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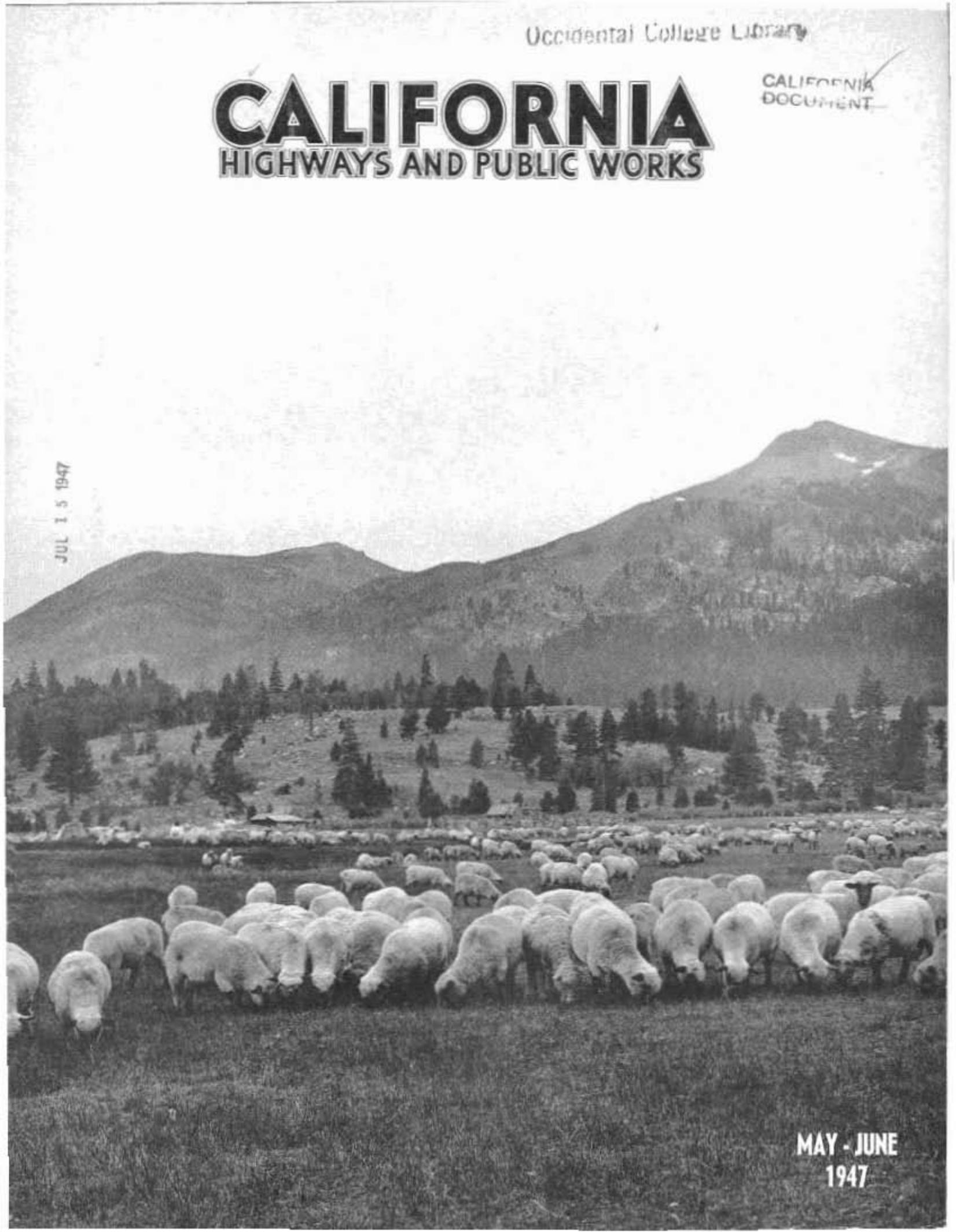
CALIFORNIA

HIGHWAYS AND PUBLIC WORKS

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CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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

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Public Works Department Saves State More Than Million Dollars On Purchases Of War Surplus

By REX FULTON, Associate Highway Engineer

SINCE January, 1946, the California Division of Highways, acting through the Department of Finance, has purchased \$817,500 in material from the War Assets Administration, resulting in a net saving to the State of over \$500,000.

During the same period, the Division of Architecture, acting through and in conjunction with the Department of Finance, purchased and erected \$266,938 worth of scarce and non-existent building materials and equipment from the War Assets Administration resulting in a net saving to the State of \$522,190.

In general, the items purchased were nonexistent on the open market and have ranged from pen points to fork lift trucks, covering 350 commodities.

One of our major purchases was steel fence posts which were furnished in 5-foot, 2 feet 8 inch and 2-foot lengths. These posts are obviously too short for right of way fences and arrangements have been made to butt weld a 2-foot and 5-foot post together making a 7-foot post. Ten holes are then punched along the post for fastening the wire by means of cotter pins or staples. The holes are so spaced as to permit fastening any of the standard combinations of woven and barbed wires. The posts are then wire brushed and given a shop coat of zinc-chromate paint, the paint also having been purchased from war surpluses.

Corner, end and gate posts are similar construction, except that two line posts are longitudinally welded to make a double post of tubular section. Braces will consist of 5-foot and 7-foot line posts attached with bolts.

BIG PURCHASE OF STEEL POSTS

The posts are of a winged-channel or hat section and weigh approximately two pounds per foot, whereas our highway specifications require a weight of only 1.4 pounds per foot. It is proposed



New steel guide posts in place

to furnish the steel fence posts as state-furnished material on contracts after July 1, 1947, at which time they will be available in quantity.

Out of a total of 1,429,441 steel posts purchased in various lengths, similar items are being fabricated such as sign posts in lengths of from 5 feet to 12 feet, and guide posts in lengths of 5 feet 4 inches.

Because of the current scarcity of suitable timber, it is proposed to fabricate about 275,000 guide posts, which consist of two 2-foot 8-inch posts butt welded for a total length of 5 feet 4 inches, on which is mounted a steel plate 8 inches x 24 inches in size and painted white. The completed steel guide post can be furnished for the same price as wood and will have the additional advantage of being driven into place, whereas the wood post must be dug-in and then field painted.

A net saving of about \$0.65 each, complete in place, is anticipated by using the steel post.

At the present time, neither the War Assets Administration nor anyone else has been able to furnish suitable sheet metal in quantity for making the plate. Operations are therefore restricted to making about 7,000 guide posts from materials on hand. However, the fabrication of this initial order will offer an opportunity to eliminate any bugs in their development, such as: Should the plate be welded to the post or will additional handling costs favor field assembly? Should the edges of the plate be rolled to minimize lacerations in highway accidents? It is hoped that these questions will be clarified in the field before full production gets under way.

THREE MILLION TENT PEGS

Another major item in quantity if not in monetary value, is 3,000,000 tent pegs purchased from war surplus. These pegs are hardwood, turned from 1 inch x 9 stock. They are nicely pointed and headed and will make excellent survey stakes for reference points as small hubs, commonly known as "ginnies." Three million such stakes are at least a five years' supply.

The department has also analyzed various usages of other materials, such as mail bags for stake bags; gauze for wiping cloths; pilot house stools for drafting stools; barracks and quonset huts for offices; powder magazines for ware houses; and rubber life rafts for survey boats.

NYLON ROPE USES

Nylon rope used in parachute construction has been successfully used by painters on the Bay Bridge. Nylon is about $2\frac{1}{2}$ times as strong as manila and is light and flexible.

Another item of reconversion was the adaptation of tin spice boxes by the laboratory. The large tin boxes con-

tain a set of cans which were used as sample cans, and the outside box and lid were made into laboratory utensils.

As a correlation to war surplus activities, the Division of Highways purchased 4,500 tons of steel "H" piling from the Bethlehem Steel Company. It was found that as each bridge contract was let, a delay of from six to nine months was entailed in scheduling the rolling of necessary piles. Rather than accept this delay on each project, it was deemed advisable to accept the delay but once, and maintain an active inventory in this item for use by contractors.

Because of the necessity of temporarily storing the piles, requiring additional handling charges, it was not so much the intention to save money on this transaction as to render a service in speeding up construction operations.

Included in the total saving effected by surplus purchases is \$76,967.04

Use of Survey Stakes Being Standardized by Division of Highways

NORMAL use of survey stakes by the Division of Highways is about 1,350,000 stakes annually consisting of 23 varieties purchased in small amounts by the 11 highway districts at a total cost of \$40,000 a year.

By standardization on six different sizes of stakes and buying a year's supply at a time, the division recently has let contracts whereby the required number of stakes can be distributed to the districts for a total cost of \$25,000, resulting in a net saving to the State of \$15,000 annually.

saved by the Headquarters Shop of the Division of Highways in Sacramento in the acquisition of \$111,244.52 worth of equipment.

Fourteen 12-yard Le Tourneau scrapers were bought at a saving of \$7,500; 13 Dodge Command trucks were acquired at a saving of \$22,000; and the purchase of eight 25 kilowatt generator sets effected a saving of \$5,700.

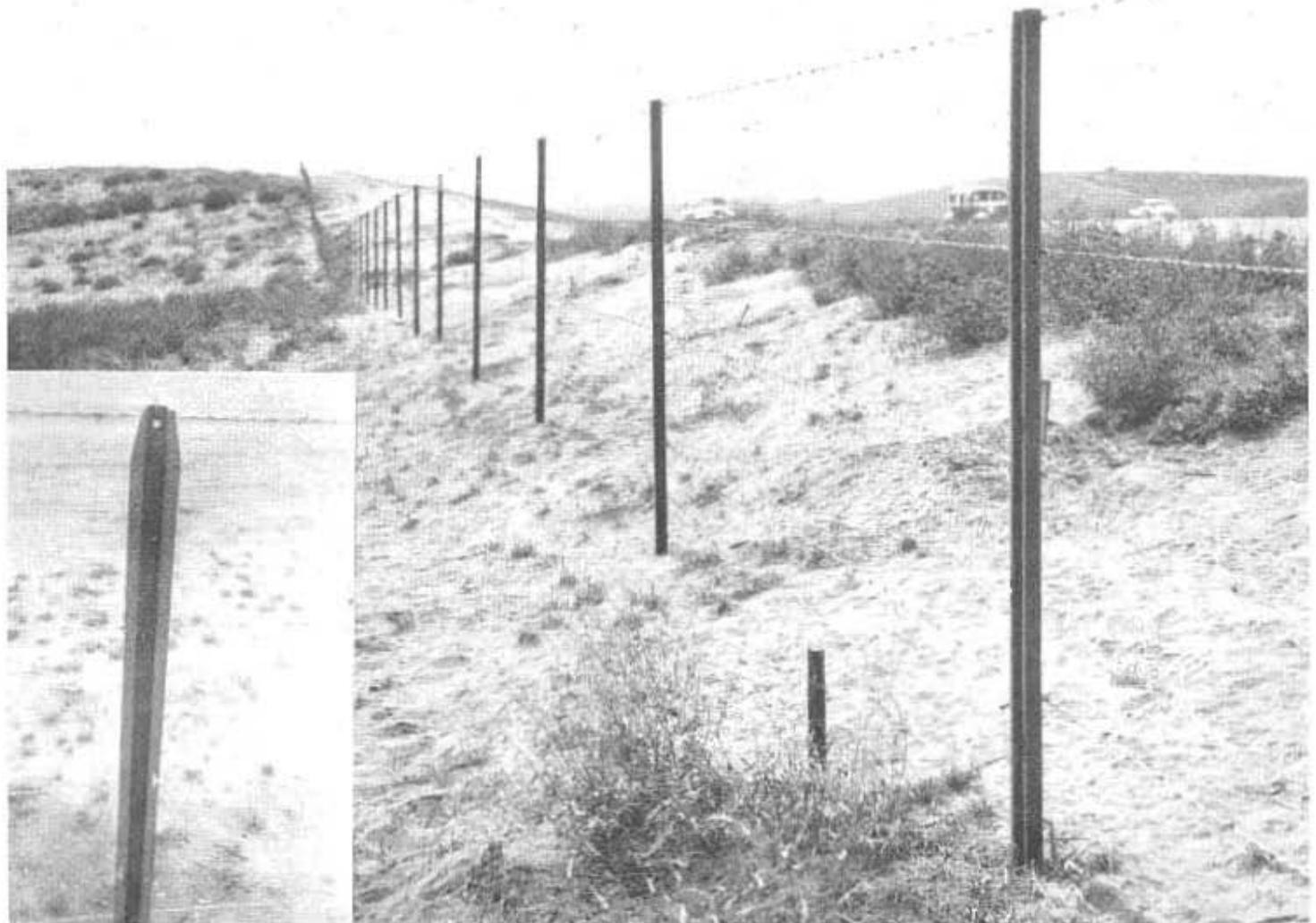
These are only three of several hundred war surplus items obtained by the Headquarters Shop.

The savings made by the Division of Architecture were on the following projects:

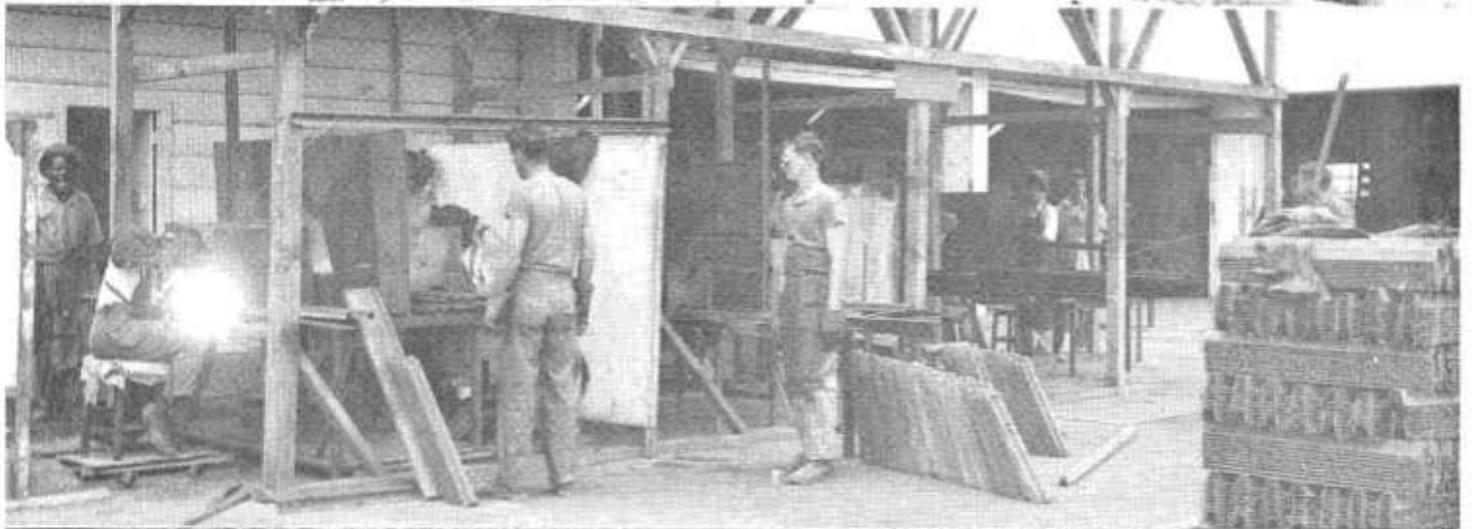
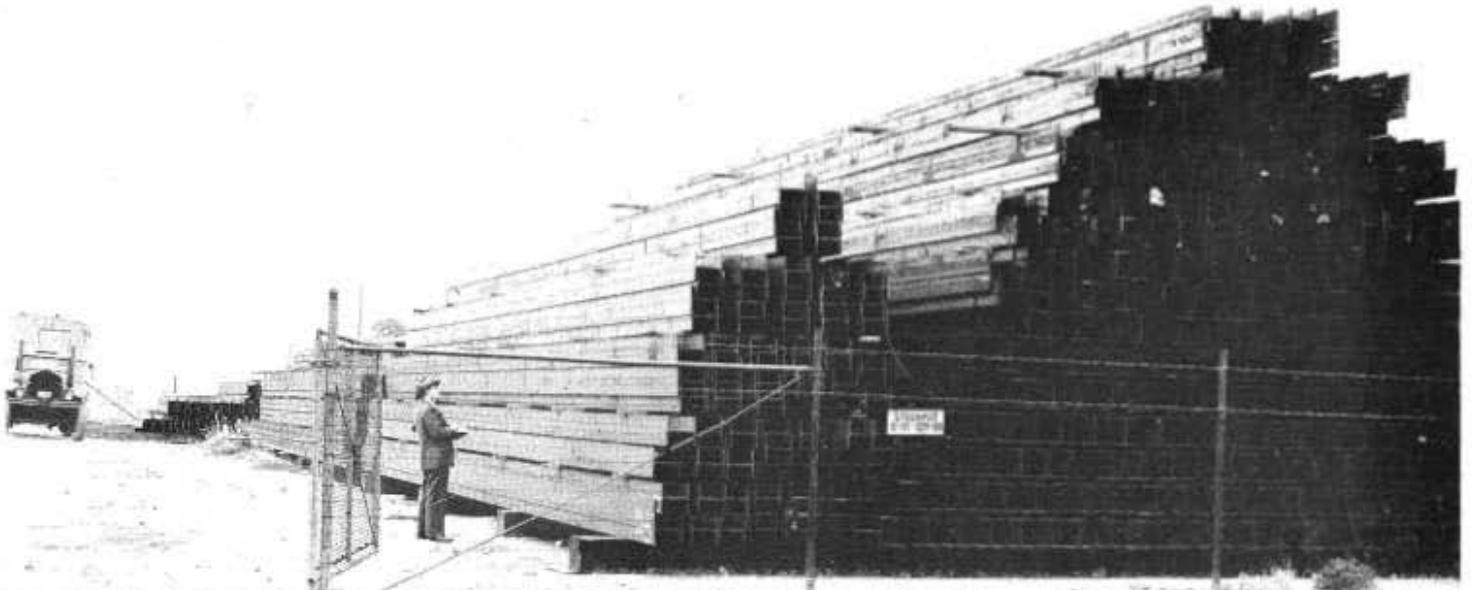
90,240 square feet of steel Army barrack buildings used as classrooms for veterans' educational program at six state colleges;

25,600 square feet of Army barrack buildings used as housing facilities.

(Continued on page 8)



Steel fence posts fabricated from war surplus. Inset shows how wire is mounted with cotter keys



Upper—"H" piling at Wilmar purchased for current bridge construction program. Center—Furnaces where steel fence posts are welded
Lower—Boxes containing approximately three million tent pegs stored at Puente warehouse for future use as survey stakes

Modernization of Coast Highway

EARL E. SORENSON, District Construction Engineer

A CCEPTANCE by the Director of Public Works on May 19, 1947, of the completed contract for the "Traffic Signal Installation" at the main entrance to Camp Pendleton completed a series of five contracts which have transformed Route 2, U. S. 101, "El Camino Real," into a modern four-lane highway from Oceanside to San Clemente, a distance of approximately 20 miles. The signals were installed by the Tri-Cities Electrical Co. of Oceanside at a cost of approximately \$6,000.

The heavy traffic resulting from military needs and congested population over this portion of the highway, resulted in numerous accidents and property losses, which made the improvement imperative. Unusual accidents which occurred due to conditions resulting from defense activities and probably inadequate highway facilities are illustrated in the accompanying photo of a collision between a large motor line truck and an airplane which failed to clear on the San Onofre overhead. The improvement has nearly eliminated the possibility of this type of accident.

NEW BRIDGE

The preceding units of this series of contracts covered the construction of a new bridge paralleling an existing concrete structure across San Mateo Creek. The existing bridge, which is in excellent condition, will handle north bound and the new one south bound traffic. The bridge was constructed by Oberg Brothers of Inglewood at a cost of approximately \$160,000, with W. H. Johnson as Resident Engineer for the State.

Where the traffic warrants, and due to both economy and the possibilities for handling existing traffic with a minimum of inconvenience, the installation of a new structure entirely separate from the existing one represents a policy which is rapidly gaining in favor.

VARIOUS CONTRACTS

The section of highway from the vicinity of Las Flores underpass to Orange County line was constructed by N. M. Ball Sons of Los Angeles under the supervision of H. F. Caton as Resident Engineer for the State.

The total cost was approximately \$695,000.

Basich Brothers Construction Company of Alhambra constructed the portion of highway from Oceanside to Aliso Creek at an approximate cost of \$635,000. R. C. Payne was the State's representative in charge.

The grade separation across the Santa Fe main line at Oceanside was supervised for the State by W. V. Cryderman as Resident Engineer, with Fred D. Kyle Company of Los Angeles as the Contractor. The cost approximated \$100,000.

