

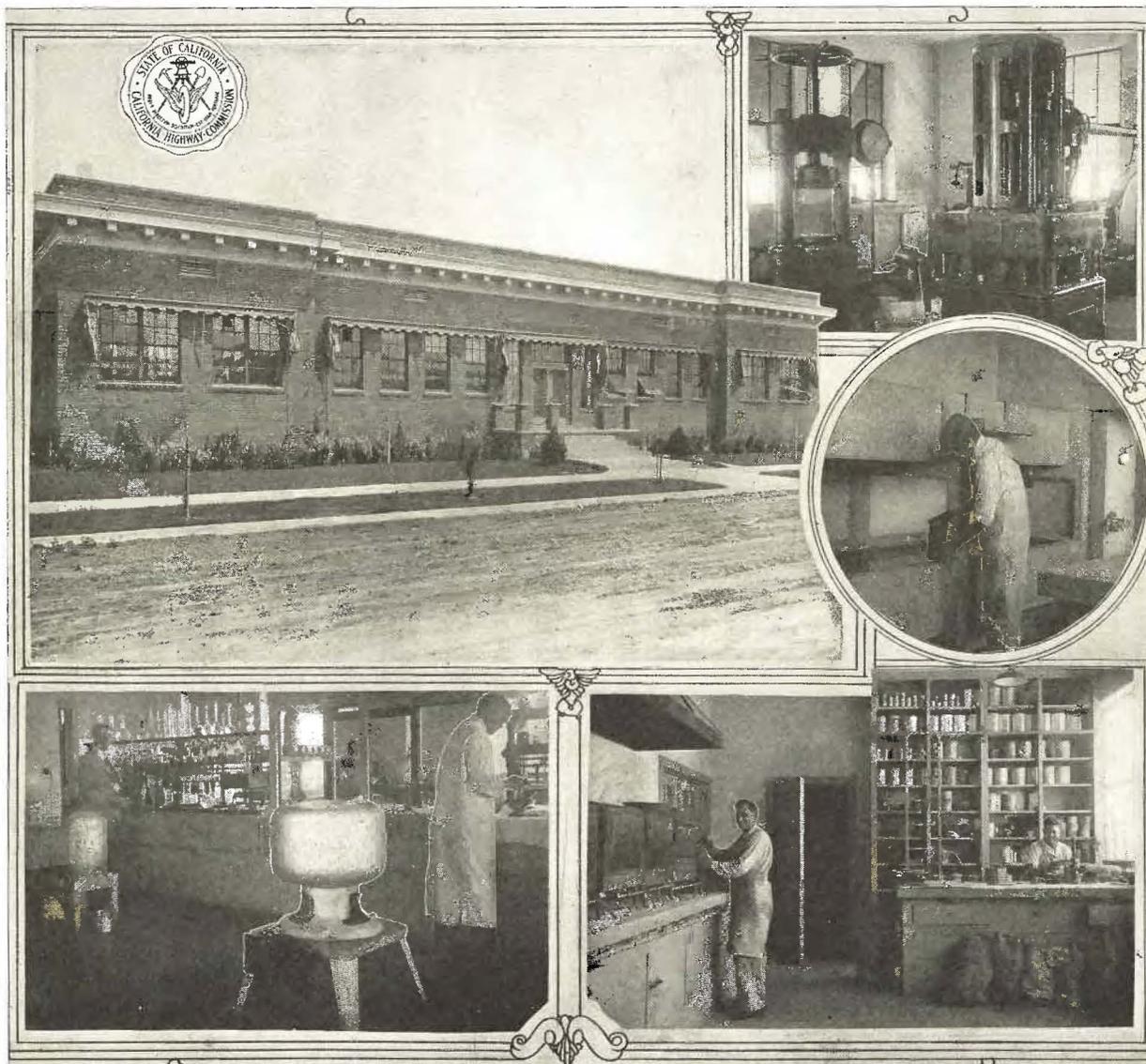
CALIFORNIA HIGHWAYS

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

Vol. 2

JUNE, 1925

No. 6



WHERE TESTS BRING OUT THE TRUTH ABOUT MATERIALS FOR CALIFORNIA HIGHWAYS—Upper left, Laboratory Building, Sacramento; upper right, Physical Laboratory, compression machines of 50,000 and 200,000 pounds capacity; right center, Physical Laboratory, concrete storage tank for curing cement and concrete specimens; lower left, Chemical Laboratory, centrifuge, distillation apparatus, etc.; and lower right, Physical Laboratory, preparation room, battery of drying ovens.

In this issue: DETERMINING THE QUALITIES OF SHOULDER MATERIALS BY LABORATORY TESTS—STANDARD SPECIFICATIONS FOR FUTURE CONSTRUCTION.

CALIFORNIA HIGHWAYS

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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. 2 June, 1925 No. 6

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NEW ROAD OPENS ANOTHER PARADISE

(From the Los Angeles Examiner.)

THE EXCELLENT road which the state has built between Mojave and Bishop as a substitute for the desert trail formerly existing has brought the Owens Valley and the High Sierras at least eight hours nearer to Los Angeles. This is one of the most important highway improvements within recent years, vastly extending the motorist's southern California and bringing into convenient travel distance one of the most marvelous scenic regions and playgrounds in the world. * * *

The old road was described by motorists, perhaps truthfully, as the worst in the state. The new one, following the same route along the Los Angeles aqueduct, is in splendid shape for vacation travel.

Perhaps there has not been a finer example of the magic of a good road than this. There is nothing that unlocks the doors to that treasure house of California's immense natural wealth like well-built highways.

ROADS GOOD

(From the Inyo County Register, Bishop.)

MAINTENANCE forces on the highways under Division Engineer Somner's direction are doing work that wins praise from many motorists who travel them of late. Toward Mono Lake, via Long Valley, the road is pronounced in splendid condition with the exception of one very short detour, and that was to be remedied this week. To the south, Mojave is now reached over the best highway that has ever existed on that route, and motorists are making, as a daily occurrence, time that used to be considered remarkable. It is the very general opinion that the Highway Commission did this slope a great favor indeed in allotting Division IX so competent and result-getting an officer as Mr. Somner.

The Exact Difference.

"Father," said the conventional small boy, "what is the difference between a pedestrian and a jay-walker?"
 "A pedestrian," returned the conventional father, "is a person who walks when you are walking. A jay-walker is a person who walks when you are driving."—*The Kablegram.*

“BIND THE REPUBLIC TOGETHER WITH A PERFECT SYSTEM OF ROADS”

LET IT NOT BE SAID that internal improvements may be wholly left to the enterprise of the states and of individuals. I know that much may be justly expected to be done by them; but in a country so new and so extensive as ours there is room enough for all the general and state governments and individuals to exert their resources. Many of the improvements contemplated are on too great a scale for the resources of the states or of individuals, and many of such a nature that the rival jealousy of the state, if left alone, might prevent. They require the resources and the general superintendence of the government to effect and complete them.

But here are higher and more powerful considerations why congress should take charge of this subject. If we were only to consider the pecuniary advantages of a good system of roads and canals, it might indeed admit of some doubt whether they ought not to be left wholly to individual exertions; but when we come to consider how intimately the strength and political prosperity of the Republic are connected with this subject, we find the most urgent reasons why we should apply our resources to them. Good roads and canals, judiciously laid out, are the proper remedy. *Let*

us, then, bind the Republic together with a perfect system of roads and canals.

The fund proposed to be set apart in this bill is about \$650,000 a year, which is doubtless too small to effect such great objects of itself, but it will be a good beginning. Every portion of the community—the farmer, the mechanic, and the merchant—will feel its good effects; and, what is of greatest importance, the strength of the community will be greatly augmented and its political prosperity rendered more secure.—*From an address by John C. Calhoun before the House of Representatives, 1817.*

A GREAT deal is being said these days about federal aid for highways. The charge has been made that it is in violation of the principle of states' rights; that under that doctrine the states should assume the entire obligation for the building of the highways of the nation. The above quotation from an address by the greatest of all advocates of the rights of the states proves he held a different view.

The need for “binding the Republic together with a perfect system of roads” is as urgent now as it was a hundred years ago. In fact, in this age of motor transportation, it is more urgent. Federal aid will make it possible.

NEW LAW CHANGES STATE'S HIGHWAY POLICY

CONSTRUCTIVE changes in the highway policy of California are embodied in Assembly Bill 589 (Melville), approved by Governor Richardson May 19th, to be in effect July 24th (Chap. 234, Laws of 1925). The measure codifies and clarifies provisions of the Political Code governing powers and duties of the California Highway Commission, and adds several new and important sections, including one directing the commission to take over for maintenance all traversable state highways.

Such action was recommended by the commission in its last biennial report and also was approved by the Highway Investigating Committee. It had the endorsement of the Supervisors' Association of the state and many civic organizations.

All question of the legality of the expenditure of maintenance funds on unconstructed state highway routes is now swept aside. The 1925 maintenance funds are allocated but plans are being made to comply with the legislative authorization during 1926. As fast as the work can be properly organized, trained maintenance crews of the commission will extend some measure of relief to those communities that have waited patiently since the first bond issue for improved highway service.

Betterment Now Possible.

Gradual betterment of mountain laterals will now be possible, and, in the course of a few years, improved traffic conditions may be expected, which will serve until such time as final construction can be undertaken.

This action upon the part of the legislature and the Governor should make possible a greater concentration of funds available for

new work on the main trunk lines and important interstate connections, and result in a more orderly and logical construction of the uncompleted portions of the state system.

Construction Through Small Towns.

The Melville bill also directs the commission to construct the state highway through all municipalities of 2500 population, or less, to the same standards as the highway approaching such cities and towns. Under this provision many uncompleted gaps in state pavements will be closed, adding to the comfort and convenience of users of the highways.

