

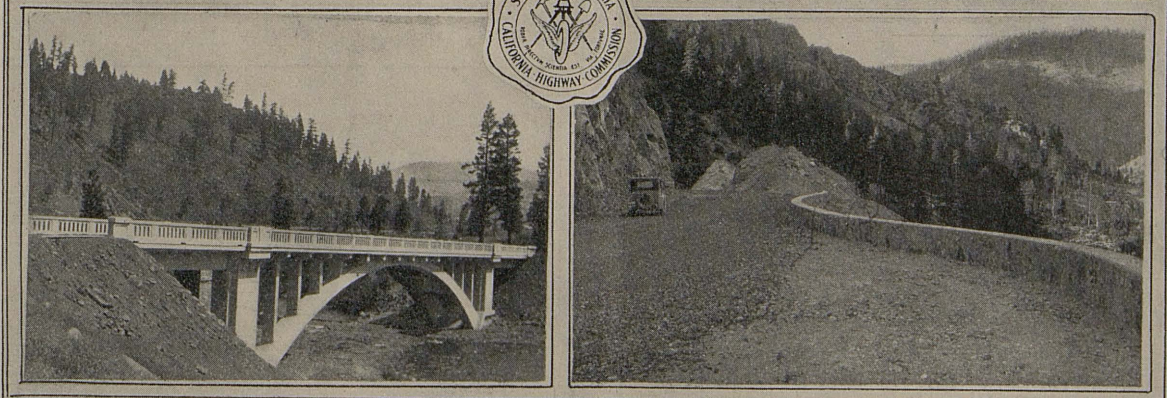
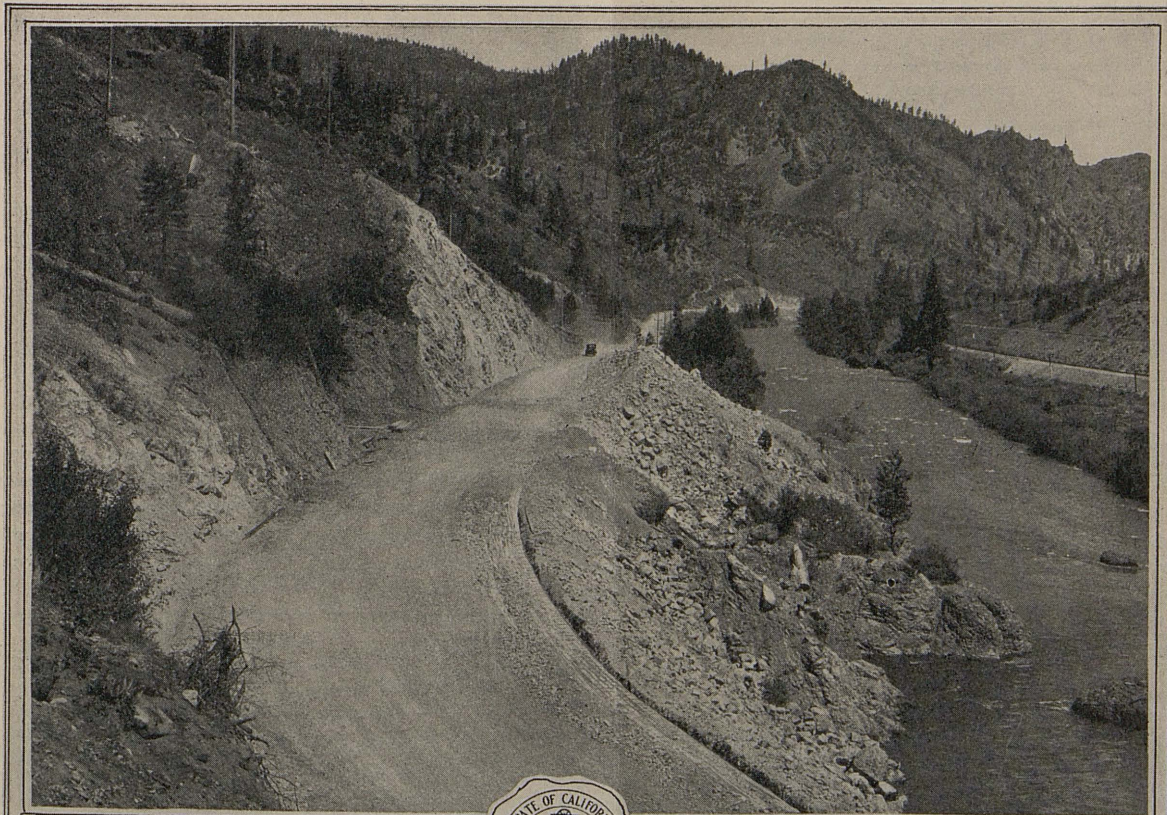
CALIFORNIA HIGHWAYS

A BULLETIN ISSUED BY THE CALIFORNIA HIGHWAY COMMISSION FOR THE
INFORMATION OF ITS EMPLOYEES AND THE PUBLIC

Vol. 3

JUNE, 1926

No. 6



IN THE TRUCKEE CANYON—Scenes on the Truckee River highway, California's latest interstate connection with Nevada and the East, opened to traffic this month after being under construction for two and a half years. *Above*, Highway, river, railroad, in Truckee canyon; *Lower left*, Boca arch, concrete span over Truckee River near Boca; *Lower right*, Rock retaining wall overlooking canyon protects parking space for motorists. Photos taken prior to opening of highway to traffic on June 10th. See article on page three.

In this issue: TRUCKEE RIVER HIGHWAY DEDICATED—WHITTIER BOULEVARD COMPLETED

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Colors by Munsell Color Services Lab

1	39.12	65.43	49.87	44.26	55.56	70.82	63.51	39.92	52.24	97.06	95.02	87.04	82.14	71.16	61.05	15
2	13.24	18.71	16.72	-22.23	22.85	-24.49	53.60	-46.07	18.51	1.13	0.23	0.21	0.43	0.28	0.19	14
3	19.63	38.62	28.86	16.19	8.29	3.44	31.41	72.46	72.95	29.37	54.91	43.96	82.74	52.78	50.87	30
4	0.01	-0.04	0.60	0.73	0.19	-0.81	-0.23	20.98	-24.45	16.83	13.06	-39.91	52.00	3.45	50.88	27
5	0.75	0.98	1.24	1.67	2.04	2.42	0.01	-0.18	0.54	-0.05	0.19	0.49	-19.43	55.93	68.80	26
6	0.01	-0.04	0.60	0.73	0.19	-0.81	-0.23	20.98	-24.45	16.83	13.06	-39.91	52.00	3.45	50.88	25
7	0.01	-0.04	0.60	0.73	0.19	-0.81	-0.23	20.98	-24.45	16.83	13.06	-39.91	52.00	3.45	50.88	24
8	0.01	-0.04	0.60	0.73	0.19	-0.81	-0.23	20.98	-24.45	16.83	13.06	-39.91	52.00	3.45	50.88	23
9	0.01	-0.04	0.60	0.73	0.19	-0.81	-0.23	20.98	-24.45	16.83	13.06	-39.91	52.00	3.45	50.88	22
10	0.01	-0.04	0.60	0.73	0.19	-0.81	-0.23	20.98	-24.45	16.83	13.06	-39.91	52.00	3.45	50.88	21
11	0.01	-0.04	0.60	0.73	0.19	-0.81	-0.23	20.98	-24.45	16.83	13.06	-39.91	52.00	3.45	50.88	20
12	0.01	-0.04	0.60	0.73	0.19	-0.81	-0.23	20.98	-24.45	16.83	13.06	-39.91	52.00	3.45	50.88	19
13	0.01	-0.04	0.60	0.73	0.19	-0.81	-0.23	20.98	-24.45	16.83	13.06	-39.91	52.00	3.45	50.88	18
14	0.01	-0.04	0.60	0.73	0.19	-0.81	-0.23	20.98	-24.45	16.83	13.06	-39.91	52.00	3.45	50.88	17
15	0.01	-0.04	0.60	0.73	0.19	-0.81	-0.23	20.98	-24.45	16.83	13.06	-39.91	52.00	3.45	50.88	16

D50 Illuminant, 2 degree observer

Golden Thread

CALIFORNIA HIGHWAYS

HARVEY M. TOY, Chairman;
 N. T. EDWARDS and LOUIS EVERDING, Commissioners.
 ROBERT M. MORTON, State Highway Engineer.
 W. F. MIXON, Secretary.

We are pleased to permit publication of any of the matter contained herein or to loan cuts, and this privilege is extended newspapers and periodicals without restrictions.

FRANK B. DURKEE - - - - - Editor
 P. O. Box 1103, Sacramento, California.

Vol. 3 JUNE 1926. No. 6

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General Headquarters, Fifth Floor, Forum Bldg., Sacramento



DURING the early part of 1926, promotional examinations were held to give engineers in lower grades opportunity to qualify in the grades next above. Insofar as engineering grades V and VI were concerned, the results were a disappointment.

As the experience of the young engineer broadens with increasing years and responsibility, it is to be expected that, if he is sincere in his efforts, he will advance in the state's service. If advancement comes slower than his ambition grows, before criticising those who are responsible for passing upon his qualifications in competitive examinations, he should analyze whether he himself is making the most of his present opportunities.

From the engineering grades V and VI are selected the men who direct the work of large units of the organization. To be successful in administrative positions, a man must have abilities along the lines of organization, and some of the qualifications of a successful manager. For this ability to be useful, he must have a knowledge of the aims, policies, and methods of his superiors.

In the oral examinations above referred to, most of the applicants exhibited a lack of conception of the economic features of highway financing, planning, and construction. It appeared to the examining board that many of the men applying for the higher grades (to enter which by promotional examination requires a mark of 85 per cent) had never given a thought to the underlying engineering and economic reasons governing highway

(Continued on page 4.)

EVERY employee of the highway commission has a direct interest in the improvement of the highway organization's methods and results, both engineering and clerical, office and field. To that end, the State Highway Engineer invites constructive criticism or suggestions from every employee.

Ideas as to the more economical and efficient handling of your job, or suggestions for elimination of waste will be welcomed. Criticism is also desired from persons outside the organization, who are in a position to give facts.

Send only signed communications addressed as follows: California Highways, P. O. Box 1103, Sacramento, Cal.

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Truckee River Highway Dedicated to Memory of Pioneers

ACCLAIMED as a notable accomplishment in road building, the Truckee River interstate highway, connecting California and Nevada and providing a new gateway to the east over the route of the pioneer Overland Trail, has been completed and opened to traffic. The joyful event was fittingly celebrated at the state line on June 10th with dedication ceremonies participated in by the governors of the two states, highway officials, and citizens.

Opening of this long-heralded and scenic route provides practically a water grade from Reno, Nevada to Donner Lake, California, which may be kept free from snow whenever the Donner Summit can be opened to traffic. The Dog Valley grade and the less discussed but more objectionable Dog Valley summit of 6500 feet elevation have been eliminated from the highway system of California.

The Truckee River highway stands as a monument to a valiant band of western road enthusiasts, who never gave up in their efforts for a water grade highway as an eastern entrance to California. Not the least of these is Chairman Harvey M. Toy of the California Highway Commission, who, as the first president of the Utah-Nevada-California Highway Association, was an advocate of the route long before his appointment to the commission. The association was sponsor of the Victory highway to which the Truckee canyon unit is California's most important contribution.