Considerable investigation and preliminary planning entered into the design of this unit of the work. At this location the old three-lane highway was separated from the railway by an underpass which was in good shape and, based on modern standards, adequate for one-way traffic, both from a volume and safety standpoint. However, the curved approaches leading to it from both directions restricted the sight distance and made it a danger point for two-way traffic.

(Continued on page 8)



Showing six-foot separation by means of double stripe north of Flores

Traffic Striping Developments

By MARTIN O'BRIEN, Maintenance Department

TRAFFIC stripes and other pavement markings are recognized as very necessary aids in the operation of traffic on the highways. The development of such items as the standards to be followed and specifications for materials, as well as of the equipment used in placing the stripes and markings, have been given much attention during the last 20 years, and improvements are still in process.

The standards of traffic marking as now defined by the Joint Committee on Uniform Traffic Control Devices are quite generally observed by the various states. In order to comply with these standards, California, early in 1946, adopted a combination solid and dashed four-inch white line for zones where traffic proceeding in one direction is permitted to pass—while that in the opposing lane is restricted.

This dashed line consists of nine-foot lengths of painted stripe spaced fifteen feet apart. No change has been made in the two solid parallel white lines which denote zones where passing over the center line into the opposing lane is prohibited. Our experience with the dashed line has been very satisfactory since we find it not only provides good visibility under varying conditions but effects a 60 percent reduction in material costs.

TRAFFIC LACQUER FORMULAS

Paint manufacturers as well as laboratories of the several highway departments have developed satisfactory formulas to meet the exacting requirements of traffic lacquer for striping and pavement marking purposes. These qualities include such items as quick drying and long life under the wear of traffic as well as good adherence to concrete and a variety of bituminous surface types without serious discoloration. The material must also serve to hold glass beads embedded in the surface.

Unfortunately, it is not possible at the present time to secure the materials required to make up good quality traffic lacquer. Before the war it was not unusual for a stripe to give satisfactory service for a period of 18 months or even more. Under present conditions it is frequently necessary to repaint the stripes on heavily traveled sections of

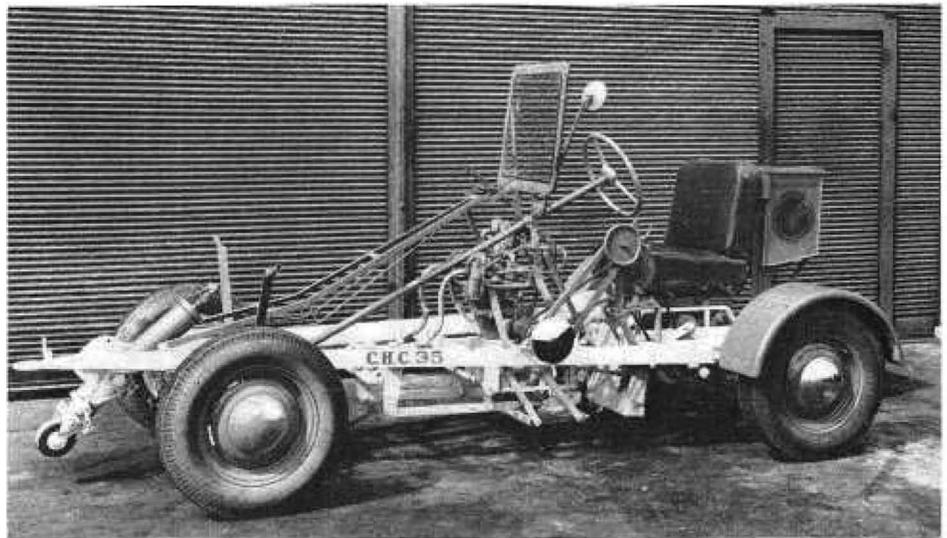


Photo No. 1

highways five times in an 18-month period. It is hoped that this material situation will improve shortly, but in the meantime it is impossible to maintain the stripes to a desirable standard.

EQUIPMENT IMPORTANT

The equipment used in placing these stripes is very important. However, due to the many changes in stripe design, commercial products have not been available and many of the states have proceeded with the design of their own equipment. At first, the work in California was done with a hand-propelled machine. Later, this unit was towed by a truck until it was found to perform more satisfactorily when pushed in front of the truck. The first push-type machine was built during 1935 and since then some eleven such units have been constructed. Refinements have been added from time to time to keep pace with the changes in striping design. These changes were largely developed as a result of information supplied Headquarters Shop personnel by the paint machine operators.

When only solid stripes were being placed the equipment required was comparatively simple. The striping machine consisted mainly of a frame on wheels with a seat for the operator and support for the spray guns and the paint and air hose lines. The paint supply tanks and the compressor which

furnished air to operate the spray guns were carried in the bed of the pusher truck.

WARTIME STRIPING

When the use of a broken stripe was adopted as a wartime conservation measure it became necessary to develop an arrangement to turn the paint on and off at definite intervals. It was necessary also to synchronize the operation of the bead dispenser which consisted of a small trailer unit placed immediately behind the paint sprays. The development of a satisfactory design would not have been so difficult for a single application of a stripe in restriping if it were not imperative to match the original marking.

In the machine constructed during wartime the cycle length was governed by a disc valve operated by a bicycle wheel which was in contact with a drum on the rear axle of the striping machine. In machines of this type, the cycle length of the broken line is affected by any change in the radius of the driving wheel. Such change may be caused by variations in temperatures, the weight of the operator riding the machine, air pressure in the driving wheel, or a number of other causes. Frequent adjustments were accordingly necessary to pick up or retard the operation of the paint guns and bead dispenser to account for these variants.

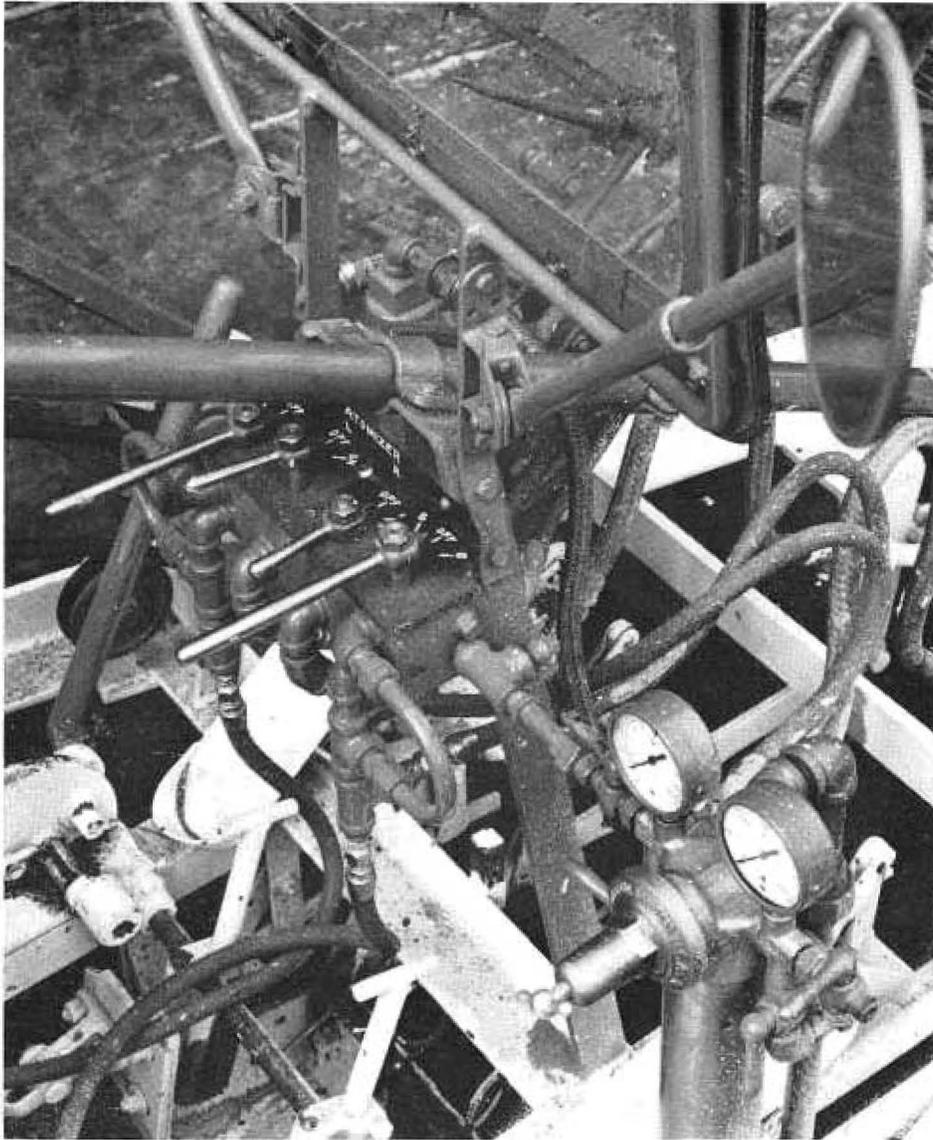


Photo No. 2

NEW MACHINES NECESSARY

It was necessary to develop a more positive control for retracing the broken stripe and since other desirable improvements had been suggested, it was decided to construct 12 new machines. One machine has now been completed and given a careful field trial and work is in progress on the others.

In redesigning the striping machine simplicity of operation was a first objective. The routine operation of the machine in placing the present standard stripes requires that the operator be able to make the following transitions in sequence of work without stopping the machine:

1. To place a single broken stripe.

2. To place a double white stripe consisting of a broken stripe on the left and a solid stripe on the right.
3. To place double solid white stripes.
4. To place double white stripes consisting of a broken stripe on the right and a solid stripe on the left.
5. To place a continuous black stripe between the double stripes when required.

BEAD DISPENSER

A second objective was to design a bead dispenser which would make a uniform application of beads at a pre-

determined rate and would also follow out the above sequence of operations with accuracy.

A third objective was to allow painting an offset stripe adjacent to traffic bars, and other locations where the machine could not be operated directly on the line of the stripe.

A fourth objective was to improve the machine so the alignment of the stripe would not be seriously affected by rough pavement, etc.

A fifth objective was to provide for the comfort and convenience of the operator and to save time in cleaning out the hoses and spray guns at the end of painting operations.

IMPROVEMENTS MADE

The new striping machine as shown in **Photograph No. 1** retains the same general appearance as the present machines. However, a knee action front axle is now used to compensate for rough or uneven pavement. A higher more comfortable seat is provided and the operator's platform has foot rests. A windshield and rear view mirror are also provided.

The spray equipment is arranged for good visibility and all controls are within convenient reach of the operator. Three paint nozzles are provided, two for white lacquer and one for black lacquer, the black line being placed between the two others for use on concrete pavement when required. The entire assembly is readily removed for cleaning.

The controls for operating the new striping machine are entirely different from those used on the older machines and are much more simple and accurate when set. The air and lacquer are both carried in pipe lines from the supply in the body of the pusher-supply truck to manifolds installed close to the paint spray guns. Operations are controlled by the four small levers shown in **Photograph No. 2**. The two long levers operate the mechanism for painting white lines. They control the supply of air and lacquer to the spray guns as well as air required to operate the bead dispensers. These levers control a system of three-way valves.

LEVER OPERATION

When placed in the position marked "S" a solid or continuous line will be placed. When turned to the position marked "B" a broken line will result. The two shorter levers operate the spray gun atomizers and are only turned off when the machine is not in operation. The mechanism controlling

the placing of the broken line consists of two poppet valves. These valves are operated from an adjustable cam, which in turn, is driven by one of the rear wheels. The cam is on the same shaft as the close-up of the white and black disc shown in **Photograph No. 3**. This disc represents one cycle of the line and space. The disc acts as an indicator to the operator who may make an adjustment by means of the small wheel in order to start the line directly over an old line.

In order to lengthen or shorten the cycle of the stripe and space an adjustable double sheave is arranged in the drive from the driving wheel axle to a cam shaft which has been substituted for the bicycle wheel drive used on the old machine. By rotating the

double sheave assembly forward or backward the sheaves are increased or decreased in diameter but still retain the same belt length necessary in the drive. This is done by turning a horizontal adjusting screw at the top of the assembly in either direction as desired. The double sheave assembly is mounted on a hinged plate for raising in order to overcome belt wear and to act as a tightener. All revolving shafts are mounted on self-aligning ball bearings to eliminate excessive wear. This type of assembly obviates the necessity of making frequent adjustments and repairs.

BEAD DISPENSING MACHINES

There are two bead dispensing machines, one directly behind each white

paint spray gun. Each dispenser consists of a small bead storage compartment located over a cone which extends into a circular opening in the bottom of the compartment. The cone is welded onto a shaft which is connected to an air cylinder. When air is turned on to operate the paint spray the same supply of air operates the air cylinder and opens the compartment to allow beads to flow over the cone.

When the air supply is shut off a spring returns the cone to its former position. The opening is closed and the flow of beads is shut off. Small fins are placed on the surface of the cone to insure a uniform distribution of beads onto the line. The two dispensers are connected by flexible metal hoses to a box located behind the operator's seat



Photo No. 3

which contains the main bead supply. A narrow window in the back of this hopper enables the truck driver to observe the bead supply to insure replenishing the supply when necessary.

LIFTING DEVICE

The front end of the unit weighs 650 pounds, and it is necessary to provide a lifting device so that it may be raised and attached to the rear of the paint truck when traveling. The cylinder arrangement shown on the front of the spray rig is an air hoist or air lift for this purpose. The air lift has a rubber-tired castor wheel attached to the lower end of the cylinder to facilitate side shifting in order to hook the towing rig onto the truck draw bar after the front end of the machine is raised to the necessary height. The air lift will raise the front end of the machine to a height of 36 inches off the ground.

Most of the older trucks now equipped and used with the paint striping machines are to be replaced and an effort will be made to secure cab-over-engine types which provide much better visibility for the truck operator when pushing the paint machine ahead of the truck. On account of the inaccuracy of speedometers at the low speeds at which paint striping is done, all trucks are being equipped with engine tachometers so that a uniform speed of the truck can be determined when applying a paint stripe. Mechanically driven paint agitators are being installed in the paint supply tanks as well as better facilities for cleaning the tanks, piping, and hose.

The idea of the cone type gravity-feed bead dispenser was developed and details worked out by James J. Keleher, Assistant Mechanical Foreman, and the various improved features of the spray machine were worked out and the entire machine constructed at Headquarters Shop under the directions of Frank E. Burnside, Shop Superintendent, and R. H. Stalnaker, Equipment Engineer.

Tramp: "I've asked for money, I've begged for money, and I've cried for money, mum."

Lady: "Did you ever think of working for it, my man?"

Tramp: "No mum. You see, I'm going through the alphabet and haven't come to W yet."

Traffic cop—"Say, you! Didn't you see me wave at you?"

Sweet young thing—"Yes, but you're wasting your time. I'm engaged to be married."

Modernization of Coast Highway

(Continued from page 4)

Consideration was given to increasing or doubling its width by the construction of a duplicate pass alongside, permitting the complete physical separation of traffic and avoiding disturbance of the existing structure. The extremely heavy military traffic to be carried on the railroad during the period of construction prevented this solution, which would have been both feasible and economical in normal times. As no method could be devised which would not result in some delay to traffic on the rails, and as no practical railway by-pass was possible, the plan was abandoned.

The matter of constructing an entirely new overhead for both north and southbound traffic was then investigated, and was discarded due to the extremely heavy construction expense and to the dictates of good engineering, which, from an economy standpoint, required consideration of the high salvage value of the existing underpass.

Thorough study of all possibilities, both from a traffic standpoint and cost features, eliminated all methods but the construction of a new overhead for northbound traffic only and the utilization of the existing structure for southbound traffic only. This plan eliminated all interference with railway traffic and permitted total salvage of the underpass.

Insofar as we know, this design is unique in that highway traffic is carried on two separate planes with the rail traffic in between. The arrangement is illustrated by one of the accompanying photographs.

Innovations and techniques which were developed on these jobs were described in an article appearing in the May-June, 1946, issue of this magazine. Experiments in the placing of cement stabilized base described in this article were continued, and resulted in the development of a new method insofar as placing cement stabilized base from a central mixing plant is concerned. On the Basich Brothers portion of the highway contract, a Barber-Greene mixing plant was used to proportion and mix the aggregate, water, and cement at a central location. The material was then hauled to the street and spread through a Barber-Greene spreader.

(Continued on page 30)

Public Works Department Saves State More Than One Million Dollars on War Surplus Purchases

(Continued from page 2)

ties for attendants who are mostly returned veterans, on four state hospital sites;

11,360 square feet of Army barrack buildings to be used as classrooms and treatment for cerebral palsied children on two sites—one in the south and one in the north section of the State;

4,480 square feet of Army barrack buildings use as housing facilities for inmates at the Veterans Hospital and Women Relief Corps Home;

111,520 square feet of Army barrack buildings used as classrooms for the education and rehabilitation of inmates at five state prisons;

8,160 square feet of Army barrack buildings used as classrooms for the teaching of trades and the education of delinquent juveniles at two state correction schools;

The surplus barrack buildings as listed above originally cost the Army approximately \$2.30 per square foot. The State was able to secure these buildings at one-half the original cost less an additional 40 percent discount, or \$0.69 per square foot if used for educational purposes or for veterans' use.

Approximately \$115,000 of Army surplus laundry and kitchen equipment at a cost of \$54,000 to the State is installed in the various hospitals, schools, and prisons throughout the State.

About \$18,000 of surplus electrical wire, transformers, pipe, mechanical equipment, consisting of boilers, pipe machines, and miscellaneous items, was purchased at a total cost of \$7,500 to the State and installed at five state hospitals, schools, prisons, and various other state institutions.

The Division purchased \$68,000 of surplus building materials at a cost to the State of \$32,000, consisting of 125M FBM of lumber, 60,000,000 square feet of 4-inch insulating material, 200 kegs of nails, barbed wire, roofing material, 50,000,000 square feet of 18 gauge corrugated aluminum sheets, and many other materials too numerous to list.

Report on Progress and Records in Pavement Construction During 1946

By EARL WITHYCOMBE, Assistant Construction Engineer

DURING the year 1946, a total of 395.6 miles of pavement and surfacing was constructed of which 387.1 miles was on the State Highway System. Of the 8.5 miles off the system, 7 miles was county secondary construction and 1.5 miles was federal access.

Of the total mileage built, there were 71.7 miles of portland cement concrete or asphalt concrete, which is about six times the mileage of high type pavement built in 1945. The beginning of construction of the postwar highway program accounts for this decided increase in pavement mileage.

Nearly 308 miles of the 387.1 miles constructed on the State Highway System, or 80 percent, consisted of resurfacing of existing pavements or a combination of widening and resurfacing. This is a good indication of the present condition of the State Highway System. For every mile of new construction for which funds are available, it was necessary to provide major repairs for another 3.8 miles, in order to keep the highways in operating condition. Considering the number of miles of major repairing carried on during the war years when new construction was

prohibited, the ratio is even greater than the yearly comparison indicates.

Portland Cement Concrete

All of the concrete pavements built in 1946 were constructed without expansion joints. Weakened plane joints were installed at 15-foot intervals. All were built in single lane widths, and the longitudinal joint was provided with load transfer by means of a tongue and groove design which is maintained in contact by means of tie-bolts threaded into hexagonal metal couplers imbedded in the slab. All pavement was 5-sack concrete.

Weakened plane joints were constructed with a depth of groove of only one and one-fourth inches. It was hoped that this shallow depth of groove would provide a greater amount of coarse aggregate interlocks in the subsequent crack through the remainder of the slab. The relatively large percentage of mid-panel cracking in some projects has led to a change in depth of groove to two inches, or one-fourth the thickness of the slab. Nearly all of the mid-panel cracking originated at a tie-bolt.

The omission of provision for expansion has resulted in but one pavement blowup to date. This was occasioned within a few days after the slab was poured and before the concrete had obtained sufficient strength to resist shear diagonally through the longitudinal axis. A sudden rise in temperature during summer construction caused the failure. The defective panel was removed and replaced prior to the completion of paving. It is the belief of the department that the relief from the many defects brought about by the presence of expansion joints will result in a much longer life of pavement, and the benefits derived from their omission will far outweigh the cost and annoyance of repairing an occasional blowup. The fact that there has been but one failure in some 53,000 panels to date would seem to indicate that too much reliance has been placed on the former belief that expansion joints were essential to prevent frequent failures in the pavement.