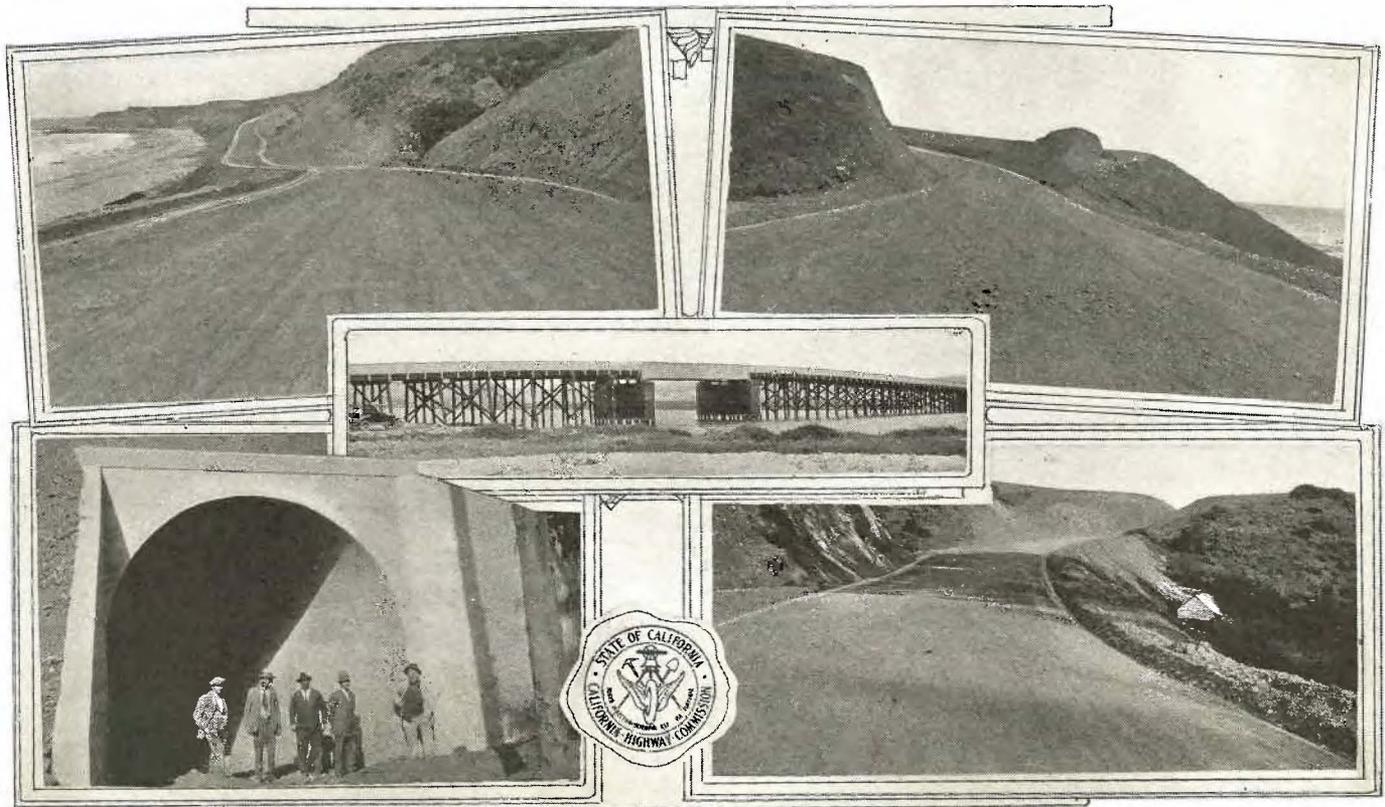
A provision also was added permitting the commission to turn over sections of state highway within their borders to municipalities, where the governing body desires and accepts jurisdiction. This should be a useful section as the commission is not organized for the purpose of constructing or maintaining streets within the larger cities, which have annexed highways or incorporated after the state highways were built. The control properly belongs with the municipality. Roads may be similarly relinquished to the counties.

Change of Routes.

Authority also is granted the commission to alter or change the route of any state highway and to abandon portions no longer needed when such abandonment is necessary or advisable. This will facilitate reconstruction of the state highways on higher standards of grade and alignment, a problem which is becoming more pressing as traffic increases. The commission also is given authority to maintain detour roads.

(Continued on page 4.)

ADDITIONAL GRADING FINISHED ON SOUTHERN COAST ROUTE



MCCRAY CONTRACT, ORANGE COUNTY—Recently completed section of grading on the Oxnard-San Juan Capistrano highway between Corona Del Mar and Laguna Beach. *Upper views*, highway along ocean front; *center*, new bridge built by Orange County under state supervision over north arm of Newport Bay; *below*, special arch culvert; the wide grade. (Photos by Div. VII.)

CONSTRUCTION of the Oxnard-San Juan Capistrano coast highway is moving steadily forward. The commission has just accepted as completed the contract for grading 5.56 miles between Corona Del Mar and Laguna Beach, in Orange County. But one more section of twelve miles remains to be graded, that from Laguna to Serra, and the entire route will be broken through south of Long Beach.

Completion of the grading as far south as Laguna puts the latter beach in direct connection, via the coast, with Long Beach and the other beach cities of Los Angeles and Orange counties. Previous to the opening of this road, Laguna had but one outlet, the Orange County highway to Irvine. An attractive loop trip from Los Angeles to these beaches is now possible.

The new grade has been built on high standards of alignment. For a considerable portion of the distance, it has a width of forty feet and on the remainder a width of thirty feet. Several large reinforced concrete arch culverts are a feature of the project. All pipe culverts also are of reinforced concrete.

The work was done by W. D. McCray of Los Angeles. The allotment for the work, including the Boat Canyon extension at Laguna, was approximately \$134,000. The work was financed with federal aid.

The new unit of the Coast highway opens to motorists a beautiful section of the Orange County coast which for years has been the delight of artists and sketchers of the sea.

C. N. Ainley was resident engineer. He was assisted by J. P. McAndrew and L. R. McNeely.

NEW LAW CHANGES POLICY

(Continued from page 3.)

Provisions regarding the authority of the commission to condemn property for highway purposes are extended and clarified. The commission may now acquire through such proceedings not only rights of way, but lands for offices, shops, storage yards, gravel pits, rock quarries, sand or earth borrow pits, lands adjoining the highway for parks, and lands and trees within three hundred feet of the highway for the purpose of protecting the roadbed or preservation of the attractiveness and beauty of the adjacent lands.

The commission also may acquire property to make possible an unobstructed view of the highway where the same is necessary to

provide for the safety of traffic; it may acquire and maintain stock trails paralleling the highway and require that all untethered stock shall be driven over such trails.

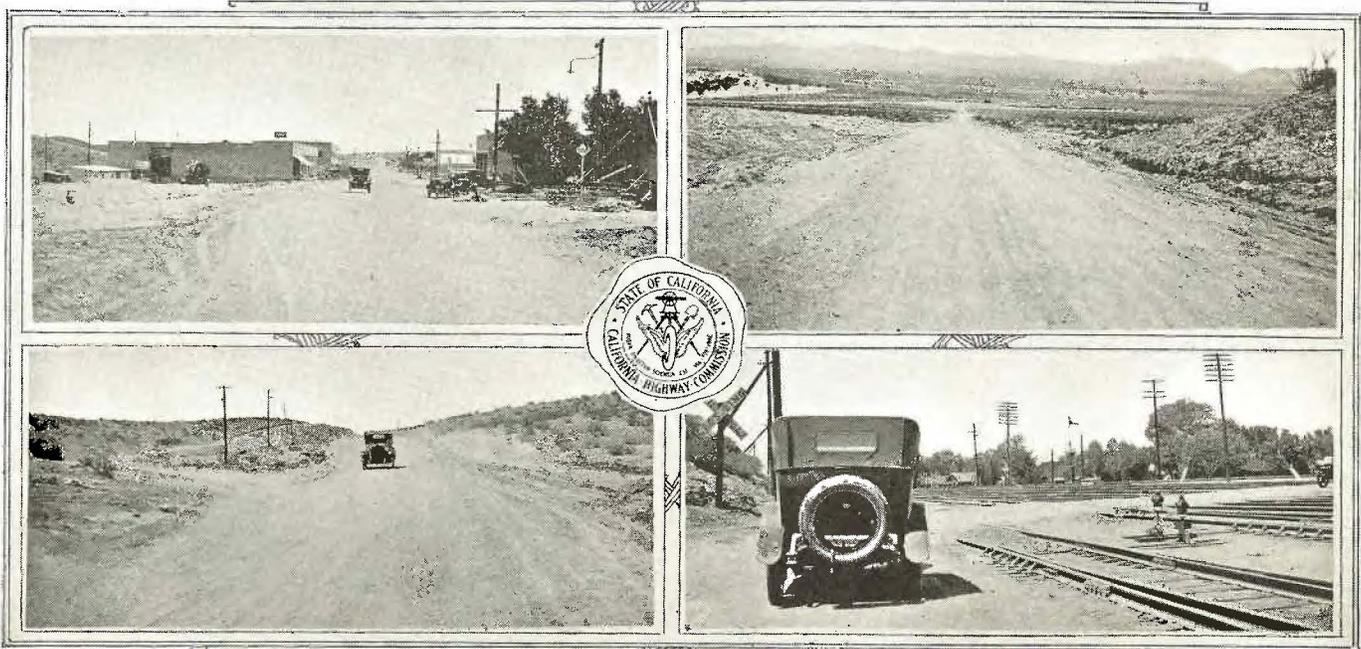
Other Powers and Duties.

Among other powers and duties conferred upon the commission by the act are the following:

To make investigations and compile information concerning improved methods of highway building;

Assist counties, cities, boulevard and highway districts in making surveys, plans and specifications for the construction of highways and bridges, and, in its discretion, act as consulting engineer on such projects;

NEW HIGHWAY ELIMINATES DANGEROUS GRADE CROSSINGS



BARSTOW LINE CHANGE—Views of the recently completed section of the National Old Trails state highway at Barstow, San Bernardino County. *Upper left*, business buildings under construction on the route of the new highway; *upper right*, the new grade stretching away across the desert, eliminating the meanderings of the old road; *lower left*, near Barstow, the new grade, old county road at left; *lower right*, former crossing of the Santa Fe railroad yards, this and several other dangerous grade crossings have been eliminated by the new routing.

