocated and many sharp curves eliminated. The top picture shows clearing operations preparatory to straightening the road at one of the curves. Below, at left, is a view of grading operations on the precipitous Redway Bluffs. At right is a picture of one of the redwood cribs used for fills.

## Director Kelly Inaugurates Policy of Opening Bids in Southern California

**A** NEW policy in the opening of bids was inaugurated by Director Earl Lee Kelly on May 17th, when he opened bids for highway construction in southern counties at the State Building in Los Angeles.

The occasion brought out a large attendance of representatives of the construction industry and civic bodies in southern California who applauded Mr. Kelly's change of

John C. Austin, representing the Los Angeles Chamber of Commerce, and F. J. Connolly, manager of the Southern California Chapter of Associated General Contractors of America, also spoke. Austin said the former policy of opening all bids in Sacramento has worked a great handicap on southern California contractors. He commended Director Kelly for the courage displayed and said the



**OFFICIAL PARTY**—Standing, left to right: R. H. Wilson, J. G. Standley, F. J. Connolly, John C. Austin, Glen V. Slater and C. C. Carleton. Front row, seated, left to right: S. V. Cortelyou, George T. McCoy, Earl Lee Kelly and Philip A. Stanton.

policy. Heretofore all bids for highway work have been opened in the headquarters building at Sacramento.

The initial bid opening in the south took place in the large auditorium of the State Building. Eighteen bids were received and opened on two major projects in Los Angeles and Orange counties.

#### HANDICAP REMOVED

In a brief talk Director Kelly said that in the future it is planned to open here not only bids on southern California highway projects but also bids on all other State public works, such as buildings and similar matters of primary interest to this district.

official has made a distinct contribution to the community.

#### DIRECTOR COMMENDED

Mr. Connolly said Director Kelly "deserves great credit for his decision to provide this convenience for southern California business." He added the Associated General Contractors have been urging the step for several years.

Among those who participated besides those mentioned were R. H. Wilson, office engineer, State Division of Highways; Glen V. Slater, assistant State Registrar of Contractors; J. G. Standley, principal assistant engineer, State Division of Highways; S. V. Cortelyou,





**DREW PACKED HOUSE**—Bidders, material and bonding company representatives and interested visitors filled the large auditorium of the Los Angeles State building at the first bid opening in southern California.

district highway maintenance engineer; G. T. McCoy, assistant State Highway Engineer; Phil Stanton, Highway Commissioner, and C. C. Carlton, chief counsel of the Department of Public Works.

A telegram from Harry L. Harper, president of the Los Angeles Chamber of Com-

merce, expressing gratification, was also read.

In celebration of the event and to honor the director a dinner meeting will be held in the evening at the University Club by Southern California Chapter, Associated General Contractors, it is announced by Manager Conolly.

## *Many Improvements to Coast Highway in Santa Barbara County*

**T**HE Coast Highway in Santa Barbara County is being improved at numerous locations by important projects that share in the NIRA funds.

At Ellwood, a change of line, including the approaches to the new concrete bridge over the Southern Pacific tracks, has been completed with a 20-foot P. C. C. pavement on a 36-foot graded roadbed under the provisions of the National Industrial Recovery Act.

Between Arroyo Honda and Gaviota, a distance of 4.9 miles, the road is under reconstruction with a 20-foot reinforced P. C. C. pavement on a 36-foot graded roadbed. It is anticipated this project will be completed in August.

Between Olive Mill Road and the Santa Barbara city limits, a distance of 0.8 mile,

the pavement is being widened to a 40-foot asphaltic concrete pavement on a 56-foot roadbed with 8-foot oiled earth shoulders. This project under the provisions of the National Industrial Recovery Act is through the business section of Montecito, a highly improved residential suburb of Santa Barbara.

In the city of Santa Barbara there is under construction a through-traffic boulevard, six miles in length, from the easterly city limits to a point near Hollister Avenue at the west of the city. This is a 30-foot Portland cement concrete base, with an asphaltic concrete surface, on a roadway 46- to 76-feet in width. This work is handled as two contracts, J. E. Haddock, Ltd., being the contractor on both jobs. It is anticipated that the work will be completed in November. This work also comes under the provisions of the National Industrial Recovery Act.

Passenger: "Conductor, have I time to say good-bye to my wife?"

Conductor: "I don't know, sir, how long have you been married?"

## Massive Overpass Has 4 Traffic Lanes

(Continued from page 4)

artistic appearance. It replaces an old concrete bridge at times inadequate for traffic.

### SUBWAY UNDER RAILROAD

Further to the northwest a crossing is made beneath the Santa Fe Railroad tracks through a subway 44 feet in clear roadway width. Its approaches are of easy gradients and the sight distance is more than a quarter of a mile. This was made possible partly by the favorable direction of surface drainage at the easterly approach, which permitted a lower grade elevation for the vertex of the vertical curve at this approach, and partly by the location at this point of earth borrow suitable

county development, pass around the north-easterly ramp approach and weave into the northbound main line traffic at the foot of the ramp. The northerly ramp delivers the traffic on to the tangent alignment of U. S. Route 99 near the Standard Oil tank farm.

### COMPACTION STUDIES MADE

As a whole, the project required the most careful planning and scheduling of operations, in order that no contractor's work be delayed and that the whole project be opened to traffic at the earliest possible date.

Construction throughout followed the standards of the State Department of Public



**OFFICIAL DEDICATION PARTY**—Left to Right: Hugh Pomeroy, Advisor of Kern County and San Mateo County Planning Commissions; W. E. Drury, Kern County Planning Commissioner; C. A. James, Engineer of Kern County Planning Commission; John W. Howe, Secretary, California Highway Commission; Stanley Abel, Kern County Supervisor; Morgan Keaton, Deputy Director of Public Works; J. R. Giet, Mayor of Bakersfield; A. E. Hoagland, President, Kern County Chamber of Commerce; W. H. Jahant, Chairman, Kern County Planning Commission; J. R. Thornton, Kern County Surveyor; L. B. Nourse, Secretary, Kern County Chamber of Commerce; Harry A. Hopkins, Chairman, California Highway Commission; Perry Britte, Supervisor Kern County; Philip A. Stanton, Member, California Highway Commission; Thomas Klipstein, Bakersfield Chamber of Commerce and Frank A. Tetley, Member, California Highway Commission.

for embankment and pavement subgrade. The extensive side borrow at this place gives the approach an unusual and pleasing appearance.

Still further to the north, approach ramps of easy curvature and gradients and a massive concrete and steel over-pass carry the traffic above the main line tracks of the Southern Pacific Railroad and over the present State highway, which will still be maintained as a county road, carrying the southbound traffic destined to the Kern County Airport or Oildale. Northbound traffic from these local points will later, under a proposed

Works, Division of Highways, and all work was done under the inspection of the engineers of that division.

During the construction of the high embankments, which would receive pavement immediately following the completion of grading, careful studies were made to determine the relative compaction being obtained and to insure that the support by the pavement would be adequate.

### MAXIMUM WETTING OBTAINED

In order to obtain the greatest service from water used the earth was wet the full depth

(Continued on page 31)





## IRRIGATION DISTRICTS

Office work on compiling and checking data for the annual report on irrigation districts was completed. This work consisted of summarizing for the year of 1933, the population, number of farms, water diverted, crops produced, assessments and collections and bond transactions for all irrigation districts.

The land owners of the Santa Clara Valley in the area lying between Morgan Hill and the Pajaro River are investigating the feasibility of organizing a conservation district for the purpose of the control and spreading of the waters of Uvas and Llagas creeks for replenishment of the ground water of the area. This highly developed section is irrigated from wells, and the recession of ground water over a large portion of the area during recent years is reported to have become alarming.