Nearly all the paving projects in 1946 started without the aid of trained finishers, as they were not available. As a result, considerable experimenting was resorted to by the districts to sim-

(Continued on page 11)

PORTLAND CEMENT CONCRETE PAVEMENT RECORDS FOR 1946

Location	Contractor	Resident Engineer	Street Assistant	Average cu. yds. laid per day	Average strength 28 days, lbs. per sq. inch	Roughness Index, inches per mile
Concord Ave.-0.4 Mi. W. of Ohmer Sta.	Guy F. Atkinson Co.	H. H. Deardorf	E. Carlstad	285.0	3195	7.6
Oakland Distribution Structures-7th St.	Lee J. Immel	F. W. Montell	L. G. Marshall	203.9	3731	13.1
Calwa Overpass-Fresno	M. S. Hanrahan	C. F. Oliphant	F. B. England	562.1	4000	5.9
Brundage Lane-24th St., Bakersfield	Griffith Co.	J. W. Cole	R. Ostrander	508.9	2420	13.4
Route 77, Pomona	Matich Bros.	C. L. Gildersleeve	H. D. Johnson	457.0	2826	12.5
Vineyard Ave.-Etiwanda Ave.	Matich Bros.	J. M. Cowgill	J. Smith, C. Dibble	633.3	3466	7.0
Mulberry St.-Colton	Griffith Co.	B. Nelson	J. B. Smith	763.0	3442	5.9
Redlands, State St.-E. City Limits	Matich Bros.	J. M. Hollister	K. Stone	597.5	3322	12.0
Ulatia Creek-Midway	Fredrickson Bros.	G. R. Hubbard	W. Douglas	619.4	3487	6.0
Midway-2 Mi. N. of Dixon	Fredrickson Bros.	G. R. Hubbard	W. Douglas			
Grant Line Road-Mossdale	M. J. B. Constr. Co.	W. L. Hurd	W. Lewis	581.6	3675	5.9
1 Mi. N. of Flores Cr.-San Clemente	N. M. Ball Sons	E. L. Craun	F. J. Leithold	335.4	3212	5.5
San Luis Rey River-0.2 Mi. N. Aliso Cr.	Basich Bros. Const. Co. & Basich Bros.	H. F. Caton	W. Cattell	594.4	3595	8.3
		R. C. Payne	R. Goodell	407.7	2613	7.7
			Averages	568.5	3400	7.4



Two recently completed 23-foot lanes of portland cement concrete pavement near Dixon, Solano County

ASPHALT CONCRETE PAVING RECORDS FOR 1946

Location	Contractor	Resident Engineer	Street Assistant	Average tons laid per day	Average stability of surface mix %	Roughness index inches per mile
Waldo-Ignacio	Brown-Ely Co.	G. Heberling	C. Schemel	465.0	42	20.9
Oakland, Distribution Strcuts., 7th St.	Lee J. Immel	F. W. Montell	G. Levier	473.6	41	16.0
2 Mi. S. of Salinas-Salinas	Granite Constr. Co.	G. Hamlin	A. L. Lamb	444.7	45	14.0
Calwa Overpass-Fresno	M. S. Hanrahan	C. F. Oliphant	R. S. Percival	329.7	43	13.9
Brundage Lane-24th St.	Griffith Co.	J. W. Cole	R. H. Ostrander	560.5	44	23.8
Orange Grove Ave.-San Fernando Blvd.	Chas. J. Dorfman	H. E. Belford	H. E. Belford	538.0	47	30.0
Burbank Blvd.-Orange Grove Ave.	Jesse S. Smith	F. A. Read	F. L. Everitt	719.7	42	26.1
Rosemead Blvd., Huntington Dr.-Colorado St.	Griffith Co.	C. P. Montgomery	H. E. Belford	849.0	41	12.9
Vallejo, Virginia St.-Santa Clara St.	C. M. Syar	G. R. Hubbard	G. R. Hubbard	462.9	43	21.5
1 Mi. N. Las Flores Cr.-San Clemente	N. M. Ball Sons	H. F. Caton	C. Hagberg	699.0	34	19.2
San Luis Rey River-0.2 Mi. N. Aliso Cr.	Sasich Bros. Const. Co. & Basich Bros.	R. C. Payne	R. Goodell	410.1	44	28.5
				<u>530.6</u>	<u>42</u>	<u>20.6</u>
			Averages	530.6	42	20.6

Report on Progress and Records in Pavement Construction During 1946

(Continued from page 9)

ply finishing and improve the quality of the work performed by the inexperienced personnel.

One district eliminated the edging of weakened plane joints. By timely manipulation of the steel forming strips and careful withdrawal, no edging of the joints was necessary. To prevent breakage of the joint edges under the cut float, the joints were poured with the asphalt sealing compound prior to cutting. This practice resulted in the smoothest riding pavement of the year and none of the projects in this District exceeded 6.0 inches per mile of roughness, which is a remarkably good record.

On one entire project and on portions of another, the weakened plane joints were cut in the pavement by means of power driven diamond-studded saws. The joints formed in this manner are very pleasing in appearance and the process seems to have considerable merit. The equipment used is one that has been developed commercially within this State.

The **highest average daily production** was obtained on the largest paving job of the year, Contract 8XC5-F, between Mulberry Street and Colton; Griffith Company, Contractors, and B. Nelson, resident engineer, with J. B. Smith, street assistant, 62,183 cubic yards of concrete were poured at the average rate of 763 cubic yards per day, with one double-drum mixer.

The **best average strength** for concrete pavement was obtained on Contract 6TC3-F, between Calwa Overpass and Fresno; M. S. Hanrahan, contractor, C. F. Oliphant, resident engineer, with F. B. England, street assistant, in which the average of 28-day cylinders was 4,000 pounds per square inch.

The **record for riding qualities** was obtained on Contract 10TC10-F, between Grant Line Road and Mossdale; M. J. B. Construction Company, Contractors, E. L. Craun, resident engineer, and F. J. Leithold, street assistant, in which the average roughness index was 5.5 inches per mile. The average for the State in 1946 was 7.4 inches per mile as compared to 14.2 inches in 1945.



Two 23-foot lanes of plant-mixed surfacing near Mira Loma, Riverside County

Asphalt Concrete

Side forms were used on slightly more than half of the asphalt concrete tonnage laid in 1946. Spreading and finishing was performed by the type of machine that rides on the side forms. The resulting riding qualities were somewhat disappointing in that they were no better than the average for the year. The knack of operating such equipment apparently has been lost since the use of the type of machine that establishes its own grade has become more common.

The standards for subgrade under asphalt concrete have been materially raised. No subgrade in the 1946 program had a bearing ratio of less than 80 percent. They consisted of crusher-run base, cement-treated base, and portland cement concrete.

The **highest average daily output** of asphalt concrete was reached on Contract 7XC15-F, Huntington Drive to Colorado Street, on Rosemead Boule-

vard. Griffith Company were the contractors, C. P. Montgomery, resident engineer, and H. E. Belford, street assistant. An average of 849 tons were laid per day. This project also holds the yearly record for riding qualities with an average of 12.9 inches per mile. The average roughness index for the year was 20.6 inches per mile, as compared to 24.7 inches in 1945.

The **highest average stability** results of surface mixtures for the year were obtained on Contract 7AVC1 in Burbank, from Orange Grove Avenue to San Fernando Boulevard. Chas. J. Dorfman, Contractor, H. E. Belford, resident engineer, with an average of 47 percent.

Bituminous Treated Surfaces

Bituminous treated surfacing in 1946 was largely constructed by plant-mix methods, 86 percent being mixed through a plant and 14 percent mixed on the road.

The trend in plant-mixed surfacing is toward the use of heavier oils and asphalts. In many projects, paving asphalts were used to good advantage. This was made possible principally by the use of the self-propelled spreading and finishing machines that operate without the use of side forms. The use of cutback asphalts has been practically abandoned due to the differential in price and to the susceptibility of the mixture to trouble from moisture.

The 1946 record for smoothness of riding surface on plant-mixed surfacing was obtained on Contract 8VC6-F,

between Mira Loma and 2.5 miles west of Riverside; George Herz & Co., Contractor, E. A. Bannister, resident engineer, with an average of 7.4 inches per mile. The average for the State was 17.0 inches per mile, as compared to 19.5 inches per mile in 1945.

The 1946 record for smoothness on road-mixed surfacing was obtained on Contract 11VC8, 6 miles east of Desert Center to Hopkins Well; Arthur A. Johnson, Contractor, M. C. Barron, resident engineer, with an average of 12.5 inches per mile. The average for the State was 22.1 inches per mile as

compared to 31.2 inches per mile in 1945.

Although we have not reached the standard of excellence in pavement construction that existed prior to the war, the marked improvement in all types of pavement over that of the previous year is very gratifying. The construction employees are to be congratulated on their accomplishments under adverse circumstances, and the Contractors have earned the gratitude of us all for their cooperation which made these accomplishments possible.

BITUMINOUS TREATED SURFACES—RECORD FOR 1946 PLANT MIX

Location	Contractor	Resident Engineer	Roughness Index, Inches per Mile
Loleta-Patrick's Point	Mercer, Fraser Co.	H. M. Hansen	10.6
Loleta-Fields Landing	Mercer, Fraser Co.	H. M. Hansen	14.0
Patrick's Point-Big Lagoon	Mercer, Fraser Co.	E. L. Blomquist	13.5
Willits-2.6 Mi. N.	C. M. Syar	R. A. Burns	16.3
Burke Hill-1 Mi. N.	C. M. Syar	F. H. Johnson	23.7
1.2 Mi. N. of Rodman Narrows Rd.-Rte. 15	Louis Biasotti & Son	C. A. Shervington	15.6
Fall River Mills-8.3 Mi. E. of Bieber (por.)	M. J. Ruddy & Son	W. H. Bartlett	21.9
Yreka-Camp Lowe	Clements & Co.	D. Elder	18.7
Weed-Yreka (por.)	Clements & Co., Milo A. Browne	D. Elder	11.6
4.5 Mi. E. of Ingot-Montgomery Cr.	W. C. Railing	P. F. Duffy	34.6
Seamans Gulch, 1 Mi. W. of Ingot	A. A. Tieslau & Son	Ray Huck	25.3
1.5 Mi. W. of Bird Flat-Doyle	Utah Construction Co.	H. B. Milner	14.5
Viewland-Secret Valley	E. B. Bishop	J. Aramayo	16.2
Shasta River-Gazelle	Clements & Co.	D. Elder	14.8
3 Mi. N. of Arbuckle-4 Mi. S. of Williams	Harms Bros.	E. Hay	16.2
Cache Creek-Dunnigan	Fredrickson Bros.	F. E. Wilson	16.5
Oroville Wye-Nelson, Durham RRRing-Chico, Big Chico Creek-6th St., Chico	Lester L. Rice	T. Jain	33.5
Williams, 293 Ft. S. of F St.-D St.	Harms Bros.	E. Hay	18.8
Mile 6.5-Mile 8.0, Rte. 99	A. Teichert & Son	M. E. Ryan	16.5
4.7 Mi. W. of Tahoe City-1.7 Mi. S. of Nev. Co. Line, Truckee Wye-Church St., Truckee	Clements & Co.	L. E. Christman	17.6
Sacramento-0.5 Mi. E., 0.4-9.6 Mi. N. of Solano Co. Line	Harms Bros.	C. H. Weeks	16.2
A St. & Redwood Rd., San Lorenzo Creek Bridge-Poctor Rd.	Hayward Bldg. Material Co.	E. W. Brocett	33.6
Maitland Dr.-Earhart Rd.	Gallagher & Burk	F. W. Montell	12.0
Concord Ave.-0.4 Mi. W. of Olmer Sta.	Guy F. Atkinson Co.	H. H. Deardorf	22.5
Dublin-Mission San Jose, Alvarado-San Leandro	A. S. Jones	C. D. Hamma	14.4
At Hollister Wye	Jesse S. Smith	J. C. Adams	15.9
Prunedale Junction-Santa Clara Co. Line	Granite Constr. Co.	A. L. Lamb	8.8
Santa Maria River-1.5 Mi. S. of Nipomo	Fairey-Hammond Inc.	H. J. Holman	20.7
Fairview Ave.-Tecolote Cr.	Dimmitt & Taylor	J. C. Adams	11.1
Hollister Wye-Fairview Ave.	Dimmitt & Taylor	J. C. Adams	12.4
Santa Rita-0.8 Mi. N. of Crazy Horse Summit	A. Teichert & Co.	V. E. Pearson	7.7
Famosa-Cecil Ave., Delano	Griffith Co.	J. W. Cole	16.8
3.6 Mi. S.-0.4 Mi. S. of Kingsburg	Valley Paving & Const. Co.	P. A. Boulton	14.0
8.7 Mi.-2.0 Mi. W. of Wasco	Griffith Co.	J. W. Cole	21.1
1.4 Mi. N. of El Toro Rd.-S. City Limits of Tustin	John J. Swigart	B. N. Frykland	9.7
Los Patos Ave., Sunset Beach-Second St., Seal Beach	Griffith Co.	C. L. Gildersleeve	15.0
Verona St.-W. City Limit Santa Ana	John J. Swigart	B. N. Frykland	9.6
6th St.-0.4 Mi. N. of Imperial Hwy.	Cox Bros. Constr. Co.	Roy Cooley	9.2
Sprout St.-Anaheim-Telegraph Rd.	Griffith Co.	C. L. Gildersleeve	12.0
Mulberry St.-Colton (por.)	Griffith Co.	B. Nelson	14.7
Victorville-Oro Grande Underpass	George Herz & Co.	L. M. Barnett	10.2
Midway-E. City Limits, Banning	Herz Paving Co.	J. M. Hollister	24.5
Cameron-Mojave	Gunner Corp.	R. F. Johnson	10.6
In Venicia, various streets	Parish Bros.	G. R. Hubbard	18.9
Byron Rd.-Banta Rd.	M. J. Ruddy & Son	W. H. Ammon	23.9
Atwater-2 Mi. N.	Gunner Corp.	M. W. Ellis	9.5
San Joaquin River-Madera Co. Line	Frank B. Marks & Sons	George Barry	20.0

BITUMINOUS TREATED SURFACES—RECORD FOR 1946—PLANT MIX—Continued

Location	Contractor	Resident Engineer	Roughness Index, Inches per Mile
Leucadia-San Mateo Creek (por.)	N. M. Ball Sons	W. T. Rhodes	9.3
San Ysidro-Chula Vista, Rte. 2-Imperial Beach, Grossmont-El Cajon	R. E. Hazard Contracting Co.	J. F. Jorgenson	11.7
Las Posas Rd., Rte. 2-Rte. 153	MacDonald & Kruse	R. M. Cooley	11.8
About 0.5 Mi. N. of Palmdale	A. A. Edmondson	F. L. Everitt	23.6
Mira Loma-2.5 Mi. W. of Riverside	George Herz & Co.	E. A. Bannister	7.4
Calexico-El Centro, and in El Centro	Tanner Const. Co.	L. H. Williams	18.0
		Average	17.0

ROAD MIX

Location	Contractor	Resident Engineer	Roughness Index, Inches per Mile
5th Standard Parallel S.-1.5 Mi. N.	W. C. Railing	R. Windele	36.6
Alpine-Lake Arrowhead-Burnt Mill	R. R. Hensler	O. B. Brinkerhoff	24.7
Rte. 23-Sheep Corral	George E. France	L. Wulff	34.0
Antioch Bridge-Emmaton	Sheldon Oil Co.	W. F. Fleharty	39.8
6 Mi. E. of Desert Center-Hopkins Well	Arthur A. Johnson	M. C. Barron	12.5
1.3 Mi. N. of Imperial Co. Line-0.5 Mi. S. of San Bernardino Co. Line	Arthur A. Johnson	L. W. McCleary	17.4
		Average	22.1

ARMOR COAT

Location	Contractor	Resident Engineer	Roughness Index, Inches per Mile
N. W. Pacific R.R. Underpass-1.1 Mi. S. of Willits	A. R. McEwen	R. A. Miller	71.4



These 30-foot lanes were resurfaced with asphalt concrete south of San Clemente in Orange and San Diego Counties



El Camino Real looking north at Broadway, San Mateo, showing unit of progressive signal system

Thirty-Five Miles Per Hour Speed Limit Solves Many Problems on El Camino Real

By JERRY O'SHEA, Assistant District Traffic Engineer

THE EL CAMINO Real (U. S. 101) is one of the two principal arterials leading from San Jose and the Peninsula into the City of San Francisco. This route had its origin as a trail used by the Padres in traveling between the California Missions during the Eighteenth Century. The section with which we are concerned was the connecting link between Mission Santa Clara, near San Jose, and Mission Dolores in San Francisco. The old trail has steadily improved until today it is one of our most important highways serving the highly developed Peninsula area south of San Francisco.

With the removal of the restrictions on speed which were in effect during the war, the district was immediately faced with the problems of speed on

the Peninsula as a whole. Newspapers and civic groups began a campaign for enforcement and the installation of numerous signals and traffic control devices; however, most of these were not obtainable since they required a large amount of critical material.

CONGESTED AREA

The section of the Peninsula presenting the greatest problem was that extending from Menlo Park to Burlingame, which, progressing northward, passes through the Cities of Menlo Park, Atherton, Redwood City, San Carlos, Belmont, San Mateo and Burlingame, all bordering one on the other.

This area is composed largely of residential districts and the majority of the people work in San Francisco.

Both the Bayshore Highway and El Camino Real run through this area paralleling each other, the Bayshore being one to two miles easterly of El Camino Real. At this time El Camino Real was a "hodge-podge" of 55 m.p.h. zones, speed traps in the form of unreasonable "slow-down" areas, and a nonuniform series of open and restricted zones. With so many transitions from 55 m.p.h. zones to 25 m.p.h. zones, the traveling public and the enforcing officers were under a great burden. Because of the large amount of roadside development, the entire character of El Camino Real was changed from one of a highway to that of a city street. This can be clearly seen from the accompanying photographs.

SPEED ZONE SURVEY

In November of 1945 a speed zone survey of El Camino Real was started. The topography through each city was mapped in order to qualify existing business and residential zones. Speed checks were taken at several locations in each city. The accident records were investigated and the enforcing officers interviewed. As the information was gathered for each city, the result of the survey was presented to the chief of police and the speed restriction possibilities as outlined in the Vehicle Code were explained.

After consultations with the chiefs of police of the cities involved and the California Highway Patrol, it was the aim of this district to establish El Camino Real as the safest route of travel for recreational drivers, Peninsula shoppers, and others whose principal interest is to safely reach their destination, leaving the Bayshore Highway for those drivers, particularly the daily commuters, whose interest is to get to their destination as rapidly as possible. It was agreed by all concerned that the solution to the problem was the establishment of a uniform series of 35 m.p.h. speed zones extending through the Peninsula cities from the southerly limits of

Menlo Park to the northerly limits of Burlingame. This would provide the traveling public with a route which could be used with a feeling of security at a speed materially below that on the Bayshore Highway, yet fast enough to safely reach their destination without passing through unreasonable "slow-down" areas.

AUTHORITIES COOPERATE

At the time the zones were discussed with the chiefs of police, a few were dubious as to the wisdom of removing 25 m.p.h. zones and the substitution of 35 m.p.h. zones; however, they admitted that the enforcing officers were issuing citations for very few cars in the 25 to 35 m.p.h. speed bracket. Their attitude was that while they did not enforce a 25 m.p.h. speed limit, it was an added protection for themselves and was necessary in shopping areas and where school children crossed the highway.

It was pointed out to them that while a road is zoned for 35 m.p.h., it is not a license to drive at that speed through the 24 hours of the day. Section 511(a) 1 of the Vehicle Code sets forth a prima facie speed limit of 15 miles per hour when passing school grounds while children are playing, or going to, or leaving the grounds. Dur-

ing the evening hours when shoppers and commuters increase the vehicular and pedestrian traffic volume, the speed of vehicles is governed by Section 510 of the Vehicle Code. This section sets forth that no person shall drive a vehicle upon a highway at a speed greater than is reasonable or prudent, having due regard for the traffic on, and the surface width of, the highway, and in no event at a speed which endangers the safety of persons or property.

When it was brought out to these chiefs of police that the traveling public in general should not be penalized by a slow restricted speed zone in order to provide an enforcement medium required for a short period of time and for a small percentage of drivers because these factors are taken care of by the Vehicle Code in the two sections which were quoted, there was then complete agreement as to the establishment of the 35 m.p.h. speed.

SPEEDING IS REDUCED

After the zones had been in effect for several months, the chiefs of police of the cities involved, the enforcing officers, and the California Highway Patrol were again contacted and their opinion was requested as to the merits

(Continued on page 17)



El Camino Real looking north at Broadway, Redwood City.



Upper—El Camino Real looking north from Five Points, Redwood City, showing roadside development in progress. Center—El Camino Real looking south at San Mateo Avenue, San Bruno. Lower—El Camino Real looking north at Jenevein Avenue, San Bruno, showing typical roadside development.