THREE more dangerous grade crossings have been removed from the California highway system—this time by an improvement on the National Old Trails route through the town of Barstow, San Bernardino County, 150 miles east of Los Angeles.

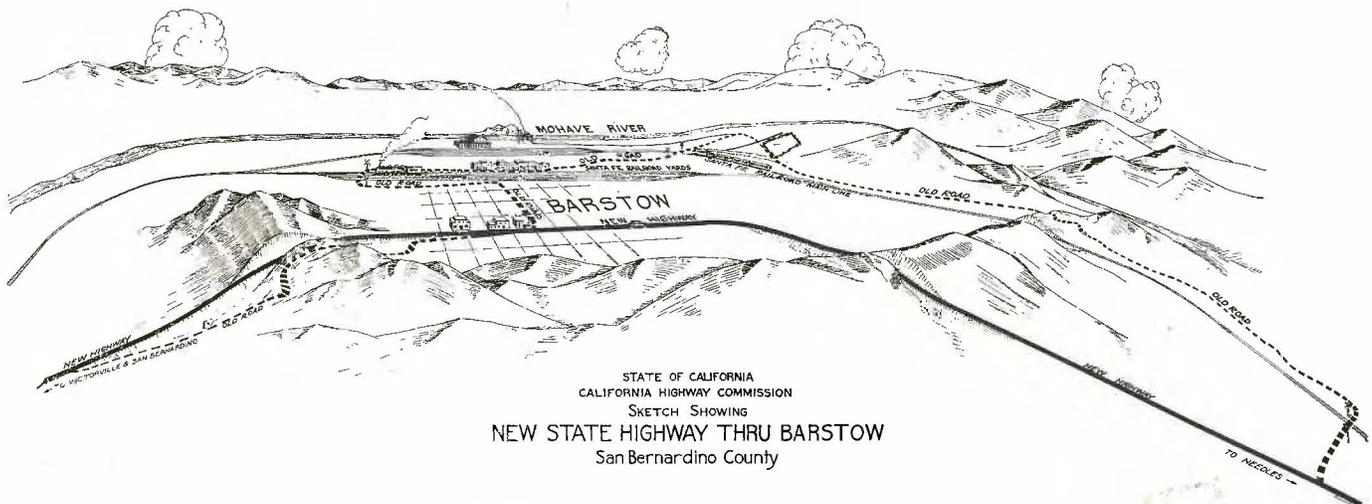
The old county road, shown in the illustration, followed a tortuous course through the town, crossing the main line of the Santa Fe railroad twice and passing through its freight yards. It had many right angle turns and the view at two of the crossings was obstructed. Accidents were frequent.

Grading of less than three miles of the state highway shortened the distance $1\frac{1}{2}$ miles and eliminated the three railroad crossings.

Town Moves to New Road.

The business section of Barstow has always been located in a depression between the passenger and freight yards of the Santa Fe, a noisy and dusty location for a desert town. The influence of modern highways is well illustrated by the fact that, since the highway has been constructed on the new line away from the tracks, a large part of the business section is being moved to a new location along the state highway, where a number of substantial business buildings have been erected.

There is general rejoicing in Barstow over the fine appearance of the new structures and the slightly location of the new business district.



Drawing by Ray D. Spencer.

DETERMINING THE QUALITIES OF SHOULDER MATERIALS BY LABORATORY TESTS

UP TO THE present time no satisfactory test has been worked out to determine, before actual use, the qualities present in materials proposed for construction of highway shoulders. The qualities generally necessary are a good binder, resistance to wear, retention of moisture in dry climates, and freedom from excessive shrinkage. If previous to use materials proposed for shoulder work could be measured by these standards, so that definite knowledge might be substituted for the opinion of the engineer, saving of large sums in unavailing expenditures would be possible.

With this thought in mind the laboratory has been endeavoring to work out a test that will give the desired information. Six samples of proposed shoulder material, recently submitted by Acting Division Engineer E. Q. Sullivan of Division VIII, provided the opportunity for a series of experiments the results of which will be of interest to engineers throughout the department.

These samples consisted of disintegrated granite, quarry waste, and other materials from various sources along the highways of the division. Standard tests for determining hardness and toughness of stone could not be made on this material and, in any event, would not have been conclusive, it is pointed out by C. L. McKesson, research engineer.

Shoulders of the type proposed to be constructed will be exposed to use in regions of exceedingly light rainfall. Binding quality, therefore, is of the highest importance and probably more important than the wear resisting qualities of the particles.

How the Tests Were Made.

Reporting to Mr. Morton through the construction department, Mr. McKesson had the following to say regarding the results of these tests of shoulder material:

"This material received special consideration with the idea of attempting to work out new tests which will indicate binding qualities of material for shoulders and surfacing. The material as received was moistened and mixed preparatory to moulding in 6 x 6 x 12" prismatic moulds. The amount of water necessary to reach moisture equivalent stage in the material was noted. Some additional water was added until the material was wet enough to give about 2" slump. It was then tamped into the moulds and finished up exactly as with concrete specimens.

Considerable difficulty was experienced in getting the specimens dry enough to permit their removal from the moulds. By the use of electric fans and by covering the specimens with hot sand, they were hardened sufficiently for removal in about a week. They were then dried for four days in an air current and three days in a warm cabinet at 100° F. The specimens were then capped with plaster of paris and crushed in our testing machine. The compressive strength developed ranged from 620 pounds to 6430 pounds on the end of the 6 x 6" specimen.

Moisture equivalent determinations (Rose method) were made and shrinkage determinations. A complete mechanical analysis was also made of the material because it was realized that binding qualities alone were not sufficient. The mechanical analysis, moisture equivalent determination and shrinkage tests show the percentage of rocky material contained in the samples, percentage of clay and silt and probable stability of the material in the presence of varying amounts of moisture.

Tables Give Details of Tests.

Tables No. 1 and No. 2 following show in detail the results of these tests:

TABLE No. 1.

Sample No.	Description	Compressive strength, 6 x 6 x 12"	Per cent H ₂ O in specimen	Moisture equivalent, total	Moisture equivalent, Rose's method	Shrinkage volume, per cent	Shrinkage lin., per cent
1855	D. G. and caliche	620	19.0	14.9	12.2	8.19	2
1856	D. G. and red clay	6430	15.9	13.0	11.8	8.13	2
1852	Clay crusher waste	2270	16.7	12.4	10.7	6.12	2
1851	D. G. and red clay	3320	14.7	11.4	10.0	8.15	2
1853	Rock dust and No. 5	2350	14.3	10.3	9.0	5.11	1
1854	¾-inch rock and dust	1360	14.5	9.9	8.3	1.58	1

NOTE.—Samples arranged in order of relative moisture equivalent.
D. G. = Disintegrated Granite.

TABLE No. 2.

Screens	1851 Per cent passed	1852 Per cent passed	1853 Per cent passed	1854 Per cent passed	1855 Per cent passed	1856 Per cent passed
Total sample grams	9750	11,840	13,055	11,470	11,360	10,945
Wash	13.5	10.5	11.2	8.2	16.5	12.6
200	16.5	12.3	17.4	13.0	20.2	16.9
100	24.6	15.2	24.9	18.9	30.0	26.2
80	29.2	16.6	28.6	21.0	35.1	30.1
50	37.1	19.2	33.2	24.7	40.9	36.2
40	42.4	21.9	38.0	28.3	46.1	41.6
30	49.0	25.0	43.6	32.1	51.6	47.2
20	63.1	32.5	56.2	41.3	62.6	61.4
10	82.0	48.6	76.2	58.0	78.2	83.9
3	97.2	84.5	100.0	88.6	93.1	96.4
½-inch	99.2	98.6	---	99.3	97.6	98.4
¾-inch	100.0	100.0	---	100.0	100.0	99.1
1-inch	---	---	---	---	---	100.0

Relative Suitability.

The foregoing tests, together with examination of the rocky particles after washing, justify the following report on the materials in the order of relative suitability:

Sample 1856—

Red disintegrated granite.

Source: .4 miles north state highway on road to Amboy

Station 150, VIII-Riv.-26-D.

Quantity: Unlimited.

This material consisted of disintegrated granite with 12.6 per cent of clay and silt lost in washing. Ninety-six per cent of the material passed No. 3 sieve. The disintegrated granite particles were reasonably hard and suggests that the material may be expected to wear well. The cementing value of this material was

NEW DIVISION HEADQUARTERS AT REDDING COMPLETED



DIVISION II HEADQUARTERS—Upper right, the new division office at Redding, Shasta County, recently occupied by H. S. Comly and his staff; upper left, the accounting department; and, below, the large airy drafting room.

SHOULDER MATERIAL TESTED

(Continued from page 7.)

very high. The total load on 6 x 6 specimens was 6430 pounds or a compressive strength of 179 pounds per square inch.

Sample 1851—

Disintegrated granite.

Source: .2 miles north of Station 554, VIII-Riv.-26-D.

Quantity: Unlimited.

This material consisted of light colored disintegrated granite with 13½ per cent of clay and silt lost in washing. The grading of the material is almost identical with that of the preceding sample, but the particles are somewhat softer and the binding quality only about half that of the preceding sample. Probably make good shoulder material, but not equal in quality to No. 1856.

Sample 1852—

Clay crusher waste.

Source: Blue Diamond Rock Company, Corona Plant.

Quantity: 50-ton lot.

This material is somewhat coarser than the two preceding samples and contained only 10½ per cent of clay and silt lost in washing. The rock particles are extremely hard and would wear well under traffic. The specimen took a total load of 2270 pounds (63 pounds per square inch) which, while considerably less than the disintegrated granite specimens, nevertheless indicates good binding quality. It is believed that this material would make satisfactory shoulders.

Sample 1853—

No. 5 crushed rock.

Source: Orange County Rock and Gravel Company, Frink Plant.

Quantity: 25 tons.