Governor Dedicates Highway.

As pointed out by Governor Friend Wm. Richardson in his address at the dedication ceremonies, the Truckee River highway is one of the major projects authorized and completed by the present highway commission. It was undertaken in accordance with the policy of the administration to concentrate funds on interstate connections and trunk highways. The Governor spoke, in part, as follows:

"As Governor, I am proud of the record the highway department has made during the past three and a half years. In addition of other important work, nearly 300 miles of new highway have been completed on the state's six major interstate connections at an expenditure of nearly \$8,000,000. Many more miles have been improved by maintenance.

Today, you have viewed what has been done in this beautiful canyon to complete this gateway to the East. Three grading contracts and five bridge contracts, representing an expenditure of over \$900,000, have forever eliminated the Dog Valley summit.

Other states are striving in the face of many difficulties to improve this great transcontinental highway. And California would have been unfair, would have failed in her duty to Nevada and Utah, had we declined to build our highway through the Truckee Canyon. We have kept our promise, the interstate connections are being finished.

In the name of the pioneers who suffered and struggled through these mountains to found a new American commonwealth, I dedicate the Truckee River highway to the service of The People."

The Work of Engineers.

When the present commission took office the Truckee River project was one of the first to receive consideration. State Highway Engineer R. M. Morton investigated the proposed location and reported favorably upon its feasibility, following which, the commission, early in 1923, authorized location surveys, the preparation of plans and specifications and a call for bids. Its history from then on is a story of the work of engineers—of many difficulties met and overcome. Division Engineer F. W. Haselwood tells of this part of the work, as follows:

The distance from the town of Truckee to the Nevada line near Verdi via the Truckee River is 19.1 miles. The canyon is well crowded with both natural and man-made obstructions. High undulating benches terminating more or less

(Continued on next page.)



DEDICATING TRUCKEE RIVER HIGHWAY—Scenes at the state line when California and Nevada celebrated the opening of the Truckee River highway. *Left*, Chairman Harvey M. Toy of the California Commission presiding at the speaking program; *Center*, left to right; Chairman Toy; Governor Friend Wm. Richardson of California; Governor James G. Scrugham of Nevada; W. B. Gelatt of Donner Lake; *Right*, Governor Richardson making the dedicatory address. (See views of highway on front cover.)

TRUCKEE HIGHWAY DEDICATED

(Continued from page 3.)

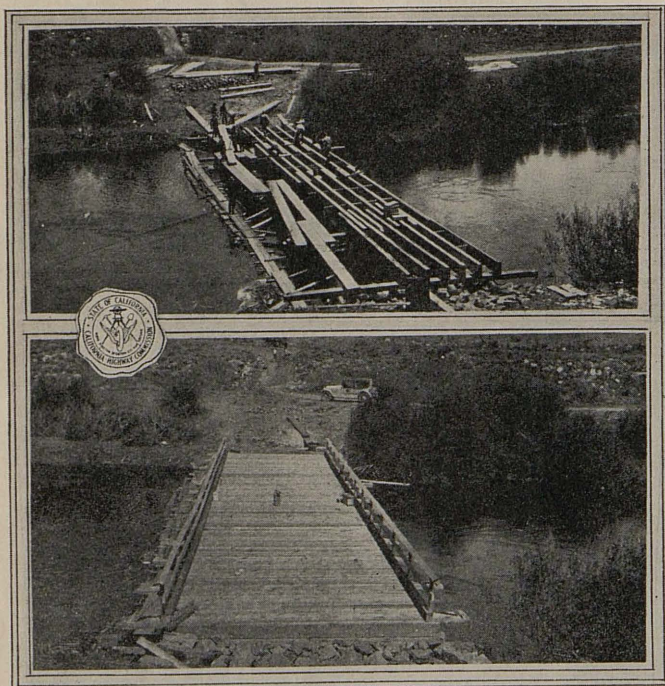
abruptly at the river, precipitous rock cliffs rising from the water's edge cut by deep gorges, lava rims over or from which loose talus slopes to the river, these are some of the natural obstructions. The Southern Pacific has a double track railroad through the canyon on a 400-foot right of way which it jealously guards against any encroachment. There are in addition five pole lines, a paper mill, a power house, a large flume, that lies just below the road for two miles, numerous ice ponds, and three small towns.

The task of projecting a desirable location that would be as free as possible from snow, take advantage of the scenic possibilities and be not prohibitive in cost required considerable ingenuity, technical skill, physical effort and detailed study. All of the location was influenced in some manner by the Southern Pacific and its wide right of way. The result of the location studies, which occupied a period of two years, is a road that fully meets the requirements set. It can be kept free from snow in normal years at little cost; there are scenic views that could be had from no other location and the road is fast and safe with good alignment and grade.

Bridges Part of Project.

In the nineteen miles there are four crossings of the river, one of which crosses the Southern Pacific at the same time, a four-track crossing of the Southern Pacific, a channel change of the Truckee River, high masonry retaining walls and other incidental structures.

The grading work was done in three contracts. The first from Truckee to Boca, a distance of 7.31 miles, was built by Irey and Holden of Lodi in 1924. The second from Boca to



Temporary bridge over Truckee River built in six days by young engineer of Division III. It will handle traffic until permanent structures now under way are completed.

Floriston, a distance of 5.8 miles, was also built by Irey and Holden, and was completed in March, 1926. The third unit from Floriston to the state line, a distance of 5.97 miles, was built by the Nevada Contracting Company of Fallon.

The construction of bridges and overhead crossings was directed by the bridge department. A river bridge and an overhead crossing at Hinton are yet incomplete, but a temporary bridge has been built and a good two-way road provided around the uncompleted structures, which, when completed, will eliminate all grade crossings in the canyon.

The work was done with power shovels and dump trucks except two short stretches of team work. Most of the

shovels operated double shifts and work was suspended on account of cold weather but a few weeks in the winter of 1924-25. Often as many as five shovels were in continuous operation, two shifts per day.

At two locations deposits of volcanic cinders were encountered which were spread as a temporary surfacing on twelve miles of the road, and as a base course for the rock surfacing to follow next year. On the remaining seven miles adjacent to the Nevada line arrangements have been completed for an application of crushed rock.

The record would not be complete without mention of the men who have been the division's representatives since 1923. J. W. Vickrey was chief locating engineer and after construction started A. R. McEwen and J. L. Piper were resident engineers.

With the opening of the Truckee River highway, the dream of those whose enthusiasm for the river route met and overcame innumerable obstacles is realized, and in the realization let us hope they will in nowise be disappointed.

YOUNG ENGINEER BUILDS TEMPORARY BRIDGE IN RECORD TIME.

TO MAKE possible the holding of the Truckee River highway celebration on the scheduled date, June 10th, it was necessary to open a 0.7 of a mile detour around an uncompleted bridge and overhead grade separation. This involved construction of a temporary bridge across the river.

The Maintenance Department of Division III assigned the task to Assistant Resident Engineer Clyde Rust with orders to complete the bridge in five days, although it was hardly expected that the work could possibly be accomplished in that time.

The Job Starts.

Rust gathered a crew and went to work. The bridge was finished on the evening of the sixth day. It is 102 feet long, 21 feet wide, with a wheel guard and hand rail. It is founded on four rock-filled timber cribs and has held up under passage of a power shovel and heavy trucks.

The feat of the young engineer was related to the Governor and members of the commission, when they passed over the bridge on the initial trip over the new highway.

"STRAIGHT FROM THE CHIEF."

(Continued from page 2.)

financing, location, construction, etc. Some of them were unable to analyze even the simplest of highway economic problems.

THIS situation is a reflection on our system of engineering promotion. It indicates that the younger men are not being sufficiently coached and advised by the men of greater experience and responsibility. It also indicates that the applicants themselves are not using portions of their spare time in the study and analysis of highway economic problems, and are not studying the written matter on the subject, which is constantly being made available to them in engineering periodicals and in book form.

Only by understanding the solution to the problems met with in the job above you, can you expect to demonstrate your ability to fill that position. To inform the examining board that you used a certain method only because it is the standard of the Highway Commission, indicates that you do not have an appreciation of why the standard was adopted. You should know the underlying reasons behind every standard. Mental analysis of the problems in the job above you, and a grasp of the reasons of your superiors for taking certain action, is entirely possible and should be given serious thought by the ambitious engineer.

We hope that the results of the next examinations will show evidence of some study of highway economics, and that a number of our ambitious engineers will be qualified for promotion. Obtaining the services of ambitious men who will think for themselves is the biggest problem confronting any executive.

COOPERATIVE PROJECT COMPLETES NEW WHITTIER BOULEVARD



RECONSTRUCTION OF WHITTIER BOULEVARD—The state highway between Los Angeles and Whittier is now a fifty-six-foot street surfaced with heavy pavement for the entire distance. *Left, above*, Old oil macadam surfacing twenty-two feet wide; (note extreme crown, dangerous to motor vehicle traffic); *Right*, New state highway through Pico, paved with concrete for full width of street. *Left to right, below*, Rebuilding pipe line to care for irrigation; oil macadam scarified to provide base for new pavement; paving approaches and retaining walls at Montebello subway; A. N. George, resident engineer. Reconstruction with gasoline tax funds. (Photos by Div. VII.)

ON ONE of the most historic of southern California roads, a route first trod by the feet of early Spanish explorers, the California Highway Commission has completed the rebuilding of a wide, paved boulevard, from the Los Angeles city limits to Whittier. The county of Los Angeles and a special assessment district assisted the state to the extent of one-half the cost of the project, the state's share of which was financed with reconstruction funds.

This route, a part of the Los Angeles-San Diego trunk highway, Division VII, probably carries the heaviest sustained traffic of any state highway in California. The rebuilding of early pavements, first placed by the county more than ten years ago, on the standards of a city street was determined upon by the commission in 1924 and by successive contracts the work has been pushed forward to completion. The last contract from First street, Montebello, to Philadelphia street, Whittier, 3.3 miles, has just been completed by Kuhn Brothers, contractors.

Whittier boulevard passes through a territory undergoing transition from country to city. Orchards are being subdivided for residential, business, and industrial purposes and problems of both a rural highway and a city street had to be met. Willingness of the county and adjoining property owners to cooperate made possible construction of a pavement fifty-six feet wide, with curbs and gutters, the roadway grade being extended to a width of sixty-eight feet.

Railroad Crossing Eliminated.

In addition to the rebuilding of the pavement, a dangerous crossing of the Union Pacific Railroad was eliminated by the

building of an underpass with two twenty-eight-foot openings for traffic. The county, state, and the railroad joined in financing this project, the commission meeting the cost of the pavement through the subway, slope paving and retaining walls, and the lighting and dewatering systems. The railroad consented to the raising of its grade seven feet, so that the floor of the underpass would be above the groundwater level. This proved less costly than the heavier construction that otherwise would have been necessary to resist the hydrostatic pressure of groundwater.

Resident Engineer Describes Project.