## DISTRICTS SECURITIES COMMISSION

The Commission issued the following orders:  
Byron-Bethany Irrigation District, Contra Costa County: Approving certification of a refunding bond issue in the amount of \$569,000.

Santa Fe Irrigation District, San Diego County: Approving refunding expenditures in the amount of \$5,002.90.

La Mesa, Lemon Grove and Spring Valley Irrigation District, San Diego County: Granting authority to enter into a contract with PWA for a loan and grant of \$600,000.

South Fork Irrigation District, Modoc County: Approving as feasible the voting of a bond issue of \$165,000 to be used in support of a loan from PWA of a like amount.

Lindsay-Strathmore Irrigation District, Tulare County: Approving of agreement with Packwood Canal Co., relative to certain water rights; also agreement with Farmers Ditch Co., relative to the transfer of stock.

Palo Verde Irrigation District, Riverside County: Approving refunding plan.

## FLOOD CONTROL AND RECLAMATION

### *Maintenance of Sacramento Flood Control Project.*

A small force has been carrying on routine maintenance work on levees, structures, canals, etc., in

Sutter County. A small force has also been engaged in fire guard work, removing dry vegetation in the vicinity of bridges and timber structures.

### *Sacramento Flood Control Project—Bank Protection.*

The U. S. Engineer office at Sacramento has continued work under the State-Federal cooperative program for permanent bank protection, in Reclamation District No. 108 and Reclamation District No. 1500.

### *Sacramento Flood Control Project.*

The Reclamation Board has requested this Department to raise and move certain buildings and improvements on the property of W. D. De Jarnatt in connection with the construction of the levee on the left bank of the Sacramento River below Colusa, at an approximate cost of \$4,000.

### *Flood Measurements and Gages.*

No work other than routine maintenance of stations and gages was performed during this period, and the operation of certain gages maintained for flood purposes only was discontinued on May 1st. The collection and arrangement of flood data have been continued.

## WATER RIGHTS

### *Supervision of Appropriation of Water.*

Thirty-five applications to appropriate water were received during the month of April; 10 were denied and 15 were approved. In the same period 8 permits were revoked and 21 passed to license.

Among the more important applications which were approved during the month was one by Pacheco Pass Water District of Hollister wherein appropriations were allowed from Pacheco Creek for the irrigation of some 9600 acres at an estimated cost of \$200,000.

Projects covered by permits of this office situated in Santa Clara, Santa Cruz, San Benito, Monterey, San Luis Obispo, Santa Barbara, Los Angeles, Orange, San Bernardino, Riverside, San Diego and Inyo counties were inspected during the month of April.

## SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

In continuation of its endeavor to secure subscriptions from the water users to match available State funds so that the water supervision might be reestablished and carried on through the 1934 season, the Permanent Committee of the Sacramento-San Joaquin

(Continued on page 26)

## *“Roughograph” Invented by Engineers to Locate Bumps on New Pavements*

By E. L. SEITZ, Resident Engineer, District VII

**T**HE riding qualities of hard surfaced pavements have been greatly improved during the past several years and there exists, among the different engineering crews, considerable rivalry in obtaining a record job for smoothness of the finished pavement.

Much has been done in the way of mechanical spreaders and finishers to insure an even distribution of surfacing materials, but there still remains the problem of locating and marking the minor inequalities which inevitably occur under accepted construction methods. This is especially true in the case of asphalt concrete pavement, where the smaller “bumps” must be found and outlined in order that they may be ironed out by cross-rolling.

### OLD METHOD LABORIOUS

A usual method of locating bumps is by means of a five-foot straightedge, the operator stooping over and laboriously straightedging and marking the entire area of the pavement. His labors were considerably lessened when the resident engineer allowed a rigid handle to be attached to the straightedge and the assistant assigned to that disagreeable task might walk upon his hind legs instead of creeping about on all fours.

But the engineering assistant who is up and coming is not satisfied with one small improvement. Numerous devices have been tried out which would indicate the presence of a bump by watching an indicator or a recording stylus as the device was slid or wheeled along the pavement surface.

Credit is due to Harry D. Johnson, assistant resident engineer on contract 67UCL road VII-L.A-4-A, 5.1 miles asphalt pavement project between Santa Clara River and Castaic school, for working out the principle of the so-called “Roughograph,” which not only finds the bumps but automatically marks their location on the pavement. Mr. Johnson was ably assisted by his co-worker, V. A. Miller, in working out the mechanical details of this device and one rainy afternoon when a lull occurred in paving operations, a crude affair was constructed, using miscellaneous lumber and hardware.

### SIMPLE CONSTRUCTION

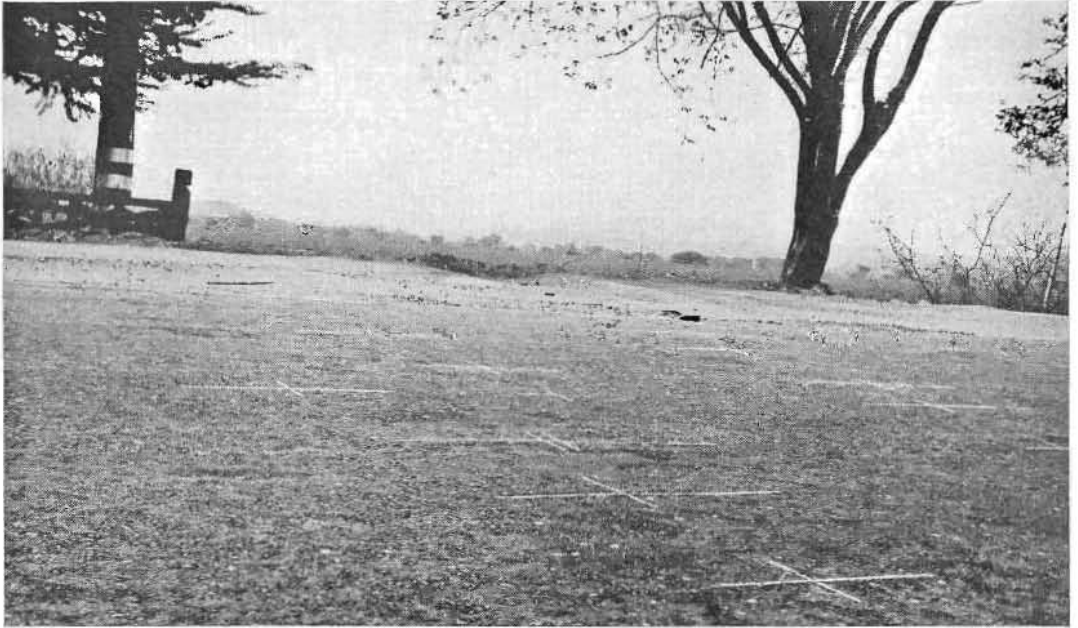
The original machine consisted of a frame five feet in length with a runner at each end and a third runner, set at the mid point of the frame, connected by means of a compound lever to a crayon marker set immediately behind the third runner. The compound lever was so arranged that a slight upward movement of the third runner caused the crayon marker to move downward, the movement of the crayon being several times greater than that of the runner; a ratio of 4 : 1 between the crayon and the runner was found to be satisfactory. The runners showed considerable wear after several hours use and small wheels were substituted, a second wheel being placed at the forward end to allow the machine to stand alone.

The “Roughograph” is wheeled longitudinally along the pavement surface and as it passes over a bump the middle wheel is raised in respect to the supporting wheels at either end of the frame. The marker crayon is moved downward so as to bear against the pavement surface and leave a mark.