This material is considerably finer than any of the preceding samples, 100 per cent passing No. 3 and 76 per cent passing 10

mesh. The sample contained 11.2 per cent clay and silt removed in washing. The rock particles were sound and cementing quality quite satisfactory. The total compressive load was 2350 pounds (65 pounds per square inch).

Sample 1854—

¾" rock and dust mixture.

Source: Orange County Rock and Gravel Company, Frink Plant.

Quantity: 25 tons.

This material is somewhat finer than sample No. 1853 and contained only 8.2 per cent clay and silt. The stone particles were sound but binding quality was rather low. The total load was 1360 pounds (38 pounds per square inch). This material would apparently be much less suitable for shoulder work than any of the preceding samples.

Sample 1855—

Disintegrated granite and caliche.

Source: Right of Way Station 400, Riverside-26-D.

Quantity: Unlimited.

In grading, this material quite closely resembles the disintegrated granite samples, but contained 16½ per cent of fine material lost in washing. The stone particles were rather soft and cementing value very low. The total load on this specimen was only 620 pounds. The material might be expected to make loose dusty shoulders which would not be adapted for use in a dry, hot climate.

Standard Methods Seem Possible.

The results obtained in the experiments above described indicate there is a possibility of working up standard methods of testing which will indicate the binding quality of material. This, taken in conjunction with hardness and toughness tests and the character of the binding material as indicated by moisture equivalent and shrinkage tests, should enable us to anticipate the probable road-making qualities without waiting for a service test on the road."

Standard Specifications for Future Construction

By L. V. CAMPBELL, Office Engineer.

STANDARD specifications which will govern future state highway construction have been approved by the State Highway Engineer and will be ready for distribution to contractors by the time this is in print. A single volume will contain the specifications for various items ordinarily employed in the construction of both roads and bridges.

The plan, which is being adopted by California for the first time, has been successfully followed for a considerable period by a number of the states and the United States Bureau of Public Roads.

As soon as the standard specifications are available, the practice which has prevailed heretofore of printing separate specifications for each project on which bids are asked will be discontinued. In the future only special provisions, proposal, and contract forms will be printed for individual contracts.

Special Provisions to Cover Modifications.

The standard specifications, in so far as they apply, will govern all future construction and necessary modifications or additions for any particular job will be included in the special provisions.

As soon as ready for distribution, a copy of the new standard specifications will be sent each contractor whose name is on the department's mailing list; a supply also will be furnished the division offices. When work is advertised for bids, the special provisions, proposal, and contract forms will be distributed in the manner which now prevails in the distribution of specifications. Prospective bidders will be furnished with the special provisions, and these, together with the standard specifications previously supplied, will constitute the specifications for particular jobs.

After a contractor has once been furnished the standard specifications, additional copies will be sent him only upon specific request.

Changes May Be Quickly Grasped.

California highway specifications have been undergoing a process of evolution with the result that hardly two succeeding sets have been issued without changes of more or less importance. The convenience of the new specifications will be readily appreciated by the engineers and contractors alike when they become accustomed to their use. In the future they need not be constantly on the alert for minor changes affecting the cost or manner of doing the work, as all such modifications will be contained in a few paragraphs in the special provisions.

The standard specifications represent present practices as demonstrated in some of the latest 1925 projects. The individuality of each job, which is the result of careful planning and thorough study, will be reflected in the special provisions under the new plan.

Recent Changes in Specifications.

Some of the changes which have been made recently and which are retained in the new standard specifications are as follows:

Grading provides that refuse from clearing be burned; that existing drainage ditches be cleared of weeds, brush, etc.; and that on repaving jobs, grading for changes in alignment be carried on sufficiently in advance of paving operations to permit thorough compacting of new fills.

Crushed gravel or stone surface provides for a maximum one-inch-sized material in both base and wearing course. The provision for compacting by hauling over the surfacing already placed, and by dragging, is retained. Thickness designated for a rock surface is the loose thickness as the material is spread.

The specifications for bridges, culverts, and other structures have been combined into two sections, covering Portland cement concrete structures and foundations for structures. The appropriate clause of these sections will apply to either bridge or culvert construction.

A section for a waterbound macadam base has been included. Bituminous macadam specifications have been rewritten to provide for three types of bituminous macadam surface.

A section for asphaltic road oil has been included.

The asphalt concrete specifications permit the use of collector dust in the base course. There are three types of asphalt concrete surfacing, one using 1¾-inch maximum aggregate, one using ¾-inch maximum, and a modified Topeka mix.

To the present four classes of Portland cement concrete, has been added a fifth class of quick hardening concrete designated Class "D" concrete, for use in patching base or shoulder construction when an asphalt surface is being laid.

Paving Requirements.

Except for Class "A" concrete in structures, three sizes of aggregates are required in proportioning. The paving specifications prohibit the dumping of aggregates on the subgrade or shoulders. This would require the use of a central proportioning plant and the hauling of the dry batches to a mixer on the grade; or a central mixing plant and the hauling of the wet mixed concrete to the grade. This is not a recent provision but it seems to have been overlooked on occasions. The use of a roller in finishing pavement is no longer required.

The gauge of metal for corrugated metal pipe has been increased in some of the sizes, otherwise the specifications remain unchanged.

A requirement for minimum strength of light reinforced concrete pipe has been included in the specifications for that material.

SERVICE TO THE PUBLIC BY DIVISION III CREW IS APPRECIATED

CREWS of the California Highway Commission are employees of the public, and, as such, it is their desire at all times to faithfully serve the users of the highways. A spirit of service pervades the entire organization and motorists should have no hesitancy in asking aid of maintenance forces when help is needed.

That assistance to those needing aid is fully appreciated, is evidenced by the following letter received by Division III from a San Francisco man, whose machine left the grade above Auburn during a recent rain:

STEPHEN SMITH & COMPANY

639 Mission Street

San Francisco

June 5, 1925.

California State Highway Department,
Sacramento, California.

Atten: Mr. T. H. Dennis, Ass't Div. Engr.

DEAR MR. DENNIS: On May 31st you passed through Alta in your car. You saw my Nash car over the grade and gave permission to your men to utilize the state trucks in pulling it out.

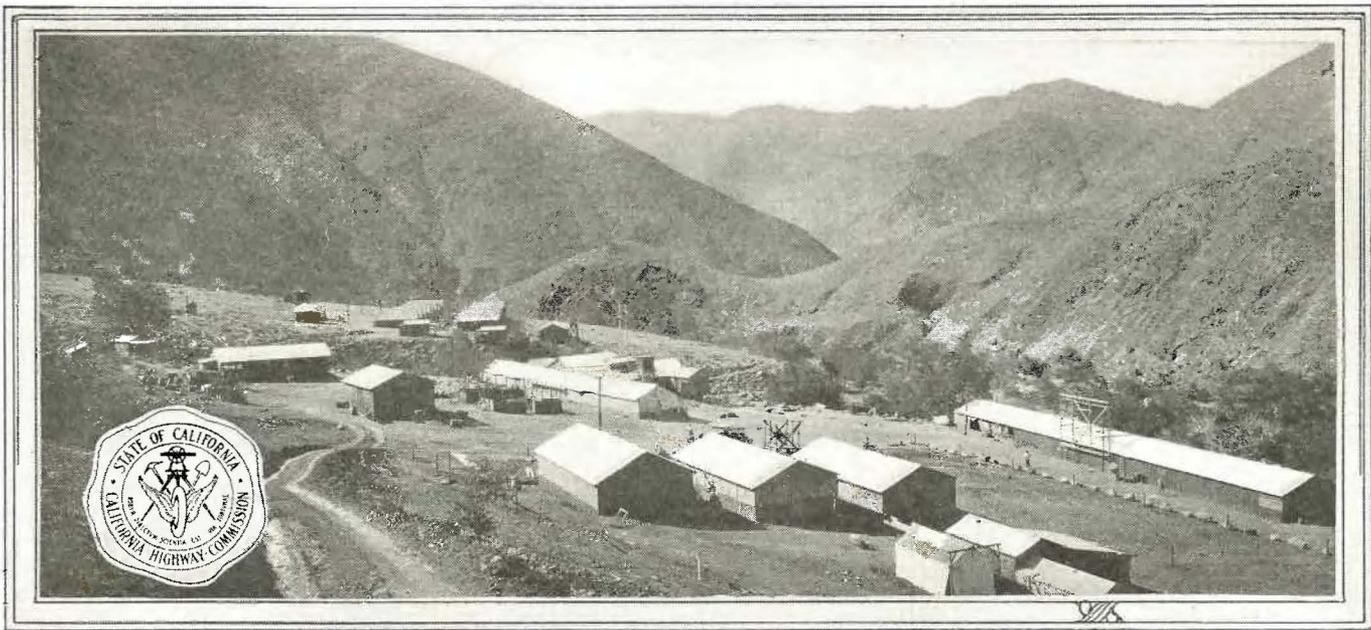
I want to thank you and Mr. W. M. Barnes and Mr. Joe Nelson. These latter two gentlemen showed very great interest in getting the car out, and did everything in their power to help us get out of the mountains.

I wish to congratulate you on having two such men in your organization, for they surely are conscientious workers and are thinking of the state's interest at all times.

Yours truly,

STEPHEN SMITH & COMPANY,

(Signed) Stephen Smith, President.



KERN RIVER CONVICT CAMP—Home of 200 prisoners from Folsom State Prison engaged in the building of the state highway through the Kern River Canyon, east of Bakersfield on the Walker Pass highway. (Div. V.)

TO FINISH KERN CANYON PROJECT IN DECEMBER

THE KERN RIVER Canyon project, 8.7 miles of grading and surfacing, under construction with convict labor, will be completed in December of this year. This is the prediction of Division Engineer J. B. Woodson of Fresno, after a study of progress since July, 1924, when the Folsom prison camp was moved from the Trinity lateral to Kern County.

Completion of this section of the Walker Pass route will provide the people of Bakersfield and Kern County with a high standard highway through the Kern River Gorge as far east as Democrat Springs, where the highway emerges from the canyon into the upper Kern River Valley, in which is located the towns of Bodfish, Isabella, Weldon, Kernville, and Onyx.