A. N. George, resident engineer for Division VII, under whose direction inspection of all paving work was done, tells of the many problems on the Whittier boulevard project as follows:

Width of most of right of way on Whittier boulevard at the time that it was taken over as a state highway was fifty feet. In recent years, through the efforts of the Los Angeles County Planning Commission no subdivision maps of tracts fronting the boulevard have been accepted for recording which did not provide at least an eighty-foot right of way, and in most cases for a ninety-foot width for the highway.

Many tracts, however, were unsubdivided at the time this improvement was planned. Some of these were fruit orchards or nut groves, with their irrigation systems, while others had been leased in small parcels as business property. These leased tracts were in most cases occupied by flimsy buildings, fronting directly on the old right of way. Thus it was necessary to deal with both the property owner and the lease holder in obtaining the extra width of right of way.

(Continued on next page.)

BOARD OF CONTROL ANNOUNCES PLANS FOR NEW BUILDING

THE State Board of Control, through Chairman George G. Radcliff, has announced plans for the construction in Sacramento of an office building to house the State Highway Department, the Division of Motor Vehicles, and several smaller state departments for which there is not sufficient room in the new state office building. The new building, to consist of several stories, will be located at Eleventh and P streets. It will be financed by San Francisco capital, the state taking a long term lease with an option of purchase, which may be exercised if the legislature makes the necessary appropriation.

Chairman Radcliff has been working on the problem of state offices for many months and the departments which will occupy the new building appreciate his efforts to get them adequately housed, with the particular work and needs of each taken into consideration in the planning of the building.

The proposal to locate the highway and motor vehicle departments in a building of their own has the hearty approval of Governor Friend Wm. Richardson.

MODOC APPRECIATES MAINTENANCE

THE Modoc County Development Board, which has its headquarters at Alturas, has forwarded headquarters the following letter commenting upon the maintenance work being done by Division II on the Redding-Alturas lateral:

MODOC COUNTY DEVELOPMENT BOARD
Alturas, California

June 9, 1926.

California Highway Commission,
Sacramento, California.

Gentlemen:

We wish to send to you an expression of our appreciation of the maintenance work being done by your man, Mr. J. W. Clark, on the Redding-Alturas lateral of the state highway system. The improvement of this lateral is considerably increasing the tourist travel through Modoc County, and we are quite mindful of the assistance that the California Highway Commission has been giving us.

Assuring you of our hearty cooperation in the future, we are,

Yours very respectfully,

MODOC COUNTY DEVELOPMENT BOARD.
By (Signed) O. D. MORGAN, Secretary.

ANOTHER letter regarding conditions on this route has been received by Chairman Harvey M. Toy. It compliments the work being done by J. W. Clarke, one of the Division II maintenance foremen assigned to the Alturas lateral. The letter reads as follows:

MODOC COUNTY BANK
Alturas, California

June 10, 1926.

Mr. Harvey M. Toy,
State Highway Commission,
Hotel Manx,
San Francisco, Calif.

Dear Mr. Toy:

I thought you would be interested in knowing that your Mr. J. W. Clarke, in charge of maintaining the highway from Adin to Cedarville, is doing some very fine work, and we hear a lot of favorable comment on it as well as derive a great deal of pleasure in driving over his roads.

You are to be congratulated on being able to have a man of Mr. Clarke's ability in charge here.

Very truly yours,

(Signed) R. R. BAKER, Vice-President.

WHITTIER BOULEVARD COMPLETED

(Continued from page 5.)

Petty Disputes Required Patience.

Justice required that the state or county should pay for the moving of improvements from the strip of land to be deeded the state for highway purposes. Ornamental fences were moved back to the new property line; retaining walls were replaced with slope pavement; irrigation pipes were moved back onto the property, and the buildings were moved back to front on the new right of way. This takes only a few words to record, but it represents months of patient negotiation and adjustment. Once the resident engineer was summoned from one end of the job to settle a dispute between a house mover and a house owner over the responsibility for the upsetting of a shelf of jelly. Another property owner demanded that the contractor muzzle his mules, while grading operations were under way, to prevent the animals from browsing on the overhanging limbs of the former's walnut trees.

Oil, gas, and water pipes, including a 48-inch water main, traversed the highway, as well as telephone, telegraph, and power lines. Owners of these utilities were asked to move their lines to new locations between the curb line and the new property lines, and although they responded promptly and willingly, the contractor was seriously hampered at times by their presence.

Due to legal complications, it was found advisable to divide the road in halves longitudinally, to permit the state to award a contract for one half, and the assessment district and county the other half. Kuhn Brothers, however, were low bidders on both the state and county projects and from a construction standpoint the effect was the same as if all the work had been awarded in one contract.

Part of the inspectors were furnished by the county and part by the state, all working under the direction of the state representative. There was perfect cooperation at all times.

How the Work was Done.

The actual improvement consisted of a fifty-six-foot concrete pavement, varying in thickness from seven inches at the thinnest points to nine inches at all joints and at the edges. This concrete was placed on a subbase composed of five inches of macadam, salvaged from the original pavement, and decomposed granite. A curb with a face varying from ten to twelve inches was placed on each side of the pavement, which was carried out to the property lines at intersecting streets. The pavement was placed in four 13-foot strips with a two-foot gutter strip next to each curb.

Thus has Whittier boulevard passed through another phase of its evolution from a winding path along which came the padres, to one of the main traffic arteries of the expanding metropolis of the southland.

MAINTENANCE CREW WORKS NIGHT AND DAY TO OPEN BRIDGE.

THE SPIRIT of the Maintenance Department of the California Highway Commission, whose motto evidently is "Traffic Shall Not Stop," was typified recently by the feat performed by a crew of Division X under the direction of Superintendent George Marshall.

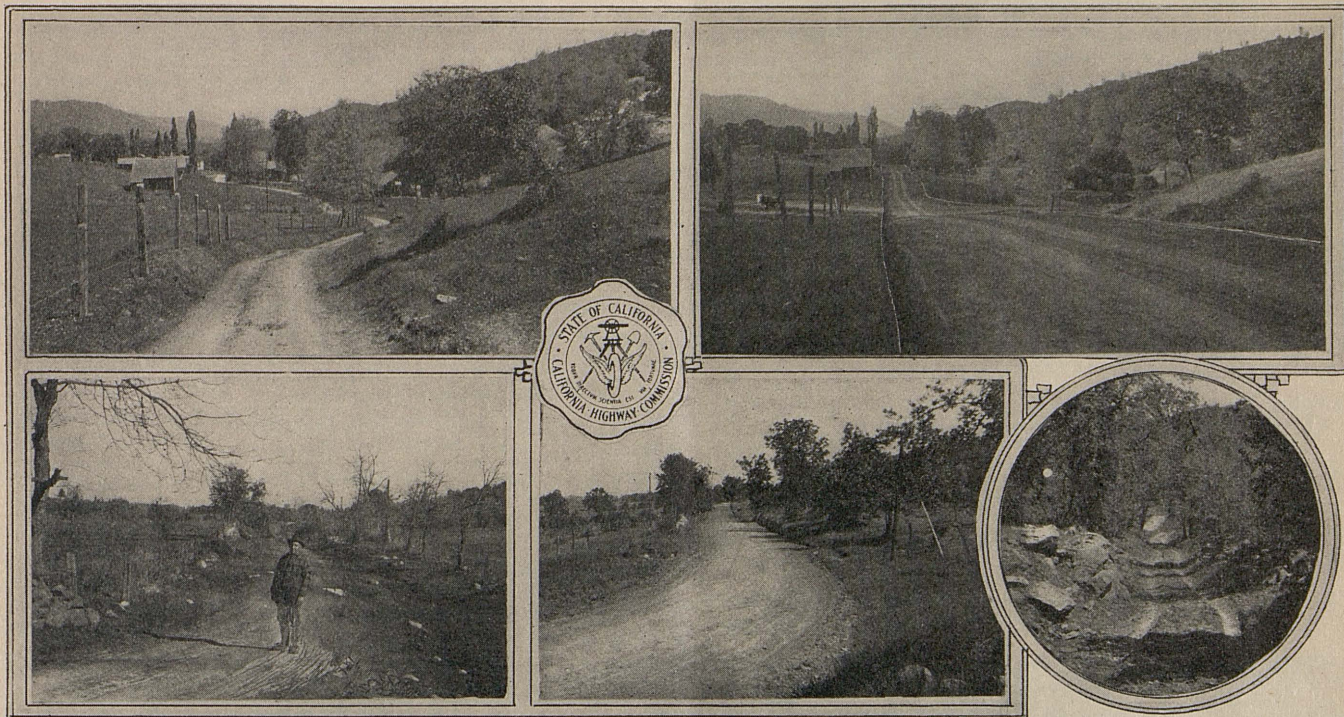
While the Rio Vista bridge across the Sacramento River was being opened, the main drive shaft in one of the bascule lifts broke in two places and it was necessary to have a new one made in San Francisco. The gears had to be removed and taken to the San Francisco foundry to be fitted onto the new shaft, which was rushed back by Marshall in his car.

The break happened on Sunday evening and the crew was forced to do most of the work from boats. A high wind, which strained the leaf while in mid air and caused the break, made work from the boats difficult and dangerous. But the crew never faltered. Work went on during the night, all next day, and until 3 a.m. on the second morning, before the bridge could be lowered. Superintendent Marshall did not stop for rest until traffic was resumed.

A contractor called up an architect and said: "Hold my bid, I forgot to figure in the steel and brickwork."
Architect: "That's all right, you're the high bidder anyway."

Six

PIONEER TRAILS OF MOTHER LODE COUNTRY TRANSFORMED
BY STATE MAINTENANCE



ON THE MOTHER LODE HIGHWAY—New plan of state maintenance on unconstructed highways has wrought wonders on pioneer trails of the gold seekers in Divisions III and X. *Left, above*, Old road approaching Nashville, El Dorado County; *Right*, New road improved with maintenance funds. (Note improved alignment.) *Below*, Before and after views on another section of same route. *In circle*, section of narrow road on Log Town grade, a 17 per cent climb to be eliminated by relocation. (Photos by Div. III.)

By T. H. DENNIS, Assistant Division Engineer, Division III.

“Wonder who has passed here
In the long ago,
Laughing, weeping, sighing—
I shall never know.
Only know the hill trails
As they are today,
The makers of the hill trails
Have long since passed away.”

IN COMMEMORATION of these hardy trail makers and as a meed of recognition of their sturdy worth, the Legislature of 1921 designated as a state road what is known as the Mother Lode highway. It extends from Auburn, in Placer County, to Sonora, Tuolumne County, through divisions III and X. The term “Mother Lode” originated with the early miners and was their conception of the source of the gold found in the placer mines of the Sierra foothills. Some held the opinion that it had been washed down from solid ledges far back in the mountains, and this mythical ledge, known as the Mother Lode, was ever the object of their search. As a matter of fact the source of California’s placers, which, between 1849 and 1856, produced many millions of dollars, was never ascertained.

The Mother Lode highway act of 1921 provided that the five counties through which the road passed were to provide funds for its maintenance. Whatever repair work was done was the work of Boards of Supervisors until January 1st of this year, when, by virtue of a legislative act of 1925 known as Assembly Bill 589, the state assumed active maintenance of all unconstructed state highways.

Division III Begins Work.