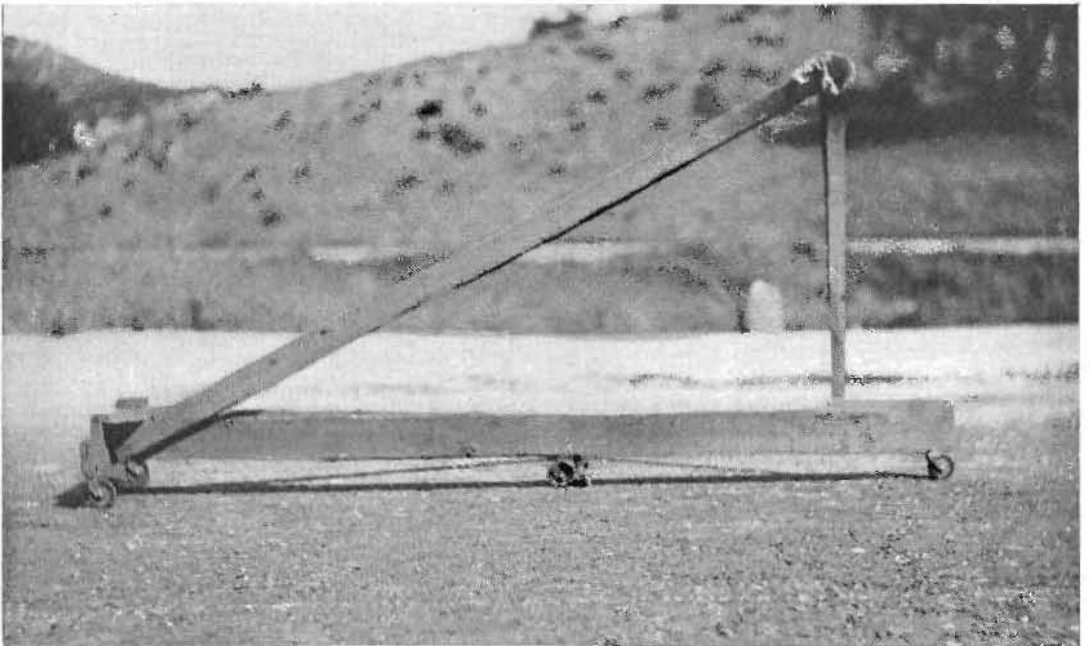
Since the wheel and crayon are set adjacent to one another the mid point of the mark is also the mid point of the bump. By wheeling the “Roughograph” over the pavement on paths two or three feet apart all of the bumps are marked, with the marks running longitudinally along the pavement, and if desirable, cross marks can then be made on each bump. The accompanying photograph shows a section of pavement after being so marked.

The original machine being of rather crude construction, it was decided to have one built more substantially, and accordingly plans of the “Roughograph” were turned over to W. B. Cannon, superintendent of equipment at Shop 7. The crayon marker required constant adjustment to compensate for wear, and to eliminate this feature, details of a device to use a fluid instead of a crayon for marking were worked out and a machine built that would leave one, two or three marks, according to the height of each bump.





**CROSSES MARK THE SPOTS** where the "Roughograph" has detected high places in the newly laid asphalt concrete pavement which will be ironed out by cross-rolling.



**FIRST "ROUGHOGRAH"** built by the inventor, Assistant Resident Engineer Harry D. Johnson, of District VII. The five-foot timber frame carries a crayon marker actuated by a runner set at mid point of the frame.

# Summer Water Supply Outlook Bad

(Continued from page 23)

River Problems Conference sent out a further appeal on May 1st. Further subscriptions have been coming in and the Committee is hopeful the funds will soon be sufficient that the work can be under way.

The advance of the season has brought no reason to modify the estimate of April 1st, that summer water supply conditions will approach closely those of the dry seasons of 1924 and 1931. On May 15, 1934, the flow of the Sacramento River at Sacramento was about 5700 second-feet, corresponding to a flow on the same date in 1931 of 4000 second-feet. The flow of the San Joaquin River near Vernalis was down to about 600 second-feet early in May.

Salinity sampling is being maintained at three points only and the establishment and maintenance of the usual program of salinity sampling in the delta is contingent upon the success of the efforts of the Permanent Committee to secure sufficient funds to start the Water Supervisor work. The following shows the result of tests of samples taken at the three stations on May 14, 1934, compared to the corresponding salinity on May 14, 1931.

## Salinity—May 14th

Salinity in parts of chlorine  
per 100,000 parts of water

	1931	1934
Bullshead .....	870	820
Antioch .....	90	21
Collinsville .....	150	35

## DAMS

Application for the construction of the Del Rio Woods Dam in Sonoma County was filed on April 19, 1934. The proposed dam will be a timber flash-board structure located on the Russian River about 2½ miles easterly from Healdsburg. The dam will be approximately 6½ feet in height and store approximately 70 acre-feet of water for recreation purposes. This application was approved by the State Engineer on April 30th.

Application was filed on May 5, 1934, for the enlargement of the Boca Dam on the Little Truckee River near Truckee. The existing structure is a concrete gravity type of dam originally 26 feet high, the crest of which had been lowered by the owner to an extent such that it was no longer within the jurisdiction of the department. The proposed enlargement contemplates the construction of a timber section within the lowered portion of crest of the dam and the storage of approximately 800 acre-feet of water for municipal and domestic purposes.

Application for the alteration of Lake Temescal Dam of the East Bay Municipal Utility District in Alameda County was filed on May 2, 1934. The proposed work will provide drainage at the downstream toe. This application was approved by the State Engineer on May 12, 1934.

An application for repair of the Lower Loberts Reservoir, located in Modoc County, was filed on May 2, 1934, and contemplates work to increase the wasting

capacity of the structure. This application was approved by the State Engineer on May 17, 1934.

The city of San Diego recently let the contract for the extension to the spillway channel at the El Capitan Dam and work is now in progress.

Office studies are under way on the revised plans for the construction of the Verdugo Wash Dam of the Los Angeles County Flood Control District.

## FEDERAL COOPERATION—TOPOGRAPHIC MAPPING

Vertical controls were run during April on Paynes Creek Quadrangle in Shasta and Tehama counties and drafting in connection with the revision of Colfax Quadrangle in Nevada and Placer counties was completed.

Topographic mapping of Dudley No. 2 Quadrangle in Fresno and Kings counties has been completed and the topographic mapping in Parkfield No. 1 Quadrangle in Fresno, Monterey and Kings counties is in progress.

Advance sheets of a revision of the Truckee Quadrangle sheet are now available as are also final sheets of the La Cima Quadrangle sheet in Fresno and Kings counties.

## WATER RESOURCES

### Ventura County Investigation.

The report on the Ventura County Investigation, Bulletin No. 46 of the Division of Water Resources, came from press during the month. This investigation started in 1927 and was concluded in the fall of 1932. It resulted in a general evaluation of the water supply of Ventura County as compared to the present and future demands upon it and a plan for future development. It was financed jointly by the county of Ventura and the State of California.

### South Coastal Basin Investigation.

The South Coastal Basin Investigation continued during the month, efforts being centered on the annual mimeographed report of water levels in the basin and on the hydrological data, also on the forthcoming geological report.

## VENTURA-MARICOPA HIGHWAY AGAIN OPEN

All slides caused by heavy winter rains have been removed from the Ventura-Maricopa Highway and the road is now entirely open. This new 85-mile highway extending from Ventura via Ojai Valley and Wheeler's Hot Springs north to Maricopa was officially dedicated on October 22 of last year. It offers a more direct north-south route from the San Joaquin Valley west side to the Ventura coast.

Head Cook: "Didn't I tell you to notice when the soup boiled over?"

Assistant: "I did. It was half past ten."





ANOTHER WORLD'S RECORD is represented by Pier W-6 of the Bay Bridge, located 1160 feet west of Yerba Buena Island; the first pier ever built and completed by the compressed-air-flotation caisson method.