Order of the Director of Public Works Adopting Regulations for the Enforcement Of the California Outdoor Advertising Act

WHEREAS, By Section 5215 of the Business and Professions Code, the Director of the Department of Public Works is authorized to make orders and regulations for the enforcement of the Outdoor Advertising Act, Division 3, Chapter 2, of the Business and Professions Code, as amended, and to authorize the Division of Highways of the Department of Public Works to enforce the provisions of said act and of said regulations; and

WHEREAS, Division 3, Chapter 2, Article 6 of said code sets out certain regulations for the enforcement of said Outdoor Advertising Act, particularly regulations with respect to prohibited signs, structures and locations; and

WHEREAS, It appears desirable and in the public interest that the interpretation of the Department of Public Works of said regulations, and particularly of the provisions of Section 5286 of said Code with respect to such prohibited signs, structures and locations, be set forth for the guidance of persons and corporations subject to the provisions of said act; and

WHEREAS, It has been found and determined, and the Director of the Department of Public Works does hereby find and determine, that the use in illuminated advertising displays, or for any advertising purpose, of red or yellow color illumination, or any color or combination of colors, which gives the effect of red or yellow, or the use of red, yellow or green flashing, blinking, or intermittent lights, or the placing of displays containing reflector units or reflecting elements, at the locations or in the shapes or designs hereinafter specified, simulate and imitate directional and information signs, and warning and danger signs and signals, and are likely to be mistaken for such permitted signs and signals and are likely to be construed as giving warning to traffic;

NOW, THEREFORE, Pursuant to the authority vested in the Director of the Department of Public Works by law, and in particular by said Section 5215 of the Business and Professions Code, IT IS HEREBY ORDERED that the following regulations be, and the same are hereby, adopted by the Director of Public Works as regulations for the enforcement of the Outdoor Advertising Act:

1. No advertising display shall be placed

- (a) Within the right of way of any highway;

- (b) If visible from any highway and simulating or imitating any directional, warning, danger or information sign or device permitted under the provisions of the Outdoor Advertising Act, Division 3, Chapter 2, of the Business and Professions Code, as amended, or if likely to be mistaken for any such permitted sign or device, or, if intended or likely to be construed as giving warning to traffic, such as by the use of the words "stop" or "slow down";

- (c) If visible from any highway and displaying any flashing, blinking or intermittent light likely to be mistaken for a warning, traffic, danger signal or device;

- (d) If the illumination thereon is of such brilliance and so positioned as to blind or dazzle the vision of travelers on highways adjacent thereto; or

- (e) If in violation of any other regulation or provision of said act or of these regulations.

2. ILLUMINATED DISPLAYS (Other than displays containing reflecting elements). No red or yellow illumination, or any color or combination of colors which gives the effect of red or yellow, shall be used for, on, or in any illuminated advertising display, and displays using such colors for illumination are hereby prohibited, except in the following locations:

- (a) Upon the building occupied by the business advertised or in which the product or article advertised is sold;

- (b) On the same parcel of land and at the immediate location of the business advertised;

- (c) In an unincorporated village, town, or business district, as defined by Section 89 of the Vehicle Code.

3. DISPLAYS CONTAINING REFLECTOR UNITS OR REFLECTING ELEMENTS. Displays containing reflector units or reflecting elements (including reflectorized sheeting material or surfaces coated with glass beads) of the shape or in the locations hereinafter specified are prohibited

- (a) If in the design or shape of an arrow;

- (b) If placed on curves, except on the outer side thereof;

- (c) If placed on either side of the highway within 800 feet of any official warning sign indicating a curve or within 300 feet of any other official warning sign, unless facing in the opposite direction from such official signs.

4. FLASHING LIGHTS. If visible from any highway, any blinking, intermittent, or flashing light containing red, yellow or green, or any color or combination of colors which gives the effect of red, yellow or green, is prohibited.

5. These regulations are hereby promulgated as the interpretations of the Department of Public Works of the provisions of Division 3, Chapter 2, Article 6, of said Business and Professions Code, particularly Section 5286 thereof, for the purpose of further defining prohibited signs, structures and locations.

6. The Division of Highways of the Department of Public Works and the State Highway Engineer and his authorized representatives are hereby authorized and directed to enforce the provisions of said Outdoor Advertising Act and of these regulations, and are further authorized and directed to revoke any license or permit heretofore issued for any violation of the provisions of said act or of these regulations.

Thirty-Five Miles per Hour Speed Limit Solves Problem

(Continued from page 15)

of the 35 m.p.h. speed limit. In all but one case, the reactions were extremely favorable. There was complete concurrence in that the uniform speed zones established on this route promoted an excellent enforcement program since it eliminated 55 m.p.h. gaps between zones.

It was observed that the character of the traffic had changed to a great extent and those drivers who previously were making full use of the open zones, slowing somewhat in the restricted zones, had been forced over to the Bayshore Highway where they could maintain a 55 m.p.h. speed and least endanger themselves and others. Recreational drivers, the so-called "Sunday drivers," realized that the new zone afforded them a great deal of protection and thus many of the slower-moving vehicles were removed from the Bayshore leaving it for those drivers, the commuters in particular, whose destination had to be reached in haste.

Many of the chiefs of police were so enthused with the workings of the 35 m.p.h. zone that they have requested the assistance of the District Traffic Engineer in setting up 35 m.p.h. zones on arterial city streets under their jurisdiction.

SPEED CHECKS TAKEN

A series of speed checks were taken along the new zone the early part of this year in order to make a comparison with the checks taken before its establishment. In all instances the new checks showed no increase and in some locations a marked decrease in vehicular speeds.

Since El Camino Real is undergoing a change from a highway to a city street, further provision must now be made for the orderly movement of vehicles. With this in mind, the district traffic department is in the process

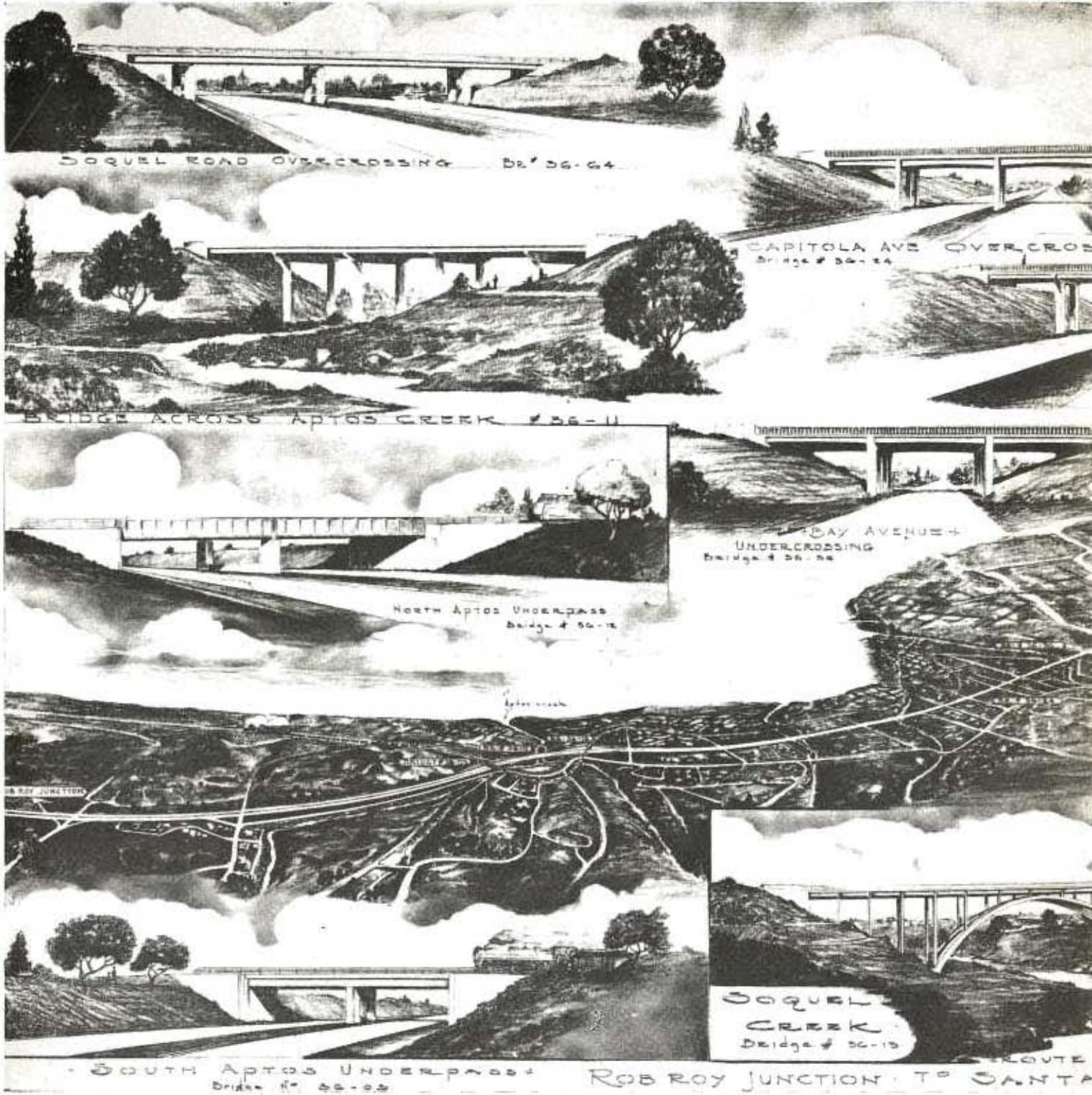
(Continued on page 29)

7. Those certain regulations heretofore adopted and referred to as Division of Highways Circular Letters Nos. 44 and 55, are hereby superseded, and said circular letters hereby revoked. This order shall be effective as of the date hereof.

Dated at Sacramento, California, this third day of June, 1947.

C. H. PURCELL
Director of the Department of
Public Works

(Original signed by C. H. Purcell)



THE MAJOR relocation of the present state highway, State Sign Route 1, and the Construction of a freeway from Rob Roy Junction to Santa Cruz will involve the construction of eight major bridge structures and two large arch culverts. Of these 10 structures, two will be the South Aptos and North Aptos Underpasses. The remaining six major structures are the Aptos Creek and Spreckels Drive combined bridge, Bay Avenue Undercrossing, Soquel Creek and Wharf Road combined bridge, Soquel Road Overcrossing near Wood's Lagoon. The two large arch culverts are located on Valencia Creek near Aptos. The new freeway will provide a four-lane roadway with two lanes in each direction separated by a dividing strip. Alignment of the new freeway will provide a more nearly direct route from Rob Roy Junction to Santa Cruz than the existing highway. Roadway curves are of long radii.

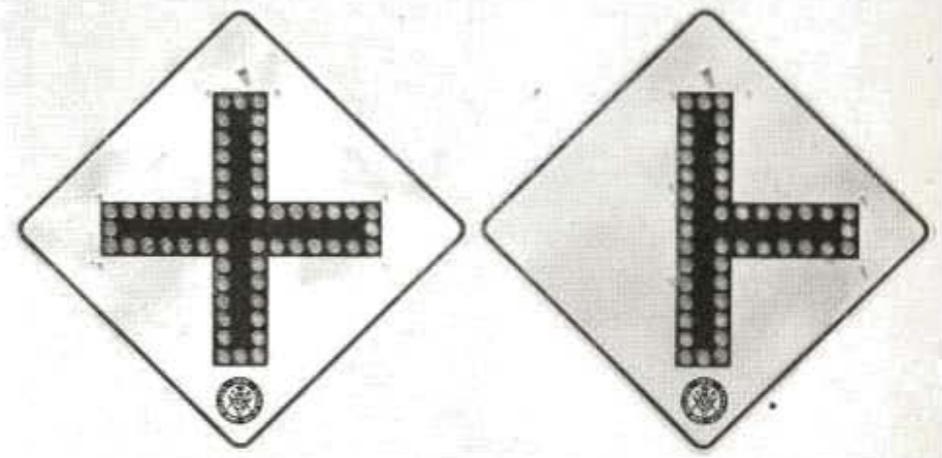


Junction to Morrisey Avenue in Santa Cruz be railroad grade separations known as the combined bridge, the Capitola Avenue Over-Lagoon, and La Fonda Avenue Overcrossing. lanes of traffic in each direction separated, and will have much less total curvature

New Directional Signs Set Up by State

DIRECTOR of Public Works C. H. Pureell has announced that the Division of Highways will conform to the recent changes in highway warning signs recommended by the National Joint Committee on Uniform Traffic Control Devices. This committee is composed of representatives of the American Association of State Highway Officials, Institute of Traffic Engineers and National Conference on Street and Highway Safety.

Certain of the square warning signs have been changed to diamond shape, and the messages shortened or replaced by symbols.



Motorists will soon see two of the new signs pictured above, which will be used in lieu of the old familiar **CROSS ROAD** and **SIDE ROAD** signs.

The erection of these new signs will be gradual as they will only be erected as replacements are required.

Henceforth, the erection and maintenance of state highway directional signs will be handled by the Division of Highways. For many years this work was done by the California State Automobile Association and the Automobile Club of Southern California. The emblem on the new signs will be that of the Division of Highways instead of those of the Automobile Clubs.

In connection with the new system of sign posting on state highways, Director of Public Works C. H. Pureell wrote to the California State Automobile Association as follows:

"Gentlemen:

"As you know, the agreement between the State, your organization and the Automobile Club of Southern California relative to sign posting on State Highways expired January 1, 1947. The matter of renewing this agreement has been given long and careful consideration. In view of the splendid cooperation which the department has had from both clubs throughout the years, the department naturally feels reluctant to allow the long-standing arrangement to be discontinued. However, it is the conclusion of the State Highway Engineer, in which I concur, that the volume of the sign-posting work, including maintenance, has become so great and of such urgency as to require the State to organize its own forces to handle the work directly. Accordingly, the decision has been reached not to ask the two clubs to renew the contract.

"I am advised by our legal department that since the contract has expired, there will be no continuing or further obligations on the part of either club to maintain any sign heretofore placed.

"I wish to take this occasion to express to you my appreciation and that of the whole State Highway Department for the great contribution you have made to the State and to the public highway programs in California over so many years. The State Highway Department alone has benefited by many hundreds of thousands of dollars in the value of labor and other services which you have contributed without cost. An even greater benefit has been achieved by reason of the uniformity in signing of our streets and highways which has resulted from the activities of the clubs in furnishing this service to the State, the counties, and the cities.

"It is with this thought in mind that I wish to ask that the monthly committee meetings with your representatives on signing matters be continued so that we may have the benefit of your wide experience in this field. Inasmuch as you will undoubtedly continue to be the road-signing agency for the respective counties and the cities, it is highly desirable that these meetings be continued, so that our mutual purpose of continued uniformity may be achieved."

Marysville-Yuba City Bridge Will Be Completed Next September 1

By C. C. WINTER, Associate Bridge Engineer

A MODERN highway is being constructed on new alignment between Marysville and Yuba City to facilitate traffic between and through these two cities when the new bridge which will replace the old narrow and inadequate span across the Feather River is completed about September 1st.

The traffic count in the summer of 1940 over the existing bridge was 18,380 vehicles on a Monday count. A traffic jam occurs daily during the morning and evening rush hours and is accentuated during the fruit harvest season. The old bridge is 19 feet between curbs and is posted to restrict speed for loads over five tons. The new highway will by-pass the main business streets of the two cities.

The new Feather River Bridge is a steel plate girder bridge over the Western Pacific Railroad tracks and the Feather River. The bridge consists of 24 spans. Most of these are 115 feet long, but longer spans up to 161 feet are used across the main channel of the river. Every second span contains a 72-foot suspended girder. This bridge is 2,674 feet long. The deck will provide four lanes divided by a four-foot strip and flanked by sidewalks, steel railing and street lighting. The overall width is 66 feet 4 inches.

The pier and highway construction was described in the September-October, 1946, issue of this magazine.

The bridge piers were started March 9, 1946, and all piers were ready for structural steel on October 18, 1946.

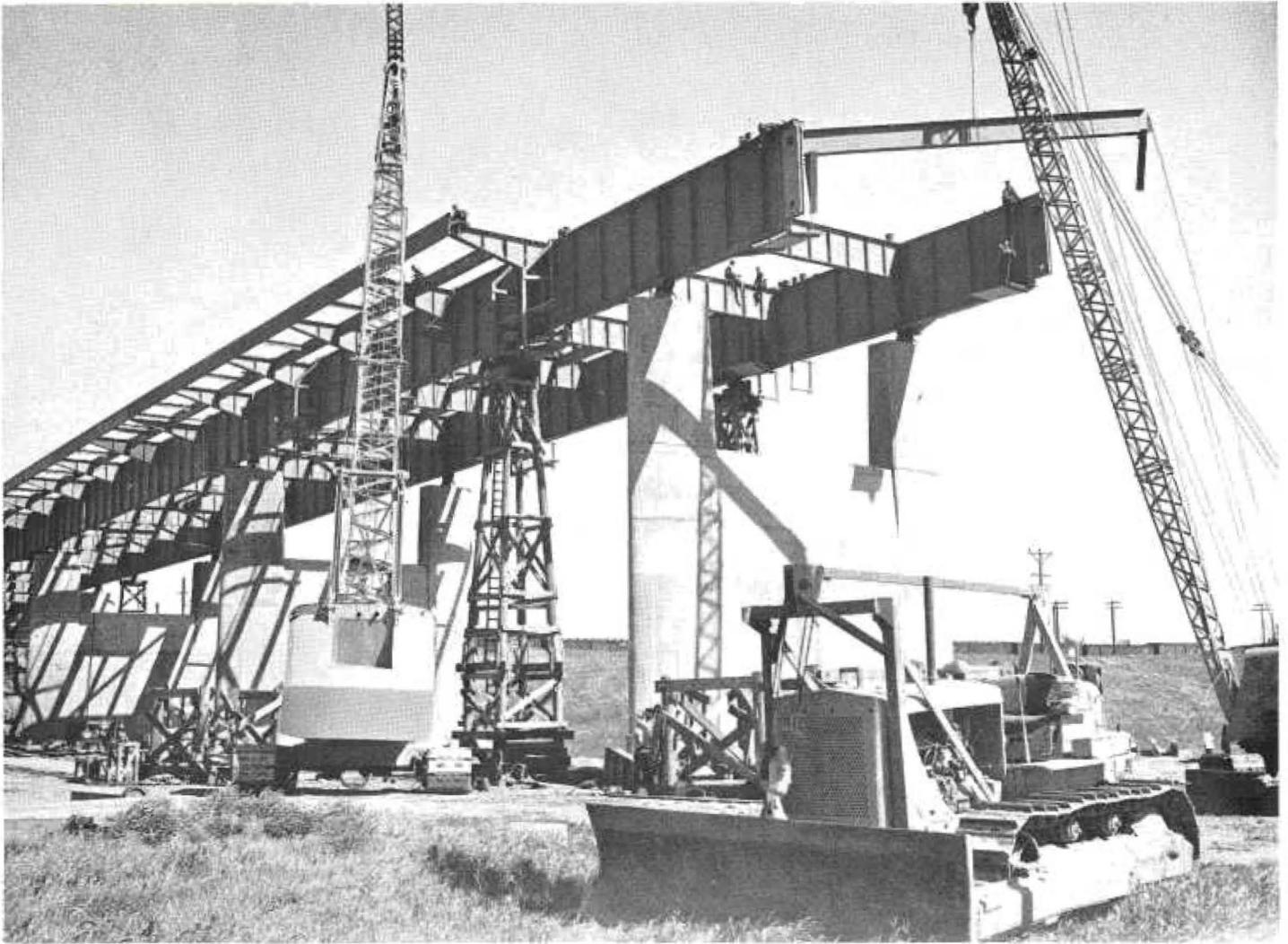
A temporary road and bridge was constructed over the river during the low water and it was possible to work piers from the ground. Very good progress was made in spite of difficulties encountered in getting lumber and construction materials.

Structural steel erection could have been started early in July, 1946, and if materials had been available this bridge probably would have been completed in 1946. Due to strikes and consequent delays some of the necessary steel shapes were not delivered to the fabricators until early in February 1947.

The first structural steel girders were received March 24, 1947, and the last are expected in June.



This sketch by Van der Goes of the Bridge Department of the Division of Highways excellently portrays various features of the Marysville-Yuba City bridge now under construction



This construction view of the Marysville-Yuba City Bridge shows steel superstructure being erected

In general the girders weigh 17 tons over the piers and 22 tons in the suspended spans and are 10 feet deep. The girders over Piers 22 and 23 at the river near the Yuba City end are 13

feet deep and 93 feet long and weigh about 56 tons. A temporary road with culvert pipes is being rebuilt to serve during the erection of the structural steel.

The steel is received on railroad cars at a siding in Marysville where it is unloaded and stored until needed. While there, it is prepared for erection.

(Continued on page 25)



This is the new four-lane divided approach to the Marysville-Yuba City bridge

Modoc County Leads in Federal Aid Secondary Road Program

By F. W. HASELWOOD, District Engineer

AT LONG last, after 10 years of effort, Modoc County's dream of an improved highway along the west side of Surprise Valley is being realized with the completion of the first major federal secondary highway project to be awarded.