Division III’s part of this historic road, 35.3 miles in length,

Seven

extends from Auburn to the Huse Bridge over the Cosumnes River, the northern boundary of Amador County. This thirty-five miles of road in Division III is divided into four sections, on only one of which, that from Coloma to Placerville, had any maintenance been done by the state prior to January of this year. When taken over by the division, the road in many places was narrow and rough and almost impassable. This article describes what has been accomplished on a particular section south of El Dorado, El Dorado County. It is typical of work being done at various places along the route by both divisions.

The Mother Lode highway traverses the foothills between Auburn and Sonora. It is a rugged country where the mining towns of today exist alongside abandoned hamlets, cabins, and diggings that stir the imagination and recreate again a picture of that happy-go-lucky, devil-may-care race, gathered from many lands by the discovery of gold. The Forty-niners necessarily lived a crude existence, but it was they who first heralded the glory and wealth of California to the far corners of the earth.

To build a road along the trails used by those hardy sons of the gold pan, sluice box, and “Long Tom” rocker is indeed a worthy task. Especially is this true of the section between El Dorado and the Cosumnes River known in the division records as ED-65-C. Starting as a trail out of Mud Springs, now El Dorado, it heads for its objective, the river, with a directness typical of its makers. It pauses not at the summit but plunges downward over a boulder-strewn hillside, known locally as the Log Town grade, for approximately a mile on a 17 per cent gradient. The trail, used for years, was finally worn down to bed-rock, the accumulation of disturbed boulders being piled six to eight feet high on each side of the narrow one-track roadway.

(Continued on next page.)

COMMISSION INVITES BIDS ON SURPLUS EQUIPMENT

THE California Highway Commission has on hand some articles of equipment no longer needed for highway work. Much of this machinery is in good used condition and capable of giving considerable service, but on account of changes in policies or methods is not now required by the department.

Those interested in the purchase of any of the articles listed below may inspect the same and file bids with the Superintendent of Equipment of the division where the equipment is located or with the Equipment Department at Sacramento, from whom further information and complete lists of equipment available for sale may be obtained.

The following is a list showing some of the major articles available, together with their present location:

EQUIPMENT IN DIVISION I. HEADQUARTERS, WILLITS.		
C.H.C. No.	Description	Location
1.	Crane, Thew Mod. 00, No. 1647. Traction wheels, 25' boom. Cook upright 2 cyl. gas eng.	Eureka yard
1.	Roller, road, tandem, steam, 5-ton Kelly Springfield	Willits yard
2.	Roller, road, three-wheel, steam. 12-ton Case	Eureka yard
3.	Roller, road, three-wheel, steam. 12-ton Buffalo-Pitts	Mayers yard
5.	Roller, road, three-wheel, steam 12-ton Buffalo-Pitts	Eureka yard
2.	Shovel, Erie Standard, Type B, 3/4-yd., steam Traction wheels	Cummings

EQUIPMENT IN DIVISION II. HEADQUARTERS, REDDING.		
C.H.C. No.	Description	Location
6 to 15 inc.	Cars, Matteson, 14 1/2 cu. ft. 18" gauge, plain bearings, turn-table steel body and truck mine dump	Redding
27.	Engine, gas, 30 h.p. Stover	Redding
28.	Engine, gas, 32 h.p. Fairbanks Morse, type N	Redding
24.	Engine, gas, 25 h.p. Doak	Redding
26.	Engine, gas, 30 h.p. Doak	Redding

11.	Roller, road, three-wheel Austin, 10-ton gas type, S-14	Redding
13.	Roller, road, three-wheel Austin, 10-ton gas type, 1-700	Redding
16.	Roller, road, three-wheel Kelly Springfield, 10-ton gas. No. 3471	Redding
10.	Tractor, Mogul. No. 5 D. Model 8-16	Redding

EQUIPMENT IN DIVISION III. HEADQUARTERS, SACRAMENTO.		
C.H.C. No.	Description	Location
1 & 2	Buckets, clamshell, 3/4 cu. yd. Lakewood type, 641 B	Sacramento
21.	Roller, tandem, steam, 5-ton Kelly Springfield	Sacramento

EQUIPMENT IN DIVISION IV. HEADQUARTERS, SAN FRANCISCO.		
3.	Bucket, clamshell, 3/4 cu. yd. Lakewood type 641	San Jose
4.	Bucket, clamshell, 1 1/4 cu. yd. Williams	San Jose
3.	Hoist, steam, Clyde, 3-drum, 50 h.p., 8" x 12" with 4" x 6" swinging eng.	San Jose
11.	Hoist, steam, Washington, 2-drum 25 h.p. Model 747S, 7" x 10"	Fruitvale
40.	Mixer, concrete, Foote paver. 2-sack with Novo Eng.	Fruitvale

EQUIPMENT IN DIVISION V. HEADQUARTERS, SAN LUIS OBISPO.		
4.	Derrick, American, 5-ton stiff-leg 45'. 14" x 14" Mast 60' 12" x 14" boom	San Luis Obispo
5.	Hoist, steam, 3-drum, Clyde, 50 h.p. 8" x 12" cylinders	San Luis Obispo

EQUIPMENT IN DIVISION VI. HEADQUARTERS, FRESNO.		
25.	Crusher, rock. No. 5 Champion. 11" x 20" jaw	Bakersfield
5.	Derrick, American stiff-leg 45', 14" x 14" mast 60' 12" x 14" boom	Bakersfield
45.	Roller, road, steam, tandem. 5-ton Erie	Fresno
46.	Roller, road, steam, tandem. 5-ton Kelly Springfield	Fresno
59.	Mixer, concrete. Paver, Foote. 1-sack traction, 6 h.p. Fairbanks-Morse	Merced

PIONEER TRAILS TRANSFORMED

(Continued from page 7.)

A relocation three and one-half miles in length eliminates an equal distance of the old trail, including the Log Town grade. A less strenuous route is to be followed to the Huse bridge, the road lying along the hill sides at times above and again in close proximity to the beautiful Cosumnes.

The ruggedness of the country and the condition of the roadway would not permit of half-way measures. To spend money on the road in its present location, which in time would have to be abandoned, was out of the question. To meet the situation, Division Engineer F. W. Haselwood asked the El Dorado County Board of Supervisors to assist in securing a new right of way for the better maintenance of the highway.

Supervisor W. S. Biggs, through whose district the road passes, set to work enthusiastically and with the exception of that portion which provided for elimination of the Log Town grade was able to secure an 80-foot right of way. In addition he financed the erection and replacement of necessary fencing.

Heavy Equipment Necessary.

Upon completion of these negotiations, Maintenance Foreman C. G. Sackett of El Dorado began operations. He had a crew of fourteen hard-rock men, equipped with hand steel and double jacks, a 30 Best tractor, an 18-foot Pacific revolving scraper, and an 8-foot Standard leaning wheel grader. Necessity of heavy drifting and grading and the size of the numerous boulders made it apparent that this type of equipment was too light.

Accordingly, a 60 Best tractor, a 12-foot Russell grader, and a 3-yard land leveler were rented and placed on the job.

Heavy bank cuts were made, trees and large boulders pushed aside, and many yards of embankment made. Hanging to the side hill under precarious traction, this outfit, under the capable direction of Foreman Sackett, fought its way through and produced a road which, in the time occupied and equipment and labor used, would have elicited the admiration of those same pioneers whose trail he has replaced.

To date six and one-half miles have been improved, three and one-half on the El Dorado end and three on the river crossing end, at an average cost of \$700 to \$800 per mile. The El Dorado Superior Court has granted an order of possession for new rights of way for the elimination of the Log Town grade and this work is now starting. Completion of this latter section will make possible comfortable travel over the El Dorado section of the pioneer trails, made historic through the tales of Bret Harte and Mark Twain.

SERVICE TRUCK EQUIPPED.

A service truck equipped as a traveling branch office of the Division of Motor Vehicles has been fitted up for that department by the headquarters shop of the Highway Commission. The truck is equipped to test headlights, weigh an overloaded truck, issue license plates, explain the kinks of the motor vehicle laws to a perplexed farmer, or do anything else coming within the scope of motor vehicle acts. It is making trips through various sections of the state.

Nature keeps things balanced. Europe has the most wars, but we have nine times as many automobiles.

TESTS OF OIL FOR DESERT SAND TREATMENT

By C. L. McKesson, Materials and Research Engineer.

FROM the highway engineer's viewpoint it sometimes appears that all agencies are combined in an effort to destroy the highway which he has striven to make permanent.

Overloaded vehicles do their part but natural forces are even more active. Swelling and unstable soils, alkali, extreme temperature changes, floods and wave action along the coast are some of the better known destructive agencies. In some localities the wind joins other natural forces in the attack on the highways. In fact wind alone, if given free scope, would soon efface some of the highways.

The sand hills section in Imperial County, in California, is one on which highway engineers have battled the wind ever since highway construction began in that section. Since the construction of the temporary plank road across these dunes, each heavy wind storm has buried long stretches of the highway beneath deep sand drifts in some ways not unlike the snow drifts of other regions. Thousands of dollars have been expended in removing the sand only to have it replaced by the next storm.

The Oregon highway department has waged a similar battle with drifting sands along the Columbia River east of The Dalles, and in a single wind storm has lost long stretches of newly graded highway. Before the advent of the Columbia River highway the railroad had been for years engaged in a struggle against the drifting sands, and perhaps it is to its engineers that we are indebted for the initiation of the practice of oiling as a protection against wind action. The Oregon Highway Department after a few rather disastrous experiences adopted oil protection, to the extent of oiling large areas on the windward side of the highways as well as the highway right of way and the slopes. The work done by them and the equipment used was described by A. F. Morris, in *Public Roads*, for August 1920.

Protection Planned for Sand Hills.

In planning the new highway across the sand hills section, engineers of the California Highway Commission responsible for design and construction decided to utilize oil for slope and shoulder protection, and the Testing and Research department was asked to make tests to determine character of oil suitable for the work and the amount required.

Rather simple tests were made which, it is believed, indicate service values. These tests will be described for the benefit of those interested in the problem of drifting sands or wind erosion.

In making the tests various oils were used with asphalt contents up to about 65 per cent. The experiments have demonstrated that the oil best suited for the work should contain 40 to 50 per cent of asphalt. Oil of this kind can be applied without heating and will penetrate readily. There is a sufficient asphalt content to give good body and to hold sand particles together in a heavy flexible mat after the more volatile oils have evaporated.

A large sample of the desert sand for test purposes was obtained from Division Engineer E. Q. Sullivan. The sand was placed in pans having an area of one square foot and the oil applied in a finely divided spray under an air pressure of 50 pounds. Repeated trials indicated that one-half gallon per square yard was the least amount that would entirely cover the sand. The lighter oils were applied cold and the heavier oils were heated. After the application of oil, the resulting oil cake was cut in small squares and the average thickness measured. The values given in the following table are averages of a number of samples.