From this point eastward, there is a travelable county road across the Sierra Nevada Mountains via the Walker Pass to Freeman. At this point, it intersects the route of the trunk line state highway east of the Sierra.

First Section Was Contract Job.

Previous to the establishment of the convict camp, 6.8 miles of this route was graded and surfaced under contract at a cost of \$434,914.73. This work extends from a point about ten miles east of Bakersfield to Rich Bar, in the canyon of the Kern. Between Bakersfield and the beginning of the W. S. Mead contract, no work has been done except the building of a reinforced concrete bridge across Cottonwood Creek, now under construction with funds supplied by Kern County.

The prison camp was established some distance above Rich Bar. At the present time, about 210 convicts and 40 free men are engaged in the work. In the opinion of the engineers excellent progress has been made, considering the many difficulties encountered. The excavation for the grade in many places is through almost solid rock where the use of a large amount of explosives is necessary. These have been secured largely from excess war supplies and consists of T. N. T., Sodatol, Pyrotol, all having approximate strength of 40 per cent dynamite.

End of Project in Sight.

Up to the present time, three miles of highway have been completed and surfaced to a width of 22 feet, and on two additional miles rough grading has been finished. Due to the large amount

of rock to be moved, costs are averaging about \$1.20 per cubic yard, or \$60,000 per mile. This, however, includes the cost of all structures and the placing of six inches of decomposed granite surfacing.

For the last two and a half miles of the project, the highway passes through an earth formation where it is expected grading costs will drop to \$30,000 a mile. The allotment for the entire project of 8.7 miles was \$500,000. Division Engineer Woodson expects a considerable portion of this amount will remain unexpended when the work is completed.

Two steam shovels are being used in connection with grading operations. The shovels are manned with free labor as required by law; truck drivers and structural workers also are free men.

Highway Added by 1919 Bond Issue.

The new highway, a route added to the state system by the 1919 bond issue, will shorten the mileage and greatly decrease the grades of the trans-Sierra road between Bakersfield and the Trunk Line highway between Los Angeles and the Owens Valley. It will provide the lower San Joaquin Valley with an outlet into the higher elevations of the mountains, and it is probable that this was one of the objects its promoters had in mind when it was urged as a state highway.

As opportunity offers, Superintendent Ralph W. Brown has continued, at the new camp, his policy of promoting interest among the prisoners in outdoor recreational activities. The camp baseball team plays games with organizations from Bakersfield and other nearby communities. A radio and motion pictures provide entertainment at frequent intervals and a well supplied library, largely the work of the Sacramento County librarian, furnishes books and magazines.

The Kern River camp is the first prison road camp to be established in the southern part of the state. As such camps are a success only in the remoter mountain sections, where there is much hand labor to be performed in the construction of the state highways, most of the road projects on which prison labor could be used to an advantage have been in the northern counties.

C. M. Rosenberg was resident engineer at the inception of the project but has been compelled to take a leave of absence because of ill health. T. W. Voss is now resident engineer.

PEST ERADICATION APPRECIATED BY ORANGE COMMISSIONER

MAINTENANCE forces of the California Highway Commission have problems to solve other than strictly highway work. Not the least of these is the control of roadside growths and the spread of various pests, which may be capable of great damage to adjoining property.

The work of the maintenance forces of Division VII, in their efforts to assist in the spread of Johnson grass in Orange County, is appreciated by the Horticultural Commissioner of that County, as evidenced by the following letter received by Division Engineer S. V. Cortelyou:

Office of
COUNTY HORTICULTURAL COMMISSIONER
Room 319
HALL OF RECORDS
Santa Ana, California

A. A. BROCK,
Commissioner

CHAS. F. COLLINS,
Deputy Commissioner

May 11, 1925.

MR. S. V. CORTELYOU,

Division Engineer, California Highway Commission,
Pacific Finance Bldg., Los Angeles, California.

DEAR SIR: This is to acknowledge receipt of yours of the 8th inst. and thank you for the splendid spirit of cooperation expressed therein.

We feel sure that it is only a matter of good business to eradicate this small patch of Johnson Grass before it becomes spread over a large area which means more expense for eradication.

Could we receive such cooperation from all with whom we deal as we get from your department, our work would indeed be easy.

Again thanking you, I am,

Very truly yours,

(Signed) CHAS. F. COLLINS,
Deputy Commissioner.

Liberal quantities of crude salt were used in the extermination work discussed in the above letter.

DIVISION III FOREMEN INSPECT EACH OTHER'S SECTIONS

UNDER the direction of Assistant Division Engineer T. H. Dennis, maintenance foremen of Division III, stationed in the Sacramento Valley, were taken on an inspection trip over each other's sections on May 26th and 27th.

The four foremen from the west side of the valley assembled in Sacramento, May 26th, and were taken on a trip over the highway on the east side. On the following day, the four east side foremen were taken on a trip over the west side state highway, each man having an opportunity to study the methods of other maintenance foremen in the valley.

The friendly exchange of views and discussions of mutual problems, which took place, should result in benefit to the work. The foremen participating in the inspection were:

F. R. Garrison, Willows; William Hampton, Arbutle; B. D. Gipner, Woodland; P. Forrest, Williams; A. D. Kipp, Chico; J. E. Stevens, Wheatland; L. A. Vance, Gridley; S. A. Martindale, Roseville.

MAINTENANCE PROBLEMS DISCUSSED

MAINTENANCE problems from the viewpoint of the man in the field were discussed by the maintenance foremen of Division X, who were called into conference in Sacramento on May 16th by Division Engineer J. C. McLeod. After a short talk by Mr. McLeod, Assistant Division Engineer R. E. Pierce, who is in charge of maintenance in the division, led the discussion.

Misunderstandings regarding letters of instruction, methods of

Eleven

STOCKTON COMMITTEE HEAD PRAISES MAINTENANCE WORK

THE Stockton Chamber of Commerce is thoroughly convinced of the efficiency of the maintenance work of the California Highway Commission, especially that which is being done on the mountain laterals leading to Yosemite National Park. The Stockton Chamber recently conducted its annual sociability run into the park over the Big Oak Flat road, which is in charge of Superintendent W. H. Martin of Groveland.

When he returned home, G. E. Reynolds, chairman of the committee in charge, addressed the following letter to Superintendent Martin:

STOCKTON, CALIFORNIA, May 26, 1925.

MR. W. H. MARTIN,
Superintendent Big Oak Flat Road,
Groveland, California.

MY DEAR MR. MARTIN: Now that the San Joaquin County Sociability run to Yosemite Valley is over, on behalf of the Out Door Committee of the Stockton Chamber of Commerce and the various participants in the tour, I want to thank you and your coworkers for the splendid cooperation given us. We were quite prepared, through the warnings given us, to encounter bad roads and were most agreeably surprised to find them so much better than we expected. The condition of the highway showed the results of your heroic efforts to put the road in shape for us. On all sides we heard nothing but praise for the splendid work of the State Highway Maintenance Department.

We were sorry to impose on your forces as we did, but under the circumstances we felt a postponement out of the question. We had 191 people signed up for the tour on the day that you phoned. We would have lost more than half of these by postponing until this week end and a two-weeks postponement would have conflicted with the date of the visit of the Congressional Appropriations Committee which is scheduled to go over the Big Oak Flat road on the morning of June 8th. Three weeks' delay would have thrown us into the middle of June. Our people wanted to see the Valley in May with the waterfalls at their height.

Our party was a splendid success from every standpoint and was without a single mishap or untoward circumstance. Please convey to your men an expression of our appreciation of their hard work. We are proud of the Big Oak Flat road and we are loyal boosters for the State Highway Maintenance Department. I had hoped to see you on the road as we went up but missed you. If you are ever in Stockton, drop in at the Record Office and give me a call.

Again thanking you and with kindest wishes, I am,

Very sincerely yours,

(Signed) G. E. REYNOLDS,
Chairman Out Door Committee,
Stockton Chamber of Commerce.

accounting for equipment, and rental of equipment, were among the subjects gone into in detail during the discussions. Short talks were made by Assistant State Highway Engineer T. E. Stanton; Assistant Highway Engineer G. R. Winslow, in charge of maintenance for the entire state; and W. F. Mixon, secretary of the commission.

That much good was accomplished by the interchange of views between the field men and the division headquarters staff was the opinion of those in attendance, who were:

J. C. McLeod, W. K. Wright, R. E. Pierce, L. E. McDougal, R. A. Watkins, E. W. Zumwalt, C. J. Temby, A. M. Nash, division headquarters, Sacramento; and foremen J. W. Bertram, Ione; B. W. Bicksler, Sacramento; C. Bevey, Stockton; R. Brennan, San Andreas; J. H. Gates, Fairfield; S. W. Harris, Jamestown; W. P. Hodgson, Davis; L. P. Laird, Modesto; G. E. Marshall, Rio Vista; W. H. Martin, Groveland; G. P. Merrill, Woodfords; and F. M. Walker, Pine Grove.

WHAT THE DIVISIONS ARE DOING

FORTY-FIVE MILES OF SURFACED
HIGHWAY REPAIRED IN DIVISION I

MAINTENANCE forces of Division I have been busy during the past month placing gravel and crushed rock on approximately forty-five miles of highway in the division in anticipation of heavy summer traffic. This work is imperative due to the damage done by the unusually heavy rains of the past winter. Use of light oil as a dust preventive will be tried in Division I during the summer. If the experiment proves successful and economical, the work will be expended if funds are available.

CALCIUM CHLORIDE TO BETTER
CONDITIONS ON PACIFIC HIGHWAY

DIVISION II is completing the application of calcium chloride on all unpaved sections of the Pacific highway in Siskiyou County and on the recently widened section between Bayha and Half Way Creek, in Shasta County. The use of chloride, together with the late rains, is expected to eliminate much of the dust nuisance on this heavily traveled route during the summer months. Late rains and high water delayed construction of a temporary bridge across Trinity River at Cedar Flat, on the Trinity River highway, where traffic was cut off by a washout last winter. This route is now open to traffic and in good condition. Grading in the vicinity of Weaverville has been completed. Normal progress is being made by the Nevada Contracting Company on the big grading contract between Half Way Creek and Dog Creek, on the Pacific Highway, Shasta County. This section is now open to traffic from 7 a.m. to 10 p.m. daily. Landscaping of the new division office grounds at Redding has been completed and they now present an improved appearance.