Modoc County occupies a rectangular area of 4,094 square miles in the northeastern corner of California. It has a population of 8,713. The topography is mountainous with lava-strewn plateaus and peaks up to 10,000 which separate the fertile valleys. Alturas, the county seat, is located at the junction of the north and south forks of the Pit River.

Modoc County had its part in the early history of the State. Here crossed the trails of the pioneers, Applegate, Lassen, Bidwell, Fremont, Thompson, and others. Over the Applegate Trail from the Humboldt Valley, across Surprise Valley and the Warner Range, and along Goose Lake into Oregon came the early pioneers in wagon trains. Here were the Indian wars, the story of which reveals little to justify pride in the part taken by the white men.

VARIED POLITICAL HISTORY

Modoc County has had a varied political history. It was once a part of the self-styled State of Deseret, which never obtained recognition by the Federal Government, then a part of Utah, later a part of Roop County, Nevada, and, in California, a part of Siskiyou before being split off as a separate county.

Surprise Valley is aptly named. Truly, the view of Surprise Valley from vantage points of the Hays Canon Range on the east or the Warner Range on the west is a surprise.

Early in the 1860's, the United States Cavalry was established at Fort Bidwell. The first store in Cedarville was established by Townsend, in 1865. After he was killed by the Indians, the store was sold by his widow to Wm. Cressler and John H. Bonner. The first road over the Warner Range, through Cedar Pass, was built by Bon-

ner. The grade from Cedar Pass down to Cedarville is an official historical monument known as the Bonner Grade. Judge E. C. Bonner, a well-known resident of Alturas, is the son of the pioneer John H. Bonner.

Geographically most of the county is in the Cascades, but east of Alturas and extending through the county from north to south, are the Warner Mountains. This is the most westerly of the basin ranges and its eastern front compares in ruggedness and picturesque-ness with the western front of the Wasatches in Utah, which is the eastern boundary of the Great Basin.

SURPRISE VALLEY CREATED

The Warner Range is an orogenic block elevated from a lava-strewn plateau and, at the time of its elevation, parallel depressions occurred on either side. On the west the depression is occupied by Goose Lake and the two forks of the Pit. On the east the depression, once a lake 70 miles long, 6 to 7 miles wide, and 550 feet deep, has been filled with silt and is now Surprise Valley. The remnants of the lake are three shallow playas, upper, middle, and lower alkali lakes. In very wet seasons these lakes may have as much as two feet of water. Most seasons they are dry.

Surprise Valley is connected with the rest of the county and California by a state highway which crosses the Warner Range at Cedar Pass, at elevation 6,350, and descends Cedar Creek to Cedarville.

East of Surprise Valley and parallel to it in the State of Nevada is the Hays Canon Range, another of the innumerable north and south basin ranges. Between the Hays Canon Range and the three playas in the center of the valley, the bench and valley land is dry, covered with sagebrush, and is used for grazing only. From the foot of the Warner Range to the three playas, the land is watered by the fairly abundant runoff from the Warner Range, which is usually held at the high altitude as snow until late

spring. This strip of land, some three to eight miles wide and 50 miles long, is fertile and productive.

PRODUCTS OF VALLEY

The products of Surprise Valley are grain, hay, alfalfa, potatoes, alfalfa seed, and livestock. The towns are Cedarville, at the foot of the Warner Range, where Cedar Creek and the state highway emerge, Eagleville, 15 miles south, Lake City, 10 miles north, and Fort Bidwell, 25 miles north.

Surprise Valley in Modoc County contains 60,234 acres of grazing land and 44,338 acres of irrigated farming land. Of the latter, in 1946, 7,911 acres were devoted to raising grain, 6,657 to alfalfa hay, and 13,595 to native or other hay crops. The balance is devoted to miscellaneous crops. There are 358 farm units in the area.

In 1946 the major shipments from the valley were: Cattle, live, 17,177; cattle, slaughtered, 1,684; hogs, slaughtered, 1,800; sheep, live, 20,000; sheep, slaughtered, 800; wool, 150,000 pounds; alfalfa seed, 100,000 pounds; baled hay, 3,000 tons.

Other products, not all of which are shipped out, are 302,149 pounds of butter, and 12,000 sacks of potatoes. The potatoes were produced on 60 acres. In 1947, the expected acreage of potatoes is 250.

BENEFITS OF NEW HIGHWAY

In addition to the products of Surprise Valley in Modoc County, the northeastern corner of Lassen County and northern Washoe County in Nevada, which formerly shipped via Gerlach, Nevada, now ship via Modoc's new highway and Cedarville. These areas comprise 1,400 acres of hay land and winter range for 30,000 cattle and 10,000 sheep. Also, the outlet for products of Warner Valley in Lake County, Oregon, is via Modoc's new highway and Cedarville.

Future extensions of the highway north and south will contribute greatly to the economic benefit of this highway to the areas directly served and to the whole State.



View of Modoc County's new Federal Aid Secondary Highway taken about six miles north of Cedarville, looking north. Upper Alkali Lake is on right and the Warner Range is on the left

The effect of the construction of this highway on Cedarville is very pronounced. New business establishments have been built, old ones renovated and expanded, and a great increase in all lines of business has been noted. As an illustration, 1946 commercial deposits in the Cedarville bank increased 23 percent over those of 1945.

The principal traffic movement in the valley is along the west side roads connecting with the state highway at Cedarville. All of the products of the valley are moved over these roads and the highway to outside markets and all outside necessities are brought in over them. The shipment of cattle by truck is particularly heavy in the fall and the west side county roads have frequently been in such a condition that the transportation trucks would not go beyond Cedarville and much loss of weight resulted when stock were driven to this point on the state highway.

MODOC TAKES INITIATIVE

Modoc County has long been ambitious to have an improved highway from Lassen County on the south, through Surprise Valley and on to the Oregon line, some 18 miles north of Fort Bidwell, a total length of about 65 miles. County officials have at times

nourished hopes that this west side road might some day become a state highway.

Modoc County has not been in the habit of sitting down and depending on wishful thinking to make her dreams come true. Back in 1938, without assurance of outside aid, Modoc County set out to grade a road between Cedarville and Eagleville to state highway standards. In 1939 the Federal Government offered the first direct aid to counties for construction of feeder roads leading from rural areas to a state highway. This aid had to be matched by the local agency and Modoc was prepared with the matching funds. As a result, two units were graded and surfaced in 1940. One was 4.6 miles, extending from Cedarville southerly toward Eagleville. The other was 10.9 miles long, extending from four miles north of Lake City to half a mile south of Fort Bidwell. These units were graded, graveled and surfaced with road-mixed gravel under contracts awarded and supervised by the Division of Highways.

STATE GIVES AID

The discontinuance of federal assistance to counties did not deter Modoc County. There were still 25

miles of unsatisfactory road between Eagleville and Fort Bidwell and the supervisors of the two districts did something about it. Partly by their own efforts and partly with the direct aid or supervision of the engineers of the Division of Highways these 25 miles were located to improved standards. With limited funds allocated for the purpose, over 15 miles of this was graded and drained and a gravel base was constructed by the end of 1945.

The final impetus came in 1945 when the Federal Highway Act of 1944 became effective. This act authorized the establishment of a system of federal aid secondary highways and provided for financial aid for their improvement over a period of three years beginning July 1, 1945. By the County Highway Aid Act of 1945, state funds were made available for matching these federal aid secondary funds. The State also provided financial aid to the counties in the form of an appropriation of \$90,000,000 commonly referred to as "Chapter 20 Funds." These funds were allocated to the counties for improvement of roads, for water supply, sanitation, and other special purposes. Of the amount allocated for road use, only \$75,000 did not require matching by local funds. The balance

required matching by local funds on a 50-50 basis.

ACTIVITY INCREASES

With this turn of the financial tide, activity in Modoc County for additional improvement of the Surprise Valley Road was revived. In the process of adopting a system of federal aid secondary highways in each county, this Surprise Valley Road from the Lassen County line to Fort Bidwell, 50.3 miles, was included.

As in the case of many counties in the State, Modoc County lacked the engineering organization to plan and supervise a project of such magnitude. Consequently, the Division of Highways was given the task of preparing the plans and supervising the construction of a 29.5-mile project which included the resurfacing of 4.6 miles.

Considerable attention was given by District II to the problems of these federal aid secondary projects in the several counties of the district. It seemed apparent that the success or failure of the principle of federal aid for this class of roads depended on the progress and success of the construction program. If the execution of this program lagged or failed for whatever cause its continuance seemed doubtful.

MODOC PROJECT

The urgent need for road improvement in the rural counties where local finances were so inadequate, and where engineering organizations were lacking, required the attention and assistance of the district if there was to be a demonstration of ability of these counties to take full advantage of the program. In those counties, including Modoc, where assistance from the district was welcome, major projects utilizing available funds for the three-year period were contracted in 1946. It has been amply demonstrated by Modoc and other rural counties that, with proper encouragement and some assistance, the problems of the trial period of this federal aid adventure into the rural communities is being met with great local benefit.

This Modoc project required completion of the grading and drainage construction of a gravel base and a plant-mixed gravel surface 20 feet wide and 2 inches thick. The streets of Eagleville and Cedarville were paved full width and, through Cedarville, curbs and gutters were constructed.



This photograph was taken south of Cedarville. The 10,000-foot Eagle Peak of the Warner Range is in the background.

All along the valley at the base of the Warner Range, gravel is abundant in the deltas at the outlets of the steep canyons and in the old lake shore deposits. Many of the road cuts are through gravel deposits. Approximately 90 percent of road grade, whether in cut or fill, consists of gravel. One of these deposits, about two miles north of Cedarville, was used as a source of mineral aggregate for plant-mixed surface.

CONTRACT TOTALED \$437,500

Bids for the 29.5-mile project were opened May 8, 1946, and the contract was awarded June 6th to D. Gerald Bing and E. B. Bishop. The cost of the project, including construction engineering, is \$437,500.50. This is financed by \$324,532 federal and state aid funds, \$101,168 Chapter 20 funds, and \$11,800.50 provided by Modoc County. The work done by the county in constructing grade, drainage structures, and gravel base has a value of approximately \$70,000.

Thus Modoc County, by its eagerness to help itself, earns and deserves its position as a leader among the

counties of the State in taking full advantage of the opportunity to obtain a road improvement of great benefit to the residents of Surprise Valley.

The contract for the project with D. Gerald Bing supervising the grading, and Paul Wilcox supervising the paving for E. B. Bishop was completed late in May. The Resident Engineer for the Division of Highways was Phil F. Duffy. H. C. Amesbury represented the district as Construction Engineer.

MILK GOES OVER RURAL ROADS

Old Bossy has stepped up production! Last year, some 34,677,000 tons of milk were hauled over rural roads on the journey to milk plants and dealers, according to a report from the Public Roads Administration.

She—"You not only have broken my heart, but you have spoiled my entire evening."

Irate wife (at 2:30 a.m.)—"I want an explanation and I want the truth."
Husband—"Which do you want first?"

Marysville-Yuba City Bridge Soon to be Completed

(Continued from page 21)

tion. When needed it is loaded onto a truck and trailer by means of a Lima "1001" Crane with 65-foot boom and capable of lifting 45 tons at 12 feet. The truck hauls the girders to the erection crane where they are picked up by a Manitowoc "3900" Crawler Crane with 83-foot boom (70 tons at 20 feet). After one girder is set in place a second crane, a Manitowoc "2000" Crawler Crane (25 tons at 12 feet) connects a transverse floor beam to the girder to provide lateral support in case of wind and holds it until the opposite girder is erected and landed.

One timber falsework tower is placed in each span to support the girder until the splices can be pinned and bolted to support the loads. The balance of the floor beams, brackets, lateral bracing and stringers are filled in as required or received.

The rivet gangs follow along as fast as possible. The contractor has not been able to get more than six rivet gangs working at once. All together there are about 80 men employed on the structural steel work.

Steel erection should be completed during June and the riveting about July 1, 1947.

A reinforced concrete deck is being placed on the structural steel. Deck form panels are prefabricated in a mill near the site and are trucked to the bridge. After the forms are adjusted and blocked, the reinforcing steel is placed. Then the screeds are set and concrete runways placed.

Concrete aggregate is manufactured from Yuba River gravel at Hallwood Gravel Plant and batch weighed at the L. L. Riee Plant in Marysville. The batched material is trucked to a two-cubic yard Mixermobile at the bridge where it is mixed and placed in two one-cubic yard buckets. A Bay City truck crane hoists the one-cubic yard batch to a hopper on top of the bridge. Concrete buggies transport the concrete to the section being placed, where it is deposited, struck off and finished. Curing is by water sprinklers.

The first deck concrete was placed May 12, 1947, and it is planned to complete the concrete work by August 1st. A steel railing will be erected on each side of the bridge. Electric street lights will be installed.



These photographs show narrow existing bridge across the Feather River connecting Marysville and Yuba City, which will be replaced by new structure

After the deck concrete has cured, the forms will be removed from underneath and the structural steel will be painted. The final coat will be aluminum paint.

The bridge will be complete September 1, 1947.

The structures were designed by the Bridge Department of the Division of Highways and the approaches by the District Office in Marysville. Harry Carter was Resident Engineer on the Substructure and the author is Resident on the Superstructure. The Contractor is J. H. Pomeroy & Co., Inc., of San Francisco.

Father—"When I was a little boy I always ate the crusts of my bread."

Willie—"Did you like them?"

Father—"Of course I did."

Willie—"Then you may have mine."

A Bridgeman Tex got to the Pearly Gates. St. Peter told him he didn't have room for him. Tex thought a few minutes and said "St. Peter are any of my buddies there?"

St. Peter said, "Why sure."

Tex: "Would you mind sending in a message for me?"

St. Peter: "I'd be glad to."

Tex: "Tell them there's an overtime job in Hell."

A few minutes later there was a rush of bridgemen headed for Hell, with Tex about to follow.

St. Peter to Tex: "There's room now."

Tex: "I better follow them there, might be something in that rumor."

Sign on a display of tomatoes in a vegetable market: "Don't squeeze me till I'm yours."

U. S. 299 Improved to Facilitate Movement of Needed Lumber

By L. R. REDDEN, District Office Engineer

THE UNPRECEDENTED demand for lumber required for housing has given rise to a vast increase in the logging and lumbering industry in northwestern California during the postwar years. Numerous sawmills, both large and small, for producing lumber, plywood, shingles and other similar products have sprung up and are in production; and other mills are in the process of building.

Much of the hauling of the needed logs is being done over secondary roads, often where grades are steep and the roadbed narrow and winding. One of these roads is the state highway (U. S. 299) between Arcata on Humboldt Bay and Willow Creek, 44 miles easterly.

This route is the only feasible outlet to markets from a hinterland of per-

haps 2,500 square miles, much of which is virgin timber land. From this area it is estimated that 96,000,000 board feet of lumber were produced and hauled over this route during 1946. This amount of lumber would be enough to build some 9,600 five-room houses.

MAD RIVER BRIDGE

The importance of the log and lumber production of the area was recognized by the government during the war when a weak bridge on the route necessitated a detour of two miles over a very narrow, poorly surfaced county-constructed road in the State's Highway System. War restrictions prevented replacement of the weak bridge, but authority was received to improve the two-mile detour to provide a satisfactory facility for the transportation of logs. The replace-

ment of the weak bridge, which spans Mad River, is now under way.

The government further recognized the importance of the area's contribution to the war effort by authorizing in 1944 the resurfacing of a 5.1 mile section between Mad River Bridge and Blue Lake.

This route was taken into the highway system in 1915. The route of travel at that time was via Bald Mountain, which required several miles of out-of-direction travel. Following World War I, Humboldt County constructed a road along the present route to tap a vast area of untouched timber land. Construction followed the general route of the old Lord-Ellis trail, and it was inevitable that the new road would be known by the same name.



Logging trucks waiting to pass through highway widening operations on U. S. 299, east of Blue Lake



Typical of heavily loaded logging trucks crossing suspension bridge across North Fork of Mad River on U. S. 299. This route is used extensively in hauling logs from forest to mills in Humboldt Bay area

POOR SECTION OF ROUTE

For reasons that should be obvious, the name soon degenerated into the "Lord Helpus" Road. After its completion, the road was subsequently taken over and maintained as a state highway. Except for maintenance, oiling and elimination of minor bridges, the route has remained essentially as county constructed.

Surfacing on that part of the route between Blue Lake and Redwood Creek, a 16.4 mile section, fell into a bad state during World War II, due to unavoidably inadequate maintenance. The bituminous surface disintegrated so far that as much as 75 percent of the road consisted of no more than an unoled, rough gravel. In addition, the roadbed was narrow and curvature excessively sharp for the long logging truck and trailer combi-

nations using it. One particularly bad section contained three hairpin turns on 30-foot radius and 180 degree central angle. Maximum grades prevailed over much of the section. All these conditions made for hazardous driving, high maintenance of logging equipment, and slow speeds, all of which had the effect of preventing a badly needed increase in the output of logs reaching the mills on Humboldt Bay.

MOVEMENT OF LUMBER

In an effort to help expedite the movement of logs from forest to mill, Humboldt Bay logging interests appealed to the Federal Housing Administration during the summer of 1946 for funds to alleviate the most glaring of the deficiencies in the route. It was intended that the narrow roadbed would be widened to provide an ade-

quate 26-foot width for two lanes of traffic; that the sharpest turns, particularly the three hairpin turns, would be eased off so the logging trucks could get around them with less difficulty; and that the existing weak base and surfacing would be thickened, widened, and oiled to withstand the very heavy loads of logs being hauled over it.

By so doing, it was the belief of the logging interests that the improved road would encourage producers to increase their logging production as much as 40 percent during 1947, or from 96,000,000 board feet in 1946 to an estimated 132,000,000 in 1947.

FUNDS MADE AVAILABLE

As a result of the appeal, the Federal Housing Administration made available in August, 1946, the sum of

\$182,500. To this amount the State added a like amount, making a total of \$365,000 available for the improvement.

Due to the lateness of the season, and the urgency of getting the work under way as soon as possible, time was not available for the preparation of contract plans, and it was accordingly decided to proceed with the grading involved in the widening by using state forces. This was to be followed by a contract for furnishing and placing of base material, for which no formal plans were required. Upon the base material a double seal coat was to be constructed by state forces.

Work on widening operations got under way on the easterly 4.7 miles of the project between Redwood Summit and one mile east of Redwood Creek late in August, 1946. It was believed that this length was the maximum that could be improved before winter weather set in. Improvement of the three hairpin turns was undertaken first, as they were by far the most difficult places for loaded trucks to negotiate. Local realignments at each turn were made; on two of them the existing 30-foot radii were increased to 60 feet; on the third, a 45-foot radius was the maximum that could be obtained without very heavy cost.

PROJECT STARTED

Widening of the existing roadbed, varying from 0 feet to 10-12 feet, then continued on the remainder of the unit until completion of grading late in December, when weather conditions caused a shutdown in these operations.

The progress of the work was hampered to a considerable extent by the difficulty in obtaining both labor and equipment. It had been planned to overcome this anticipated difficulty by using, in part, prison labor from a nearby prison camp, but federal regulations prevented it.

Work on the contract for furnishing and placing the base material on the easterly 4.7 mile unit got under way early in November, 1946, and continued, with less weather delays than anticipated, to completion early in February, 1947. The material consisted of a mixture of river gravel and quarry rock, blended together during crushing and screening operations. The blended material was hauled to the grade and spread and rolled to a compacted thickness of seven inches,



Large logging trucks occupy much of the available roadway width in negotiating the numerous sharp curves and steep grades on this route

except that a thickness of nine inches was spread at the three hairpin turns.

With the completion of the base on the unit all construction work was suspended until the following season.

OPERATIONS RESUMED

Widening operations were resumed in early April, 1947, on the westerly 11.7 miles of the project, and are still under way. The operations are similar to those of the easterly unit, except on the westerly two miles where existing conditions generally are comparatively satisfactory, and it is planned to do no work other than constructing a seal coat.

On the westerly unit a contract for furnishing and placing base material is also under way, with the placing

following behind the completed grading. The contract also calls for the furnishing and stockpiling of screenings for the seal coat to be placed upon the base material. This phase of the contract is now complete.

Construction of the seal coat on the easterly 4.7 mile unit is now under way by state forces. Seal coating of the westerly 11.7 mile unit will be undertaken later in the season.

It is expected that grading operations by the State will be completed about August 1st. The placing of the base material by contract is scheduled for completion during the latter part of August; and the placing of the seal coat, which will complete the entire project, should be completed late in September.

The cost of the completed contract work on the easterly 4.7 mile unit was \$59,972; the contract bid for the westerly 11.7 mile unit is \$98,320. The total contract-performed work will cost, with contingencies, approximately \$160,000; and that work being done by state forces will cost approximately \$188,000. The balance of the available funds, or \$17,000, is reserved for contingencies and engineering.