After measuring the penetration of oil in the cold sand the pans containing the sand were placed in an oven and maintained

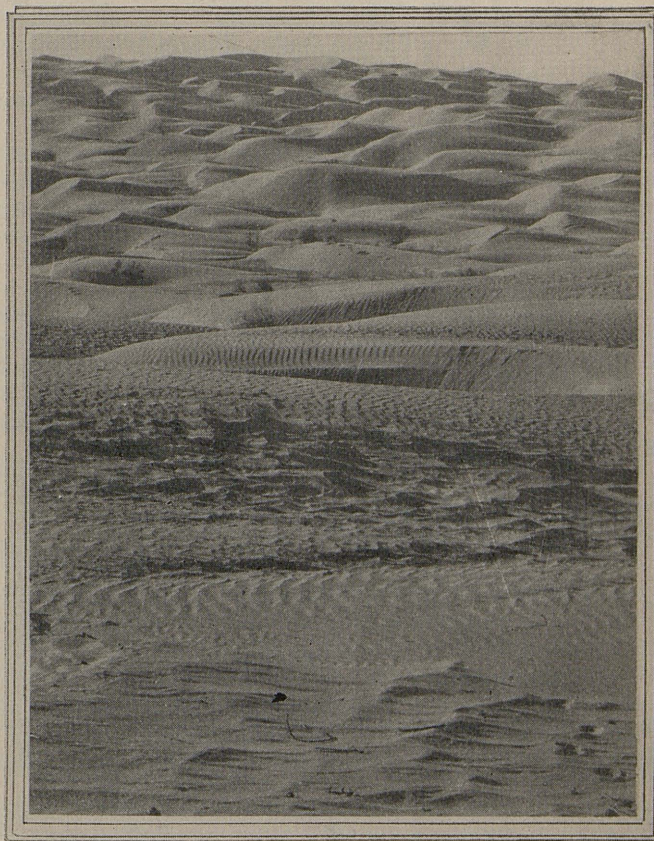
at a temperature of 150° F. for one week and the depth of penetration again determined. This was done to determine maximum probable penetration which will be obtained in the summer time under desert heat conditions.

Results of Tests.

Penetration of desert sand with various asphaltic oils:

Kind of Oil	Sp. Gr. Be	Amt. per Sq. Yd. Gal.	Penetration Cold Sand	Penetration 150° F. 1 Week	Remarks
43% Asphalt	18.2°	1/2 3/4 1	1/4 5/8 7/8	3/4 1 1/4 1 1/2	Applied at about 75° F.
Fuel Oil	17.2°	1/2 3/4 1	1/2 5/8 3/4	3/4 7/8 1 1/8	Applied at about 75° F.
50% Asphalt Road Oil	16.8°	1/2 3/4 1	1/4 3/4 1 1/4	1/2 1 1/4 1 3/4	Applied at about 75° F.
62% Asphalt Road Oil	15.2°	1/2 3/4 1	1/4 1/2 3/4	3/4 3/4 1 1/4	Applied 150°-175° F.
65% Asphalt Road Oil	13.7°	1/2 3/4 1	1/2 3/4 1	3/4 1 1 3/8	Applied 150°-175° F.

A Diesel oil was also tested but it lacked "body" and did not produce a good oil mat on the sand.



IMPERIAL COUNTY SAND HILLS—A close-up of a section of the six miles of dunes across which a pavement is now being placed. Shoulders and slopes will be oiled to prevent erosion by winds.

All of the oils gave good mats of oil and sand but the lighter oils gave good penetration without heating and were therefore recommended for use.

Oiling as above described gives protection against drifting sand when adjacent dunes and sandy areas are oiled and is also useful in preventing erosion of sand fills by wind and water.

SAN JUAN BRIDGE JOB IN SOUTH SHOWS HIGH STRENGTH CONCRETE

MORE than fifty samples of concrete taken during the construction of the San Juan bridge on the Los Angeles-San Diego highway, in Orange County, after test at the headquarters laboratory, show average strengths at twenty-eight days of 2890 pounds for Class C (mass concrete in piers) and 3900 pounds for Class A concrete going into other parts of the bridge.

These are some of the interesting facts concerning this project contained in a report of A. J. Meehan, resident engineer for the bridge department. The bridge is not the first to span San Juan Creek at the present site, two predecessors having been washed away by sudden floods which sometimes occur in the locality. The present heavy reinforced concrete structure replaces a temporary wooden bridge erected several years ago following a flood.

Precautions Taken.

Because of past experience with the stream unusual precautions were taken in building the new bridge. The channel was enlarged fifty feet by removal of restricting roadway fills, slope paving was placed along both banks and bases of channel piers were extended fourteen feet below the bed of the stream and founded upon timber piles thirty feet long. The bridge terminals are each supported by a reinforced concrete beam capping four thirty-foot reinforced concrete piles.

The total length of the bridge is 180 feet. The three channel spans are each forty-six feet in length as compared with eleven feet in the old bridge. The greater length was provided to enlarge the waterway, which was further enlarged by an increase of more than a foot in the under clearance. The end spans are each twenty-one feet in length and the clear roadway width thirty feet.

Parts of former bridges which had to be removed while excavating for pier foundations caused the contractor considerable annoyance and delay. Blasting was necessary and water jets had to be used to facilitate driving of piles.

Abrams Theory Followed.

Abrams fineness modulus theory of concrete proportioning was applied throughout construction. Over fifty samples of concrete were taken and the range of laboratory results are tabulated below:

When comparing these tests with others, consideration should be given the following items:

1. Except in mass sections of structures, the use of rock larger than 1½" is prohibited by physical conditions whereas its use as in pavements, contributes to strength.

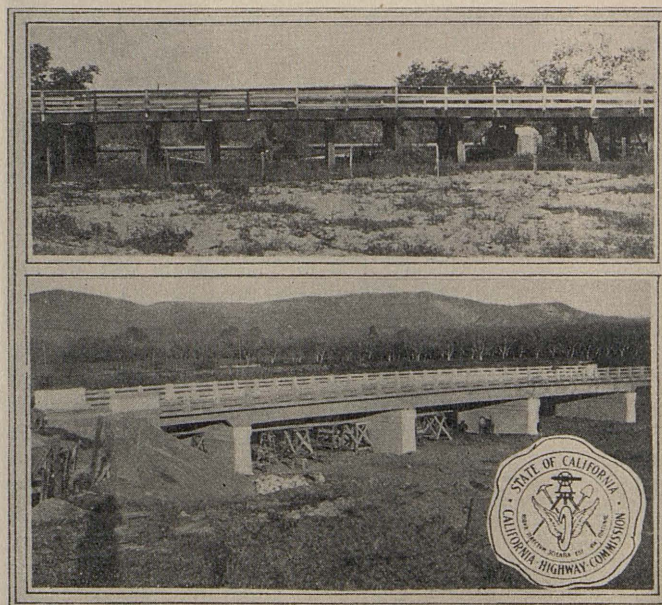
2. Low cement content in Class "C" concrete.

3. More water is required in bridge concrete than paving because of form and reinforcing restrictions.

4. Absence of machine tamper on this contract required more water in the pavement mixture.

Class concrete	Sacks cement per cu. yd.	Slump average	28-day high	Strength low	(Lbs. sq. in.) average
"A" Bridge	6	3"	5740	2900	3900
"A" Slope paving	6	1 7/8"	4910	3830	4490
"A" Paving	7	1 5/8"	5290	3970	4710
"C" Bridge	4.2	1 3/4"	4050	1860	2890

Stevens Brothers and Haas were the contractors. The project being reconstruction was financed with gasoline tax and federal aid funds.



OLD AND NEW—Above, old San Juan bridge on state highway in Orange County. Below, new reinforced concrete structure recently completed by the Bridge Department. Opening for flow of storm waters has been considerably increased.

CLAIM OF DIVISION VII TO BEST TRAFFIC MARKER IS DISPUTED

FROM articles reaching the Bulletin office, it is evident a rivalry has arisen between Divisions VII and X as to the ability of their respective maintenance departments in the perfection of traffic-marking devices. More than a year ago the Bulletin described a marker built by Superintendent B. W. Bicksler of Division X. Sometime later Division VII put forth the "Henry" marker. Now Division X says its marker has been improved and is "equally efficient."

Referring to the recent description of the Henry marker, which appeared in the issue of February, 1926, a communication from Division X says:

Superintendent Bicksler has now improved his device, so that it is equally efficient in painting a traffic stripe or spraying it with asphalt. When spraying hot asphalt, the attachment is fastened to a Ward oiler instead of a White truck, as originally used. Only two men are required to operate the truck and spray outfit. A guide wheel fastened to an outrigger runs along the pavement edge or along the center longitudinal joint, which ever is desired.

Experimental stripes have been sprayed on a twenty-foot concrete pavement south of Sacramento, using XX asphalt, Gilmore asphalt, and Gilmore asphalt sanded. The latter type is proving the most satisfactory as it does not track and leaves a very clean-cut job which turns black after a few weeks. When the pavement is wet or muddy, the sanded strip shows up much better than those not so treated.

The above mentioned device applies the sand on the asphalt stripe immediately behind the spray. Superintendent Bicksler still maintains he has the best and most efficient appliance for this work now in use in any of the divisions.

FOREMAN KILLED FIGHTING FIRE.

While assisting his men in an attempt to extinguish a fire on a wooden bridge across the Klamath River near Orleans, Humboldt County, Foreman U. S. Grant was killed when the bridge collapsed. He fell fifty feet into the river. Another member of the crew was injured.

The structure was of the suspension type and was built by the Forest Service during the construction of the Klamath River highway, added to the state system by the bond issue of 1919.

Foreman Grant was of Indian blood and was only recently employed by Division II. He was formerly in the service of the Bureau of Public Roads. The accident occurred on Sunday, June 13th.

WELDED PIPE LINE USED ON DIVISION VII PROJECTS

SUBSTITUTION of welded pipe lines for the former system of screw pipe is being tried on concrete paving projects in Division VII. A description of the plan used on the Jahn & Bressi contract, north of San Juan Capistrano, is furnished by C. N. Ainely, resident engineer.

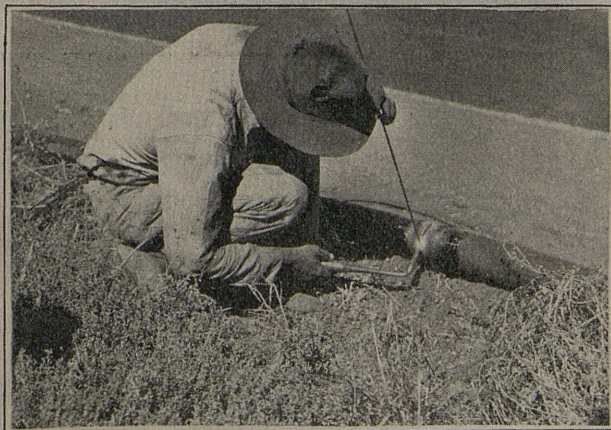
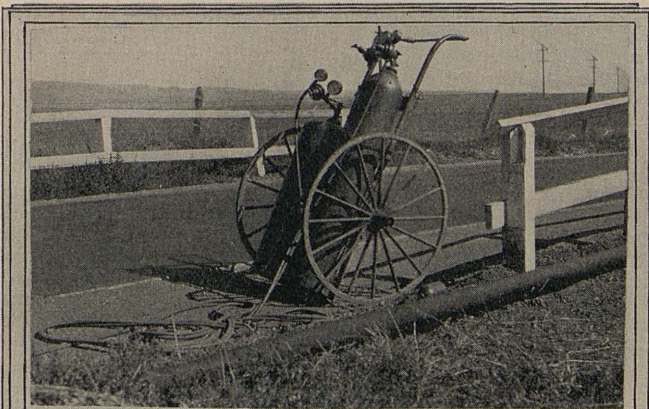
Jahn & Bressi contracted with the pipe company for the complete handling of the pipe during the period of construction. The pipe used, secondhand boiler tubing, is strung out over portions of the job where it is to be needed and is then welded by means of an acetylene torch. The cost of installing, which includes welding joints and pipe stubs for hydrants at 100-foot intervals, was reported to have been $3\frac{1}{2}\text{¢}$ per foot for 3" pipe and 5¢ per foot for 4" pipe.