## *Submarine Battle of Bay Bridge Won*

THE submarine battle, major engagement in the campaign to build a bridge over the broad bosom of San Francisco Bay, has been won. It was the unknown underwater region, between the surface of the bay and bedrock, that made the people of San Francisco and Oakland say for years it was impossible to bridge the bay.

Of course, long before the start of the building of the bridge, the bay bottom was punched by diamond drillers, so that the profile of the bedrock has been wholly known to the engineers both as to depth and quality, but these borings revealed that the bedrock is deeper than any piers have been sunk heretofore. This depth and the deep, swift tides made the substructure the major engagement in the building of the great bridge.

### CONTRACTORS GAMBLER MILLIONS

Methods were designed by Chief Engineer C. H. Purcell and his staff by which the contractors were to conquer the deep water and deep rock, in order to make foundations for the bridge towers, and when State Director of Public Works Earl Lee Kelly awarded contracts to the low bidders, it took bold contractors, with complete faith in Chief Engineer Purcell and his staff, to accept the job

of sinking piers by new methods, far deeper than any piers had ever been sunk before by any methods.

The contractors gambled millions of dollars on their belief in the State's engineering designs.

Now, all the deep piers of the San Francisco-Oakland Bay Bridge have been sunk to final elevation save one, E-3, 1400 feet east of Yerba Buena Island, which is even now more than half way to its final placement.

World-wide engineering interest was attracted by the West Bay piers of the bridge, which were sunk by the compressed-air-flotation caisson method, adapted by Chief Engineer Purcell's staff from an original design by the granddaddy of foundation engineering, Daniel E. Moran of New York City.

All of these compressed-air-flotation caissons, which are distinguished by their cylindrical dredging wells, and which are domed during the floating stage, are now either sealed or being sealed to rock, which means that a concrete floor has been poured on the cleaned-off rock after the caisson was stopped, with its bottom 10 feet above rock, and the pouring begun down the dredging wells to build that floor ten feet or more thick with columns of concrete extending up each well at least 30 feet.

## Dams Not Necessary to Conserve Ventura County Water Supply

**D**IRECTOR Earl Lee Kelly announces the release by Edward Hyatt, State Engineer, of Bulletin 46, "Ventura County Investigation," by Harold Conkling, Deputy State Engineer. The bulletin contains 244 pages, 94 tables and 55 plates, of which some are colored.

The investigation covered five full years and was financed jointly by the State and Ventura County. A specially intensive investigation of reservoir sites on Piru Creek was made because of conflict over the occupancy of two sites by the relocated Los Angeles-Bakersfield highway. This portion of the investigation was financed largely by the Division of Highways.

### DAMS NOT NECESSARY

The bulletin represents the conclusions from a vast amount of data gathered concerning the hydrology and geology of the county. The obvious method for conserving water is by construction of reservoirs in the headwaters but the conclusions from this study indicate that water in Ventura County can be conserved in other ways at a fraction of reservoir cost. Principal conclusions as to water supply for rainfall such as has occurred in the past 40 years are as follows:

1. No shortage of water present or prospective is possible in Santa Clara Valley proper.
2. A slight shortage may exist in Oxnard Plain and intrusion of saline water from the ocean may threaten.
3. A shortage may exist in part of Simi Valley and Pleasant Valley.
4. No shortage exists in Las Posas Valley.
5. Probably no shortage exists in Ojai Basin or upper Ventura River Basin.
6. Ventura City has four possibilities for increasing water supply: 1. Construction of a reservoir on Santa Ana Creek. 2. Improvement of Upper Ventura River Basin. 3. Pumping near the mouth of Ventura River. 4. Pumping in the vicinity of the mouth of Santa Clara River.

### KILL WILLOWS, SAVE WATER

The cheapest means of amplifying the supply to Oxnard Plain is by spreading the floods of Santa Clara River on the south side in the vicinity of Saticoy. The cheapest means of amplifying the supply to Pleasant Valley is by a canal passing around the west end of South Mountain and fed by pumping from the lower end of Santa Clara Valley.

It is estimated that the willows along Santa Clara River are wasting 12,000 acre feet of water annually to keep them alive. Pumping in this area would lower the water table, kill the willows and thus make this waste available for beneficial use besides creating underground capacity into which the river floods would percolate and thus in part be salvaged.

Reservoirs in the mountains are extremely expensive at sites investigated. The estimated capital cost per acre-foot for conserving water during a ten-year dry period such as that beginning 1922 varies from \$455 to \$730 at various sites on Piru Creek; \$224

### ALL IN THE DAY'S WORK FOR THE HIGHWAY FOREMAN

Department of Natural Resources  
Division of Forestry  
Sacramento

Mr. E. E. Wallace,  
District Engineer,  
State Division of Highways,  
San Diego, California.

Dear Mr. Wallace:

I wish to take this opportunity of expressing our appreciation of the cooperation extended to the State Division of Forestry, by your foreman, Mr. Cummings, at Julian, during the recent Banner Grade fire.

He extended to us every possible courtesy, and was of material assistance to us by keeping the Banner Grade cleared of debris so that our equipment could travel the road with safety.

He also made available all facilities around the maintenance station and carried many messages for us.

We also appreciate the closing of the road to public travel during the worst part of the fire as it stopped any possibility of a traffic jam on the road when our equipment was being used suppressing the fire and at the same time probably prevented the loss of life, as the road was not safe to travel on several occasions.

Very truly yours,

L. C. GORDON,  
State Forest Ranger.

By J. A. Graves,  
Fire Chief.

### INDUSTRIES FEEL LOSS OF HIGHLY TRAINED MEN

"One of the unexpected results of the depression years," says Ralph E. Weeks, president of a correspondence school, "is that now when an industry urgently needs its highly skilled men, in many cases it finds there are not enough to fill the demand. Many of the older men have passed beyond the active age or have died. Others have drifted off to other localities or into other ways of making a living. The farm has claimed not a few. The problem of training a new generation of skilled workers is likely to become increasingly acute as industrial activity gains acceleration."

to \$366 on Sespe Creek and \$390 to \$480 on Ventura River. As compared to this the estimated capital cost of spreading is \$28 per acre-foot at works near Saticoy.

Except for Ventura City and the possible intrusion of salt water into Oxnard Basin, both of which situations can be easily remedied, the situation as to water supply does not call for construction at this time.

If and when reservoirs become necessary, the cheapest are found on Sespe Creek while those on Piru Creek are the most expensive.



## One Hundred Men Employed Daily in Building Overpass

(Continued from page 14)

Thanks to the splendid cooperation of the city of Los Angeles, which prepared the plans for the structure, the Pacific Electric Railway Company, which conducted its track and trolley movement without delay, the public utilities, who have promptly shifted their various utilities, wires and pipe lines, the property owners and traveling public, who have been temporarily inconvenienced, the contractor, the Federal employment agency and various Federal authorities interested in financing the work and in the quality of construction, the job is progressing smoothly and the structure is rapidly taking shape. At times there have been over one hundred men daily employed on construction work.

Mr. Paul Watson, representing the State, is supervising the work of construction. The cost of the project will be approximately \$130,000.

To install the huge bridge has involved 6000 yards of excavation. Into this makeup goes 3796 yards of different classes of concrete and 808,000 pounds of reinforcing steel. It calls for 730 tons of asphaltic concrete paving and 11,560 linear feet of reinforced concrete.

"Every minute of time saved for thousands of persons journeying along those boulevards is of tremendous economic importance to the entire city," says the *Los Angeles Times*.

"Thus the new structure will further the welfare of the expanding regions that stretch out toward and beyond the western reaches of the city, Hollywood, Glendale. By the same token it has its large place in providing more convenient accessibility into a large and very important section of the downtown areas."

### FOREST FIRE HAZARD SERIOUS

Motorists and outing devotees are urged by the U. S. Forest Service to exercise the utmost care this year in the use of fire in California's many wooded areas.