W. C. Railing of Redwood City, California, is the Contractor for both contracts; J. G. Strand is the Superintendent for the State on the widening operations. L. L. Spinney is Resident Engineer for both the contract and state-constructed parts of the work. The project is located in the Eureka District of the California Division of Highways, for which C. P. Sweet is the Construction Engineer, and G. F. Hellesoe is District Engineer.

John L. Piper Retires

IN 1912, in the formative period of the State Highway Department, John L. Piper became an employee of the agency that was later to become the present day Division of Highways. On June 30th he will retire after 33 years of service. He has been district construction engineer for the division with headquarters at Marysville for the past three years.

Mr. Piper came to California in 1907 and went to Mexico for one year for the Southern Pacific Company on a railroad building project. He entered the employ of the State Highway Department in 1912 and with the exception of one year, which he spent in an engineering capacity in Stanislaus County, he has been employed continuously by the State. He was first stationed in Modesto, later transferred to Sacramento and then to Marysville.

Mr. Piper was married in 1913 to Agnes Macy of San Jose. They have two sons, Donald of San Francisco, and Lacey, an engineer with the Tidewater Associated Oil Company.

Mr. Piper will celebrate his sixty-fifth birthday on June 28. He and Mrs. Piper will move to Carmel to make their home.



Partially completed widening operations on U. S. 299 between Blue Lake and Redwood Summit. When completed an adequate two-lane roadway will be available

Ford Chatters Goes Back To Personnel Board

IN ORDER to accept appointment by Governor Earl Warren as a member of the State Personnel Board, Ford A. Chatters resigned as Secretary of the California Highway Commission. He was named for a 10-year term on the Personnel Board, of which he was a member from April, 1943, to February, 1946, during the absence of Harry Lutgens, who was on military leave.

Chatters is missed by all the

members of the Highway Commission. Since 1916, Chatters has been a newspaper publisher in Lindsay, California. He was a member of the Assembly of the State Legislature during the sessions of 1933 and 1935; is a former member of the State Board of Education; Past Commander of Lindsay Post 28, American Legion; and a past president of the California Newspaper Publishers Association. He served overseas in World War I.

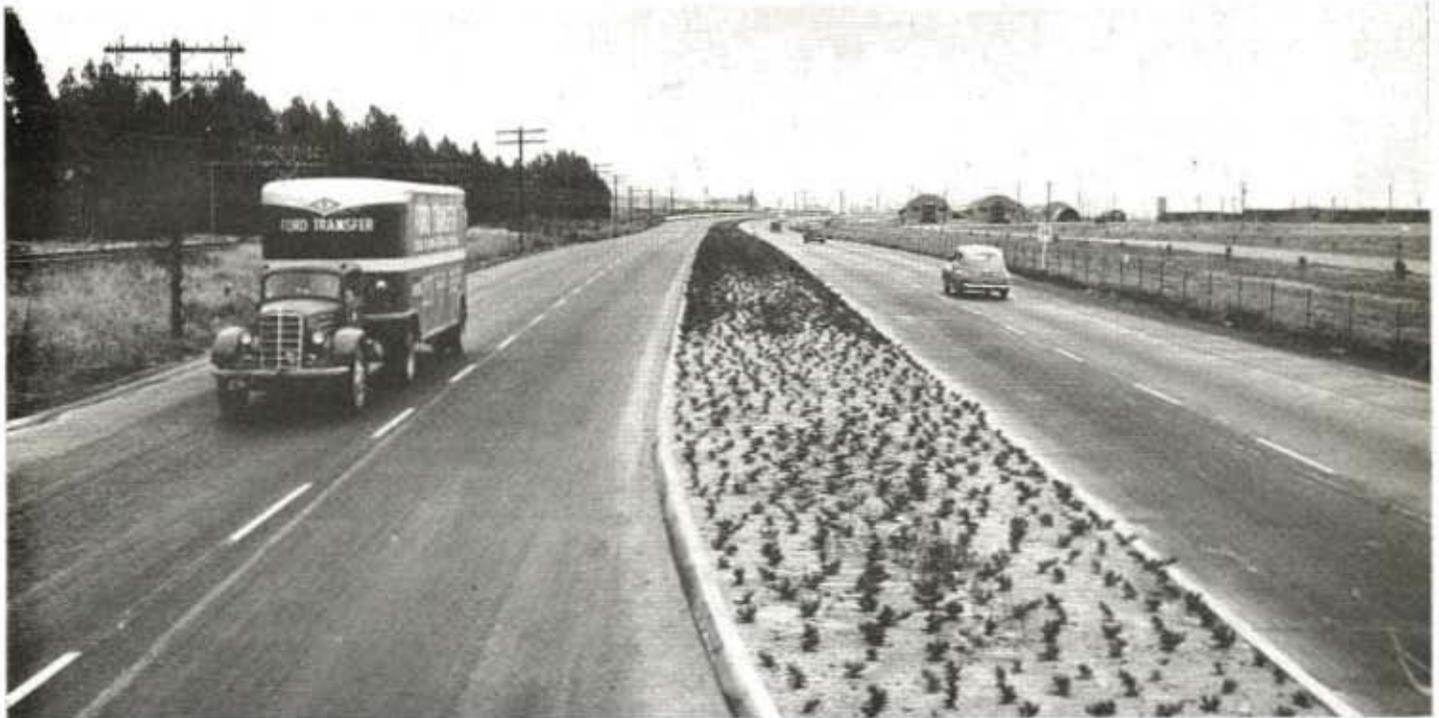
Thirty-Five Miles per Hour Speed Limit Solves Problem

(Continued from page 17)

ess of designing a progressive traffic signal system by which the speed and flow of vehicles can be more closely controlled. This system will control the speed of vehicles in the existing zone and will also extend northward

through the Cities of Millbrae, San Bruno and South San Francisco, and southward through San Jose. Time space diagrams are being prepared with a regulating speed as close as possible to the present 35 m.p.h.

When finally completed, the traveling public will be able to take advantage of a systematically controlled traffic flow extending along El Camino Real for a distance of 50 miles.



Looking south from Weather Station, Santa Margarita Valley, showing physical separation of lanes by means of curbs.

Modernization of Coast Highway

(Continued from page 5)

The spreader was adapted for the work by installing rubber tired wheels which supported the cut-off screed on the header boards and by disconnecting the vibratory mechanism. This gave positive control of the depth of spread as gauged by the header boards. Very accurate work was obtained by this method and no cutting or shaping of the subgrade was necessary after the spreading and rolling of the cement treated base.

The article in the previously mentioned issue of the magazine emphasized that the elimination of the cutting or shaping operation in placing cement stabilized base would add greatly to the quality of workmanship. The elimination of this operation was accomplished with the Barber-Greene adaptation, as described, and the method is now being used on other current contracts in this district.

SAVING OF EXPENSE

This method does not solve the problem of cutting or shaping where the water and cement are injected into the aggregate on the grade. Spreading and cutting in these cases will be given further study, although it is believed

that, in the future, this method of operation will not be used to any great extent.

In addition to the saving of expense to the contractor due to the decreased number of operations and lessened labor by using the Barber-Greene spreader, it is felt that the reduction in time for the complete cycle of operations as well as the higher standard of workmanship obtained due to the elimination of scars as a result of the cutting, adds greatly to the value of the finished base course and subgrade, insofar as the State is concerned.

Considerable difficulty has always been experienced in securing consistently good consolidation of concrete pavement along the header boards. This was due to dependence on hand spading and thereby the introduction of the human element with its high percentage of failures. A Blaw-Knox concrete spreader was used on the N. M. Ball contract, which carried a vibrating screed on the rear. Two three-fourths inch dowels about five inches in length were welded in a vertical position on the outer ends of this screed. These dowels projected into the freshly poured slab transmitting the vibratory action of the screed into the concrete along the edges, and entirely eliminated any rock pockets. The elim-

ination of two laborers ordinarily assigned to the hand spading resulted in a considerable saving to the contractor.

HEAVY TRAFFIC VOLUME

The anticipated decrease in traffic due to the termination of the war and partial cessation of manufacturing activities in the San Diego area has not been experienced and the new section of highway has continued to carry a volume of traffic far in excess of that estimated. With the continued influx of population into San Diego County, the need for expanding the Coast Highway capacity from Del Mar to Oceanside and a connection with the recently completed units is a necessity.

Studies and project reports are now being submitted for reconstructing those portions of this section which are not already a minimum four lanes in width to at least that standard. The areas which are congested to the extent where widening would be impractical are to be bypassed and the new locations are being given consideration for limited access standards.

The construction described and the studies and project reports in process are under the direction of E. E. Wallace, District Engineer, District XI, with headquarters at San Diego.



Upper—Old and new bridges. This view looking south over San Mateo Creek. New bridge on right, old existing structure on left
Lower—Oceanside grade separation, showing three planes of travel

In Memoriam

Arthur Smith Moore

IN A LITTLE over six months after Arthur Smith Moore retired from state service, he was called to the Great Beyond.

Art Moore was born on September 5, 1876, in the little town of San Juan Bautista in San Benito County. His first enterprise was a thriving merchandise store in San Juan, which he operated with his brother.

Seeking wider fields for his endeavors, he first entered state service as a minute clerk in the Legislature in 1913, where he faithfully performed his duties for two sessions.

In 1915, he entered the Highway Department in what was then Division V as a subforeman and helped build the old San Juan Grade. He immediately advanced to what is now known as timekeeper and then to foreman, with headquarters at Salinas. He then transferred to Division IV, where he held the foreman's job at San Mateo where he raised his family.

With the creation of the offices of superintendents, Art Moore took over the Hayward territory, where he stayed until transferred to Ukiah in 1930. In 1934, when the county roads were taken over, he was transferred to Petaluma, where he stayed until his retirement on October 1, 1946, after 33½ years of service.

While recovering from an operation in 1926, he met and married his nurse, Mae Moore, who now survives him.

He was a charter member of Golden Gate Chapter No. 5 and its first delegate to the first CSEA Convention held in Sacramento. He was a Past Master of Texas Lodge No. 46, F. & A. M., a member of the Scottish Rite Bodies in San Mateo, and a member of Islam Temple, A. A. O. N. M. S. He was very active in Masonic affairs and was buried with Masonic honors, with his timekeeper-clerk of recent years officiating.

Death came suddenly on April 12, 1947. The services were held in Mount Funeral Chapel, Petaluma, and his ashes repose in Cypress Lawn Cemetery.

The mortality of mankind is but a part of the process of living—a step on the way to immortality.—Dying, to the good man, is but a brief sleep, from which he wakes to a perfection and fullness of life in eternity.—
Tryon Edwards.

James B. Dobson

IN THE death of James B. Dobson on February 24, 1947, his former fellow-employees on the San Francisco-Oakland Bay Bridge lost an old and esteemed friend.

Mr. Dobson was employed as a laborer on the Bay Bridge shortly after its opening date and remained there until he resigned on January 7, 1947, because of poor health. His ready wit and sense of humor were famous throughout the Bay Bridge organization and were one of the reasons for his many friends.

He was born in Philadelphia on September 30, 1893. As a young man he was engaged several years in railroad work, followed by a short period of garage work just prior to World War I.

Mr. Dobson enlisted in the Army on June 4, 1917, and served as a sergeant throughout his entire enlistment period. He served in France in Motor Truck Company No. 381 and was discharged from the Army in June 1919.

After his war service, Mr. Dobson worked as a chauffeur and truck driver for a number of years until February, 1933, when he was first employed by the Division of Highways. For several years he was employed intermittently by the Division until permanently appointed at the Bay Bridge on March 17, 1937.

Mr. Dobson was a member of Crockett Lodge No. 139, F. and A. M., San Francisco.

George Harry Nutting

THE DIVISION of Highways was saddened by the death of George Harry Nutting, who passed away April 27, 1947, following a heart attack.

Harry Nutting was born September 24, 1894, in Yolo County, California, and received his education in the public schools. He was a veteran of World War I and served overseas.

He entered the division's service on December 20, 1920, and in the short space of four years was appointed Maintenance Superintendent at Yreka, Siskiyou County, where he served until his death. The duties of a superintendent in those days were most exacting, and much depended on the inventive genius and untiring energy of the individual. Equipment was inadequate and money lacking for proper road improvement. Notwithstanding these handicaps, Harry—as he was known to everyone—rendered the public an outstanding service. His untiring efforts and innate honesty of purpose won the loyalty and confidence of both his fellow employees and the public.

The division has lost a faithful and valued employee, and takes this occasion to express deepest sympathy for his widow, Mrs. Marguerite Toms Nutting.

Fred George Knell

THE EMPLOYEES of the San Francisco-Oakland Bay Bridge announce with deep regret the sudden death of Fred George Knell at his home in San Francisco on February 9, 1947, at the age of 46 years.

Mr. Knell had been employed as a Toll Collector on the San Francisco-Oakland Bay Bridge since October 10, 1940. In all of his contacts and relations with his fellow employees and with the public, his keen sense of humor and helping hand were never known to fail, and especially during the turmoil of the war years, his aid was invaluable in lightening the burden of many trying situations.

He was born in San Francisco on January 16, 1901, the son of a pioneer family well known in the entertainment and musical circles of that city. For the greater part of his life he resided in the home town he loved so well and enjoyed living in the inimitable way characteristic of true San Franciscans.

Graduating from San Francisco Polytechnic High School in 1917, Mr. Knell was employed as a salesman for various firms in San Francisco and in Sacramento before his employment on the Bay Bridge. He was a member of Sacramento Lodge No. 40, F. & A. M.

Mr. Knell is survived by his wife, Ruby F. Knell, and his son, Frederick Gerald Knell of Los Angeles, to whom deepest sympathy is extended.

G. S. Johnson

GROVER Shirley Johnson, Highway Maintenance Foreman of the Division of Highways, with headquarters at Gilroy, in District IV, died suddenly on May 2, 1947.

Mr. Johnson was a native of Los Gatos and resided in Santa Clara County most of his life, with a short interval of time in which he served in World War I. He was a member of the American Legion Post 217, Gilroy.

Shirley was a faithful and trusted employee of the Division of Highways for 28 years and the principal portion of that time was spent in the maintenance of state highways in the southerly portion of Santa Clara County.

He will be greatly missed by those under whose direction he worked and by all others with whom he came in contact.

Surviving is his widow; also, two stepchildren, George Pimentel of Millbrae and Mrs. Evelyn Tate of San Francisco; and the following brothers and sisters: Gertrude Pimentel of San Jose, Eda Burke of San Jose, Joseph Johnson of San Jose, Albert Johnson of Salinas, Bessie Bowen of Gilroy, Walton Johnson of Gilroy, Mrs. Mabel Murray of Morgan Hill and Arthur Johnson of Red Bluff.

Highway Bids and Contract Awards for April and May 1947

April, 1947

ALAMEDA COUNTY—On San Francisco-Oakland Bay Bridge approach, right of way fence between Toll Plaza and Distribution Structure District IV, Route 5. Anchor Post Products, Inc. of California, San Francisco, \$4,577.29; The California Wire Cloth Corp., Oakland, \$4,055.56. Contract awarded to Cyclone Fence Division American Steel & Wire Co., Oakland, \$4,511.31.

COLUSA COUNTY—Across Sacramento River at Colusa, the existing bridge to be repaired. District III, Route 758. A. Soda & Son, Oakland, \$144,247.84; Johnson Western Co., Alameda, \$149,855; E. B. Bishop, Orland, \$189,565; M. & K. Corporation, San Francisco, \$204,009.50. Contract awarded to Lord & Bishop, Sacramento, \$136,165.

CONTRA COSTA COUNTY—Across Pacheco Slough near Avon, a steel plate girder swing bridge with reinforced concrete approach spans to be constructed. District IV, Route 797. Dan Caputo, San Jose, \$240,980; Guy F. Atkinson Co., South San Francisco, \$245,952.50; A. Soda & Son, Oakland \$248,999.54; H. F. Lauritzen, Pittsburg, \$256,034.22; United Concrete Pipe Corp., Baldwin Park, \$257,469; Fredrickson & Watson Const. Co., Oakland, \$263,033.70; Butte Construction Co., San Francisco, \$289,680.42; Healy Tibbitts Construction Co., San Francisco, \$297,290. Contract awarded to The Duncan-Harrelson Co., San Francisco, \$226,434.

FRESNO COUNTY—Between Fowler and Calwa Overpass, about 4.8 miles, to be resurfaced with plant-mixed surfacing and between 4.6 miles north of Kings County line and Mountain View Avenue, about 6.4 miles, portions to be widened with untreated rock borders and the entire length resurfaced with plant-mixed surfacing. District VI, Routes 4, 125, Sections B, A. Ted F. Baun, Fresno, \$111,085; Valley Paving and Construction Co., Fresno, \$117,140; R. M. Price Co., Huntington Park, \$115,180; M. J. Ruddy & Son, Modesto, \$132,138. Contract awarded to Gunner Corporation, Pasadena, \$107,885.

HUMBOLDT COUNTY—Between Greenlaw Bluffs and Scotia, about 3.2 miles, cement treated base to be constructed and surfaced with plant-mixed surfacing and seal coat. District I, Route 1, Section E. Mercer, Fraser Company, Eureka, \$90,832; Sheldon Oil Co., Suisun, \$93,824; Fairey-Hammond, Inc., San Francisco, \$98,635. Contract awarded to Clements & Co., Hayward, \$89,205.

TULARE AND KERN COUNTIES—Between Delano and 2.5 miles south of Earlimart, and between 2.1 miles east of Wasco and Famoso, about 8.3 miles to be surfaced with plant-mixed surfacing. District VI, Routes 4, 33, Sections A, D. Contract awarded to Griffith Company, Los Angeles, \$80,685.

KERN AND INYO COUNTIES—Between Indian Wells and Little Lake, portions, about 2.7 miles in net length, to be graded, surfaced with plant-mixed surfacing on imported borrow and a steel span bridge on reinforced concrete abutments to be constructed. District IX, Route 23, Sections E, G. Spencer Webb Co., Inglewood, \$275,802. Contract awarded to Basich Bros. Construction Co. & Basich Bros., Alhambra, \$199,539.

LAKE COUNTY—Across Kelsey Creek at Cobb, a reinforced concrete bridge and approaches to be constructed. District I, Route 89, Sections B, C. A. Soda & Son, Oakland, \$36,382.84; J. Henry Harris,

Berkeley, \$43,225.30; Piombo Construction Company, San Francisco, \$56,773. Contract awarded to Arthur B. Sirl, Santa Rosa, \$31,625.

LASSEN COUNTY—Between 2 miles north of Milford and Bird Flat, about 12.4 miles, to be surfaced with plant-mixed surfacing and shoulders to be constructed of imported borrow. District II, Route 29, Section D. Fredericksen & Kasler, Sacramento, \$128,780; A. Teichert & Son, Inc., Sacramento, \$137,665; Fairey-Hammond, Inc. & R. A. Farish, San Francisco, \$138,965; Isbell Construction Co., Reno, \$141,192.50; E. B. Bishop, Orland, \$175,000. Contract awarded to Clements & Co., Hayward, \$119,825.

LOS ANGELES AND ORANGE COUNTIES—On Firestone Blvd. between Pioneer Blvd. and Lincoln Avenue, about 5.9 miles to be resurfaced with plant-mixed surfacing and imported borrow to be placed on shoulders and bituminous surface treatment applied thereto. District VII, Route 174. Sections B, A. Sully Miller Contracting Co., Long Beach, \$87,775; Vido Kovacevich Co., South Gate, \$88,855; Oswald Bros., Los Angeles, \$89,145; Warren Southwest Inc., Los Angeles, \$94,092.50; J. E. Haddock, Ltd., Pasadena, \$95,547.50; Griffith Co., Los Angeles, \$96,305; W. E. Hall Co., Alhambra, \$106,860. Contract awarded to Jesse S. Smith, Glendale, \$86,200.

LOS ANGELES COUNTY—Between Citrus Avenue and Grand Avenue, about 1 mile in length, to be resurfaced with plant-mixed surfacing. District VII, Route 9. Section H. Jesse S. Smith, Glendale, \$8,630; W. E. Hall Co., Alhambra, \$9,432. Contract awarded to Griffith Co., Los Angeles, \$7,708.

LOS ANGELES COUNTY—On Santa Ana Parkway, at Euclid Avenue and at Marietta Street in the City of Los Angeles, two reinforced concrete box girder undercrossings and roadway approach embankments thereto to be constructed. District VII, Route 2. Vido Kovacevich Co., South Gate, \$266,140; W. J. Disteli, Los Angeles, \$274,283.55; Oberg & Cook, Gardena, \$265,448.10; J. E. Haddock, Ltd., Pasadena, \$283,238.35; Oberg Bros., Inglewood, \$291,833.30; The Contracting Engineers Co., Los Angeles, \$292,049; C. B. Tuttle Co., Long Beach, \$293,016.20; Carlo Bongiovanni, North Hollywood, \$296,452.33; Guy F. Atkinson Co., Long Beach, \$297,219.50; Peter Kiewit Sons Co., Arcadia, \$301,376; Winston Bros., Co., Los Angeles, \$303,863.50; Byerts & Dunn, Los Angeles, \$312,251.25. Contract awarded to Spencer Webb Co., Inglewood, \$253,089.70.