With the joints laid end to end as unloaded from the truck, one man can average 35 welded joints per day. The time of welding in a stub for hydrants is about 10 minutes.

Advantages of Plan.

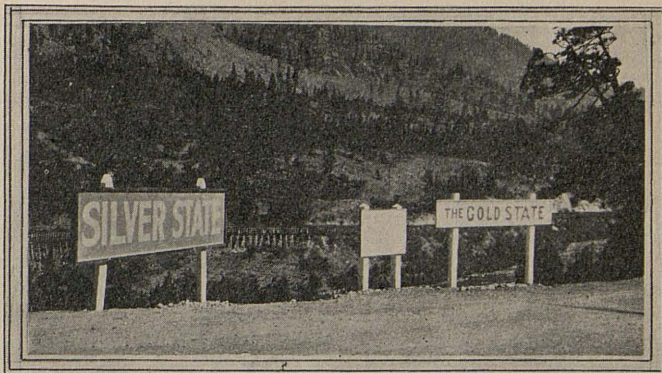
The use of welded pipe has a number of advantages. The line can be shifted without danger of breaking, if ordinary care is used; a leak or break is easily repaired, and the line is readily disconnected with the torch for moving.

The boiler tubing with the welded joints used on this job will stand about 500 pounds pressure. It is asserted that there is no noticeable increase in friction head due to the use of this pipe; in fact, friction is decreased. Welded pipe has been used on two jobs with success, which, apparently, establishes the fact that it is cheaper than former methods.



Method followed in welding pipe for water supply, Division VII concrete paving project; and, above, equipment of subcontractor supplying and operating pipe line.

Eleven



California and Nevada signs at state line on Truckee River highway.

NEVADA ENGINEERS FAIL IN EFFORT TO BEST DIVISION III

DETERMINATION of Division III to have the Truckee River highway in the best possible condition for its opening on June 10th, was responsible for the failure of plans of Nevada highway engineers to place the first marker at the state line.

Division Maintenance Engineer T. H. Dennis, just before dark on the evening of the 9th, made a final trip through the canyon to see that everything was in readiness for the opening ceremonies. At the state line he came upon a crew of the Nevada Highway Department erecting a large sign on the Nevada side, which read, "SILVER STATE."

Work Through Night.

Dennis hurried back to Truckee. He was told the local constable was the only sign painter in town. Dennis found the officer and explained the situation. Constable Titus put his deputy on duty and went to work. All night long he and his wife and daughter toiled to fulfill their promise to Dennis.

When the Nevada caravan arrived at the state line in the morning, it was greeted on the California side by a handsome sign with a blue background and gold letters, which read, "THE GOLD STATE."

"I put up my sign just about three hours too soon," Division Engineer Sam Durkee said to Dennis when the two met at the dedication ceremonies.

IMPORTANCE OF SMOOTH ROAD SURFACES.

EXPERIMENTS by A. T. Goldbeck at the Arlington Experimental Station of the Bureau of Public Roads indicate that a 5000-pound wheel load moving at 20 miles per hour would produce a stress which could readily be carried by a 6-inch smooth concrete slab, but which in a slab having $\frac{1}{2}$ -inch unevenness would require a thickness of 10 inches of concrete to carry the stress. Similarly, a 6-inch smooth slab would be subjected to no greater stress than a 7-inch slab having a surface variation of $\frac{1}{4}$ inch.

These tests illustrate the extreme importance of obtaining a smooth surface finish on concrete roads and joints in a perfect plane.—C. S. Pope.

A TOUGH JOB.

Resident Engineer A. N. George was confronted with the problem of laying five pipe lines within an eight-foot parking. A 48" line, a 36" line and three 12" pipe lines.

Someone came to George's assistance with the solution: "Put the 36" pipe inside the 48"."

This is just one of the many details Mr. George had to take care of on the Whittier boulevard job, Division VII.

WHAT THE DIVISIONS ARE DOING

DIVISION I COMMENTS ON USE OF STEEL TRAFFIC TREADS

AN EXPERIMENT with AW steel traffic plates has been under way in Division I since February, when treads were installed on the Jordan Creek bridge, a wooden structure on the Redwood highway about five miles south of Scotia, Humboldt County. The plates have now been in service for a period of approximately four months.

Commenting upon the results, Division Engineer T. A. Bedford has this to say:

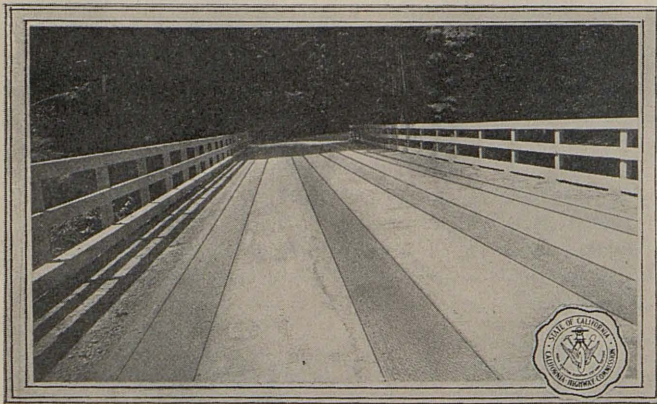
Four lines of traffic treads, 20 inches wide and 3/8 inch thick, were installed on the Jordan Creek bridge, 140 feet in length, as a protection to the wooden floor.

Approaches to this bridge are on curves and the plates are laid on tangents. As a result machines run off the plates at each end and in the middle for the reason that, in a length of 140 feet, drivers do not notice the treads until they are nearly across the bridge.

Not Advisable on Short Structures.

Observations would indicate that, for best results, installation of traffic treads should not be made on bridges of less than 200 feet in length; more particularly if the roadway at the approaches is on a curve.

There is reason to believe that on long bridges drivers will follow the plates and that the life of wooden floors will



TRAFFIC TREADS ON WOODEN BRIDGE—Division I is trying steel traffic treads to prolong the life of wooden bridges on the Redwood highway. View above shows installation at Jordan Creek.

thereby be materially increased. Better results will be obtained if plates with a width of 24 to 30 inches are used instead of the 20-inch size installed at Jordan Creek. The wider plates will be worth the difference in cost because of the greater ease with which they can be followed by traffic.

FINED FOR CUTTING TREES.

For cutting trees on the state highway right of way in Division IV, a resident of San Mateo County recently was fined \$10. The complaint was filed by a representative of the division because the cutting was done without a permit. Requests for permits to cut or remove trees from the highway are always carefully investigated and every effort is made to obviate removal of trees whenever possible.

A man who can speak six languages has just married a woman who can speak three. That seems to be about the right handicap.—*Punch.*

DIVISION III.

HEADQUARTERS, SACRAMENTO.

F. W. HASELWOOD, DIVISION ENGINEER.

Counties of Butte, Colusa, El Dorado, Glenn, Nevada, Placer, southern Plumas, Sierra, Sutter, Yuba, and northern Sacramento and Yolo.

WITH the Truckee River highway completed and open to traffic, Division III is now turning its attention to one of the big problems before it—the building on adequate standards of a highway about the shores of Lake Tahoe. After months of planning and negotiation with property owners for rights of way, work is now under way at several locations along the west shore.

From now on whatever new work is done on the route around the lake will be on new alignment. Deeds for an eighty-foot right of way are being secured, and it is the expectation of the division that several miles of new road will be completed and surfaced by the end of the present summer. J. W. Vickrey is in charge of construction operations.

Survey parties are now making a location over Cascade Ridge at Emerald Bay, Lake Tahoe. A relocation is also being made on Route 39 along the north shore of the lake.

Work Starts Above Placerville.

Work of grading at several points between Sportsmen's Hall and Riverton on the Placerville-Tahoe route, Irely and Holden contractors, is now well under way. The contract includes surfacing of the entire section. J. L. Piper is resident engineer.

An informal contract has been awarded A. L. Williams for surfacing work between Marysville and the Seven-mile house on the Tahoe-Ukiah highway. Clifford Yost is in charge for the state. Yuba County is assisting in financing the project.

On the trunk highway between Donner Lake Camp and Truckee numerous improvements have been made, including the placing of considerable new surfacing. A. C. Irish, assistant resident engineer, is in charge.

Progress on Bureau Project.

Excellent progress is being made by the Isbell Construction Company, contractors, on the Forest project for grading a 4.5 mile section of the Truckee-Tahoe City highway, a part of the state system. The government has the option of extending the contract for a second unit of 4.5 miles, if sufficient funds are appropriated by congress. The United States Bureau of Public Roads has charge.

On the Tahoe-Ukiah highway, west of Grass Valley, surfacing is being placed by state forces which are using the Grass Valley crushing plant at the North Star Mine.

Oiling to Prevent Dust.

Superintendent H. D. Miller is engaged in spreading oil as a dust preventive. About 100 miles in the division will be oiled during the summer.

In addition to the Mother Lode highway, one of the interesting routes taken over by the commission under the new policy of state maintenance is the Oroville-Quincy ridge route by way of Bidwell Bar, Merrimac, and Meadow Valley. The accomplishments of Foreman C. P. Butz in charge on the Butte County side and of Foreman A. S. Brown on the Plumas end have been favorably commented upon in the Oroville Register by George C. Mansfield, former state highway commissioner.

DIVISION V.

HEADQUARTERS, SAN LUIS OBISPO.

L. H. GIBSON, DIVISION ENGINEER.

Counties of San Benito, Monterey, San Luis Obispo, and Santa Barbara.

DANGEROUS grades over Ortega Hill were eliminated from the Coast highway, when Division V, on June 3d, opened to traffic the newly graded section of state highway extending through Summerland to the Santa Barbara city limits. The old grade over the hill is replaced by a new direct route considerably

CALIFORNIA HIGHWAYS.

shorter than the old county road. A rock surfacing will be maintained until fills have had time to settle, when a permanent pavement will be placed.

A feature of the new alignment is a wide parking place on the bluff on the side of Ortega Hill from which an inspiring view of Santa Barbara channel may be had. A safe stopping place for motorists has been provided at this point. The McCray Company was the contractor on this project with E. B. Brown as resident engineer.

The Cornwall Construction Company has just completed the placing of a new section of state highway in the vicinity of Carpinteria, Santa Barbara County. A 30-foot pavement was placed through the town proper and a 20-foot pavement for two miles southerly. E. B. Brown was resident engineer.

Pismo Change Almost Ready.