This State is faced with one of the longest and most serious fire hazards in years, we are warned by the service, due largely to a precipitation last winter only 69 per cent of normal, coupled with the highest spring temperatures on record, and an advanced season.

### In Memoriam

LYLE M. RANSON, one of the most beloved and highly esteemed employees of District VII of the State Division of Highways, passed away from heart trouble at 7 a.m., May 28th, at Los Angeles.

Mr. Ranson entered the State's service February 10, 1913, and was employed by the State continuously from that date as Draftsman, Assistant Resident Engineer, Resident Engineer, Assistant Division Engineer, Associate Highway Engineer and Senior Highway Engineer. He had been District Construction Engineer in District VII for the last ten years. During that time he had charge of the construction of many of the largest highway projects in southern California.

His education was received at the University of West Virginia. After completing three years in the University, he enlisted in the First West Virginia Infantry in the Spanish American War. At the close of the war, he entered the employ of the American Steamship lines as Engineer Cadet, after which he was employed in various engineering capacities with several railroad companies until 1912. During 1912 and early 1913 he was engaged in surveying for power development on the Isthmus of Panama. Following this he began his twenty-one years of continuous service with the State Division of Highways.

All who came in contact with Mr. Ranson had the highest regard for him both personally and professionally and his many promotions show that his efficient service was fully appreciated by the heads of his department.

Mr. Ranson is survived by his widow, Grace Ranson; his father, Dr. B. B. Ranson, of West Virginia; a brother, Dr. B. B. Ranson, Jr., of New York City; and a sister who resides in Japan.

HALVOR THORSON REESE, aged 68, retired employee of District VII of the Division of Highways, died at Los Angeles on May 11, 1934. Mr. Reese began work with the Division of Highways in 1918 and until his retirement in 1933 was a loyal and efficient employee.

He was born in Norway, coming to the United States at the age of seventeen, and lived in California twenty-seven years.

He is survived by his widow, four daughters and one son, all residents of Los Angeles.

General orders were issued by Regional Forester S. B. Show, effective May 15, regarding smoking, discharging fireworks, camp fire permits, closure of areas to public use, and carrying shovel and ax in Federal forests.

Inhabitants of the Island of Crete built a road about 1500 B.C., that is still in such condition that an automobile may be driven over it as fast as 60 miles an hour, according to a recently published report.

# Highway Bids and Awards

FOR MAY

**ALAMEDA COUNTY**—Between San Leandro and Oakland, 1.1 miles to be graded and paved with asphaltic concrete or Portland cement concrete. District IV, Route 5, Section D. United Contracting Company, Portland, Ore., \$116,982; Hanrahan Company, San Francisco, \$114,814. Contract awarded to Heafey-Moore Co., \$110,275.

**FRESNO AND TULARE COUNTIES**—Between Orange Cove Rd. and Gen. Grant National Park and between Academy and East end Huntington Lake, 87.0 miles to be treated with fuel oil. District VI, Routes 41, 76, Sections T, U, A, B, C, D, E. Oilfields Trucking Co., Bakersfield, \$37,950; Stewart & Nuss, Inc., Fresno, \$40,835. Contract awarded to C. W. Wood & L. C. Pulley, Stockton, \$36,818.

**FRESNO COUNTY**—Between Tulare Street and Stanislaus Street, about 0.5 miles in length to be graded and asphaltic concrete paved. District VI, Route 4. Valley Paving & Construction Co., Fresno, \$36,496. Contract awarded to Union Paving Co., San Francisco, \$35,159.

**INYO COUNTY**—Between one mile west of Lone Pine and the East end of Zinc Hill Grade, about 32.9 miles to be treated with fuel oil. District IX, Routes 127, Sections B, C, D, E, and F. Tiffany Construction Co., San Jose, \$9,657; Pacific Tank Lines, Inc., Los Angeles, \$9,452; Gilmore Oil Co., Los Angeles, \$9,303; Paulsen & March, Inc., Los Angeles, \$8,062; Square Oil Co., Inc., Los Angeles, \$8,151. Contract awarded to C. W. Wood and L. C. Pulley, Long Beach, \$7,442.

**INYO COUNTY**—Between So. Sierras Power Plant No. 4 and Camp Sabrina, about 10.8 miles to be treated with fuel oil. District IX, Route 76, Section B. Paulsen & March, Inc., Los Angeles, \$2,973; Gilmore Oil Co., Ltd., \$2,346. Contract awarded to C. W. Wood and L. C. Pulley, Long Beach, \$2,004.

**INYO COUNTY**—Between East boundary of Death Valley National Monument and Death Valley Junction, about 18.3 miles to be treated with fuel oil. District IX, Route 127, Sections L and M. Tiffany Construction Co., San Jose, \$5,412; Pacific Tank Lines, Inc., Los Angeles, \$5,412; Gilmore Oil Co., Los Angeles, \$5,899; Paulsen & March, Inc., Los Angeles, \$5,268. Contract awarded to Square Oil Co., Inc., Los Angeles, \$3,842.

**KERN COUNTY**—Between Haypress Canyon and Bear Mountain Ranch, about 6.3 miles in length to be graded. District VI, Route 53, Section D. Griffith Company, Los Angeles, \$115,311; Union Paving Co., San Francisco, \$118,886; Morrison-Knudsen Company, Los Angeles, \$147,295; J. F. Knapp, Oakland, \$108,410; Gibbons & Reed Company, Burbank, \$111,013; Dimmitt and Taylor, Los Angeles, \$122,914; Sharp and Fellows Contracting Co., Los Angeles, \$121,882; Peninsula Paving Company, San Francisco, \$151,970. Contract awarded to Coutoules Const. Co., San Francisco, \$106,883.

**KERN COUNTY**—Between Westerly Boundary and 6.6 miles west of McKittrick and between the junction of Route 58 and Route 144 and State Institution for Women, 15.8 miles to be treated with fuel oil. District VI, Routes 58, 144, Sections H, I and A. Geo. K. Thompson, Los Angeles, \$16,940; John Jurkovich, Fresno, \$15,600. Contract awarded to C. W. Wood and L. C. Pulley, Stockton, \$15,576.

**KERN COUNTY**—Between Mojave and 7 miles northwesterly. About 7 miles to be treated with asphalt road oil. District IX, Route 58, Section G. Pacific Tank Lines, Inc., Los Angeles, \$2,536; Gilmore Oil Co., Los Angeles, \$2,156; Paulsen & March, Inc., Los Angeles, 2,014; Square Oil Co., Inc., Los Angeles, \$3,087. Contract awarded to C. W. Wood and L. C. Pulley, Long Beach, \$1,833.

**LAKE COUNTY**—In Lake County between Middletown and Lower Lake road. About 20.2 miles to be treated with fuel oil. District I, Route 89, Sections B and C. Melvin W. Prather, Lakeport, \$6,131; C. F. Fredericksen & Sons, Lower Lake, \$5,652; Chas. Kuppinger, Lakeport, \$4,960; Helwig Constr. Co., Sebastopol, \$6,334. Contract awarded to Basalt Rock Co., Napa, \$4,827.

**LASSEN AND MODOC COUNTIES**—Between Litchfield and Alturas, about 92.2 miles to be treated with fuel oil. District II, Route 73, Sections C, D, E, F,

G, C and D. Tiffany Constr. Co., San Jose, \$25,411; Pacific Truck Service, San Jose, \$26,341; Oilfields Trucking Co., Bakersfield, \$27,374; Peninsula Paving Co., San Francisco, \$27,374; Basalt Rock Co., Inc., Napa, \$24,792. Contract awarded to C. F. Fredericksen & Sons, Lower Lake, \$23,862.