COLFAX-GOLD RUN GRADING TO BE
COMPLETED AHEAD OF SCHEDULE

RAPID progress is being made by C. R. Adams, contractor on the grading contract covering the Colfax-Gold Run section of eight miles, in Placer County. Six miles of heavy grading has been finished to date and completion of the work ahead of schedule, probably by October, 1925, is predicted by Division III engineers. Work is starting on the Camino-Sportsman's Hall grading project in El Dorado County, recently awarded to Ireys and Holden. Completion of the work by next fall is expected. Surveys and plans have been authorized for the extension of the state highway through the town of Truckee. Surveys also have been ordered of sites for bridges across Walker Creek, Glenn County, on the Willows-Oroville lateral; and for a new bridge across Auburn Ravine, at the southern limits of Lincoln, Placer County. Glenn County and the Town of Lincoln will participate in the cost of these bridges. Plans will be made by the headquarters bridge department.

Improvements at Lake Tahoe.

On the north shore of Lake Tahoe, a crew has resumed grading operations preparatory to surfacing work, bids for which recently were received by the commission. Revised plans have been completed for a thirty-foot concrete pavement between the American River bridge and North Sacramento, to be built in conjunction with the underpasses under the two railroads at this point, already under contract. Considerable slide removal work has been done on the roads about Lake Tahoe and on the recently completed grade between Truckee and Boca, in the Truckee River Canyon. Widening operations on the highway between Emerald Bay and Meeks Bay, Lake Tahoe, have been resumed, an allotment of \$10,000 from maintenance funds having been made for this purpose.

A sharp curve at Browns Corners, Yolo County, on the west-side trunk highway, has been improved by widening the pavement. Oil macadam shoulders are being placed on the state highway through North Sacramento.

Maintenance Material Stock Piled.

Division III recently completed the stock piling of 6000 tons of crushed rock on Sacramento Valley routes for patching pavement

and other maintenance work. Superintendent W. H. Miller and a crew of seven men had charge. The unloading equipment consisted of an "A" frame and steel apron, a 3/8-inch cable and slip scraper, single drum hoist operated by a F-M type Z gas engine, fastened as a unit on skids and mounted on a trailer. The hauling was done by three five-ton trucks with hydraulic end dumps. From 150 to 200 tons was handled per day at a cost of 68 cents per ton. The average haul was two miles.

BAY SHORE HIGHWAY PROGRESS
SPEEDED UP BY CONTRACTOR

CONSTRUCTION of the initial unit of the Bay Shore highway, from South San Francisco to Broadway Station, San Mateo County, is now progressing more rapidly than at any time since the inception of the work, it is reported by Division IV. D. A. Foley, contractor, has installed a new 134-yard steam shovel which is doing excellent work. The earth moving equipment on the job consists of four gasoline locomotives and thirty-six four-yard dump cars operating over an industrial railroad. The resident engineer reports a recent day's run of 732 cars, working two shifts of eight hours each. Two power shovels and a drag line excavator are among the major equipment on the project. Two power shovels are working on the J. P. Holland contract on the Skyline boulevard but late spring rains have delayed resumption of operations on the scale of last summer. Three miles of grading remains to be done immediately north of the junction of the La Honda road.

Widening Contracts Under Way.

The widening contract between San Pablo and El Cervo, Contra Costa County, is well under way. The Kaiser Paving Company has sublet the grading to Blumenkranz and Vernon, who are at work on heavy grading near Tank Farm hill. Placing of asphalt macadam shoulders to increase the width of the pavement to thirty feet will complete the project. Preliminary work on the widening project on the Peninsula highway, between Cypress Lawn cemetery and San Bruno, has been started by the Federal Paving Company, contractors. Culverts are being widened and an asphalt concrete mixing plant is being set up at Baden station. The Spring Valley Water Company is lowering its 54-inch water main which parallels the easterly side of the pavement from San Bruno to Baden.

Oiling Starts on Surfaced Roads.

Maintenance forces of Division IV are busy placing road oil, as a dust palliative, on many miles of crushed rock and gravel surfaced highways throughout the division. Work accomplished on the Pacheco Pass highway is reported satisfactory. The work is



VOLCANIC CINDERS—The state highway near Independence, Inyo County, surfaced with crushed volcanic cinders. (Division IX.)

now progressing on the Skyline boulevard south of San Francisco where more than ten miles have been spread with oil. The Black Point cut-off and the Beltane-Schellville highways, on the north side of the bay, will be similarly treated.

**KERN COUNTY GRADING SECTION OF
WALKER PASS STATE LATERAL**

THE board of supervisors of Kern County on several occasions has extended liberal cooperation in the construction of state highway laterals in that county. The most recent instance is the grading of three miles of the Walker Pass lateral, east of the city of Bakersfield, connecting with the new Cottonwood Creek bridge and the state construction in the Kern River Canyon.

An offer also has been made to grade a section of the Mojave-Barstow state highway, if a definite location survey is made by the state. The matter is now under consideration.

Maintenance Station Planned.

The commission recently completed the purchase of an acre of land near Lemoore on the Coalinga lateral, where Division VI contemplates the location of a maintenance station.

Division VI has three reconstruction contracts under way on the main trunk line through the valley in Merced, Fresno and Kern counties, where widening and thickening of the old pavement is being done.

An allotment of \$9,145 has been made for the relocation of a section of the Yosemite lateral in Mariposa County. This is probably the beginning of an extensive widening and straightening of the old grade, which, as originally constructed, is not up to the standards of the new work beyond the town of Mariposa and in the Merced River canyon.

**TRAFFIC ON BEACH HIGHWAY IS
AIDED BY OIL CAKE SHOULDERS**

DIVISION VII has completed the placing of oil cake shoulders on the Coast boulevard from Huntington Beach southerly to the vicinity of Newport. The material was secured from the city of Huntington Beach, where an extensive street paving program is under way. Shoulders were placed at either side of the twenty-foot concrete pavement by removing the sand to a depth of seven inches for a distance of eight feet. After spreading, the oil cake was disked, sprinkled, shaped and rolled into a hard, smooth shoulder. It is wide enough for cars to park entirely off the pavement.

Providing a safe parking place will aid traffic and greatly add to the pleasure of motoring along the ocean front. Assistant Superintendent A. W. Schmuck had charge of the work.

Line Change Under Contract.

Another slide has prevented the final completion of the Hauser contract on the Ventura County coast. Some 10,000 yards of earth recently slid onto the grade near La Jolla Creek. The big slide at Big Sycamore Canyon has been cleared. South of the Hauser contract, grading is being pushed with vigor on the coast route through the Malibu Ranch.

The much discussed San Onofre-San Mateo Creek line change, in northern San Diego County, is at last under contract, including the grading and paving and construction of two new bridges. The new line will shorten the distance nearly a mile, eliminating sixteen curves.

**DIVISION X RECONSTRUCTION
IS PROGRESSING RAPIDLY**

RAPID progress is being made by J. F. Knapp, contractor, on repaving work between Turner Station and the Stanislaus River, San Joaquin County, reports Division X. The fifteen-foot pavement between Manteca and Calla already has been widened to twenty feet with flush concrete shoulders. Grading is well under way on other portions of the project.

Superelevating of curves on the highway between Davis and Dixon, which was done in connection with the widening contract now under way in Yolo County, has greatly improved traffic conditions. The Kaiser Paving Company will complete the placing of flush concrete shoulders in the near future. F. C. Hewitt is now resident engineer in charge.

Resurfacing Appreciated.

Between Putah Creek and the Winters Wye surfacing of the original concrete pavement with asphalt concrete has been com-

Thirteen

pleted and the work is greatly appreciated by users of the highway.

Maintenance funds have been allotted for repairs to the east trestle approach of the New Hope Landing bridge between Walnut Grove and Thornton, San Joaquin County.

BRIDGE DEPARTMENT NEWS

THE AMOUNT of bridge work under way throughout the state is increasing. Contracts for several important structures were awarded during the month and bids are pending on four more which, in all probability, will be under contract by the time this bulletin is out.

Beauty, as well as utility of design, have been considered in the preparation of plans for the five structures in the Truckee River Canyon, which will be the main entrance to the northern part of the state.

Construction has been finished on the bridge over the north arm of Newport Bay, which was built by Orange County under state supervision. J. B. Hodges represented the bridge department.

The sidewalk on the Rio Honda bridge in Los Angeles County has been completed. The plans were the work of the bridge department.

Southern Bridges Under Way.

Construction has been commenced on three new bridges in southern California, over the San Gabriel River on the Whittier boulevard; over San Onofre Creek in San Diego County; and the Ventura bridge extension, Ventura County. J. B. Hodges, G. W. Thompson, and C. W. Jones, respectively, have been assigned to these projects as resident engineers.

Painting of four steel bridges between Saugus and the foot of the Ridge route is now under way under the supervision of the bridge department.

E. J. Murray has been assigned to the North Sacramento under-grade crossings as resident engineer.

J. P. Winslow will be assistant resident engineer in charge of the painting of five bridges on the Redwood highway in Humboldt County. The work is under contract.

W. P. Wesch, recently with the Montana Highway Commission, and M. L. Hyde of Division VII are new engineers added to the staff of the bridge department.

News has reached headquarters of the recent marriage of V. A. Endersby and Miss Frances Helen Holman of Berkeley.

New Civil Service Rules.

The State Civil Service Commission recently issued a new set of requirements and qualifications for positions in the bridge department. Engineers having a structural engineer's or structural draftsman's rating will be reclassified as "inside" or office men and "outside" or construction men, as follows:

Office:

- Junior Designing Engineer—Bridges—Grade III.
- Assistant Designing Engineer—Bridges—Grade IV.