Grading for the Pismo line change, San Luis Obispo County, is about completed and opening of the new highway to traffic early in July is now expected. The new bridge across Villa Creek and the overhead crossing of the Southern Pacific Railroad, built under the direction of the bridge department, have been completed and the finishing of the fill will make useable an excellent line change. It considerably shortens the distance, eliminates numerous dangerous curves, and a railroad grade crossing. J. L. Webster of Chico built the bridges while the grading was done by Collins and Seppi of Stockton. Chas. P. Sweet was acting resident engineer for the division.

Preliminary work on the Santa Barbara-Goleta widening project is being started by the Cornwall Construction Company, contractor. E. B. Brown will be resident engineer.

San Juan-Hollister Job Progresses.

Reconstruction of 6.9 miles of the San Juan-Hollister highway is now under way, the contract having been awarded to the Granite Construction Company of Watsonville. Cement concrete shoulders will be placed with a second-story bituminous macadam surfacing over the old pavement. R. S. Badger is resident engineer.

A crew under the direction of Foreman Roy S. Peck is rapidly completing the flooring of the San Benito River bridge on the San Juan Bautista-Hollister route.

Paul M. Joseph is in charge of the rebuilding of the San Jose Creek bridge and repair of other county bridges on the Carmel highway along the Monterey coast. This route was taken over for maintenance on January 1st.

Maintenance crews have discovered that puncture vine has been brought into Division V, presumably by automobiles traveling over lateral roads from the San Joaquin Valley.

DIVISION VI.

HEADQUARTERS, FRESNO.

E. E. WALLACE, ACTING DIVISION ENGINEER.

Counties of Fresno, Madera, Merced, Mariposa, Kings, Tulare, and Kern, north of the Tehachapi.

ROUGH grading has been practically completed on the Merced canyon entrance to Yosemite Valley. Completion of the grading is being followed as rapidly as possible by placing of rock surfacing. It is the purpose of the division to have the entire seventeen miles surfaced and oiled prior to the opening date for the highway, July 31st.

In addition to the work between Briceburg and El Portal arrangements have been made for oiling the 37.7 miles of the Yosemite lateral from Briceburg to the westerly border of Mariposa County. This is being done as a dust preventive measure.

The division is looking forward to the erection of a division office building on the 3.5-acre site recently acquired by the commission at the northern limits to Fresno. Bids for the building were opened on June 14th. A division shop building already has been completed on this property.

Park Lateral Improved.

Curve widening on the Sequoia National Park lateral east of Visalia has caused much favorable comment. A greatly increased traffic is reported on this highway to date this summer.

A power shovel has been building levees and constructing drainage ditches on the Cholame lateral, in the vicinity of Lost Hills, to take care of future flood waters. Considerable damage was done to this highway by cloud bursts during the spring.

Maintenance crews are making a number of experiments in the campaign against puncture vine, which was developed into an all-year-round battle in Division VI.

DIVISION VII.

HEADQUARTERS, LOS ANGELES.

S. V. CORTELYOU, DIVISION ENGINEER.

Counties of Los Angeles, Ventura, Orange, San Diego, and eastern Kern, south of Mojave.

WORK of improving the alignment, eliminating "blind" curves, and widening shoulders and fills on the Ridge route in Los Angeles County, by state forces, has now progressed to a point two miles northward beyond Reservoir Hill, a distance of over twenty-one miles from where the work was started near Castaic School in May, 1924.

A contract is now nearing completion for the widening of the pavement on the ridge on the inside of curves, where the align-



KEEPING TRAFFIC MOVING—Maintenance crews in Ventura County, Division VII, used teams to get traffic through the mud washed onto the pavement by unprecedented rains during April.

ment has been changed. This widening is being done by constructing crescent-shaped areas of macadam.

San Diego Paving Near Completion.

Rapid progress is being made on the Jahn & Bressi contract north of Oceanside in San Diego County. Ten and one-half miles of concrete pavement have been placed, 20 feet wide. From Stuart southerly toward Oceanside for a distance of three miles, the concrete pavement has been laid half width. On the one and one-half mile extension to the contract, extending the work into Oceanside, most of which is on new right of way, the shovel is working two shifts to complete the grading ahead of the paving crew. A new underpass crossing of the Santa Fe tracks is under construction, just north of Oceanside.

On the Coast highway, in Ventura County, between Camarillo and Ventura, good progress is being made on the contract for widening and thickening the old 15-foot concrete pavement. The new pavement is now open to traffic from Ventura easterly to El Rio.

Except on the line change near the Big Tujunga, where grading operations are nearing completion, all culvert and paving work has been finished on the contract for widening of the Foothill boulevard between San Fernando and La Canada.

Serious rock slides have continued to occur on the Ventura coast route and several power shovels are now at work removing a large yardage of accumulated rock and earth, which must be removed before this route can be opened to traffic following completion of grading farther south.

According to George E. Reynolds, managing editor of the *Stockton Record*, the Big Oak Flat road into the Yosemite was a "veritable boulevard clear up to the national park line" on the occasion of the recent sociability run of the Stockton Chamber of Commerce.

Commission employees from headquarters and the other highway department offices in Sacramento motored to Olympia Park, near Grass Valley, on Sunday, June 20th, for a picnic, dancing and swimming party. R. W. McCrea was active in making arrangements.

DIVISION VIII.

HEADQUARTERS, SAN BERNARDINO.

E. Q. SULLIVAN, DIVISION ENGINEER.

Counties of San Bernardino, Riverside, and Imperial.

THE 14.5 miles of reconstructed pavement between Riverside and Ontario, placing of which has been under way for several months, was scheduled for completion and opening to traffic late this month. That the new pavement, which was financed by the gasoline tax, is appreciated by residents of the communities on the route, is evidenced by the following quotation from a recent issue of the Ontario *Daily Report*:

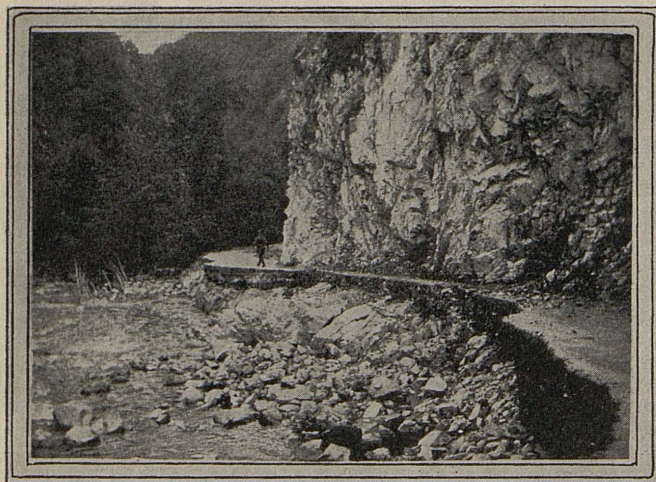
For some time the road between Ontario and Riverside has been closed while being widened and resurfaced. When it is opened shortly, the splendid surface over which motor cars will skim will more than offset the inconveniences of the "best temporary route" detours that have confronted motorists recently.

The road is now open between Riverside and Collins station. It will soon be open to Ontario and the entire stretch will be a revelation to people who have not been over that portion already finished and opened to traffic.

The writer was over that part recently between Wineville and Riverside and was so delighted with the improvement that he wrote to the Highway Commission for some definite data about it.

This reply was received from Division Engineer E. Q. Sullivan at San Bernardino:

"The old 18-foot pavement is being widened to 20 feet, and a new top of asphaltic concrete is being put on. The



WHAT APRIL SHOWERS DID—Scene in Arroyo Seco, Division VII, where roadbed was washed away by a cloud burst. Spring rains made heavy and unexpected calls on maintenance funds in several of the divisions.

thickness of asphaltic concrete varies from two to six inches, depending on the condition of the old pavement over which it is placed.

Wider and Better.

To make a still further improvement, disintegrated granite is placed on each side of the pavement for a two-foot width to avoid danger when cars may get off the pavement on the natural sandy soil.

The cost per mile for this job was slightly over \$14,000; a total cost of \$207,000 for the 14½ miles. This is an exceptionally low price for this type of work. In view of this low price, the very good work done by the contractor, Steele Finley, is particularly gratifying."

Work on National Old Trails.

Improvement of the National Old Trails between Mineola and Hector, a distance of 20 miles, has been begun. The highway is being graded and rock surfacing is being placed on sandy sections.

Matich Brothers, contractors, have started work on their contract for the widening of the highway between Whitewater and Edom, on the San Bernardino-Imperial Valley trunk highway. The existing 16-foot pavement will be widened to 20 feet by

placing a four-foot cement concrete shoulder. While this is desert country, the contractors expect to continue operations through the summer.

Two miles of asphalt concrete pavement have been completed on the Sand Hills job and the contractors now assert that they will complete the job without suspension of operations, unless the summer heat becomes too great.

Placing of a second-story cement concrete pavement between Beaumont and Banning, 20 feet wide, has been completed and opened to traffic.

DIVISION IX.

HEADQUARTERS, BISHOP.

F. G. SOMNER, DIVISION ENGINEER.

Counties of Inyo, Mono, and eastern Kern County, north of Mojave.

THE Tioga road, scenic eastern entrance to Yosemite National Park, was opened to traffic this year on June 4th, a month earlier than the previous record for the opening of this highway.

Erection of log bridges is planned to overcome interruption of travel on the Sonora Pass road caused by high water in tributaries of Walker River. Rapid melting of snow resulted in streams flooding the roadway.

Contracts for surfacing work on the work on the 37-mile section between Ricardo and Five-Mile canyon, Kern and Inyo counties, are about completed and ready for acceptance. The work has been done by Harry Wilson and Callaway and Voss.

Flood Damage to be Averted.

Considerable work has been done between Mojave and Red Rock canyon to prevent reoccurrence of damage to the highway in this section, which follows frequent cloud-bursts in the mountains to the west. A ditch and levee have been constructed parallel to the highway for a distance of eight miles.

With the cooperation of the City of Los Angeles, paved dips will be built at points where there are outlets from the city's aqueduct. These paved dips will prevent washing of the roadway when the aqueduct overflows following storms.

DIVISION X.

HEADQUARTERS, SACRAMENTO.

R. E. PIERCE, ACTING DIVISION ENGINEER.

Counties of Amador, Calaveras, Alpine, Tuolumne, Stanislaus, San Joaquin, Solano, and southern Sacramento and Yolo counties.

CONSTRUCTION of a sand fill embankment for an approach to the M street bridge, in Yolo County, has been completed by H. V. Tucker Company, contractor, and bids have been asked for a concrete pavement to complete the new western entrance to Sacramento.

Sand for this work was secured from the Sacramento River, using a six-yard clam shell dredger to deposit it on the top of the west levee. From this stock pile it was sluiced into place through timber sluice boxes. This method proved very satisfactory except for a distance of about 400 feet farthest away from the river. For this distance a dragline was installed to move material from the end of the sluice to the end of the job. The work of finishing was done with fresnos, blade and mules.

Reconstruction of that portion of the state highway in Stanislaus County from Modesto to the northerly boundary is progressing satisfactorily. The Valley Paving and Construction Company has started placing the cement concrete shoulders.

Experimental Oiling Under Way.

Repairs to the Mokelumne River bridge at the Amador-Calaveras County line have been completed by maintenance forces. The old deck and guard rail have been removed and replaced with new laminated deck and standard guard rail.