**LOS ANGELES COUNTY**—Between Redondo Beach and Wilmington, about 5 miles to be graded and paved with asphaltic concrete or Portland cement concrete. District VII, Route 60, Sections D-Tor. Griffith Company, Los Angeles, \$319,235; J. L. McClain, Los Angeles, \$303,561; Union Paving Co., San Francisco, \$334,828; Sully-Miller Contracting Co. and Kovacevich and Price, Inc., Southgate, \$305,505; Basich Brothers, Torrance, \$301,809; Oswald Bros., Los Angeles, \$324,429; Jahn & Bressi Constr. Co., Inc., Los Angeles, \$323,587; Sharp and Fellows Constr. Co., Los Angeles, \$320,271. Contract awarded to United Concrete Pipe Corporation, Los Angeles, \$293,563.

**LOS ANGELES AND ORANGE COUNTIES**—7.9 miles to be graded and paved with asphaltic concrete or Portland cement concrete. District VII, Route 174, Sections B, A. F. J. Akmadzich, Los Angeles, \$296,772; Oswald Bros., Los Angeles, \$247,048; Basich Bros., Torrance, \$236,101; Jahn and Bressi Const. Co., Inc., Los Angeles, \$281,562; Los Angeles Paving Co., Inc., Los Angeles, \$246,368; Griffith Company, Los Angeles, \$289,951; Union Paving Company, San Francisco, \$282,244. Contract awarded to United Concrete Pipe Corp., Los Angeles, \$234,247.

**MARIN COUNTY**—Between Stinson Beach and Marshall, about 14.6 miles in length, apply bituminous surface treatment and asphalt seal coating. District IV, Route 56, Sections B, C. Pacific Truck Service, Incorporated, San Jose, \$29,981; A. J. Raisch, San Jose, \$36,967; E. A. Forde, San Anselmo, \$29,774. Contract awarded to Lee J. Immel, Berkeley, \$28,831.

**MENDOCINO COUNTY**—Between Gualala and Mendocino City, 51.1 miles to be treated with fuel oil. District I, Route 56, Sections A, B, C and D. Basalt Rock Co., Inc., Napa, \$17,609; Helwig Const. Co., Sebastopol, \$16,629. Contract awarded to Charles Kuppinger, Lakeport, \$16,055.

**MODOC COUNTY**—Between Lakeview Road and Cedarville, about 2.7 miles in length, to be graded and surfaced with crushed gravel or stone. District II, Route 28, Section C. Blasotti-Willard and Blasotti, Stockton, \$116,696. Contract awarded to Larsen Brothers, Sacramento, \$77,881.

**MONTEREY COUNTY**—56-I, 2.6 miles, fuel oil to be applied and mixed on existing shoulders; Mon-118-A, 7.6 miles; and Mon-56-J, 11.3 miles fuel oil dust palliative to be applied to existing shoulders. District V, Routes 56, 118, Sections I, J. A. Walter B. Roselip, San Luis Obispo, \$5,427; L. A. Brisco, Arroyo Grande, \$6,409. Contract awarded to Granite Constr. Co., Ltd., Watsonville, \$5,137.

**MONTEREY COUNTY**—King City to San Ardo, a distance of 15.1 miles, fuel oil to be applied as dust palliative to shoulders each side existing pavement. District V, Route 2, Sections F and G. Oilfields Trucking Co., Bakersfield, \$3,048; L. A. Brisco, Arroyo Grande, \$2,019; Granite Constr. Co., Ltd., Watsonville, \$2,070. Contract awarded to Walter B. Roselip, San Luis Obispo, \$2,019.

**NEVADA AND SIERRA COUNTIES**—Treating with fuel oil in Nevada and Sierra counties between Truckee and Hobart Mills, Sierraville and Calpine, Sierra City and Junction of Routes 25 and 83. District III, Routes 25 and 83, Sections A and B, B and C. C. F. Fredericksen & Son, Lower Lake, \$8,888. Contract awarded to Tiffany Construction Co., San Jose, \$8,829.

**ORANGE COUNTY**—Between Newport and Dana Pt., between Doheny Park and Gallivan, between Irvine and Tustin—about 26.5 miles to be treated with bituminous seal coat. District VII, Routes 60 and 2. Sections A, B, C and A, C. Kovacevich & Price, Inc., South Gate, \$15,377; Matich Bros., Elinore, \$16,523; Griffith Co., Los Angeles, \$16,660; Miracle Co., San Diego, \$17,936; Sully-Miller Contr. Co., Long Beach, \$18,980. Contract awarded to Gogo & Rados, Los Angeles, \$13,397.

**PLACER COUNTY**—Bridge in Placer County 2.7 miles south of Tahoe City across Ward Creek. Dis-

(Continued on page 32)



## Traffic Circle in Bakersfield By-Pass

(Continued from page 22)

in the borrow pit by pumping water into dikes, testing results with soil auger and controlling water used to the percentage estimated to give maximum compaction when placed.

This prior wetting tended toward compaction being obtained, beginning with the first spreading of material by caterpillar drawn scraper and increasing with each rolling and with every trip of the trucks loaded or empty. In spite of the fact that spreading and rolling followed usual standards and were entirely satisfactory, it was definitely proven that the additional compaction resulting from the truck haul over the rolled surface was very noticeable.

Throughout the project the same general type of construction was followed, viz, a 46-foot roadbed with berms on fills; standard subgrading specifications; 30 feet of asphaltic concrete pavement of 9"-7"-9" section, laid in three courses, base, leveling course, and surface, with borders 3 feet x 6 inches composed of crushed rock, 1 inch to dust, plant mixed with about 3.9 per cent "E" grade asphalt, cut back with 13 per cent of kerosene solvent; shoulders, berms and sandy cuts oiled with pipe line run oil. Sandy cuts were constructed on  $1\frac{1}{2}$  to 1 slopes and oiled to prevent ravel.

### GUTTERS PAVED ON GRADES

Throughout the subway cut constructed through a sandy soil, sometimes consisting of clean channel sand, it was necessary to pave the gutters where on grades in order that wash be prevented. Cut back mix was placed 3 inches thick and  $2\frac{1}{2}$  feet wide and rolled transversely with a tandem roller. This cross rolling, under careful control, developed an evenly dipped cross-section for the gutter with little extra hand work.

The traffic circle on Chester Avenue was particularly desired by the Planning Commission of Kern County and has proven to be a decided asset to the road in segregating, from through traffic, the traffic to and from the airport, Oildale and Bakersfield. The central area is bounded by a curb following a circle of 278 feet in diameter. This area is being prepared for landscaping.

The paved portion of the circle is 42 feet wide. The surface of this pavement is super-

elevated to favor, as far as possible, the main line traffic, but warps from this super-elevation to a modified and variable cross-section as the outer lane approaches an intersecting street which delivers or receives traffic with such easy turn over profiles that a car traveling at 25 miles per hour is not at all inconvenienced.

### CIRCLE DRAINAGE SYSTEM

At the same time the cross-section is such as to handle the drainage to curbside inlets or gratings flush with gutter surface. These in turn lead to silt basins, thence to sumps. In general the water is led to sumps located inside the central park area and which are dug well into coarse sand beds, backfilled to the top line of the inlet pipes with broken concrete and gravel. Above the elevation of the top of this pipe the sump is sealed over with an earth backfill, well compacted.

The arrangement of the drains and gutters is such that, should any sump fail to accommodate all of the drainage delivered to it the excess can flow by way of the gutters to other sumps and finally, if not fully subdrained at these points, would flow through a part circle culvert, to the gutters of Chester Avenue on the south and thence to the city's storm sewers.

### COOPERATIVE FINANCING

The construction of the Kern River Bridge was financed from the State highway construction fund. The remaining features of the project were financed from the highway general fund. The city of Bakersfield contributed to the last named fund \$8,500 of their  $\frac{1}{4}$  cent gas tax fund, as cooperation toward the construction of the traffic circle, the total cost of which was \$19,710.31.