Field:

- Junior Construction Engineer—Bridges—Grade III.
- Assistant Construction Engineer—Bridges—Grade IV.
- Superintendent of Construction—Bridges.

PRAISES CALIFORNIA HIGHWAYS

"I came to spend several weeks and stayed two months."

This was the answer of C. J. McKenzie, highway engineer of New Zealand and a member of the Public Works Department of that country, when asked his opinion of California state highways following the completion of his recent investigation.

Mr. McKenzie is on a tour of the United States and Great Britain, inspecting highway construction for New Zealand where an extensive highway building program is contemplated. He had planned a comparatively short stay in California, but found so much of interest that he remained more than his allotted time.

Mr. McKenbie visited all parts of the state, investigating every phase of the department's activities, discussed construction methods with the engineers, and went away with the highest praises for California's highways.

Traffic made the demand, economics has shown that the demand was warranted, a splendid construction system has been the outcome and good roads are the result.

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
449	VII	Orange	60	B	COMPLETED AND ACCEPTED SINCE MAY 4, 1925 Corona Del Mar to Boat Canyon	5.56	Grading	W. D. McCray	\$150,834 37	Aug. 22, 1924	150
467 468	VII III	San Diego Nevada	2 38	D B	AWARDED SINCE MAY 4, 1925. San Mateo Creek Truckee River near Hinton		Bridge Bridge	R. A. Wattson McKay Engineering Co.	\$84,135 38 37,902 15	June 3, 1925 June 3, 1925	200 150
					Sub-total				\$122,037 53		
					PENDING AWARD.						
	VIII II III III III	Riverside Tehama Nevada Nevada Nevada	26 7 38 38 38	E A A A B	Coachella Storm Water Drain Through Corning Across Truckee River at Prosser Creek Across Truckee River near Boca Across Southern Pacific Railroad at Hinton	1.0	R.C. Girder Bridge P.C. Concrete Pavement R.C. Girder Bridge R.C. Bridge R.C. Girder Bridge		\$37,069 43 41,537 48 25,981 88 33,964 88 21,178 12		
					Sub-total	1.0			\$159,731 79		
					Total State Highway Fund Jobs Awarded and Pending Award	1.0			\$281,769 32		

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

MOTOR VEHICLE 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
M-58	VII	Los Angeles	2	D	COMPLETED AND ACCEPTED SINCE MAY 4, 1925 Rio Honda Bridge		Sidewalk	K. O. Wetzel Co.	\$3,722 06	Jan. 3, 1925	8100
					AWARDED SINCE MAY 4, 1925.						
M-79 M-80 M-81 M-82 M-83 M-84 M-85	VII I III VI VII VIII VII	Ventura Humboldt El Dorado Kern San Diego San Bernardino Los Angeles	2 1 11 4 2 26 2	D C-E-G E-F D D A D	Ventura River Bridge Various Camino to 2 miles east Sportsman's Hall Beardsley Canal to Lerdo San Onofre to westerly boundary Santa Ana River to Redlands Montebello to Whittier	5.8 8.2 3.65 5.49 3.32	Extension Painting Five Bridges Grade and Gravel Shoulders and Surface P.C. Concrete Pavement P.C. Concrete Pavement P.C. Concrete Pavement	Otto Parlier R. Zehinsky Irey and Holden Federal Paving Co. R. A. Wattson Basich Bros. Co. Kuhn Bros.	\$22,497 19 56,952 00 51,464 34 155,006 30 134,223 88 140,197 16 138,050 46	May 20, 1925 May 20, 1925 May 20, 1925 May 20, 1925 June 3, 1925 June 3, 1925 June 3, 1925	125 150 180 150 125 150 150
					Sub-total	26.46			\$698,391 33		
					PENDING AWARD.						
	V V III IV VI	Monterey Monterey Placer Sonora Merced	2 2 39 1 32	H-I G A B C	1 mile north of Bradley to San Ardo San Ardo to San Lucas Tahoe City to Nevada State Line Healdsburg to Mark West Creek 6 miles east of Los Banos to San Joaquin River	12.1 11.0 11.6 8.79 10.0	Macadam Shoulders Macadam Shoulders Gravel Surface Concrete Pavement Stone Shoulders		\$39,600 00 34,880 63 26,901 00 313,630 20 26,289 00		
					Sub-total	53.49			\$441,300 83		
					Total Motor Vehicle Fund Jobs Awarded and Pending Award	79.95			\$1,139,692 16		

NOTE—The above obligations charged against the Motor Vehicle and Gasoline Tax Funds do not include funds from these sources obligated for general maintenance and for specific betterments not being done under contract.

Fourteen

CALIFORNIA HIGHWAYS.

HIGHWAY NEWS NOTES

Lund Succeeds Grant.

ALEX LUND, formerly assistant superintendent at Briceburg, has assumed the superintendency of the Smith River convict camp in Del Norte County, succeeding George D. Grant, resigned.

H. T. Heaton, resident engineer in Division II, has resigned to accept a position with an irrigation district.

Division III News.

H. R. Church has been promoted to resident engineer on the Camino-Sportsman's Hall grading job, El Dorado County. H. B. La Forge has been assigned to this contract as assistant to Mr. Church.

Gets Promotions.

W. T. Rhodes, assistant resident engineer on the convict work in the Merced River Canyon, has been promoted to resident engineer. T. W. Voss, attached to the Kern River convict camp, has been similarly promoted.

Ross Westbrook, formerly assistant resident engineer on the Beaumont paving project in Division VIII, has been transferred to Division VI for work near Fresno.

Division VII Gets Surprise.

FOLLOWING the resignation recently of Miss Grace Brummette, for a number of years clerk in the Los Angeles office, Division VII was informed that she had become the bride of Edward Rawson, former superintendent in the south and now a contractor.

L. R. McNeely has been assigned to the Jahn and Bressi contract near Capistrano, Orange County, as assistant resident engineer.

Pierce Attends Convention.

R. E. Pierce, assistant division engineer in charge of maintenance, Division X, attended the national convention of the A. A. E. as a delegate from the Sacramento Chapter. The gathering took place during the early part of the month in Orlando, Florida.

Who said a woman can't keep a secret? Lorene Lucy Gibson, typist with Division X, has just announced the fact that more than a year ago she became the bride of James Kirkwood Young, a recent graduate of the University of California. The wedding took place in San Rafael.

Friends of Mrs. E. E. Fifield from Divisions III and X recently presented her with a silver vase upon the occasion of her departure from Sacramento to accept a position in Berkeley. She has been with the department as a clerk for a number of years.

From the Equipment Department.

J. K. Kinsman has been promoted to the position of assistant equipment engineer and has been placed in general charge of the shop work in the several divisions.

T. A. (Tommy) Mendenhall, popular mechanic for the Committee of Nine on its many trips about the state, is the proud father of a son who arrived May 31st.

Bridge Engineer Takes Bride.

Albert A. Lernhart, resident engineer for the bridge department, was married recently to Miss Lucile Whitney of Eureka.

Accepts Federal Position.

W. K. Reed, for a number of years resident engineer in Division III and VI, has resigned to accept a position as engineer in charge of the paving work under way in Yosemite Valley.

H. O. Ragan will be resident engineer in charge of the concrete shoulder work in Fresno County.

Al Gregory, draftsman in Division VI, has resigned and started on a trip around the world.

A. N. Wakefield, former chief of party, has been reappointed as assistant resident engineer in Division VI.

To be City Manager.

R. A. Watkins, superintendent equipment, Division X, has resigned to accept a position as city manager of Pittsburg, Contra Costa County.



DRESSING UP THE ROADWAY—Mower attachment on a light tractor cutting roadside growth near Stockton. This work improves the appearance of the highway and lessens the fire danger during summer months. (Division X.)

MOWING WEEDS IMPROVES APPEARANCE OF HIGHWAY

MOWING weeds and grass along the roadsides keeps the highways looking neat and orderly, particularly following seasons of as heavy rainfall as the last one which was particularly favorable for a rank growth along the right of way in many sections of the state.

Various methods have been tried to remove roadside growth; disking and grading have been resorted to. Where grading is necessary to widen shoulders and improve drainage conditions, it probably is justified, but after a satisfactory roadbed has been secured it is a heavy expense as means of removing weeds.

When slopes are loosened by grading and disking, considerable material may be washed away by rains, and in light soils winds create an undesirable dust condition. If weeds and grass are mowed, the roots remain and tend to hold the soil.

Pierce Makes Report.

These are some of the opinions expressed by Maintenance Engineer R. E. Pierce in a report to Division Engineer J. C. McLeod of Division X, which has been trying out a Roderick lean worm driven mower attachment on a Fordson tractor. Considerable roadside mowing has been done in San Joaquin County, starting in March with a second cutting about May 1st.

One man operates the outfit and can clean up about five miles of both sides of the highway per day. Pierce gives the cost per mile as follows: Labor 90 cents; rental Fordson and mower, 64 cents; materials, gas oil, etc., 26 cents; total \$1.80 per mile.