Division X has inaugurated a program of oiling gravel roads. The first sections to be treated were portions of the Alpine highway east and west of Jackson. Experiments are being tried on stretches of road in various parts of the division. Results of the oiling under varying different conditions will be studied by the Maintenance Department.

Life is that way, too. You're usually advanced to second and third, but getting to first is your own job.—*Wilmington Dispatch.*

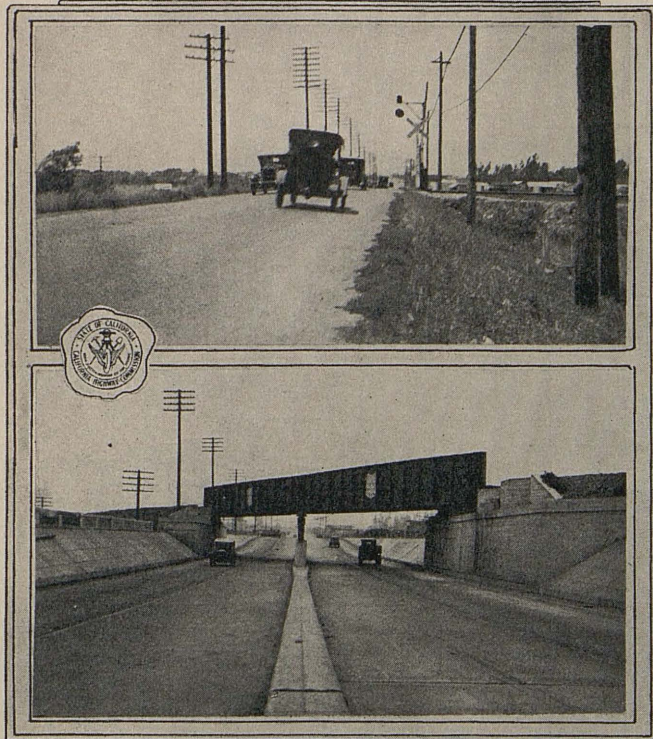
BRIDGE DEPARTMENT NEWS

HARLAN D. MILLER, BRIDGE ENGINEER.

THE GREAT Ventura seawalls, probably the longest of their kind in the world, have been completed and back filling and removal of the old wooden trestles is now under way. The walls have a total length of 6391 feet. They contain approximately 16,000 cubic yards of concrete, in the making of which nearly 100,000 bags of cement were used.

El Portal Bridge Finished.

The new bridge over the Merced River near El Portal on the Yosemite entrance has been completed and turned over to the commission. Stewart Mitchell was resident engineer. Four other



MONTEBELLO SUBWAY—Above, Crossing of Union Pacific Railroad and narrow macadam pavement at Montebello, Whittier Boulevard, Los Angeles County. Below, New subway recently completed by the Highway Commission, the railroad and county cooperating. Each opening has a width of thirty feet for one-way traffic.

structures are under way on the highway through the Merced canyon with Albert A. Lernhart as resident engineer.

Work on the new bridge across Santa Maria River, on the Coast highway, has been started by Rocca and Caletti. John C. Wilson is resident engineer.

Contracts for widening the Rio Honda and the Santa Ana River bridges in southern California were recent awards of the commission. Work will be under way on both structures by the time this is in print. A. S. Kennedy represents the state on the Rio Honda bridge.

The San Pablo Creek bridge, Contra Costa County, is being reconstructed on new alignment and with a greater width. R. B. McKenzie is the contractor and L. DeCew, resident engineer.

Many Contracts Awarded.

Other bridge contracts recently awarded provide for the following structures:

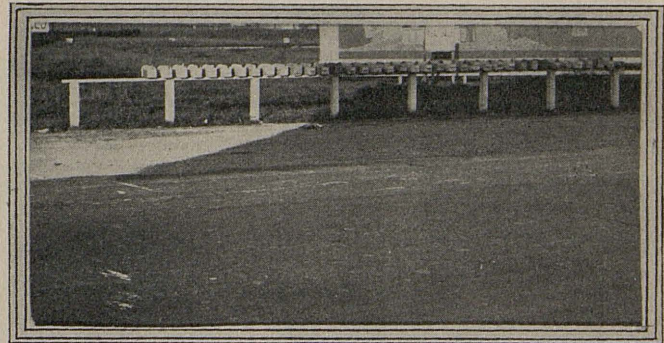
Three wooden bridges in Imperial County; three small structures in the California State Redwood Park; completion of the Truckee River bridge at Hinton; one culvert and two bridges on the Coast highway near San Ardo, Monterey County; concrete girder bridge across Auburn Ravine, Placer County; reinforced concrete arch bridge across Smith River on the Redwood highway, Del Norte County.

Fifteen

UNIFORM STANDS FOR RURAL MAIL BOXES HELP CLEAN UP ROADSIDE

THROUGHOUT the state maintenance forces are constantly endeavoring to clean up the roadsides in order that the state highways may present as neat and slightly an appearance as possible. Rural mail boxes projected to varying heights and affixed to all sizes and shapes of posts have been one of the worst problems along the right of way.

At points where there are a considerable number of these boxes, Division IV has evolved the plan of putting them all on one



UNIFORM RACKS FOR MAIL BOXES—Appearance of the roadside is being improved on state highways by building uniform height racks for rural mail boxes off the traveled way. The scene above is in Contra Costa County, Division IV.

stand of uniform height, as shown in the illustration. The placing of a small quantity of crushed rock on the driveway leading to the boxes, made it possible to move them back to the edge of the right of way, and was greatly appreciated by the rural carrier. He may now stop entirely off the paved part of the highway, free from moving traffic. Discarded guard rail lumber was used for building the stand.

Maintenance Engineer G. R. Winslow proposes that a similar plan be followed throughout the state, wherever five or more mail boxes may be placed together at a single location.

HIGHWAY NEWS NOTES

R. P. DUFFY, formerly maintenance superintendent for Division IV in Marin and Sonoma counties, has been promoted to the position held by H. W. Schreiber, resigned. Mr. Duffy is now in charge of all maintenance work in Division IV with headquarters in the division office at San Francisco.

N. D. Douglas has been placed in charge of the survey party which is running a new line around the San Juan grade in Division V, succeeding R. S. Badger, who has been assigned to other duties.

T. W. Voss, resident engineer, has been transferred from the Berkeley convict job to Division V.

A. R. McEwen is now resident engineer for Division IX on reconstruction work between Mojave and Little Lake.

Desert Foremen Have Picnic.

Maintenance foremen working on the National Old Trails highway, Division VIII, gathered at Newberry Springs on Sunday, May 30th for a get together and picnic. Swimming and dancing were enjoyed by the maintenance men and their families. Newberry Springs is a little oasis on the highway, the only one for many miles.

“Perhaps the most prolific source of accidental death to motorists is the grade crossing. In a few cases such crossings can not be removed without an unreasonable expenditure of money. The majority, however, will be eliminated from the nation’s highways, while the scientific location of routes will make a complete abolition of grade crossings possible on the newly built roads.”—H. G. Shirley, Chairman, Virginia Highway Commission.

STATE HIGHWAY FUND CONTRACTS (Bond Funds, Including Federal Aid)

Cont. No.	Di- vision	County	Route	Sec.	Location	Miles	Type	Contractor	Estimated cost	Date contract awarded	Contract time, days
COMPLETED AND ACCEPTED SINCE MAY 15, 1926.											
471	III	Nevada	38	A	Across Truckee River near Boca		Reinf. Concrete Arch Bridge	Rocca and Caletti	\$33,964 88	June 17, 1925	
473	V	San Luis Obispo	2	E	At Pismo		Bridge and Overhead Crossing	J. L. Webster	58,346 65	June 17, 1925	
474	III	Nevada, Sierra	38	B-A	Floriston to Nevada State Line	5.96	Grading	Nevada Contracting Co.	333,821 25	June 17, 1925	
486	VI	Mariposa	18	G	Across Merced River 1/2 mile west of El Portal		Reinf. Concrete Girder Bridge	Otto Parlier	36,894 38	Oct. 23, 1925	
493	X	Yolo	6	C	Between Fifth St. in Washington and the M St. Bridge	0.25	Grading	H. V. Tucker Co	17,640 00	Feb. 8, 1926	
AWARDED SINCE MAY 15, 1926.											
500	II	Lassen	28	A	Between 4 miles west of Bieber and Bieber	3.80	Grading and Gravel Surface	John F. Collins	\$74,608 02	May 27, 1926	125
502	VIII	Imperial	26	H	Between Brawley and Westmoreland		Three Timber Bridges	Norman B. Conway	15,973 31	June 8, 1926	125
					Sub-total	3.80			\$90,581 33		
PENDING AWARD.											
	VIII	Imperial	26	H	Between Brawley and Westmoreland	6.46	Grading and Std. Surfacing		117,950 11		200
	VI	Fresno			At Fresno		Division Office Building		22,406 63		100
					Total State Highway Fund Contracts Awarded and Pending Award	10.26			\$230,938 07		

NOTE.—Primary construction covered by the above contracts does not include funds obligated on cooperative forest highway projects, prison camp road activities or day labor jobs not being done under contract.

STATE HIGHWAY MAINTENANCE FUND CONTRACTS (Including Gasoline Tax Fund)

Cont. No.	Di- vision	County	Route	Sec.	Location	Miles	Type	Contractor	Estimated cost	Date contract awarded	Contract time, days
COMPLETED AND ACCEPTED SINCE MAY 15, 1926.											
M-85	VII	Los Angeles	2	D	Montebello to Whittier	3.47	P.C. Concrete Pavement	Kuhn Brothers	\$184,821 77	June 3, 1925	
M-97	VII	Los Angeles	2	D	Philadelphia St. to Michigan Ave.	1.90	P.C. Concrete Pavement	J. Paul Benson	93,185 66	Aug. 14, 1925	
M-100	X	Sacramento	4	B	Sacramento to 1/2 mile south	0.47	Asphalt Concrete Pavement	A. Teichert and Son	22,680 56	Sept. 21, 1925	
AWARDED SINCE MAY 15, 1926.											
M-128	IV	Santa Cruz	44	A	Btw. Boulder Creek and California Redwood Park		Reinf. Concrete Box Culverts	Noble Brothers	\$16,687 12	June 8, 1926	125
M-129	III	Sacramento	3	B	Btw. Globe Iron Works and El Camino Ave.	1.14	Asphalt Concrete Pavement	Clark and Henery Const. Co.	32,443 88	June 8, 1926	125
M-130	VII	Orange	2	D	Across Santa Ana River, 2 miles north Santa Ana		Reinf. Concrete Girder Bridge	Charles and F. W. Steffgen	116,859 49	June 8, 1926	225
M-131	II	Modoc	28	C	Btw. Alturas and Royce Ranch	10.84	Grading and Std. Surfacing	J. P. Holland, Inc.	66,883 50	June 8, 1926	100
					Sub-total	11.98			\$332,873 99		
PENDING AWARD—None.											
					Total State Highway Maintenance Fund Contracts Awarded and Pending Award	11.98			\$232,873 99		

NOTE.—The above obligations charged against the State Highway Maintenance Funds do not include funds from these sources obligated for general maintenance and for specific betterments being done under day labor authorization.

CALIFORNIA HIGHWAYS.

Sixteen

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