The right of way through the city was obtained and cleared of buildings at the expense of Kern County. The city of Bakersfield, by agreement, guaranteed the State of California against claims due to changes of street grades and the construction of the highway.

The project, extending from Union Avenue to the Standard Oil tank farm, totals 5.24 miles, constructed at a total cost of approximately \$594,982.04 and represents the most modern high standard highway construction.

## Highway Bids and Awards Made During the Month of May

(Continued from page 30)

trict III, Route 38, Section A. E. T. Lesure, Oakland, \$12,530; Holdener Const. Co., Sacramento, \$10,091; F. H. Neilson, Orland, 11,080; Nelson & Wallace, Escalon, \$11,359; J. P. Brennan, Redding, \$11,308; Poulos & McEwen, Sacramento, \$11,921; Johns Heilmann, San Francisco, \$12,950; M. B. McGowan, Inc., San Francisco, \$11,353. Contract awarded to N. R. Mayfield, Tahoe City, \$9,145.

**PLUMAS COUNTY**—Between Rich and Quincy; between westerly boundary and Quincy; between Keddie and Chester; and between Blairsden and Sierra County line, 102.2 miles, to be treated with oil. District II, Routes 21 and 83, various sections. Tiffany Construction Co., San Jose, \$25,061; Pacific Truck Service, Inc., San Jose, \$27,592; Basalt Rock Co., Inc., Napa, \$29,911. Contract awarded to C. F. Frederickson & Son, Lower Lake, \$23,151.

**SACRAMENTO COUNTY**—At the bridge across the Sacramento River about 1.3 miles North of Isleton, fenders to be constructed for two piers. District III, Route 11, Section D. Bundesen & Lauritzen and Delta Dredging Co., Pittsburg, \$13,183; M. B. McGowan, Inc., San Francisco, \$11,562. Contract awarded to M. A. Jenkins, Sacramento, \$11,470.

**SAN BERNARDINO COUNTY**—Between the Dolly Varden Angling Club and South Fork of Santa Ana River, about 16.6 miles of roadbed to be treated with fuel oil. District VIII, Route 190, Sections E, F. Geo. Gardner & Sons, Redlands, \$9,789. Contract awarded to Geo. Herz & Co., San Bernardino, \$8,918.

**SAN DIEGO COUNTY**—Furnish and apply heavy fuel oil as a dust palliative between Morettis and the northerly boundary, and between Bonsall and Rincon in San Diego Co. District XI, Routes 78 and 195, Sections D, E, and B. C. Gilmore Oil Co., Los Angeles, \$10,541; Lamb's Transfer Co., Long Beach, \$9,514; Paulsen & March, Inc., Los Angeles, \$10,806; Square Oil Co., Inc., Los Angeles, \$10,210. Contract awarded to Morgan Bros., Huntington Park, \$8,950.

**SAN DIEGO COUNTY**—Overhead Crossing over A. T. & S. F. Ry. near Carlsbad; 1-26' 10 1/2" span, 2-30' 7" spans, 1-32' span, and 1-45' span on concrete bents to be widened. District XI, Route 2, Section B. Bodenhamer Const. Co., Oakland, \$13,656; Contracting Engr., Inc., Los Angeles, \$14,307; John Oberg, Los Angeles, \$13,203; Oscar Oberg, Los Angeles, \$14,255. Contract awarded to R. E. Bishop, Long Beach, \$13,052.

**SAN LUIS OBISPO COUNTY**—Between 6 miles east of Morro and Atascadero Summit, about 3.2 miles in length to be graded and portions surfaced with selected material. District V, Route 125, Section A. Peninsula Paving Company, San Francisco, \$125,947; Biasotti, Willard & Biasotti, Stockton, \$103,041; R. E. Campbell, Long Beach, \$92,758; Chas. L. Harney, San Francisco, \$91,785; B. G. Carroll, San Diego, \$108,382; Dimmitt & Taylor, Los Angeles, \$107,691; Sharp and Fellows Contracting Co., Los Angeles, \$99,687. Contract awarded to Union Paving Co., San Francisco, \$78,846.

**SANTA BARBARA COUNTY**—Santa Barbara County, Routes 2, 149, 27.9 miles oil treatment to be applied to shoulders. District V, Routes 149, 2, Sections B-C-H-J-K-D. Contract awarded to L. A. Brisco, Arroyo Grande, \$11,031.

**SANTA CLARA COUNTY**—Between College Avenue and Page Mill road in the city of Palo Alto, about 0.4 mile in length to be graded and Portland cement concrete paved. District IV, Route 2, Sections P and A. Union Paving Co., San Francisco, \$41,703; Hanrahan Company, San Francisco, \$42,958. Contract awarded to A. J. Raisch, San Jose, \$41,378.

**SANTA CRUZ COUNTY**—Between 1 mile north of Inspiration Point and Scott's Valley, 6.7 miles to be surfaced with bituminous macadam and bituminous surface all to be placed on crusher run base. District IV, Route 5, Section B. Granite Construction Co., Ltd., Watsonville, \$183,585; Healy-Thibbitts Construction Co., San Francisco, \$207,750; Union Paving Co., San Francisco, \$187,461; A. J. Raisch, San Jose, \$212,072. Contract awarded to Hanrahan Co., San Francisco, \$179,222.

**SOLANO COUNTY**—Between Vacaville and North-every boundary, and between Junction of Route 101 and

### In Memoriam

**DANIEL MURRAY LEE**, senior highway construction crew foreman in District XI, died on May 10th at Mecca, where he had gone from his home in Niland in connection with the work of grading State Route No. 187, the North Shore Highway along the Salton Sea.

Mr. Lee was born September 11, 1876, at Garrisonville, Stafford County, Virginia, and was educated at the Washington and Lee University, Lexington, Virginia. He was a direct descendant of General Robert E. Lee, the famous Southern officer. He came to California in 1897 and was employed for some years on railroad construction work in Mexico and by the Pacific Steamship Company. He was appointed as construction superintendent for the Division of Highways, Department of Public Works, on July 26, 1928, and assigned to District VI. He worked continuously as construction superintendent in Districts III, VI and XI, having charge of various projects using convict labor, until December 15, 1932, when he resigned on account of illness from heart trouble. He returned to work as senior highway construction crew foreman in District XI on December 1, 1933.

Besides his widow, Mrs. Ann Elizabeth Lee, he leaves one son, Daniel Lee, III; three brothers, Burwell Lee of Pleasanton, California, Colonel Sydney Smith Lee of the Marine Barracks at Washington, D. C., and Harry F. Lee of Goldsborough, North Carolina; and two sisters, Mrs. W. E. Pratt and Miss Edmo Lee of Fredricksburg, Virginia.

Mr. Lee had gained the respect and friendship of every man with whom he was associated in his engineering work and the sympathy of the entire department is extended to the bereaved family.

Route 53 and 1 1/2 miles south of Dixon, 36.1 miles to be treated with fuel oil and asphaltic road oil. District X, Routes 90 and 101, Sections A-A and B. A. Teichert & Son, Inc., Sacramento, \$7,793; E. F. Hilliard, Sacramento, \$7,246; Sheldon Oil Company, Suisun, \$5,947; Lee J. Immel, Berkeley, \$6,874; E. A. Forde, San Anselmo, \$7,902; Peninsula Paving Co., San Francisco, \$8,458. Contract awarded to Basalt Rock Co., Inc., Napa, \$6,729.

**SONOMA COUNTY**—Between Vineburg Junction and Easterly Boundary to be surfaced with crusher run base and bituminous surface treatment, about 0.83 mile. District IV, Route 8, Section B. Helwig Constr. Co., Sebastopol, \$13,459; E. A. Forde, San Anselmo, \$11,732; Lee J. Immel, Berkeley, \$11,796. Contract awarded to Ransome Co., Emeryville, \$11,167.