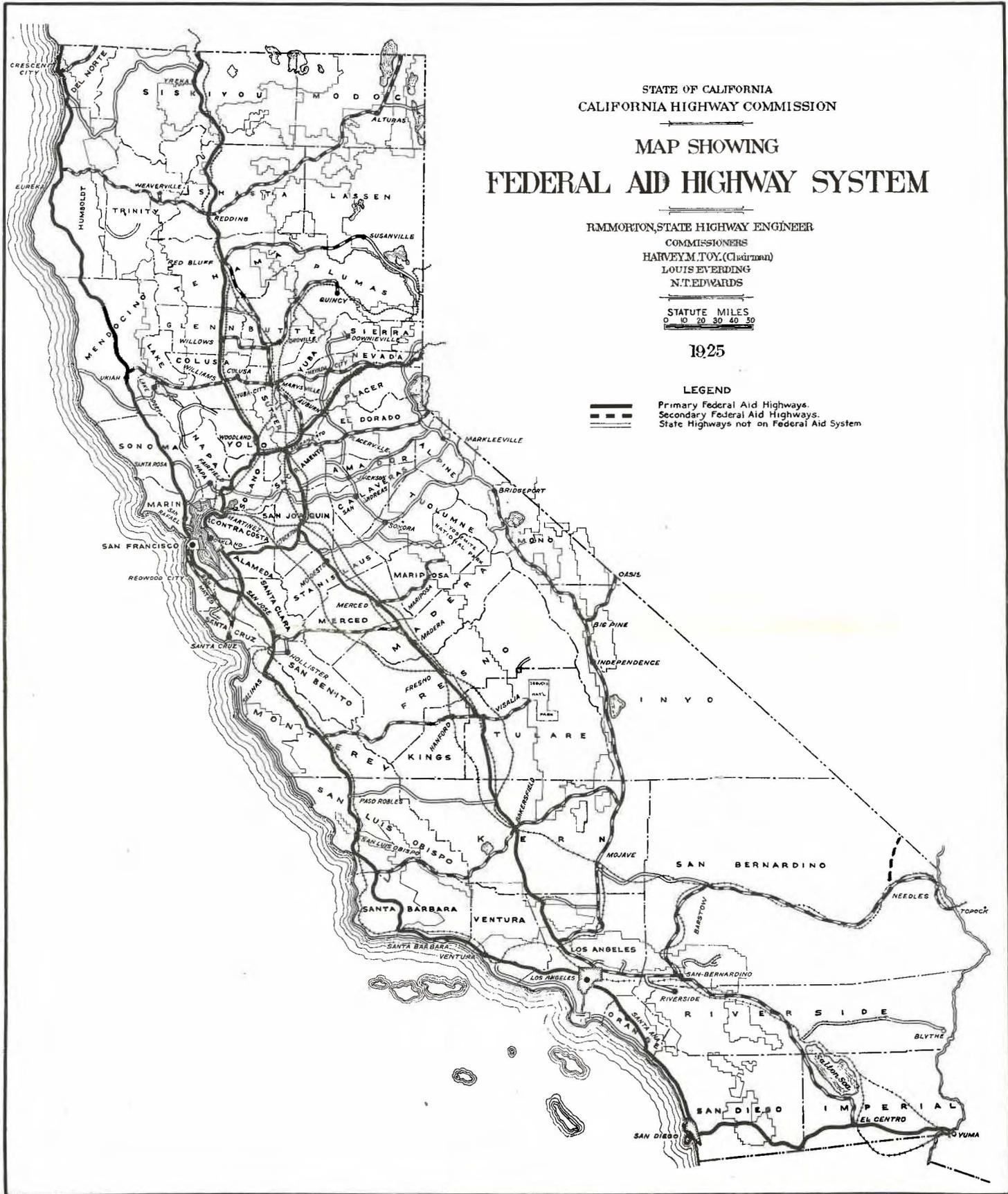
Rubbish along the roadsides often causes trouble and in order to keep delays to a minimum the operator carries with him an extra guard and also extra teeth.

The Curse of Civilization.

A Yosemite Indian, who still lives in the same mountain clearing and the same little shack that his grandfather started, was questioned regarding a deed for a highway right of way. His answer was that he did not want the highway past his place unless he gets \$500 because it brings "too many robbers."

The Oregon highway department, it is announced, has adopted the thickened edge type of cement concrete pavement. This is the design that has been used on California concrete pavements for the past several years.

Good roads, canals and navigable rivers by diminishing the expense of carriage, put the remote parts of a country nearly on a level with those in the neighborhood of a town; they are, upon that account, the greatest of all improvements.—*Adam Smith's "Wealth of Nations."*



The above map shows the federal aid highway system of California in its relation to other state highways. The roads shown on this map constitute the present state highway system, except in one or two minor particulars where the federal aid system includes short sections not designated state highways.

CALIFORNIA STATE PRINTING OFFICE
JOHN E. KING, State Printer
SACRAMENTO, 1925

To obtain insurance for the protection of its members, engineers and employees while engaged in state work;

To have charge of all cooperative highway work engaged in by the state and the federal government.

Local Contractors to Have Chance.

Authority also is granted the commission to advertise for bids for work, the estimated cost of which does not exceed \$15,000, the bids to be opened by the division engineer after notice for eight days in a paper within the county where the work is to be performed. At present such work has to be advertised for four weeks, and the bids opened by the state highway engineer. This prevents much small emergency work from being done under contract. The provision was inserted upon the recommendation of the state highway engineer and will give local contractors an opportunity to bid on work now performed largely by day labor.

At the suggestion of the Attorney General, the attorney for the commission has been authorized to approve contracts, relieving the Attorney General's office of this duty. This will facilitate getting work under contract.

The act contains many other useful changes in highway procedure which will make it possible for the commission and the state highway engineer to more efficiently serve the public. All financial transactions of the department are subject to the supervision of the State Board of Control.

NEW HIGHWAYS ADDED TO SYSTEM

The Bay Shore highway was extended and seven new routes were added to the system by bills signed by Governor Richardson. They are as follows:

BAY SHORE HIGHWAY, SAN FRANCISCO TO SAN JOSE—41.5 miles (San Francisco, San Mateo and Santa Clara counties). The new law definitely places this route in the state highway system and changes its description from "the county line of the city and county of San Francisco to and through the county of San Mateo," as enacted in 1923, to "from San Francisco to the city of San Jose." It is urged as a new trunk line into San Francisco to relieve traffic congestion on the Peninsula highway.

POINT SAN QUENTIN TO SAN RAFAEL—3 miles (Marin County). This road is needed as new trunk line feeding into San Francisco from the Redwood highway. Its construction will aid in relieving congestion on the Marin side of the bay.

UKIAH TO TALMADGE—2 miles (Mendocino County). This road will connect a state hospital with the Redwood highway.

CRESCENT CITY TO THE OREGON LINE—19 miles (Del Norte County). This highway is needed to connect the California system with the trunk highway under construction down the coast by the state of Oregon, known in that state as the Roosevelt highway. It was already a part of the 7 per cent federal aid system of California.

ANGELS CAMP TO CALAVERAS BIG TREES—24 miles (Calaveras County). This addition will connect the Mother Lode highway with the Ebbitts Pass state road, by way of the Big Trees.

OXNARD TO EL RIO—2 miles (Ventura County). This road is an omission of the bond issue of 1919. It is needed to connect the coast state highway, ending at Oxnard, with the trunk highway extending from San Francisco to Los Angeles.

NEEDLES TO THE COLORADO RIVER OPPOSITE TOPOCK, ARIZONA—12 miles (San Bernardino County). This is another omission of the 1919 bond issue. The bridge across the Colorado River is at Topock, not Needles, and at the former point the California road connects with the Arizona state highway system.

BARSTOW TO THE NEVADA LINE NEAR JEAN—(Silver Lake Cut Off) 125 miles (San Bernardino County). This highway forms a part of a direct route between Los Angeles and Salt Lake City, generally designated the Arrowhead Trail. It is favored by the Bureau of Public Roads and the state of Nevada and will connect with an improved road in that state.

Total added to system approximately 230 miles.

Five

**FEDERAL-AID ROAD JOB
ONE-THIRD THROUGH**

GOVERNMENT HAS PLACED 54,954 MILES OF HIGHWAY UNDER CONSTRUCTION, TO COST \$452,880,341

UNCLE SAM is helping build roads so fast that when he turned the corner into 1925 he had placed under construction nearly one-third of the total mileage of the main, interstate and intercounty system provided for in the Federal Highway Act approved in November, 1921. In brief, according to the report of the Bureau of Public Roads, he had placed 54,954 miles of federal-aid roads under construction up to January 1 last, which will cost him \$452,880,341, while his contract with his peoples calls for 174,350 miles. In addition a very large mileage, probably in excess of the mileage proposed for improvement with federal aid, already has been improved by the states without federal assistance.

The total of all federal aid funds apportioned to the states up to the beginning of the year was \$525,125,000, of which \$469,498,477 had been definitely allotted to particular projects totaling 57,073 miles. The 54,954 miles which had been placed under construction will receive federal aid in the amount of \$452,880,341, and of this sum \$380,528,813 had been paid up to January 1 for work completed on these projects.

Of the mileage which had been placed under construction up to the beginning of the current year a total of 42,828 miles had been completed, leaving a balance of 12,127 miles actually under construction at the beginning of the year. Work will be continued on this mileage during the year and it is anticipated that fully ten thousand miles will be completed before January 1, 1926.

The accompanying chart shows the mileage of the approved federal-aid system in each state and the portion which had been placed under construction with federal aid up to the beginning of the year.

The state with the largest approved mileage is Texas in which the system includes 10,930 miles, nearly five thousand miles of which already has been placed under construction with federal aid.—*American Motorist.*

OTHER HIGHWAY LEGISLATION.

Other highway legislation approved by the Governor which may be mentioned includes:

Senate Bill 604, authorizing the State Board of Control to sell to the highest bidder real estate under the jurisdiction of the commission and which is no longer needed for highway purposes.

Senate Bill 360, granting the commission a thirty-foot strip from the lands of the Whittier State School for the widening of the Whittier boulevard in Los Angeles County.

Assembly Bill 430, prohibiting cities from changing the grade of completed state highways which were constructed prior to the incorporation of the municipality or the annexation of the highway in question, unless consent of the highway commission for such change is first obtained.

The Governor also approved an appropriation of \$150,000 for state aid in the construction of highways by joint county highway districts.

"By Ear."

"My dear young lady," said the clergyman in grieved tones, as he listened to the extremely modern young woman tear off some of the very latest jazz on the piano, "have you ever heard of the Ten Commandments?"

Modern Young Lady—"Whistle a few bars and I think I can follow you."

The other day a resident of Anderson, Shasta County, chipped a glittering object from the concrete pavement of the state highway to find that it was a gold nugget which assayed \$2.30. The gravel used in the construction came from Clear Creek where much mining was done in the early days.