MADERA COUNTY—Across Fine Gold Creek about 34 miles northeast of Madera, a structural steel bridge to be constructed and about 0.2 mile of approaches to be graded. District VI, Route 962. Northup Construction Company, Long Beach, \$79,793; Taylor-Wheeler Commercial, Inc., Fresno, \$83,483.20; Charles MacClosky Company, San Francisco, \$85,924; Ted F. Baun, Fresno, \$86,062.50. Contract awarded to Dan Caputo, San Jose, \$78,799.

MARIN COUNTY—Between San Rafael and Waldo, about 2.1 miles in net length to be resurfaced with asphalt concrete and shoulders to be constructed with crusher run base and seal coat. District IV, Route 1, Section C. Brown-Ely Co., Contractors, El Cerrito, \$76,277.25; E. A. Forde, San Anselmo, \$79,158; A. G. Raisch Co., San Francisco, \$82,982.75; Chas. L. Harney, Inc., San Fran-

cisco, \$84,671.50. Contract awarded to Lee J. Immel, San Pablo, \$74,603.75.

MENDOCINO COUNTY—Between Hopland and Crawford Ranch, about 6.6 miles cement treated base to be constructed and surfaced with plant-mixed surfacing and seal coat. District I, Route 1, Section B. Sheldon Oil Co., Suisun, \$158,937; A. Teichert & Son, Inc., Sacramento, \$159,780; A. R. McEwen & C. M. Syar, Willits, \$160,408.50; Ted F. Baun, Fresno, \$160,590; Parish Bros., Benicia, \$176,073.50; Fairey-Hammond Inc. & R. A. Farish, San Francisco, \$178,187.50; M. J. Ruddy & Son, Modesto, \$178,386.50; Fredericksen & Kasler, Sacramento, \$180,187; Chas. L. Harney Inc., San Francisco, \$182,474; A. G. Raisch Co., San Francisco, \$190,713.75; Fredrickson Bros., Emeryville, \$199,336. Contract awarded to Clements & Co., Hayward, \$152,760.

MERCED COUNTY—Between Planada and 5.3 miles east, about 5.3 miles in length, untreated rock base to be placed over existing pavement and surfaced with plant-mixed surfacing. District X, Route 18, Section A. Frank B. Marks & Sons, Tracy, \$94,095; Browne & Krull, Palo Alto, \$98,859; Louis Biasotti & Son, Stockton, \$103,572.50; W. C. Railing, Redwood City, \$115,615. Contract awarded to M. J. Ruddy & Son, Modesto, \$84,373.

PLACER COUNTY—At Nevada Street and in the vicinity of East Street Undercrossing, a highway lighting system to be furnished and installed. District III, Routes 17, 37, Section B. Aub. H. W. Ruby, Sacramento, \$8,719.42. Contract awarded to L. H. Leonardi Electrical Construction Co., San Rafael, \$6,000.

PLUMAS AND LASSEN COUNTIES—Between 0.3 mile west and 0.8 mile east of Plumas-Lassen County line, about 1.1 miles in length, to be graded, surfaced with plant-mixed surfacing and seal coats applied thereto. District II, Route 29, Sections A, A. Piombo Construction Co., San Francisco, \$87,954.50. Contract awarded to Fredrickson & Watson Construction Co., Oakland, \$81,964.75.

RIVERSIDE COUNTY—Between 1.9 miles west of Palowalla and 3.9 miles west of Blythe, and between 3.6 miles north of Imperial County line and 1.8 miles south of San Bernardino County line, a net distance of about 12.3 miles to be repaired by placing road-mixed surfacing over the existing surfacing and a portion to be repaired with imported base material and road-mixed surfacing. District XI, Routes 64, 146, Sections E, ABCDE. Arthur A. Johnson, Laguna Beach, \$70,694; Geo. Herz & Co., San Bernardino, \$74,322; Tanner Construction Co., Phoenix, \$83,890. Contract awarded to MacArthur & Son, Palmdale, \$56,689.

SAN BERNARDINO COUNTY—At San Timoteo Creek and Santa Ana River on Waterman Avenue between Riverside-Redlands Road and Mill Street, two steel beam span bridges to be constructed and about 2.7 miles to be graded and surfaced with plant-mixed surfacing. District VIII, Route 712. George Herz & Co., San Bernardino, \$392,501.70; Spencer Webb Co., Inglewood, \$397,704.90. Contract awarded to Griffith Co., Los Angeles, \$372,811.65.

SAN DIEGO COUNTY—At Dulzura Creek about 5 miles south of Jamul, a net distance of about 0.3 mile to be graded and bituminous surface treatment to be applied, and a reinforced concrete bridge to be constructed. District XI, Route 200, Section B.

Northrup Construction Co., Long Beach, \$82,923; Walter H. Barber, La Mesa, \$86,957.65; Carroll & Foster, San Diego, \$99,711.50; Oberg & Cook, Gardena, \$103,450; Spencer Webb Co., Inglewood, \$105,711; O'Brien & Bell Construction Co., Santa Ana, \$110,781; E. S. & N. S. Johnson, Fullerton, \$114,209; C. B. Tuttle Co., Long Beach, \$122,471.90. Contract awarded to Griffith Co., Los Angeles, \$77,665.50.

SAN DIEGO COUNTY—In the City of San Diego, between "A" Street and 0.4 mile south of Mission Valley Road, about 2.9 miles to be planted and a sprinkling system to be furnished and installed. District XI, Route 77. Leonard Coats Nurseries, Inc., San Jose, \$71,624.92; Milton P. Sessions, Inc., La Jolla, \$78,635.88; Walter Anderson Nurseries, San Diego, \$112,775.64. Contract awarded to Jannock Nurseries, Altadena, \$68,683.40.

SAN JOAQUIN COUNTY—Between Middle River and Holt, about 4.4 miles to be surfaced with plant-mixed surfacing on untreated rock base. District X, Route 75, Section A. Asta Construction Company, Rio Vista, \$99,834; A. Teichert & Son, Inc., Sacramento, \$99,950; Louis Biasotti & Son, Stockton, \$109,867; Fredrickson & Watson Construction Co., Oakland, \$118,015.75. Contract awarded to M. J. B. Construction Co., Stockton, \$93,715.

SAN JOAQUIN COUNTY—Across Mokelumne River about 5 miles northwest of Lodi, a structural steel and reinforced concrete bridge to be constructed. District X, Route 901. Dan Caputo, San Jose, \$161,922; Charles MacClosky Company, San Francisco, \$167,883; Lord & Bishop, Sacramento, \$170,672; A. Soda & Son, Oakland, \$173,789.84; Fredrickson & Watson Construction Co., Oakland, \$178,848.05; Pomeroy Sinnock, Stockton, \$193,575; Maceo Corp., Clearwater, \$197,404; Butte Construction Co., San Francisco, \$230,815.35. Contract awarded to A. A. Edmondson & A. L. Miller, Sacramento, \$159,071.50.

SAN LUIS OBISPO COUNTY—Between State Route 137 and Rinconada-Las Pilitas Road, about 6 miles to be graded and imported base material placed thereon. District V, Route 1086. Frank T. Hickey, Inc., Los Angeles, \$57,057.20; Miles & Bailey & Harms Brothers, Madera, \$58,854.98; A. Madonna, San Luis Obispo, \$59,801.80; Brown-Doko, Pismo Beach, \$68,343.70; Silva & Hill Construction Co., Los Angeles, \$78,457.60; George E. Murray, Stockton, \$79,994.80; S. Edmondson & Sons, Los Angeles, \$87,030.70; Dimmitt & Taylor, Los Angeles, \$88,877.10; Henry C. Dalessi, San Luis Obispo, \$91,259.50; Bonadiman-McCain, Inc., Los Angeles, \$95,189.06; Rexroth & Rexroth, Bakersfield, \$97,452.50; Granite Construction Co., Watsonville, \$100,844.40. Contract awarded to Nathan A. Moore, San Gabriel, \$49,659.30.

SAN LUIS OBISPO COUNTY—On Oso Flaco-Nipomo Road, between Southern Pacific Railroad and 3.2 miles easterly, about 3.2 miles to be graded, imported borrow to be furnished and placed, bituminous surface treatment to be applied to central portion thereof and seal coat applied thereto, and penetration treatment applied to shoulders. District V, Route 683. A. A. Edmondson, Glendale, \$51,628.45; Brown-Doko, Pismo Beach, \$53,523.25; Browne & Krull, Palo Alto, \$55,316; Nathan A. Moore, San Gabriel, \$56,694.80; Frank T. Hickey, Inc., Los Angeles, \$59,354.20; MacArthur & Son, Palmdale, \$63,231.75; Dimmitt & Taylor, Los Angeles, \$67,711; Granite Construction Co., Watsonville, \$69,987.30. Contract awarded to A. Madonna, San Luis Obispo, \$50,890.70.

SAN MATEO COUNTY—On Bayshore Freeway in the City of South San Francisco, three bridges and the substructures for two

railroad overheads to be constructed. District IV, Route 68. Carrico & Gautier, San Francisco, \$421,905.35; Dan Caputo & Edward Keeble, San Jose, \$439,938.35; Carl N. Swenson Co., San Jose, \$457,544.20; Guy F. Atkinson Co., South San Francisco, \$465,861.60; Barrett & Hilp, San Francisco, \$473,308.20; Chas. L. Harney, Inc., San Francisco, \$492,925.80; M & K Corporation, San Francisco, \$498,159.35; Eaton & Smith, San Francisco, \$573,878. Contract awarded to Peter Sorensen and Harry J. Oser, Redwood City, \$412,331.55.

SANTA BARBARA COUNTY—Between 2.6 miles east of Buellton and Grand Avenue, about 2.3 miles in net length to be graded and surfaced with road-mixed surfacing on crusher run base. District V, Route 149, Section D. Granite Construction Co., Watsonville, \$121,607; Brown-Doko, Pismo Beach, \$129,272.25; A. Madonna, San Luis Obispo, \$130,274; N. M. Ball Sons, Berkeley, \$132,115.90; Frederickson & Kasler, Sacramento, \$138,575; Dimmitt & Taylor, Los Angeles, \$138,802; Heuser & Garnett, Glendale, \$152,444; L. A. & R. S. Crow, Los Angeles, \$156,204; George von KleinSmid, Bakersfield, \$160,046; Silva & Hill Construction Co., Los Angeles, \$174,002. Contract awarded to Frank T. Hickey, Inc., Los Angeles, \$119,782.95.

SANTA CLARA COUNTY—About 1 1/2 miles west of Merced County line, about 0.1 mile in length to be graded and bituminous surface treatment applied. District IV, Route 32, Section C. Contract awarded to Granite Construction Co., Watsonville, \$10,718.

SOLANO COUNTY—Across Pleasants Creek, Alamo Creek, and tributary to Putah Creek, between 1.5 and 14 miles northwest of Vacaville, 5 bridges to be constructed. District X, Routes 1106, 1108, 1110. Dan Caputo, San Jose, \$86,706; Erickson, Phillips & Weisberg, Oakland, \$88,860.20; Charles MacClosky Co., San Francisco, \$89,499; Chittenden & Chittenden, Auburn, \$93,451; Ted F. Baun, Fresno, \$98,413; A. L. Miller, Sacramento, \$99,186; Carl N. Swenson Co., San Jose, \$105,418; Klay-Bennett Construction Co., Palo Alto, \$109,721; E. H. Peterson & Son, San Pablo, \$119,269; Northrup Construction Co., Long Beach, \$119,328; Butte Construction Co., San Francisco, \$126,684. Contract awarded to G. M. Carr & Bati Rocca, Santa Rosa, \$85,420.

SOLANO AND SACRAMENTO COUNTIES—Repairing a bridge across Sacramento River at Rio Vista. District X, Route 53, Sections C. A. Evans Construction Co., Berkeley, \$6,991; Fred Kaus, Stockton, \$7,539; C. C. Gildersleeve, Marysville, \$9,778; A. Soda & Son, Oakland, \$14,830.84. Contract awarded to C. M. Allen, Fairfield, \$3,540.

SONOMA COUNTY—Between 3 miles north of Petaluma and 1 mile south of Petaluma, about 4 miles to be resurfaced with asphalt concrete and shoulders to be constructed with crusher run base and seal coat. District IV, Route 1, Section C. Brown-Ely Co., Contractors, El Cerrito, \$87,035.55; E. A. Forde, San Anselmo, \$97,911.75; Arthur B. Siri, Santa Rosa, \$109,633.31; M.J.B. Construction Co., Stockton, \$101,833; Chas. L. Harney, Inc., San Francisco, \$105,435.20; Lee J. Immel, San Pablo, \$108,344.60; A. R. McEwen and C. M. Syar, Vallejo, \$112,159.10. Contract awarded to A. G. Raisch Co., San Francisco, \$85,911.28.

STANISLAUS AND SAN JOAQUIN COUNTIES—About 8 miles northwest of Modesto, a steel bridge across Stanislaus River to be constructed. District X, Route 4, Sections B. A. Soda & Son, Oakland, \$353,765.84; Maceo Corporation, Clearwater, \$354,449; Erickson, Phillips & Weisberg, Oakland, \$355,353.90; Spencer Webb Co., Inglewood, \$383,586. Contract awarded to Fredrickson & Watson Construction Co., Oakland, \$341,807.82.

TEHAMA COUNTY—Between Mill Race Creek and Red Bluff, about 2.8 miles, to be graded, surfaced with plant-mixed surfacing on crusher run base and on existing pavement. District II, Route 3, Section D. Fredrickson Bros., Emeryville, \$130,127.30; H. Earl Parker & Clements & Co., Marysville, \$136,209.50; A. Teichert & Son, Inc., Sacramento, \$137,457.50; Fairey-Hammond, Inc., & R. A. Farish, San Francisco, \$139,854; A. A. Edmondson, Glendale, \$143,244.40; Browne & Krull, Palo Alto, \$145,461.50; N. M. Ball Sons, Berkeley, \$147,488.25; E. B. Bishop, Orland, \$184,294. Contract awarded to Morrison-Knudsen Co., Inc., San Francisco, \$123,009.25.

YOLO COUNTY—Between 1 1/4 miles north of Solano County line and Woodland, and between 3 1/2 miles north of Woodland and 1 mile south of Knights Landing, a net length of about 9.2 miles to be repaired with plant-mixed surfacing and seal coat. District III, Routes 7, 87, Section A, Wd. A. Sheldon Oil Co., Suisun, \$92,690; A. Teichert & Son, Inc., Sacramento, \$96,152.25; Fredrickson Bros., Emeryville, \$98,597; Frederickson & Kasler, Sacramento, \$114,053.70; Fairey-Hammond Inc. & R. A. Farish, San Francisco, \$117,558.25. Contract awarded to McGillivray Construction Co., Sacramento, \$84,128.75.

May, 1947

ALAMEDA COUNTY—Between San Miguel Avenue and Parkway in Castro Valley, about 0.4 mile, a storm drain to be constructed. District IV, Route 5, Section B. F. J. O'Shaughnessy, San Francisco, \$22,350.60; J. Henry Harris, Berkeley, \$25,057; Underground Construction Co., Oakland, \$25,491.35. Contract awarded to McGuire & Hester, Oakland, \$22,061.40.

FRESNO COUNTY—On Reed Avenue between Manning Avenue and Route 41, about 8 miles to be graded, plant-mixed surfacing to be constructed on bituminous treatment and penetration treatment applied to shoulders. District VI, Route 823. Louis Biasotti & Son, Stockton, \$208,966.50; F. Gunner Gramatky, Fresno, \$222,900; Brown & Doko, Pismo Beach, \$227,055.50; R. M. Price Co. & Rex B. Sawyer, Huntington Park, \$228,673.50. Contract awarded to A. Teichert & Son, Inc., Sacramento, \$206,530.50.

FRESNO AND KINGS COUNTIES—Across Kings River near Hardwick, a reinforced concrete girder bridge to be constructed. District VI, Route 623. Ted F. Baun, Fresno, \$145,179; O. B. Pierson, Beilflower, \$161,060; Charles MacClosky Company, San Francisco, \$171,789; Northrup Construction Co., Long Beach, \$178,435; Bent Construction Company, Los Angeles, \$183,670. Contract awarded to Klay-Bennett Construction Co., Palo Alto, \$141,867.50.

FRESNO AND MADERA COUNTIES—Across San Joaquin River and Overflow at Firebaugh, two steel beam bridges to be constructed. District VI, Route 811. A. Soda & Son, Oakland, \$285,674.84; Dan Caputo, San Jose, \$287,654; Erickson, Phillips & Weisberg, Oakland, \$303,006.30; Maceo Corp., Clearwater, \$308,210; Bent Construction Co., Los Angeles, \$314,314; Granite Construction Co., Watsonville, \$337,402.50; Fredrickson Bros., Emeryville, \$359,855.75. Contract awarded to Charles MacClosky Co., San Francisco, \$253,917.30.

HUMBOLDT COUNTY—Across Klamath River, at Weitchpec, the substructure for a bridge to be constructed and about 0.5 mile of approaches to be graded and surfaced with imported base material. District I, Routes 84 and 46. Sections B, CD. Mercer, Fraser Company, Eureka, \$299,644. Contract awarded to Clifford A. Dunn, Klamath Falls, Oregon, \$260,602.40.

KERN COUNTY—Between Muroc Junction and 6.5 miles east, about 6.5 miles to be surfaced with road-mixed surfacing. District IX, Route 58, Section B. Contract awarded to Basich Bros. Construction Co. & Basich Bros., Alhambra, \$30,265.

IMPERIAL COUNTY—Between El Centro and Brawley, about 13.1 miles to be graded and surfaced with plant-mixed surfacing on cement treated base. District XI, Routes 12, 26, Sections C, ECn, F, Imp. G., Brw. R. E. Hazard Contracting Co., San Diego, \$1,468,861.80; Winston Bros. Co., Los Angeles, \$1,482,930.80; Morrison Knudsen Co. Inc., Los Angeles, \$1,487,061; United Concrete Pipe Corp. & Ralph A. Bell, Baldwin Park, \$1,494,584.20; Fredericksen & Kasler and E. B. Bishop, Sacramento, \$1,553,599.70; Peter Kiewit Sons Co., Arcadia, \$1,603,847.30. Contract awarded to Basich Bros. Construction Co. & Basich Bros., Alhambra, \$1,431,227.80.

INYO COUNTY—Between Route 23 and Mono County Line, in Bishop between West City Limits and Route 23, and between Route 23 and Keeler, about 3.2 miles in length to be surfaced with road-mixed surfacing. District IX, Routes 76, 127, Sections A, Bis., C. Basich Bros. Construction Co. & Basich Bros., Alhambra, \$23,592; Oilfields Trucking Co., Bakersfield, \$24,287.50; Geo. E. France, Visalia, \$26,871.10. Contract awarded to Browne and Krull, Palo Alto, \$16,463.40.

INYO COUNTY—Near Bishop, on Warm Springs Road and Poleta Road, a net distance of about 4.4 miles to be graded and penetration treatment to be applied thereto and two timber trestle bridges to be constructed. District IX, Route 1070. Nevada Constructors, Inc., Reno, Nevada, \$119,545.33; Bonadiman-McCain, Inc. Los Angeles, \$138,481.40; MacDonald & Kruse and Hensler Construction Corporation, Glendale, \$143,176.20; Macco Corporation, Clearwater, \$156,139.10. Contract awarded to Basich Bros. Construction Co. & Basich Bros., Alhambra, \$117,702.20.

KERN COUNTY—On Comanche Drive, between State Route 58 and 3.3 miles southerly, about 3.3 miles to be graded, bituminous surface treatment to be applied to the central portion and penetration treatment to the shoulders. District VI, Route 884. Rand Construction Co., Bakersfield, \$40,387.40; Oilfields Trucking Company, Bakersfield, \$41,203.75; George von KleinSmid, Bakersfield, \$45,948; Griffith Company, Los Angeles, \$46,685.90; A. A. Edmondson, Glendale, \$48,273.30; Ted F. Baum, Fresno, \$49,729. Contract awarded to Rexroth & Rexroth, Bakersfield, \$36,734.