**SONOMA AND MENDOCINO COUNTIES**—Between Cloverdale and Hopland, about 13.9 miles in length, to be surfaced with bituminous treated crushed gravel or stone (plant mixed). District IV, Route 1, Sections D, L. Basich Brothers, Torrance, \$99,828; Pacific States Construction Co., San Francisco, \$109,345. Contract awarded to Peninsula Paving Co., San Francisco, \$99,017.

**YUBA AND BUTTE COUNTIES**—Repair bridges across Simmerly Slough (Yub-87 A) and Middle Honcut Creek (But-87-A). District III, Route 87, Section A-A. Contract awarded to M. A. Jenkins, Sacramento, \$3,952.

Jud Tunkins says he and his wife always think exactly alike, only she usually has first think.—*Washington Star*.



# STATE OF CALIFORNIA

## Department of Public Works

HEADQUARTERS: PUBLIC WORKS BUILDING, ELEVENTH AND P STS., SACRAMENTO

FRANK F. MERRIAM.....Governor

EARL LEE KELLY.....Director

MORGAN KEATON.....Deputy Director

### DIVISION OF HIGHWAYS

#### 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

#### HEADQUARTERS STAFF, SACRAMENTO

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J. G. STANDLEY, Principal Assistant Engineer  
R. H. WILSON, 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

#### DISTRICT ENGINEERS

J. W. VICKREY, District I, Eureka  
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, District VI, Fresno  
S. V. CORTELYOU, District VII, Los Angeles  
E. Q. SULLIVAN, District VIII, San Bernardino  
S. W. LOWDEN (Acting), District IX, Bishop  
R. E. PIERCE, District X, Stockton  
E. E. WALLACE, District XI, San Diego  
General Headquarters, Public Works Building,  
Eleventh and P Streets, Sacramento, California

### DIVISION OF WATER RESOURCES

EDWARD HYATT, State Engineer, Chief of Division  
J. J. HALLEY, Jr., Administrative Assistant  
HAROLD CONKLING, Deputy in Charge Water Rights

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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P. T. POAGE, Assistant Chief  
W. K. DANIELS, Administrative Assistant

#### HEADQUARTERS

H. W. DeHAVEN, Supervising Architectural Draftsman  
C. H. KROMER, Principal Structural Engineer  
CARLETON PIERSON, Supervising Specification Writer  
J. W. DUTTON, Principal Engineer, General Construction  
W. H. ROCKINGHAM, Principal Mechanical and Electrical Engineer

### DIVISION OF CONTRACTS AND RIGHTS OF WAY

C. C. CARLETON, Chief  
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

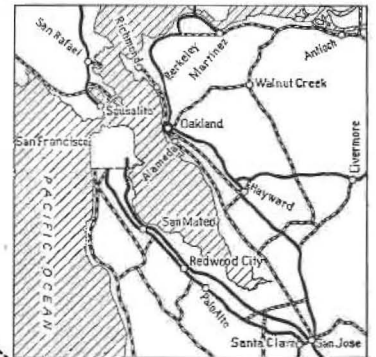
Port of Eureka—William Clark, Sr., Surveyor  
Port of San Jose—Not appointed

STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS

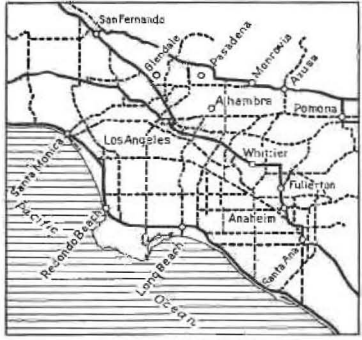
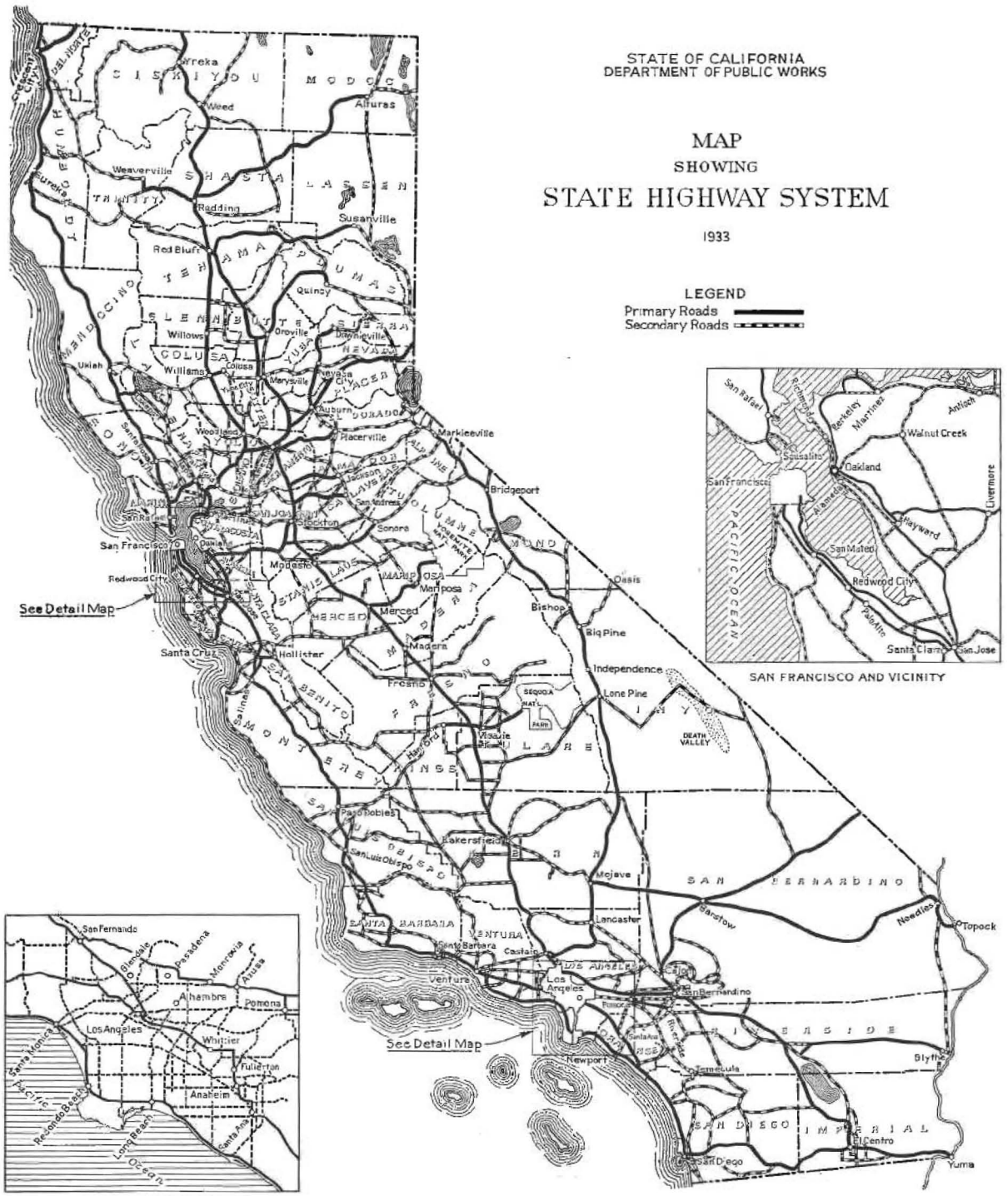
MAP  
SHOWING  
STATE HIGHWAY SYSTEM

1933

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



SAN FRANCISCO AND VICINITY



LOS ANGELES AND VICINITY

See Detail Map

See Detail Map