LOS ANGELES COUNTY—On Santa Ana Parkway between Aliso and Kearney Streets, interchange roadways between the Aliso Street Viaduct, Ramona Parkway and Santa Ana Parkway, to be graded and paved with Portland cement concrete and asphalt concrete. District VII, Route 2. Peter Kiewit Sons Co., Arcadia, \$213,358.25; J. E. Haddock Ltd., Pasadena, \$234,877.50; Griffith Co., Los Angeles, \$281,369.25; Mike Radich & Co., Burbank, \$281,697.85; MacDonald & Kruse-Hensler Const. Corp., Glendale, \$289,546.75. Contract awarded to Vido Kovacevich, South Gate, \$192,220.75.

LOS ANGELES COUNTY—On Santa Monica Boulevard, between Doheny Drive and La Brea Avenue, furnishing and installing traffic signal systems at 13 intersections and reconstructing traffic signal systems at two intersections. District VII, Route 162, Section A. Econolite Corp., Los Angeles, \$70,603. Contract awarded to C. D. Draucker Co., Los Angeles, \$63,930.

LOS ANGELES COUNTY—On Lakewood Boulevard, between Spring Street and Conant Street, about 0.7 mile in net length, existing shoulders to be reconstructed and surfaced

with plant-mixed surfacing. District VII, Route 168, Section A. Sully-Miller Contracting Co., Long Beach, \$30,907; Vido Kovacevich Co., South Gate, \$33,291; M. S. Mecham & Sons, Lynwood, \$35,251; Cox Bros. Construction Co., Stanton, \$35,677; Griffith Co., Los Angeles, \$37,072; Catalina Construction Co., Covina, \$38,789. Contract awarded to Jesse S. Smith, Glendale, \$30,354.

LOS ANGELES COUNTY—At the intersection of Rosemead Boulevard and Broadway, a traffic signal system to be furnished and installed. District VII, Route 168, Section C. Econolite Corp., Los Angeles, \$11,624; C. D. Draucker Co., Los Angeles, \$12,430. Contract awarded to Prescott Electric & Manufacturing Co., Los Angeles, \$8,400.

MERCED AND STANISLAUS COUNTIES—Between 3 miles north of Livingston and Stanislaus County line and between Modesto and Empire, a distance of about 8.9 miles to be resurfaced with plant-mixed surfacing. District X, Routes 4, 110, Section D. C. Frank B. Marks & Sons, Tracy, \$65,744.50; M. J. B. Construction Co., Stockton, \$74,352; E. A. Forde, San Anselmo, \$74,590. Contract awarded to M. J. Ruddy & Son, Modesto, \$60,968.50.

MODOC COUNTY—Between Lassen County Line and Canby and between 6.8 miles and 7.4 miles northwest of Canby, about 20.8 miles, to be repaired with crusher run base and seal coats. District II, Routes 28, 210, Sections A, A. W. C. Railing, Redwood City \$172,565.25; Fredericksen & Kasler and E. B. Bishop, Orland, \$183,023. Contract awarded to Harms Bros., Sacramento, \$148,631.50.

MONO COUNTY—Between Point Ranch and Bridgeport, about 2.8 miles in length, imported borrow to be placed over existing roadbed and surfaced with road-mixed surfacing. District IX, Route 23, Section I. Browne and Krull, Palo Alto, \$39,471; Basich Brothers Construction Co. and Basich Brothers, Alhambra, \$41,412; Nevada Constructors Inc., Reno, Nevada, \$47,219.50; D. Gerald Bing, Sacramento, \$58,120. Contract awarded to George E. France, Visalia, \$37,872.50.

MONTEREY COUNTY—Between Chualar and 3 miles north, between Salinas and Castroville, and between Werner Hill and Watsonville Junction, about 3.7 miles to be repaired by placing plant-mixed surfacing over the existing pavement. District V, Routes 2, 118, 56; Sections B, A, J. A. Teichert & Son, Inc., Sacramento, \$27,762. Contract awarded to Granite Construction Co., Watsonville, \$22,478.

NAPA COUNTY—On Silverado Trail between 4 miles northeast of Napa and Calistoga, about 4.7 miles to be graded and surfaced with crusher run base and armor coat and a reinforced concrete bridge to be constructed. District IV, Route 607. A. G. Raiser Co., San Francisco, \$120,883.50; Harold Smith, St. Helena, \$128,887; Asta Construction Co., Rio Vista, \$129,315; E. A. Forde, San Anselmo, \$130,750.25; A. R. McEwen & C. M. Svar, Willits, \$139,647.55; Edmondson & Miller, Sacramento, \$139,969.50; Louis Biasotti & Son, Stockton, \$152,637.50; Fredrickson Bros., Emeryville, \$156,353; J. Henry Harris, Berkeley, \$167,061.70; Pionbo Construction Co., San Francisco, \$224,789.50. Contract awarded to Geo. E. Murray, Stockton, \$118,496.50.

SACRAMENTO COUNTY—Between 12 miles east of Sacramento and Riley Street in Folsom, about 5.4 miles in length, plant-mixed surfacing to be placed over existing pavement and on portions of the project imported borrow to be placed on the shoulders. District III, Route 11, Section B. Pol. A. Teichert & Son Inc., Sacramento, \$56,532; McGilivray Construction Co., Sacramento, \$58,535; Fredericksen & Kasler, Sacramento, \$65,938. Con-

tract awarded to Harms Bros., Sacramento, \$56,023.

SANTA BARBARA COUNTY—Between 0.2 mile east of Park Place and Rancheria Street in the City of Santa Barbara, about 2.2 miles in net length, a four-lane divided highway to be graded and paved with Portland cement concrete on cement treated subgrade, other areas to be surfaced with plant-mixed surfacing on crusher run base and on imported borrow and a reinforced concrete bridge on timber piles to be constructed. District V, Route 2. United Concrete Pipe Corp. & Ralph A. Bell, Baldwin Park, \$968,034; J. E. Haddock Ltd., Pasadena, \$1,016,294.65; Guy F. Atkinson Co., South San Francisco, \$1,055,833.50; A. Teichert & Son Inc. & Dimmitt & Taylor, Sacramento, \$1,090,533. Contract awarded to N. M. Ball Sons, Los Angeles, \$877,917.50.

SAN BERNARDINO COUNTY—Across Day Canyon Flood Canal, approximately 5 and 7 miles east of Upland, two reinforced concrete slab bridges and approach work to be constructed. District VIII, Route 190, 9, Sections A, A. C. B. Tuttle Co., Long Beach, \$78,638.28; Geo. Herz & Co., San Bernardino, \$79,983.05; A. R. Coffey Co., Corona, \$82,897.85; Oberg Bros., Inglewood, \$85,875.20; Oberg & Cook, Gardena, \$89,834.30; E. S. & N. S. Johnson, Fullerton, \$91,807.50; Bonadiman-McCain, Los Angeles, \$97,103.10. Contract awarded to George W. Peterson, Los Angeles, \$72,884.30.

SAN BERNARDINO AND RIVERSIDE COUNTIES—Between east city limits of Upland and 0.6 mile east of Haven Avenue, between 2.4 miles and 0.3 mile west of Riverside, and between Panorama Point and Squirrel Inn, about 10.7 miles in net length to be repaired by placing plant-mixed surfacing and seal coat over existing pavement. District VIII, Routes 9, 19, 43, Sections A, A. A. George Herz & Co., San Bernardino, \$122,895.15; Griffith Co., Los Angeles, \$126,253.80; Jesse S. Smith, Glendale, \$129,874. Contract awarded to Match Bros., Colton, \$114,562.

SAN LUIS OBISPO COUNTY—For constructing a bridge across Steiner Creek. District V, California Polytechnic School, Rio Construction Co., Inglewood, \$10,445; Dinsmore & McCoy, Santa Barbara, \$11,730; Brown-Doko, Pismo Beach, \$13,305; A. Madonna, San Luis Obispo, \$13,475; Fred D. Kyle Co., Pasadena, \$13,700; Ted F. Baum, Fresno, \$13,800; Maimo Construction Co., San Luis Obispo, \$14,199.75. Contract awarded to O. R. Ochs & Son, San Luis Obispo, \$9,225.

SAN MATEO COUNTY—At Geneva Avenue near the San Francisco County line and in Brisbane near Visitation Avenue, portions about 0.6 mile in net length, existing pavement to be widened to provide channelization of intersections and traffic signal systems to be installed. District IV, Route 68, Section A. Eaton & Smith, San Francisco, \$79,717. Contract awarded to Chas. L. Harney, Inc., San Francisco, \$74,177.30.

SANTA BARBARA AND SAN LUIS OBISPO COUNTIES—Between Zaca and Wigmore and between 1½ miles south of Nipomo and Deleissigues Creek, a net distance of about 3.9 miles, portions to be repaired by placing crusher run base over the existing pavement and surfacing with plant-mixed surfacing, and portions to be repaired by placing plant-mixed surfacing over the existing pavement. District V, Route 2, Sections C, F. A. Madonna, San Luis Obispo, \$128,812; Granite Construction Co., Watsonville, \$144,274. Contract awarded to Brown-Doko, Pismo Beach, \$114,120.

SANTA CLARA COUNTY—Between Alameda County Line and Milpitas, about 1.0 mile to be repaired with crusher run base and asphalt concrete. District IV, Route 5, Sec-

tion A. A. J. Raisch Paving Company, San Jose, \$44,367.50; Leo F. Piazza, San Jose \$46,844.70. Contract awarded to A. S. Jones Napa, \$42,593.

SISKIYOU COUNTY—Across Cottonwood Creek and under the tracks of the Southern Pacific Company about 2 and 5.5 miles north of Hornbrook, respectively, a bridge and an underpass to be constructed. District II, Route 3, Section C. Carl N. Swenson Co., Inc. San Jose, \$339,347.50; Guy F. Atkinson Company, South San Francisco, \$383,040. Contract awarded to Ted F. Baun, Fresno, \$319,307.60.

SISKIYOU AND MODOC COUNTIES—Between Route 72, 3 miles north of Dorris and 4 miles west of Hatfield, about 15.6 miles to be surfaced with plant-mixed surfacing and seal coat, and between 2.4 miles north of Stronghold and Oregon State Line, about 7.2 miles to be surfaced with plant-mixed surfacing and seal coat and shoulders to be restored with imported borrow. District II, Routes 753, 210, Sections B, A. Sheldon Oil Company, Suisun, \$163,185; Frederickson & Kasler, Sacramento \$185,164.50; Harms Bros., Sacramento, \$185,725; The Utah Construction Co., San Francisco, \$193,237.25; Frederickson Bros., Emeryville, \$247,828. Contract awarded to Fairey-Hammond Inc. and R. A. Farish, San Francisco, \$159,675.

SOLANO COUNTY—Between Fairfield and 3.5 miles north and in Vacaville about 4.8 miles in length to be repaired by placing plant-mixed surfacing over the existing pavement. District X, Routes 7, 90, Sections C, Vac. & City St. Parish Bros., Benicia, \$35,965; C. M. Syar, Vallejo, \$37,906.20; Sheldon Oil Company, Suisun, \$38,780.75; Asta Construction Co., Rio Vista, \$39,245.50; J. Henry Harris, Berkeley, \$42,018.75. Contract awarded to Fredrickson Bros., Emeryville, \$28,277.

TULARE COUNTY—Across White River about 7 miles southeast of Earlimart, a reinforced concrete slab bridge to be constructed. District VI, Route 1130, Wm. E. Thomas Construction Co., Sacramento, \$15,950; F. Fredenburg, Temple City, \$16,290; O. B. Pierson, Bellflower, \$18,165; Ted F. Baun, Fresno, \$18,500; E. G. Perham, Los Angeles, \$18,687; Wheeler Construction Co., Oakland, \$23,700; Evans Construction Co. & Barton & Anderson, Berkeley, \$23,951.50. Contract awarded to E. H. Peterson & Son, Richmond, \$15,940.

TULARE COUNTY—Across St. Johns River, about 5.5 miles east and about 1.5 miles north of Visalia, two reinforced concrete slab bridges to be constructed. District VI, Routes 1136, 1138, Erickson, Phillips & Weisberg, Oakland, \$175,258; Ted F. Baun, Fresno, \$189,924; R. M. Price Co. & Rex B. Sawyer, Huntington Park, \$190,119; Dan Caputo, San Jose, \$198,497; Charles MacClosky Company, San Francisco, \$221,778. Contract awarded to Northrup Construction Co., Long Beach, \$147,415.

VENTURA COUNTY—Between Oxnard and Big Sycamore Creek about 5.7 miles in length to be resurfaced with plant-mixed surfacing and imported borrow to be placed on the shoulders and bituminous surface treatment applied thereto. District VII, Route 60, Section A. O'Brien & Bell Construction Co., Santa Ana, \$89,997.50; Ted F. Baun, Fresno, \$91,302.50; MacDonald & Kruse & Hensler Construction Corp., Glendale, \$98,187.50; J. E. Haddock, Ltd., Pasadena, \$98,745; Griffith Co., Los Angeles, \$104,180. Contract awarded to Baker & Pollock, Ventura, \$87,925.

VENTURA COUNTY—Between Ellsworth Barranca and Santa Paula about 4.0 miles to be resurfaced with plant-mixed surfacing, and imported borrow to be placed on shoulders and bituminous surface treatment

applied thereto. District VII, Route 79, Section A. Jesse S. Smith, Glendale, \$24,130; J. E. Haddock Ltd., Pasadena, \$29,506.25. Contract awarded to O'Brien & Bell Construction Co., Santa Ana, \$22,066.

YOLO COUNTY—Between Solano County Line and two miles south of Irrigation Canal about 8.9 miles in length, shoulders to be constructed of imported borrow. District III, Route 99, Section A. Browne & Krull, Palo Alto, \$24,911.50; Asta Construction Co., Rio Vista, \$26,570.50; Harms Bros., Sacramento, \$27,043; A. A. Edmondson and A. L. Miller, Sacramento, \$28,233.50; H. & D. Construction Co., San Anselmo, \$32,500; Biasotti Construction Co., Stockton, \$32,707.50; Chittenden & Chittenden, Auburn, \$39,080; J. Henry Harris, Berkeley, \$40,087.50. Contract awarded to McGillivray Construction Co., Sacramento, \$23,732.50.

CONTRA COSTA COUNTY—At Rodeo, between Sixth Street and Fourth Street, about 0.3 mile, existing pavement to be widened with asphalt concrete and shoulders to be constructed with crusher run base. District IV, Route 14, Section B. J. R. Armstrong, El Cerrito, \$10,946.82; Lee J. Immel, San Pablo, \$11,973; E. A. Forde, San Anselmo, \$13,987; J. Henry Harris, Berkeley, \$14,706. Contract awarded to Morgan Construction Co., Pleasanton, \$10,874.

HUMBOLDT COUNTY—Repairing and hauling steel truss members for future use as a bridge across Redwood Creek, about 30 miles east of Eureka. District I, Route 20, Section C. Modern Iron Works, Oakland, \$7,967; Moore Dry Dock Company, Oakland, \$8,780. Contract awarded to Osborne Engineering Company, San Leandro, \$4,820.

KERN COUNTY—Across Kern River, about six miles southwest of Bakersfield, a reinforced concrete slab bridge to be constructed. District VI, Route 575, A. R. Coffeen Co., Corona, \$93,498.15; C. B. Tuttle Co., Long Beach, \$105,004. Contract awarded to O. B. Pierson, Bellflower, \$83,325.

LOS ANGELES COUNTY—On Hollywood Parkway, between Vineland Avenue and Berkham Boulevard, about 1.8 miles to be graded and paved with Portland cement concrete and asphalt concrete, and a grade separation structure to be constructed. District VII, Route 2, Winston Bros. Co., Los Angeles, \$1,427,148; J. E. Haddock, Ltd., Pasadena, \$1,491,952.70; Guy F. Atkinson Co., Long Beach, \$1,494,587.25; United Concrete Pipe Corporation & Ralph A. Bell, Baldwin Park, \$1,496,189.50; James L. Barnes Construction Co., Santa Monica, \$1,518,981; Morrison-Knudsen Co., Inc., Los Angeles, \$1,550,731.50; Mike Radich & Co. & W. R. Shriver, Burbank, \$1,564,995.75; Griffith Co., Los Angeles, \$1,588,854.75; Bressi & Bevanda Constructors, Inc., Los Angeles, \$1,687,355.75. Contract awarded to Peter Kiewit Sons Co., Arcadia, \$1,327,527.90.

LOS ANGELES COUNTY—Between Whitaker Summit nine miles north of Castaic and Frenchman's Flat at Piru Creek, about 3.8 miles to be graded and surfaced with plant-mixed surfacing on untreated rock base. District VII, Route 4, Section H. Morrison-Knudsen Co. Inc., Los Angeles, \$1,499,817.99; Guy F. Atkinson Co., South San Francisco, \$1,718,553; Bressi-Bevanda Constructors, Inc., Los Angeles, \$1,724,544.50; Peter Kiewit Sons Co., Arcadia, \$2,088,257.75. Contract awarded to Winston Bros., Co., Los Angeles, \$1,468,303.50.

MARIN COUNTY—Across Lagunitas Creek in Samuel P. Taylor State Park, a structural steel and timber bridge to be constructed. District IV, Bos Construction Company, Oakland, \$8,654.23; Butte Construction Co., San Francisco, \$11,389.40; C. C. Gildersleeve, Marysville, \$11,650; Litchfield

Construction Company, San Rafael, \$13,668; H. & D. Construction Co., San Anselmo, \$14,152. Contract awarded to C. M. Allen, Fairfield, \$7,906.50.

STANISLAUS COUNTY—Across Tuolumne River about 6 miles east of Modesto, a reinforced concrete girder bridge to be constructed. District X, Route 912, Dan Caputo, San Jose, \$128,890; Butte Construction Co., San Francisco, \$166,813; S. C. Giles & Co., Stockton, \$215,333.22. Contract awarded to Erickson, Phillips and Weisberg, Oakland, \$128,141.00.

Courtesy of the Road

W. E. GRIFFITH & SON

Oakland 12, Cal.

Maintenance Department
Division of Highways
Sacramento, California

Gentlemen: The writer is pleased to forward this communication to you and make comment upon an incident which occurred on March 22d, at about 7 p.m. at a point midway between Willits and Ukiah, California.

While proceeding south near the Ridgewood Ranch, a tire blew out on my automobile and being the possessor of a National Automobile Card I deemed it expedient to call their local representative and with a flash-light signaled the first car going north. The situation was explained to the gentleman driving who made the statement that it would take about half an hour to drive to Willits, possibly an hour for the garage to get started and half an hour for the garage men to appear upon the scene. He stated that he would do better than that; he would be pleased to change the tire, and the writer, being a man well along in years (and not relishing the exertion), was very glad to accept this kind offer.

When the job was completed I asked the gentleman's name, and he stated that it was Oney Harmon, and that he was employed by the State of California in the Maintenance of Roads Department.

It seems fitting that Mr. Harmon's kind action should be conveyed to his superiors. Mr. Harmon was off duty and did this kind act on his own time. I am,

Sincerely yours,

H. B. CUTTING

State of California
EARL WARREN, Governor

Department of Public Works

Headquarters: Public Works Building, Twelfth and N Streets, Sacramento

CHARLES H. PURCELL, Director of Public Works
A. H. HENDERSON, Deputy Director

HIGHWAY COMMISSION

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C. ARNHOLT SMITH, San Diego
CHESTER H. WARLOW, Fresno

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T. E. STANTON, Materials and Research Engineer
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F. W. PANHORST, Bridge Engineer
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H. B. LA FORGE, Engineer, Federal Secondary Roads
L. V. CAMPBELL, Engineer of City and Cooperative Projects
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J. W. VICKREY, Traffic Engineer
E. R. HIGGINS, Comptroller
FRANK C. BALFOUR, Chief Right of Way Agent

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E. Q. SULLIVAN, District VIII, San Bernardino
S. W. LOWDEN (Acting), District IX, Bishop
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E. E. WALLACE, District XI, San Diego
HOWARD C. WOOD, Bridge Engineer, San Francisco
Oakland Bay Bridge and Carquinez Bridge

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SPENCER BURROUGHS, Attorney
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W. K. DANIELS, Assistant State Architect, Administrative
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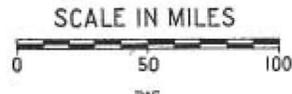
HEADQUARTERS

H. W. DeHAVEN, Supervising Architectural Draftsman
D. C. WILLETT, Supervising Structural Engineer,
School Buildings
CARLETON PIERSON, Supervising Specification Writer
FRANK A. JOHNSON, Supervising Structural Engineer,
State Buildings
C. A. HENDERLONG, Principal Mechanical and Electrical
Engineer
WADE HALSTEAD, Supervising Estimator of Building Construction

DIVISION OF CONTRACTS AND RIGHTS OF WAY (LEGAL)

C. C. CARLETON, Chief
FRANK B. DÜRKEE, Attorney
C. R. MONTGOMERY, Attorney

CALIFORNIA STATE HIGHWAY SYSTEM



~ LEGEND ~
 Primary Routes ———
 Secondary Routes ———
 Proposed Routes - - - - -

